Family **Noctuidae** Latreille, 1809

Subfamily **Noctuinae** Latreille, 1809

Tribe **Noctuini** Latreille, 1809

The ***Eugnorisma-Eugraphe*** generic complex

Taxonomy. The genus *Eugnorisma* was erected by Boursin (1946) and *Graphiphora insignata* (Lederer, 1853) was designated as type species. The name of the genus has ancient Greek origin and expresses the cognition of this taxon (gnorisma = proof; anagnorisis = recognition). The species belonging to this genus previously have been mentioned mostly as *Lycophotia* Hübner, 1813 (*partim*) and *Rhyacia* Hübner, [1821] 1816 (*partim*). It belongs to the tribe Noctuini (subtribe Noctuina) (Lafontaine & Schmidt 2010) and is closely related to the genera of the "*Gnorisma*-complex" (*Sinognorisma* Varga & Ronkay, 1987, *Protognorisma* Ronkay & Varga 1999, *Anagnorisma* Ronkay & Varga, 1999, *Schizognorisma* Ronkay & Varga, 1999, *Agnorisma* Lafontaine, 1998, *Prognorisma* Lafontaine, 1998, *Opigena* Boisduval, 1840, *Pseudohermonassa* Varga, 1990 and *Paramathes* Boursin, 1954), but *not* to *Protexarnis* McDunnough, 1929 and *Parexarnis* Boursin, 1946, etc. (= *Actebia* Stephens, 1829), as suggested by Boursin (1946, 1954). This group of genera is also related with a further complex of genera characterised by a sclerotised dentate ribbon at the apex of aedeagus, as in *Coenophila* Stephens, 1850, *Eugraphe* Hübner, 1821, *Goniographa* Varga & Ronkay, 2002, *Oligarcha* Varga, Ronkay & Gyulai, 1995, *Paradiarsia* McDunnough, 1929, *Protolampra* McDunnough, 1929, etc. *Ammogrotis* Staudinger, 1895 shows also some similar characters of male genitalia; however with presence of small plesiomorphic clavus which is exceptional in the subtribe Noctuina.

Lafontaine (1998: 20–21) discussed the taxonomic relationships of Noctuini/Noctuina genera and essentially confirmed these results. He outlined 9 larger, probably monophyletic "generic groups" of Noctuina, based on numerous imaginal and larval characters. The group (8), called "*Abagrotis* group" consists of 10 Nearctic/Holarctic genera: *Abagrotis* Smith, 1890, *Adelphagrotis* Smith, 1890, *Agnorisma*, *Parabagrotis* Lafontaine, 1998, *Prognorisma, Pronoctua* Smith, 1894, *Protolampra, Pseudohermonassa, Setagrotis* Smith, 1890 and *Tesagrotis* Lafontaine, 1998. It was also mentioned that the Palaearctic *Eugnorisma* and *Sinognorisma* (latter genus as an "autapomorphic *Eugnorisma*") should belong to the same generic group. Two new genera (*Prognorisma* and *Agnorisma*) have been erected and described by him, and this large and obviously rather heterogenous group has been subdivided (Lafontaine 1998: 171–172). *Agnorisma, Eugnorisma, Protognorisma, Anagnorisma, Prognorisma, Pseudohermonassa* and *Sinognorisma* are characterised by having a "field of spines at the apex of the aedoeagus" (i.e. carina) that does not extend onto the vesica. Thus, they have been separated from the sixth and seventh group of genera consisting *inter alia* of *Adelphagrotis, Coenophila, Eugraphe, Graphiphora, Parabagro-*

tis and *Setagrotis* in which a narrow, ribbon-like, eversible carinal bar ("spine band") is extending from the apex of the aedeagus onto the basal part of the vesica, similarly to *Xestia* Hübner, 1818 and other related genera. Surprisingly, the monotypic genus *Oligarcha* which was associated with *Eugnorisma*, also shows this obviously plesiomorphic character (see its presence in *Diarsia*), though in a specially modified configuration. Interestingly, in *Paramathes* both character states, the dentate sclerotised plate and the ribbon-like extension, are combined. In the diverse genus *Spaelotis* a special trend of modification of this structure can be observed, namely the separation of the distal part of the spine band as a subbasal cornutus or group of cornuti in the vesica.

The most relevant taxonomical characters mentioned by Lafontaine (1998) are briefly summarized below, with some comments concerning their taxonomical evaluation.

– In *Eugnorisma* and closely related genera the field of spines on the heavily sclerotised lamina of the carina ("apex of the aedeagus" sensu Lafontaine) is not "ribbon-like" and does not extend ventrally onto the vesica, as opposed to *Xestia* s.l., *Coenophila, Eugraphe, Oligarcha, Ammogrotis, Paradiarsia* and *Protolampra,* etc. However, it may be apparently reduced to a convex, bulbous sclerotisation (*Anagnorisma goniophora* and *A. zakaria*) or strongly reduced (*Eugnorisma trigonica*-group), may appear at the ventral surface as a single thorn (*E. chaldaica, E. kristenseni* and *E. spodia*), a hooked, flattened crest (*Schizognorisma fuscisignata*, *S. rhodostola*) or may be strongly prolonged apically, projecting inwards the basal part of the vesica (e.g. in certain *Eugnorisma* and *Protognorisma* species).
– The vesica is projecting ventrally (as in many other related genera, which is probably only a symplesiomorphy), but it may project dorsally just within a compact species-group as the *E. chaldaica*-group, where the three species have ventral tooth at the end of aedeagus, or projecting dorso-laterally in *Schizognorisma* where the hooked process is situated ventro-laterally.
– In *Eugnorisma* there are some shared characters of the vesica, e.g.:
(i) The large proximal diverticulum of the vesica with fine apical, not bulbed cornutus (contrasting, e.g. to *Eugraphe sigma*, furthermore *Goniographa* spp. as *G. marcida, G. decussa, G. funkei* and their sibling species, but also *Miniphila miniago* and *M. persago*, with bulbed cornutus on a rather short diverticulum, near to the corpus of vesica). Based on this character, the Central Asiatic *Goniographa* taxa seem to be more closely related to *E. sigma* (also strictly Palaearctic!) than to the Holarctic *Coenophila*.
(ii) The distal, more or less saccate spinulose field is close to the ductus ejaculatorius which is present also in *Protognorisma* but may be lacking in some species-groups and most of the related genera.
– It seems to be a general trend that the distal spinulose field of the vesica is lacking in those *Noctuini* groups in which the ventral, ribbon-like dentate sclerotisation of carina extends onto the ventrally projected vesica. In those groups, which share the ribbon-like dentate sclerotisation onto the vesica, e.g. *Paradiarsia, Coenophila, Eugraphe, Spaelotis,* etc., also *Xestia* s. l., the lack of the spinulose field generally appear as a plesiomorphic character, while in the other generic group, in which the carina shows the "*Eugnorisma*"-type but they do not have the distal spinulose field of vesica, this latter structure may be secondarily reduced, as in *Anagnorisma* and *Schizognorisma* and also in the subgenus *Metagnorisma* of *Eugnorisma*. These characters obviously correlate with the different "technics" of copulation.
– There is a "subapical process" (pseudopollex) on the ventral margin of the valva, which is derived from the "ventral angle of the valva" and is not homologous with the pollex of *Xestia* which is a ventral extension originating from the sclerotised base of the harpe ("clasper" in Lafontaine) that projects below the ventral margin of the valva. This pseudopollex of the *Eugnorisma*-group possibly represents a modified saccular extension, derived from the distal end of the sacculus (see *Protognorisma, Schizognorisma* and *Anagnorisma*). This is mostly evident in *Schizognorisma*, recognizable also in *Anagnorisma* and in a few other species of *Eugnorisma*. Furthermore, the scale-like vestiture of the pseudopollex is a synapomorphy of the *insignata*-group and the *trigonica*-group in *Eugnorisma* s. str. and it can be considered as subgeneric character of *Eugnorisma* s. str. On the other hand, species of the subgenus *Metagnorisma* do not have any pollex-like valval extension ventrally but have a posterior extension of the harpe (clasper) as in *Prognorisma*, although it is connected to the inner surface of the valva. The pollex or any pollex-like extension can also be reduced in several genera, *inter alia* in the diverse genus *Spaelotis* but also in the oligotypic *Pseudohermonassa* and *Graphiphora* and in the monotypic *Ammogrotis* and *Oligarcha* as a homoplasy.

Other characters used for the characterization of the genera of this complex:

- The third segment of the labial palpus: it is smooth in *Eugnorisma* and *Pseudohermonassa*, while *Prognorisma* and *Agnorisma* have a ventral tuft on it; in addition, one of the species of *Schizognorisma* (*rhodostola*) has well-developed ventral tuft on third segment, while the other one (*S. fuscisignata*) has it but smoothly scaled. The scaled second segment of *Eugnorisma*, *Schizognorisma*, *Anagnorisma*, *Protognorisma* and *Metagnorisma* is characteristically axe-shaped, only its width is variable, while the segment is elongate in *Oligarcha* and *Ammogrotis*, with more or less parallel dorsal and ventral margin. In *Spaelotis* the labial palpus has broad spatulate scales laterally, and longer scales ventrally forming fringe but without apical tuft.
- The shape of the uncus and its tip is apically flattened in *Agnorisma*, but it is flat, straplike in *Prognorisma*; and various in *Eugnorisma*. This character shows different states even by very closely related species, e.g. *Eugnorisma insignata* and *E. conformis*. Obviously, it may be useful for the characterisation of certain supraspecific taxa but it is probably without any phylogenetic significance, due to homoplasic changes (flattened apex) in different genera and species-groups (e.g. *Goniographa*, *Spaelotis*).
- The presence of signa is considered as plesiomorphic character, relatively rarely occurring in Noctuinae. The species of the Nearctic genera *Prognorisma* and *Agnorisma* have signa, four long signa in *Prognorisma* and two or four "prominent" signa in *Agnorisma*. In the Palaearctic groups: *Sinognorisma* has four long, ribbon-like signa, *Anagnorisma* may have more or less weak, partly interrupted signum stripes (more developed in *A. chamrani, A. eucratides, A glareomima* but reduced in *A. goniophora* and *A. zakaria*), *Protognorisma* and *Metagnorisma* have four modified, patch-like signa, in *Eugnorisma* s.str. and in *Schizognorisma* the signa are completely missing while *Haggettia* and *Afrognorisma* only have weak, spot-like signa. In the diverse *Spaelotis* signa are variably developed, most often traces of four signa are recognisable but in certain species-groups are reduced. Some other genera as *Pseudohermonassa, Paramathes, Opigena*, have well-developed stripe-like or string-shaped signa.
- Leg spining: *Eugraphe* has four rather than three rows of setae on the basal segment of mid- and hind tibiae, the others have three rows of setae. The appearance of this "fourth" row of spines is variable within the genus *Eugraphe* s.l., sometimes also within a single species (e.g. in *E. sigma*). Curiously, the holotype of *Schizognorisma rhodostola* has an additional "fourth-row spine" on the basitarsus of the left hindleg while the right hindleg has only three regular rows on the same segment. The genera *Eurois* and *Spaelotis* have a complete spining on both sides of the foretibiae but otherwise their closer relationship seems to be problematic.

Based on the analysis of the main taxonomic characters we follow Lafontaine (1998) who subdivided the "*Abagrotis*" group of *Xestiini* based on the structure of the carina. From the ten genera of the "*Abagrotis*" group the genera *Agnorisma, Prognorisma, Eugnorisma, Sinognorisma* and *Pseudohermonassa* proved to be more closely related to each other. This group will be completed with the following genera (Ronkay & Varga 1999): *Protognorisma, Metagnorisma, Anagnorisma* and *Schizognorisma*.

We consider *Protognorisma* as closely related to *Eugnorisma*, because they share a set of "eugnorismoid" male genitalia characters: dorsal, spinulose plate of carina, aedeagus with ventrally projected vesica, having a basal diverticulum with not bulbed apical cornutus and a spinulose terminal field, presence of a pollex-like process derived from a saccular extension etc. The external appearance and the female genitalia are, however, different. *Protognorisma* conserved the xestioid appearance, the presence of the ventral tuft on the third segment of the labial palp, the "eugnorismoid" male genitalia and the female genitalia with relatively simple structure of ductus and appendix bursae and with four signa on corpus bursae. The latter characters of the female genitalia come close to those of *Metagnorisma*: the broad, shield-shaped ductus, the not sclerotised and not ribbed appendix bursae and the presence of signa are the important shared characters. The shared characters of *Protognorisma* and *Metagnorisma* are, however, mostly plesiomorphic.

As opposed to *Protognorisma*, *Metagnorisma* can be mostly characterised by reductive apomorphies: lack of saccular process, lack of distal angle of valvae, reduced sclerotisation of carina, saccate form of vesica with more or less reduced distal spinulose field, combined with a nearly complete plesiomorphy

of female genitalia. The very special, shield-shaped ductus bursae however, which does not occur in any related genera, must be regarded as synapomorphy and crucial evidence supporting the sister-group relation of these genera.

The genera *Anagnorisma, Schizognorisma* and *Eugnorisma* share also a set of "eugnorismoid" characters. These are in male: the aedeagus with ventrally projected vesica, the lack of the ribbon-like elongate ventral sclerotisation of carina, on valvae the presence of the apical process and pollex-like distal processus of sacculus, the falciform harpe; in females: the strongly sclerotised tubular ductus. Other characters display a more mosaic-like distribution. The dorsal, spinulose plate of the carina occurs in typical form in *Anagnorisma* (all species) and *Eugnorisma* (most species); the carina is strongly modified in *Schizognorisma* with falcate and flattened ventro-lateral process, and also in one species-group of *Eugnorisma* (*chaldaica*-group with axe-shaped sclerotisation of carina). Basal diverticulum of vesica with not bulbed, acute apical cornutus is present in *Anagnorisma* and *Eugnorisma*, but lacking in *Schizognorisma*. Distal spinulose field of vesica occurs in *Eugnorisma*, but absent in *Anagnorisma* and *Schizognorisma.* The signa are varied, partly preserved in *Anagnorisma*, but often with a tendency of reduction (*Anagnorisma* partim, *Schizognorisma, Eugnorisma*).

Several groups display autapomorphic characters, as follows. In *Protognorisma*: the huge basal diverticulum of the wide, T-shaped vesica and the strongly developed saccular process; in *Metagnorisma* the rounded shape of valva, lack of the saccular and the distal process; in *Anagnorisma* the huge cornutus on the basal diverticulum; in *Schizognorisma* the falcate and flattened ventro-lateral process on the carina, the huge, ribbed vesica; in *Eugnorisma* the ribbed-folded ductus and rugulose appendix bursae; in the *chaldaica*-species-group the axe-shaped carina, in the *insignata*- and *trigonica* species-groups the saccular process is covered with scales. Other shared, mostly reductive characters can only be regarded as homoplasies, e.g. wide, saccate form and the lack of the distal spinulose field of the vesica, the reduction of the basal diverticulum and cornutus.

The monophyly or paraphyly of *Eugnorisma* (in connection with *Sinognorisma*) was discussed by Lafontaine (1998). He characterized the monotypic genus *Sinognorisma* as an "autapomorphic *Eugnorisma*" and suggested a possible paraphyly of the genus *Eugnorisma* sensu Varga & Ronkay (1987). He did not mention, however, any species-group taxa within *Eugnorisma* which could represent the sister-group of *Sinognorisma.* The latter genus has not only a "simplified vesica and enlarged saccus" as autapomorphies but has asymmetrical sacculi which is unique within all *Eugnorisma*-like supraspecific units and the whole male genital capsula is gigantic compared with the other members of *Eugnorisma* sensu lato; in addition, the female genitalia have four ribbon-like signa. This probably plesiomorphic character cannot be found within *Eugnorisma* but present, for instance, in *Protognorisma* and also in some *Eugraphe* species. Thus, *Sinognorisma* cannot be regarded simply as an autapomorphic *Eugnorisma*, but it represents an own, monotypic phylogenetic line with mosaic-like combination of plesiomorphic and autapomorphic characters.

The other major but more heterogenous group of genera is mostly characterised by the sclerotised, ribbon-like dentate carinal bar extending onto the basal part of vesica. They belong to the sixth and seventh group of genera according to Lafontaine (1998). Two of these genera, especially *Spaelotis* Boisduval, 1840 (incl. subgenus *Amphitrota* Warren, 1909) and *Graphiphora* Ochsenheimer, 1816, show closer relationship with the fifth, "*Noctua*-group" as already confirmed by Boursin (1955). The rather problematic position of this genus was already pointed out by Guenée (1852: 258) in his magnificent book on European Noctuidae expressed as follows: "*any distinctive characters have been found which would not be present in some other species of Agrotis*". Other genera, as *Coenophila* and *Goniographa,* could be more allied with *Xestia* s.l. These genera can be characterised by the presence of pollex on the ventral margin of the valve. The pollex is an extension of the harpe-ampulla complex that projects beyond the ventral margin of the valve as a heavily sclerotized finger-like process connected to the plate of the harpe by a sclerotized rod fused to the inner wall of the valve. Thus, it cannot be considered as homologous with the pseudopollex of the "*Gnorisma"* complex. Since this group is most probably paraphyletic and can be mostly characterised by some plesiomorphic traits which are discussed in detail in the systematic part of the book.

Zoogeography. The genera treated in this volume are biogeographically rather diverse: relic-like mono- or oligotypic genera with restricted distribution and widely distributed Palaearctic or even Holarctic groups also belong to this generic complex. Especially, the fauna of the monsoonic orobiomes of the Sino-Himalayan region displays an ancestral character with the occurrence of numerous mono- and oligotypic genera (Ronkay & Ronkay 1994; Varga 1996). The relic-like genera and species-groups of Noctuinae (e.g. *Palaeamathes, Paramathes*, *Hoeneidia, Perissandria,* and the *Raddea, Estimata*, *Erebophasma,* and *Spinipalpa* lineages of *Xestia* s.l.) and the bulk of the species of the large Noctuinae genera (*Diarsia, Xestia* s.l. and *Hermonassa*) belong to this faunal type. Thus, the importance of this SE Asiatic oro-arboreal faunal type is hardly to overlook in the genesis of the Palaearctic and Holarctic biota, respectively.

The phylogenetically oldest members of the 8th generic group of Noctuina (Lafontaine 1998, see details in the taxonomic chapter) are the *Eugnorisma*-related oligotypic genera (*Protognorisma, Anagnorisma, Schizognorisma, Oligarcha, Sinognorisma*) consisting of strictly localized, relic-like species, which mostly occur in mountainous regions of Eastern-Southeastern Asia with more or less intensive monsoonic influence. The genera *Anagnorisma*, *Schizognorisma* and *Protognorisma* belong to the most ancient lineages of this clade; their species occur in Central Asia and the wide sense Himalayan region. The genus *Anagnorisma* is most widely distributed and comprises five taxa from the western Himalayan region to NE. Iran: *A. eucratides* (Eastern Afghanistan, Hindukush Mts), *A. glareomima* (SE Afganistan: Nuristan), *A. goniophora* (W Himalayas: Deosai plains, Karakoram), *A. zakaria* (W Himalayas: Deosai plains) and *A. chamrani* (Iran: Khorasan, Binaloud Mts). The two sister species of *Schizognorisma*, *S. fuscisignata* and *S. rhodostola* have a restricted allopatric distribution in Kashmir, in the north-western Himalayan region. The *Protognorisma* species occur in the Indian Kashmir (*P. xestioides*), in Nepal (*P. fusca*: Ganesh Himal; *P. lineolata*: Langtang Himal) and in the SE frontier of the Tibetan plateau in China (*P. minjakonka*: Nord-Yunnan, Li-kiang). Other mono- or oligotypic Noctuini genera are restricted to the Tibet plateau and mountains of West China (*Oligarcha, Palaeamathes, Paramathes*, *Paraxestia,* and *Hoeneidia*).

While the ancestral, oligotypic groups of the "eugnorismoid" phyletic line (8th generic group of Noctuina, *Protognorisma, Anagnorisma* and *Schizognorisma*) remained restricted to the Sino-Himalayan area, the more derived *Eugnorisma* (s. str.) line could cross the "xeromontane filter" (Varga 1996) and, due to this achievement, could differentiate into subgenera, several species-groups and many species within the newly occupied adaptive zone. This process can be characterized also by the survival of some endemic species in well-defined areas of endemism of the Palaearctic semiarid orobiomes (e.g. the Kopet-Dagh, Tien Shan, Pamir and Hindukush massives) and by the secondary expansion of the "extant" species into the steppe and semi-desert zonobiomes, followed by speciation, as well. The most expansive species of the subgenera *Hologнorisma* and *Eugnorisma* s. str. could penetrate into the Southern Siberian – Turkestanian steppic areas and, thus, reach also easternmost Europe and Asia Minor while some species of the *Metagnorisma* line and *Afrognorisma* could reach the Iberian Peninsula and the Maghreb area. The circum-Mediterranean disjunctions of some relic-like *Metagnorisma* taxa (*M. arenoflavida, M. heuristica, M. hermannhackeri*) can be regarded as consequences of the Late Tertiary ("Messinian") aridity crisis.

The third important process of the biogeographical history of the "eugnorismoid" genera was the crossing of the "taiga"-filter ("*Rhododendron*-filter" in Varga 1996), which has resulted in the expansion into S Siberia, and, throughout the Beringian, also into the Nearctic arboreal zonobiomes, where also secondary differentiation processes have taken place in the genera *Pseudohermonassa* (three Palaearctic species + three Nearctic species), *Prognorisma* (*P. substrigata* in the Nearctic, *P. albifurca* in the E Palaearctic) and *Agnorisma.* Similar type of distribution can be observed also in the subgenus *Amphitrota* of *Spaelotis* where both widely distributed and more restricted species occur in the Nearctic. The bulk of *Spaelotis* (s. str.) species is Central Palaearctic, mostly in steppic and semi-arid montaneous regions. The most strictly localised taxa occur either in some eastern or Central Asiatic mountains (*S. sinophysa, S. deplorata, S. baltistana, S. nyctophasma*) while others are more widely distributed and represented by allopatric subspecies (*S. defuncta, S. restricta, S. scotopsis, S. spania*). Oppositely, the subspecific taxa of *S. senna* are typical for some southern European and West Asiatic mountains. The Trans-Beringian distribution, vicariance and speciation seem to be restricted to *Amphitrota* but otherwise rather widespread in some diverse genera of Noctuini, e.g. *Diarsia,* and several species-groups of *Xestia,* and related genera.

The biogeographically extremely interesting genus *Goniographa* belongs typically to the Turkestanian xeromontane faunal type with two main core areas of species in the western Tien Shan and in the Hissaro-Darvaz+Hindukush chains, respectively. Isolated endemic species occur also in Transcaspia and in the western Pamirs. The genus comprises three monophyletic species-groups sharing important synapomorphies in the genitalia of both sexes. The species-pair *Goniographa decussa–G. discussa* typically shows the differentiation between the western Tien Shan system (including Chatkal Mts, Susamyr Mts, Transili and Kungei Alatoo, Alai Mts) and the Hissaro-Darwaz system, Zeravshan Mts, and western Pamirs (including Badakhshan). *Goniographa funkei* shows a relatively extended distribution from the Zeravshan range, across the western Tien-Shan Mts (Turkestan Mts, Karategin range, Peter I. Mts, etc.), to the western parts of the Pamirs where it occurs sympatrically with *G. naumanni.* The other two members of this species "triplet" are more restricted, *G. metafunkei* to the western part of the Tien-Shan massif and the Alai Mts, and *G. naumanni* to the Hissar Mts, the western Pamir Mts (Shugnan range, Khorog) and the northeastern territories of Afghanistan (Prov. Badakhshan, Kadaghan and Darwaz Mts), respectively. The third species-group (pair!) shows a typically disjunct range: *Goniographa marcida* appears to be confined to the Kopet-Dagh mountain system, both in Turkmenistan and Iran (Khorassan region), and *G. gyulaipeteri* has a more extended distribution in the western Tien-Shan Mts, in the Hissar and Alai Mts, in the western Pamirs (Shugnan range) and also in northeastern Afghanistan (Badakhshan). The geographical pattern of sister species can be explained by allopatric speciation, without or with secondary overlap in marginal areas, mostly in the Hissaro-Darwaz system which seems to be a transitional area with overlap of different faunal elements. The geographical isolations are also thereby enhanced that they do not occur in lowland steppic or semi-desert areas.

The largest number of xeromontane and steppic species belong, however, to the subgenera of *Eugnorisma*. These exhibit a considerable variation in habitats, colouration and genital structures. Some of them show homoplastic characters as the lack of the cornutus in *Eugnorisma* (*Fakognorisma*) *enargiaris* and *E.* (*Eugnorisma*) *rafidain,* the appearance of a pale yellowish ground colour versus the greyish one in *E.* (*Fakognorisma*) *enargiaris, E.* (*Eugnorisma*) *variago, E.* (*Metagnorisma*) *heuristica*, etc. Some of the stenochorous species do not extend to the more cold-continental mountains of Central Asia (Tien Shan, Altai), e.g. *E. (E.) conformis* and *E. (E.) asad* does not occur either in the main chain of the Hindukush Mts. or in the NE (Badakhshan) edge of the country (Mts. Darwaz and the Pamir). At the same time, some expansive members of the genus which are widely distributed in the arid continental Central Asiatic Mts (*E. (E.) insignata, E. (E.) eminens, E. (Hologнorisma) puengeleri* and *E. (H.) mikkolai*) are able to reach the mountains of south-eastern Afghanistan (Nuristan) and even Kashmir (NW Pakistan and Himachal Pradesh in India), too. Other species have a southern limit in the cold-continental NE Pamir and the Hissaro-Darwaz region (*E. (E.) deleasma, E. (E.) variago*). Others do not occur southwards from the Alai and western Tien Shan Mts (*E. (H.) spodia, E. (H.) chaldaica, E. (H.) ignoratum, E. (E.) gaurax, E. (E.) variago*). The most curious disjunction connected with subspecific differentiation (Eastern Afghanistan, the Kopet-Dagh Mts and the Transcaspian steppes) was observed in *E. (H.) atrabaelbops*, a locally frequent species of medium altitudes. From the Central Asiatic species only *E. (H.) tamerlana* shows an adaptation to desert habitats (in Transcaspia, Turkmenistan and Uzbekistan).

The evolution and distribution of the subgenus *Eugnorisma* s.str. (with scales on the pseudopollex) has a particular importance. It seems that this group also differentiated in the semi-arid mountains of Central Asia, perhaps mostly in the western Tien Shan, where special types of xerophilous broad-leaved forests grow ('apple-forests'). One part of these species — the *trigonica* group — remained only in the arid-semiarid high mountains. The distribution of the more recently dispersed, 'successful' species, *E. (E.) trigonica* covers nearly exactly the entire area of the purely allopatric species-pair *E. (E.) gaurax–E. (E.) deleasma.* The latter show a marked tendency for evolving into geographically isolated endemic races: *E. (E.) deleasma reducta* – E. Hindukush, *E. (E.) deleasma hissarica* – Hissaro-Darwaz Mts, *E. (E.) deleasma deleasma* – Pamirs. The distribution of the taxonomically isolated, mostly localised and scarce species, *E. (E.) jubilans*, is obviously only insufficiently known. The other part of the species — the *insignata* group — is more vigorously differentiated; one species, *E. (E.) insignata* is also widely distributed in the steppe areas. This species shows a curious subdivision of colour morphs. The forms '*columbina*' and '*leuconeura*' are fairly common in some mountains of Eastern Anatolia and Armenia, while the populations of the

Kopet Dagh (*'pallescens'*), of the Tien Shan system, Southern Siberia and Mongolia (*E. (E.) insignata insignata*) are strictly monomorphic. The most conspicuous species of this group, *E. (E.) rafidain,* shows a western, localized distribution in the Kurdistan triangle of Turkey, Iraq and W Iran, and Farsistan (West Iran), respectively. Its genital configuration suggests that the subgenus *Metagnorisma* can be derived from a similar but more ancient western wave of dispersal, passing an important biogeographical filter during the Messinian aridity crisis as a consequence of the xerophilization of the Eastern Mediterranean vegetation. The most typical habitats of the *Eugnorisma* species are arid or semi-arid mountains with xerophytic vegetation, often covered with loose stands of scrub-like sclerophyllous forests or scrubs (e.g. hard-leaved *Quercus, Juniperus,* different *Rosaceae,* etc.). The most expansive species populate different types of mountainous and table-land steppes, from Mongolia to easternmost Europe (Volga region) and Asia Minor. However, they only exceptionally occur in the lowland steppic areas of Eastern Europe.

The *Metagnorisma* species show reductional tendencies in the male genitalia and they are connected to semi-open xeric arboreal habitats. It seems to be evident that their dispersal into the W Palaearctic and their connection to (at least partly) xerophilous forest or scrub-forest habitats depends closely on each other. The *Metagnorisma* species represent the more ancient speciation wave of this subgenus, are obviously relict-like ones (*E. (M.) arenoflavida* in SW Europe and (*E. (M.) jomooseri* in NW Africa, *E. (M.) heuristica* and *E. (M.) hermannhackeri* in Asia Minor and North Iran, and *E. (M.) deserta* in the Transcaspian mountains). The more continuous, Ponto-Mediterranean distribution of *E. (M.) pontica* with peripheral subspeciation in the Armenian plateau and W Iran may be a more recent (Upper Pleistocene and postglacial) phenomenon; similarly to the formation of the nearly continuous European range of *E. (M.) depuncta* from a Ponto-Caspian arboreal center. The expansion of *E. (M.) depuncta* must have taken place before the Litorina transgression, because the species could reach the British Isles and S Scandinavia before the major Holocene re-forestation and the expansion of the humid, closed, broad-leaved forests of *Carpino-Fagetea* which have begun in the Atlanticum. *Eugnorisma (M.) arenoflavida* and *E. (M.) joomoseri* (latter in Maghreb) do not represent peripheral isolates of this very young postglacial expansion but they belong to an earlier stage of the evolution of the subgenus, lacking the connection to the Eastern Mediterranean relatives.

The occurrence of some Central Asiatic – South Siberian species, as *Eugnorisma (H.) chaldaica, E. (H.) ignoratum, E. (H.) mikkolai, E. (E.) insignata* at the easternmost steppe belts of Europe can be regarded as another recent distributional phenomenon, connected to the postglacial history of the zonal steppe biome. On the other hand, it is a well-known phenomenon, that zonally distributed plant and animal species of the E-SE steppe zone can be derived from relatives inhabiting the mountainous steppe (xeromontane) habitats of the vast Central Asiatic Mts.

From this review we can conclude that the size of the area of *Eugnorisma* species does not show any close connection to the subspecific differentiation. It seems that the separation of subspecies is mostly a consequence of the area regression (i.e. refugial versus peripheral isolation). This process is often connected with allopatric speciation, as in two pairs of closely related species: *E. (M.) depuncta – E. (M.) arenoflavida*, *E. (E.) gaurax – E. (E.) deleasma* which are strictly allopatric. However, the sibling species are somewhat overlapping in three other cases (*E. (H.) spodia – E. (H.) kristenseni, E. (H.) eminens – E. (H.) atrabaelbops* and *E. (E.) insignata – E. (E.) conformis*); one member of each pair is polycentric-expansive and occurs also in higher altitudes, the other one seems to be restricted to the habitats of lower regions. Some *Eugnorisma* species are often abundant or even dominant species in their habitats (e.g. *E. (H.) chaldaica*, *E. (E.) insignata*, *E. (H.) eminens, E. (M.) pontica* in E Turkey, Armenia and W Iran; *E. (H.) eminens*, *E. (E.) insignata* and *E. (E.) variago* in NE Afghanistan; *E. (E.) asad* in NW Pakistan, etc.) but we know some species which have never been collected in larger numbers (*E. (M.) hermannhackeri*, *E. (M.) heuristica, Anagnorisma eucratides, A. glareomima*, *A. chamrani,* etc.).

Genus ***Schizognorisma*** Ronkay & Varga, 1999

Schizognorisma Ronkay & Varga, 1999, *Acta Zoologica Academiae Scientiarum Hungaricae* **45**(4): 366. Type species: *Richia fuscisignata* Hampson, 1903, by original designation.

Diagnosis. *Schizognorisma* is one of the most ancient lineages of the "*Gnorisma*" generic complex; its main diagnostic characters are as follows. Externally, the palpi may have well-developed ventral tuft on third segment (*S. rhodostola*); male antenna with short fasciculate cilia, that of female filiform, with sparse, fine cilia; tarsi have regularly three rows of spines on basal segment ventrally, occasionally additional spine may appear laterally; abdomen slender, long, cylindrical, dorsal crest reduced, anal tuft large; inner parts of the forewing cell not or only slightly darkened; and the hindwing may be white or whitish. One of the species (*S. fuscisignata*) has finely concave outer margin at forewing apex, being similar to the genus *Protognorisma* while the other one (*S. rhodostola*) is more similar to certain *Anagnorisma* (*A. zakaria*) or *Eugnorisma (Metagnorisma)* species (the *depuncta*-group) with its more rounded forewing apex, rosaceous brownish colouration and large stigmata. Wingspan 38–42 mm.

In the male genitalia, the carina of *Schizognorisma* has no strong dorsal plate but possesses long, hooked-falcate ventro-lateral process, the vesica is huge and ribbed, the subbasal cornutus is missing and the pseudopollex is acute, wedge-shaped, being close to the middle of the ventral margin of the valva. In the female genitalia, *Schizognorisma* has simple, broad but short ostium bursae, trapezoidal ductus bursae with strong, rounded postero-lateral lobes and the corpus bursae lacks the signa.

The comparison of the genitalia of *Schizognorisma* and *Anagnorisma* is given in the diagnosis of the latter genus.

Distribution. The genus seems to be restricted to a smaller area of the historical Kashmir (recently India: Jammu and Kashmir) and the Kaghan area (Pakistan), the two known species seem to be completely allopatric. The adults are autumnal; they are on the wing in September-October.

Schizognorisma fuscisignata (Hampson, 1903)

(Plate 1, Figs 1–2; Plate 34, Figs 1–8; gen. fig. 1)

Richia fuscisignata Hampson, 1903, *Catalogue of the Lepidoptera Phalaenae in the British Museum* **4**: 597, pl. 76, f. 15. Type-locality: Kashmir, Goorais Valley. Holotype: female, in coll. BMNH.

Diagnosis. *Schizognorisma fuscisignata* has, in comparison with *S. rhodostola*, narrower, apically more pointed, pale reddish-brown forewing with sharper, straighter crosslines, narrower stigmata with darker filling of reniform and pale whitish-ochreous hindwing of both sexes. *S. fuscisignata* differs from the externally also similar *Protognorisma* species by its larger size (wingspan 39–42 mm versus 29–36 mm, respectively), much paler (whitish-ochreous, not brownish-grey) hindwings, broader and less tapering forewing median area, straighter and whitish-ochreous defined antemedial and postmedial crosslines, etc.

The male genitalia of the two *Schizognorisma* species differ conspicuously, as *S. fuscisignata* has, comparing with those of *S. rhodostola*, broader distal section of valva, finer, more acute pseudopollex, slenderer harpe, larger, more falcate hook of the carina and the more ample, more recurved vesica.

The female genitalia of the two congeners are more similar but the antrum of *S. fuscisignata* is broader and less trapezoidal, and the sclerotised ductus bursae is proportionally larger, with more convex and anteriorly less tapering lateral margins than in *S. rhodostola*.

Distribution. Western Himalayan. The species occurs in the eastern (Indian) part of the historical Kashmir.

Schizognorisma rhodostola Ronkay & Varga, 1999

(Plate 1, Figs 3–4; Plate 34, Figs 9–12; gen. fig. 2)

Schizognorisma rhodostola Ronkay & Varga, 1999, *Acta Zoologica Academiae Scientiarum Hungaricae* **45**(4): 367, figs 7–10, 23–24, 36. Type-locality: Pakistan, Himalaya Mts, Kaghan valley, Tathabaya, 2200 m. Holotype: male, in coll. G. Ronkay.

Diagnosis. *Schizognorisma rhodostola* differs externally from its close relative, *S. fuscisignata,* by its broader, apically less pointed forewing with dark rosaceous brown ground colour, less distinct, more sinuous crosslines, larger, less darkened stigmata but with darker patch between them and the dark greyish brown hindwing. The underside of wings is also different in the two species, that of *S. rhodostola* being greyish white with stronger dark brown irroration (especially on the forewing) while the underside of both wings is pale milky ochreous in *S. fuscisignata.* Another externally similar species, *Anagnorisma zakaria*, is smaller in size (wingspan 36–38 mm, that of *S. rhodostola* 39–41 mm), having shorter, broader, red-brown forewing with ochreous irroration and the hindwing is also darker, greyish brown, not whitish-ochreous than in *S. rhodostola*.

The male genitalia of *S. rhodostola* differ from those of *S. fuscisignata* by their much narrower distal part of valva with more rounded cucullus, stronger, thicker, straighter pseudopollex, longer harpe, finer hook of the carina and by the smaller, less spacious vesica.

In the female genitalia, *S. rhodostola* has shorter, more trapezoidal ductus bursae with straight lateral margins and larger, stronger postero-lateral folded lobes while the ductus bursae of *S. fuscisignata* is longer and narrower, with arcuate lateral margins.

Distribution. A late autumnal species, the rather worn females collected in October were found together with the typical members of the winter fauna (e.g. *Himalistra* and *Meganephria* species). The habitats are steep rocky slopes with open Himalayan conifer woodlands and rocky grasslands at 2200–2500 m a.s.l. The imagines are attracted to artificial light. The distribution pattern of the twin species is probably allopatric, as *S. fuscisignata* was found in the more eastern (Indian) part of the historical Kashmir while *S. rhodostola* is known only from the Kaghan area.

Genus ***Protognorisma*** Ronkay & Varga, 1999

Protognorisma Ronkay & Varga, 1999, *Acta Zoologica Academiae Scientiarum Hungaricae* **45**(4): 356. Type-species: *Richia xestioides* Hampson, 1903, by original designation.

Diagnosis. *Protognorisma* belongs to a small clade, the sister-group of which is the *Eugnorisma* s.l. trunk. It differs from the externally most similar *Metagnorisma* by its more *Xestia*-like appearance with the apex more acute, and the outer margin slightly concave below apex. This colouration and wing pattern resembles also certain *Xestia* Hübner, 1818 species (e.g. *X. ochreago* (Hübner, 1790), *X. curviplena* (Walker, 1865), *X. brunneago* (Staudinger, 1895), etc.) but the genitalia of both sexes clearly show their distinctness. *Protognorisma* is smaller in size than the other externally similar genus, *Schizognorisma* (wingspan 29–36 mm versus 38–42 mm, respectively), having simple, sharper brown defined antemedial and postmedial crosslines, more sinuous subterminal line, broader and less dark filled reniform stigma, etc.

Head small, eyes large, rounded, palpi with distally strongly broadened second and very small, smoothly scaled third segment. Frons broad, smooth, with large, cap-shaped tuft projecting forward, vertex also smooth, with smaller tuft. Antenna of male ciliate with fasciculate cilia, dorsal surface of axis covered with scales, antenna of female filiform, with scarce, fine cilia. Basal tuft of antenna small, less prominent. Thorax slender, vestiture rather homogenous, collar unicolorous, medium-large. Tegulae less distinct, prothoracic tuft forming narrow crest, metathoracic tuft small. Tibiae of forelegs with 4–8 spines in a row at inner margin and two separate spines near apex on both margins, those of mid- and hindlegs with two rows of long 4 – 7 spines ventrally and ventro-laterally; basal segments of tarsi with three rows on

ventral side. Abdomen slender, cylindrical, relatively short, dorsal crest reduced, anal tuft larger, usually orange-brown. Forewing elongate, narrow, with apex pointed, outer margin slightly concave below apex. Ground colour regularly ochreous-brown with variably strong pinkish- or violaceous-brown suffusion, especially in median area. Ante- and postmedial crosslines simple, rather sharply defined, former oblique, almost straight, latter fine, slightly sinuous; median fascia broad, diffuse, greyish brown. Orbicular and reniform stigmata large, rounded, fully encircled, claviform rather large, apically rounded. Subterminal line wide, double, consisting of less sinuous, interrupted inner and more sinuous, continuous outer lines. Hindwing ochreous grey, suffused with brown, veins slightly darker; cilia ochreous, spotted with brown.

In the male genitalia, *Protognorisma* has, in comparison with the species belonging to the *Eugnorisma* subgenus, *Metagnorisma,* more elongated valva with well-developed apical extension and pseudopollex, and less expressed prolongation of basal part of harpe. The cornutus of the vesica is considerably larger, longer, and more acute, claw-like. The ample vesica has a saccate field of depressed fine spinulose structures. *Protognorisma* differs from *Schizognorisma* by the different shape of valva, less curved harpe, different carinal plate (being dorsally strongly sclerotised and serrate-dentate, lacking the large hook-like process being typical of *Schizognorisma*) and the armature of vesica, possessing large distal spinulose field and large pointed cornutus sitting on long subbasal diverticulum which are both missing from *Schizognorisma*.

Comparing the female genitalia of the two genera, ovipositor and the ductus bursae of *Protognorisma* are stronger in sclerotization, a rather strong medial fold may be present in the latter and the signa are more or less ribbon-like, their reduction into rounded patches is much less expressed than in *Metagnorisma.* The female genitalia of *Protognorisma* differ from those of *Schizognorisma* by the considerably longer and slenderer ovipositor, narrower, rather cordiform antrum and narrower, more tubular ductus bursae, smaller, more proximally positioned, partly ribbed-cristate appendix bursae, and the smaller corpus bursae having small signum patches.

Distribution. Himalayan-Sino-Tibetan.

Protognorisma xestioides (Hampson, 1903)

(Plate 1, Figs 5–6; Plate 34, Figs 13–15; gen. fig. 3)

Richia xestioides Hampson, 1903, *Catalogue of the Lepidoptera Phalaenae in the British Museum* **4**: 596, pl. 76, fig. 14. Type-locality: [India] Kashmir, Goorais valley. Lectotype: male, in coll. BMNH.

Diagnosis. *Protognorisma xestioides* differs externally from the other members of the genus by its narrower and longer forewings with more acute apex and more concave outer margin at termen, more variegated ochreous red-brown forewings with sharper defined red-brown crosslines, prominent broad darker brown shadow following subterminal line at inner side, and the narrower reniform stigma. Wingspan 33–38 mm.

The male genitalia of *P. xestioides* differ from all three congeners by the shorter vinculum, stronger dorso-medial process of juxta and the weakest dorsal carinal plate of the aedeagus. The harpe of *P. xestioides* is more medially positioned and proportionally longer, the apical fine process is smaller than those of *P. fusca* and *P. lineolata*; the apical valval section is broader, much less acute, the harpe is longer, broader and less pointed than in *P. minjakonka*.

Distribution. Himalayan. The known area of the species is restricted to the Indian part of Kashmir.

Protognorisma fusca (Hreblay & Ronkay, 1998)

(Plate 1, Figs 7–8; Plate 34, Figs 16–27; gen. fig. 4)

Eugnorisma fusca Hreblay & Ronkay, 1998, *in* Haruta, *Tinea* **15**(Supplement 1): 142, pl. 145, fig. 12, gen. figs 939, 942. Type-locality: Nepal, Ganesh Himal, near Godlang, 2520 m. Holotype: male, in coll. G. Ronkay (Budapest).

Diagnosis. *Protognorisma fusca* is the darkest and more concolorous species of the genus, with dark red-brown head, thorax and forewings, rather strong darker violaceous-brown suffusion in the median area and outwards subterminal line; the elements of the noctuid pattern is less prominently marked than in the other congeners. Wingspan 29–32 mm.

The male genitalia differ from those of the most similar *P. lineolata* by the broader vinculum, slenderer and longer harpe, more distally located pseudopollex and less convex costa; from *P. minjakonka* by the much broader and apically less acute valvae, shorter and less pointed pseudopollex, and the longer, distally thinner and more acute cornutus of vesica; from *P. xestioides* by the longer vinculum, weaker juxta, larger ventro-apical valval lobe and smaller pseudopollex, stronger dorsal carinal plate, larger cornutus of vesica, etc.

In the female genitalia, *P. fusca* has broader antrum, proportionally shorter ductus bursae and stronger ribbed appendix bursae than in *P. lineolata*; smaller and less triangular antrum, much shorter and weaker proximally less dilated ductus bursae and more proximo-laterally positioned, stronger ribbed appendix bursae than in *P. minjakonka*.

Distribution. Southern Himalayan. The species is known from Nepal only, mostly from different localities of the Ganesh Himal, but also from Kalinchok and Langtang areas.

Protognorisma lineolata (Hreblay & Ronkay, 1998)

(Plate 2, Figs 1–2; Plate 34, Figs 28–37; gen. fig. 5)

Eugnorisma lineolata Hreblay & Ronkay, 1998, *in* Haruta, *Tinea* **15**(Supplement 1): 140, pl. 145, fig. 13, gen. figs 938, 941. Type-locality: Nepal, Langtang Himal, near Chandrabari, 2860 m. Holotype: male, in coll. G. Ronkay (Budapest).

Diagnosis. *Protognorisma lineolata* is the sympatric sister-species of *P. fusca*. It differs from the latter species by its generally paler, more unicolorous brown forewings with more distinct red-brown crosslines and outlines of stigmata, and paler hindwings; from *P. minjakonka* by its darker, more red-brown shaded (less pinkish) forewing ground colour, less sharply defined crosslines and darker hindwings. Wingspan 29–34 mm.

The male genitalia of *P. lineolata* differ from all close relatives by the shortest and basally thickest harpe and the distally more dilated valva with strongly convex costa; the pseudopollex is more proximally positioned than in *P. fusca* and weaker than those of the related species.

The female genitalia can be distinguished from those of the most similar *P. fusca* by the slightly longer apophyses, more cordiform antrum, medially more constricted and proportionally longer ductus bursae, and the much weaker ribbed appendix bursae; from those of *P. minjakonka* by the much shorter and weaker antrum and ductus bursae, and the more proximo-laterally positioned, longitudinally ribbed appendix bursae.

Distribution. Southern Himalayan. *Protognorisma lineolata* occurs partly sympatrically with *P. fusca*; its area covers the Central part of the Nepalese Himalayan (Langtang, Ganesh Himal and Annapurna Himal) and the bordering Chinese regions (Tibet: Nyalam).

Protognorisma minjakonka Ronkay & Varga, 1999

(Plate 2, Figs 3–4; Plate 34, Figs 38–40; gen. fig. 6)

Protognorisma minjakonka Ronkay & Varga, 1999, *Acta Zoologica Academiae Scientiarum Hungaricae* **45**(4): 359, figs 3–4, 13–14, 27–28. Type-locality: China, Yunnan, Li-kiang, 4000 m. Holotype: male, in coll. ZFMK.

Diagnosis. *Protognorisma minjakonka* is similar externally to *P. fusca* and *P. lineolata,* differing from them by its paler, more pinkish forewing ground colour, more sharply defined crosslines and paler hindwing. Wingspan 29–34 mm.

The specific features of the male genitalia of *P. minjakonka,* compared with *P. fusca* and *P. lineolata*, are the longer aedeagus, the shorter uncus, the more elongate, distally much more tapering valva continuing directly in the acute apical lobe, the longer, stronger pseudopollex, and the basally thicker, less curved harpe. This valval shape resembles mostly that of *Eugnorisma trigonica* but the apical lobe is smaller, the pseudopollex is stronger, more acute, lacking the blackish macrotricha and the harpe is much shorter, thicker than that of *E. trigonica.*

The female genitalia of *P. minjakonka* differ from those of *P. fusca* and *P. lineolata* by the stronger, broader ovipositor having longer gonapophyses, longer and more triangular antrum, much broader, proximally dilated, medially strongly folded ductus bursae, larger, more distinct and generally membranous appendix bursae, and the elliptical-sacculiform corpus bursae with longer signa.

Distribution. Sino-Tibetan. The species is known only from the SE frontier of the Tibetan plateau (China: Yunnan, Sichuan).

Genus ***Anagnorisma*** Ronkay & Varga, 1999

Anagnorisma Ronkay & Varga, 1999, *Acta Zoologica Academiae Scientiarum Hungaricae* **45**(4): 361. Type-species: *Eugnorisma goniophora* Varga, Ronkay & Hacker, 1990, by original designation.

Diagnosis. The comparison of *Anagnorisma* with the genera *Eugnorisma* (s. str.), *Protognorisma* and *Schizognorisma* is given in detail in certain paragraphs of the phylogenetic considerations of the whole genus-group. The main external difference between the sister-genera *Anagnorisma* and *Schizognorisma* is the presence of the dark brown or blackish intracellular patches in *Anagnorisma*, this area is not or only slightly darker in the species of *Schizognorisma.* Wingspan 35–38 mm.

The diagnostic features of the male genitalia of *Anagnorisma* are the simplified dorsal carinal plate (which may be smoothly sclerotised or armed by a small tooth) but lacking stronger dentation or larger, hooked ventro-lateral process; the strong, acute, spine- or thorn-like subbasal cornutus; the reduction of the distal spinulose field to a small scobinate area; the rather distally located, smaller spine like or larger triangular (but not cuneate) pseudopollex; and the fine, long and slender, finely arched harpe. In *Schizognorisma,* the dorsal plate of the carina is not sclerotised but substituted by long, hooked-falcate ventro-lateral process; the subbasal cornutus is missing; and the pseudopollex is acute, wedge-shaped.

In the female genitalia of all but one species (*A. goniophora*), the antrum of *Anagnorisma* is large or very large, sclerotised, with variably large and deep postero-medial cleft, the ductus bursae is long, sometimes folded, and the corpus bursae is elliptical-saccate, with weakly sclerotised ribbon-like signa. In *Schizognorisma* the antrum is simple, broad but short, the ductus bursae is shorter, with strong, rounded postero-lateral lobes, and the corpus bursae is large, ample, sacculiform, without signa. In *A. goniophora*, the shape and size of the antrum is similar to those of the *Schizognorisma* species, the ductus bursae is short, flattened-tubular (like in *Protognorisma fusca* and *P. lineolata*), and the corpus bursae is ample, without signa; but the appendix bursae is small, much smaller than and not falciform as in *Schizognorisma*, and the ductus bursae lacks the postero-lateral sclerotised lobes which are typical of the latter genus.

Distribution. The genus has a curiously disjunct range in north-eastern Iran (*A. chamrani*), and with a huge hyatus from the eastern Hindukush and Nuristan (*A. eucratides, A. glareomima*) extending to the south-western parts of the Karakoram and north-western Himalayas (*A. goniophora, A. zakaria*). The habitats of the species are often strongly different, including dry, warm mountainous grasslands, montane semi-deserts and subalpine meadows with rich herbaceous vegetation and with sparse, shrubby birch stands. The flight period of the taxa begins at the end of the summer (mid-August) or at the early autumn (September) and is finished in the late autumn (mid-October). The species are seemingly local and rare except *A. goniophora* which may appear in higher individual numbers around the artificial light.

Anagnorisma eucratides (Boursin, 1957)

(Plate 2, Figs 5–6; Plate 34, Figs 41–42; gen. fig. 7)

Eugraphe eucratides Boursin, 1957, *Bulletin Mensuel de la Société Linnéenne de Lyon* **26**: 245. Type-locality: [Afghanistan] Salang valley, Ejan, 2050 m. Holotype: female, in coll. ZSM.

Diagnosis. *Anagnorisma eucratides* differs externally from its western sister-species, *A. chamrani*, by its reddish-brown shaded thorax, ground colour of forewing and filling of stigmata, more arched antemedial and less crenellate postmedial line, more sinuous subterminal line and paler, basally more whitish hindwings.

The genitalia of the two species are very similar in both sexes and differ from the other members of the genus by the longer and finer harpes and pseudopollexes, more humped valval costa, and the fine carinal tooth (males); the large, quadrangular antrum-plate with fine postero-medial cleft, and the rather long, tubular, medially angled posterior two-thirds of ductus bursae (females).

The male genitalia of *A. eucratides* differ from *A. chamrani* by the somewhat thicker, distally less arched harpe, the longer and finer pseudopollex, narrower, more U-shaped vinculum and the larger cornutus of the vesica having stronger basal plate. In the female genitalia, *A. eucratides* has smaller, less incised antrum, and broader but somewhat shorter ductus bursae than in its sister-species.

Distribution. A rare and strictly localised autumnal species. Known only by a few specimens from Afghanistan (Salang pass, Paghman Mts).

Anagnorisma chamrani Gyulai, Rabieh, Saraj, Ronkay & Esfandiari, 2013

(Plate 2, Figs 7–8; Plate 34, Figs 43–44; gen. fig. 8)

Anagnorisma chamrani Gyulai, Rabieh, Saraj, Ronkay & Esfandiari, 2013, *ZooKeys* **317**: 18. Type-locality: Iran, Khorassan, Binaloud Mts, Razavi, 2500 m. Holotype: female, in coll. P. Gyulai (Miskolc).

Diagnosis. *Anagnorisma chamrani* is the western sister-species of *A. eucratides*; the main external differences are the following: thoracic pubescence, ground colour of forewing and filling of stigmata of *A. chamrani* are more unicolorous, not reddish-brown as in *A. eucratides*; antemedial line oblique, somewhat zigzagged; postmedial line more crenulate, both of them have a finer black-marked definition; subterminal line less wavy; hindwing darker greyish; cilia pale pinkish. *Anagnorisma chamrani* differs from *A. goniophora*, by its much paler in colouration, having ochreous-grey ground colour, more zigzagged antemedial line, less evenly arched postmedial line, being terminally oblique and not perpendicular to inner edge of forewing, and much paler ochreous grey-brown postmedial line; from *A. glareomima* by its darker and more elongated wings, larger stigmata, different configuration of orbicular and reniform stigmata and black intracellular maculation; finally, it cannot be confused with the conspicuously different, orange-brown coloured *A. zakaria*. Wingspan 34–35 mm.

In the male genitalia, *A. chamrani* has medially more extended valvae than in *A. eucratides* (with costal and dorsal margins being less parallel), shorter subapical valval process and pseudopollex, somewhat longer, V-shaped vinculum, smaller and obtuse carinal tooth (it is markedly stronger in *A. eucratides*, bear-

ing conspicuous, strong thorn). The male genitalia of *A. chamrani* differ from those of *A. goniophora* by the broader valva (particularly its distal part and the assemblage of the valval apex), much longer, arcuate harpe and the longer, crest-like carinal plates; from *A. zakaria* by the much longer, arched harpe, the considerably shorter (about half as long) pseudopollex and the longer and not extended, crest-like carinal plate.

The female genitalia of *A. chamrani* differ from those of *A. eucratides* by the larger and more sclerotised, asymmetrically subquadrangular antrum having deeper U-shaped postero-medial incision; longer ductus bursae with less elbow-like lateral projection and the longer and more prominent, conical appendix bursae; from those of *A. glareomima* and *A. zakaria* by the almost evenly broad and medially angled ductus bursae; and from *A. goniophora* by the much larger antrum, the longer and medially angled ductus bursae, the smaller corpus bursae having fine signum stripes and the longer, more conical appendix bursae.

Distribution. The species is known only from the type locality, the higher Binaloud Mountains. The dominant species in the vegetation of the habitat are *Onobrychis montana*, *Amygdalus scoparia*, and *Bromus tectorum*; the other mentionable plants are *Bromus*, *Artemisia* and *Astragalus* spp. The adults were attracted to light early on a cold night in September. The early stages are unknown.

Anagnorisma goniophora (Varga, Ronkay & Hacker, 1990)

(Plate 3, Figs 1–3; Plate 35, Figs 1–7; gen. fig. 9)

Eugnorisma goniophora Varga, Ronkay & Hacker, 1990, *Acta Zoologica Academiae Scientiarum Hungaricae* **36**(3–4): 332, pl. I: 1–2, figs 1–2, 6–7. Type-locality: Pakistan, Baltistan, Gilgit, 1600 m, 35°53' N, 74°21' E. Holotype: male, in coll. ZSM.

Diagnosis. *Anagnorisma goniophora* is similar in its appearance to the dark and small specimens of certain *Eugnorisma (Hologнorisma)* species but differs from them by its darker, rather unicolorous chocolate-brown forewings and the uniformly dark brown hindwings. It differs from the externally most similar congener, *A. eucratides*, by its generally darker brown ground colour of both wings, the lack of the reddish shade and the different shape of the blackish triangles of the cell. Wingspan 35–39 mm.

The male genitalia of *A. goniophora* show close relationship with the other members of the genus though are rather distant from them and are very different from those of *Eugnorisma* by the general shape of the valva, the absence of macrotricha on the pseudopollex and the presence of a large, wide-based cornutus on the basal diverticulum. *Anagnorisma goniophora* has, in comparison with the other congeners, thicker uncus, broader and shorter harpe, shorter and more rounded subapical process, larger subbasal diverticulum and smaller distal part of vesica.

The configuration of the female genitalia of *A. goniophora* differs from those of all other *Anagnorisma* species by the much smaller antrum, the short and flattened, medially not angled ductus bursae, and the huge, membranous corpus bursae lacking the signa; from those of the externally somewhat similar *Eugnorisma* species by the non-folded, flattened, but strongly sclerotized ductus bursae (as a plesiomorphic feature in the genus), the weak and indistinct appendix bursae and the huge, membranous corpus bursae.

Distribution. *Anagnorisma goniophora* is a late summer and early autumnal species and is only known from the Pakistani part of the Himalaya Mts (Deosai plains, Astor vicinity) and the Karakoram range.

Anagnorisma glareomima (Varga & Ronkay, 1991)

(Plate 3, Fig. 4; Plate 35, Fig. 8; gen. fig. 10)

Eugnorisma glareomima Varga & Ronkay, 1991, *Acta Zoologica Academiae Scientiarum Hungaricae* **37**(3–4): 265, pl. 1, fig. 5, text fig. 5. Type-locality: Afghanistan, Prov. Kunar, Nuristan, Lindai-Sin valley, 1500 m. Holotype: female, in coll. SMNK.

Diagnosis. A poorly known species, only the female holotype is known. *Anagnorisma glareomima* resembles externally mostly *Haggettia glareosa* but differs by its broader forewings and sinuous subterminal line. The other similar species, *A. eucratides* and *A. chamrani*, have darker colouration and different

blackish markings in the cell of the forewing. Finally, the somewhat similar *Eugnorisma* s.l. species have different intracellular dark markings and paler hindwings. Wingspan 34 mm.

The configuration of the female genitalia displays the relationship with the other species of the genus *Anagnorisma*, the most characteristic differences are the lyriform posterior lobes of the ostium and the twisted anterior part of ductus bursae; this latter feature is present in the taxa of the *Eugnorisma (E.) trigonica* species-group.

Distribution. The area of the genus *Anagnorisma* extends from the Binaloud Mts (Iran, Khorassan) and E Afghanistan to the SW Himalayas; *A. glareomima* seems to have a medial position in this range. The single specimen was found in north-east Afghanistan (Nuristan).

Anagnorisma zakaria Ronkay & Varga, 1999

(Plate 3, Figs 5–6; Plate 35, Figs 9–16; gen. fig. 11)

Anagnorisma zakaria Ronkay & Varga, 1999*, Acta Zoologica Academiae Scientiarum Hungaricae* **45**(4): 364, figs 5–6, 19, 21, 33. Type-locality: Pakistan, Kashmir, Himalaya Mts, Deosai Plains, 3650 m. Holotype: male, in coll. G. Ronkay (Budapest).

Diagnosis. *Anagnorisma zakaria* is an allopatric sibling species of *A. glareomima* although externally mostly resembles the members of the subgenus *Metagnorisma* of *Eugnorisma* (s.l.) by its rather robust body, brownish ground colour of the forewing and by the rather diffuse dark markings of the cell. It differs externally from the somewhat similar *Schizognorisma fuscisignata* by its shorter, broader, apically less acute forewing (the upper part of the outer margin is not concave), less sinuous crosslines, smaller, more darkened orbicular and reniform stigmata, and the darker, brownish coloured (not whitish) hindwing. Wingspan 36–38 mm.

The distinctive features of the male genitalia of *A. zakaria* are the significantly larger pseudopollex, the apically rounded, rather short, flattened harpe, the longer, more slender uncus and the sclerotization of the carina where the dorsal dentate plate is missing but the ventral part is dilated, having short, triangular, sclerotized plate. The clasping apparatus is most similar to that of *Protognorisma fusca* but the vinculum is shorter, the valva longer with larger, more acute pollex-like extension and thicker, less curved, apically more rounded harpe, and the sacculus is much broader with larger lobe of clavus.

The female genitalia of *A. zakaria* are close only to those of *A. glareomima* by the configuration of the ostium and ductus bursae but the ostial part is generally broader with larger, more rounded posterolateral lobes and with much broader, U-shaped medial incision, and the signa are missing. The female genitalia of *A. zakaria* differ mostly from the other members of the genus by their considerably larger ostium bursae with much deeper, U-shaped caudal incision, longer, more funnel-like, proximally more tapering ductus bursae with rounded, membranous-wrinkled proximal bulb and by the shorter, elliptical-ovoid corpus bursae, having no signa.

Distribution. North-west Himalayan. The species is known only from the type locality (Pakistan, Deosai National Park). It lives in subalpine meadows with rich herbaceous vegetation, the surrounding slopes with sparse, shrubby birch stands; the moths are on the wing in August.

Genus ***Eugnorisma*** Boursin, 1946

Eugnorisma Boursin, 1946, *Revue française d'Entomologie* **10**: 188. Type-species: *Graphiphora insignata* Lederer, 1853, by original designation.

Diagnosis. The members of the genus *Eugnorisma* are generally medium-sized or moderately large species (wingspan 25–45 mm). Antennae of males shortly ciliate but not pectinate; frons semiglobular, smooth; palpi slender, upturned, laterally with darker scales and hairs, third segment short, more or less pointed, without large ventral tuft; proboscis well-developed. Thorax usually robust, tegulae not strongly marked, pro- and metathoracic tufts strong, distinct; abdomen smoothly scaled, covered by long and flattened hair-scales, abdominal tufts and dorsal crest absent.

The genus comprises four subgenera (*Hologнorisma, Eugnorisma* s. str., *Phacognorisma* and *Metagnorisma*), which are easily distinguishable by their external and genital features.

Male genitalia. Uncus strong, more or less long and curved, sometimes pointed or medially dilated, in special case spatulate (*E. conformis)*; tegumen relatively wide, usually high; valvae strongly sclerotised, generally broad and elongate, without corona, cucullus and clavus. The latter character excludes the earlier supposed (Boursin 1946) closer relationship with the *Actebia* Stephens, 1829 generic complex (including *Protexarnis, Parexarnis,* and *Hemiexarnis*). Harpe usually strong, often curved, falcate or sword-like, its basis wide, often with angulate outer edge; valvae usually possess more or less prominent pseudopollex and apical costal lobe; pseudopollex has no connection with costal or saccular sclerotizations (in *Hologнorisma*, pseudopollex usually acute or angulate, without scales but often with sclerotized crest or acute extension, in *Eugnorisma* s. str. pseudopollex covered with small, depressed scales (modified macrotricha)). Sacculus symmetrical, normal, without processes; juxta wide, often with apical process or medial crest(s); vinculum strong, narrow V-shaped; saccus small, membranous. The size and shape of the aedeagus strongly varies in the genus but is characteristic for the species-groups. The dorsal surface of the distal part (carina) is usually strongly sclerotized, in the subgenus *Hologнorisma* it forms a slightly convex or straight, dentated shield or this shield is reverted to a large ventral hook (*E. chaldaica*-group). In *Eugnorisma* s.str., the *insignata*-group has moderately sclerotized and finely dentate or smooth dorsal carinal plate, in the *trigonica*-group this plate may be reduced to a slightly sclerotized, smooth or only minutely dentated lamina. The vesica is conspicuously uniform in the whole genus, which is most probably a synapomorphy of *Eugnorisma* s.l. It consists of two main parts: a large, spacious sac that is often elongated or saccate, sometimes recurved and a subbasal diverticulum originating from near to sinus penis and terminated in a small, not bulbed cornutus. The large sac has more or less expanded spinulose field near to ductus ejaculatorius consisting of tighten spiculi which can be erected from the membrane during eversion, this field forming in some cases a pocket-like pouch (e.g. most species of *Hologнorisma*) or with somewhat different manner in the *insignata-conformis* pair of species. The *trigonica*-group is characterised by the globular shape of the huge vesica. The spinules of this field cannot be considered as a fascia of cornuti but they represent a modified form of the granulous surface structure of the vesica.

Female genitalia. Papillae anales are generally weakly sclerotized, short and usually wide, rounded or triangular, the gonapophyses are rather short. Antrum and ductus bursae are usually strongly sclerotized; the latter is usually plicate, folded and/or reflexed. The length and sclerotisation of the ductus is correlated with the length and carinal sclerotisation of the aedeagus. Appendix bursae is relatively strongly sclerotised and usually strongly rugulose, arcuate or retroflexed. Corpus bursae is elliptical or rounded, more or less large and wide.

Distribution. *Eugnorisma* is exclusively Palaearctic with some characteristic differences in the distribution and habitat types of the four subgenera. The subgenera *Hologнorisma* and *Eugnorisma* s. str. are mostly Central and Middle Asiatic with some few expansive steppic species reaching Asia Minor and East Europa, mostly near to the Southern Urals and lower Volga region. Their habitats are mostly steppes and semi-deserts or rupicolous scrubby formations with grassy patches. Some species have more or less zonal distribution in the Eurasiatic steppe belt (e.g. *E. ignoratum, E. insignata*, etc.), others show conspicuously disjunct distribution with subspeciation like, for instance, *E. (H.) atrabaelbops*. The subgenus *Phacogno-*

risma is restricted to the Anatolian-Iranian subregion, inhabiting xerothermic grasslands in rocky places. The subgenus *Metagnorisma* is mostly Western Palaearctic with some Mediterranean character; with a single widely distributed species and six more regionally distributed ones in Iberia and Maghreb, Balkans, Asia Minor, Armenian plateau, Iran and Turkmenistan. These species are mostly connected with open, loosely grown forests or xerophilous scrubs, often in rupicolous habitats.

Subgenus *Hologhorisma* subgen. nov.

Type-species: *Agrotis chaldaica* Boisduval, 1840, here designated.

Diagnosis. The subgenus includes altogether 10 species, 4 of them are represented by more than one subspecies. The taxa of *Hologhorisma* are often confusingly similar externally, forming pairs or groups of closely related, partly sympatric siblings. The subgenus is divided into three distinct lineages, the *chaldaica-, ignoratum-*, and the *eminens* species-groups, which are easily separable by their genital (and often also by external) features.

Medium-sized and colourful species (wingspan 35–45 mm) with more or less robust body and elongate and usually narrow forewings with apex pointed. Forewing ground colour grey or greyish, often with special, pastel-like reddish, blueish, violaceous or ochreous shade which are typical of certain species and subspecies. The subgenus is characterised by the deep black pre- and intermacular (intracellular) markings, the shape and size of these markings, as well as their possible bronze-metallic reflection, are usually specific features, displaying important taxonomical traits. Noctuid pattern often regular (*E.* (*H.*) *ignoratum, E.* (*H.*) *chaldaica*) or modified into a more complex pattern (*E.* (*H.*) *eminens, E.* (*H.*) *atrabaelbops*), in case of *E.* (*H.*) *tamerlana* strongly reduced. Hindwings white or whitish in both sexes with most often darker irroration on veins and variably strong marginal suffusion, especially in the females.

The diagnostic features of the male genitalia are 1) the generally strongly sclerotized genital capsule; 2) the long or very long, elongated-trapezoidal valvae with small apical extension and variably strong digitus; 3) the more or less acute pseudopollex without scale-shaped macrotricha but with variably strongly sclerotised crest or acute spine; 4) the long or very long, usually sword-like harpe; 5) the long, cylindrical or tubular, straight or only slightly curved aedeagus; 6) the very strongly sclerotized dorsal carinal plate, with a) strongly dentated plate or b) acute and reclinate hook-shaped process; 7) the elongate-tubular vesica with distal (most often subterminal) spinulose field, forming in some cases pocket-like structure; and 8) the usually well-developed subbasal diverticulum, terminated in small, spine-like cornutus.

In the female genitalia, 1) the antrum and the ductus bursae are both very strongly sclerotized; 2) the ductus bursae is elongate-tubular, often twisted and/or cristate and laterally lobate; 3) the appendix bursae is also strongly sclerotised and roughly rugose-ribbed, often with expressed extension for the reception of the dentate or hook-shaped carina; 4) the corpus bursae is huge, elliptical-sacculiform, without signa.

Synopsis

Eugnorisma (*Hologhorisma*) *chaldaica chaldaica* (Boisduval, 1840)
Eugnorisma (*Hologhorisma*) *chaldaica kurdistana* Hacker, 1986 **stat. rev**.
(= *isabellina* Varga & Ronkay, 1987, **syn. n.**)
Eugnorisma (*Hologhorisma*) *chaldaica rubicunda* Varga & Ronkay, 1990
Eugnorisma (*Hologhorisma*) *kristenseni* **sp. n.**
Eugnorisma (*Hologhorisma*) *spodia spodia* (Püngeler, 1900)
Eugnorisma (*Hologhorisma*) *spodia psammochrea* Varga & Ronkay, 1987
Eugnorisma (*Hologhorisma*) *ignoratum* Varga & Ronkay, 1994
Eugnorisma (*Hologhorisma*) *cuneiferum* Varga & Ronkay, 1994
Eugnorisma (*Hologhorisma*) *puengeleri* Varga & Ronkay, 1987
Eugnorisma (*Hologhorisma*) *mikkolai* **sp. n.**

Eugnorisma (*Hologнorisma*) *tamerlana* (Hampson, 1903)
Eugnorisma (*Hologнorisma*) *eminens eminens* (Lederer, 1855)
Eugnorisma (*Hologнorisma*) *eminens clarior* Varga, 1975
Eugnorisma (*Hologнorisma*) *atrabaelbops atrabaelbops* Varga, 1975
Eugnorisma (*Hologнorisma*) *atrabaelbops firyuza* **ssp. n.**
Eugnorisma (*Hologнorisma*) *atrabaelbops scotophaia* **ssp. n.**

Distribution. The subgenus has a wide distribution from the easternmost steppic regions of Europe and from Central Anatolia, throughout the xerothermic western and Central Asiatic steppes and high mountains to Southern Siberia and the north-western part of the Hindukush-Karakoram-Himalayas region in north-east Afghanistan and north-west Pakistan.

The ***chaldaica*** species-group

Diagnosis. This group consists of three externally and also in genital structures rather similar, partly sympatric species. The synapomorphies of this monophyletic species-group is the nearly straight, heavily sclerotised carina with robust ventral process forming more (*kristenseni*) or less (*chaldaica*) reclinate hook, and, as a consequence of the heavily sclerotized ventral carinal process, the dorsally everted basal part of vesica. The specific differences are found in the shape and size of the apical process of the cucullus, the sclerotised structures (crest vs. spine) of the pseudopollex and the harpe; the length and retroflexion of the vesica and the sclerotised structures of the antrum, ductus bursae and appendix bursae.

Eugnorisma* (*Hologнorisma*) *chaldaica chaldaica (Boisduval, 1840)

(Plate 3, Figs 7–8; Plate 35, Figs 18–24; gen. fig. 12)

Agrotis chaldaica Boisduval, 1840, *Genera et Index Methodicus Europaeorum Lepidopterorum*: 140. Type-locality: [Russia] Sarepta. Lectotype: male, in coll. NHMB.

Synonymy
Agrotis chaldaica var. *caerulea* Wagner, 1932, *Internationale Entomologische Zeitschrift* **26**: 141. Type-locality: Turkey, Akshehir. Lectotype: male, in coll. NHMW;
Eugnorisma buraki Koçak, 1983, *Priamus* **3**: 41. An unnecessary objective replacement name of *Agrotis chaldaica* var. *caerulea* Wagner, 1932.

Diagnosis. The typical subspecies of *E. (H.) chaldaica* can be distinguished from the closest related *E. (H.) kristenseni* and *E. (H.) spodia* by the deep black intracellular patches, lacking the bronze-metallic sheen being typical of the latter two species, and the more brown and red-brown variegated ashy grey forewings with sharper defined crosslines and stigmata (with often somewhat reddish filling of the reniform stigma); from *E. (H.) mikkolai* and *E. (H.) puengeleri* by its pure white hindwings and more bluish-shaded grey forewings. Wingspan 35–39 mm.

The male genitalia of *E. (H.) chaldaica* differ from those of the closest related *E. (H.) kristenseni* by the distally slenderer harpe, narrower valva with less pointed apical process and shorter, anteriorly less peaked crest of pseudopollex, narrower tegumen, somewhat shorter and less arcuate aedeagus with more pyramidal, less hooked ventral carinal process, and the rather semilunar arranged spinulose field of vesica. The diagnostic, better visible differences between *E. (H.) chaldaica* and *E. (H.) spodia* are the slender harpe and the rather of pseudopollex of *E. (H.) chaldaica*; the harpe of *E. (H.) spodia* is significantly stronger, and the pseudopollex has huge, shark-tooth-like process. The other externally similar species have conspicuously different male genitalia; see the gen. figs 18–22.

In the female genitalia, *E. (H.) chaldaica* has larger, broader antrum with weaker postero-medial concavity than in *E. (H.) kristenseni* and *E. (H.) spodia*, the appendix bursae is more elongated than in *E. (H.) kristenseni*, and the ductus bursae has smaller and less evenly rounded left lateral lobe than in *E. (H.) spodia*.

Distribution. The typical subspecies of *E. (H.) chaldaica* has a wide distribution extending from the Russian steppes (Sarepta, type locality) and Central and Eastern Anatolia to Armenia, Daghestan and Northwest Iran. The species is regularly rather frequent in its habitats; the moths are on the wing in August-September.

Eugnorisma* (*Hologнorisma*) *chaldaica kurdistana Hacker, Kuhna & Gross, 1986, **stat. rev.**

(Plate 4, Figs 1–2; Plate 35, Figs 25–32; gen. fig. 13)

Eugnorisma kurdistana Hacker, Kuhna & Gross, 1986, *Mitteilungen der Münchner Entomologischen Gesellschaft* **76**: 89, pl. 2, figs 9–10; pl. 6, figs 44–45. Type-locality: Turkey, Prov. Bingöl, Buglan Pass, 1600–1800 m. Holotype: male, in coll. ZSM.

Synonymy

Eugnorisma (*Eugnorisma*) *caerulea isabellina* Varga & Ronkay, 1987, *Acta Zoologica Academiae Scientiarum Hungaricae* **33**(1–2): 210, pl. 2, 22, gen. figs 26–27, 30–31, 129. Type-locality: W Iran, Kasri Shirin, Bala-vi-Taq. Holotype: male, in coll. NHMW; **syn. n.**

Diagnosis. This subspecies displays a strong cline in the change of the forewing colouration and the intensity of the noctuid pattern from north-west (eastern Turkey) to south-east (western Iran): the ground colour tends to be paler grey and the dark crosslines turn to be finer and more faded. The Kerman population of the subspecies consists of uniformly pale ochreous-grey or slate-grey specimens, with very fine crosslines and outlines of stigmata, this population was described as a distinct subspecies (ssp. *isabellina*) by Varga & Ronkay (1987).

The ssp. *kurdistana* differs from the nominate subspecies by its slightly larger size (wingspan 38–41 mm), more unicolorous ochreous-grey to pale violaceous-grey ground colour of head, thorax and forewing, the much weaker, often fully reduced reddish suffusion in the filling of the stigmata and the definition of the crosslines, and the paler subterminal line.

The male genitalia of the two subspecies display no unambiguous differences, though the whole clasping apparatus of the ssp. *kurdistana* is somewhat larger, and the juxta is broader with relatively shorter ventral extension. In the female genitalia, the antrum of the ssp. *kurdistana* is broader, more trapezoidal, and the ductus bursae is more robust than in the nominotypical ssp. *chaldaica*.

Distribution. Southeast-East Turkey, Iraq (Kurdistan), and the north-western and western parts of Iran, as far to the south-east as the SE Zagros Mts (Kerman). The ranges of the two subspecies, ssp. *chaldaica* and ssp. *kurdistana* are partly overlapping in certain areas of south-eastern Turkey (e.g. in the Provinces Bitlis and Bingöl) and NW Iran, a few transitional specimens are also known from this area.

Eugnorisma* (*Hologнorisma*) *chaldaica rubicunda Varga & Ronkay, 1990

(Plate 4, Figs 3–4; Plate 35, Figs 33–36; gen. fig. 14)

Eugnorisma (*Eugnorisma*) *chaldaica rubicunda* Varga & Ronkay, 1990, *Acta Zoologica Academiae Scientiarum Hungaricae* **36**: 333, pl. 1, fig. 4, gen. figs 8–21. Type-locality: [Uzbekistan] Margelan. Holotype: male, in coll. ZSM.

Diagnosis. This taxon differs from the nominate subspecies by its narrower and apically more pointed forewings with rather unicolorous, pastel-shaded rosy-grey suffused ochreous-grey ground colour, the reduced, often completely deleted antemedial and postmedial crosslines, and the fine reddish filling of the stigmata. The ssp. *rubicunda* displays a contrasting tendency with the taxa ssp. *kurdistana* as this latter

subspecies can be characterized by the reduction of the reddish colouration, the broader forewings, and the fine noctuid pattern. Wingspan 36–37 mm.

The configuration of the male genitalia is very similar to that of the ssp. *chaldaica*, but ssp. *rubicunda* has relatively narrower valvae with more acute pseudopollex, slenderer harpes and more saccate spinulose field.

Distribution. The eastern subspecies of *E. (E.) chaldaica* occurs in western Siberia, the Russian and Kazakh Altai, and the northern foothills of the western Tien Shan.

Eugnorisma (*Hologнorisma*) *kristenseni* sp. n.

(Plate 4, Figs 5–6; Plate 35, Figs 37–40; Plate 36, Figs 1–4; gen. fig. 15)

Holotype. Male, Turkmenistan, Kopet-Dagh Mts, Firyuza, 37°59'N, 58°05E, 400–600 m, 12.X.1991, leg. A. Podlussány, L. Ronkay & Z. Varga (coll. G. Ronkay).

Paratypes. **Turkmenistan**. Kopet-Dagh Mts. 28 specimens, with the same data as the holotype, slide Nos: VZ 8775m, VZ 8794m, VZ 8803m, VZ 8876m (coll. G. Ronkay, Z. Varga & HNHM); 14 specimens, from the same locality, 25.IX.1991 (coll. S.T. Kovács, G. Ronkay & HNHM); 23 specimens, from the same locality, 28.IX.1991 (coll. HNHM); 20 specimens, from the same locality, 13.X.1991 (coll. G. Ronkay, Z. Varga & HNHM); 6 specimens, from the same locality, 14.X.1991 (coll. HNHM); 1 female, 3–11. XI.1991, leg. M. Hreblay & G. Ronkay (coll. HNHM); 48 specimens, 5 km S of Chuli, 7–800 m, 37°56'N, 58°01'E, 30.IX.1991, leg. L. Ronkay & Z. Varga, slide Nos: VZ 8775m, VZ 8776m, VZ 8778m, VZ 8834m, VZ 8925f, VZ 8955f (coll. G. Ronkay, Z. Varga & HNHM); 24 specimens, Vanovskiy, 5 km NE of Firyuza, 400 m, 38°00'N, 58°06E, 27.IX.1991, leg. A. Podlussány, L. Ronkay & Z. Varga (coll. G. Ronkay & HNHM); 2 males, 2 females, Karayalchi valley, 20 km E of Nochur, 800 m, 38°23'N, 57°12'E, 4.X.1991, leg. A. Podlussány, L. Ronkay & Z. Varga (coll. G. Ronkay, Z. Varga); 10 specimens, from the same locality, 4.X.1991, leg. A. Podlussány, L. Ronkay & Z. Varga (coll. G. Ronkay, Z. Varga & HNHM); 1 male, valley of the rivers Point-Kala and Ipay-Kala, 800–1500 m, 38°13-15'N, 59°54-57'E, 30.VI–4.VII.1992, leg. Gy. Fábián, B. Herczig, A. Podlussány & Z. Varga (coll. HNHM); 3 males, Dushak, 2300 m, 37°57'N, 57°54'E, 6–8.VII.1992, leg. Gy. Fábián, B. Herczig, A. Podlussány & Z. Varga (coll. P. Gyulai, G. Ronkay & Z. Varga); 1 male, Dushak, 1500 m, 37°54'N, 57°56'E, 7–8.VIII.1992, leg. M. Hreblay, Gy.M. László & G. Ronkay (coll. G. Ronkay); 1 male, Dushak, 2400 m, 37°57'N, 57°54'E, 9–10.VIII.1992, leg. M. Hreblay, Gy.M. László & G. Ronkay (coll. HNHM); 3 specimens, Dushak, 2200 m, 1–2.X.1991, leg. A. Podlussány, L. Ronkay & Z. Varga (coll. HNHM); 7 specimens, Kurkulab, 6 km W of Germob, 38°04'N, 57°50E, 3.X.1991, leg. L. Ronkay & Z. Varga (coll. S.T. Kovács, G. Ronkay & Z. Varga); 1 female, Firyuza, 24.X.1990, leg. V.V. Dubatolov (coll. G. Ronkay). 6 specimens, 80 km SE of Serahs, 35°52'N, 61°28'E, 19.XI.1991, leg. M. Hreblay & G. Ronkay (coll. G. Ronkay); 2 males, Kara-Kum desert, 42 km N Ashkhabad, 100 m, 38°21'N, 58°33'E, 15.X.1991, leg. A. Podlussány, L. Ronkay & Z. Varga (coll. HNHM); 2 males, "Kopet-dagh, S of Geok-tepe, iii-iv", one of them is with the labels "Rhyacia spodia Püng.", "Rothschild Bequest" (coll. BMNH). **Kazakhstan**. Prov. Almaty. 30 males, 44 females, 20 km NW of Kapchugay, 550 m, 44°00'N, 77°00'E, 31.VIII.–1.IX.1997, leg. Z. Varga & A. Orosz, slide Nos: VZ 8703m, VZ 8756m, VZ 8758m, VZ 8813m, VZ 8831m, VZ 8849m, VZ 8869m, VZ 8875m, VZ 8877m, VZ 8878m, VZ 8893f, VZ 8898f (coll. G. Ronkay, Z. Varga & HNHM); 11 specimens, from the same locality, 430 m, 4.X.2002, leg. T. Csővári (coll. HNHM); 10 specimens, Keroulak, 20 km N of Kapchugay lake, 8–20.X.1993, leg. A. Horváth (coll. G. Ronkay & HNHM); 3 males, 10 km NW of Krasnogorka, 1250 m, 43°20'N, 75°10'E, 2.IX.1997, leg. Z. Varga & A. Orosz (coll. G. Ronkay & Z. Varga); 1 male, W Tien Shan Mts, Altyn-Emel Mts, Altyn-Emel pass, 1700 m, 78°30'E, 44°10'N, 4.IX.1997, leg. Z. Varga & A. Orosz, slide No. VZ 8833m (coll. Z. Varga); 2 males, 6 females, Izvestkovye, Kaskelen, 8.VIII.1995, leg. Z. Varga & A. Orosz (coll. Z. Varga); 1 male, 10 km NW Bakbakty, 25 km SE of Bakanas, 400 m, 76°35'E, 44°40'N, 30.VIII.1997, leg. Z. Varga & A. Orosz (coll. S.T. Kovács); 9 specimens, Syugeti Mt., 8 km NW of Kok-Pek, 980 m, 25.IX.2002, leg. T. Csővári (coll. HNHM); 14 specimens, near river Ili, 10 km S of Usharal, 460 m, 5.X.2002, leg. T. Csővári (coll. HNHM & T. Csővári); 1 male, 10 km N of Masak, 460 m, 24.IX.2002, leg. T. Csővári (coll. HNHM); 1 male, Karatau Mts, Tshymkent region, 650 m, 28.VI.–11.VII.1994, leg. I. Pljushtch (coll. P. Gyulai). **Tadjikistan.** 1 female, Dushanbe, 750 m, 12.X.1964, leg. Y. Shchetkin (coll. G. Ronkay); 1 male, Hissar Mts, Khosratisko Mts, Nikolaj Pass, Suroabad, 2000 m, 18.IX.1958, leg. Y. Shchetkin, slide No.: GYP 953m (coll. P. Gyulai); 1 male, 1 female, N Turkestansky Mt., Ayaktshy district, 850 m, 25–30.X.1997, leg. V. Gurko (coll. P. Gyulai); 1 female, S Zeravshansky Mt., Kitab district, 1800–2000 m, 10–20.X.1997, leg. V. Gurko, slide No.: GYP 3996f (coll. P. Gyulai). **Uzbekistan**. 2 males, "Samarkand" (coll. BMNH); 1 male, Kizil-Kum desert, Aldarkul Lake, 1800–2000 m, 1–10.X.2007, leg. V. Gurko, slide No.: GYP 3995m (coll. P. Gyulai). **Iran**. Prov. Khorasan. 1 male, 38 km NW Binaloud, 18–19.IX.2006, leg. P. Gyulai & A. Garai (coll. P. Gyulai); 1 male, Jozak NP, 2 km W of Jozak, 1350 m, 16–17. IX. 2006, leg. P. Gyulai & A. Garai, slide No.: GYP 2043m (coll. P. Gyulai); 1 male, Kuh-e-Binaloud, NE of Neyshapur, 1770 m, 7–8. VII.2010, leg. P. Gyulai & A. Garai, slide No.: GYP 4081m (coll. P. Gyulai); 5 males, 1 female, Kopet-Dagh, 80 km NE of Quacan, 2000 m, 14.–15.VII.2000 (coll. P. Gyulai); 1 male, Kopet-Dagh, Tandure NP, near Jevenly, 2000 m, 17–18. IX.2006, leg. P. Gyulai & A. Garai (coll. P. Gyulai).

Diagnosis. *Eugnorisma (H.) kristenseni* displays an intermediate position between *E. (H.) spodia* and *E. (H.) chaldaica*, both in its external and genital features. This situation implies the interpretation of this

taxon as a natural hybrid of the two species but it occurs sympatrically only with *E. (H.) spodia*, moreover *E. (H.) kristenseni* is much more widespread and frequent in its entire eastern Turkestanian range than the generally western Turkestanian *E. (H.) spodia*. *Eugnorisma (H.) kristenseni* is the eastern, allopatric sister species of *E. (H.) chaldaica*, showing a probably secondary overlap with the more differentiated *E. (H.) spodia*. Its eastern allopatric origin is also supported by the fact that in the Turkestanian hilly areas *E. (H.) kristenseni* is widely distributed and often rather numerous while *E. (H.) spodia* is more local and infrequent.

Eugnorisma (H.) kristenseni is closer externally to *E. (H.) spodia* due to the bronze-metallic reflection of the black intracellular patches and the usually rather indistinct crosslines. It is, however, smaller on average than *E. (H.) spodia* (wingspan 35–40 mm versus 36–45 mm, respectively) and has narrower, apically more pointed forewings with generally more ochreous shaded grey ground colour. *Eugnorisma (H.) kristenseni* is hardly distinguished externally from the more ochreous-grey coloured and somewhat smaller sized eastern subspecies of *E. (H.) spodia*, ssp. *psammochrea*, though the new species is somewhat more narrow-winged and the hindwings also have a fine milky ochreous hue (and the specimens from Kazakhstan are somewhat more greyish than the specimens from Turkmenistan). The satisfactorily separation of these two taxa requires the study of their genitalia.

The new species differs from the other closely related species, *E. (H.) chaldaica*, by its narrower and more pointed forewings with paler ochreous-greyish ground colour, weaker, more indistinct antemedial and postmedial crosslines, absence of the reddish irroration from the stigmata, and the presence of the bronze-metallic shining of the intracellular black patches. The collecting locality of the specimens also helps in the identification as *E. (H.) kristenseni* does not occur sympatrically with *E. (H.) chaldaica*.

It differs from the two externally somewhat similar species of the *ignoratum*-group, *E. (H.) puengeleri* and *E. (H.) mikkolai*, by its smaller size, narrower forewings, less distinct crosslines, intense metallic reflection of intracellular black patches (which is missing or, occasionally very faintly present in the latter two species) and the pure white, not greyish suffused hindwings. The other *Hologнorisma* species are easily separable from *E. (H.) kristenseni* by their different external appearance.

The male genitalia of the new species differ from those of *E. (H.) spodia* by the considerably longer and serrated crest-like (not sharktooth-like) ridge of pseudopollex, having larger peak at its internal extremity, the somewhat longer and much slenderer, apically acute harpe and the less backwardly projecting carinal tooth; from *E. (H.) chaldaica* by its broader valvae with more acute, inclined apical process and longer pseudopollex with stronger, more sclerotised longitudinal crest, stronger and thicker harpe, stronger and more acute ventral carinal tooth, and the somewhat longer, more hollowed and distally more saccate vesica with larger spinulose field.

The female genitalia of *E. (H.) kristenseni* differ from those of *E. (H.) spodia* and *E. (H.) chaldaica* by the narrower and postero-medially deeper incised antrum, the narrower, laterally less lobate ductus bursae and the broader, less elongated appendix bursae.

The genitalia of *E. (H.) kristenseni* differ conspicuously from those of the other *Hologнorisma* species; see the characterisations of the *ignoratum* and the *eminens* species-groups.

Distribution. Iranian-Turkestanian. It is widely distributed and frequent in the mountainous areas of Turkmenistan, mostly in medium altitudes but also occurs in north-eastern Iran (Khorassan), furthermore is one of the most frequent Noctuinae species in hilly steppic areas of southern Kazakhstan ("Ili-region"). It locally occurs also in Tadjikistan and Uzbekistan and possibly also in Kirghisia. A late summer-autumnal species, the adults are on the wing from August to Mid-October.

Etymology. The new species is dedicated to the memory of Niels Peder Kristensen.

Eugnorisma (*Hologorisma*) *spodia spodia* (Püngeler, 1900)

(Plate 4, Figs 7–8; Plate 36, Figs 5–12; gen. fig. 16)

Agrotis chaldaica var. *spodia* Püngeler, 1900, *Deutsche Entomologische Zeitschrift. Gesellschaft Iris zu Dresden* **12**: 289. Type-locality: [Turkmenistan]: Ashkhabad (Ashgabat). Lectotype: female, in coll. ZMHU.

Diagnosis. *Eugnorisma (H.) spodia* belongs to the larger species of the genus with its wingspan 38–45 mm. It is closely related to both formerly discussed species, with recognisable external differences. *Eugnorisma (H.) spodia* is larger in size than *E. (H.) chaldaica* and *E. (H.) kristenseni*, having broader and generally pale ashy grey to brownish shaded grey forewings with relatively weak antemedial and postmedial crosslines. It differs from *E. (H.) chaldaica* also by the characteristic, strong metallic sheen of the intracellular black patches, the reduction of the reddish hue and irroration of the stigmata and the more transparent, milky ochreous shaded white hindwings. It is easily distinguished from *E. (H.) puengeleri* and *E. (H.) mikkolai* by its more pointed and paler grey forewings with finer crosslines, metallic reflected intracellular black patches and more white hindwings; from *E. (H.) cuneiferum* and *E. (H.) tamerlana* also by the differently shaped intracellular patches and the colouration of both wings; finally, from *E. (H.) ignoratum* by the conspicuously different colouration of both wings and the much more indistinct wing pattern.

The male genitalia of *E. (H.) spodia* differ from those of both closely related species by the sharktooth-shaped ridge of pseudopollex, the strongest, thickest and apically obtuse harpe, and the most backwards curved and proportionally largest ventral carinal tooth.

In the female genitalia, the ductus bursae is more lobate laterally than in *E. (H.) chaldaica* and *E. (H.) kristenseni* which is obviously correlated with the larger size of the "anchor" of the carina.

Distribution. The typical subspecies occurs in the Kopet-Dagh Mts in Turkmenistan and NE Iran (Prov. Khorasan). It is rather common in the hot and xeric rocky grassland habitats; the flight period is relatively long, extending from mid-August to early October.

Eugnorisma (*Hologorisma*) *spodia psammochrea* Varga & Ronkay, 1987

(Plate 5, Figs 1–2; Plate 36, Figs 13–16; gen. fig. 17)

Eugnorisma (*Eugnorisma*) *spodia psammochrea* Varga & Ronkay, 1987, *Acta Zoologica Academiae Scientiarum Hungaricae* **33**(1–2): 205, pl. 1, figs 13–14, gen. figs 14, 16, 127. Type locality: [Uzbekistan] Aulie-Ata. Holotype: male, in coll. NHMW.

Diagnosis. The eastern subspecies of *E. (H.) spodia* differs from the nominate ssp. *spodia* by its on average smaller size (wingspan 35–42 mm), somewhat narrower forewings and the lighter colouration: the forewings are most often characteristic ochreous-grey or sandy grey, the hindwings are nearly pure white; a few specimens from the Tien Shan region are more greyish. This subspecies is often confusingly similar to certain specimens of *E. (H.) kristenseni*; therefore the study of the genitalia is necessary for the proper identification.

The configuration of the genitalia of the two subspecies does not show remarkable differences in both sexes. The male genitalia differ from those of *E. (H.) kristenseni* by the shorter, sharktooth-shaped ridge of the pseudopollex, the thicker and shorter harpe and the larger, more backwards curved ventral carinal tooth; in the female genitalia the antrum is broader with shallower postero-medial cleft, the ductus bursae is broader, more lobate laterally, and the appendix bursae is narrower than in *E. (H.) kristenseni*.

Distribution. Turkestanian. The eastern subspecies of *E. (H.) spodia* is distributed in the hilly or riverine steppic or semi-desert areas of Kazakhstan, Uzbekistan (and possibly also in Kirghisia). It appears much less frequent than the typical *E. (H.) spodia* and the sympatrically occurring *E. (H.) kristenseni*. The moths are on the wing from August to the end of September.

The *ignoratum* species-group

Diagnosis. This group consists of altogether five species, from which *E. (H.) ignoratum* is the most widely distributed one, and also most closely related with the other two species-groups. *E. puengeleri, E. mikkolai* and *E. cuneiferum* are forming a triplet of mostly allopatric species which is closely related to *E. tamerlana*. The most important characters of this species-groups are the *Hologнorisma*-type colouration and forewing pattern, the elongate-trapezoidal shape of valva, the long and slender (cylindrical or tubular), distally variably strongly arched aedeagus with strongly sclerotised and dentate dorsal carinal plate, and the long and heavily sclerotized, anteriorly strongly folded ductus bursae which often partly or entirely fused with the also strongly sclerotized and broad antrum.

Eugnorisma* (*Hologнorisma*) *ignoratum Varga & Ronkay, 1994

(Plate 5, Figs 3–4; Plate 36, Figs 17–24; gen. fig. 18)

Eugnorisma (*Eugnorisma*) *ignoratum* Varga & Ronkay, 1994, *Acta Zoologica Academiae Scientiarum Hungaricae* **40**(1): 93. Nomen novum pro *Eugnorisma chaldaica* Auctorum nec Boisduval. Type-locality: "Rossia merid." Holotype: female, "Russia merid."; "Coll. E. Frivaldszky", in coll. HNHM.

Diagnosis. *Eugnorisma (H.) ignoratum* is an easily recognizable species, due to its characteristic rosy-grey to pinkish-grey forewing ground colour. It differs, besides the reddish forewing shade, from the externally most similar *E. (H.) chaldaica* by its more greyish irrorated ochreous-white hindwings; from *E. (H.) tamerlana* and *E. (H.) cuneiferum* by the differently shaped intracellular black patches, much stronger defined crosslines and the colouration of the hindwing; from *E. (H.) puengeleri* and *E. (H.) mikkolai* by its on average smaller size (wingspan 34–39 mm), shorter forewings, more intense forewing pattern and the lighter hindwings.

The most characteristic features of the male genitalia are the huge, dentated plate of the carina and the large, ample basal diverticulum of the vesica. *Eugnorisma (H.) ignoratum* has shorter and broader, apically more rounded valvae than in the other species of the *ignoratum*-group, shorter harpe, reduced subapical process (it is larger in all other *Hologнorisma* species), more medially located pseudopollex, and differently shaped, finger-like digitus (it is lobate in the other taxa of the subgenus).

The female genitalia of *E. (H.) ignoratum* can be distinguished from those the other members of the *ignoratum*-group by the broader and rather distinct antrum (it is narrower and fused with ductus bursae in the other members of the *ignoratum*-group); from the species of the *chaldaica*-group by the straight posterior part and the twice folded anterior part of ductus bursae; and from the taxa of the *eminens*-group by the longer folded section of ductus bursae and the broader antrum.

Distribution. South Siberian–Central Asiatic; a species typical of the zonal steppe and the xeromontane areas of the Central Asiatic high mountains. Its area extending from the Russian and Kazakh steppes, from the southern Ural region to the Central and eastern Tien Shan (Kazakhstan: Transili-, Kungei- and Dzhungarian Ala-Tau, Ketmen and Altyn-Emel Mts, Kirghisia: Turkestanian, Kirghis and Alexander chains), the south-western Altai and the Tarbagatai Mts (Zaisan) but absent from the more southern arid mountains (Turkey, Iran, Afghanistan and northern Pakistan). *Eugnorisma (H.) ignoratum* is often rather frequent in its habitats, mostly in medium altitudes, from August to the end of September.

Eugnorisma* (*Hologorisma*) *cuneiferum Varga & Ronkay, 1994

(Plate 5, Figs 5–6; Plate 36, Figs 25–32; gen. fig. 19)

Eugnorisma cuneiferum Varga & Ronkay, 1994, *Acta Zoologica Academiae Scientiarum Hungaricae* **40**(1): 93. Type-locality: Turkmenistan, Kopet-Dagh Mts, Karayalchi valley. Holotype: female, in coll. HNHM.

Diagnosis. *Eugnorisma (H.) cuneiferum* is the western sibling species of *E. (H.) puengeleri* (and *E. (H.) mikkolai*). It resembles externally mostly *E. (H.) tamerlana* by its elongate "cuneiform" intracellular black markings and the reduced crosslines, this feature is the shared synapomorphy of these two species. *Eugnorisma (H.) cuneiferum* differs from *E. (H.) tamerlana* by the remarkably darker, more brownish shaded (not whitish ashy grey) forewing ground colour and the fine brown-grey suffused ochreous-whitish hindwings; from the closest related *E. (H.) puengeleri* by the cuneiform black intracellular patches, and the somewhat more elongated forewings with more brownish shaded ground colour. *Eugnorisma (H.) cuneiferum* is more narrow-winged and more evenly coloured than *E. (H.) mikkolai*, lacking the dark black-brown irroration in and around stigmata which is typical of the latter species; while the members of the *chaldaica*-group have white or milky ochreous-whitish hindwings. Wingspan 33–43 mm.

The male genitalia of *E. (H.) cuneiferum* are very similar to those of *E. (H.) puengeleri*, sharing the characteristically obliquely flattened dentate carinal plate. The main differences between them are found in the shape of the valva and the harpe: *E. (H.) cuneiferum* has shorter and more arched harpe, less curved valvae, smaller subapical process and pseudopollex; moreover, the distal third of the aedeagus is more curved ventrally than in *E. (H.) puengeleri*. Both species differ from *E. (H.) mikkolai* by their flattened dorsal carinal plate, straighter harpe, and the larger lobe of digitus; from *E. (H.) tamerlana* by the differently shaped distal part of valva, less pointed subapical process, shorter and stronger harpe, differently shaped and positioned digitus, shorter dorsal carinal plate and the broader vesica.

The female genitalia of *E. (H.) cuneiferum* differ from those of *E. (H.) puengeleri, E. (H.) mikkolai* and *E. (H.) tamerlana* by the somewhat shallower postero-medial cleft of antrum, anteriorly less tapering ductus bursae with shorter and laterally less lobate folded section and the broader and proportionally shorter appendix bursae.

Distribution. Transcaspian endemic. It occurs in Turkmenistan (Kopet-Dagh) and NE Iran (Kopet-Dagh and Binaloud Mts), partly sympatrically with *E. (H.) spodia* and *E. (H.) kristenseni*. *Eugnorisma (H.) cuneiferum* is locally frequent in dry steppic habitats at medium-high altitudes. The moths are on the wing from mid-July to mid-September.

Eugnorisma* (*Hologorisma*) *puengeleri Varga & Ronkay, 1987

(Plate 5, Figs 7–8; Plate 36, Figs 33–36; gen. fig. 20)

Eugnorisma puengeleri Varga & Ronkay, 1987, *Acta Zoologica Academiae Scientiarum Hungaricae* **33**(1–2): 199, pl. I, figs 4–8, gen. figs 5–9, 125. Type-locality: Afghanistan, Paghman, 30 km NW of Kabul. Holotype: male, in coll. NHMW.

Diagnosis. This species has long been confused with the following, newly described species, *E. (H.) mikkolai*, due to their similar external appearance and the similar genitalia of both sexes. The thorough study of the recent, large *Hologorisma* material from Central Asia revealed that "*puengeleri*" includes two species, the much rarer and more stenochorous, more southerly distributed *E. (H.) puengeleri* and an actually undescribed, more widespread and locally frequent species occurring in the Tien Shan and the Hissaro-Pamir system. The type-series of *E. (H.) puengeleri* is also mixed, including only two specimens of this species; all other paratypes belong to *E. (H.) mikkolai*. Its closest relative is, however, not *E. (H.) mikkolai* but the externally less similar preceding taxon, *E. (H.) cuneiferum*. The detailed comparison of these two species is given above, in the Diagnosis of the latter species.

Eugnorisma (H.) puengeleri differs externally from *E. (H.) mikkolai* by its on average somewhat smaller size (wingspan 38–41 mm), narrower and apically more pointed forewings with paler ashy-grey to slate-grey ground colour, the absence of the blackish-brown irroration in and around stigmata (but a fine

reddish-brown irroration may be present in the reniform stigma), and the more whitish hindwings; from *E. (H.) tamerlana* by its smaller size, less elongate forewings with darker ground colour, differently shaped intracellular black markings, stronger crosslines and darker hindwings. It is easily separable from the *E. (H.) spodia-E. (H.) kristenseni* species-pair by the lack of the bronze-metallic reflexion of the intracellular black patches and the more greyish shaded hindwings; from *E. (H.) chaldaica kurdistana* by its longer, apically more pointed forewings, weaker crosslines and darker shaded hindwings.

The male genitalia are very similar to those of *E. (H.) cuneiferum* (and *E. (H.) mikkolai*) but *E. (H.) puengeleri* has straighter harpe, more arched valvae with longer digitus, larger and more prominent subapical process and pseudopollex, and the distal end of aedeagus is straighter than in the related species, having more flattened dorsal carinal plate.

The female genitalia of *E. (H.) puengeleri* differ from those of *E. (H.) cuneiferum* by the deeper postero-medial cleft of antrum, almost evenly broad posterior (non-folded) and longer and anteriorly more lobate folded section of ductus bursae, and the more elongated, proportionally longer appendix bursae.

Distribution. The known area of this rare species is composed from small, disjunct area fragments. It has been recorded from North-East Iran (Prov. Khorasan: Binaloud Mts), eastern Afghanistan and northwestern Pakistan (Gilgit region). This is one of the few *Eugnorisma* s.l. species which have never been found as locally frequent; the moths are on the wing from August to early October.

Eugnorisma (*Hologнorisma*) *mikkolai* sp. n.

(Plate 6, Figs 1–2; Plate 37, Figs 1–12; gen. fig. 21)

Holotype. Male, Kazakhstan, Prov. Almaty, Kuluktau, Temerlik Mt., Kegen Pass, 1600 m, 43°10'N, 79°20'E, 27.VIII.1997, leg. Z. Varga & A. Orosz (coll. Z. Varga).

Paratypes. **Kazakhstan**. Prov. Almaty. 16 specimens, with the same data as the holotype (coll. G. Ronkay & Z. Varga); 31 specimens, Altyn-Emel Pass, 1700 m, 44°10'N, 78°30'E, 4.IX.1997, leg. Z. Varga & A. Orosz (coll. G. Ronkay & Z. Varga); 2 males, 1 female, Elsyn-Bujryk Mt., 15 km SW of Karasaz, 2000 m, 43°00'N, 79°50'E, 26.VIII.1997, leg. Z. Varga & A. Orosz (coll. G. Ronkay & Z. Varga); 1 female, Almatinskiy Zapovednik, Issyk valley, 1800–2000 m, 43°15'N, 77°30'E, 20–21.VIII.1997, leg. Z. Varga & A. Orosz (coll. G. Ronkay); 8 specimens, Dzhungar-Alatau, Koksu valley, 5 km NE of Koksu, 1250 m, 44°45'N, 78°55'E, 6.IX.1997, leg. Z. Varga & A. Orosz (coll. G. Ronkay & Z. Varga); 8 specimens, 9 km SE of Kaskalen, 1000 m, 43°08'N, 76°37'E, 24.X.1994, leg. Gy. Fábián & Gy.M. László (coll. G. Ronkay & HNHM); 2 males, 5 females, from the same locality, 8.VIII.1995 (coll. Z. Varga); 4 specimens, from the same locality, 10.X.1994, leg. Gy. Fábián & Gy.M. László (coll. G. Ronkay); 2 females, from the same locality, 19.X.1994, leg. Gy. Fábián & Gy.M. László (coll. G. Ronkay); 41 males, 57 females, 20 km NW of Kapchugay, 550 m, 44°00'N, 77°00'E, 31.VIII.–1.IX.1997, leg. Z. Varga & A. Orosz, slide Nos: VZ 6863m, VZ 8760m, VZ 8725m, VZ 8707f, VZ 8740f, VZ 8952f (coll. G. Ronkay, Z. Varga & HNHM); 4 specimens, from the same locality, 430 m, 4.X.2002, leg. T. Csővári (coll. HNHM); 10 specimens, 10 km NW of Krasnogorka, 1250 m, 43°20'N, 75°10'E, 2.IX.1997, leg. Z. Varga & A. Orosz, slide Nos: VZ 8718m, VZ 8753m, VZ 8847m (coll. S.T. Kovács, G. Ronkay & Z. Varga); 2 males, 1 female, 10 km NW Bakbakty, 25 km SE of Bakanas, 400 m, 76°35'E, 44°40'N, 30.VIII.1997, leg. Z. Varga & A. Orosz (coll. S.T. Kovács); 5 males, 15 km S of Issyk, 1750–1950 m, 43°13'N, 77°13'E, 20–22.IX.1994, leg. Gy. Fábián & Gy.M. László (coll. G. Ronkay & HNHM); 15 specimens, from the same locality, 1710 m, 23.IX.2002, leg. T. Csővári (coll. HNHM); 2 males, Bokaydin-Tau, 4 km S of Malibay, 800–1250 m, 43°26'N, 78°24'E, 27–31.V.1994, leg. Gy. Fábián & I. Retezár (coll. G. Ronkay); 111 specimens, Syugeti Mt., 8 km NW of Kok-Pek, 980 m, 25.IX.2002, leg. T. Csővári (coll. HNHM & T. Csővári); 1 male, 1 female, Kizil Zsar (Red Valley), 30 km SE of Almaty, 1110 m, 01. X. 2002, leg T. Csővári (coll. T. Csővári); 25 specimens, 10 km N of Masak, 460 m, 24.IX.2002, leg. T. Csővári (coll. HNHM); 4 specimens, Kuluktau Mts, Kegen Pass, 1500 m, 79°13'E, 43°10'N, 30.X.1994, leg. Gy. Fábián & Gy.M. László (coll. HNHM); 5 specimens, Zailiskiy Alatau Mts, 30 km SE of Almaty, 1110 m, 23.IX.2002, leg. T. Csővári (coll. HNHM). Prov. Taldykurgan. 1 male, Dzhungarian Alatau, Taldy-Kurgan, slide No.: VZ 8814m (coll. Z. Varga); 6 specimens, Malaysari Mts, 2 km S Arharly Pass, 1000 m, 2.X.2002, leg. T. Csővári (coll. HNHM); 1 female, Dzhungarsky Alatau, Taldykurgan, Prigorodny, 638 m, 44°58'51"N, 78°22'51"E, leg. A. Belousov (coll. A. Belousov); 2 males, 1 female, Katutau Mts, Konyrolen River, 20 km NW Aidarly village, 920 m, 44°11'34"N, 79°22'30"E, 1.X.2015, leg. K. Nupponen (coll. K. Nupponen); 1 male, Charyn River, 1220 m, 43°14'36"N 78°52'48"E, 5.X.2015, leg. K. Nupponen (coll. K. Nupponen); 3 females, Kuluktau Mts, 15 km N Kegen village, 1590 m, 9.X.2015, 43°09'57"N, 79°10'11"E, leg. K. Nupponen (coll. K. Nupponen). **Uzbekistan**. 14 males, 10 females, Chimgan Mts, 1600 m, 20.IX.1992, leg. L. Miško (coll. P. Gyulai & G. Ronkay) ; 1 male, 3 females, Chimgan Mts, 100 km Tashkent 1600 m, 1–6.IX.1988, leg. Jürivete, slide Nos: VZ 8712m, VZ 8951f (coll. Z. Varga); 6 males, 8 females, Alai Mts, Dugobo, 30.IX.1985, leg. Z. Varga (paratypes of *E. (H.) puengeleri*), slide Nos: VZ 3309, VZ 3311, VZ 3312, VZ 3317, VZ 3320 (coll. P. Gyulai, G. Ronkay, Z. Varga & HNHM); 1 female, Dugobo, 2600 m, 45 km S Fergana, 15.VIII.1985, leg. Danilevsky, slide No.: HT 354f (coll. HNHM); 2 males, 1 female, Fergana, 10.VII.1985, slide No.: HT 356m (coll. HNHM); 1 female, W Tien Shan Mts, Chimgan, 800–2000 m, 18–25.VII.1990, leg. P. Gyulai & M. Hreblay, slide No.: GYP 959f (coll. P. Gyulai); 1 male, 3 females, W Tien

Shan, Chatkal Mts, near Chinaulsay, 10–15.IX.2001, leg. V. Gurko (coll. P. Gyulai); 1 male, [Uzbekistan] Aulie Ata, slide No.: VZ 2681m (paratype of *E. puengeleri*) (coll. NHMW). **Kirghisia**. 1 male, 1 female, Orusai, 2200 m, 17–31.VII.1993, leg. Toropov (coll. P. Gyulai); 1 male, Kirghiz range, Orusai, 2400 m, 1–5.IX.1995, leg. Toropov (coll. P. Gyulai); 1 male, Chon-Tash, 16–18.VIII.1993, leg. Toropov (coll. P. Gyulai); 1 male, Chon-Aryk, 1200 m, 17–23.VIII.1993, leg. Toropov (coll. P. Gyulai); 1 male, Norus, 1300 m, 20–25. VIII.1993, leg. Toropov (coll. P. Gyulai); 2 females, Naryn, Archaly, 2700 m, 9.IX.2002, leg. V. Siniaev (coll. HNHM). **Tadjikistan**. 2 males, Pamir Mts, Artuch, 2–10.VIII.1988, leg. A.V. Nekrasov (coll. G. Ronkay & HNHM); 1 female, Tigrovaya Balka, Pianj river area, 1–10.VIII.2006, leg. V. Gurko (coll. L. Srnka); 2 males, 3 females, Karategin gorge, Sangikar, 1300–1400 m, 28.VIII.1969, leg. Y. Shchetkin (coll. P. Gyulai); 19 males, 13 females, Peter I. Mts, Ganishou, 2100 m, 23–24.VIII.1994, leg. Y. Shchetkin (coll. P. Gyulai); 3 males, 2 females, from the same locality, 21–22.VIII.1994, leg. Y. Shchetkin (coll. P. Gyulai); 1 female, from the same locality, 17–18. VIII.1994, leg. Y. Shchetkin (coll. P. Gyulai); 9 males, 2 females, Peter I. Mts, 1700 m, Darai-Nasarak, 15.VIII.1992, leg. Y. Shchetkin, (coll. P. Gyulai); 1 male, 1 female, Hissar Mts, 1100m, near Kondara, 7–10.IX.1994, leg. Y. Shchetkin (coll. P. Gyulai); 1 male, from the same locality, 20.VIII.1994, leg. Y. Shchetkin (coll. P. Gyulai); 3 males, 2 females, from the same locality, 2.IX.1994, leg. Y. Shchetkin (coll. P. Gyulai); 2 males, 3 females, Hissar Mts, Gushary, 1300–1400 m, 8–16.X.1994, leg. Y. Shchetkin (coll. P. Gyulai); 28 males, 17 females, from the same locality, 17–25.IX.1985, leg. Y. Shchetkin (coll. P. Gyulai); 1 female, from the same locality, 20.X.1994, leg. Y. Shchetkin (coll. P. Gyulai); 1 female, from the same locality, 18–27.VIII.1992, leg. Y. Shchetkin (coll. P. Gyulai); 1 male, Karatau, 850 m, near Parchar, 11.VI.1985, leg. Y. Shchetkin (coll. P. Gyulai); 8 males, 3 females, Suroabad, 2000 m, 28.VIII., leg. Y. Shchetkin, slide No.: GYP 4264 (coll. P. Gyulai); 3 males, Romit reserve, 1400 m, 4–6.IX.2006, leg. V. Gurko, slide No.: GYP 4263m (coll. P. Gyulai & Z. Varga); 1 female, Ishkatinshky Mt., 3000–3200 m, 3.VII.1977, leg. J. Wojtusiak (coll. HNHM); 1 female, Pamir Mts, Khorog, 2300 m, 19–21.IX.1999, leg. Y. Shchetkin (coll. P. Gyulai); 2 females, from the same locality, 2–5.X.1969, leg. J. Wojtusiak, slide No.: RL 11632f (coll. HNHM); 1 male, from the same locality, 5.VIII.1981, leg. K. & L. Krusek (coll. Krusek); 1 female, from the same locality, 1.IX.1987, leg. Surakov (coll. HNHM); 1 female, from the same locality, 1968, coll. Smelhaus (coll. HNHM); 1 female, Darwaz Mts, near Khobarabad pass, 1900 m, 19–29.VIII.2006, leg. V. Gurko (coll. HNHM). **Afghanistan**. 1 male, Paghman Mts, 30 km NW of Kabul, 2450 m, 5–10.IX.1965, A. Vartian & E. Vartian, slide No.: VZ 2469m (paratype of *E. puengeleri*) (coll. NHMW).

Diagnosis. The new species resembles externally mostly *E. (H.) puengeleri* but has somewhat larger size (wingspan 37–45 mm), broader and apically less pointed forewings with darker and more ochreous shaded slate-grey, sand-grey or pale brownish-grey forewings, usually somewhat stronger crosslines, variably strong (most often prominent) blackish-brown irroration in and around stigmata (which is missing from *E. (H.) puengeleri*) and more ochreous-grey shaded hindwings. It can be easily distinguished from *E. (H.) chaldaica* by its larger size, different ground colour, weaker, more indistinct crosslines and stigmata, dark irroration in and under forewing cell, darker hindwings, etc.; from the *E. (H.) spodia-E. (H.) kristenseni* species-pair by its broader wings with larger and more prominent black intracellular stigmata lacking the bronze-metallic sheen and by the dark irroration in and below cell; from *E. (H.) cuneiferum* and *E. (H.) tamerlana* by its broader, less pointed forewings, differently shaped (not "cuneiform") black marking below the larger and less flattened orbicular stigma and the different hindwing colouration.

The male genitalia of *E. (H.) mikkolai* are generally similar to those of *E. (H.) puengeleri* and *E. (H.) cuneiferum*, but the new species has narrower, distally not dilated valvae with more parallel margins, smaller apical lobe and pseudopollex, smaller, shorter digitus, slenderer, medially more curved harpe, longer and distally more evenly arched aedeagus with dorsally convex, not flattened carinal plate; the subbasal diverticulum is broader, the spinulose field is more pocket-like than in the two related species.

The female genitalia of the three closely related species are very similar. *Eugnorisma (H.) mikkolai* has, in comparison with the other two relatives, the shortest folded anterior section of ductus bursae with the larger antero-lateral lobe; the postero-medial cleft on the antrum is shallower than in *E. (H.) cuneiferum* while the appendix bursae is more elongate than in *E. (H.) puengeleri*.

Distribution. Central Asiatic. The known area of this species extends from southern Russia across Kazakhstan, Uzbekistan, Kirghisia, and Tadjikistan to NE Afghanistan; its range overlaps with that of *E. (H.) puengeleri* only in the last region. A locally frequent species with rather long flight period, the moths can be found from August to early October.

Remarks. The specimens designated in the original description as paratypes of *E. (H.) puengeleri* from Uzbekistan (Aulie Ata; Prov. Ferghana, Alai Mts, Dugobo) represent, in fact, this newly described species.

Etymology. The new species is dedicated to the memory of Kauri Mikkola.

Eugnorisma* (*Hologнorisma*) *tamerlana (Hampson, 1903)

(Plate 6, Figs 3–4; Plate 37, Figs 13–20; gen. fig. 22)

Lycophotia tamerlana Hampson, 1903, *Catalogue of the Lepidoptera Phalaenae in the British Museum* **4**: 541, pl. 74, fig. 22. Type-locality: [Kazakhstan] Syr-Darya region. Syntypes: 1 male and 1 female, in coll. BMNH.

Diagnosis. An unmistakable species, due to its long and narrow forewings with fine ochreous-shaded whitish-grey to ash-grey forewings with reduced crosslines, strongly flattened orbicular stigma and long, cuneate suborbicular black patch, the pure white, patternless and hemi-diaphanous hindwings and the silky white underside of both wings. Wingspan 36–43 mm.

The male genitalia of *E. (H.) tamerlana* differ from those of all related species by the very long, medially and distally dilated valvae with long and acute subapical process, more distally located and wedge-shaped pseudopollex, oblique digitus, longer and slenderer harpe, large and rather thick, straight aedeagus with straight and very long dorsal carinal plate covered with stronger teeth, and the thinner vesica with large terminal diverticulum covered with fine spinules.

The diagnostic features of the female genitalia are the broad and deep postero-medial cleft of antrum, the anteriorly evenly tapering antrum-ductus bursae complex, having short and less folded anterior section, and the relatively short, elliptical-ovoid corpus bursae.

Distribution. A species typical of the semi-desert and desert habitats. It occurs in the sandy and saline deserts of the eastern European steppes and Turkestan, from the eastern Caspian area towards to eastern Kazakhstan. The species is rather local but usually frequent or even common in its habitats; the moths are on the wing in September-October.

The ***eminens*** species-group

Diagnosis. This species-group is mostly characterised by the very specific, complex and sharply marked dark forewing pattern. The genitalia of both sexes are most similar to those of *E. (H.) ignoratum*; the diagnostic features are the different shape of the apical valval section (resembling more the taxa of the *chaldaica*-group) and the straight aedeagus (males) and the shorter folded anterior section of ductus bursae and the less elongated appendix bursae in the females.

The species-group comprises two closely related, partly sympatrically occurring polytypic species. The second species of the group has been discovered rather late, its eastern subspecies was first recognised while the existence of the two western races of *E.* (*H.*) *atrabaelbops* has been clarified only during the recent investigations.

Distribution. The species-group has a wide area from eastern Anatolia and the eastern European steppes to western Siberia and the Altai Mts to the north-east and the Pakistani Hindukush to the east. The area of the more widespread *E. (H.) eminens* is more or less continuous within this range while *E.* (*H.*) *atrabaelbops* has three small, disjunct areas, where it is sympatric with its sister-species.

Eugnorisma (*Hologorisma*) *eminens eminens* (Lederer, 1855)

(Plate 6, Figs 5–6; Plate 37, Figs 21–28; gen. fig. 23)

Graphiphora eminens Lederer, 1855, *Verhandlungen des Zoologisch-Botanischen Vereins in Wien* **5**: 106, pl. 1, fig. 3. Type-locality: [Russia], Altai Mts. Lectotype: male, here designated, in coll. ZMHU.

Synonymy

Agrotis excellens Staudinger, 1867, *Stettiner entomologische Zeitung* **28**: 107. Type-locality: [Russia], Altai Mts. Holotype: male, in coll. ZMHU.

Lectotype designation. Lectotype of *Graphiphora eminens* Lederer, 1855, here designated: male, "Origin." (pink label), "Eminens m. Altai" (handwriting of Lederer), "Altai, Kinderm." (green label); deposited in coll. ZMHU (Plate 31, Fig. 21).

Diagnosis. *Eugnorisma (H.) eminens* is the larger, more distinctly marked member of the otherwise unmistakable species-pair, no other similarly patterned Noctuidae species is known. It differs from its sister-species, *E. (H.) atrabaelbops*, by its on average larger size (wingspan 34–43 mm versus 32–40 mm), broader forewings, broadly conjoined antemedial and postmedial crosslines (the latter with much larger upper arch), much stronger and longer arrowhead-streaks on veins between reniform stigma and postmedial line, and the less sinuous subterminal line. The colouration of both species is strongly variable from pale whitish- or ochreous-grey to dark brown-grey, the dark irroration in the median and marginal fields also show a great variation.

The genitalia of the two twin-species are surprisingly similar, the specific differences are small and their recognition often requires the thorough study of the slides. In the male genitalia, *E. (H.) eminens* has usually broader valvae with more extended pseudopollex and subapical process, less retroflexed vesica with strongly pocket-like spinulose field, and basally narrower subbasal diverticulum; in the female genitalia, the antrum of *E. (H.) eminens* is broader and is more distinct from the posterior end of ductus bursae, and the proximal (folded) part of ductus bursae is proportionally shorter than in *E. (H.) atrabaelbops*.

Distribution. West and Central Asiatic, South Siberian. The nominotypical subspecies occurs in eastern Anatolia, Transcaucasia, northern and western Iran (Elburs, Zagros, Khorassan), Turkmenistan (Kopet-Dagh), Tadjikistan (Pamir, Hissar), W. and E. Tien Shan (Alai and Transalai Mts), the Tarbagatai and the Altai Mts (Kazakh, Russian and Mongolian parts). A generally frequent, locally common species; the flight period extends from the end of August to the beginning of October.

Eugnorisma (*Hologorisma*) *eminens clarior* Varga, 1975

(Plate 6, Figs 7–8; Plate 37, Figs 29–36; gen. fig. 24)

Eugnorisma eminens clarior Varga, 1975, *Zeitschrift der Arbeitsgemeinschaft oesterreichischer Entomologen* **27** (1/2): 12, fig. 6, pl. 1, fig. 20. Type-locality: Afghanistan (Central), Khurd-Kabul, SE of Kabul. Holotype: male, in coll. NHMW.

Diagnosis. The south-eastern subspecies differs from the nominate race with its somewhat larger size (37–42 mm), lighter, more greyish colouration of forewing, more sharply defined dark markings, mostly in the median and terminal areas. This subspecies of *E. (H.) eminens* is partially sympatric with the typical subspecies of *E. (H.) atrabaelbops*.

The genitalia of the two subspecies are very similar, the ssp. *clarior* has stronger, somewhat more robust clasping apparatus with less convex costa, shorter and slenderer harpe, thinner uncus and stronger, straighter dorsal carinal plate (males); somewhat broader antrum and broader appendix bursae (females).

Distribution. The ssp. *clarior* occurs in the Hindukush Mts in Central and eastern Afghanistan and NW Pakistan (Hindukush, Karakoram, and NW Himalayas). It is generally local and infrequent, rarer than the western and Central Asiatic populations of the ssp. *eminens*. The adults are on the wing in August-September.

Eugnorisma (*Hologнorisma*) *atrabaelbops atrabaelbops* Varga, 1975

(Plate 7, Figs 1–2; Plate 37, Figs 37–40; gen. fig. 25)

Eugnorisma atrabaelbops Varga, 1975, *Zeitschrift der Arbeitsgemeinschaft oesterreichischer Entomologen* **27** (1/2): 11, fig. 6, pl. 1, fig. 21. Type-locality: Afghanistan (Central), Khurd-Kabul, SE of Kabul. Holotype: male, in coll. NHMW.

Diagnosis. *Eugnorisma (H.) atrabaelbops* shows a more decent general appearance than its sister species. Dark forewing markings generally finer, filling of stigmata clearer, radial dark markings on veins between reniform stigma and postmedian line partly reduced; crosslines finer, having more parallel course, especially lower section of postmedial line, therefore antemedial and postmedial lines do not conjoined; subterminal line more sinuous, especially in its medial part. Surprisingly, these characters are nearly identically expressed in all three disjunct subspecies. Wingspan 32–37 mm.

The differences between the male genitalia of the two species are found in the valval shape and the configuration of the vesica. In *E. (H.) atrabaelbops*, the valvae are medially narrower than in *E. (H.) eminens*, having weaker pseudopollex, the vesica is broader with larger, basally broader subbasal diverticulum and larger, broader distal spinulose field. In the female genitalia, the antrum of *E. (H.) atrabaelbops* is narrower and more distinct from ductus bursae, having usually deeper postero-medial cleft, and the folded section of ductus bursae is proportionally longer than in *E. (H.) eminens*.

Distribution. The typical subspecies occurs in the Hindukush Mts in Eastern Afghanistan, and in the Tadjik Pamir. The few known specimens were collected at the beginning of September.

Eugnorisma (*Hologнorisma*) *atrabaelbops firyuza* **ssp. n.**

(Plate 7, Figs 3–4; Plate 38, Figs 1–8; gen. fig. 26)

Holotype. Male, Turkmenistan, Kopet-Dagh, Kurkulab, 6 km W of Germob, 38°04'N, 57°50E, 3.X.1991, leg. L. Ronkay & Z. Varga (coll. G. Ronkay).

Paratypes. **Turkmenistan**. Kopet-Dagh Mts. 13 specimens, with the same data as the holotype (coll. M. Fibiger, G. Ronkay, Z. Varga & HNHM); 64 specimens, 5 km S of Chuli, 700–800 m, 37°56'N, 58°01'E, 30.IX.1991, leg. L. Ronkay & Z. Varga, slide Nos 8808, 8809, 8811, 8822, 8823, 8827, 8829, 8841, 8857 males, 8896, 8902 females (coll. G. Ronkay, Z. Varga & HNHM); 2 males, Karayalchi valley, 20 km E of Nochur, 800 m, 38°23'N, 57°12'E, 4.X.1991, leg. A. Podlussány, L. Ronkay & Z. Varga, slide No.: VZ 8808 (coll. G. Ronkay & Z. Varga); 7 specimens, Karayalchi valley, 25 km E of Nochur, 1600 m, 38°21'N, 57°09'E, 5.X.1991, leg. A. Podlussány, L. Ronkay & Z. Varga (coll. G. Ronkay & Z. Varga); 9 specimens, Firyuza, 37°59'N, 58°05E, 400–600 m, 12.X.1991, leg. A. Podlussány, L. Ronkay & Z. Varga, slide Nos: VZ 8825, VZ 8842 (coll. G. Ronkay & Z. Varga); 14 specimens, from the same site, 25.IX.1991, leg. A. Podlussány, L. Ronkay & Z. Varga (coll. G. Ronkay, Z. Varga & HNHM); 7 males, from the same locality, 28.IX.1991 (coll. HNHM); 2 males, from the same locality, 12.X.1991 (coll. HNHM); 1 male, 1 female, from the same locality, 13.X.1991 (coll. HNHM); 7 specimens, Dushak, 2200 m, 1–2.X.1991, leg. L. Ronkay & Z. Varga, slide No.: VZ 8826m (coll. P. Gyulai, G. Ronkay, Z. Varga & HNHM); 7 specimens, Parkhay, 6 km NW of Kara-Kala, 400 m, 38°22'N, 56°13'E, 30.IX.1991, leg. L. Ronkay & Z. Varga (coll. G. Ronkay & Z. Varga); 7 specimens, Vanovskiy, 5 km NE of Firyuza, 400 m, 38°00'N, 58°06E, 27.IX.1991, leg. A. Podlussány, L. Ronkay & Z. Varga, slide No.: VZ 8810m (coll. P. Gyulai, Z. Varga & HNHM). **Iran**. Prov. Khorasan. 1 male, female, Kopet-Dagh, Tandure NP, 10 km N of Jevenly, 2300 m, 27–28.VIII.2000, leg. P. Gyulai & A. Garai (coll. P. Gyulai & Z. Varga); 1 female, Kopet-Dagh, 1 km W of Jevenly, 2100 m, 27–28.VIII.2000, leg. P. Gyulai & A. Garai (coll. P. Gyulai); 1 male, Kopet-Dagh, Tandure NP, near Jevenly, 2000 m, 17–18.IX.2006, leg. P. Gyulai & A. Garai, slide No.: GYP 4069m (coll. P. Gyulai); 2 males, Kopet-Dagh Mts, 3 km SSW of Tangeh-ye-Torkaman, 1241 m, 37°54,411'N, 56°55,783'E, 12.X.2010, leg. J. Babics & T. Csővári, slide Nos: VZ 8855m, VZ 8860m (coll. Z. Varga). 1 female, Elburs Mts, Firizkuh, 7000 feet, 12.IX.1961, leg. S.L. Sutton (coll. BMNH).

Diagnosis. The ssp. *firyuza* is slightly larger on average than the typical subspecies; wingspan 33–40 mm. It differs from the ssp. *atrabaelbops* by its somewhat more elongate forewings, more ochreous forewing ground colour, stronger brown irroration in median area, weaker defined claviform stigma and more ochreous shaded hindwings with fine brown-grey covering on the veins and the marginal area.

The male genitalia are more or less identical with those of the typical subspecies, but the valval costa is slightly more arcuate, the vesica is more reclinate ventrally and dilated distally, and both diverticula are very large. In the female genitalia, the ssp. *firyuza* has the narrowest antrum and ductus bursae within the three subspecies of *E. (H.) atrabaelbops*.

Distribution. The ssp. *firyuza* is endemic to the Kopet-Dagh massif (Turkmenistan, NE Iran: Khorasan). Locally common in dry scrubby, steppic or semi-desert-like habitats at medium altitudes. Its flight period starts usually later than that of the sympatrically occurring *E. (H.) eminens* which is already on wing from mid-July, the flight period of both species extends to the beginning of October.

Eugnorisma (*Hologнorisma*) *atrabaelbops scotophaia* ssp. n.

(Plate 7, Figs 5–6; Plate 38, Figs 9–16; gen. fig. 27)

Holotype. Male, SW Kazakhstan, Prov. Mangistau, Ustyurt Nature Reserve, Kokusem cordon, 30.IX.2010 (coll. P. Gyulai).
Paratypes. **Kazakhstan**. Prov. Mangistau. 69 males, 26 females, with the same data as the holotype (coll. P. Gyulai & K. Nupponen); 1 male, with the same data as the holotype, slide No.: VZ 8873m (coll. Z. Varga); 4 males, 1 female, from the same locality, 2.X.2010, leg. local collector, slide No.: GYP 4134f (coll. P. Gyulai); 1 male, from the same locality, 10.X.2010, leg. Goshko (coll. L. Srnka); 2 males, Ustyurt Nature Reserve, Kendyrli cordon, 3.X.2010, leg. local collector (coll. P. Gyulai); 2 specimens, from the same locality, 27–29.IX.2010, leg. local collector (coll. G. Ronkay); 52 males, 44 females, with the same data, slide Nos: GYP 4071f, GYP 4074m (coll. P. Gyulai & K. Nupponen); 3 males, 2 females, Ustyurt Nature Reserve, Sand Tynyshtyk, 21.IX.2010, leg. local collector (coll. P. Gyulai & K. Nupponen). Prov. Kyzylorda. 1 male, Syrdariya, Karatau Mt. range, 12 km NW of Aksumbe aul, 450 m, 1.X.2014, leg. local collector (coll. P. Gyulai); 1 female, near river Ili, 10 km S of Usharal, 460 m, 5.X.2002, leg. T. Csővári (coll. T. Csővári); 1 male, chalk hills near Emba River, 15 km N Mijaly village, 132 m, 47°22'40"N, 55°32'34"E, 16.IX.2010, leg. K. Nupponen (coll. K. Nupponen); 4 males, 40 km S Sai-Utes village, 223 m, 44°00'51"N, 53°25'43"E, 19.IX.2010, leg. K. Nupponen (coll. K. Nupponen); 6 males, 5 females, Ustyurt Nature Reserve, Onere spring, 12-47 m, 42°36'25"N, 54°08'34"E, 12–47 m, 23-26.IX.2010, leg. K. Nupponen (coll. K. Nupponen); 1 male, 25 km W Aralsk town, 155 m, 46°46'54"N, 61°21'59"E, 21.IX.2011, leg. K. Nupponen (coll. K. Nupponen); 4 males, 2 females, 17 km NE Emba village, 280 m, 48°55'29"N, 58°18'49"E, 26.IX.2011, leg. K. Nupponen (coll. K. Nupponen), 3 males, 1 female, 15 km N Kurylys village, 150 m, 48°47'07"N, 60°48'30"E, 21.IX.2015, leg. K. Nupponen (coll. K. Nupponen). **Russia**. 2 males, Batkul Lake, 13–15.IX.1998 and 19–29.IX.1998, leg. Miatleuski, slide No.: GYP 1079m (coll. M. Fibiger & P. Gyulai). **Turkey**. 1 male, Prov. Kars, 3 km E Karakurt, 1450 m, 12.IX.1993, leg. M. Fibiger (coll. M. Fibiger).

Diagnosis. The ssp. *scotophaia* is the smallest (wingspan 31–38 mm), more short-winged and darkest within the three subspecies of *E. (H.) atrabaelbops*. Head and thorax "smoky" brownish-grey, abdomen slightly lighter; forewing brownish-grey, densely irrorated with blackish-brown scales, outer part of marginal field strongly dark brown-grey suffused, medial section of subterminal line very strongly waved, reniform and claviform stigmata darkened, filled with blackish-brown scales, orbicular stigma lighter greyish; hindwing whitish, paler than in the ssp. *firyuza*, often with weak marginal suffusion and greyish covering on veins.

The male genitalia differ slightly from those of the typical subspecies by the somewhat straighter ventral margin of valva, the broader and more rounded subapical lobe, the smaller pseudopollex and the slightly shorter and more curved and apically more obtuse harpe. The female genitalia differ mainly by the shape of the antrum which has more quadrangular postero-medial cleft in the ssp. *scotophaia* than in the other two subspecies.

Distribution. South-western Kazakhstan (Prov. Mangistau: Ustyurt plateau, Prov. Kyzylorda: Karatau Mts), SE Russia (Batkul Lake) and NE Turkey (Kars).

Subgenus *Phacognorisma* subgen n.

Type-species: *Xestia enargiaris* Draudt, 1936, *Entomologische Rundschau* **53**: 469; here designated.

Diagnosis. This monotypic subgenus represents an intermediate evolutionary lineage between the subgenera *Hologнorisma* and *Eugnorisma*, displaying autapomorphic reductive characters. The group features are as follows: 1) forewing ground colour pale ochreous-yellowish with indistinct pattern; 2) crosslines simple (or partly double), red-brownish, as well as the outlines of orbicular and reniform stigmata and the darker covering on veins; 3) claviform stigma reduced; 4) ochreous-white shaded, slightly

transparent white hindwings; 5) very strong, falcate uncus; 6) long, straight valvae with parallel costal and ventral margins and reduced apical lobe and digitus; 7) pseudopollex very strong, digitiform, rather distally located; 8) harpe strong, sword-like, acute apically; 9) aedeagus long, tubular, distally curved and dilated; 10) dorsal carinal plate huge, heavily sclerotized, covered with large, acute teeth; 11) vesica ample, recurved, with small distal spinulose field; 12) subbasal diverticulum absent; 13) antrum large, sclerotized, cup-shaped, with shallow, U-shaped postero-medial incision; 14) ductus bursae strongly sclerotized, compressed and folded medially; 15) appendix bursae large, more or less discoidal, only finely plicate or rugulose; and 16) corpus bursae elliptical-ovoid, without signa.

The subgenus *Phacognorisma* is distinguished from all other subgenera of *Eugnorisma* by the absence of the subbasal diverticulum and cornutus. It differs from *Hologнorisma*, besides this feature, by the generally *Hologнorisma*-type forewing markings but on a yellowish-ochreous ground and lacking the dark intracellular markings, the differently shaped pseudopollex, the absence of the digitus-lobe, the special structure of the dorsal carinal plate, the basally much broader, distally strongly tapering vesica, the differently folded ductus bursae and the much weaker rugose-ribbed appendix bursae. The differences between *Phacognorisma* and the subgenus *Eugnorisma* are similarly large and prominent. Externally, the new subgenus differ from the yellowish coloured *Eugnorisma* species by the different wing shape and elements of pattern (large, rounded orbicular and reniform stigmata, without darker filling; reticulate pattern due to the red-brown covering on the veins); in the male genitalia, by its much larger genital capsule, larger pseudopollex lacking the scale-covering (which is a group apomorphy of *Eugnorisma* s. str., missing only in *E. (E.) jubilans*) remarkably longer aedeagus with much stronger dorsal carinal plate and the very small distal spinulose field; in the female genitalia, mainly by the weaker surface structures of appendix bursae. It is important to note that *Phacognorisma* shows closer connections with *Hologнorisma* in its external and male genital features while the configuration of the female genitalia is much closer to that of *Eugnorisma* s. str.

Distribution. Anatolian-Iranian.

Eugnorisma* (*Phacognorisma*) *enargiaris (Draudt, 1936)

(Plate 7, Figs 7–8; Plate 38, Figs 17–24; gen. fig. 28)

Xestia enargiaris Draudt, 1936, *Entomologische Rundschau* **53**: 469. Type-locality: [Turkey] Marash. Types destroyed.

Diagnosis. An unmistakable species, it cannot be confused with any other Noctuinae species due to its characteristic external appearance. It differs from the yellowish coloured *Eugnorisma* s. str. and *Metagnorisma* species by the different, less elongated and apically less pointed forewings, the large, rounded and not darkened orbicular and reniform stigmata, lacking the dark intracellular markings between them, and by the fine but clearly visible reticulate pattern composed by the red-brown crosslines and the similarly coloured dark covering on the veins; from the externally somewhat similar *Miniphila* species and the *Xestia ochreago* (Hübner, 1790) – *X. pallidago* (Staudinger, 1900) species-pair also by the filiform male antennae. Wingspan 32–39 mm.

The genitalia of both sexes differ from those of the externally similar species by the features mentioned in the characterisation of the subgenus (see the gen. figs 28, 33–37, 52 and 77–79).

Distribution. Anatolian-Iranian. The rather limited area of *E. (P.) enargiaris* extends from Central and Eastern Turkey to western and Central Iran. A locally occurring, usually infrequent species with autumnal adults; the moths are on the wing from the mid-September to the end of October.

Subgenus *Eugnorisma* Boursin, 1946

Eugnorisma Boursin, 1946, *Revue française d'Entomologie* **10**: 188. Type-species: *Graphiphora insignata* Lederer, 1853, by original designation.

Diagnosis. The subgenus *Eugnorisma* s. str. comprises two, externally easily separable species-groups, the *trigonica-* and the *insignata*-groups. Both species-groups include generally medium-sized species, often forming groups of closely related, partly sympatrically occurring species. The external group features distinguishing the subgenus from *Hologнorisma* and *Phacognorisma* are the generally shorter and more or less triangular forewings with reduced (*insignata*-group) or characteristically oblique C-shaped (*trigonica*-group) dark intracellular markings, with darker filling or reniform (and sometimes also orbicular) stigma but lacking the reticulate pattern which is the group apomorphy of *Phacognorisma*. The members of the *insignata*-group are usually more similar to the taxa of *Metagnorisma* but have more triangular, apically more pointed forewings and less sharply black defined subbasal and antemedial crosslines.

The ground colour within the subgenus *Eugnorisma* s. str. is most often greyish, ochreous- or reddish-grey, only in some few cases with pastel-like reddish, bluish or violaceous shade, being characteristic of certain species and subspecies (*E. (E.) gaurax, E. (E.) asad*). The dark markings are often typical for a group of closely related species (*trigonica*-group) or more or less reduced (*insignata*-group), often polymorphic in some populations (see e.g. the colour forms of *E. (E.) trigonica* or *E. (E.) insignata*); the dark, blackish-brown intermaculation in the medial cell is only expressed in the *trigonica*-group. The hindwings are most often white or whitish in both sexes, with some darker irroration on veins at marginal field, especially in the females.

The group apomorphy of the male genitalia is the prominent scale-covering of pseudopollex (which is absent only from *E. (E.) jubilans*, this species lacks the entire pseudopollex). The male genital capsule is much weaker sclerotized and smaller than in the subgenera *Hologнorisma* and *Phacognorisma*, the valvae lack the digitus which is always present in *Hologнorisma*. The valvae are more quadrangular than the rather ear-shaped valvae of *Metagnorisma*, with well-developed pseudopollex (except *E. (E.) jubilans*) and often with larger (*trigonica*-group) or smaller, sometimes reduced (*insignata*-group) subapical lobe. The harpe is regular, long and slender (*trigonica*-group) or variably long (*insignata*-group), without elongated basal ventral extension being typical of *Metagnorisma* (except *E. (E.) rafidain*). In *Eugnorisma* s. str. the uncus is pointed or medially dilated, exceptionally (*E. (E.) conformis*) spatulate; and the apical valval lobe is bill-like and pointed (*trigonica*-group, *E. (E.) rafidain*) or reduced, rounded (*insignata*-group). The size and shape of the aedeagus vary strongly but are characteristic for the species-groups: in the *insignata*-group the dorsal carinal plate is stronger than in the *trigonica*-group but much weaker than in *Hologнorisma* and *Phacognorisma*; the vesica is generally very broad and inflated, much broader than in *Hologнorisma*. The spinulose field is differently built in the two species-groups, that of the *trigonica*-group is much larger than in the other three subgenera, covering the broadly rounded and dilated distal third of the vesica, surrounded by large scobinate area; that of the *insignata*-group is smaller but still larger than in the other subgenera, covering the surface of a semiglobular diverticulum. The subbasal diverticulum is large, elongate, sometimes resembling the neck and head of birds; subbasal cornutus simple (*trigonica*-group) or more or less bulbed (*insignata*-group).

The female genitalia are very similar to those of *Phacognorisma*, differing from *Hologнorisma* by the shorter and less folded ductus bursae, and the less elongated appendix bursae and corpus bursae; from *Metagnorisma* by the much stronger sclerotized antrum and ductus bursae, the larger and more rugulose-ribbed appendix bursae, and the less spacious corpus bursae. The species of the *trigonica*-group and *E. (E.) rafidain* have signa, similarly to *Metagnorisma*, while *Hologнorisma* and *Phacognorisma* lack the signa.

Distribution. Western and Central Asiatic. The mostly expansive species *E. insignata* can reach Eastern Europe (south of Urals, lower Volga region).

The *trigonica* species-group

Diagnosis. This group comprises four medium-sized species (wingspan 29–41 mm). The characteristic external morphological features are the slender body, the elongated-triangular forewings with pointed apex and with large intracellular dark patches which are most often conjoined into an oblique, black, blackish-brown or red-brown, C-shaped mark, and the usually white or whitish hindwings with only fine dark irroration in the marginal field, especially in the females.

The male clasping apparatus resembles that of the *chaldaica*-group of *Hologнorisma* but much smaller and less robust, the subapical lobe more prominent, often acutely pointed, the digitus is absent and the pseudopollex is covered by depressed scales (except in *E. (E.) jubilans* which has reduced pseudopollex). The aedeagus is much shorter and generally thicker than in *Hologнorisma*, usually more or less arcuate, with usually less sclerotized and much weaker dentate-spinose dorsal carinal plate. The vesica is generally ample and hollowed, distally dilated and rather globular or rugby-ball-shaped; with large distal spinulose field followed by scobinate areas.

The female genitalia have strongly sclerotized, trapezoidal antrum, strong and short, anteriorly twisted and partly folded, with an inflexed dorsal crest; large, spacious, variably strongly rugose-ribbed appendix bursae, being as large as or larger than corpus bursae, and small, rounded-discoidal corpus bursae, with four small signum-patches.

The species are usually distinguishable by their external features; in the problematic cases the study of the genitalia provides a satisfactory identification. It is important to mention that the differences in the genitalia are considerably larger in the males; the separation of the females requires a more thorough study and practice.

Distribution. Central and Inner Asiatic, Turkestanian. Most species express a conspicuous geographical variation, often adapted to the colouration of the substrate. These taxa are often strictly localised to high mountainous habitats.

Eugnorisma (*Eugnorisma*) *trigonica trigonica* (Alphéraky, 1882)

(Plate 8, Figs 1–4; Plate 38, Figs 25–40; gen. fig. 29)

Agrotis trigonica Alphéraky, 1882, *Horae Societatis Entomologicae Rossicae* **17**: 43, pl. 4, fig. 39. Type-locality: [China, Xinjiang] Kuldja. Lectotype: male, in coll. ZISP.

Diagnosis. *Eugnorisma (E.) trigonica* is one of the most variable species of the genus in size (wingspan of the typical subspecies is 32–39 mm) and colouration but is easily recognisable by the relative constancy of the forewing pattern. Head, thorax and forewing grey or/and brown, reddish or ochreous; intensity of wing pattern also varied (the blackish intracellular mark also may be faded). It differs from the other members of the species-group by its broader and usually less pointed forewings, the broader and regularly widely conjoined, C-shaped intracellular dark mark, the double but less prominent antemedial and postmedial crosslines and the larger hindwings with somewhat stronger fine grey-brown irroration. The problematic specimens are easily distinguished from the related taxa by the study of the genitalia in both sexes.

The male genitalia of *E. (E.) trigonica* differs from those of the other members of the species-group by the larger clasping apparatus, having longer and slenderer uncus, more elongated valvae with more concave distal ventral margin, far more proximally located pseudopollex, and the slenderer and more arched harpe.

The female genitalia of *E. (E.) trigonica* differ from those of *E. (E.) gaurax* and *E. (E.) deleasma* by the shorter antrum, the posteriorly more folded ductus bursae and the shorter, more discoidal appendix bursae; from *E. (E.) jubilans* by the longer antrum, more folded ductus bursae and broader, more rugose-ribbed appendix bursae.

Distribution. The typical ssp. *trigonica* is distributed in the large arid mountain chains of Central Asia, mostly in different parts of Tien Shan massif, in the Hissaro-Darwaz Mts, the western Pamirs, the Peter I. Mts and the Afghani Hindukush. The species is rather widespread and frequent but not common in most of its habitats; the moths are on the wing from the end of June to the end of August.

Eugnorisma* (*Eugnorisma*) *trigonica gauracoides Hacker & Peks, 1990

(Plate 8, Figs 5–6; Plate 39, Figs 1–8; gen. fig. 30)

Eugnorisma (*Eugnorisma*) *trigonica gauracoides* Hacker & Peks, 1990, *Esperiana* **1**: 294, pl. C, fig. 8., gen. fig. 36. Type-locality: India, Ladakh, Lotsun, 3000 m. Holotype: male, in coll. H. Peks (Schwanfeld).

Diagnosis. The south-eastern subspecies of *E. (E.) trigonica* is larger on average than the nominate subspecies (wingspan 38–41 mm), having longer and darker coloured, most often grey shaded forewings and somewhat more distinct crosslines. Head, thorax and forewings plumbeous-grey, intracellular "*trigonica*" marking darker, blackish-grey. The eastern Afghan populations resemble the ssp. *gauracoides* rather than the typical subspecies but are smaller in size, the forewings are shorter and somewhat broader, and have usually a fine reddish-brown nuance (see the Plate 38, Figs 37–40).

The male genitalia are more or less identical with those of the ssp. *trigonica* but the entire genitalia of the ssp. *gauracoides* is somewhat larger, having broader valvae with stronger pseudopollex and proportionally shorter distal part of valva, the subbasal diverticulum of vesica is slightly more elongate, with more acutely pointed cornutus, and the terminal part of vesica is less dilated, less angular than in the ssp. *trigonica*. In the female genitalia, the appendix bursae of ssp. *gauracoides* is somewhat narrower and more elongate than in the typical subspecies.

Distribution. This subspecies is distributed in north-west Pakistan (Hindukush, Karakoram, and NW Himalayas) and the Indian Kashmir. The flight period is somewhat later in the year, from the mid-August to the mid-September.

Eugnorisma* (*Eugnorisma*) *gaurax gaurax (Püngeler, 1900)

(Plate 8, Figs 7–8; Plate 39, Figs 9–20; gen. fig. 31)

Agrotis gaurax Püngeler, 1900, *Deutsche Entomologische Zeitschrift. Gesellschaft Iris zu Dresden* **12**: 117, pl. 4, fig. 9. Type-locality: [Kirghisia] Alexander Mts. Lectotype: male, here designated, in coll. ZMHU.

Synonymy.

Eugnorisma (*Eugnorisma*) *gaurax funebris* Varga & Ronkay, 1990, *Acta Zoologica Academiae Scientiarum Hungaricae* **36**: 335. Type-locality: Uzbekistan, Alai Mts, Dugobo. Holotype: male, in coll Z. Varga (Debrecen); **syn. n**.

Lectotype designation. Lectotype of *Agrotis gaurax* Püngeler, 1900, here designated: male, "Typus" (red label), "Type gaurax Püng. ♂" (pink label, with the handwriting of Püngeler), "Asia centr., Tien-schan, Alexandergebirge, Rückbeil, 1899", "Préparation MB148 Ch. Boursin", "Zool. Mus. Berlin" (yellow label); deposited in coll. ZMHU (Plate 39, Fig. 9).

Diagnosis. *Eugnorisma* (*E.*) *gaurax* is less variable in colouration as the preceding one, though the specimens occurring in the western part of its range often have a darker fuscous grey colouration with the reduction of the rosy nuance in the Alai Mts ("ssp." *funebris*) but with transitions to the typical form. Wingspan 29–35 mm.

This species is very similar to the closely related *E.* (*E.*) *deleasma* and the colouration of both species slightly overlap in the northern populations where *E. (E.) deleasma hissarica* has also the reddish- or rosy-grey ground colour being characteristic to most populations of *E.* (*E.*) *gaurax.* The best differential external character between the two taxa is the strong reduction of transversal lines in *E.* (*E.*) *gaurax* while *E.* (*E.*) *deleasma* usually has strong, blackish antemedial and postmedial lines; in addition, both wings of *E.* (*E.*) *gaurax* are somewhat broader, and the forewing is less pointed apically.

The differences between the genitalia of this species-pair are less conspicuous than between *E.* (*E.*) *trigonica* and the two sister-species, but are constant and clearly recognisable. In males, the whole organ of *E.* (*E.*) *gaurax* is larger and stronger, the uncus is shorter, the valvae are more elongated, with less ventrally projecting subapical process, the medial part of the valva is less dilated, having smaller and narrower base of pseudopollex, the harpe is slenderer, and the dorsal carinal plate is stronger and twisted. *Eugnorisma* (*E.*) *gaurax* differs from *E. (E.) trigonica* by its shorter uncus, broader and shorter valvae, larger pseudopollex, much longer dorsal carinal plate, distally more rounded vesica, etc.

In the female genitalia, *E. (E.) gaurax* has, in comparison with *E.* (*E.*) *deleasma*, longer, less trapezoidal antrum, longer ductus bursae with obliquely sclerotized proximal section at junction to bursa copulatrix; comparing with *E. (E.) trigonica*, much longer antrum and considerably larger and more elongated appendix bursae.

Distribution. Central Asiatic, a species typical of the Tien Shan system. It has been recorded from Uzbekistan (Ferghana, Alai Mts: gorge Dugobo), Kazakhstan (Semirechye, Transili-Alatau), Kirghisia (Alexander Mts (type locality), Naryn region, Susamyr Mt., Turkestanski Mts) and NW China (Keng Tau Mts). The species is locally frequent or even common; the adults are on the wing from July to October.

Remarks. One of the original specimens of Püngeler, labelled by Boursin as "Paratype" (slide No.: Boursin MB331) belongs, in fact, to *E.* (*E.*) *deleasma*.

Eugnorisma* (*Eugnorisma*) *deleasma Boursin, 1967

(Plate 9, Figs 1–2; Plate 39, Figs 21–28; gen. fig. 32)

Eugnorisma deleasma Boursin, 1967, *Entomops* **2**(10): 45, figs 3–4. Type-locality: Afghanistan, Badakhshan, Sarekanda. Holotype: male, in coll. ZSM.

Diagnosis. *Eugnorisma (E.) deleasma* differs from *E. (E.) gaurax* and *E. (E.) trigonica* by its on average smaller size (wingspan 28–36 mm), narrower, apically more pointed forewings and smaller hindwings, in the sspp. *deleasma* and *reducta* grey or ochreous-grey (sometimes ochreous) thorax and forewing without pinkish or reddish-rosy hue, relatively strong and often blackish defined antemedial and postmedial crosslines, thinner, often medially interrupted black intracellular "C"-mark and clearer, usually pure white hindwings.

The male genitalia differ from those of its sister-species, *E. (E.) gaurax*, by their smaller clasping apparatus with longer, more flattened uncus, shorter and medially broader valvae, more ventrally projecting subapical lobe, larger, broader triangular base of pseudopollex, and thicker harpe; from *E. (E.) trigonica* by the shorter and considerably broader valvae with differently shaped subapical process, more distally located and basally much more prominent pseudopollex, thicker harpe, etc.

The female genitalia of *E. (E.) deleasma* and *E. (E.) gaurax* are very similar but *E. (E.) deleasma* has somewhat shorter and more trapezoidal antrum and shorter, anteriorly evenly sclerotized ductus bursae. The differences in the female genitalia between *E. (E.) deleasma* and *E. (E.) trigonica* are somewhat larger, as the former species has larger, stronger antrum and broader, more elliptical-ovoid appendix bursae.

Distribution. A rather stenochorous species, the range of the typical ssp. *deleasma* is restricted to the high mountains of NE Afghanistan (Badakhshan, the Paghman area and the Wakhan valley), Tadjikistan (the Pamir and the Peter I Mts), Kirghisia (Alexander Mts) and the Pakistani Hindukush. The adults are on the wing from July to October.

Eugnorisma (*Eugnorisma*) *deleasma reducta* Boursin, 1967

(Plate 9, Figs 3–4; Plate 39, Figs 29–34; gen. fig. 33)

Eugnorisma deleasma reducta Boursin, 1967, *Entomops* **2**(10): 46, fig. 6. Type-locality: Afghanistan (Central), Band-i-Amir, 3000 m. Holotype: male, in coll. NHMW.

Diagnosis. The populations occurring in the central part of the Afghan Hindukush differ from all other taxa of the *trigonica*-group by their bright ochreous-grey or ochreous slate-grey head, thorax and forewings, more reduced crosslines and the pure, shining white hindwings. The size and shape of wings of the ssp. *reducta* are similar to those of the nominate subspecies, the crosslines are represented usually by a few dark spots in the costal area, the outlines of orbicular and reniform stigmata are also faint, and the claviform stigma is always absent. Intracellular "C"-marking dark grey or blackish, conjoined only by a very fine line or divided into two parts. Subterminal line faint, terminal line a row of pale grey triangles; white hindwing and pale ochreous-white or ochreous-grey underside of forewing regularly patternless.

The configuration of the male genitalia differ slightly from those of the nominate subspecies by the somewhat narrower and more elongate apical part of valva and the slenderer harpe; from those of the ssp. *hissarica* by the broader valvae and the thicker and somewhat shorter harpes.

Distribution. The south-western subspecies of *E. (E.) deleasma* is confined to the western part of the Hindukush range (Koh-i-Baba Mts) in Central Afghanistan.

Eugnorisma (*Eugnorisma*) *deleasma hissarica* Varga & Ronkay, 1987

(Plate 9, Figs 5–6; Plate 39, Figs 35–40; gen. fig. 34)

Eugnorisma (*Eugnorisma*) *deleasma hissarica* Varga & Ronkay, 1987, *Acta Zoologica Academiae Scientiarum Hungaricae* **33**(1–2): 224, pl. 3, fig. 38, gen. fig. 38. Type-locality: [Tadjikistan] Hissar Mts, Anzob Pass, Kondara. Holotype: male, in coll. ZSM.

Diagnosis. This subspecies differs from *E. (E.) d. deleasma* with its characteristic colouration, fine black(ish) wing pattern and slightly stronger valvae. It resembles often more *E. (E.) gaurax* but the narrower and longer wing shape, the less intense reddish-rosy hue of the forewing and the clearer white hindwing provide help in their separation. Wingspan 33–35 mm.

The male genitalia of the ssp. *hissarica* differ from those of the other two subspecies of *E. (E.) deleasma* by the longer and slenderer harpes; from those of *E. (E.) gaurax* by the specific differences mentioned above in the Diagnosis of the nominate subspecies. The female genitalia of the two subspecies (the females of the ssp. *reducta* are still unknown) are very similar but the ssp. *hissarica* has, in comparison with the ssp. *deleasma*, medially more constricted ductus bursae and larger, more globular appendix bursae.

Distribution. This subspecies is supposedly endemic to the Hissar Mts. The adults are on the wing from July to September.

Eugnorisma (*Eugnorisma*) *jubilans* Varga, Ronkay & Gyulai, 1995

(Plate 9, Figs 7–8; Plate 40, Figs 1–8; gen. fig. 35)

Eugnorisma (*Eugnorisma*) *jubilans* Varga, Ronkay & Gyulai, 1995, *Acta Zoologica Academiae Scientiarum Hungaricae* **41**(1): 64. Type-locality: Uzbekistan, Chimgan Mts. Holotype: female, in coll. P. Gyulai (Miskolc).

Diagnosis. This species is rather distant from the other members of the *trigonica* species-group, displaying certain specific autapomorphies of the male genitalia. It resembles externally the reddish coloured specimens of *E. (E.) trigonica* but is separable from them by the apically more pointed forewings and the narrower and dark plumbeous-grey filled reniform stigma. In *E. (E.) jubilans*, the costal area, the basal field and the broad stripes following the postmedial line are paler than ground colour while the fore-

wing colouration of *E. (E.) trigonica* is rather unicolorous. Finally, the hindwings of *E. (E.) jubilans* are more ochreous than in *E. (E.) trigonica*. *Eugnorisma (E.) jubilans* differs from *E. (E.) deleasma* and *E. (E.) gaurax* by its orange-brown to reddish-brown ground colour, the much paler, generally dark red-brown (not black or blackish) intracellular marking, and the more ochreous shaded whitish hindwings. Wingspan 34–37 mm.

Eugnorisma (E.) jubilans is easily separable from all other *Eugnorisma* s. str. species by the reduced pseudopollex lacking the black scale-covering which is a group synapomorphy of the subgenus. This reduction should be considered as an autapomorphy of a marginally isolated, stenochorous species. In addition, this species has the smaller subapical valval lobe and the strongest dentate-spinose dorsal carinal plate within the *trigonica*-group. The shape and size of the vesica is close to that of *E. (E.) trigonica*, but broader, the subbasal diverticulum is longer with larger apical cornutus.

In the female genitalia, the antrum of *E. (E.) jubilans* is broader, and the ductus bursae is longer and proximally significantly narrower than those of the related species.

Distribution. Western Turkestanian. *Eugnorisma (E.) jubilans* is known only from Uzbekistan (Chimgan Mts, Chatkal Mts, Alai Mts: Dugobo, and Fergana), where it occurs partly sympatrically with *E. (E.) trigonica*; it appears as a local and rare species. The moths are on the wing from July to September.

The ***insignata*** species-group

Diagnosis. This group contains the type-species of the genus, *E.* (*E.*) *insignata*, and its close relatives, altogether five species represented by 8 subspecies. The somewhat transitional taxonomic position of *E. (E.) rafidain* indicates the closer connections with *Metagnorisma* due to its certain genital features (the large basal ventral extension of the harpe and the long and strongly dentate dorsal carinal plate in the males, the short and rather quadrangular, not twisted-folded ductus bursae, the postero-laterally projecting appendix bursae and the presence of signa in the females) while the other external and genital features are matching well with the group features of *Eugnorisma* s. str.

The *insignata*-group includes medium-sized species (wingspan 30–42 mm), with rather broadly triangular forewing having slightly pointed or rounded apex. The members of the group can be characterised by the reduced black elements of the forewing pattern (the intracellular dark markings are absent and the blackish definition of the antemedial and postmedial crosslines are very faint or obsolete), the rather distinctly outlined stigmata and the usually similarly well-visible crosslines, and the usually white or whitish hindwings with often darker marginal suffusion.

The male genitalia are characterized by strong, more or less broad valvae with rounded or slightly angulate apex, small subapical lobe, well-developed pseudopollex with black(ish) covering by flattened scales, medium-sized, slightly curved aedeagus with moderately sclerotized and more or less strongly dentate dorsal carinal plate, less elongated, rather discoidal-globular or saccate vesica, long, slender subbasal diverticulum with small terminal cornutus, and the well-developed distal spinulose field located on a flattened, large diverticulum on the inner curve of the vesica.

The female genitalia are rather similar to those of the members of the *trigonica*-group, having large, more or less trapezoidal antrum, short to medium-long, sclerotized, twisted and partly folded ductus bursae, large subconical and rugose-ribbed appendix bursae (it is remarkably smaller and differently shaped than in the *trigonica*-group), and reduced signa (except in *E. (E.) rafidain*).

Distribution. Iranian-Turkestanian, with wider expansion to the steppes of southeastern Europe, steppes and mountain steppes of southern Siberia and Mongolia to the north-east (*E.* (*E.*) *insignata*) and to the south-western Himalayas to the south-east (*E.* (*E.*) *asad*).

Eugnorisma (*Eugnorisma*) *variago variago* (Staudinger, 1882)

(Plate 10, Figs 1–2; Plate 40, Figs 9–16; gen. fig. 36)

Hiptelia variago Staudinger, 1882, *Stettiner Entomologische Zeitung* **43**: 44. Type-locality: [Kazakhstan] "Saisan". Lectotype: male, in coll. ZMHU.

Diagnosis. *Eugnorisma (E.) variago* is a conspicuous species which is easily separable from the other members of *Eugnorisma* s. str. by its light ochreous or yellowish-brown head, thorax and forewing with more or less strong brownish irroration, prominent dark filling of reniform stigma and the pure white hindwings; from *E. (M.) heuristica* by its larger size (wingspan 31–39 mm), more elongated, light ochreous or yellowish-brown forewings with stronger crosslines and dark filled reniform stigma and the pure white hindwings; from the *Miniphila* species by its different wing shape, stronger defined crosslines, differently shaped stigmata and the finely ciliate (not shortly bipectinate) male antenna.

The male genitalia of *E. (E.) variago* are distinguished from those of the closest related *E. (E.) insignata – E. (E.) conformis* species-pair by its considerably shorter and broader valvae with more pointed subapical lobe, broader, rather triangular pseudopollex, the basally thicker harpe, and the fine, longer and acutely pointed subbasal cornutus of the vesica.

The female genitalia of the three species are very similar, but the posterior margin of the antrum of *E. (E.) variago* is straight, without medial cleft, the ductus bursae is medially more dilated and less folded and the appendix bursae is more conical, apically less rounded than in the two related species.

Distribution. Central Asiatic. The nominotypical subspecies represents the eastern population group of the species: it occurs in the eastern Tien-Shan Mts (Saisan), mostly in mountain steppic or dry scrubby habitats. It has a sympatric occurrence with *E. (E.) insignata* in most of its range. A locally distributed species which is rather common in certain places of the Tien Shan massif; the moths are on the wing from August to October.

Eugnorisma (*Eugnorisma*) *variago xanthiago* Varga & Ronkay, 1987

(Plate 10, Figs 3–4; Plate 40, Figs 17–24; gen. fig. 37)

Eugnorisma variago xanthiago Varga & Ronkay, 1987, *Acta Zoologica Academiae Scientiarum Hungaricae* **33**(1–2): 228, pl. 3, figs 47–48, pl. 4, fig. 49; gen. figs 68–70, 142. Type-locality: Tadjikistan, Hissar Mts, Kondara valley. Holotype: male, in coll. ZSM.

Diagnosis. This subspecies is slightly larger on average with the wingspan 34–41 mm than the typical ssp. *variago*, having more vivid yellowish-orange ground colour and less intensive darker brownish irroration of the medial and terminal fields. Specimens from the Korzhin-Tau and the Transili Ala-Tau often have reduced dark pattern, their colouration is pale reddish.

The male genitalia of the two species are almost identical, the valvae of the ssp. *xanthiago* are more elongate than in the nominate subspecies, having slightly larger apical lobe and narrower apical section. The female genitalia are also very similar, but the antrum of the ssp. *xanthiago* is somewhat broader, proximally more tapering than in the ssp. *variago*.

Distribution. West Turkestanian. The known area of this subspecies extends mostly westwards of the typical subspecies; it has been recorded from Uzbekistan (Korzhin-Tau, Margelan), Southern Kazakhstan (Transili-Alatau Mts), Tadjikistan (Hissar Mts, Pamirs) and North-East Afghanistan (Shewa plateau, Badakhshan). An early autumnal species (the flight period is extending from the second half of August to the end of September); it is locally frequent in dry steppic habitats.

Eugnorisma (*Eugnorisma*) *insignata insignata* (Lederer, 1853)

(Plate 10, Figs 5–6; Plate 40, Figs 25–40; Plate 41, Figs 1–4; gen. fig. 38)

Graphiphora insignata Lederer, 1853, *Verhandlungen des Zoologisch-Botanischen Vereins in Wien* **3**: 366. Type-locality: [Russia] Altai (Mts). Lectotype: male, in coll. ZMHU.

Synonymy

Noctua intermedia Eversmann, 1855, *Bulletin de la Société des Naturalistes de Moscou* **28**(2): 421. Type-locality: [Russia] Altai (Mts). Holotype: male, in coll. ZISP;

Agrotis insignata var. *pallescens* Christoph, 1893, *Deutsche Entomologische Zeitschrift. Gesellschaft Iris zu Dresden* **6**: 90. Type-locality: [Turkmenistan] Ashkhabad. Type(s): in coll. ZISP.

Lycophotia leuconeura Hampson, 1918, *Novitates Zoologicae* **25**: 113. Type-locality: [Iran] Persia, Kerman. Syntypes: 1 male and 1 female, in coll. BMNH;

Agrotis insignata fuliginosa Draudt, 1936, *Entomologische Rundschau* **53**: 467, pl. 5, fig. b4. Type-locality: "Russian Armenia", Migry, Araxes, Njuvady. Syntypes: in coll. ZMHU;

Agrotis insignata columbina Draudt, 1936, *Entomologische Rundschau* **53**: 467, pl. 5, fig. b2. Type-locality: [Turkey] Sultan Dagh, Akshehir. Holotype: male (destroyed).

Diagnosis. One of the most polymorphic species of the genus, displaying remarkable external variation in the forewing colouration (from ochreous-yellowish and pale ash-grey to dark brown-grey and fumous grey-brown), especially in the western part of its range (Near East, Turkey, Armenia and Iran). These differences mostly appear however, as a polymorphism at population level, thus they cannot be separated as subspecies. The externally most strikingly different form was described as *Lycophotia leuconeura* by Hampson from Iran (Kerman) as a distinct species. This form has dark chestnut-brown to often blackish-brown suffused forewings with pale whitish-ochreous veins, and is most frequent in eastern Anatolia and Armenia, occurring partly sympatrically with two other prominent colour forms (the fuscous f. *fuliginosa* Draudt and the bluish-grey coloured f. *columbina* Draudt). The frequency of these colour forms is different in most populations and though they occur mostly in the western populations, the f. *leuconeura* unexpectedly re-appears also in Central and southern Iran, the Pamirs, and in the Wakhan region in Afghanistan with relatively high frequency. The f. *pallescens* Christoph is nearly the exclusive one in some populations of Turkmenistan and NE Iran but it also often co-occurs with the typical form in polymorphic populations. The Siberian-Mongolian populations are mostly monomorphic. The variation in the size is also considerable, wingspan 30–40 mm, while the configuration of genitalia of both sexes is strikingly constant in all populations of *E. (E.) insignata*.

The pale and unicolorous specimens of *E. (E.) insignata* differ externally from its sister-species, *E. (E.) conformis*, and the externally also rather similar *E. (E.) rafidain* by their on average larger size, more robust body and broader wings, larger stigmata, stronger (regularly faintly blackish) defined subbasal and antemedial (and sometimes also postmedial) crosslines. The ochreous-reddish specimens differ from *E. (E.) variago* by the larger and not dark filled reniform stigma; otherwise the characteristic blackish forewing markings of subbasal, antemedial and of the also postmedial crosslines distinguish *E. (E.) insignata* from the other species of the genus.

The key feature of the male genitalia separating *E. (E.) insignata* from *E. (E.) conformis* is the shape of uncus which is longer and distally much slenderer in *E. (E.) insignata*, not spatulate as in *E. (E.) conformis*. All other male genital features of the twin species have a smaller or larger overlap, therefore the study of the uncus provides a satisfactory identification. As this feature is most often clearly visible by the brushing of the anal tuft of the specimens, usually no dissection is needed to confirm the identification of the male specimens.

The female genitalia are also very similar in the two sister species but the antrum of *E. (E.) insignata* is longer and somewhat narrower, more quadrangular (less cordiform) than in *E. (E.) conformis* and the appendix bursae is proportionally smaller, narrower conical and less ribbed-rugose.

Distribution. A widely distributed species, occurring from eastern Europe (Volga region, steppes around the southern Urals), Asia Minor, Iran and Transcaucasia to southern Siberia and the Central Asiatic arid mountains as far to the east as north-western Pakistan, Central Siberia and Mongolia. It is usually frequent

in its habitats, in certain places belongs to the dominant species of the given locality. The preferred habitats are lower and medium-high altitude mountain steppes, semi-deserts and scrublands grasslands but the species appears also in much higher regions (above 3000 m elevations in the Afghani and Pakistani Hindukush and the north-western Himalayas). The flight period is long, extending from about mid-July to the end of September.

Eugnorisma* (*Eugnorisma) conformis (Swinhoe, 1885)

(Plate 10, Figs 7–8; Plate 41, Figs 6–12; gen. fig. 39)

Agrotis conformis Swinhoe, 1885, *Transactions of the Entomological Society of London* **1885**: 349, pl. 9, fig. 5. Type-locality: [Pakistan] Quetta. Holotype: male, in coll. BMNH.

Diagnosis. *Eugnorisma (E.) conformis* is the sister-species of *E. (E.) insignata*, resembling strongly the uniformly ochreous-grey or slate-grey specimens of the latter species (mainly the f. *pallescens*). It differs from the latter taxon by its smaller size (wingspan 30–37 mm) and slenderer body, narrower and weaker defined orbicular and reniform stigmata, absence of the blackish definition from the subbasal and antemedial line, and by the characteristic greyish suffusion of the hindwing which is present in *E. (E.) insignata* only in the differently coloured f. *columbina*. Another externally very similar species is *E. (E.) rafidain* but *E. (E.) conformis* has larger and more arched, sharper outlined and more bean (kidney)-shaped reniform stigma, more indistinct crosslines, and paler or reduced, never black or blackish costal spot at subterminal line.

In the male genitalia, the uncus of *E. (E.) conformis* is broadly spatulate and apically angular, this autapomorphic feature is unique within the entire generic complex. The other two similar species have longer, distally narrower and apically pointed uncus. The harpe of *E. (E.) conformis* is shorter than in *E. (E.) rafidain*, lacking the long basal ventral extension which is typical of the latter species, the subapical lobe is smaller and less pointed, the pseudopollex is thinner and longer and the dorsal carinal plate is weaker sclerotised and less dentate.

The female genitalia of *E. (E.) conformis* differ from those of *E. (E.) insignata* by the broader, more cup-shaped or cordiform antrum and the larger and less conical, apically more rounded and stronger rugose-ribbed appendix bursae; from *E. (E.) rafidain* by the considerably larger and broader antrum, the longer and stronger, more folded ductus bursae, the subconical, not laterally positioned appendix bursae and the absence of the signa.

Distribution. This species is confined to a restricted area in SE Afghanistan and Pakistan (Baluchistan), occurring sympatrically with *E. insignata* in these areas. It occurs in medium-high (rarely in lower) altitudes; locally common in its habitats. The flight period is August-September.

Eugnorisma* (*Eugnorisma*) *asad asad Boursin, 1963

(Plate 11, Figs 3–4; Plate 41, Figs 25–32; gen. fig. 41)

Eugnorisma asad Boursin, 1963, *Bulletin Mensuel de la Société Linnéenne de Lyon* **32**(10): 293. Type-locality: Afghanistan, Paghman Mts, 30 km NW of Kabul. Holotype: male, in coll. NHMW.

Diagnosis. A conspicuous and easily recognisable species with unique colouration and wing pattern. The typical subspecies is pale rosy-grey forewings with variably strong pinkish-brown suffusion and sharply defined, fine, fishbone-like black streaks at costal parts of antemedial and postmedial lines; the other parts of the crosslines are obsolete or absent, the outline of orbicular stigma is usually also finely black and ochreous, the reniform stigma is encircled with pale ochreous and filled with dark ash-grey; the costal area and most of the veins are also suffused with ashy-grey; the hindwings whitish with some greyish-brown shade. Wingspan 34–40 mm.

The genitalia of *E. (E.) asad* are most similar to those of *E. (E.) insignata* and *E. (E.) conformis* in both sexes. In the male genitalia, *E. (E.) asad* has straighter and medially more dilated valvae with reduced subapical

lobe, basally somewhat thicker harpe, larger, stronger sclerotised dorsal carinal plate and distally more dilated vesica with larger spinulose field than in the two related species; the uncus is distally not spatulate as in *E. (E.) conformis* and the pseudopollex is longer than in *E. (E.) insignata*. The female genitalia differ from those of *E. (E.) insignata* and *E. (E.) conformis* by the much larger and less ribbed-rugose, semiglobular-discoidal appendix bursae, the less separated, more saccate corpus bursae and the longer and proportionally narrower antrum.

Distribution. The nominotypical subspecies is restricted to the mountains of East Afghanistan.

Eugnorisma (*Eugnorisma*) *asad plantei* Varga, Ronkay & Hacker, 1990

(Plate 11, Figs 5–6; Plate 41, Figs 33–39; Plate 42, Figs 1–2; gen. fig. 42)

Eugnorisma (*Eugnorisma*) *asad plantei* Varga, Ronkay & Hacker, 1990, *Acta Zoologica Academiae Scientiarum Hungaricae* **36**(3–4): 334. Type-locality: Pakistan, Baltistan, Babusar Pass, north slope, 1650 m. Holotype: male, in coll. ZSM.

Diagnosis. The north-western Himalayan subspecies differs from the other two races by its generally larger size (wingspan 36–42 mm), more robust body and broader wings, much darker, fuscous-grey or purplish-grey forewing ground colour (often with fine argillaceous hue but without the delicious rosy-brown shade being characteristic for the typical ssp. *asad*), usually shaper defined antemedial line and the darker greyish-brown suffusion of the whitish-ochreous hindwings.

In the male genitalia, the ssp. *plantei* has distally less arcuate and apically more rounded valvae than in the ssp. *asad*, the costal lobe is more reduced or even absent, and the pseudopollex is somewhat larger; in the female genitalia, the antrum is somewhat broader than in the nominate subspecies and the ductus is proportionally longer and less plicate.

Distribution. The ssp. *plantei* has much wider area than the nominotypical ssp. *asad*; it is distributed from NW Pakistan to Kashmir and Ladakh, inhabiting the medium-high and higher altitudes (2000–3300 m). It often appears in large individual number in its habitats, from about mid-July to October.

Eugnorisma (*Eugnorisma*) *asad eva* ssp. n.

(Plate 11, Figs 7–8; Plate 42, Figs 3–4; gen. fig. 43)

Holotype. Male, India, Himachal Pradesh, Spiti valley, 1 km NW of Kaza, 3550 m, 11.VIII.1994, leg. P. Kautt & V. Weisz, slide No.: RL 11647m (coll. G. Ronkay).
Paratypes. **India**. Himachal Pradesh. 1 male, 2 females, with the same data as the holotype, slide No.: RL 11646f (coll. P. Gyulai & G. Ronkay); 1 male, Spiti, Parahio valley, Kagha village, 3850 m, 6.VIII.1994, leg. Kautt & Weisz (coll. P. Gyulai).

Diagnosis. The most south-easterly distributed subspecies is on average smaller than the former two subspecies, differing from them by its much paler colouration. The ground colour of the body and forewing of the ssp. *eva* is pale ash-grey with fine brown and reddish irroration; the forewing pattern is weaker than in the other two subspecies of *E. (E.) asad*, and the hindwings are light ochreous with fuscous-grey marginal area and veins, darker than in the ssp. *asad* but paler than in the ssp. *plantei*.

In the male genitalia, this subspecies has the narrowest, apically more elongated valvae, finest pseudopollex and the shortest harpes; in the female genitalia, the antrum is proportionally the longest within the three subspecies.

Distribution. SW Himalayas (India: Himachal Pradesh, Spiti valley). This is the easternmost known *Eugnorisma* s.l. taxon; it occurs in the highest altitudes within the races of *E. (E.) asad*. The few known specimens were collected in August.

Etymology. The new subspecies is dedicated to the famous collector and lepidopterist Mrs. Eva Vartian.

Eugnorisma (Eugnorisma) rafidain (Boursin, 1936)

(Plate 11, Figs 1–2; Plate 41, Figs 13–24; gen. fig. 40)

Rhyacia rafidain Boursin, 1936, *Bulletin de la Société Entomologique de France* **41**: 224. Type-locality: Iraq, Baghdad. Holotype: female, in coll. BMNH.

Synonymy

Rhyacia semiramis Boursin, 1940, *Mitteilungen der Münchner Entomologischen Gesellschaft* **30**: 491, pl. 9, fig. 28. Type-locality: Iraq, Kurdistan, Berserini. Holotype: female, in coll. BMNH; **syn. n.**

Rhyacia semiramis farsica Boursin, 1940, *Mitteilungen der Münchner Entomologischen Gesellschaft* **30**: 492, pl. 9, fig. 29. Type-locality: Iran, Fars, Str. Shiraz-Kazeroun, Fort Sine-Sefid. Holotype: male, in coll. NRS; **syn. n**.

Taxonomy. The species has long been separated into three different taxa, *E. (E.) rafidain, E. (E.) semiramis semiramis* and *(E.) semiramis farsica*; the name *rafidain* was incorrectly used for the small *Eugnorisma* (*Metagnorisma*) species occurring in East Turkey by Varga & Ronkay (1987). The background of this mistake was the unrecognised conspecificity of the holotype of *E. (E.) rafidain* (a rather worn female specimen from Iraq) with the holotype of *E. (E.) semiramis* (a female of much better condition from Iraqi Kurdistan). The available material of *E. (E.) semiramis* was also very limited that time therefore the infraspecific and individual variability of the taxon was hardly estimable. The subsequently considerably increased material and the detailed study of the type-specimens revealed the taxonomic identity of the two species, and the more or less continuous geographical variation within the range of the species. Therefore, *E. (E.) semiramis semiramis* and *(E.) semiramis farsica* are synonymised here with *E. (E.) rafidain*.

Diagnosis. A medium-sized species (wingspan 32–39 mm) with variable colouration and mostly reduced pattern. It resembles externally mostly *E. (E.) conformis*, but *E. (E.) rafidain* is slightly larger on average and somewhat more broad-winged, the crosslines are better defined and less sinuous, the reniform stigma is straighter, more elliptical, and the black(ish) costal patch at subterminal line is more prominent. The two species appear as completely allopatric, thus, the collecting locality also helps in the identification. *Eugnorisma* (*E.*) *rafidain* is also similar to the partly sympatrically occurring *Maraschia grisescens* Osthelder, 1933, but has somewhat narrower wings, more variegated greyish forewings with paler filled stigmata, straighter antemedial line, paler and more double postmedial line, continuous (not dotted) subterminal line with prominent black(ish) costal patch. The hindwings of *E. (E.) rafidain* are lighter than in most Asiatic populations of *M. grisescens* and the genitalia of the two species are completely different both sexes.

The genitalia of *E. (E.) rafidain* display certain features which are unique within the *insignata*-group or even the entire subgenus. In the male genitalia, only this *Eugnorisma* s. str. species has prominent basal ventral extension of the harpe (a group feature of *Metagnorisma*), and the dorsal carinal plate is the strongest dentated in the *insignata*-group. The valvae are slenderer than those of *E. (E.) conformis, E. (E.) insignata* and *E. (E.) asad*, the harpe is longer, slenderer, more arched, the subapical process is longer, more pointed, and the pseudopollex is shorter but broader than in the related species.

The diagnostic features of the female genitalia are the presence of signa, the flattened and less sclerotised, not folded ductus bursae and the rather laterally positioned appendix bursae; the broadly quadrangular, rather uniformly sclerotized ductus bursae is an autapomorphy of *E. (E.) rafidain*. All these features are exceptional in the *insignata*-group, displaying closer relationship with the *Metagnorisma* taxa, while the rather discoidal-globular corpus bursae and the strongly ribbed-rugose surface of appendix bursae are typical of *Eugnorisma* s. str.

Distribution. Anatolian-Iranian. The species is known to occur in Iraq, south-eastern Turkey and the western parts of Iran. It has long been considered as a very local and rare species but it was found as more widespread and locally frequent during the new faunistical investigations in Iran. An autumnal species, the moths are on the wing from the end of September to mid-November.

Subgenus ***Metagnorisma*** Varga & Ronkay, 1987

Metagnorisma Varga & Ronkay, 1987, *Acta Zoologica Academiae Scientiarum Hungaricae* **33**(1–2): 194. Type-species: *Agrotis depuncta* var. *pontica* Staudinger, 1891, by original designation.

Diagnosis. This subgenus consists of small to relatively large species (wingspan is 25–42 mm) with rather strong body and broadly triangular forewings. Forewing apex finely pointed, outer margin convex; dark noctuid pattern usually clearly visible (except in *E. (M.) heuristica*) and strongly variable; hindwing whitish-ochreous with weak(er) brown or grey irroration or suffused with dark brown.

The male genitalia are considerably less sclerotized than in *Eugnorisma* s. str. Valvae elongate, usually dilated at middle, apex rounded, apical lobe and pseudopollex absent; harpe moderately long, usually thick and less arcuate, but sometimes slenderer, basal part most often broad, with variably long ventral projection. Aedeagus relatively short, dorsal carinal plate well-developed, covered by small teeth or reduced to a smaller and smoothly sclerotised surface (*E. (M.) pontica*). Vesica large and spacious, sometimes more elongated, subbasal diverticulum small, slender and erected relatively far from the distal end of aedeagus, terminated in fine, small, conical cornutus; distal spinulose field usually large, sometimes saccate (*E. (M.) deserta*), most often consisting of rather long spinules but sometimes this field is reduced to a small group of spinules.

The diagnostic features of the female genitalia are the less sclerotised antrum and ductus bursae, the postero-laterally located, more or less conical but not ribbed-cristate appendix bursae, and the large, more or less elliptical-sacculiform corpus bursae with 2–4 signum patches (sometimes arranged in broad and weak signum-stripes).

Distribution. Mediterranean-Turkestanian.

Eugnorisma (Metagnorisma) depuncta depuncta (Linnaeus, 1761)

(Plate 12, Figs 1–2; Plate 42, Figs 5–12; gen. fig. 44)

Phalaena Noctua depuncta Linnaeus, 1761, *Fauna Suecica* (edn **2**): 321. Type-locality: Sweden. Type(s): in coll. LSL.

Synonymy
Noctua mendosa Hübner, 1803, *Sammlung Europäischer Schmetterlinge* **4**: pl. 26, fig. 120. Type-locality: Europe.

Diagnosis. *Eugnorisma (Metagnorisma) depuncta* is on average the largest species of the subgenus (wingspan 35–42 mm); its diagnostic feature is the rather evenly dark brown hindwing. It differs externally from the most similar *E. (M.) deserta* by its somewhat longer forewings with less arched upper section of postmedial line, more spotted and at subcellular vein less projecting black markings of antemedial line, and the remarkably darker hindwings. The other species of the subgenus are generally paler in the colouration of both wings. It is worth to mention that *E. (M.) depuncta* is the only member of the subgenus which has (more or less) melanistic forms.

The male genitalia of the *depuncta*-line (*depuncta, jomooseri* and *arenoflavida*) are characterised by the long and strong ventral projection of the basal plate of the harpe and the broad and strong, densely dentate dorsal carinal plate; the members of the *pontica*-line (*pontica, deserta, heuristica* and *hermannhackeri*) have much shorter ventral basal process of harpe and narrower, less sclerotised and less dentate-spinose dorsal carinal plate. The three species of the *depuncta*-line differ mostly in the shape and size of the erect part of harpe, the shape of valva and the width of the dorsal carinal plate. *Eugnorisma (M.) depuncta* has the narrowest valva, the shortest and thickest harpe and the broadest carinal plate within the three species of the *depuncta*-lineage.

The female genitalia of the two main lineages of *Metagnorisma* differ in the sclerotisation of ductus bursae: the species of the *depuncta*-line has no sclerotised plate in the posterior half of ductus bursae (but there is a gelatinous section which absorbs the paint in the staining process, therefore this feature is better studied in the native slides), which is present in the members of the *pontica*-line. *Eugnorisma (M.)*

depuncta differs from *E. (M.) jomooseri* by its narrower, more tapering posterior part of ductus bursae and the larger signa; from *E. (M.) arenoflavida* by its larger and longer, more cup-shaped antrum and the more pronounced, more conical appendix bursae.

Distribution. A widespread West-Palaearctic species occurring from the Pyrenees to the Urals and Armenia. The ssp. *depuncta* lives in Europe, inhabiting various lightly wooded and open biotopes. The adults appear at the late summer, the flight period extends to the end of September-beginning of October.

Eugnorisma (Metagnorisma) depuncta transcaucasica ssp. n.

(Plate 12, Figs 3–4; Plate 42, Figs 13–16; gen. fig. 45)

Holotype. Male, Turkey, Prov. Erzurum/Erzincan, Aşkale, 1700 m, 39°50'N, 40°34'E, 8.VIII.1988, leg. P. Gyulai, M. Hreblay, G. Ronkay & L. Ronkay, slide No.: RL 11443m (coll. G. Ronkay).
Paratypes. **Turkey**. 2 males, with the same data as the holotype (coll. P. Gyulai & HNHM). **Russia**. 1 male, 3 females, Chechnya, Caucasus Mts, Harachoj, 1100 m, 14.VIII.1988, leg. B. Herczig, K. Szeőke & Z. Mészáros (coll. G. Ronkay & Z. Varga); 1 female, Chechnya, Caucasus Mts, Itum-kale, 850 m, 11.VIII.1988, leg. B. Herczig, K. Szeőke & Z. Mészáros (coll. G. Ronkay); 3 males, Russia, Chechnya-Ingoushetia, Caucasus, Kerigo, 1000 m, 9–10.VIII.1988, leg. B. Herczig, Z. Mészáros & K. Szeőke, slide No.: RL 11442m (coll. G. Ronkay & Z. Varga); 1 female, Kabardino-Balkaria, C. Caucasus Mts, Tershkol, 2300 m, 27–29.VIII.2013 (coll. L. Srnka). **Armenia**. 1 female, 40 km E of Yerevan, Geghard, 1700 m, 7–10.VII.1967, leg. Vartian (coll. NHMW); 1 male, Sevan, botanical garden, 25–26.IX.1983, leg. Z. Varga (coll. Z. Varga).

Diagnosis. The new subspecies is slightly smaller on average than the typical ssp. *depuncta* (wingspan 36–38 mm), having remarkably lighter, more ochreous-brown ground colour of head, thorax and forewing, without dark brownish-grey or chocolate-brown shade which is typical of the nominotypical race, somewhat more curved upper section of postmedial line, lighter (whitish-ochreous) defined crosslines and stigmata, weaker blackish-brown pattern of forewings, and much paler, whitish-ochreous suffused greyish-brown hindwings with fuscous marginal area.

In the male genitalia, ssp. *transcaucasica* has somewhat stronger uncus, slightly longer harpe, and larger distal spinulose field of vesica than in the ssp. *depuncta*; in the female genitalia, the antrum is slightly narrower than that of the nominotypical subspecies, and the signa are smaller, more rounded.

Distribution. The south-eastern subspecies of *E. (M.) depuncta* occurs in the Caucasus region in Armenia and Russia (Chechnya-Ingousetia, Kabardino-Balkaria), and in NE Turkey.

Eugnorisma (Metagnorisma) jomooseri sp. n.

(Plate 12, Figs 5–6; Plate 42, Figs 17–20; gen. fig. 46)

Holotype. Male, Morocco, High Atlas Mts, Ait el Qaq, 1800–2000 m, 1–10.VIII.2012, sugar bait, leg. G. Müller & E. Révay, slide No.: GYP 4007m (coll. P. Gyulai).
Paratypes. **Morocco**. 2 males, 1 female, with the same data as the holotype (coll. P. Gyulai); 5 males, 9 females, from the same locality, 1–20.IX.2012, leg. G. Müller, J. Mooser & E. Révay (coll. P. Gyulai); 1 male, 1 female, Morocco, High Atlas Mts, below Oukaimeden, 2200 m, 25.IX.–10.X.2012, leg. G. Müller, J. Mooser & E. Révay (coll. P. Gyulai); 1 male, from the same locality, 15–31.X.2012, leg. G. Müller, J. Mooser & E. Révay (coll. P. Gyulai); 1 female, High Atlas Mts, El Jam'ane Forest, 1600 m, X.2012, leg. G. Müller, J. Mooser & E. Révay, slide No.: RL 11640f (coll. G. Ronkay).

Diagnosis. The new species is the smallest member of the *depuncta*-line with its wingspan 27–35 mm. It differs externally from the similarly coloured *E. (M.) arenoflavida* by its shorter and somewhat broader forewings with more ochreous-brown shaded ground colour (no orange-brown or light rosaceous-brown coloured specimens are known while such colour forms are frequent in *E. (M.) arenoflavida*), smaller praeorbicular black patch, most often stronger dark brown costal patch of subterminal line and the darker, more grey-brownish suffused ochreous-whitish hindwings. *Eugnorisma (M.) jomoseri* is easily separable from its taxonomically closer relative, *E. (M.) depuncta*, by its smaller size, shorter and paler colouration of both wings, and the less distinctly marked crosslines.

The male genitalia of the new species are characterised by the medially strongly dilated valva and the very long and slender, sword-like harpe (this species has the longest harpe within the *depuncta*-line). The dorsal carinal plate of *E. (M.) jomooseri* is narrower than that of *E. (M.) depuncta* but longer and stronger than in *E. (M.) arenoflavida*.

The female genitalia of *E. (M.) jomooseri* are most similar to those of *E. (M.) depuncta* but the gonapophyses are somewhat shorter and weaker, the posterior part of ductus bursae is broader and anteriorly more tapering, the appendix bursae is longer and more conical, and the signa are smaller, weaker sclerotised.

Distribution. *Eugnorisma (M.) jomoseri* appears as endemic to the High Atlas Mts in Morocco. The species was found in the medium-high altitude forested areas, between 1600–2200 m elevations; the moths are on the wing from August to October.

Etymology. The new species is dedicated to the memory of Josef Mooser, renowned lepidopterist and collector of a part of the type-series.

Eugnorisma (Metagnorisma) arenoflavida (Schawerda, 1934)

(Plate 12, Figs 7–8; Plate 42, Figs 21–28; gen. fig. 47)

Rhyacia depuncta ab. *arenoflavida* Schawerda, 1934, *Internationale Entomologische Zeitschrift* **28**: 425. Type-locality: Spain, Teruel, Albarracin. Lectotype: male, in coll. NHMW.

Synonymy
Rhyacia pontica var. *minaya* Agenjo, 1941, *Eos* **17**: 297. Type-locality: Spain, Burgos.

Diagnosis. The taxonomic identity of the species was clarified by Varga, Ronkay & Yela (1990). *Eugnorisma (Metagnorisma) arenoflavida* can be distinguished from the externally most similar *E. (M.) pontica* by its somewhat smaller size, narrower and more pointed forewings, usually more reduced, less distinctly marked crosslines and more ochreous shaded whitish hindwings with better visible underside discal spot; from *E. (M.) jomoseri* by its on average larger size (wingspan 31–37 mm), narrower and apically more pointed, more unicolorous forewings (usually with less distinctly marked crosslines), larger and more acute preorbicular patch and much paler, milky whitish hindwings.

This species differs conspicuously in its appearance from *E.* (*M.*) *depuncta* by its smaller size, narrower and apically more pointed forewings with much lighter ochreous-grey or pale sand brown, sometimes orange-brown or light rosaceous brown ground colour and reduced pattern, and much paler, milky whitish-ochreous hindwings, without or with narrow marginal dark suffusion. It is worth to note that *E.* (*M.*) *depuncta* and *E.* (*M.*) *arenoflavida* occur sympatrically in the Southern Pyrenean shore; this fact also supports their separation at species level.

The male genitalia of *E. (M.) arenoflavida* are most similar to those of *E. (M.) depuncta* but having shorter and medially more dilated valvae with more convex margins, narrower harpe with somewhat shorter and broader basal ventral extension, shorter and slightly broader, less curved aedeagus with distally narrower and less densely dentate-spiculate dorsal carinal plate, and less sclerotized and expanded spinulose field of vesica. The male genitalia of *E. (M.) arenoflavida* differ from those of the externally more similar *E. (M.) jomooseri* by the much shorter and basally broader harpe, weaker dorsal carinal plate and smaller, finer spinulose field of vesica; from the different populations of *E. (M.) pontica* by the strong and long ventral basal extension and the much shorter erect part of the harpe, and the stronger, more dentate-spinulose dorsal carinal bar.

In the female genitalia, *E. (M.) arenoflavida* has the narrowest antrum and the basally broadest appendix bursae within the three species of the *depuncta*-line; the signa are larger than in *E. (M.) jomooseri*.

Distribution. Central Spain.

Eugnorisma (Metagnorisma) pontica pontica (Staudinger, 1891)

(Plate 13, Figs 1–2; Plate 42, Figs 29–36; gen. fig. 48)

Agrotis depuncta var. *pontica* Staudinger, 1891, *Deutsche Entomologische Zeitschrift. Gesellschaft Iris zu Dresden* **4**(2): 266. Type-locality: [Turkey] Amasia. Syntypes: in coll. ZMHU.

Synonymy

Agrotis depuncta var. *pontica* ab. *consenescens* Staudinger, 1891, *Deutsche Entomologische Zeitschrift. Gesellschaft Iris zu Dresden* **4**(2): 266. Type-locality: [Turkey] Amasia. Syntypes: in coll. ZMHU.

Diagnosis. *Eugnorisma (Metagnorisma) pontica* differs from the externally often very similar *E. (M.) arenoflavida* by its somewhat broader and apically less pointed forewings with most often stronger, more distinctly marked crosslines and stigmata, and the more whitish hindwings with stronger brown covering on veins and in the marginal area, the underside discal spot smaller and less visible. The two species are similar in size (wingspan of *E. (M.) pontica* is 31–39 mm), displaying the similar colour variation but the colouration of both wings are less pastel-shaded in *E. (M.) pontica*, with more expressed, although most often scarce, darker irroration on the forewing. Finally, the two species are completely allopatric, *E. (M.) pontica* has a Ponto-Mediterranean-Iranian distribution while *E. (M.) arenoflavida* (and the other similar species, *E. (M.) jomooseri*) occur in the Iberian Peninsula and the Atlas Mts, respectively.

The genitalia of both sexes show clearly recognisable differences between the two species. In the males, *E. (M.) pontica* has much shorter ventral basal extension and longer, more acutely pointed erect part of harpe, weaker sclerotized and not or only minutely dentate-spinulose dorsal carinal plate, and larger, stronger distal spinulose field of the vesica. In the females, the antrum is narrower but longer, more trapezoidal, the posterior part of ductus bursae has a sclerotized area which is missing from *E. (M.) arenoflavida*, and the appendix bursae is narrower and more conical than in its congener.

Distribution. A Ponto-Mediterranean species occurring from the Southern Carpathians to East Anatolia, the f. *consenescens* specimens appear everywhere within this range but much more frequent in Central and Eastern Anatolian populations. The moths inhabit open, dry and xeric woodlands and open shrubby or grassland biotopes; the flight period extends from the end of August to the end of October.

Eugnorisma (Metagnorisma) pontica anis Varga & Ronkay, 1987

(Plate 13, Figs 3–4; Plate 42, Figs 37–40; Plate 43, Figs 1–8; gen. fig. 49)

Eugnorisma (*Metagnorisma*) *pontica anis* Varga & Ronkay, 1987, *Acta Zoologica Academiae Scientiarum Hungaricae* **33**(1–2): 242, pl. 5, figs 67–68; gen. figs 95–100. Type-locality: Armenia, Geghard, 40 km E of Yerevan, 1700 m. Holotype: male, in coll. NHMW.

Diagnosis. The eastern and south-eastern populations of *E. (M.) pontica* display conspicuous differences in their colouration and wing pattern in comparison with the nominotypical subspecies. These populations can be divided into two strikingly differently coloured subspecies (ssp. *anis* and ssp. *zaghros*) which show a narrow transitional zone in northern Iran. The Armenian ssp. *anis* differs from the ssp. *pontica* by its characteristic rosy-brown colouration and dark pattern, dark covering of veins and darker hindwing; the *consenescens*-like specimens are very rare and considerably darker than in the populations of the ssp. *pontica*. Wingspan 34–39 mm.

The male genitalia of the ssp. *anis* are generally identical with those of the typical subspecies but the valvae are more dilated medially, the harpe is proportionally thicker, having longer and stronger basal ventral extension, and the distal spinulose field of the vesica is more extended.

The female genitalia differ slightly from those of the ssp. *pontica* by the slightly narrower posterior section of ductus bursae, the shorter and more elliptical corpus bursae, and the proportionally more detached, more rounded-conical appendix bursae.

Distribution. The range of the ssp. *anis* extends along the southern chains of the Caucasus massif, including mainly the southern part of Armenia, NE Turkey (Kars, Agri), western Azerbaijan and certain areas of north-western Iran (Elburs). It is locally one of the dominant species of the early autumnal period; the adults are on the wing from the end of August to early October.

Eugnorisma (Metagnorisma) pontica zaghros Varga & Ronkay, 1987

(Plate 13, Figs 5–6; Plate 43, Figs 9–16; gen. fig. 50)

Eugnorisma (*Metagnorisma*) *pontica zaghros* Varga & Ronkay, 1987, *Acta Zoologica Academiae Scientiarum Hungaricae* **33**(1–2): 242, pl. 5, fig. 69; gen. fig. 94. Type-locality: Iran, Kasri-Shirin, Bala-vi-Taq, 1100 m. Holotype: male, in coll. NHMW.

Diagnosis. The south-eastern subspecies is the palest coloured and weakest patterned within *E. (M.) pontica*, having characteristically pastel-shaded, unicolorous pale ochreous-grey to slate-grey forewings. The majority of the populations show the above-mentioned colouration and pattern, but in the higher regions of the Zagros Mts and in certain areas of the Elburs Mts specimens may have some reddish shade and more extended darker pattern. The former, small and reddish-shaded moths may represent a distinct taxon, while the latter ones are rather transitional between the typical ssp. *zaghros* and the more northerly distributed ssp. *anis*.

The ssp. *zaghros* can be distinguished from the externally most similar *E. (M.) arenoflavida* by its broader and apically more rounded forewings, finer but longer black definition of antemedial line, better visible postmedial and subterminal lines, and the more whitish inner area of the hindwings. Wingspan 32–37 mm.

The genitalia of *E. (M.) pontica zaghros* differ from those of *E. (M.) arenoflavida* by the specific features discussed under the Diagnosis of the nominotypical subspecies. In the males, the valvae of the ssp. *zaghros* are somewhat more elongate and less dilated medially than in the other two subspecies, especially of the ssp. *anis*, and the erect part of the harpe is usually slenderer than in the sspp. *pontica* and *anis*. The female genitalia of the three subspecies differ mainly in the shape and size of the appendix bursae which is the smallest and the most rounded conical in the ssp. *zaghros*.

Distribution. Western and south-western Iran.

Eugnorisma (Metagnorisma) deserta Varga & Ronkay, 1987 **stat. rev.**

(Plate 13, Figs 7–8; Plate 43, Figs 17–24; gen. fig. 51)

Eugnorisma (*Metagnorisma*) *pontica deserta* Varga & Ronkay, 1987, *Acta Zoologica Academiae Scientiarum Hungaricae* **33**(1–2): 244, pl. 5, fig. 70, gen. figs 89, 101. Type-locality: Turkmenistan, Ashkhabad. Holotype: male, in coll. ZMM.

Diagnosis. The taxon was originally proposed as the easternmost subspecies of *E. (M.) pontica*; the subsequent revision on a much larger material of the *Metagnorisma* species provided the basis to separate the populations occurring in the Kopet-Dagh Mts at species level.

Eugnorisma (M.) deserta differs from *E. (M.) pontica* by its on average larger size and the darker hindwing (this latter character resembles rather *E.* (*M.*) *depuncta* than *E.* (*M.*) *pontica*), and in several characters of the genitalia in both sexes. Wingspan 35–41 mm.

The configuration of the genitalia of both sexes show the closer relationship of *E. (M.) deserta* with the members of the *pontica*-line due to the short and weak ventral extension of the harpe and the less sclerotized and weakly dentate-spinulose dorsal carinal bar in the males, and the presence of a sclerotized area in the posterior section of ductus bursae in the females.

In the male genitalia, the clasping apparatus of *E. (M.) deserta* is stronger built than that of *E.* (*M.*) *pontica*, having larger valvae, basally stronger, apically slenderer and more pointed harpe with weak and short ventral basal extension only. In the aedeagus, the distally strongly saccate vesica of *E. (M.) deserta* has very large subbasal diverticulum and large, strongly sclerotised, pouch-like spinulose field.

In the female genitalia, the main diagnostic characters of *E. (M.) deserta* are the large sclerotized area of ductus bursae, the very large, prominent and stronger ribbed appendix bursae, and the more rounded signa.

Distribution. This most easterly distributed member of the subgenus is known from the Kopet-Dagh massif in Turkmenistan and Iran (Khorassan), and the Jozak National Park in the Ala Dagh Mts in NE Iran. It appears as locally frequent in dry, scrubby habitats; the adults are on the wing from the end of August to early October.

Eugnorisma (Metagnorisma) heuristica Varga & Ronkay, 1987

(Plate 14, Figs 1–2; Plate 43, Figs 25–33; gen. fig. 52)

Eugnorisma (*Metagnorisma*) *heuristica* Varga & Ronkay, 1987, *Acta Zoologica Academiae Scientiarum Hungaricae* **33**(1–2): 244, pl. 5, figs 71–72, gen. figs 102–107, 142. Type-locality: Turkey, Prov. Hakkari, Altin Mts, Süvarihalil pass, 2400 m. Holotype: male, in coll. ZSM.

Diagnosis. *Eugnorisma (M.) heuristica* is easily separable from all other *Metagnorisma* taxa by its yellowish to pale yellowish-brown forewings and the pale ochreous-grey or ochreous-brown irrorated whitish-ochreous hindwings, this colouration is unique in this subgenus. The specific features of the wing pattern are the complete absence of the blackish definition of the subbasal and antemedial lines (a pale brown costal patch may appear in a few specimens) and the presence of a fine black dot at lower extremity of reniform stigma (the darker filling of the stigmata is rarely more extensive, see the Plate 43, Fig. 28). The rare dark forms of *E. (M.) heuristica* have relatively strong, blackish defined subbasal and antemedial lines and conspicuous brown median fascia. This wing pattern resembles strongly that of *E. (M.) hermannhackeri*, but the two species are easily separable by their different genitalia and pattern of distribution. The stigmata are generally smaller than in the other *Metagnorisma* taxa except *E. (M.) hermannhackeri* which also has rather narrow reniform stigma and oblique orbicular stigma. *E. (M.) heuristica* differs from this latter species by its larger size (wingspan 31–35 mm versus 25–28 mm, respectively), different colouration of both wings, much less prominent crosslines, and, in case of the females, the longer, more pointed forewings.

The male genitalia of *E. (M.) heuristica* differ from those of the other members of the *pontica*-line by the narrower valvae, the thicker and shorter, more recumbent harpe (except of *E. (M.) hermannhackeri*), the stronger dentation of the dorsal carinal plate and the much broader, large and globular vesica. The female genitalia of *E. (M.) heuristica* can be distinguished from those of the species of the *pontica*-line by the large, cup-shaped and less sclerotised, mainly membranous antrum and the narrow but strongly sclerotized medial part of ductus bursae; the appendix bursae is smaller and more rounded than in *E. (M.) pontica* and *E. (M.) deserta*, and the corpus bursae is shorter, elliptical-ovoid.

Distribution. Transcaucasian-Iranian. The species is known from Turkey (eastern Anatolia: Kars, Agri, Bitlis, Van and Hakkari), Armenia and Iran (western and central part of the Elburs Mts). The moths appear in higher montane rocky slopes with shrubby vegetation, often in gorges and deep river valleys. The moths are on the wing in September-October.

Eugnorisma (Metagnorisma) hermannhackeri **sp. n.**

(Plate 14, Figs 3–4; Plate 43, Figs 34–36; gen. fig. 53)

Holotype. Male, Turkey, Prov. Konya, Seytan Daglari, 2 km S of Huglu, 1400 m, 2.IX.1983, leg. H. Hacker, slide No.: HH 1852m (coll. ZSM).

Paratypes. **Turkey**. Prov. Konya. 1 female, with the same data as the holotype, slide No.: RL 1383f (coll. ZSM). Prov. Bitlis. 1 female, Mus Ovasi, 6 km SE of Güroymak and 23 km WNW of Tatvan, 17.IX.1985, leg. H. Hacker, slide No.: VZ 3667f (coll. ZSM).

Diagnosis. The new species has long been confused with *E. (E.) rafidain* (Varga & Ronkay 1987 and the subsequent papers dealing with the Noctuidae fauna of Iraq, Turkey and Iran) due to the insufficient information about the female holotype of the latter taxon (see also the Diagnosis of this species). The revision of the type material of *E. (E.) rafidain* and *E. (E.) semiramis* revealed the conspecificity of these two taxa and the distinctness of *E. (E.) rafidain* from the *Metagnorisma* lineage.

Eugnorisma (Metagnorisma) hermannhackeri is the smallest species of the subgenus. Externally it is similar to *E.* (*M.*) *depuncta* and the typical populations of *E. (M.) pontica* but is much smaller and short-winged than the related species (wingspan: 25–28 mm versus 34–42 mm and 31–38 mm, respectively), having paler, more ochreous ground colour, and small blackish spot in the lower part of the reniform stigma; the hindwings are paler, more ochreous-whitish than in *E.* (*M.*) *depuncta*. The comparison of the species with *E. (M.) heuristica* is given in the Diagnosis of the preceding taxon.

The male genitalia of *E. (M.) hermannhackeri* are easily separable from those of all closer relatives by the short and distally strongly dilated valvae, the very short and thick harpe with short ventral basal extension, and the thickest, short uncus. The female genitalia are most similar to those of *E. (M.) heuristica* but has smaller antrum, shorter membranous anterior section of ductus bursae, and basally much broader appendix bursae.

Distribution. Central Anatolian. A poorly known species, it has been found only twice, in two relatively disjunct areas of the southern part of Turkey. The moths were collected in September.

Etymology. The new species is dedicated to our friend, Hermann-Heinrich Hacker, expert of the Old World Noctuoidea, collector of the type-series.

Genus ***Haggettia*** Beck, 1999, **stat. rev.**

Eugnorisma (Haggettia) Beck, 1999, *Herbipoliana* 5(1): 697. Type-species: *Phalaena* (*Noctua*) *glareosa* Esper, 1788, by original designation.

Diagnosis. The taxonomic placement of the type-species of the genus has long been disputed by the authors. It was formerly most often associated with *Paradiarsia* Packard, 1867 (e.g. Hartig & Heinicke 1973, Leraut 1980, Fibiger 1993, etc.), later with *Eugnorisma* (e.g. Fibiger & Hacker 2005, Fibiger et al 2011, etc.). The thorough revision of the *Eugnorisma-Eugraphe* generic complex revealed the earlier segregation of the *Haggettia-Afrognorisma* and the *Miniphila* lineages from the main trunk of *Eugnorisma* s.l., therefore these three groups are treated here as three distinct genera. The two, closely related genera are placed after the *Metagnorisma* branch of *Eugnorisma*, representing the sister-group of the *Eugnorisma* s.l. clade.

The diagnostic external features of *Haggettia* are the minute pectination of the male antenna, the narrow forewings, the less sinuous crosslines, the sharply defined (most often deep black) intracellular markings and the whitish hindwings of both sexes (except in the dark form, f. *edda*). The body is more robust and the male forewings are more elongated than in *Afrognorisma*, and the male antenna is remarkably shorter pectinated. *Haggettia* has, in comparison with *Metagnorisma*, narrower and longer forewings and less sinuous crosslines.

The group characteristics of the male genitalia are the presence of the long, partly sclerotised longitudinal ribs of the inner curve of the vesica (a shared feature with *Afrognorisma*), the lack of the distal cornuti field (which is always present in *Eugnorisma*), and the reduced subbasal diverticulum bearing the cornutus (it is larger and more prominent in *Afrognorisma* and much longer and more hyaline membranous in *Eugnorisma*). The valvae of *Haggettia* are apically more acute than in *Metagnorisma* and simple, not bifid as in *Afrognorisma*; the ventral edge of the sacculus is forming a fine ridge which is absent in *Metagnorisma* while there is a large, partly sclerotised and acutely pointed process in *Afrognorisma*. Finally, the harpe is shorter than in the two related groups, and its ventral basal extension is much shorter

and weaker than in *Metagnorisma* (the basal section of harpe is quite differently built in *Afrognorisma*, lacking ventral basal projection).

The female genitalia differ from those of *Afrognorisma* by the much shorter, ring-like antrum, much weaker sclerotised and shorter ductus bursae, and the presence of small signum-patches arranged into scarce rows; from *Metagnorisma* by the smaller, ring-like antrum, shorter and anteriorly less constricted ductus bursae, and the smaller (though similarly built) signum-patches.

Haggettia glareosa (Esper, 1788) **comb. rev.**

(Plate 14, Figs 5–6; Plate 43, Figs 37–40; Plate 44, Figs 1–8; gen. fig. 54)

Phalaena (*Noctua*) *glareosa* Esper, 1788, *Die Schmetterlinge in Abbildungen nach der Natur mit Beschreibungen* **4**: pl. 128, fig. 3. Type-locality: Europe.

Synonymy

Phalaena (*Noctua*) *decempunctata* de Villers, 1789, *Caroli Linnaei Entomologica, Fauna Suecicae Descriptionibus Aucta* **2**: 273, pl. 5, fig. 17. Type-locality: [France, Lyon] Lugdunum;

Noctua hebraeica Hübner, 1819, *Sammlung Europäischer Schmetterlinge* **4**: pl. 140, figs 642–643. Type-locality: Europe;

Noctua i-geminum Duponchel, 1826, *Histoire Naturelle des Lépidoptéres ou Papillons de France* **6**: 80, pl. 77, fig. 6. Type-locality: France and Spain. Syntypes: in coll. MNHNP;

Agrotis glareosa var. *edda* Staudinger, 1891, *Deutsche Entomologische Zeitschrift. Gesellschaft Iris zu Dresden* **4**: 266. Type-locality: [Great Britain] Shetland Islands. Syntypes: 2 males and 1 female, in coll. ZMHU.

Diagnosis. The species is easily distinguished from the externally somewhat similar *Afrognorisma* and *Eugnorisma (Metagnorisma*) species by the narrower, more elongated and uniformly ashy or silvery-grey (in the f. *edda* dark brown) coloured forewings with sharply defined dark markings. The male antennae are much less pectinated than in the two *Afrognorisma* species; the crosslines are straighter and better defined than in the *E. (Metagnorisma)* taxa. Wingspan 38–45 mm.

The genitalia of both sexes differ conspicuously from those of all externally somewhat similar species, see the gen. fig. 44–56 and the Diagnoses of the genera *Haggettia* and *Afrognorisma*.

Distribution. Atlanto-Mediterranean. The species is rather widespread in western and northern Europe, from Morocco, the Iberian Peninsula and the British Isles towards western and south-western Scandinavia, appearing very locally in the Baltic area, Central Europe (Austria, Czechia, Slovakia) and in Poland.

Genus ***Afrognorisma*** **gen. n.**

Type-species: *Agrotis picata* Bang-Haas, 1912, here designated.

Diagnosis. The two species of the genus have long been associated with the Himalayan-Tibetan *Paramathes* though their relationship with *Haggettia* is much closer than with *Paramathes*. The group features of *Afrognorisma* are 1) the acutely pointed and partly sclerotised long postero-ventral process of sacculus (a unique autapomorphy of the lineage within the tribe Noctuini); 2) the long and finely arched, somewhat S-shaped harpe with short basal plate lacking postero-ventrally projecting process (which is typical of *Haggettia* and the subgenus *Metagnorisma* of *Eugnorisma*); 3) the strongly sclerotised and large, subdeltoidal juxta; 4) the reduction of the sclerotised plates of carina to a short, eversible, serrate-dentate ribbon; 5) the short and semiglobular-subconical subbasal diverticulum of the vesica; 6) the presence of longitudinal, partly sclerotised ribs along the inner curve of the vesica (a shared, plesiomorphic feature of several Noctuini genera but absent in most derived groups of the *Eugnorisma-Eugraphe* generic complex); 7) the compact, strongly sclerotised and dorso-medially incised antrum; 8) the long, flattened and heavily sclerotised ductus bursae; and 9) the shortened, discoidal-globular corpus bursae lacking signa.

The moths are medium-sized (wingspan 35–43 mm), with gracile body and relatively short but broad, apically finely pointed forewings, the male antenna is shortly bipectinate (that is very shortly pectinate, almost filiform in *Haggettia*); the colouration and wing pattern is different in the two species, providing their easy separation by the external features.

The genitalia of the two species show the same ground plan but differ in practically all details in both sexes.

Distribution. Northwest African. The species of the genus are known from Morocco and Algeria, displaying an allopatric distribution pattern.

Afrognorisma picata (Bang-Haas, 1912) **comb. n.**

(Plate 14, Figs 7–8; Plate 44, Figs 9–18; gen. fig. 55)

Agrotis picata Bang-Haas, 1912, *Deutsche Entomologische Zeitschrift. Gesellschaft Iris zu Dresden* **26**: 140. Type-locality: Algeria, Batna. Holotype: female, in coll. ZMHU.

Synonymy

Agrotis nona Oberthür, 1913, *Bulletin de la Société Entomologique de France* **1913**: 259. Type-locality: Algeria, Aflou. Type(s): in coll. BMNH.

Diagnosis. *Afrognorisma picata* is easily separable from the externally similar members of the *Eugnorisma (Eugnorisma) trigonica* species-group by its smaller size (wingspan 35–40 mm vs 40–52 mm, respectively), darker, generally blackish intracellular patches, straighter crosslines (especially the subterminal line is more distinct and less waved), well-defined hindwing discal lunule and the shortly bipectinate male antenna. *Afrognorisma picata* can be distinguished from *Haggettia glareosa* by its slenderer body and broader forewings with different colouration and the conjoined black intracellular patches, the hindwing discal lunule and the longer pectination of the male antenna; from *A. maroccana* by the compact, horizontal C-shaped intracellular patch, sharper crosslines and paler (whitish-ochreous) hindwings.

The male genitalia of *A. picata* differ from those of *A. maroccana* by the shorter aedeagus, larger and more distinct subbasal diverticulum and less strongly defined longitudinal ribs, somewhat thinner uncus, stronger juxta with more robust dorso-medial process, distally more dilated and finely "wrinkled" harpe, more elongated valvae with rather evenly bifurcate apical part, and the shorter and apically more curved and pointed postero-ventral saccular process.

In the female genitalia, the antrum of *A. picata* is smaller, more quadrangular (rhomboidal) with narrower cleft, and the the ductus bursae is more unevenly sclerotised at junction to corpus bursae than in *A. maroccana*.

The genitalia of *A. picata* and the externally resembling *Eugnorisma* and *Haggettia* species are quite dissimilar; see the Diagnosis of the genus.

Distribution. Algeria and the eastern part of Morocco. The moths are on the wing in September-October.

Afrognorisma maroccana (Rungs, 1972) **comb. n., stat. rev.**

(Plate 15, Figs 1–2; Plate 44, Figs 19–27; gen. fig. 56)

Paramathes picata maroccana Rungs, 1972, *Bulletin du Muséum National d'Histoire Naturelle, Série 3, Zoologie* **46**: 675, pl. 1, fig. 11, genitalia pl. 2, fig. 5. Type-locality: Morocco, Rif Mts, Ketama. Holotype: male, in coll. MNHNP.

Diagnosis. This species was described and long been considered as the western subspecies of *A. picata*, despite the remarkable external and genital differences. *Afrognorisma maroccana* differs externally from *A. picata* by its somewhat larger size (wingspan 37–43 mm) and less pointed forewings, with characteris-

tic sand-brown ground colour, less distinctly marked crosslines, separated black intracellular patches and the darker, more pale brown suffused outer part of the hindwing.

The key features in the male genitalia are found in the structure of the aedeagus and the vesica as the aedeagus of *A. maroccana* is longer, the subbasal diverticulum is less distinct from the main tube of the vesica and the longitudinal ridges of the internal curve of the vesica are remarkably stronger than in *A. picata*. The clasping apparatuses are also show specific differences between the two species as *A. maroccana* has shorter but broader triangular subapical process ("pseudopollex"), more evenly broad harpe, longer and apically less curved saccular extension, more deltoidal juxta, etc.

In the female genitalia, the antrum of *A. maroccana* is broader, anteriorly more rounded than in *A. picata* (see the gen. figs 55 and 56) and has deeper and broader cleft, and the anterior end of ductus bursae is evenly sclerotised at both sides.

Distribution. The species is known only from Morocco. The adults are autumnal; the flight period is September-October.

Genus ***Sinognorisma*** Varga & Ronkay, 1987

Sinognorisma Varga & Ronkay, 1987, *Acta Zoologica Academiae Scientiarum Hungaricae* **33**(1–2): 189. Type-species: *Eugnorisma gothica* Boursin, 1954, by original designation.

Diagnosis. The genus represents a strongly autapomorphic lineage within the *Eugnorisma-Eugraphe* generic complex, it is hardly derived from any other group of the clade. The generic features are most expressed in the male genitalia while the external appearance and the female genitalia are much less specialised. The group features of the male genitalia of *Sinognorisma* are the very large and heavily sclerotized male genital capsule, the huge vinculum and saccus, the very large and strongly asymmetrical sacculus (with two processes, in one side the inner process is large and elongate, and the outer is small while on the other side the outer is strong and the inner is smaller, see the gen. fig. 57), the three fine subapical ventral lobes (the most proximal lobe is a true pollex while the medial and the subapical lobes are pseudopollexes), the distally arched, tubular aedeagus with heavily sclerotized and serrate-dentated dorsal carinal plate and shorter, humped and smoothly sclerotised ventral carinal plate, the ventrally projecting vesica with small frontal and large, curved, subconical subbasal diverticula, and the lack of the armature of the vesica.

The main external features of *Sinognorisma* are as follows: male antenna relatively short, finely ciliate; frons smooth; palpi regular with slightly pointed apical segment; metatarsi with three rows of spines; abdomen covered with more or less long hairs, but without dorsal tufts or crests; forewing dark violaceous- or claret-brown in both sexes, with dark intracellular markings; hindwing dark brown.

The male genitalia can be characterized, besides the autapomorphic features listed above, by the short and slender uncus, narrow, gracile tegumen, large and strong, elongate valvae without cucullus and corona, and the long and straight harpe with weakly developed, oblique basal plate.

In the female genitalia, ovipositor short and rather weak, antrum flattened and strongly sclerotized, with small postero-lateral lobes, ductus bursae flattened and heavily sclerotized, with long dorsal crests; appendix bursae small, conical, membranous, corpus bursae large, elliptical-ovoid, membranous, with four long, ribbon-like signa.

Sinognorisma gothica (Boursin, 1954)

(Plate 15, Figs 3–4; Plate 44, Figs 28–34; gen. fig. 57)

Eugnorisma gothica Boursin, 1954, *Bonner Zoologische Beiträge* **5**(3–4): 255, pl. 4, figs 14, 17; pl. 11, fig. 50. Type-locality: China, Yunnan, Li-kiang. Holotype: male, in coll. ZFMK.

Diagnosis. The species is easily distinguished from all known relatives of the *Eugnorisma-Eugraphe* generic complex, due to the rather convex forewing costal margin, the violet- or claret-shaded dark brown ground colour with fine greyish irroration and conspicuous black intracellular (intermacular) markings, and the uniformly dark brown hindwings. It is larger and more robust than the species of *Protognorisma*, darker and more contrastingly marked than the somewhat similarly reddish-shaded *Eugnorisma ignoratum*, and more sharply patterned than the in wing shape most similar *Sineugraphe* Boursin, 1954 species. Wingspan 45–51 mm.

The male genitalia differ conspicuously from any possibly similar species (see the Diagnosis of the genus and the Fig. 57). The female genitalia are distinguished from those of the most similar *Sineugraphe* species by the larger, more flattened antrum, the shorter but broader, strongly cristate-ribbed ductus bursae, the more ample corpus bursae and the more proximally positioned signum-stripes.

Distribution. Sino-Tibetan. The species is known from the mountains bordering the SE edge of the Tibetan plateau (China: Sichuan, Yunnan). It lives in the medium-high and higher regions (3100–4000 m altitudes), where locally may be frequent; the adults are on the wing in August-September.

Genus ***Prognorisma*** Lafontaine, 1998

Prognorisma Lafontaine, 1998, *Moths of America North of Mexico* 27.3 [MNA27.3]: 171. Type-species: *Noctua substrigata* Smith, 1895, by original designation.

Diagnosis. *Prognorisma* is a member of the *Eugnorisma-Eugraphe* generic complex, its closest relatives are *Pseudohermonassa*, *Opigena* and the Nearctic *Agnorisma* Lafontaine, 1998. This subgroup can be characterized by the sclerotized, dentate-spinose ventral (or ventro-lateral) carinal plate not or only shortly extended onto the vesica. The genera of this subgroup possess fine, pointed pseudopollex (subapical process on the ventral margin of the valva, being not homologous with pollex), which is reduced in *Pseudohermonassa*. Such pseudopollex is present in a number of other Noctuini genera (e.g. *Paramathes, Goniographa*, *Coenophila, Eugraphe*, etc.) but in these genera the eversible carinal bar is extended far more towards the basal portion of the vesica.

The diagnostic features of *Prognorisma* are the presence of complete rows of setae on both the inner and outer margins of the foretibia, and a posterior extension from the base of the harpe towards valval apex that is free from the inner surface of the valva. It is worth to note that the Nearctic *Prognorisma substrigata* (Smith, 1895) has flat, straplike uncus, while the uncus of the Palaearctic *P. albifurca* is fine, slender and curved. The male genitalia of *Prognorisma* differ from those of *Opigena*, besides the posterior basal process of harpe, the broader, distally dilated valvae, much shorter harpes, flat juxta (that of *Opigena* has well-developed, sclerotised dorso-medial process), and reduced subbasal and medial diverticula in the vesica, without cornutus on the subbasal diverticulum; from those of *Pseudohermonassa* by the more elongate and less sclerotised, distally dilated valva, much longer and finer, basally thinner harpe and more ample, more recurved vesica.

The group features of the female genitalia distinguishing *Prognorisma* from *Opigena* and *Pseudohermonassa* are the simple, and smooth, infundibular sclerotisation of antrum, the large and coiled appendix bursae (this structure is present in *Graphiphora* and in certain species-groups of *Spaelotis*), and the long, continuous, thin signum-stripes (they are interrupted or partly reduced in the two related Palaearctic genera).

Distribution. Holarctic.

Prognorisma albifurca (Ershov, 1877)

(Plate 15, Figs 5–6; Plate 48, Figs 1–8; gen. fig. 58)

Agrotis albifurca Ershov, 1877, *Horae Societatis Entomologicae Rossicae* **12**(4): 337. Type-locality: [Russia] Transbaikalia, Irkutsk. Type(s): in coll. ZISP.

Synonymy

Agrotis costata Staudinger, 1881, *Entomologische Zeitung. Entomologischen Vereine zu Stettin* **42**: 420. Type-locality: [Kazakhstan] Saisan. Holotype: male, in coll. ZMHU. A junior primary homonym of *Agrotis costata* Grote, 1876;

Rhyacia reticulata Kozhanchikov, 1923, *Ezhegodnik Gosudarstvennova Muzeya immeni Mart'janova* **1**(1): 35. Type-locality: [Russia] Minussinsk. Type(s): in coll. ZISP.

Diagnosis. *Prognorisma albifurca* is an easily recognisable species, it can be distinguished from the closely related Nearctic *P. substrigata* by its stronger dark covering on and more distinct lighter stripes along the forewing veins, more distinct arrowhead-spots defining the stronger and more whitish defined subterminal line, more sinuous postmedial line, narrower reniform stigma with more variegated filling, and the somewhat darker, more greyish suffused inner area of the hindwing.

There is no really similar species in the Eurasiatic fauna except the members of *Opigena* but *P. albifurca* differs externally from them by its slenderer, dorso-ventrally less flattened body, less dark marked thorax, more extensive whitish-ochreous to beige suffusion along the dark covered veins, less sinuous and whitish filled antemedial and postmedial crosslines, paler, most often ochreous-grey or orange-grey filled orbicular and reniform stigmata, uniformly ochreous-grey suffused hindwings with well visible, lunulate discal spot, etc. Wingspan 43–48 mm.

The genitalia of both sexes are rather dissimilar from those of the externally similar genera; the detailed comparison of *Prognorisma* with *Opigena* and *Pseudohermonassa* is given above, under the diagnosis of the genus.

Distribution. Siberian. The species is widespread along the taiga belt from western Siberia throughout the Siberian high mountains and Mongolia to Transbaikalia; it occurs also in the northern frontier of the Tibetan plateau (NW China: Altun Shan).

Genus ***Opigena*** Boisduval, 1840

Opigena Boisduval, 1840, *Genera et Index Methodicus Europaeorum Lepidopterorum* **1840**: 103. Type-species: *Noctua polygona* [Denis & Schiffermüller], 1775, by monotypy.

Diagnosis. The species of *Opigena* are similar externally to those of *Prognorisma* but their relationship, according to the genitalia features, is not very close. The genus displays a unique combination of morphological features which show connections also to *Goniographa, Graphiphora* and *Spaelotis*.

The diagnostic external features of the genus are as follows: medium-sized moths (wingspan 35–44 mm) with strong body, filiform male antennae, long scale-ridge on palpi, sharply marked collar and thorax, with erect pro- and metathoracic tufts; long and narrow forewings with apically finely rounded apex and sharply defined, *Chersotis*-like noctuid pattern, and flattened abdomen.

The male genitalia are characterised by the long, slender uncus, cordiform juxta with strong but short dorso-medial process; slender, long valvae with acute apical section, very long and strong, straight or finely arched harpes; well-developed or reduced pseudopollex, long, tubular aedeagus with smooth carinal plate and eversible, short and serrate bar extending towards base of vesica, long, narrowly or somewhat dilated tubular vesica with large subbasal diverticulum armed by large, bulbed cornutus; smaller or larger distal diverticulum also present.

The typical features of the female genitalia are the short ovipositor, the very strongly sclerotised, cordiform or forcipate antrum, the flatened and sclerotised, rather long ductus bursae, the subconical,

wrinkled-ribbed appendix bursae and the ample, elliptical-sacculiform corpus bursae with the very characteristic four rows of signa consisting of smaller or larger, more or less disjunct, rounded and sclerotised patches. This signum configuration is a generic apomorphy of *Opigena* though a somewhat similar modification of signa (partly interrupted signum stripes) appears in certain *Pseudohermonassa* and *Spaelotis* species. Interestingly, the *Chersotis sarhada* Brandt, 1941 species-group has a surprisingly similar structure of signa (see the Witt Catalogue, Vol. 6, gen. figs 102–105), as a convergential phenomenon.

The genus includes, based on the genitalia features, two species-groups, the *huberi*- and the *polygona*-groups. In the *huberi*-group the pseudopollex is reduced to a flat lobe, the apical part of the valva ("cucullus") is shortened, the juxta has larger, longer dorso-medial process, and the vesica is broader, more inflated and less tubular, with more prominent distal diverticulum (males); the antrum is smaller and more cordiform, with shallower postero-medial cleft, and the ductus bursae is shorter and posteriorly broadened (females). The pseudopollex of the *polygona*-group is well-developed, finely cuneate, the apical part of valva is long and falciform, with acute apex, the vesica is long, tubular, recurved, with small, little hump-like distal diverticulum. The antrum of this group is much larger and broader, with deep and wide, U-shaped postero-medial incision, and the ductus bursae is considerably longer, and more or less evenly wide.

The separation of the two species-groups is supported also by a curious character: both species of the *huberi*-group have flattened and oblique orbicular stigma while the orbicular stigma is rounded or elliptical-oval in the members of the *polygona*-group.

Distribution. Trans-Palaearctic, with somewhat restricted area in eastern Asia. The most widespread species is distributed from the Atlantic region to eastern Siberia (Kononenko 2005) but the genus is absent from the Pacific region. The former records of the genus from Inner Asia eastwards the western frontier of the Tibetan plateau (e.g. Fibiger 1993) do not refer to species belonging to *Opigena*.

Opigena huberi Hacker, 1999

(Plate 15, Figs 7–8; Plate 44, Figs 35–40; gen. fig. 59)

Opigena huberi Hacker, 1999, *Esperiana* **7**: 426, pl. 23, figs 5–6, gen. figs 1–2. Type-locality: Turkey, Prov. Erzurum, Palandöken Mts, 4 km S of Erzurum, 2200 m. Holotype: male, in coll. ZSM.

Diagnosis. *Opigena huberi* is on average smaller than *O. khorassana* (wingspan 35–37 mm vs 36–41 mm) and the hindwings are paler, milky-whitish to light ochreous-grey, with weak marginal suffusion. In the male genitalia, the valvae of *O. huberi* are shorter than those of *O. khorassana*, having shorter apical section, and longer, slenderer and straighter harpe, the eversible serrate carinal bar is narrower and shorter, as well as the bulbed cornutus of the vesica. In the females, the antrum is smaller in *O. huberi*, and the ductus bursae is posteriorly not dilated (as in *O. khorassana*), having more or less parallel lateral margins.

The separation of the two species of the *O. huberi* species-group from the taxa of the *O. polygona* species-group is based on the flattened orbicular stigma and, in case of *O. huberi*, also on the pale, usually whitish hindwings. In the problematic cases, the proper identification requires the study of the genitalia which provides an easy distinction, see above in the Diagnosis of *Opigena*.

Distribution. Anatolian-Iranian. The species has been recorded from Central and Eastern Turkey and the north-western parts of Iran, as far to the east as the Central Elburs Mts. It inhabits the medium-high and higher altitude xerothermic grasslands; the moths are on the wing from the end of July to the end of September.

Opigena khorassana sp. n.

(Plate 16, Figs 1–2; Plate 44, Figs 41–42; Plate 45, Figs 1–4; gen. fig. 60)

Holotype. Female, Turkmenistan, Kopet-Dagh Mts, Dushak, 1500 m, 37°54'N, 57°56'E, 7–8.VIII.1992, leg. M. Hreblay, Gy.M. László & G. Ronkay (coll. G. Ronkay).
Paratypes. Iran, Prov. Khorasan. 4 males, Kopet-Dagh Mts, 10 km N of Jevenly, 2300 m, 27–28.VIII.2000, leg. P. Gyulai & A. Garai, slide No.: GYP 4012 (male) (coll. P. Gyulai); 2 males, 2 females, Kopet-Dagh Mts, 1 km W of Jevenly, 2100 m, 27–28.VIII.2000, leg. P. Gyulai & A. Garai, slide No.: GYP 4014 (female) (coll. P. Gyulai); 1 female, Jozak NP, 2 km W of Jozak, 1350 m, 28–29.VIII.2000, leg. P. Gyulai & A. Garai (coll. P. Gyulai); 2 males, Kouh-i-Binaloud (Meched), 2800 m, 20.VIII.1938, leg. Brandt (coll. NRS).

Diagnosis. *Opigena khorassana* can be distinguished from its allopatric sibling species, *O. huberi*, by its larger size (wingspan 36–41 mm) and more ochreous-brown or pale greyish-brown suffused hindwings. The differences between the genitalia of the two species are relatively small but clearly recognisable in both sexes. In the males, *O. khorassana* has longer and more acute apical section of the valva, shorter and basally somewhat thicker harpe, larger juxta with more robust dorso-medial process, stronger eversible bar of the carina and larger cornutus; in the females, the new species has larger, broader and more cordiform antrum with deeper postero-medial cleft and stronger, posteriorly more dilated ductus bursae.

The specimens of *O. khorassana* are often very similar to the uniformly coloured specimens of the sympatrically occurring *O. polygona turcomana* but the orbicular stigma is always more flattened and oblique than in the latter taxon. In the problematic cases the study of the genitalia is required for the proper identification, the differences between the two species are conspicuous in both sexes (see the gen. figs 60 and 63).

Distribution. The species is endemic to the Kopet-Dagh massif (Turkmenistan, Iran: Khorassan, Binaloud). It lives in the xerothermic bushy and grassland habitats between 1500–2800 m altitudes; all known specimens were collected in August.

Opigena polygona polygona (Denis & Schiffermüller, 1775)

(Plate 16, Figs 3–4; Plate 45, Figs 5–12; gen. fig. 61)

Noctua polygona [Denis & Schiffermüller], 1775, *Ankündung eines Systematischen Werkes von den Schmetterlinge der Wienergegend* **1775**: 78. Type-locality: [Austria] Vienna district. Types destroyed.

Synonymy
Phalaena Noctua nigrofulva Esper, 1788, *Die Schmetterlinge in Abbildungen nach der Natur mit Beschreibungen* **4**: pl. 127, fig. 7. Type-locality: [Germany] Leipzig;
Phalaena pyramis Borkhausen, 1792, *Der Phalaenen zweite Horden, Eulen. Naturgeschichte der Europaischen Schmetterlinge nach Systematischer Ordnung* **4**: 499. Type-locality: [Austria] Vienna district.
Opigena polygona f. *rutilans* Sohn-Rethel, 1929, *Deutsche Entomologische Zeitschrift. Gesellschaft Iris zu Dresden* **42**: 40. Type-locality: Italy, Abbruzzen.

Diagnosis. A polytypic species, the only widespread member of the genus, with easily recognisable geographic subspecies. *Opigena polygona* is separable from the externally similar and partly sympatrically occurring *O. huberi* and *O. khorassana* by its rounded or elliptical orbicular stigma, from *O. narana* by its paler, not uniformly dark brown suffused hindwings and the strongly disjunct distribution pattern. Wingspan 37–44 mm.

The male genitalia of *O. polygona* differ from those of *O. narana* by the longer and medially narrower valvae, without prominent triangular costal lobe, broader, less spiniform apical section, smaller pseudopollex, and the larger cornutus of the vesica; from those of *O. huberi* and *O. khorassana* by the longer and slenderer valvae with longer and more falcate apical part, reduced or finely rounded hump-like medial costal part, well-developed pseudopollex, and the longer and more tubular vesica with much smaller distal diverticulum.

The female genitalia can be distinguished from those of the other *Opigena* species by the very strongly sclerotised, large antrum with broad and deep postero-medial cleft.

The typical ssp. *polygona* differs externally from the other *Opigena* subspecies by the variably strongly ochreous or ochreous-grey variegated forewings, more sharply defined antemedial and postmedial crosslines, and the more distinct ochreous subterminal line. In the genitalia, this subspecies has the broadest valva, and the cleft of the antrum is broader than in the ssp. *chersotimorpha* but smaller than in the sspp. *turcomana* and *obscurata*.

Distribution. Euro-Siberian. The nominotypical ssp. *polygona* is the most widespread subspecies of *O. polygona*; its area extends from Western Europe to the northern part of the Caucasus region and central Turkey. The species inhabits open and lightly wooded habitats, from the lowland to the high altitude xeromontane biotopes. The adults are on the wing from June to September, with variably long aestivation.

Opigena polygona chersotimorpha Ronkay & Varga, 1985

(Plate 16, Figs 5–6; Plate 45, Figs 13–20; gen. fig. 62)

Opigena polygona chersotimorpha Ronkay & Varga, 1985, *Zeitschrift der Arbeitsgemeinschaft oesterreichischer Entomologen* **36** (3/4): 86, pl. 1, figs 1–2. Type-locality: Armenia, Geghard, 40 km E of Yerevan, 1700 m. Holotype: male, in coll. NHMW.

Diagnosis. The ssp. *chersotimorpha* differs from the other *polygona* subspecies by its relatively short and broad, "*Chersotis*-shaped" forewings with uniformly violet shaded brown ground colour and fine dark markings; in the rare form with ochreous suffused median area this ochreous irroration is less intensive and more greyish than in the sspp. *turcomana* and *obscurata*. Wingspan 37–39 mm.

Comparing the genitalia of the four subspecies, *chersotimorpha* has the proportionally longest harpe, smallest pseudopollex and the smallest, most angular cleft on the antrum.

Distribution. This subspecies has a rather limited range in eastern Turkey, Armenia and the western and south-western parts of Iran, towards the eastern Elburs to the east and the higher parts of the Zagros Mts to the south.

Opigena polygona turcomana **sp. n.**

(Plate 16, Figs 7–8; Plate 45, Figs 29–36; gen. fig. 63)

Holotype. Female, Turkmenistan, Kopet-Dagh Mts, Firyuza, 400–600 m, 37°54'N, 58°05'E, 25–27.V.1991, leg. M. Hreblay & G. Ronkay, slide No.: RL 11473 (coll. G. Ronkay).

Paratypes. **Turkmenistan.** 1 male, Firyuza, 400–600 m, 37°54'N, 58°05'E, 25–27.V.1991, leg. M. Hreblay & G. Ronkay (coll. G. Ronkay); 1 male, from the same locality, 25.IX.1991, leg. A. Podlussány, L. Ronkay & Z. Varga (coll. HNHM); 6 specimens, from the same locality, 28.IX.1991, leg. A. Podlussány, L. Ronkay & Z. Varga (coll. HNHM); 2 females, from the same locality, 13.X.1991, leg. A. Podlussány, L. Ronkay & Z. Varga (coll. HNHM); 1 male, 1 female, from the same locality, 14.X.1991 (coll. HNHM); 1 female, Karayalchi valley, 20 km E of Nochur, 800 m, 38°23'N, 57°12'E, 4.X.1991, leg. A. Podlussány, L. Ronkay & Z. Varga (coll. G. Ronkay); 1 female, 25 km E of Nochur, Karayalchi valley, 1600 m, 38°21'N, 57°09'E, 5. X.1991, leg. A. Podlussány, L. Ronkay & Z. Varga (coll. P. Gyulai); 1 male, 6 km S of Ipay-Kala, 1600 m, 38°17'N, 57°07'E, 16–23.VIII.1992, leg. M. Hreblay, Gy.M. László & G. Ronkay, slide No.: RL 11418m (coll. G. Ronkay); 3 males, 1 female, Sayvana valley, 5 km SW of Sayvana, 1800 m, 38°17'N, 56°50'E, 28.VI.1992, Gy. Fábián, B. Herczig, A. Podlussány & Z. Varga, slide Nos: RL 8651m, RL 11425m, RL 11426f (coll. P. Gyulai, G. Ronkay & HNHM); 1 male, 1 female, Sayvana valley, 8 km E of Sayvana, 1800 m, 38°22'N, 56°55'E, 29.VI.1992, leg. Gy. Fábián, B. Herczig, A. Podlussány & Z. Varga, (coll. P. Gyulai); 1 female, Sayvana valley, 8 km E of Sayvana, 1800 m, 38°22'N, 56°53'E, 25.VI.1992, leg. Gy. Fábián, B. Herczig, A. Podlussány & Z. Varga (coll. G. Ronkay); 8 specimens, Ipay-Kala, valley of the rivers Ipay-Kala and Point-Kala, 800–1500 m, 38°13'N, 59°54'E, 30.VI.–4.VII.1992, leg. Gy. Fábián, B. Herczig, A. Podlussány & Z. Varga (coll. P. Gyulai, G. Ronkay & HNHM); 1 male, 1 female, 10 km S of Ai-dere, 1000 m, 38°14'N, 56°46'E, 27.VI.1992, Gy. Fábián, B. Herczig, A. Podlussány & Z. Varga, slide Nos: RL 8650f, RL 11424m (coll. G. Ronkay); 1 male, Dushak, 1500 m, 37°54'N, 57°56'E, 7–8.VIII.1992, leg. M. Hreblay, Gy.M. László & G. Ronkay, slide No.: RL 11524m (coll. G. Ronkay); 1 female, Dushak, 2300 m, 37°54'N, 57°57'E, 6–8.VII.1992, leg. Gy. Fábián, B. Herczig, A. Podlussány & Z. Varga (coll. HNHM); 9 specimens, Dushak, 2200 m, 1–2.X.1991, leg. A. Podlussány, L. Ronkay & Z. Varga (coll. HNHM); 15 specimens, Dushak, 1800 m, 30.VI.1992, leg. Danilevsky, slide Nos: RL 11429f, RL 11430m (coll. HNHM); 1 male, Chash-Tepe, 1000 m, 37°17'N, 57°07'E,

8–12.VI.1992, leg. V.S. Korshunov, slide No.: RL 11423m (coll. G. Ronkay); 2 females, Kara-Kum desert, 42 km N Ashkhabad, 100 m, 58°33'E, 38°21'N, 15.X.1991, leg. A. Podlussány, L. Ronkay & Z. Varga (coll. HNHM). **Iran.** Prov. Khorasan. 1 male, Kopet-Dagh, 70 km NE of Qucan, 2200 m, 37°27'N, 58°35'E, 12.V.2001 (coll. G. Ronkay); 1 female, Kopet-Dagh, 50 km SW of Darregaz, 1200 m, 37°33'N, 58°38'E, 12.V.2001 (coll. G. Ronkay); 24 males, 11 females, Kopet Dagh, 10 km N of Jevenly, Tandure NP, 2300 m, 9–10.VII.2010, leg. P. Gyulai & A. Garai, slide No.: GYP 4266 (female) (coll. P. Gyulai); 3 males, 3 females, Kuh-e-Binaloud, NE of Neyshapur, 1770 m, 7–8.VII.2010, leg. P. Gyulai & A. Garai (coll. P. Gyulai); 1 male, Kopet-Dagh, Bargovein Mt., Sharkohne, 27–28.VI.2000, leg. K. Gaskó (coll. P. Gyulai). Prov. Semnan. 1 male, SE. Elburs, 8 km S of Ali Chesmeh, near Damghan, 6–7. VII.2010, P. Gyulai & A. Garai (coll. P. Gyulai). Prov. Golestan. 1male, 1 female, E. Elburs Mts, Khosyelaq, 2100 m, 3–6.VI.2010 (coll. P. Gyulai).

Diagnosis. The on average largest and most broad-winged subspecies (wingspan 37–44 mm) is characterised, besides the large size, the fine, uniformly pale olive-grey to light greyish-brown forewings with rather indistinct crosslines and outlines of stigmata, and the silky ochreous-grey hindwings with usually weak brownish marginal suffusion. The in the median area bright ochreous suffused form is relatively frequent and the ochreous colouration is usually vivid in these specimens.

In the male genitalia, this subspecies has the longest and narrowest valvae with the most acute apex, the longest pseudopollex and the most obliquesly arched harpe. In the females, ssp. *turcomana* has the broadest cleft of the antrum within the subspecies of *O. polygona*.

Distribution. The subspecies appears as endemic to the Kopet-Dagh massif (Turkmenistan, Iran: Khorassan) and the SE part of the Elburs massif (Provinces Semnan and Golestan). It is on wing from the end of May to the beginning of October.

Opigena polygona obscurata Sohn-Rethel, 1929

(Plate 17, Figs 1–2; Plate 45, Figs 21–28; gen. fig. 64)

Opigena polygona obscurata Sohn-Rethel, 1929, *Deutsche Entomologische Zeitschrift. Gesellschaft Iris zu Dresden* **43**: 8. Type-locality: [Kirghisia] Alexander Mts.

Diagnosis. A generally darkened, medium-sized subspecies (wingspan 36–41 mm). The forewings are more or less unicolorous dark brown with often stronger dark grey-brown or blackish-brown irroration, and with rather sharply defined noctuid pattern. The paler brown or ochreous suffused forms are rather rare. The hindwings are also darker than in the other subspecies of *O. polygona*, having stronger dark covering on veins.

The male genitalia are most similar to those of the ssp. *turcomana* but having somewhat broader valvae with more falcate apex and finer pseudopollex; in the female genitalia, the postero-median cleft of the antrum is as deep as in the ssp. *turcomana* but narrower and the lateral "arms" are more angular.

Distribution. Siberian-Turkestanian. The area of this subspecies covers the steppe belt from the southern Urals to Yakutia, and the foothills and lower altitude northern part of the Tien Shan massif.

Opigena narana Hacker, 1996

(Plate 17, Figs 3–4; Plate 45, Figs 37–40; Plate 46, Figs 1–4; gen. fig. 65)

Opigena narana Hacker, 1996, *Esperiana* **4**: 436, pl. W, fig. 16, gen. figs 4. Type-locality: Pakistan, Himalaya Mts, Kaghan valley, Naran, 2400 m. Holotype: male, in coll. ZSM.

Diagnosis. The Himalayan member of the genus is relatively easily separable from its other congeners by its uniformly dark brown hindwings and chocolate-brown forewings. The characteristic elements of the forewing pattern is the less defined claviform stigma, the postmedial line running closer to reniform stigma than in the other *Opigena* species, and the rather thick and sharp black subapical costal patch. Wingspan 37–41 mm.

The male genitalia of *O. narana* differ from the other related species by the strongly angular distal part of valva with long and narrow, thorn- or spine-like apical process and long, cuneate pseudopollex; the costal hump is much larger than in *O. polygona*.

In the female genitalia, the antrum is much smaller than in *O. polygona*, its shape and size are more similar to those of *O. huberi* and *O. khorassana* but the postero-lateral arms are more quadrangular (not rounded) with their tips projecting inwards. The ductus bursae is, however, *polygona*-type, with long and poximally slightly dilated sclerotised and short anterior membranous parts.

Distribution. Western Himalayan. The species is known from the high mountains of western and northwestern Pakistan (NW Himalayas, Karakoram) and NE Afghanistan (Swat).

Genus ***Pseudohermonassa*** Varga, 1990

Pseudohermonassa Varga, 1990, *in* Varga, Ronkay & Yela, 1990, *Acta Zoologica Academiae Scientiarum Hungaricae* **36**(3–4): 337. Type-species: *Chersotis melancholica* Lederer, 1853, by original designation.

Diagnosis. The genus is rather distant from the above-mentioned related genera; the moths are externally more similar to certain *Xestia* Hübner, 1818 (s.1.) species. *Pseudohermonassa* includes two main lineages, the *ononensis*- and the *melancholica*-groups; both lineages are represented in the two continents.

The diagnostic features of the genus are the usually short and teardrop-shaped harpe, the slender, apically hooked uncus, the sclerotized valvae with reduced pseudopollex, the strongly sclerotized and spinose, plate- or necklace-like carinal plate and the relatively weakly sclerotized, horseshoe-like opening of ostium bursae, fused partly with the 8th segment. The male antenna is very shortly fasciculate, the labial palpus has smoothly scaled third segment. Body slender, thorax with distinct collar and tegulae, most often marked by fine dark and light lines; abdomen cylindrical, covered by short hair-scales, dorsal crest absent. Forewings rather narrow and long, with finely pointed apex; wing pattern variably strong, sometimes displaying the full noctuid maculation.

The members of the *ononensis*-line have longer and narrower wings with reduced or indistinct crosslines and claviform stigma but having conspicuous blackish or dark brown basal dash and subcostal (intracellular) stripe, veins also usually darker than ground colour. The members of the *melancholica*-line have somewhat broader wings, stronger or well-developed antemedial, postmedial and subterminal crosslines and claviform stigma but the dark (blackish) markings are reduced to shorter intracellular patches.

In the male genitalia, the species of the *ononensis*-line have longer and slenderer, apically acute-hooked valvae, shorter harpes, reduced dorso-medial process on the juxta, narrower and longer, more tubular aedeagus with smaller spinose carinal plate and unarmed vesica. The valvae of the *melancholica*-line species are shorter and more triangular, with larger costal hump and longer, distally slenderer harpe, the juxta possesses shorter or longer dorso-medial process, the aedeagus is shorter and thicker, with larger spinose carinal plate, and the vesica is armed by large, bulbed cornutus (in certain Nearctic species there are two cornuti).

In the female genitalia, the ductus bursae is longer and more sclerotized in the *ononensis*-group, posteriorly strongly dilated, and the corpus bursae is elliptical-ovoid, with medium-long, conical appendix bursae and fine, interrupted signum-stripes. In the *melancholica*-group, the ductus bursae is shorter, anteriorly dilated and ribbed-rugose, the corpus bursae is more or less pyriform with longer distal "neck" and large, discoidal-globular fundus; signa weaker, reduced to two fine, rounded patches.

Distribution. Holactic. The genus includes altogether six species, only one of them is Holarctic, further three species occur in North America and two in Eurasia. The members of the genus inhabit mainly the loose mountain taiga with large natural clearings in Southern and Eastern Siberia, Northern Mongolia, and NW China.

Pseudohermonassa ononensis (Bremer, 1861)

(Plate 17, Figs 5–8; Plate 46, Figs 5–20; gen. fig. 66)

Agrotis ononensis Bremer, 1861, *Bulletin de l'Académie Impériale des Sciences de St.-Pétersbourg* **3**: 486. Type-locality: [Mongolia] Onon. Type(s): in coll. ZIN.

Synonymy

Agrotis scaramangae Alphéraky, 1882, 47, pl. 2, fig. 44. Type-locality: [China, Xinjiang] Kuldja district. Type(s): in coll. ZISP;

Agrotis cicatricosa Graeser, 1892, *Berliner Entomologische Zeitschrift* **37**: 218. Type-locality: [Russia] Amurland Chabarofka (Khabarovsk). Type-locality: Amurland, Pokrofka. Holotype: male, in coll. ZMHU. (Preoccupied, a junior primary homonym of *Agrotis cicatricosa* Grote & Robinson, 1865);

Agrotis praecipua Staudinger, 1892, *Deutsche Entomologische Zeitschrift. Gesellschaft Iris zu Dresden* **4**: 360, pl. 3, fig. 5, Type-locality: [Mongolia] Kentei. Holotype: male, in coll. ZMHU.

Agrotis scaramangoides Barnes & Benjamin, 1926; *Pan-Pacific Entomologist* **2**: 107. Type-locality: Colorado, Ward, Bald Mts. Holotype: male, in coll. US NMW.

Diagnosis. A strongly dimorphic species, the two colour forms of which have long been treated as distinct species. Their conspecificity was first clarified by Remm & Viidalepp (1979) and confirmed by Kononenko (2005); the Nearctic *scaramangoides* was synonymised with the Palaearctic *ononensis* by Lafontaine (1998).

Pseudohermonassa ononensis is easily recognisable by its long black(ish) forewing stripes, and the reduced claviform stigma and antemedial and postmedial crosslines; the hindwings are also paler than in *P. melancholica* and *P. owadai*. Wingspan 36–40 mm.

There are conspicuous differences in the genitalia of *P. ononensis* and the two other congeners (see the characterisation of the two species-groups in the Diagnosis of the genus), the key features are the longer and slenderer valvae with shorter harpes, the absence of the dorso-medial process of the juxta and the lack of cornuti in the vesica (males); the much longer, stronger sclerotized and posteriorly strongly broadened, rather calyciform ductus bursae, the elliptical-ovoid corpus bursae and the four longer, interrupted signum-stripes (females).

Distribution. Holarctic. The Eurasiatic distribution pattern is Siberian; the species has a wide range in and along the southern part of the taiga belt, in Russia, Mongolia and north-western China (Kuldja). The moths are on the wing in the summer period.

Pseudohermonassa melancholica (Lederer, 1853)

(Plate 18, Figs 1–2; Plate 46, Figs 21–28; gen. fig. 67)

Chersotis melancholica Lederer, 1853, *Verhandlungen des Zoologisch-Botanischen Vereins in Wien* **3**: 367, pl. 4, fig. 3. Type-locality: [Russia] Siberia. Type(s): in coll. ZMHU.

Diagnosis. The type-species of the genus differs externally from its Taiwanese sister-species by its broder forewings, generally darker, dark grey-brown to blackish brown or blackish-grey forewings and paler, ochreous-withish inner area of hindwings, sharper, more whitish-grey defined antemedial and postmedial crosslines, broader orbicular and reniform stigmata, etc. The differences between *P. melancholica* and *P. ononensis* are given under the Diagnoses of the genus and of the latter species. Wingspan 37–42 mm.

The differences between the two species are well expressed also in the male genitalia; there are smaller or large differences in practically all mentionable characters. In *P. melancholica* the uncus is much shorter, the juxta has much longer medial process, the dorsal valval lobe is much larger, the apical section of the valva is longer and more lobate, not acutely pointed, the harpe is shorter and more acute, the distal part of the aedeagus is less more sclerotized and less spinose, and the cornutus of the vesica is longer than in *P. owadai*.

Distribution. Siberian-Pacific. The species has a wide range extending from the Ural region throughout western and eastern Siberia, Mongolia, Transbaikalia and the Amur region to the Russian Far East, Japan and NE China.

Pseudohermonassa owadai Ronkay, Ronkay, Fu & Wu, 2013

(Plate 18, Figs 3–4; Plate 46, Figs 29–36; gen. fig. 68)

Pseudohermonassa owadai Ronkay, Ronkay, Fu & Wu, 2013, *Fibigeriana Supplement. Book series of Taxonomy and Faunistics* **1**: 35, pl. 9, figs 1–2; pl. 28, figs 14–19; gen. fig. 65. Type-locality: Taiwan, Taichung County, Mt. Shuehshan, 3650 m. Holotype: male, in coll. NSMT.

Diagnosis. The allopatric sibling species of *P. melancholica* is easily distinguishable externally from its sister species by its narrower forewing with remarkably paler, more claret-brown ground colour with less distinct crosslines, more flattened orbicular stigma, uniformly darker, grey-brown suffused hindwing with darker discal spot and clear orange-brown fringes. Wingspan 43–45 mm.

Comparing the male genitalia, the two species also show easily recognisable differences. *Pseudohermonassa owadai* has much longer uncus, broader basal plate of juxta and much shorter dorsal process, remarkably broader triangular valvae with acute apex forming short spine, and with significantly smaller medial costal lobe, therefore ca ¾ of the otherwise only slightly longer erect part of harpe surpasses costal margin. Last but not least, the distal part of the aedeagus of *P. owadai* is more sclerotised than that of *P. melancholica*, having more dentated carina penis, and shorter cornutus of the vesica with longer and narrower, elliptical basal plate.

Distribution. The species is endemic to Taiwan. It inhabits the highest areas of the Taiwan Shan, usually at or above 3000 m. Univoltine, the adults are on the wing from the early August to the end of October.

Genus ***Paramathes*** Boursin, 1954

Paramathes Boursin, 1954, *Bonner Zoologische Beiträge* **5**(3–4): 276. Type-species: *Agrotis perigrapha* Püngeler, 1900, by original designation.

Diagnosis. Boursin (1954) described in his large monographic paper on Chinese Noctuinae two ancient relict-like genera related to *Amathes* Hübner [1821] (in compliance of *Xestia* Hübner, 1818), *Palaeamathes* and *Paramathes*. The latter genus was interpreted by him as probably derived from *Palaeamathes* and having intermediate position between *Palaeamathes* and *Xestia* (incl. *Anomogyna* Staudinger, 1871). This interpretation however, can be seriously questioned since *Palaeamathes* has numerous autapomorphic characters, e.g. the complete lack of spines on the foretibia, the extreme development of the harpe-ampulla complex, which makes the derivation of *Paramathes* from *Palaeamathes* rather improbable. Furthermore, *Paramathes* shows several characters which indicate its possible basal connection with the "*Gnorisma*-complex": externally the "gnorismoid" dark pattern on the forewing, the presence of a complete series of spines on the foretibia; in the male genitalia, the presence of apical process and pseudopollex on the valvae, the dentate ventral plate of carina; and in the female genitalia, the bilateral lobes of the very strongly sclerotised antrum and the presence of four signa. Additionally, it also has certain characters displaying connections with the *Eugraphe-Coenophila* complex, e.g. the relatively short and broad harpe, and the dentate ribbon-shaped sclerotisation extending from the carina onto the basal section of vesica.

Paramathes is an oligotypic genus consisting of five species. They are mostly medium-sized moths (wingspan 27–37 mm) with compact body, greyish-brownish, often with some reddish or ochreous variegated colouration and typical broad U-shaped dark pattern in the middle cell of the forewing.

Distribution. Himalayan-Sino-Tibetan. An ancient genus inhabiting one of the main centres of diversity of the Palaearctic fauna. All species seem to be infrequent and restricted to high mountainous habitats.

Paramathes tibetica Boursin, 1954

(Plate 18, Figs 5–6; Plate 46, Figs 37–40; Plate 47, Figs 1–4; gen. fig. 69)

Paramathes tibetica Boursin, 1954, *Bonner Zoologische Beiträge* **5**(3–4): 277, pl. 6, fig. 13; pl. 14, fig. 98. Type-locality: China, Qinghai, Kuku-Noor. Lectotype: male, here designated, in coll. ZMHU. An objective replacement name for *Agrotis tibetana* Staudinger, 1895.

Synonymy

Agrotis tibetana Staudinger, 1895, *Deutsche Entomologische Zeitschrift. Gesellschaft Iris zu Dresden* **8**: 306. Type-locality: China, Qinghai, Kuku-Noor. Syntypes: 3 males and 1 female, in coll. ZMHU. A junior primary homonym of *Agrotis tibetana* Moore, 1878.

Lectotype designation. Lectotype of *Paramathes tibetica* Boursin, 1954, here designated: male, "Origin" (pink label), "Tibetana Stgr." (with the handwriting of Staudinger), "Kuku-Noor, 94, Rückbl." (brown label), deposited in coll. ZMHU (Plate 46, Fig. 37).

Diagnosis. *Paramathes tibetica* is an easily separable species within *Paramathes*, having the most unicolorous slate-grey or brownish-grey forewing ground colour, most often with fine reddish-brown shadow in the centre of the median area; hardly discernible, conjectural transversal lines, and the broadest bipectinate antennae of the males. It resembles mostly *P. perigrapha* but the less variegated greyish forewing ground colour with the fine reddish-brown median shadow, the faint transverse lines, the more sharply defined orbicular and reniform stigmata with deeper black, incompletely perimacular patch, and the broader pectinated antennae of the males provide an easy separation. Wingspan 31–35 mm.

The male genitalia of *P. tibetica* can be characterised with the spatulate, proximally somewhat dilated uncus, the broad, U-shaped vinculum, the distally knee-like, angulate, strong harpe, the comparatively large carinal thorn and the long, thin sclerotized ribbon-like extension of the carina in the basal segment of the vesica. It can be distinguished from the apparently similar *P. perigrapha* and *P. amphigrapha* by the conspicuously larger, knee-like and not evenly arched harpe, broader vinculum, and the considerably shorter aedeagus. *P. tibetica* differs from *P. amphigrapha* also by its significantly broader uncus, larger carinal thorn and more reduced pseudopollex.

In the female genitalia, *P. tibetica* has, comparing with those of the most similar *P. perigrapha* and *P. amphigrapha*, larger, posteriorly more divergent, funnel-like antrum and shorter ductus bursae. The two large appendages of the antrum are flap-like, joined with the 8th abdominal sternite. The shape of ductus bursae is very dissimilar to those of the other species of *Paramathes*, being posteriorly evenly broadened, with two heavily sclerotized, long, asymmetrical lateral laminar folds in its walls which are not curved or asymmetrically humped as those of *P. perigrapha, P. amphigrapha* and *P. pulchrisigna*.

Distribution. Sino-Tibetan. *Paramathes tibetica* occurs in China in the provinces Gansu, Qinghai, Tibet and Sichuan, where it seems to be locally not rare in the higher altitudes, between 3000–4900 m; the moths are on the wing in July. A sympatric occurrence of *P. tibetica* with *P. perigrapha* is known in Qinghai (Daban Shan).

Paramathes perigrapha perigrapha (Püngeler, 1900)

(Plate 19, Figs 1–2; Plate 47, Figs 15–22; gen. fig. 71)

Agrotis perigrapha Püngeler, 1900, *Deutsche Entomologische Zeitschrift. Gesellschaft Iris zu Dresden* **12**: 290, pl. 8, fig. 10. Type-locality: China, Qinghai, Kuku-Noor. Lectotype: male, here designated, in coll. ZMHU.

Lectotype designation. Lectotype of *Agrotis perigrapha* Püngeler, 1900, here designated: male, "Type *perigrapha* Püng. ♂" (pink label, with the handwriting of Püngeler), "Tibet (Kuku-Noor) Rückbeil 1898", deposited in coll. ZMHU (Plate 47, Fig. 15).

Diagnosis. *Paramathes perigrapha* resembles externally mostly *P. tibetica.* It has, comparing with *P. tibetica*, much paler grey ground colour of forewing, lacking the reddish-brown suffusion (which is typical of *P. tibetica*), the fine light hazel-brown irroration on the frons, collar and forewing marginal area, and the sharper defined, darker grey transverse lines, especially the more or less black defined antemedial line.

Additionally, *P. perigrapha* has more varied forewing costal field and remarkably shorter pectinated antennae of the males. It is also similar externally to *P. perigrapha simonyisandori* and *P. xestioides*, but can be easily distinguished from both taxa by its much paler, hazel-brown coloration of the frons, collar and forewing. The intermacular patch (which is associated with the orbicular stigma) is regularly broader, less triangular than in *P. xestioides*, and the hindwing is more unicolorous, light brownish (that of *P. xestioides* whitish). Wingspan 29–34 mm.

The male genitalia of *P. perigrapha* differ from those of the most similar *P. amphigrapha* by the larger, proximally more broadened, spatulate uncus, broader triangular apical section of valva, smaller and finer pseudopollex, considerably larger vesica and distally broadened ribbon-like extension of the carina extending onto the basal part of vesica. The male genitalia of the typical ssp. *perigrapha* differ from those of the ssp. *simonyisandori* by the shorter distal part of valva, shorter and less acutely pointed valval apex and pseudopollex, remarkably smaller carinal thorn and the evenly broadened sclerotized carinal bar.

The female genitalia are similar in type to those of *P. amphigrapha* but the two large, wing-like postero-lateral appendages of antrum are remarkably smaller, terminally almost evenly rounded, the ductus bursae is thinner, proximally narrower and less asymmetrically humped laterally. The wing-like postero-lateral extensions of antrum of the ssp. *perigrapha* are somewhat smaller and the ductus bursae is considerably shorter than in the ssp. *simonyisandori*.

Distribution. Sino-Tibetan. The typical subspecies of *P. perigrapha* has been found in China in the provinces Gansu and Qinghai where it seems to be locally not rare at the medium-high altitudes, between 2900–3600 m; the moths are collected in July. It occurs sympatrically with *P. tibetica* in certain areas of the Qinghai region (Daban Shan).

Paramathes perigrapha simonyisandori ssp. n.

(Plate 19, Figs 3–4; Plate 47, Figs 23–30; gen. fig. 72)

Holotype. Male, China, Prov. Shaanxi, Tsinling Mts, Taibaishan Mt., 1500 m, 33°50'N, 107°44'E, 20–30.VI.2005, leg. V. Siniaev & Team; slide No.: GYP 2534 (coll. P. Gyulai).

Paratypes. **China**. Shaanxi. 2 males, China, Prov. Shaanxi, Tsinling Mts, Taibaishan, 33°55'N, 107°44'E, 3050 m, VII.2004, leg. V. Sinjaev, slide No. RL 11532m (coll. G. Ronkay). Sichuan. 1 male, road Barkam - Hong Yuan, 3800 m, 32°10,353'N, 102°29,692'E, 22.VII.2010, leg. A. Floriani & A. Saldaitis, slide No.: GYP 2907 (coll. P. Gyulai); 1 male, 2 females, from the same site and date, slide Nos: GYP 4024, 4025 (coll. A. Floriani & A. Saldaitis); 1 female, road Songpan - Zoige, 3500 m, 32°55,511'N, 103°24,959'E, 5.VII.2010, leg. A. Floriani & A. Saldaitis, slide No. RL 11530f (coll. SMNS); 1 female, from the same site and date (coll. P. Gyulai); 1 male, road Songpan - Jiuzhaigou, 3000 m, 33°08,77'N, 103°43,624'E, 23.VII.2010, leg. A. Floriani & A. Saldaitis, slide No.: GYP 2908 (coll. P. Gyulai); 1 female, road Songpan - Jiuzhaigou, 3000 m, 33°08,70'N, 103°43,624'E, 23.VII.2011, leg. A. Floriani & A. Saldaitis, slide No.: GYP 4119 (coll. P. Gyulai); 1 male, road Songpan - Jiuzhaigou, 3000 m, 33°08,70'N, 103°43,624'E, 4.VII.2010, leg. A. Floriani & A. Saldaitis, slide No.: GYP 2531 (coll. P. Gyulai); 1 female, road Songpan - Jiuzhaigou, 2900 m, 29°87,340'N, 102°30,970'E, 27.VIII.2014, A. Floriani & A. Saldaitis, slide No.: GYP 4142 (coll. P. Gyulai); 1 female, road Dawe/Lushan, Xiling Xue Shan Mt., 2800 m, 30°51,569'N, 102°46,274'E, 21.VII.2011, leg. A. Floriani & A. Saldaitis (coll. A. Floriani & A. Saldaitis).

Diagnosis. The new subspecies differs externally conspicuously from the typical ssp. *perigrapha*, the slight differences in the male and female genitalia, however, do not provide enough evidence to separate them as distinct species. *P. perigrapha simonyisandori* has grey frons and collar (the latter one with black edge), whereas those are pale hazel-brown in the nominotypical subspecies; darker, brownish-grey suffused forewing ground colour, sharply contoured, double basal, antemedial and postmedial crosslines and much darker intermacular patch. It is often more similar to *P. xestioides*; the best distinctive feature is the unicolorous brownish hindwing (it is whitish in *P. xestioides* with fine brown medial line); in addition, the intermacular patch is regularly broader, less triangular than in *P. xestioides*. Wingspan 33–35 mm.

The male genitalia are apparently very similar in the two subspecies, but the distal part of the valva in the ssp. *simonyisandori* is more elongate, the apical process is particularly longer and more acute, the carinal thorn is remarkably larger, and the carinal externsion is evenly thinner than in the ssp. *perigrapha*.

The female genitalia of the new subspecies differ from those of *P. p. perigrapha* by the larger wing-like postero-lateral appendages of the antrum, the somewhat longer ductus bursae, and the shortened, more or less rounded signa.

Distribution. *P. perigrapha simonyisandori* occurs southwards of the nominotypical ssp. *perigrapha*, it has been found in China in Shaanxi and northern Sichuan. The moths were collected at lower altitudes (1500 m) in Shaanxi and much higher (up to 3800 m) in Sichuan, from the middle of June to the end of July.

Etymology. The new subspecies is dedicated to our friend, Sándor Simonyi, expert of the Palaearctic Noctuidae.

Paramathes amphigrapha Boursin, 1954

(Plate 19, Figs 7–8; Plate 47, Figs 39–46; gen. fig. 74)

Paramathes amphigrapha Boursin, 1954, *Bonner Zoologische Beiträge* **5**(3–4): 277, pl. 6, figs 15–17; pl. 14, fig. 97. Type-locality: China, Yunnan, Batang, 5000 m. Holotype: male, in coll. ZFMK.

Diagnosis. *Paramathes amphigrapha* is the externally most variable species of the genus. The forewing ground colour varies in the shades of grey or olive grey (males), brown, reddish-brown or, exceptionally, blackish (females), but always has some red-brownish hue. Regularly the basal area is the lightest part of the wing, usually slate-grey, olive-grey or light brown, with a wide range of shades; the females are most often darker than the males. The transverse lines are regularly sharply defined, particularly the antemedial line, which has some dark (in certain females broadly black) shadow along the outer edge. The perimacular black patch is sometimes more or less reduced, especially in the females. The forewing apex is mostly obtuse and less elongate than in its congeners, except of *P. pulchrisigna*. Wingspan 30–34 mm.

The male genitalia of *P. amphigrapha* can be distinguished from those of the apparently most similar *P. p. perigrapha* and *P. p. simonyisandori* by the basally narrower, distally evenly dilated uncus, basally narrower apical section of valva, significantly larger pseudopollex, and considerably less ample vesica. The carinal thorn is remarkably smaller than in *P. p. simonyisandori* and the carinal extension is broader, more evenly stronger serrated.

In the female genitalia, *P. amphigrapha* has conspicuously larger wing-like lateral appendages of the antrum and considerably shorter and broader ductus bursae than in the two subspecies of *P. perigrapha*.

Distribution. Sino-Tibetan. The species occurs along the south-eastern and eastern frontier of the Tibetan plateau (Sichuan and Yunnan). *Paramathes amphigrapha* inhabits the high altitude regions (between 3600–4700 m); the moths are on the wing in June and July.

Paramathes pulchrisigna Boursin, 1954

(Plate 18, Figs 7–8; Plate 47, Figs 5–14; gen. fig. 70)

Paramathes pulchrisigna Boursin, 1954, *Bonner Zoologische Beiträge* **5**(3–4): 278, pl. 6, fig. 18; pl. 14, fig. 98. Type-locality: China, Yunnan, Batang, 5000 m. Holotype: male, in coll. ZFMK.

Diagnosis. *Paramathes pulchrisigna* is the easiest separable species of the genus, its forewing ground colour and characteristic wing pattern distinguishes it from all other *Paramathes* taxa. The main diagnostic features are as follows: pubescence of collar more or less red-brown suffused with black edge, that of the head and thorax blackish, forewing ground colour unicolorous dark brown or blackish, subterminal line shining ochreous, terminal area ochreous and/or bluish suffused, basal and costal areas (and sometimes orbicular and reniform stigmata) bluish irrorated; these features are better discernible on the freshly emerged specimens. The orbicular stigma is regular, the cell lacks the large intermacular patch which is typical in the other

Paramathes taxa; and the perimacular black patch is the most reduced in *P. pulchrisigna*. Last but not least, this is on average the smallest member of the genus, with the wingspan 27–31 mm.

The male genitalia of *P. pulchrisigna* are easily separable from those of the other *Paramathes* species by its evenly wide, flattened stick-like uncus, very long, evenly elongate, pointed apical valval process (appearing as somewhat falcate by its slight basal curve), more medially located, strong and dorsally projected, almost straight harpe, and the reduced carinal thorn, which is transformed into a small knob, continuing in long, more or less evenly sclerotized rib extending onto the proximal part of vesica.

The diagnostic feature of the female genitalia can be found in the ductus bursae, which is somewhat S-shaped, remarkably less broad than in the above-discussed taxa of *Paramathes*, having an immense, strongly sclerotized, long, stick-like lamina in its wall. The cleft of the antrum is broadly V-shaped, and the two postero-lateral, wing-like appendages are much less developed than in *P. perigrapha* and *P. amphigrapha.*

Distribution. Sino–Tibetan. The species is known from Yunnan, Sichuan and Tibet (Prov. Bayi, Sherkymla). The species lives in the high altitude regions, between 3700–4700 m; the flight period is June-July.

Paramathes xestioides sp. n.

(Plate 19, Figs 5–6; Plate 47, Figs 31–38; gen. fig. 73)

Holotype. Male, China, Prov. Sichuan, Aba pref., Heishui, 3100 m, 32°01,99'N, 102°98,64'E, 12.VI. – 6.VII.2013, leg. M. Murzin & O. Shulga, slide No.: GYP 4250 (coll. P. Gyulai).

Paratypes. **China**. Sichuan. 7 males, 5 females, with the same data as the holotype, slide Nos: GYP 2532 (male), 4018, 4032 (females) (coll. P. Gyulai); 1 male, Kangding, 3000 m, 29°53'N, 101°55'E, 13.VII.2009, leg. A. Floriani & A. Saldaitis, slide No. RL 11531m (coll. SMNS); 1 female, from the same site and date, leg. A. Floriani & A. Saldaitis, slide No. RL 11354f (coll. HNHM); 1 female, China, Prov. Sichuan, 5 km W of Wenchuan, 2000 m, 31°46,1'N, 103°62,7'E, 23–26.V.2012, leg. M. Murzin, slide No.: GYP 4016 (coll. P. Gyulai); 1 male, road Yajiang - Litang, 3600 m, 29°59'N, 100°52'E, 15.VII.2010, leg. A. Floriani & A. Saldaitis, slide No.: GYP 2532 (coll. P. Gyulai); 2 females, Litang, 4000 m, 29°50'N, 100°21'E, 16.VII.2010, A. Floriani & A. Saldaitis, slide No. RL 11352 (coll. G. Ronkay).

Diagnosis. *Paramathes xestioides* is on average the largest species of the genus, with the wingspan 31–37 mm. The new species can be confused externally mainly with *P. perigrapha simonyisandori*. The key features are the lighter, slightly brown suffused whitish hindwing with fine brown medial line (the hindwings of both subspecies of *P. perigrapha* are more uniformly brownish), and the more faint forewing markings, especially the transverse lines, whereas the intermacular patch is regularly lighter, narrower and more regular triangular than in *P. p. simonyisandori*. The sympatric occurrence of *P. xestioides* with *P. perigrapha simonyisandori* is not yet known but possible in Sichuan, therefore the proper identification requires the study of the genitalia in the dubious cases. The microscopic examination of the male antennae can also support the reliable recognition, since the fine pectination of the antennae is longer in *P. xestioides* than in *P. p. simonyisandori*.

The genitalia of *P. xestioides* are very distinctive in both sexes, providing an easy separation from all other *Paramathes* species. The diagnostic features of the male genitalia are the terminally lanceolate, apically pointed uncus, the large, somewhat falciform apical process of valva, forming together with the strong pseudopollex a characteristic pincer-like structure, the in *Paramathes* largest, V-shaped vinculum, the smallest juxta, and the strongest aedeagus. The strong, dorsally projected harpe resembles superficially that of *P. pulchrisigna* but it is located far more distally on the valva, close to valval apex. Finally, the carinal thorn is positioned less distally than in the other congeners.

The female genitalia of *P. xestioides* differ from all other *Paramathes* species by the immense, bilobate appendage of the antrum, with deeply U-shaped postero-medial cleft, the strong, evenly broad, heavily sclerotized ductus bursae and the more detached appendix bursae.

Distribution. Sino–Tibetan. The new species is found only in Sichuan, where it is locally not rare. *Paramathes xestioides* lives at medium-high altitude regions (between 3100–3600 m a.s.l.); the moths are on the wing in the midsummer period (June-July).

Genus ***Oligarcha*** Varga, Ronkay & Gyulai, 1995

Oligarcha Varga, Ronkay & Gyulai, 1995, *Acta Zoologica Academiae Scientiarum Hungaricae* **41**(1): 63. Type-species: *Agrotis coryphaea* Püngeler, 1900, by original designation.

Diagnosis. This genus, together with *Ammogrotis*, represents a rather remote lineage within the *Eugnorisma-Eugraphe* clade. Externally, the wing pattern of *Oligarcha* is similar to the general *Eugnorisma* markings but with unusual flesh-coloured and plumbeous-grey suffusion and very sharply defined costal sections of the subbasal, antemedial, medial and postmedial crosslines. This pattern distinguishes the only known species of the genus from all related Noctuini lineages.

In the male genitalia, the unusual configuration of the aedeagus and the vesica is an autapomorphy of the genus; a similar but in all details different structure can be found in *Ammogrotis*. The female genitalia of the two genera are also similar, due to the quadrangular, sclerotised antrum, the rather straight and medially constricted ductus bursae, and the simple, membranous corpus bursae without signa, but the proportion of the ductus bursae and corpus bursae is different in the two genera (the ductus is longer and stronger in *Oligarcha*), and the antrum is broader, stronger sclerotised than in *Ammogrotis*.

Oligarcha coryphaea (Püngeler, 1900)

(Plate 20, Figs 1–2; Plate 48, Figs 9–12; gen. fig. 75)

Agrotis coryphaea Püngeler, 1900, *Deutsche Entomologische Zeitschrift. Gesellschaft Iris zu Dresden* **13**(1): 118, pl. 4, fig. 4. Type-locality: China, Qinghai, Kuku-Noor. Holotype: female, in coll. ZMHU.

Diagnosis. Wingspan 38–40 mm. An unmistakable species, it differs externally from all related taxa by its pinkish flesh-coloured and plumb-grey irrorated ochreous-grey forewings, the partly blackish defined, distinctly marked large stigmata and crosslines with sharp black costal stripes, etc.

The genitalia of both sexes are most similar to those of *Ammogrotis*, with conspicuous differences in the males and less prominent but clearly recognisable ones in the females; see the gen. figs 75 and 76.

Distribution. Tibet (Kuku-Noor region).

Genus ***Ammogrotis*** Staudinger, 1895

Ammogrotis Staudinger, 1895, *Deutsche Entomologische Zeitschrift. Gesellschaft Iris zu Dresden* **8**: 358. Type-species: *Ammogrotis suavis* Staudinger, 1895, by monotypy.

Diagnosis. The genus *Ammogrotis* has an isolated position within the *Eugnorisma-Eugraphe* clade; see the discussion in Varga, Ronkay & Yela (1990). It is separable from the *Eugraphe* genus-group, besides the in the genus-group rather unusual external appearance, by the elongate and acute valvae without pseudopollex, the short and thick harpe, and the presence of a typical clavus as a plesiomorphic character, exceptional within the subtribus Noctuina. The female genitalia are characterised by the rather simple, quadrangular, plate-like antrum, the medially constricted, longitudinally ribbed, sclerotised ductus bursae, and the long, sacculiform corpus bursae, lacking the signa. This combination of features is present only in *Oligarcha* but the ovipositor of *Ammogrotis* is shorter and weaker, the antrum is somewhat narrower, the ductus bursae is shorter and thinner, and the corpus bursae is proportionally longer than in the closest allied genus.

The genus shows closer connection with *Oligarcha* due to the similar configuration of the aedeagus and the long, tubular vesica, and the main features of the female genitalia, with easily remarkable differences between the two genera.

The genus is monotypical, the species "*Eugraphe*" *obsoleta* Chen, 1986 is not an *Ammogrotis* but a *Xestia* belonging to the *X. spilosata* (Warren, 1912) species-complex.

Distribution. Turkestanian-Mongolian.

Ammogrotis suavis Staudinger, 1895

(Plate 20, Figs 3–4; Plate 48, Figs 13–23; gen. fig. 76)

Ammogrotis suavis Staudinger, 1895, *Deutsche Entomologische Zeitschrift. Gesellschaft Iris zu Dresden* **8**: 358, pl. 6, fig. 11. Type-locaity: Mongolia, Khangay Mts, Uliassutai. Lectotype: male, here designated, in coll. ZMHU.

Synonymy

Ammogrotis suavis var. *superba* Bang-Haas, 1910, *Deutsche Entomologische Zeitschrift. Gesellschaft Iris zu Dresden* **24**: 38. Type-locality: [China, Xinjiang] Juldus region. Type(s): in coll. ZMHU.

Lectotype designation. Lectotype of *Ammogrotis suavis* Staudinger, 1895, here designated: male, "Origin." (pink label), "*Ammogrotis* Stgr. | *Suavis* Stgr." (with the handwriting of Staudinger), "Uliassutai 94. Led." (green label), deposited in coll. ZMHU (Plate 48, Fig. 13).

Diagnosis. The species is hardly confused with any other Noctuinae species due to its large size and broad forewings with the special, somewhat Acronictinae-like forewing pattern. The differences between the genitalia of *A. suavis* and the related genera are presented in the Diagnosis of the genus.

Distribution. Turkestanian-Mongolian. The species is known from the Central Asiatic and Siberian high mountains and the northern frontier of the Tibetan plateau (Kun Lun Shan).

Genus *Miniphila* Beck, 1996

Miniphila Beck, 1996, *Neue entomologische Nachrichten* **36**: 88. Type-species: *Xanthia miniago* Freyer, 1840, by original designation.

Diagnosis. The type-species of the genus has long been associated with other genera, mostly with *Eugnorisma* and *Eugraphe*, while the externally most similar species belongs to the genera *Schizognorisma* and *Xestia*. This uncertainty is based on the unusual combination of morphological features: the external characters show a basically *Xestia*-like appearance while the genitalia are generally close to the archetype of the *Eugnorisma-Eugraphe* clade, with some generic autapomorphies. This composition of the imaginal features and certain larval morphological characters inspired Beck to distinguish this lineage at generic level; his statement is confirmed by this revisional work on the generic complex.

The diagnostic external features of the body of *Miniphila* are the short, upturned palpi, with distally gradually lengthened hair-scales forming rather flag-shaped second segment and very short, conical apical segment, the shortly bipectinate male antenna, the rather homogeneous thoracic pubescence with fine, crest-like prothoracic and larger, broaded metathoracic tufts and the short and smooth scaling of the abdomen, lacking the dorsal crest. The hind tibiae have two incomplete, strongly scattered rows of spines. The general colouration of the body and the forewings varies from pale ochreous-yellowish to orange-ochreous, orange-brown and red-brown; the hindwings are pure white with ochreous sheen and fine ochreous-brown irroration on the veins; the forewing apex is characteristically acute, with fine concavity at outer margin (like in the *Cirrhia* Hübner, 1821 species). Wingspan 30–41 mm.

The group features of the male genitalia, distinguishing *Miniphila* from the other main lineages of the *Eugnorisma* complex, are the long and strongly sclerotised valvae with more distally positioned harpe and pseudopollex, the very long, tubular aedeagus with unspecialised carina, the absence of the fine cornutus from the subbasal diverticulum, the presence of a bulbed and distally located (*Goniographa*-like) cornutus and the lack of the spinulose terminal field of the vesica. The diagnostic features of the female genitalia are the huge, flattened, rather cordiform, longitudinally cristate-ribbed antrum with shallow postero-medial cleft, the long, tubular, flattened and sclerotised ductus bursae, the large, falciform, ribbed appendix bursae, and the membranous corpus bursae, without signa.

Distribution. Anatolian-Turkestanian.

Miniphila miniago (Freyer, 1840)

(Plate 20, Figs 5–6; Plate 48, Figs 24–31; gen. fig. 77)

Xanthia miniago Freyer, 1840, *Neuere Beiträge Schmetterlingskunde* **4**: 28, pl. 304, fig. 4. Type-locality: [Russia] Sarepta. Type(s): probably destroyed.

Diagnosis. *Miniphila miniago* is the largest *Miniphila* taxon with its wingspan exceeding 40 mm. It can be distinguished from its sister-species, *M. persago*, and the externally somewhat similar *X. pallidago*, besides the larger size, by its sharper defined crosslines, darker orbicular and especially darker reniform stigmata; the median fascia is also may be present as a dark greyish shadow.

In the male genitalia, *M. miniago* has longer and narrower valva with more elongated apical part, thinner, spine-like pseudopollex, apically more elongated and pointed harpe, shorter and less pointed harpe, and stronger, longer sclerotised dorsal carinal plate. In the females, the ductus bursae of *M. miniago* is longer and thinner than that of *M. persago* and the postero-medial cleft of the antrum is shallower.

Distribution. Caspian-Turkestanian. The species is known to occur in the zonal steppe from Eastern Europe towards the northern slopes of the Central and eastern Tien Shan massif, the southern borders are in the Caucasus region and Turkmenistan. The main habitats are hot and dry lowland and hilly steppes and rocky grasslands; the moths are on the wing in September-October.

Miniphila persago persago (Gyulai & Ronkay, 2006) **comb. n.**

(Plate 20, Figs 7–8; Plate 48, Figs 32–35; Plate 49, Figs 1–5; gen. fig. 78)

Eugnorisma (*Eugnorisma*) *persago* Gyulai & Ronkay, 2006, *Esperiana* **12**: 255, pl. 27, figs 1–4; gen. figs 1–5, 10. Type-locality: Iran, Prov. Azerbayejan, E-Sharqi, Küh-e-Qoshrud, 25 km SE of Bostanabad, 1800 m. Holotype: male, in coll. P. Gyulai (Miskolc).

Diagnosis. *Miniphila persago* differ externally from its northern sister-species, *M. miniago*, by its on average smaller size (wingspan 33–38 mm, vs 33–41 mm), and the more concolorous forewings with more reduced noctuid pattern.

Comparing the male genitalia of the two species, *M. persago* has shorter valvae with broader and shorter apical section, basally thicker pseudopollex, shorter and less pointed harpe, and shorter sclerotised section of the dorsal carinal plate.

In the females, *M. persago* has shorter and broader ductus bursae, and deeper postero-medial cleft of the antrum than in *M. miniago*.

Miniphila persago resembles also *Xestia pallidago* (Staudinger, 1900) but has broder forewings, less sinuous and more convergently running antemedial and postmedial crosslines, and lacks the dark grey dot from the lower third of reniform stigma which is typical of *X. pallidago*. The genitalia of the two species differ conspicuously, as *M. persago* has smaller uncus, smaller and more rounded cucullus, thinner harpe, and the smooth carina of the aedeagus (*X. pallidago* has spinulose carinal plate) in the males; the small papillae anales, the much larger and more sclerotised antrum and ductus bursae, the large, globular appendix bursae, etc. in the females.

Distribution. Iranian. The species is known to occur in NW and W Iran (Azerbaijan, Kordestan and the Central Zaghros Mts. It inhabits hot and xerothermic grassland biotopes; the moths fly in September.

Miniphila persago peterseni (Gyulai & Ronkay, 2006) **comb. n.**

(Plate 21, Figs 1–2; Plate 49, Figs 6–8; gen. fig. 79)

Eugnorisma (*Eugnorisma*) *persago peterseni* Gyulai & Ronkay, 2006, *Esperiana* **12**: 256, pl. 27, fig. 5; gen. figs 6–7. Type-locality: Turkey, Prov. Erzurum, Kirecli Pass, 2100 m. Holotype: male, in coll. P. Gyulai (Miskolc).

Diagnosis. The Turkish-Armenian subspecies of *M. persago* is distinguished from the typical Iranian ssp. *persago* (and also from *M. miniago*) by its smaller size (wingspan 30–36 mm), the ochreous-brownish suffusion of the forewing and the more extensive dark filling of the reniform stigma. The male genitalia differ from those of the nominotypical subspecies by the shorter sacculus, the slenderer harpe and the more expanded basal section of the vesica.

Distribution. Anatolian-Armenian. The western subspecies of *M. persago* occurs in eastern Turkey and Armenia.

Genus ***Coenophila*** Stephens, 1850

Coenophila Stephens, 1850, *List of the Specimens of British Animals in the Collection of the British Museum. Lepidoptera* **5**: 74. Type-species: *Graphiphora subrosea* Stephens, 1829, by monotypy.

Diagnosis. *Coenophila* is a small genus, comprising a closely related allopatric pair of species, *C. subrosea* and *C. opacifrons* Grote, 1878, this latter species occurs in North America. The species formerly associated with *Coenophila* are transferred to *Miniphila* (*miniago*) or belongs to *Xestia* s.l. (*jordani* (Turati, 1912)), they are not members of *Coenophila*.

The genus is closely related to *Eugraphe* and certain lineages of *Xestia* s.l. It differs from *Eugraphe* by the bipectinate male antenna, slenderer body and less broadly convex forewing costa, rather pollex- than pseudopollex-like, broad and strong subapical ventral process, long and acutely pointed, more or less teardrop-shaped harpe, very long eversible ventral serrate carinal bar (similarly to several *Xestia* s.l. groups or the taxa of the *Spaelotis defuncta* species-group) and dorso-lateral smooth plate, unarmed vesica, strongly laced-dentate posterior margin of antrum, long, flattened-tubular ductus bursae, etc. *Coenophila* is hardly separable from the giant *Xestia* s.l. complex due to the very large variation of the genital features within and between the large lineages but the large pollex is unusually broad (only a few Himalayan-Tibetan *Xestia* s.l. species have similarly shaped pollex) and there are two larval features, according to Lafontaine (1998), which distinguish it from *Xestia*, 1) the larva is longitudinally striped, without the subdorsal spots or herring-bone pattern of *Xestia*; and 2) seta L1 on abdominal segment 6 of the larva is posteroventral to the ventral margin of the spiracle.

Distribution. Holarctic.

Coenophila subrosea (Stephens, 1829)

(Plate 21, Figs 3–4; Plate 49, Figs 9–20; gen. fig. 80)

Graphiphora subrosea Stephens, 1829, *Illustrations of British Entomology* (Haustellata) **2**(2): 200. Type-locality: England, Whittlesea Mere. Syntypes: 4 specimens, in coll. BMNH.

Synonymy

Agrotis subrosea var. *subcaerulea* Staudinger, 1871, *in* Staudinger & Wocke, *Catalogue der Lepidopteren des Europaeischen Faunengebiets*: 80, Type-locality: Finland, Livonia. Type(s): in coll. ZMHU;

Aplectoides furushonis Matsumura, 1925, *Journal of the College of Agriculture, Hokkaido Imperial University Sapporo, Japan* **15**: 128, pl. 9, fig. 18. Type-locality: [Russia] South Sakhalin, Sakayehama; North Nyiwo. Syntypes: in coll. EIHU;

Agrotis subrosea rubrifera Warnecke, 1931, *Verhandlungen des Vereins für Naturwissenschaftliche Heimatforschung zu Hamburg* **22**: 137. Type-locality: Germany, Hamburg;

Coenophila subrosea malickyi Spitzer & Jaros, 2010, *Denisia* **29**: 329. Type-locality: Czechia, Sumava Mts. Holotype: male, in coll. BC CAS.

Diagnosis. An easily recognisable species, having numerous colour forms (see e.g. *rhomboidea* Stephens, 1829; *f. latefasciata* Huene, 1908; *f. kieferi* Rebel, 1912; *f. decipiens* Warnecke, 1924) (Spitzer & Novák 1969, Tillotson & Spitzer 1998, Warnecke 1926, 1952). The populations, especially in the western part of its area, are strongly isolated from each other, due to the special habitat preference of the species (see, e.g. Sula & Spitzer 2000), therefore the subsequent molecular studies may prove their subspecific distinctness, confirming the opinion expressed by Spitzer and Jaros (2010).

Coenophila subrosea differs externally from the closely related *Eugraphe sigma* by its in all colour forms much paler colouration, sharper dark crosslines, smaller stigmata, paler hindwings and the rather long bipectinated male antenna. The differences in the genitalia are discussed in the Diagnosis of the genus.

The species resembles externally certain *Xestia* (e.g. *X. ashworthii* (Doubleday, 1855), *X. senescens* (Staudinger, 1881), *X. brunneopicta* (Matsumura, 1925), etc.) and *Diarsia* Hübner, [1821] species but the characteristic colouration and wing pattern and the longer pectination of the male antenna, as well as the strongly different genitalia, provide an easy identification.

Distribution. Trans-Palaearctic. The species is widely distributed in the northern part of the continent, from the British Isles to Japan and the Russian Far East, occurring along the southern tundra and the northern taiga belt. It appears locally more southwards in the mountain taiga of the Siberian and Mongolian high mountains. Its range is more scattered in Central Europe where it has a few strongly isolated populations in peat bogs. The moths are on the wing from July to September.

Genus ***Eugraphe*** Hübner, 1821

Eugraphe Hübner, 1821, *Verzeichniss bekannter Schmetterlinge:* 224. Type-species: *Noctua sigma* [Denis & Schiffermüller], 1775, by subsequent designation by Hampson, 1903.

Diagnosis. A monotypical genus, being closely related to *Coenophila* and supposedly also to the Nearctic *Eueretagrotis*. It also shows connections with the more ancient lineages of the *Eugnorisma* generic-complex, especially with *Anagnorisma*. The species formerly placed into *Eugraphe* (see Fibiger 1993, Kononenko 2005) are subsequently transferred into the genera *Goniographa (marcida, decussa, funkei), Hypernaenia* Warren, 1896 (*denticulata* Warren, 1896), *Xestia* (*ornata, senescens* Staudinger, 1881)), or *Miniphila* (*miniago*), or still in a dubious generic position ("*Eugraphe*" *versuta* Püngeler, 1908)); none of these species are congeneric with *Eugraphe sigma*.

The species mentioned by Chen (1999) in the genus *Eugraphe* belong, except *E. sigma*, to other genera. *Eugraphe obsoleta* is a *Xestia* species from the *X. spilosata* species-complex; *E. lygria* Chen, 1993 is synonymous with *Pseudohermonassa ononensis* (**syn. n.**); *E. olivacea* Chen, 1994 is a close relative of "*Conistra*" *metallica* Hreblay & Ronkay, 1998; and *E. xizangensis* Chen, 1982 is a member of the *Xestia renalis* (Moore, 1882) species-complex, most probably synonymous with *X. lobbichleri* (Boursin, 1964).

The external appearance of the only known species of the genus is rather different from those of the closely related *Coenophila*, and the genera *Anagnorisma* and *Eugnorisma*, resembling mostly certain species of *Spaelotis* Boisduval, 1840, and also *Graphiphora* Ochsenheimer, 1816.

Eugraphe differs from *Coenophila*, besides the relatively strong external dissimilarity and the presence of a partial fourth row of spines on the mid-tibiae, by the presence of the subbasal cornutus of the vesica (it is absent in *Coenophila*), the differently built apical part of the valva and the much longer, slenderer, curved harpe, the different shape of the postero-lateral appendages of the ostium bursae (they are "bear-ear-shaped" in *Eugraphe*, "mouse-antler"-shaped in *Coenophila*), and the different proportion and shape

of ductus bursae and corpus bursae (*Eugraphe* has short but strong, flattened ductus and large, spacious corpus bursae while the ductus bursae of *Coenophila* is long, narrowly tubular since the corpus bursae is rather small, elliptical).

The male genitalia of *Eugraphe* and *Anagnorisma* differ mainly by the size and structure of the subbasal cornutus (which is much stronger, longer in *Anagnorisma*), the presence/absence of the long zone of fine sclerotised ribs in the inner curve of the vesica (present in *Eugraphe*, absent in *Anagnorisma*) and the shape and size of the pseudopollex which is much more lobate in *Eugraphe* than in the *Anagnorisma* species. The typical features of the female genitalia of *Eugraphe* (e.g. the well-developed postero-lateral appendages of the ostium bursae or the medially folded ductus bursae) may appear but in different combinations in *Anagnorisma*, and certain species of the latter genus possess signa in the corpus bursae.

The main differences between the male genitalia of *Eugraphe* and *Eugnorisma* lie in the aedeagus and the vesica: the aedeagus of *Eugraphe* has a ventral sclerotised bar of the carina extending towards basal part of vesica, terminated in a strong, dentate bulb; the carina of *Eugnorisma* has generally a dorsal (dentated, hooked, etc.) projection, if there is a stronger ventral sclerotisation (in the *E. chaldaica–E. spodia* group), it is always very strong and pyramidal. Another generic apomorphy of *Eugnorisma* is the presence of a distal, smaller or larger, field of minute cornuti in the vesica, covering often the surface of a subterminal diverticulum; this cornuti field is completely missing in *Eugraphe*.

The most conspicuous differential feature of the female genitalia of *Eugraphe*, as compared with *Eugnorisma*, is the presence of large, heavily sclerotised, and terminally rounded postero-lateral appendages of the ostium bursae. The ostium bursae of *Eugnorisma* is also strongly sclerotised, but its caudal margin is more or less straight, except in certain species of the *E. chaldaica* lineage, but is much weaker, therefore the caudal edge of the ostium bursae is only slightly U-shaped. It is worth mentioning that *Paradiarsia* and *Anagnorisma* have such appendages, although those of *Paradiarsia* are considerably smaller and weaker.

Distribution. Trans-Palaearctic.

Eugraphe sigma ([Denis & Schiffermüller], 1775)

(Plate 21, Figs 5–6; Plate 49, Figs 21–28; gen. fig. 81)

Noctua sigma [Denis & Schiffermüller], 1775, *Ankündung eines Systematischen Werkes von den Schmetterlinge der Wienergegend* **1775**: 78. Type-locality: [Austria] Vienna region. Types destroyed.

Synonymy

Noctua characterea [Denis & Schiffermüller], 1775, *Ankündung eines Systematischen Werkes von den Schmetterlinge der Wienergegend* **1775**: 78. Type-locality: [Austria] Vienna region. Types destroyed.

Phalaena Noctua nubila Esper, 1789, *Die Schmetterlinge in Abbildungen nach der Natur mit Beschreibungen* **4**: 451, pl. 142, fig. 3. Type-locality: no locality given;

Noctua umbra Vieweg, 1790, *Tabellarisches Verzeichniss der in der Churmark Brandenburg Einheimischen Schmetterlinge* **2**: 67. Type-locality: [Germany] Brandenburg region;

Diarsia signum melancholica Bryk, 1949, *Arkiv för Zoologi* **41**A(1): 69, pl. 6, fig. 20. Type-locality: North Korea, Hamgyeong bugdo (Shuotsu). Holotype: male, in coll. NRS;

Diarsia sigma anthracina Boursin, 1954, *Bonner Zoologische Beiträge* **5**: 266. Type-locality: China, Prov. Shanxi, Mien-shan. Holotype: male, in coll. ZFMK.

Diagnosis. An externally rather variable species with a number of colour forms, some of them are rather extreme. It shows a more or less similar range of variation throughout Eurasia, therefore it is considered here as taxonomically homogeneous.

The species is easily distinguished from the externally somewhat similar *Spaelotis* species (e.g. *S. sennina, S. suecica*) by its broader wings with more convex costa, ochreous to ochreous-brown head, ochreous-brown to red-brownish forewing costal area and filling of antemedial and postmedial crosslines, and the darker hindwings, etc. The genitalia of the two genera are strikingly different, as *Eugraphe* has longer and stronger uncus, much broader valvae with well-developed, lobate pseudopollex, differently shaped

harpe, reduced carinal sclerotisation, different vesica, etc. (males); much larger, sclerotised antrum with well-developed, ear-shaped postero-lateral arms, sclerotised and twisted ductus bursae, large, ample, sacculiform corpus bursae, etc. (females).

The differences between the closely related *E. sigma* and *C. subrosea* are given under the diagnosis of the latter species.

Distribution. Trans-Palaearctic. The species is widely distributed in the arboreal biomes from the Atlantic Coast of Europe to the Russian Far East, Korea and Japan. The southern border of the species lie along the xerothermic western and Central Asiatic mountains, the southernmost known localities in eastern Asia are China (Sichuan and the Mien-Shan region in Shanxi). The species has summer adults, the moths are on the wing from June to September.

Genus ***Goniographa*** Varga & Ronkay, 2002

Goniographa Varga & Ronkay, 2002, *Acta Zoologica Academiae Scientiarum Hungaricae* **48**(4): 338. Type-species: *Agrotis decussa* Staudinger, 1897, by original designation.

Taxonomy. The previously described three members of the genus (*G. marcida, G. decussa,* and *G. funkei*) have long been placed into the genus *Eugraphe* though already Boursin (1954, 1963) noted that they are characterised by a complex of shared genital features which distinguish them from the typical *Eugraphe*. The genus was established by Varga and Ronkay (2002) based on the genitalic characters of both sexes, revealing the allopatric speciation within all of the three main species-groups. It is closely related with the previous genera, *Eugraphe* and *Coenophila*, but is easily distinguished from them by the autapomorphic character set of the genitalia. The taxonomic placement of the externally rather similar "*Eugraphe*" *versuta* (Püngeler, 1909) is still uncertain, but it belongs supposedly to a monobasic clade of *Xestia* Hübner, 1818 (s.l.).

Two, externally somewhat similar, small and colourful species, *Xestia ornata* (Staudinger, 1892), *X. hypographa* Varga & Ronkay, 2002, considered earlier as *Eugraphe*, have been excluded from this genus and re-arranged to *Xestia* based on genital characters (Varga & Ronkay 2002).

The genus comprises three major lineages, the *decussa,* the *funkei*, and the *marcida* species-groups. The external appearance of the species within these species-groups are often confusingly similar but even certain species of the *decussa-* and *marcida* species-groups (e.g. *G. discussa* and *G. gyulaipeteri*) also can be surprisingly similar externally. The differences in the genitalia of both sexes are, however, easily recognisable not only between the three species-groups but also in the twin species of the given species-groups. The diagnoses of the species-groups are given separately, introducing their species.

Diagnosis. The apomorphic genital features of *Goniographa* are 1) the presence of an acute, subapical pseudopollex, originating from the sclerotised margin of the valva, 2) the presence of a well-developed, long and acute, sometimes curved lateral pollex, situated close to the basis of the harpe, 3) the more distally located cornutus in the vesica, 4) the complete lack of any spinulose or specially modified surfaces on the vesica; 5) the reduction of the sclerotized postero-lateral appendages of antrum, 6) the elongated, rather funnel-shaped antrum, without or with only slight postero-medial incision, and 7) the presence of a longitudinal, less sclerotised suture on the dorsal surface of the heavily sclerotised section of ductus bursae. In the males, both distal valval processes of *Goniographa* are considerably longer and more acutely pointed than in the two closely related genera (and in the genera *Setagrotis*, *Eugnorisma*, *Adelphagrotis*, etc. which also have a subapical valval process), and the cornutus is located far more distally in the main tube of the vesica. In the female genitalia, the general shape of the antrum is most similar to that of *Protognorisma* but it is considerably larger, longer and more sclerotised; the ductus bursae is missing from the closely allied genera although present in certain lineages of the *Eugnorisma-Eugraphe* generic complex (e.g. *Opigena*).

The species of *Goniographa* are medium-sized moths (wingspan 27–36 mm) with slender or even gracile body, broadly triangular forewings and rounded hindwings. The noctuid pattern is regular, rather sharply defined, being distinct from the paler or darker grey or brown ground colour; the hindwings of males are whitish-ochreous with variably intense brownish irroration, darker grey-brown veins and marginal area; the females have generally darker hindwings.

The species of the genus are easily separable from those of the two closely allied genera by their different colouration and wings pattern and the slenderer body; the males differ from *Coenophila* also by their minutely pectinated antennae.

Distribution. Caspian-Turkestanian, expanding also into north-east Afghanistan.

The ***decussa*** species-group

Diagnosis. The adults of the species-group are characterised by their deep brown forewings with rather complex, dark blackish-brown noctuid pattern. Certain less marked specimens may be confusingly similar to those of the *marcida* species-group but they have somewhat stronger body and the inner area of the hindwing is paler, less brown suffused than in *G. marcida* or *G. gyulaipeteri*.

The typical features of the male clasping apparatus are the rather digitiform, medium-long and relatively broad, apically obtuse uncus, the short, spine-like apical process, the straight, wedge-shaped pseudopollex and the horn-like or oxbow-shaped, arched pollex, the most often strongly reduced harpe, represented only by its basal plate, the broad, shield-shaped juxta with short, bar-shaped sclerotisation apically. Aedeagus long, nearly straight, carina serrate, extended into a long, terminally curved serrate ribbon-shaped bar onto the basal part of the vesica. Vesica bilobate, with moderately strong, bulbed cornutus subterminally. The male genitalia are best distinguished from those of the other two genera by the reduced harpe, the larger, more shield-like juxta and the shape of the uncus.

The main diagnostic features of the female genitalia, comparing with those of the other two lineages, are the relatively short, somewhat calyculate antrum and the broad and heavily sclerotised, rather arch-like anterior opening of the sclerotised part of ductus bursae.

Goniographa decussa (Staudinger, 1897)

(Plate 21, Figs 7–8; Plate 49, Figs 29–36; gen. fig. 82)

Agrotis decussa Staudinger, 1897, *Deutsche Entomologische Zeitschrift. Gesellschaft Iris zu Dresden* **9**: 367. Type-locality: [Kirghisia] Alexander Mts. Lectotype: male, in coll. ZMHU.

Diagnosis. *Goniographa decussa* resembles mostly *G. discussa*; the third member of the species-group, *G. shchetkini*, is more similar externally to certain small specimens of *G. gyulaipeteri* having rounded forewing apex. It can be distinguished from its twin species by its more triangular, apically more pointed forewings, more regularly shaped orbicular, reniform and claviform stigmata, being defined finely by black scales and by fine ochreous contour-lines, and the more prominently marked subterminal black or/and red-brown chevron-spots; the hindwings of *G. decussa* are somewhat more dark suffused than those of *G. discussa*. Wingspan 30-35 mm, length of forewing 13–15 mm.

The male genitalia of *G. decussa* can be distinguished from *G. discussa* by the more convex, "humped" dorsal margin of valva, more rudimental harpe, broader juxta, somewhat slenderer uncus, the "broken" course of the ribbon-like extension of the carina and by the essentially shorter cornutus.

In the female genitalia, *G. decussa* has, comparing with those of *G. discussa* and *G. shchetkini* (Figs 82–84), the largest antrum with the strongest medio-caudal incision. The ductus bursae is similar to that of *G. shchetkini* but is considerably longer, proximally less dilated, without prominent lateral angle and the

anterior arch is significantly deeper. The characteristic structure of the anterior third of ductus bursae of the third species of the lineage, G. *discussa*, is much less developed than in G. *decussa* and G. *shchetkini*.

Distribution. Turkestanian. *Goniographa decussa* occurs in the Western Tien-Shan Mts, where it seems to be locally frequent in areas of Kirghisia and Usbekistan.

Goniographa discussa Varga & Ronkay, 2002

(Plate 22, Figs 1–3; Plate 49, Figs 37–42; gen. fig. 83)

Goniographa discussa Varga & Ronkay, 2002, *Acta Zoologica Academiae Scientiarum Hungaricae* **48**(4): 344, figs 4, 26–27, 53–54. Type-locality: [Tadjikistan] Zeravshan Mts, 45 km SE of Aini, 2000–2600 m. Holotype: male, in coll. P. Gyulai (Miskolc).

Diagnosis. *Goniographa discussa* differs externally from *G. decussa* by its narrower and more rounded forewings having generally less sharply defined markings: the noctuid maculation is less conspicuous, with less sharply defined ochreous outlines of the reniform and orbicular stigmata, narrower, more obsolescent claviform stigma, less sharply marked dark arrowhead spots defining subterminal line; the darker suffusion of the hindwing is weaker and more diffuse. Wingspan 30–35 mm, length of forewing 13–15 mm.

Comparing the male genitalia of the two sister species, the uncus of *G. discussa* is slightly broader than in *G. decussa,* slightly spatulate terminally; the valvae have less convex dorsal costa; the harpe is somewhat larger, more elongate; the dentate, ribbon-like extension of the carina is only slightly arcuate, recurved terminally; the bulbed cornutus is more acute and about twice as large as in *G. decussa.*

The female genitalia of *G. discussa* differ from those of *G. decussa* and *G. shchetkini* by the characteristic, long and deep, sometimes sinuously folded ventral crest of the anterior third of ductus bursae, terminated in a large, more or less globular ventral pouch, both related species have much larger and stronger sclerotised arch at anterior edge of ventral plate replacing this structure (see Figs 82–84). The antrum of *G. discussa* is smaller than in *G. decussa* but larger than in *G. shchetkini,* the medio-caudal incision is the smallest in *G. discussa.* The anterior third of the ductus bursae is less dilated, its lateral margins are almost parallel, this part is broader (*G. decussa)* or conspicuously broader (*G. shchetkini)* in the two related species.

Distribution. Centralasiatic. *Goniographa discussa* is distributed from the Tadjikistan (Zeravshan, Peter I., Karategin and Hissar Mts) through the western Pamir Mts to NE Afghanistan (Prov. Badakhshan), mostly at medium but exceptionally also at rather high elevations.

Goniographa shchetkini Varga & Ronkay, 2002

(Plate 22, Fig. 4; Plate 50, Fig. 1; gen. fig. 84)

Goniographa shchetkini Varga & Ronkay, 2002, *Acta Zoologica Academiae Scientiarum Hungaricae* **48**(4): 346, figs 28–29, 55. Type-locality: Tadjikistan, Pamir Mts, Vanch, Lyangar glacier, 4000 m. Holotype: female, in coll. P. Gyulai (Miskolc).

Diagnosis. The unique type specimen of G. *shchetkini* resembles mostly a small *G. discussa* female but even more unicolorous, with only very weak paler brownish-ochreous irroration but with stronger violaceous hue, the filling of the orbicular and reniform stigmata is also matching with the violaceous brown ground colour and the fine brownish suffusion of the hindwing is also more concolorous. Wingspan 31 mm, length of forewing 14 mm.

The female genitalia of *G. shchetkini* have the smallest antrum and the shortest ductus bursae with the strongest, asymmetrical anterior arch within the three closely allied species of the *decussa*-line.

Distribution. Turkestanian. A poorly known species, its unique type was collected as a pupa at a high altitude place nearby the Lyangar glacier.

The *funkei* species-group

Diagnosis. The species-group comprises three externally very similar species, but the genitalia of both sexes clearly show the rather remote position of *G. naumanni* within the lineage. This species displays certain specific autapomorphies which are unique within the entire genus but the other external and genital features clearly show its phylogenetic relationship.

The external appearance of the species belonging into this lineage is characterised by the paler and more greyish-shade forewings and the less distinctly marked though intense dark pattern; the hindwings are generally ochreous-grey. The species of the *funkei* species-group are often confusingly similar; the satisfactory identification requires the study of the genitalia although the locality of the specimens may provide important additional information.

The group apomorphies of the male genitalia are the strongly (*G. funkei, G. metafunkei*) or weakly lanceolate (*G. naumanni*), subapically dilated and apically pointed uncus, the rather proximally located and straight or less arched pollex, the small juxta, and the rather reduced ventral serrated bar of the carina (which is replaced by a large tooth in *G. naumanni*). The valva is longer and slenderer than in the other species-groups, the harpe is medium-long and rather thick, shorter and broader than in the species of the *marcida*-group (it is reduced in the *decussa*-group).

In the female genitalia, all three species have rather long, subconical-semiglobular, partly finely sclerotised and ribbed appendix bursae. In the other important features, *G. naumanni* shows conspicuously different autapomorphic character states. *Goniographa funkei* and *G. metafunkei* have long and anteriorly pointed infundibular antrum plates with fine postero-medial concavity, and long and tubular ductus bursae. The antrum of *G. naumanni* is trapezoidal, and the ductus bursae is characteristically cask-shaped.

Goniographa funkei (Püngeler, 1901)

(Plate 22, Figs 5–6; Plate 50, Figs 9–16; gen. fig. 85)

Agrotis funkei Püngeler, 1901, *Deutsche Entomologische Zeitschrift. Gesellschaft Iris zu Dresden* **13**: 181, pl. 2, figs 1–2. Type-locality: Tadjikistan, Zeravshan Mts. Lectotype: male, in coll. ZMHU.

Diagnosis. The forewing of *G. funkei* is somewhat broader than that of *G. metafunkei*; otherwise no key features can be found for the three closely related species of the group. Wingspan 32–36 mm, length of forewing 15–17 mm.

The male genitalia of *G. funkei* differ from those of *G. metafunkei* by the shape of the pollex bending characteristically down (proximo-ventrally), the narrower distal part of the valva with longer pseudopollex and the much shorter cornutus of the vesica sitting usually on a somewhat broader bulb. The differences between *G. funkei* and *G. naumanni* are much more prominent as *G. funkei* has much shorter harpe, downwardly bent pollex (it is curved upwards in *G. naumanni*) and smooth ventral carinal plate (which is armed with large, heavily sclerotised teeth in *G. naumanni*).

The female genitalia of *G. funkei* differ from its sibling species, *G. metafunkei,* by the shorter antrum, significantly shorter but somewhat broader ductus bursae having only weak lateral fold and short, less sclerotized proximo-lateral rib(s) and shorter, apically more rounded appendix bursae. The funnel-shaped antrum and the short, flattened tubular ductus bursae distinguish *G. funkei* from *G. naumanni* which has, much broader and cask-shaped ductus bursae, being fused firmly with the relatively short, broadly trapezoidal ostium bursae.

Distribution. *Goniographa funkei* has the largest distribution in this species-group. The type locality is the Zeravshan range, the area of the species covers the western Tien-Shan Mts (Turkestan Mts, Karategin range, Peter I. Mts, etc.), the Hissar Mts and also the western parts of the Pamir massif, where it occurs sympatrically with *G. naumanni.*

Goniographa metafunkei Varga & Ronkay, 2002

(Plate 22, Figs 7–8; Plate 50, Figs 2–8; gen. fig. 86)

Goniographa metafunkei Varga & Ronkay, 2002, *Acta Zoologica Academiae Scientiarum Hungaricae* **48**(4): 350, figs 7–8, 32–33, 58–59. Type-locality: Kirghisia, Susamyr Mts, valley of Chichkan river, 1800 m. Holotype: female, in coll. P. Gyulai (Miskolc).

Diagnosis. *Goniographa metafunkei* differs from the two closely allied species by its slightly (but in larger material clearly recognisable) smaller size and narrower forewing and the rather strong and blurred dark irroration. Wingspan 30–35 mm, length of forewing 13–15 mm.

The male genitalia of *G. metafunkei* differ from those of *G. funkei* by their broader distal part of the valva, the straight, oblique, thorn-like pollex and the significantly larger cornutus of the vesica; from *G. naumanni* by its shorter harpe, broader distal part of the valva, the straight, distally not upcurved pollex and the smooth carina.

The female genitalia of *G. metafunkei* can be characterized by its long, narrowly tubular ductus bursae with relatively strong, long proximo-lateral fold and the presence of a long, curved, sclerotized ribbon connecting the anterior end of ductus bursae with the inner curve of appendix bursae. The ductus bursae of *G. metafunkei* is the longest within the *G. funkei* group, the antrum is longer, more infundibular than in the two other members of the species-group. In addition, the antrum is medio-caudally less incised and the appendix bursae is longer, more conical, apically less rounded than in *G. funkei* (see the Figs 85 and 86).

Distribution. This stenochorous species has a very strictly limited distribution in the western part of the Tien-Shan massif (Susamyr and Talas Mts, etc.) and in the Alai Mts.

Goniographa naumanni Varga & Ronkay, 2002

(Plate 23, Figs 1–4; Plate 50, Figs 17–28; gen. fig. 87)

Goniographa naumanni Varga & Ronkay, 2002, *Acta Zoologica Academiae Scientiarum Hungaricae* **48**(4): 352, figs 9–11, 34–35, 60–61. Type-locality: Afghanistan, Prov. Badakhshan, Darrah-e-Kuh, 2480 m. Holotype: male, in coll. Z. Varga (Debrecen).

Diagnosis. *Goniographa naumanni* is almost equal in size with *G. funkei* (wingspan 31–35 mm), although its forewings are slightly narrower triangular with less pointed apex. There are a few slight differences between the forewing pattern of the two species (the ground colour of *G. naumanni* is somewhat more ochreous-grey, the reniform stigma is narrower, with deeper invagination outside, the postmedian line is less evenly curved and crenulate, the claviform stigma is slightly shorter and more obsolescent) and the hindwing of *G. naumanni* is somewhat more suffused marginally, but the satisfactory separation of the two species requires the study of the genitalia. This process is much easier in the females, as no dissection is needed to recognise the differences between the sclerotised antrum; only the hair-scales are to be removed around the ostial section.

The male genitalia of *G. naumanni* differ conspicuously from those of the two twin species by its considerably longer harpe, distally upcurved pollex and the huge, heavily sclerotised tooth on the ventral carinal plate.

In the female genitalia, the broadly trapezoidal antrum and the enlarged, medially strongly dilated and flattened, cask-shaped ductus bursae of *G. naumanni* provide an easy distinction from the other two relatives.

Distribution. Central Asiatic. The species is known from Eastern Afghanistan and Tadjikistan (Pamir Mts).

The *marcida* species-group

Diagnosis. The two species of the species-group are on average smaller and more gracile than the taxa of the other two lineages of *Goniographa* but a few large specimens are known from both species. The typical features of the lineage are the brown coloured forewings with less complex dark pattern (especially the marginal area lacks the stronger dark markings) and the more darkened (more brown suffused) hindwings.

The group features of the male genitalia are the thin, elongate, apically finely pointed uncus, the relatively small, shield-like juxta with stronger dorso-medial crest, the thorn-shaped, acute apical processes of which the pseudopollex is shorter than the apex (or maximum equally long); the long and slender, finely S-shaped harpe, the finely arched pollex, the finely serrate, long and eversible ribbon-shaped ventral carinal bar, and the tubular, recurved vesica with short, bulbed cornutus.

The configuration of the female genitalia is rather similar to that of the *funkei* species-group (*G. funkei* and *G. metafunkei*) but he antrum is broader and proportionally somewhat shorter, the sclerotised part of ductus bursae is broader with short but strong medio-lateral crest and a large, rounded, verrucose proximo-lateral plate at anterior end, and the appendix bursae is shorter, more semiglobular-subconical, with membranous apex and wrinkled-ribbed, scobinate basal two-thirds or with large, sclerotized, more or less rounded dorsal fold.

Goniographa marcida (Christoph, 1893)

(Plate 23, Figs 5–6; Plate 50, Figs 29–36; gen. fig. 88)

Agrotis marcida Christoph, 1893, *Deutsche Entomologische Zeitschrift. Gesellschaft Iris zu Dresden* **6**: 90 Type-locality: [Turkmenistan] Ashkhabad. Syntypes: 1 male and 1 female, in coll. ZISP.

Diagnosis. *Goniographa marcida* differs from its sister species, *G. gyulaipeteri* by its generally more unicolorous brownish forewings with less intense paler irroration in the median area and by the rather concolorous brown hindwings of both sexes (the inner area of the hindwing is much paler, often prominently whitish in *G. gyulaipeteri*). Wingspan 27–35 mm, length of forewing 12–16 mm.

In the male genitalia, *G. marcida* has longer apical "section of processes", with more arcuate pollex originating rather far from pseudopollex, these processes are shorter in *G. gyulaipeteri* and the pseudopollex is situated medially between valval apex and pollex. The harpe of *G. marcida* is somewhat longer, more S-shaped, and the juxta is narrower than in its sister species. The configuration of the vesica also shows easily recognisable differences as the vesica of *G. marcida* is armed by longer, narrower cornutus having smaller basal bulb.

The female genitalia of the two closely related species differ conspicuously by their appendix bursae (Figs 88 and 89) which is membranous-scobinate in *G. marcida* while *G. gyulaipeteri* has large, strongly sclerotized dorso-medial fold. The antrum of *G. marcida* is broader medially and shorter than in *G. gyulaipeteri*, without caudal incision, the proximal part of the ductus bursae is finely curved laterad, having short but strong medio-lateral crest and rounded, verrucose ventral plate while the ductus bursae of G. *gyulaipeteri* is straight, having more or less parallel margins, without proximo-lateral crest and verrucose plate.

Distribution. *Goniographa marcida* seems to be confined to the Kopet-Dagh mountain system, occurring both in Turkmenistan and Iran (Khorassan region).

Goniographa gyulaipeteri Varga & Ronkay, 2002

(Plate 23, Figs 7–8; Plate 50, Figs 37–44; gen. fig. 89)

Goniographa gyulaipeteri Varga & Ronkay, 2002, *Acta Zoologica Academiae Scientiarum Hungaricae* **48**(4): 357, figs 13–14, 38–40, 64–56. Type-locality: Tadjikistan, 25 km from Kirovabad, at the road to Parkhar, 800 m. Holotype: female, in coll. P. Gyulai (Miskolc).

Diagnosis. The detailed comparison of the two species is given in the diagnosis of *G. marcida.* Externally, *G. gyulaipeteri* has stronger pale ochreous(-brownish) irroration in the median area of the forewing, the filling of the stigmata is also paler; the inner area of the hindwing is whitish in both sexes, in certain male specimens the whole wing is whitish with weak darker marginal suffusion only. These pale hind-winged specimens resemble also *G. decussa* and *G. discussa,* but their crosslines are less prominent, the wing is less variegated, and the genitalia of the two species-groups show easily recognisable differences. Wingspan 27–35 mm, length of forewing 12–15 mm.

The male genitalia of *G. gyulaipeteri* are characterised by the rather uniform tripartite distal part of valva with relatively short processes. The other differences, comparing with *G. marcida*, are the shorter, more arcuate harpe, the broader subdeltoidal juxta, and the more recurved vesica armed by shorter cornutus having broad, semiglobular basal bulb.

The female genitalia of *G. gyulaipeteri* differ from its twin species by the longer, narrower antrum having shallow medio-caudal incision, longer ductus bursae without anterior crest and ventral verrucose plate and by the presence of large, strongly sclerotized dorso-medial fold on the appendix bursae which is completely missing in *G. marcida.*

Distribution. Turkestanian. The species is known to occur in the Hissaro-Pamir mountain system and from Usbekistan (Chatkal Mts).

Genus ***Graphiphora*** Ochsenheimer, 1816

Graphiphora Ochsenheimer, 1816, *Die Schmetterlinge von Europa* **4**: 68. Type-species: *Noctua augur* Fabricius, 1775, by subsequent designation by Samouelle, 1819.

Synonymy

Pseudospaelotis McDunnough, 1929, *Bulletin of the Canada Department of Mines* **55**: 49. Type-species: *Agrotis haruspica* Grote, 1875, by original designation.

Diagnosis. The genus includes a single Holarctic species. It belongs to the sensu lato *Eugraphe* generic complex, displaying connections also to *Spaelotis*. It can be easily distinguished from the related genera by its much robust body and broader wings, and certain features of the genitalia. Male antenna shortly ciliate-fasciculate, female antenna filiform; labial palpi short, upturned; second segment clothed by flat scales, third segment very short. Collar and thoracic pubescence rather homogeneous, pro- and metathoracic tufts less distinct; abdomen covered with relatively long hair-scales, dorsal crest absent.

The male genitalia of *Graphiphora* differ from the other members of the *Eugraphe* generic complex by the long and slender, distally evenly tapering and acutely pointed valvae, the absence of pseudopollex, the rather proximally located, very long and medially sinuous harpe, the shield-like juxta without dorsomedial process but with fine carving-like ornaments in its dorsal section, and the T-shaped vesica with large basal diverticulum projecting oppositely with the main tube of vesica. The valval shape is similar to the valvae of the *Spaelotis* species but the other, above-mentioned features distinguish the two genera.

In the female genitalia, the antrum is similarly built in *Graphiphora, Coenophila* and *Eugraphe* but that of *Graphiphora* is more funnel-like than that of *Eugraphe*, while the postero-lateral arms are rounded (as in *Eugraphe*) but they are serrate-laced in *Coenophila*. The flattened, sclerotised ductus bursae is longer than

in the related two genera, the appendix bursae is much larger, partly coiled, and the sacculiform corpus bursae bears medium-long, ribbon-like signa which are absent from *Coenophila* and *Eugraphe*.

Distribution. Holarctic.

Graphiphora augur augur (Fabricius, 1775)

(Plate 24, Figs 1–2; Plate 51, Figs 1–7; gen. fig. 90)

Noctua augur Fabricius, 1775, *Systema Entomologiae, sistens Insectorum Classes, Ordines, Genera, Species, Adiectis Synonymis, Locis, Descriptionibus, Observationibus. Lipsiae*: 604. Type-locality: Germany.

Synonymy

Phalaena Noctua omega Esper, 1788, *Die Schmetterlinge in Abbildungen nach der Natur mit Beschreibungen* **4**: pl. 131, fig. 2. Type-locality: no locality given [Europe];

Phalaena Noctua assimulans Borkhausen, 1792, *Der Phalaenen zweite Horden, Eulen. Naturgeschichte der Europaischen Schmetterlinge nach Systematischer Ordnung* **4**: 209. Type-locality: no locality given;

Noctua hippophaes Geyer, 1832, *in* Hübner, *Sammlung Europäischer Schmetterlinge* **4**: pl. 166, figs 782–783. Type-locality: Europe;

Agrotis unimacula Morrison, 1875, *Proceedings of the Boston Society of Natural History* **17**: 166. Type-locality: USA. Type(s): in coll. MSUEL. A junior primary homonym of *Agrotis unimacula* Staudinger, 1859.

Diagnosis. The widely distributed Holarctic species is represented in North America by a distinct subspecies, ssp. *haruspica* (Grote, 1875). The Palaearctic populations are separable into two geographic races, ssp. *augur* and ssp. *tobolskensis* Sheljuzhko, 1929.

An easily recognisable species, due to its large size (wingspan 42–55 mm), robust body and broad forewings, generally dark brown or grey-brown wings with rather reduced but usually prominently dark (fumous grey to blackish-brown) noctuid pattern. The typical subspecies can be distinguished from the externally somewhat similar *Rhyacia* Hübner, 1821 species by its larger size and darker colouration, less complex forewing markings, etc., and the quite dissimilar genitalia in both sexes.

Distribution. The western Palaearctic subspecies has a wide range in the northern and central parts of Europe, in the southern part it occurs locally in the high mountains. The south-eastern edge of its range is in the Caucasus and the Caspian region, and northern Iran. It inhabits a wide range of habitats but prefers generally humid and cool biotopes. The adults are on the wing in the first half of the summer, mainly in June-July.

Graphiphora augur tobolskensis (Sheljuzhko, 1929)

(Plate 24, Figs 3–4; Plate 51, Figs 8–15; gen. fig. 91)

Rhyacia augur tobolskensis Sheljuzhko, 1929, *Mittelungen der Münchner Entomologischen Gesellschaft* **19**: 361. Type-locality: Russia, Siberia, Tobolsk.

Synonymy

Rhyacia (Epipsilia) punctinotata sensu auctorum, nec Warren, 1914, *Novitates Zoologicae* **5**: 21. Type-locality: Russia, Siberia, Kainsk.

Diagnosis. The eastern subspecies of *G. augur* is smaller in size than the ssp. *augur* (wingspan 40–47 mm vs 42–55 mm, respectively) and has generally paler, ochreous-brown or ochreous-grey suffused forewings with more reduced crosslines, and more unicolorous hindwings with less darkened veins and weaker defined discal lunule.

Distribution. The eastern Palaearctic subspecies occurs throughout Siberia, NW China and Mongolia to the Pacific Coast, Manchuria and Japan; the western border of its area is, however, to be clarified. The old records from Tibet refer most probably to this subspecies; the available material is insufficient to decide this question. The flight period is June-August.

Genus ***Spaelotis*** Boisduval, 1840

Spaelotis Boisduval, 1840, *Genera et Index Methodicus Europaeorum Lepidopterorum* **1840**: 106. Type-species: *Noctua ravida* [Denis & Schiffermüller], 1775, by monotypy.

Taxonomy. The taxonomy and phylogeny of the genus has always been problematic, due to the great intraspecific variation and a number of group features being unique or in their combination unique within the Noctuinae s. str. Most Eurasiatic taxa were discovered in the last decades of the nineteenth century and between the two World Wars, since then, only two species have been described by Boursin. The first and only comprehensive revision of the western Palaearctic species was published by Fibiger (1993, 1997) while the Central and Eastern Asiatic members have never been revised. This could be the reason of the doubts concerning with the taxonomic content of *Spaelotis*: Fibiger (1993) listed 25 species since Lafontaine (1998) cited this number first but later in the text mentioned 16 Eurasiatic and 6 Nearctic species. It is an interesting fact that in his fundamental work Lafontaine "predicted" the total number of the Asiatic species: the present, revised checklist contains altogether 16 Eurasiatic species. There are, of course, several changes in the evaluation of the formerly described species and the total number of the species and subspecies level taxa exceeds 40!

The phylogenetic position of the genus *Spaelotis* is also problematic. The leg spining is complete which is characteristic mostly for the tribe Agrotini, but the other external and genital features show closer connections with certain Noctuini genera; moreover, the complete leg spining is present also in a few Noctuini groups (e.g. Hemipachnobia McDunnough, 1929 and Prognorisma). *Spaelotis* is usually placed between *Graphiphora* and the *Eurois* Hübner, 1821–*Anaplectoides* McDunnough, 1929 generic complex. Lafontaine also suggested to place the genus tentatively next to *Eurois* "because of the complete spining on both sides of the foretibiae and similarities in larval pattern; the subgenus *Amphitrota* Warren, 1909 also has a partial fourth row of tarsal setae and a clavus, but these are shared primitive features of the two genera".

One of the most recent molecular works (Zahiri et al, 2014), based on a survey of the barcodes of more than 1500 Canadian Noctuoidea species, placed, however, *Graphiphora* and *Spaelotis* relatively far from each other. The genera displaying the highest similarity in the barcodes are the *Abagrotis* Smith, 1890 generic complex and *Prognorisma*. This study also shows the dubious association of *Spaelotis* with any other larger clades of the Noctuinae.

The genus is traditionally divided into two subgenera, *Spaelotis* and *Amphitrota*, with the diagnostic features as follows: the typical *Spaelotis* species are exclusively Eurasiatic and have a short globular vesica and some sclerotized patches covered with spines; females do not have abdominal pockets on the seventh sternite; the subgenus *Amphitrota* includes six North American and one Eurasian species, having tubular, "banana-shaped" vesica and one or two pairs of pockets on the seventh sternum of females (Lafontaine 1998). This concept is acceptable even if certain Asiatic lineages of *Spaelotis* s. str. have differently built configuration of the vesica and often also the clasping apparatus is strongly modified. These modifications display the subsequent evolution of the genus and provide a firm basis for the infrageneric division.

The female genitalia are also very characteristic for the genus, and the diagnostic features of the species-groups clearly show the internal relationships within *Spaelotis*. The antrum is in all but one species-group a sclerotised half-ring only (the exception is the *valida*-group); the shape and size of the sclerotised posterior section of ductus bursae is an important group- and specific feature; the appendix bursae is generally small, subconical, located laterally from anterior section of ductus bursae, while the distal part of corpus bursae is a variably narrow and long, reversed funnel-like or tubular, membranous structure; and the discoidal, globular or pyriform proximal part of corpus bursae is most often bears four variably long, continuous or interrupted signum-stripes.

The male genitalia of the *valida*- and the *senna*-groups show certain common features with *Amphitrota* (e.g. the long and slender valvae having flattened apical part ("cucullus") with minute apical hook and the long and slender harpe in the *valida*-group; the more elongated vesica with reduced sclerotised elements and densely scobinate distal part, the more flattened apical section of valva with triangular, not incurved apex, relatively wide, cordiform or shield-like juxta, etc. in the *senna*-group). The length of vesica comparing with the length of aedeagus is also less distinctive as the vesica in the *spania*-group is also as long as or

even longer than aedeagus. The diagnostic subgeneric features of *Amphitrota* are, therefore, the presence of clavus in males (in most species) and the pair(s) of lateral pockets on seventh sternite. Notably, the differentiation of the sacculus is present also in the subgenus *Spaelotis* as the *lucens-*, *valida-* and *ravida*-groups possess a small, triangular clavus-lobe.

It is also worth mentioning that the scale of the differences in the male genitalia between certain major lineages of *Spaelotis* s. str. appear as comparable with that of between *Spaelotis* and *Amphitrota*, and the diversification of the female genital features within *Spaelotis* s. str. is often also similarly large. Thus, although the treatment of all main lineages as species-groups seems to be more plausible, some of the main species-groups of *Spaelotis* s. str. may deserve subgeneric rank after a complex morpho- and molecular taxonomic revision of *Spaelotis* s. l. and its close relatives.

The subgenus *Spaelotis* comprises nine distinct species-groups which will be characterised separately for each group.

Genus *Spaelotis* Boisduval, 1840

Subgenus *Amphitrota* Warren, 1909
suecica suecica (Aurivillius, 1891)
(= *suecica fehrenbachi* Boursin, 1963)
suecica gyilkosi Kovács, Kovács & Rákosy, 1996

Subgenus *Spaelotis* Boisduval, 1840
the *valida*-group
valida valida (Walker, 1865)
valida nipona Felder & Rogenhofer, 1874
(= *caliginea* Butler, 1878)

the *ravida*-group
ravida ravida ([Denis & Schiffermüller], 1775)
ravida stabulorum (Bienert, 1869) **stat. rev.**
(= *glis* (Christoph, 1887), *salva* (Corti & Draudt, 1933))
ravida similis **ssp. n.**

the *lucens*-group
lucens Butler, 1881

the *deplorata*-group
sinophysa Boursin, 1955
defuncta defuncta (Staudinger, 1896)
defuncta korshunovi **ssp. n.**
defuncta persica (Staudinger, 1896)
defuncta dominans (Corti & Draudt, 1933) **stat. rev.**
defuncta kaszabi **ssp. n.**
defuncta qaidamensis **ssp. n.**
restricta restricta Boursin, 1967
restricta theobroma **ssp. n.**
deplorata deplorata (Staudinger, 1896)
deplorata nurataica **ssp. n.**

the *sennina*-group
sennina sennina Boursin, 1955
sennina tienshana **ssp. n.**
morgoencola **sp. n.**

the *demavendi*-group
demavendi demavendi (Wagner, 1937)
demavendi anthracina **ssp. n.**
scotopsis scotopsis Boursin, 1967
scotopsis perscripta **ssp. n.**
scotopsis olivascens **ssp. n.**
scotopsis pallidifusca **ssp. n.**
scotopsis hosseinrajaeii **ssp. n.**

the *nyctophasma*-group
nyctophasma Hacker, 1990

the *spania*-group
baltistana Hacker & Peks, 1992
spania spania (Püngeler, 1906) **stat. rev.**
spania dardistana Hacker & Peks, 1992 **stat. rev.**
spania turcomana **ssp. n.**

the *senna*-group
senna senna (Freyer, 1829)
senna contorta Rebel & Zerny, 1931
senna violetta Schawerda, 1934
(*senna* ssp. from Morocco)
senna iranica Draudt, 1938
senna ipaykala **ssp. n.**

Diagnosis. The external and genital morphology of the genus is meticulously characterised by Lafontaine (1998), taking both the Nearctic and the Palaearctic fauna into consideration. The best diagnostic external features, besides the "*Spaelotis*-like" appearance (narrow, long forewings with most often full noctuid pattern, rather robust, less flattened thorax and abdomen, with well-developed fat bodies), are the configuration of the last segment of the female abdomen, the spining of the foretibiae, and the vestiture of the labial palpus. The seventh sternum "wraps around the abdomen to project over the sides of the seventh tergum as a raised ridge on each side with the tergum forming a slightly concave area between the two ridges. The subgenus *Amphitrota* takes this modification further in having a pair of ventral pockets in sternum seven and usually a pair of dorsolateral pockets as well" (Lafontaine 1998). The other two features are variable throughout the genus but the majority of the species are characterised with the following character states: 1) in most species the foretibia has a complete row of sclerotized setae on the inner and outer sides and no outer scale fringe; 2) the ventral fringe on the second segment of the labial palpus is even or slightly shorter toward the apex. The first character is known to occur in Noctuini only in *Prognorisma*, but in the Palaearctic species there are certain modifications (outer scale fringe may be present, hiding partly or fully the outer row of setae).

The species of the genus are easily separable from the related *Graphiphora, Eurois* and *Anaplectoides* by their narrower forewings with different pattern and most often paler hindwings; from the externally often very similar *Rhyacia* and *Protexarnis* by the generic features mentioned above, and the conspicuously different genitalia of both sexes.

The male genitalia are characterised by the simplified clasping apparatus and the most often rather short, tubular or basally somewhat inflated vesica with one or two spined sclerotised plates which may be partly (*senna*-group) or fully *(Amphitrota*) reduced. Uncus weak, most often short and slightly dorso-ventrally flattened, slightly wider mesially vinculum V- or U-shaped, usually medium-long; juxta U-shaped or cordiform, sometimes rounded or shield-like; valva elongated, slender, tapering towards pointed apex; apical section may be strongly or moderately incurved (in most groups of *Spaelotis* s. str.); harpe directed postero-dorsally, cylindrical or flat, slightly curved; digitus and corona absent. The clavus is missing in all

known *Spaelotis* s. str. species and in the clandestina-suecica species-pair of *Amphitrota*, but present in the other *Amphitrota* species. The aedeagus is elongate, usually with variably strong spines or cristate ridge on ventral (sometimes the dorsal) carinal plate or laterally, which is continued in certain species-groups in an eversible spined band extending onto the basal part of vesica. The vesica in subgenus *Spaelotis* is most often relatively short, tubular or basally semi-globular, shorter than aedeagus (except in the *spania*-group*),* armed with one or two sclerotized patches covered with a row of spines (a single, acute cornutus may replace this armature), these plates are variably strongly developed in the different lineages and can be partly reduced; in subgenus *Amphitrota* the vesica is larger (about as long as aedeagus), tubular or "banana-shaped", and unarmed.

Female genitalia. Ovipositor usually medium-long, in two species-groups (*spania*- and *senna*-groups*)* rather long. Papillae anales truncate posteriorly, posterior margin slightly convex, very sparsely clothed with mixture of short and long setae with dense area of short conical setae on posterior margin. Penultimate (eighth) abdominal segment lightly sclerotized dorsally, more heavily sclerotized laterally; apophyses anteriores about twice as long as lateral length of abdominal segment eight and half as long as apophyses posteriores. Ventral wall of ostium bursae (antrum) generally a crescentic transverse band bordering concave opening to ostium (except in the valida species-group, where it is a large, calyculate plate). Ductus bursae dorso-ventrally flattened, with sclerotized plate in dorsal and ventral wall extending about half length of ductus; sclerotized plate in ductus bursae rugose and grooved longitudinally in subgenus *Spaelotis* (smooth and flat in subgenus *Amphitrota*); membranous anterior half of ductus with pouch in dorsal wall in subgenus *Amphitrota*. Appendix bursae weakly developed; ductus seminalis at anterior end of ductus bursae (certain *Spaelotis* s. str. lineages) or at posterior end of corpus bursae (*Spaelotis* s. str. (part) and *Amphitrota*) on left side, its medial section often strongly dilated and inflated. Corpus bursae discoidal, globular or pear-shaped, distal section often conical or elongated-tubular; signa variably developed, most often at least traces of four signa are recognisable but in certain species-groups are hardly traceable.

Distribution. Holarctic, with Palaearctic dominance. In Eurasia, the genus is widespread in the forest steppe belt and the semiarid-arid mountainous areas, and represented by a few species in the more humid regions, including the boreal territories.

Subgenus ***Amphitrota*** Warren, 1909

Amphitrota Warren, 1909, in Seitz (ed.): *Die Gross-Schmetterlinge der Erde* **3**: 57. Type-species: *Mamestra unicolor* Walker, 1856 (a junior subjective synonym of *Noctua clandestina* Harris, 1841), by original designation.

Diagnosis. The subgenus *Amphitrota* is best characterised externally by the presence of a pair of ventral pockets (and usually a pair of dorsolateral pockets) in the 7th sternite. The diagnostic features of the male genitalia are the relatively long (about as long as aedeagus) and recurved, "banana-shaped" and unarmed vesica, the long and slender, apically flattened and not hooked valva, the rather short vinculum, the presence of the clavus (in a part of species but missing in the clandestina-suecica species-pair), and the long and slender, often somewhat S-shaped harpe. The typical characteristics of the female genitalia are the flattened and smooth sclerotized posterior plates of ductus bursae, the dorsal membranous-rugose pouch of the anterior part of ductus bursae, the place of connection of ductus seminalis and the discontinuous signum-stripes.

Distribution. Holarctic, with Nearctic dominance. Six of the seven known species occur in North America and only a single species is distributed throughout Eurasia.

Spaelotis (*Amphitrota*) *suecica suecica* (Aurivillius, 1891)

(Plate 24, Figs 5–6; Plate 51, Figs 16–23; gen. fig. 92)

Agrotis suecica Aurivillius, 1891, *Nordens Fjärilar, Sveriges, Norges, Danmarks och Finlands* **1**: 121, figs 24d-f. Type-locality: Sweden, Jemtland. Type(s): in coll. RNS.

Synonymy

Amphitrota suecica itelmena Bryk, 1941, *Entomologisk Tidskrift* **62**: 154. Type-locality: [Russia] Petropavlovsk-Kamchatsky. Holotype: male, in coll. RNS;

Spaelotis suecica fehrenbachi Boursin, 1963, *Bulletin Mensuel de la Société Linnéenne de Lyon* **32**: 257. Type-locality: [Germany] Black Forest, Wildgutach. Holotype: male, in coll. SMNK.

Diagnosis. The northern European and the Asiatic populations are considered to represent the typical ssp. *suecica* although the specimens of the eastern populations are somewhat larger on average, having better defined crosslines and stigmata. The few, isolated western Central European populations show no mentionable differences compared with those of the Scandinavian ones, therefore only the Carpathian ssp. *gyilkosi* is treated here as a distinct geographic subspecies. It is important to note that this statement is based on the external morphological features of the populations and the subsequent molecular studies may indicate constant genetic differences between the small and isolated European *suecica* populations.

Spaelotis (A.) suecica can be distinguished from the externally similar members of the *deplorata-* and *sennina*-groups by its narrower forewings with more reduced noctuid pattern, reduced basal dash and intermacular dark patch, more unicolorous hindwings with stronger dark covering on veins, the rather uniform thoracic pubescence, without distinctly marked collar; the females are easily separable by the lateral pockets of the last sternite which is missing from the other Palaearctic congeners. Wingspan 38–44 mm.

In the problematic cases, the study of the genitalia provides an easy identification, due to the conspicuous differences in both sexes, which are mentioned in the Diagnosis of the subgenus *Amphitrota*.

Distribution. Trans-Palaearctic. The species has a wide and supposedly interrupted circum-boreal area from Scandinavia to the Pacific Coast, including also the mountain taiga region in the Siberian high mountains, Transbaikalia and Mongolia; there are a few isolated area fragments in Germany and the Alps (Austria and Italy: South Tyrol). The adults are on the wing from June to the beginning of September.

Spaelotis (*Amphitrota*) *suecica gyilkosi* Kovács, Kovács & Rákosy, 1996

(Plate 24, Figs 7–8; Plate 51, Figs 24–27; gen. fig. 93)

Spaelotis clandestina gyilkosi Z. Kovács, S. Kovács & Rákosy, 1996, *Die Noctuiden Rumäniens* **1996**: 200, pl. 24, figs 20–23; gen. figs 733, 734. Type-locality: Romania, Transylvania, Cheile Bicazului, 1200 m. Holotype: male, in coll. Z. & S. Kovács (Sepsiszentgyörgy).

Diagnosis. The Carpathian population differs externally from the other western Palaearctic ones by its paler colouration, somewhat narrower and more reddish-brown suffused forewings with stronger, more distinctly marked crosslines and intracellular stigmata, and the lighter, more ochreous-grey suffused inner area of the hindwings. Wingspan 39–42 mm.

The genitalia of the two subspecies show no mentionable differences, as the valval shape, the width of the harpe and the juxta show considerable variation within the range of the species.

Distribution. Endemic to the eastern Carpathians (Romania: Transylvania); it has been recorded from a small area including the Bicaz (Békás) gorge and the calcareous rocks of the Haşmaş (Hagymás) chain from Balan to Lacu Roşu (Gyilkos-tó).

Subgenus ***Spaelotis*** Boisduval, 1840

Spaelotis Boisduval, 1840, *Genera et Index Methodicus Europaeorum Lepidopterorum* **1840**: 106. Type-species: *Noctua ravida* [Denis & Schiffermüller], 1775, by monotypy.

Diagnosis. The subgenus *Spaelotis* is distinguished from *Amphitrota* by the absence of the ventral pockets from the 7th sternite of the females, the generally apically incurved valvae lacking the clavus, the differently shaped vesica (being variable in the species-groups) with the presence of at least a finely sclerotized and dentate cornutus-plate, the variably built but never flattened and smoothly sclerotized posterior part of ductus bursae, and the often weakly defined but never fully discontinuous signum-stripes. There are a number of other character states of the genitalia in both sexes which distinguish the majority of the species of *Spaelotis* s. str. from *Amphitrota* but none of them are exclusive and exceptionally the opposite character state also occur in one or more species-groups.

The detailed morphological characterisation of the main lineages of *Spaelotis* s. str. is given for each species-group, indicating their relationships. The nine lineages can be arranged into five clades, the first clade comprises three lineages (the *valida-*, the *ravida-* and the *lucens*-groups), the second is the *deplorata-sennina* clade, the *demavendi-* and the *nyctophasma*-groups represent distinct clades while the *spania-* and the *senna*-groups form a common, fifth clade.

Distribution. Trans-Palaearctic.

The ***valida*** species-group

Diagnosis. The group-features of the lineage are as follows: large species (wingspan 42–50 mm) with robust body and relatively broad wings; wing pattern rather simple, hindwing uniformly pale; valvae slender, flattened, apex with very fine hook-like tip; harpe slender, long; sacculus with fine, triangular clavus-like prominence; ventral carinal plate long, beak-shaped; cornutus-plates very large, serrate, situated close to each other; antrum large, calyculate, sclerotized and flattened; posterior part of ductus bursae relatively short and angled medially, sclerotized and cristate-ribbed; corpus bursae large, sacculiform; appendix bursae and ductus seminalis located at anterior end of ductus bursae; signa weakly sclerotized, hardly visible.

The lineage is distinguished from the closest related *ravida* species-group by the more robust body and more rounded wings; finer and longer uncus, slenderer valvae without long and curved apical end, longer and more cuneate ventral carinal section and the more proximally situated second cornutus-plate (males); much larger and more sclerotized, calyciform antrum and shorter, more angled posterior sclerotized section of ductus bursae (females).

Distribution. Eastern Pacific.

Spaelotis* (*Spaelotis*) *valida valida (Walker, 1865)

(Plate 25, Figs 1–2; Plate 51, Figs 28–30; gen. fig. 94)

Graphiphora valida Walker, 1865, *List of the specimens of Lepidopterous Insects in the collection of the British Museum* **33**: 711. Type-locality: [China] Shanghai. Holotype: male, in coll. BMNH.

Diagnosis. *Spaelotis (S.) valida* differs from the externally most similar *S. (S.) ravida* by its more robust body, broader and apically more rounded forewings and the much lighter hindwings. The hindwing colouration is rather variable in the different populations of *S. (S.) ravida* but it is even paler in *S. (S.) valida*, without or with subtle darker marginal suffusion and darker covering of veins which is pre-

sent in all races of *S. (S.) ravida*. It is important to note that the sympatrically occurring *S. (S.) ravida similis* often has similarly broad forewings but the hindwing colouration provides an easy separation. Moreover, the typical ssp. *valida* has rather obscure noctuid pattern, being less prominent than in *S. (S.) ravida similis*, this is the reason why the Japanese ssp. *nipona* was sometimes confused with the otherwise continental Pacific subspecies of *S. (S.) ravida*. Wingspan 42–48 mm.

The genitalia of the two species show clearly recognisable differences in both sexes as it is discussed in the Diagnoses of the two species-groups.

Distribution. Manchurian-Pacific. The typical ssp. *valida* occurs along the Pacific Coast from the Russian Far East and the Korean peninsula to NE China, as far to the south as the Shanghai area. Univoltine species with long flight period, the moths are on the wing from the end of April to the end of October, possibly with longer period of aestivation.

Spaelotis* (*Spaelotis*) *valida nipona (Felder & Rogenhofer, 1874)

(Plate 25, Figs 3–4; Plate 51, Figs 31–33; gen. fig. 95)

Agrotis nipona Felder & Rogenhofer, 1874, *Reise Oesterreischen Fregatte Novara um die Erde in den Jahren 1857, 1859. Zoologischer Theil, Zweiter Band, Zweite Abtheilung, Lepidoptera* **4**: pl. 110, fig. 20. Type-locality: Japan. Holotype: male, in coll. BMNH.

Synonymy

Graphiphora caliginea Butler, 1878, *Annals and Magazine of Natural History* **5**(1): 165. Type-locality: Japan, Hakodate. Holotype: male, in coll. BMNH.

Diagnosis. The Japanese populations of *S. (S.) valida* differ from the continental ssp. *valida* by their somewhat larger size (wingspan 44–50 mm) and more elongated forewings with much distinctly marked and usually more complex noctuid pattern (better defined crosslines including the subterminal line and the dark dotted terminal line, stronger and longer basal dash, paler filling of both intracellular stigmata) and the more intense brownish costal suffusion which makes the ssp. *nipona* rather similar to the eastern populations of *S. (S.) ravida* as well. The main difference between *S. (S.) valida nipona* and *S. (S.) ravida similis* is found in the hindwing colouration which is strikingly paler, ochreous-whitish in *S. (S.) valida nipona*, without or with very weak darker marginal suffusion and covering of veins; see the Plate 51, Figs 31–33 and Plate 52, Figs 24–27.

Distribution. Japan.

The ***ravida*** species-group

Diagnosis. The monotypic species-group is characterised by the following external and genital morphological features: large species (wingspan 39–48 mm) with moderately robust body and long, relatively narrow forewings; wing pattern rather simple; valvae slender, apical third strongly tapering, apical section long and strongly hooked; harpe slender, long; sacculus without or with only very small clavus-like prominence; ventral carinal plate relatively short and rounded, knob-like; basal cornutus-plate very large, serrate, second plate much smaller and situated rather distally; antrum slender, ring-like; posterior part of ductus bursae long and strongly sclerotized, more or less straight; corpus bursae long, sacculiform; appendix bursae and ductus seminalis at anterior end of ductus bursae; signa weakly sclerotized, hardly visible.

The lineage is distinguished from the closest related *valida* species-group by the slenderer body and longer, narrower wings; stronger uncus, distally strongly tapering and apically strongly incurved valvae, shorter but thicker, more rounded ventral carinal section and the rather distally located and consider-

ably smaller second cornutus-plate (males); much smaller antrum with ring-like sclerotization, longer, straighter and caudally asymmetrically dilated posterior sclerotized section of ductus bursae (females).

Distribution. Trans-Palaearctic.

Spaelotis* (*Spaelotis*) *ravida ravida ([Denis & Schiffermüller], 1775)

(Plate 25, Figs 5–6; Plate 52, Figs 1–9; gen. fig. 96)

Noctua ravida [Denis & Schiffermüller], 1775, *Ankündung eines Systematischen Werkes von den Schmetterlingen der Wienergegend* **1775**: 80. Type-locality: Vienna region. Type(s) destroyed.

Synonymy

Noctua obscura Brahm, 1791, *Handbuch der Ökonomischen Insektengeschichte in Form eines Kalenders bearbeitet* **2**: 191. Type-locality: no locality given;

Phalaena Noctua obducta Esper, 1789, *Die Schmetterlinge in Abbildungen nach der Natur mit Beschreibungen* **4**: 452, pl. 142, fig. 4. Type-locality: [Austria] Tyrol;

Phalaena Noctua austera Esper, 1789, *Die Schmetterlinge in Abbildungen nach der Natur mit Beschreibungen* **4**: 452, pl. 142, fig. 5. Type-locality: [Germany] Leipzig region.

Diagnosis. An externally very variable species, with three main groups of populations which are treated here as geographic subspecies. The typical ssp. *ravida* has, in comparison with the ssp. *stabulorum*, broader wings, generally darker colouration, with the ochreous-reddish to reddish-brown suffusion restricted to the costal area (or entirely missing), the noctuid pattern is more distinct, with stronger basal dash, most often larger and darker encircled stigmata, and the hindwings are more grey-brown suffused. The forewings of the ssp. *ravida* are somewhat narrower and more variegated than those of the ssp. *similis*, having larger stigmata with usually paler filling and the hindwings are less unicolorous than in the Pacific subspecies. Wingspan 40–48 mm.

The typical ssp. *ravida* cannot be confused with the other congeners; the differences between *S. (S.) ravida* and *S. (S.) valida* are given in the Diagnoses of the two species-groups and the latter species.

Distribution. Trans-Palaearctic. The typical subspecies lives in the western Palaearctic, its area includes most parts of Europe, the Maghreb area and Asia Minor; the south-eastern and eastern borders of its range is still to be clarified. Univoltine species, the adults emerge in May-June and are on the wing, with a shorter or longer aestivation, to October.

Spaelotis* (*Spaelotis*) *ravida stabulorum (Bienert, 1869)

(Plate 25, Figs 6–7; Plate 52, Figs 10–23; gen. fig. 97)

Agrotis stabulorum Bienert, 1869, *Lepidopterologische Ergebnisse einer Reise in Persien in den Jahren 1858 und 1859*: 34. Type-locality: [Iran] Persia, Shakhrud. Type(s): probably in the Staudinger collection, ZMHU.

Synonymy

Agrotis glis Christoph, 1887, *In* Romanoff, *Mémoires sur les Lépidoptéres* **3**: 64, pl. 3, fig. 10. Type-locality: [Turkmenistan] Germob; [Iran] North Persia, Shakhrud. Syntypes: in coll. ZISP;

Rhyacia salva Corti & Draudt, 1933, *In* Seitz: *Die Gross-Schmetterlinge der Erde* **3** (Supplement): 70, pl. 9, row k. Type-locality: [China, Xinjiang] Juldus. Type(s): in coll. NHMB.

Diagnosis. The populations inhabiting the xerothermic western and Central Asiatic regions differ externally from both other subspecies by their longer and narrower wings, more intense ochreous-reddish to ochreous-brown suffusion of the forewing which often covers the entire wing (especially in the eastern Iranian and western Turkestanian specimens), smaller and more indistinctly outlined stigmata, more reduced basal dash and dark elements of antemedial and postmedial crosslines, and the more ochreous-greyish inner area of the hindwings. Wingspan 40–45 mm.

The male genitalia show some slight but recognisable differences between the three subspecies, though the individual variation is relatively large in most features. The ssp. *stabulorum* has, comparing with the other two subspecies, medially less curved aedeagus with less prominent ventral carinal sclerotisation, smaller teeth on the basal cornutus-plate and broader but less subconical basal dorsal diverticulum.

Distribution. Central Asiatic. The ssp. *stabulorum* has a large area in the arid regions of Asia extending from NE. Turkey and NW. Iran to the western Himalayas; the north-western and north-eastern limits of its range is still to be clarified. The flight period of this subspecies is shorter than that of the typical one and probably the aestivation is also shorter or even facultative; the moths are on the wing from the end of May to the end of September.

***Spaelotis* (*Spaelotis*) *ravida similis* ssp. n.**

(Plate 26, Figs 1–2; Plate 52, Figs 24–27; gen. fig. 98)

Holotype. Male, Russia, Russian Far East, Slavianka region, S of Vladivostok, 27.VIII.–12.IX.1993, leg. Dantshenko, slide No.: GYP 4233 (coll. P. Gyulai).
Paratypes. Russia. 1 female, [Russian Far East] Amur, Khingan gorge, 20–21.IV.1909, leg. Balogh, slide No.: RL 11565f (coll. HNHM); 1 female, Russian Far East, Ussuriysk region, Zaretschye village, 12–16.VIII.1994, leg. A. Belov (coll. P. Gyulai); 1 female, SE Sakhalin, Muravjovo, 50 km E Korsakov, 14–15.VIII.1975, slide No.: GYP 4231 (coll. P. Gyulai). Korea. 1 female, North Korea, Prov. Kangwon, Kumgang-san, Onjong-ri, 400 m, 17.VI.1988, leg. O. Merkl & Gy. Szél, slide No. RL 11649f (coll. HNHM).

Diagnosis. The new subspecies is the externally to *S. (S.) valida* most similar race of *S. (S.) ravida* due to its broad and rather unicolorous dark brown to grey-brown forewings with less complex dark noctuid maculation and less distinct crosslines, as well as the rather robust body. They can be distinguished, however, easily by the hindwing colouration which is much darker, uniformly greyish-brown suffused in *S. (S.) ravida similis* than in *S. (S.) valida*, having darker veins and marginal area.

The ssp. *similis* is closer in its external features to ssp. *ravida* than to the more easterly distributed ssp. *stabulorum*, indicating the supposed western expansion route of *S. (S.) ravida* along the southern edge of the zonal deciduous forest belt of eastern Asia. Wingspan 39–46 mm.

In the male genitalia, the only remarkable difference between the three subspecies can be found in the dentation of the basal cornutus plate which is much smaller in the ssp. *similis* than in the two more western subspecies. Notably, there is a recognisable trend in the strength of the dentation of this plate and the distance between the basal and the distal cornutus-plates: the dentation trends to be stronger and the distance changes from larger to smaller from the east to the west, and the ssp. *stabulorum* has an intermediate stage between the two other subspecies. In the other male genital features (curve of the aedeagus, shape of basal dorsal diverticulum, dorsal cleft of juxta, etc.), ssp. *similis* is more similar to the ssp. *ravida* than to the ssp. *stabulorum*.

Interestingly, the female genitalia of the new subspecies are distinguished from those of the other two races by its longer and narrower ductus bursae with larger postero-lateral extension at the right side.

Distribution. Eastern Pacific. This subspecies is found in the Russian Far East (Amur valley, Primorye territory, Sakhalin), Korea and Japan (Hokkaido), its occurrence in NE. China is supposed. The flight period is similar to that of the typical ssp. *ravida*, but with shorter autumnal period.

The ***lucens*** species-group

Diagnosis. This lineage comprises a single species possessing a number of specific autapomorphies. The diagnostic features of the *lucens*-group are the following: large species (wingspan 40–47 mm) with long and distally broadened forewings and slender body; characteristic greenish-grey forewing ground colour

with paler ochreous defined noctuid pattern; short and weak uncus; plate-like juxta; basally broad, apically strongly tapering and strongly incurved valvae; small, triangular clavus; medium-long, digitiform and straight harpe; long, tubular aedeagus with fine, serrated and eversible ventral carinal bar; short and globular vesica with two large and strongly dentate cornutus-plates; more or less infundibular, membranous antrum with fine, slender ribbon-like sclerotized ostial margin; huge, discoidal, sclerotized and cristate-ribbed ductus bursae; medium-long, rather pyriform corpus bursae; appendix bursae and ductus seminalis located mesially on ductus bursae at left side; and the signa are weakly sclerotized, hardly traceable.

The lineage is easily separable from the closely related *valida-* and *ravida*-groups by its unique colouration and the above-mentioned genitalia features, especially the highly autapomorphic configuration of the vesica and the corresponding ductus bursae.

Spaelotis* (*Spaelotis*) *lucens Butler, 1881

(Plate 26, Figs 3–4; Plate 53, Figs 1–3; gen. fig. 99)

Spaelotis lucens Butler, 1881, *Transactions of the Entomological Society of London* **1881**: 179. Type-locality: Japan, Tokyo. Holotype: female, in coll. BMNH.

Diagnosis. An unmistakable species of the genus. Its greenish-grey forewing colouration and the paler, generally ochreous to ochreous-greyish crosslines and outlines of stigmata resemble more certain *Rhyacia* Hübner, 1821, *Standfussiana* Boursin, 1946, and *Euxoa* Hübner, 1821 species or *Feltia (Trichosilia) plumbea* Alphéraky, 1887, etc. than to any other *Spaelotis* species. The genitalia of both sexes are quite dissimilar comparing with the above mentioned taxa, see the gen. fig. 99 and, e.g., the figures published by Fibiger in the Noctuidae Europaeae, vol. 3 (1997).

Distribution. Manchurian-Pacific. The species has been recorded from Japan, Korea, the Russian Far East (Sakhalin, Kurili Islands, Primorye territory) and NE. China. The moths are on the wing in the mid- and late summer periods.

The ***deplorata*** species-group

Diagnosis. The second major clade of *Spaelotis* s. str. includes three species-groups, the *deplorata-*, the *sennina-* and the *demavendi* species-groups. The shared features of the male genitalia are the long and partly eversible, serrate carinal bar, the tubular vesica, the long, tubular distal and discoidal-globular proximal section of corpus bursae. The *demavendi*-group is rather distant from the other two lineages, due to the disconnected eversible part of carinal bar, forming rather a row of cornuti and the broad, heavily sclerotized posterior part of ductus bursae, while the two other species-groups are very closely related and differ mainly in the configuration of the distal part of the aedeagus and the basal part of the vesica (males), and the size and sclerotization of the posterior section of ductus bursae in the females.

The diagnostic morphological characteristics of the *deplorata*-group are as follows: medium-sized to large species (wingspan (27)33–46 mm), with most often slender body and long, relatively narrow forewings (except *sinophysa*); noctuid pattern well developed (except *sinophysa*), ground colour highly variable from ochreous-grey to dark grey-brown and deep fumous grey; valvae slender, long, with long and pointed, incurved apical portion; harpe short or medium-long, digitiform; juxta broadly U-shaped (except *sinophysa*); aedeagus long, slender, tubular, with long and sclerotized dorsal carinal plate and eversible, variably strongly serrate-dentate, dorsal, dorso-lateral or ventral carinal bar; vesica tubular, basally variably strongly inflated, armed with one or two relatively small, variably strongly dentate cornutus-plate(s) in its anterior half; antrum broad and short, with fine, sclerotized ostial margin; posterior part of ductus bursae narrow, flattened, tubular, with generally small and variably strongly sclerotized caudal

portion; anterior part of ductus bursae membranous-wrinkled, relatively short; appendix bursae and ductus seminalis located at junction of ductus bursae to corpus bursae; posterior part of corpus bursae long, tubular, membranous, anterior part (fundus) elliptical, discoidal or pear-shaped; signa fine, thin, ribbon-like, usually well-visible (except *sinophysa*).

The *deplorata* species-group includes three closely related species which are hardly distinguished from each other and a rather remote fourth member of the lineage which is easily separable from the other taxa of the group by both its external and genital features.

The lineage is closest related to the externally very similar *sennina* species-group but the genitalia of both sexes provide an easy separation. In males, the aedeagus of the *deplorata*-group is slenderer, the eversible serrated carinal bar is longer and the cornutus plate(s) of the vesica are located sideby or rather remote from the distal end of the bar; the apical section of the valva is less elongated and less incurved, and the harpe is shorter, more digitiform. In the *sennina*-group, the aedeagus is thicker and shorter, the armature is rather forceps-like due to the shorter and terminally more dentate carinal bar and the subbasally and oppositely located, slender cornutus-plate; the apical section of the valva is longer and more incurved, and the harpe is longer, more stick-like. In the female genitalia, the sclerotized posterior part of ductus bursae is much weaker and smaller in the *deplorata*-group than in the *sennina*-group (only *S. sinophysa* may have relatively large sclerotised section of ductus bursae).

Certain populations of *S. defuncta*, especially *S. defuncta persica*, can be confused with certain *Protexarnis* McDunnough, 1928 species, but these two genera are easily distinguished by their strikingly different genitalia in both sexes.

Distribution. Generally Central Asiatic, with remarkable expansions to the western Asiatic arid mountains and the steppe belt to the west and north-west, and to the northern frontier of the Tibetan plateau (Kun-Lun Mts) and the Central Chinese mountains (Shaanxi: Taibaishan area) to the east.

Spaelotis* (*Spaelotis*) *sinophysa Boursin, 1955

(Plate 26, Figs 5–6; Plate 53, Figs 4–10; gen. fig. 100)

Spaelotis sinophysa Boursin, 1955, *Zeitschrift der Wiener Entomologischen Gesellschaft* **40**: 235, pl. 22, figs 5–6; gen. pl. 24, fig. 5.
Type-locality: China, Prov. Shaanxi, Tsinling Mts, Tapaishan (Taibaishan), 1700 m. Holotype: male, in coll. ZFMK.

Diagnosis. This species cannot be confused with any other *Spaelotis* species due to its pale ochreous-grey to slate-grey forewings with fine, often obsolete dark grey antemedial and postmedial crosslines, most often fully reduced outlines of orbicular and reniform stigmata (they are sometimes recognisable by their somewhat differently coloured filling), and the brown-grey suffused pale ochreous-grey hindwings. It differs from the externally most similar *S. (S.) nyctophasma* by its paler ground colour (without the fine red-brownish hue which is typical of *S. (S.) nyctophasma*), more uniform thoracic vestiture, absence of dark basal dash and dark outlines of stigmata, less unicolorous hindwings, and the strikingly different genitalia of both sexes, see the gen. figs 100 and 121.

Spaelotis (S.) sinophysa differs from the other three members of the species-group by its larger size (wingspan 42–46 mm), most often paler, more ochreous-greyish ground colour with more reduced noctuid pattern, and certain conspicuous differences in the genitalia. In the males, *S. (S.) sinophysa* has, comparing with those of the related taxa, broader valvae (except certain specimens of *S. (S.) defuncta*) with very short harpe, very long vinculum, more elongated dorsal carinal plate with longer and finer serrate carinal bar and a remotely placed, small distal cornutus-plate. In the females, the key feature is the sclerotisation of ductus bursae which is much longer in *S. (S.) sinophysa* than in the other three species; in addition, the distal end of corpus bursae is stronger ribbed than in its closest relatives.

Distribution. Central China. The species is known only from the mountainous areas of Shaanxi (Taibaishan area) and Gansu (Min Shan) and from northern Sichuan. The bionomics of the species is poorly

known, it seems to be connected to the higher altitude, open forest regions; the flight period is extending from June to September.

Spaelotis (*Spaelotis*) *defuncta defuncta* (Staudinger, 1896) **stat. rev.**

(Plate 27, Figs 1–2; Plate 53, Figs 19–26; gen. fig. 101)

Agrotis defuncta Staudinger, 1896, *Deutsche Entomologische Zeitschrift. Gesellschaft Iris zu Dresden* **9**: 243, pl. 4, fig. 8. Type-locality: [Kirghisia] Issyk-Kul. Lectotype: male, in coll. ZMHU.

Diagnosis. The three species of the *deplorata*-line occur partly sympatrically in the eastern part of Central Asia where the three species have no conspicuous character displacement. Thus, the specimens of the Central Asiatic populations of *S. (S.) defuncta, S. (S.) deplorata,* and *S. (S.) restricta* are often confusingly similar to each other and the proper identification requires the study of the genitalia.

The typical ssp. *defuncta* is one of the easier distinguished subspecies of *S. (S.) defuncta* with its pale ochreous-grey to light sand brown ground colour, prominent, sharply marked, usually black(ish) noctuid pattern, and the pale ochreous-grey hindwings with rather weak brownish covering on the veins. Wingspan 33–41 mm. Such specimens of *S. (S.) deplorata* occur only in Mongolia and in Chinese Turkestan but their forewings are less bright ochreous-greyish, the noctuid pattern is less contrasting grey-brown to blackish-grey, and the hindwings are somewhat darker grey-brownish irrorated than in *S. (S.) d. defuncta*. The forewings of *S. (S.) restricta* are generally more brownish shaded than in *S. (S.) d. defuncta*, the dark markings are less distinct and more grey-brown, and the hindwings are also more brown-grey irrorated (these features are recognisable on the fresh specimens, the worn and the aestivated ones are rarely separable by their external characters).

In the male genitalia, the clasping apparatuses of the three species show a considerable individual variation in all populations, therefore the details of this part of the copulatory organ cannot be used for the separation of the closely related taxa. The specific features are found in the configuration of the carina penis and the connecting basal cornutus plate. In *S. (S.) defuncta*, the eversible serrated carinal plate originates ventrally or ventro-laterally and turns ventrad, extending into the basal part of the vesica on the ventral edge and terminating close to the slender, arched basal cornutus plate, while the dorsal carinal plate smoothly sclerotised and long, bill-like. The serrated carinal plate of *S. (S.) deplorata* originates dorsally or dorso-laterally and the eversible part is extending to the basal part of vesica on the dorsal side, terminating relatively far from the small basal cornutus plate; the ventral sclerotised carinal plate short, with truncated distal end. Finally, the serrated carinal plate of *S. (S.) restricta* originates ventrally and upcurved laterally, the eversible section is extending onto the vesica laterally and terminating relatively close to the short but rather thick and strongly dentate basal cornutus plate; the dorsal carinal plate medium-long, smooth and more or less bill-like sclerotised.

In the female genitalia, the three species differ in the shape and size of the sclerotised posterior part of ductus bursae. This difference is smaller than in the males and sometimes partly overlapping in *S. (S.) defuncta* and *S. (S.) deplorata* but appears as distinctive in most cases while is better visible in *S. (S.) restricta*. In *S. (S.) defuncta*, the posterior third of ductus bursae is rather cask-shaped and wider sclerotised than in *S. (S.) deplorata* while this section is more elongate and funnel-like in *S. (S.) restricta*.

The differences between the subspecies of *S. (S.) defuncta* are discussed under the Diagnoses of the given taxa.

Distribution. Central Asiatic. The typical ssp. *defuncta* occurs in the Tien Shan massif and its northern foothills in southern Kazakhstan, Kirghisia (Alai, Transalai, Susamyr, Talas, etc.) and NW. China (Chinese Turkestan). The former records (Hacker 1992, Esperiana 3, p. 130) from Lahoul refer, most probably, to *S. (S.) restricta theobroma*.

Spaelotis (*Spaelotis*) *defuncta korshunovi* ssp. n.

(Plate 27, Figs 3–4; Plate 54, Figs 1–8; gen. fig. 102)

Holotype. Male, Turkmenistan, Kopet-Dagh Mts, 6 km S of Ipay-Kala, 1600 m, 38°17'N, 57°07'E, 16–23.VIII.1992, leg. M. Hreblay, Gy.M. László & G. Ronkay (coll. G. Ronkay).
Paratypes. **Turkmenistan**. Kopet-Dagh Mts. 35 specimens, with the same data as the holotype (coll. P. Gyulai, G. Ronkay & HNHM); 5 specimens, Dushak, 1500 m, 37°54'N, 57°56'E, 7–8.VIII.1992, leg. M. Hreblay, Gy.M. László & G. Ronkay (coll. P. Gyulai, G. Ronkay & HNHM); 5 specimens, Dushak, 2200 m, 1–2.X.1991, leg. A. Podlussány, L. Ronkay & Z. Varga (coll. HNHM); 13 specimens, Dushak, 2300 m, 6–8.VII.1992, leg. Gy. Fábián, B. Herczig, A. Podlussány & Z. Varga (coll. G. Ronkay); 13 specimens, Dushak, 2400 m, 37°57'N, 57°54'E, 9–10.VIII.1992, M. Hreblay, Gy.M. László & G. Ronkay (coll. P. Gyulai & G. Ronkay); 1 male, Dushak, 2100–2200 m, 3–13.VII.1990, leg. V.V. Dubatolov & T.D. Dubatolova, slide No.: RL 3690m (coll. HNHM); 11 specimens, Ipay-Kala valley, 15 km E of Nochur, 800 m, 38°15'N, 56°55'E, 26.VI.1992, leg. Gy. Fábián, B. Herczig, A. Podlussány & Z. Varga (coll. P. Gyulai & G. Ronkay); 11 specimens, 5 km S of Chuli, 700–800 m, 37°56'N, 58°01'E, 5.VIII.1992, leg. M. Hreblay, Gy.M. László & G. Ronkay (coll. G. Ronkay); 2 males, Ipay-Kala, valley of the rivers Ipay-Kala and Point-Kala, 800–1500 m, 38°13'N, 59°54'E, 30.VI.–4.VII.1992, leg. Gy. Fábián, B. Herczig, A. Podlussány & Z. Varga (coll. P. Gyulai). Slide Nos: RL 11335m, 11337m, 11439 m; RL 11336f. **Iran**. Prov. Khorasan. 3 males, Kouh-i-Binaloud (Meched), 3000–3300 m, 20–30.VII.1938, leg. F. Brandt (coll. NRS); 2 males, 1 female, Kouh-i-Binaloud (Meched), 1800 m, 1938, leg. F. Brandt (coll. NRS).

Diagnosis. The diagnostic features of the ssp. *korshunovi* are the relatively small size (wingspan 37–40 mm), the characteristic pastel-shaded ochreous-brown to pale brown-grey forewing ground colour, the indistinct and often rather reduced dark noctuid pattern and the light ochreous-brown suffused hindwings. The new subspecies is smaller and more narrow-winged than the somewhat similarly coloured ssp. *defuncta* and ssp. *dominans*, and the hindwing is darker and more unicolorous than in the other two races.

The stronger marked specimens of *S. (S.) defuncta korshunovi* can be confused with *S. (S.) scotopsis olivascens* and the satisfactory separation of these two taxa usually requires the study of the genitalia. This examination provides an easy identification due to the striking differences in both sexes; see the gen. figs 102 and 118.

Distribution. This subspecies is endemic to the northern chains of the Kopet-Dagh Mts in Turkmenistan and Iran. It inhabits the lower and medium-high altitude rocky slopes with xerophilous mountain steppes and semi-deserts. The moths are on the wing in the summer period, from the mid-June to the end of August.

Etymology. The new subspecies is dedicated to our friend Vladimir Sergeevich Korshunov, organizer and host of our expedition series in Turkmenistan.

Spaelotis (*Spaelotis*) *defuncta persica* (Staudinger, 1896)

(Plate 27, Figs 5–6; Plate 54, Figs 9–16; gen. fig. 103)

Agrotis defuncta persica Staudinger, 1896, *Deutsche Entomologische Zeitschrift. Gesellschaft Iris zu Dresden* **9**: 243, pl. 4, fig. 8.
Type-locality: [Iran] Persia, Shahkuh. Lectotype: female, in coll. ZMHU, designated by Fibiger, 1993.

Diagnosis. The ssp. *persica* differ from the ssp. *korshunovi* by its generally darker, unicolorous dark brown-grey forewings with sharper black basal dash and intracellular black patches defining orbicular and reniform stigmata, paler, more obsolescent crosslines and lighter, weakly ochreous-grey irrorated whitish-grey hindwings. Wingspan 34–40 mm.

Distribution. Iranian. This subspecies is known from various parts of Iran, including the Iranian side of the Kopet-Dagh Mts (Khorassan).

Remarks. The original type material was a mixed series; the lectotype female represents this taxon while the paralectotype male belongs to *Protexarnis squalida* (Guenée, 1852).

Spaelotis (*Spaelotis*) *defuncta dominans* (Corti & Draudt, 1933) **stat. rev.**

(Plate 27, Figs 7–8; Plate 53, Figs 27–30; gen. fig. 104)

Rhyacia dominans Corti & Draudt, 1933, *In* Seitz: *Die Gross-Schmetterlinge der Erde* **3** (Supplement): 73, pl. 11, row i. Type-locality: [Kazakhstan] Ural [Uralsk, Emba river]. Lectotype: male, here designated, in coll. NHMB.

Lectotype designation. Lectotype of *Rhyacia dominans* Corti & Draudt, 1933: male, Ural, m. 1894, coll. A. Corti, slide No.: NC925, deposited in coll. NHMB.

Diagnosis. The taxon has long been considered as a distinct species, most recently by Fibiger (1993, 1997) who correctly distinguished it from *S. (S.) deplorata*. The identity of *dominans* is clarified by the detailed study of the genitalia of the members of the *deplorata*-group which has pointed out the specific distinctness of *S. (S.) defuncta* and *S. (S.) deplorata* and the conspecificity of *S. (S.) dominans* with *S. (S.) defuncta*. The clearly recognisable external differences compared with the typical ssp. *defuncta* (e.g. the more brownish forewing ground colour, the much weaker and paler dark crosslines, the less sharply encircled and larger orbicular and reniform stigmata, etc.) provide the reason to distinguish the north-western populations of *S. (S.) defuncta* as a distinct subspecies. Wingspan 33–42 mm.

Distribution. The ssp. *dominans* occurs in the eastern European and western Kazakh parts of the zonal steppe belt (Ural region: Uralsk, Emba, Naryn; Karatau Mts).

Spaelotis (*Spaelotis*) *defuncta kaszabi* **ssp. n.**

(Plate 28, Figs 1–2; Plate 54, Figs 17–24; gen. fig. 105)

Holotype. Male, Mongolia, Ömnögovi aimak, Gurvan Sayhan Mts, Alyut-am, 2400 m, 23.VII.1986, leg. Gy. Fábián, M. Hreblay, L. Peregovits & G. Ronkay, slide No.: RL 2232m (coll. G. Ronkay).

Paratypes. **Mongolia.** Ömnögovi aimak. 2 males, 1 female, with the same data as the holotype, slide Nos RL 2231m, RL 2249m, RL 2285f (coll. G. Ronkay); 1 male, Gurvan Sayhan Mts, Yulin-am, 2350 m, 22.VII.1986, leg. Gy. Fábián, M. Hreblay, L. Peregovits & G. Ronkay, slide No.: RL 2247m (coll. G. Ronkay). Chovd aimak. 5 males, 2 females, Mongol Altai Mts, Cenchergol, 25 km SE from Manchan, 29–30.VII.1986, P. Gyulai, slide Nos: GYP 275 m, GYP 280m, RL 2330m, RL 2296f, RL 2300f (coll. P. Gyulai). Bajan Ölgij aimak. 1 male, 2 females, Mongol Altai Mts, Bulgan village, 6–7.VIII.1986, leg. P. Gyulai, slide Nos GYP 284m, RL 2294f (coll. P. Gyulai). Bajanchongor aimak. 13 males, 10 females, Tsagaan Bogd Mts, 50 km S of Ekhiin-gol oase, 28–30.VIII.1997, leg. P. Gyulai & A. Garai, slide No: GYP 4276m (coll. P. Gyulai).

Diagnosis. The Mongolian populations of *S. (S.) defuncta* show the largest individual variation within the species, small and relatively large (wingspan 36–42 mm), rather narrow and more broad-winged, paler and darker coloured, distinctly marked and more diffusely patterned specimens can be also found in the material. These specimens are often hardly separable from the sympatrically occurring examples of the typical *S. (S.) deplorata*; the identification of the Mongolian material requires, therefore, the dissection of the majority of the specimens. The males are much better separable by the differences in the configuration of the aedeagus and the vesica while certain females are difficult to assign to one of the two closely related species and their identification needs expertise.

Distribution. Mongolia.

Etymology. The new taxon is dedicated to the memory of Zoltán Kaszab, famous explorer of the Mongolian fauna, expert of Tenebrionidae and Meloidae of the World.

Spaelotis (*Spaelotis*) *defuncta qaidamensis* ssp. n.

(Plate 28, Figs 3–4; Plate 54, Figs 25–32; gen. fig. 106)

Holotype. Male, China**,** Qaidam Shan, 30 km NE of Da Qaidam, 3600 m, 10–13.VIII.1999, leg. S. Nykl, slide No: GYP4195 (coll. P. Gyulai).
Paratypes. China. 21 males, 5 females, with the same data as the holotype, slide Nos: GYP 4281, 4283 (males), 4258 (female) (coll. P. Gyulai); 3 males, 20 km NE of Da Qaidam city, 3600 m, 15–22.VII.2005, leg. S. Nykl (coll. P. Gyulai).

Diagnosis. The size, wing shape and the elements of pattern of the new subspecies are most similar to those of *S. (S.) defuncta kaszabi* but the forewing colouration of the specimens is much paler, light ochreous-grey to slate-grey with fine clay-brown hue and the forewing pattern is much less variable in the ssp. *qaidamensis* than in the Mongolian subspecies.

Distribution. Northern Tibetan. The ssp. *qaidamensis* is known from the Kuku-Noor (Qinghai) region only where it occurs in the medium-high altitude regions (in a northern Tibetan standard, otherwise this is the highest altitude occurrence of the species).

Spaelotis (*Spaelotis*) *restricta restricta* Boursin, 1967

(Plate 28, Figs 5–6; Plate 54, Figs 33–40; gen. fig. 107)

Spaelotis restricta Boursin, 1967, *Entomops* **2**(10): 51, figs 13, 15. Type-locality: Afghanistan, Badakhshan, Sarekanda, 4100 m. Holotype: male in coll. ZSM.

Diagnosis. The typical populations of *S. (S.) restricta* are often confusingly similar to its sister species. The ssp. *restricta* differs from most subspecies of *S. (S.) defuncta* by its more brownish shaded forewings and less intense dark noctuid pattern, from *S. (S.) deplorata* by its narrower forewings, on average smaller stigmata, but the satisfactory identification requires the dissection of the specimens, especially as it occurs partly sympatrically with them in certain parts of its range. Wingspan 37–40 mm.

The differences in the genitalia are found in the aedeagus and vesica in the males and the posterior part of ductus bursae in the females. These differences are clearly recognisable but the proper position of the aedeagus in the mounted slides and the moderate staining (or the native preparation) of the female genitalia are important for the identification. In the males, the distal part of the serrate carinal bar is positioned laterally (it is ventral in *S. (S.) defuncta* and dorsal in *S. (S.) deplorata*), and the basal cornutus plate is broader and stronger spinose than in the other two species. In the females, *S. (S.) restricta* has longer and funnel-like posterior sclerotised section of ductus bursae, this part is shorter and cask-shaped (*S. (S.) defuncta*) or quadrangular (*S. (S.) deplorata*) in the other two species.

Distribution. This species has the smallest area from the three closely related taxa, covering the Hissaro-Pamir mountain system, the eastern Hindukush, the Karakoram and the north-western Himalayas. The typical subspecies occurs in the northern part of this range, in Tadjikistan, Afghanistan, the Pakistani Hindukush and Waziristan. The moths can be found in the medium-high and higher regions, in July-August.

Spaelotis (*Spaelotis*) *restricta theobroma* ssp. n.

(Plate 28, Figs 7–8; Plate 55, Figs 1–12; gen. fig. 108)

Holotype. Male, Pakistan, Himalaya Mts, Kaghan valley, 12 km E of Naran, Battakundi, 3200 m, 26.VII.1994, leg. B. Herczig, Gy.M. László & G. Ronkay (coll. G. Ronkay).
Paratypes. **Pakistan.** Himalaya Mts. 128 specimens, with the same data as the holotype, slide Nos RL 11653m, RL 11654f (coll. P. Gyulai, G. Ronkay & HNHM); 28 specimens, Kaghan valley, 30 km S of Babusar Pass, 3500 m, 35°02'N, 73°51'E, 27.VII.1994, leg. B. Herczig, Gy.M. László & G. Ronkay (coll. G. Ronkay); 1 male, Kaghan valley, Babusar Pass, 3200 m, 35°02'N, 73°56'E, 25.VIII.1997, leg. Gy. Fábián & G. Ronkay (coll. G. Ronkay); 6 specimens, Saiful Muluk, 3100 m, 34°54'N, 73°42'E, 11.IX.1997,

leg. Gy. Fábián & G. Ronkay (coll. G. Ronkay); 14 specimens, from the same site, 24.VIII.1997, leg. Gy. Fábián & G. Ronkay (coll. G. Ronkay); 1 male, Deosai Plains, 3650 m, 35°01'N, 75°12'E, 16–18.VIII.1998, leg. Z. Varga & G. Ronkay (coll. G. Ronkay); 4 specimens, from the same site, 4.VII.2000, leg. Z. Varga & G. Ronkay (coll. G. Ronkay); 2 males, Deosai Plains, 3950 m, 35°00'43"N, 75°12'14"E, 15.VII.1998, leg. L. Ronkay (coll. G. Ronkay); 4 specimens, 5 km S of Deosai Pass, 2800 m, 35°16'N, 75°31'E, 21.VII.1994, leg. B. Herczig, Gy.M. László & G. Ronkay (coll. G. Ronkay & HNHM); 1 male, Deosai Plains, Bubin village, 3300 m, 35°13,5'N, 75°02'E, 6.VII.2000, leg. Z. Varga & G. Ronkay (coll. G. Ronkay); 1 female, Deosai Plains, 3400 m, 35°01'N, 75°12'E, 6.IX.1997, leg. Gy. Fábián & G. Ronkay (coll. G. Ronkay); 1 female, Deosai Plains, 3700 m, 35°02'N, 75°05'E, 4.IX.1997, leg. Gy. Fábián & G. Ronkay (coll. G. Ronkay); 6 specimens, Deosai Plains, Bubin village, 3300 m, 35°13,5'N, 75°02'E, 13.VIII.2001, leg. G. Ronkay, slide No. RL 11655m (coll. G. Ronkay & HNHM); 15 specimens, from the same locality, 14.VIII.2001 (coll. G. Ronkay & HNHM); 1 male, from the same locality, 14.X.1998, leg. G. Ronkay (coll. G. Ronkay); 7 specimens, Deosai Plains, Bubin village, 3150 m, 35°12,6'N, 74°59'E, 17.VIII.2001, leg. G. Ronkay (coll. P. Gyulai & G. Ronkay); 1 male, from the same site, 24.IX.1998, leg. F. Hussein (coll. G. Ronkay); 3 specimens, Nanga Parbat area, 12 km SW of Astor, Rama lake, 3500 m, 35°16'N, 74°43'E, 19–20.VII.1994, leg. B. Herczig, Gy.M. László & G. Ronkay (coll. G. Ronkay); 1 male, Kaghan valley, Tathabaya, 2400 m, 34°41'N, 73°25'E, 25.VII.1994, leg. B. Herczig, Gy.M. László & G. Ronkay (coll. G. Ronkay); 3 males, near Dzhelkhats village, 2900 m, 23–24.IX.1998, leg. P. Gyulai & A. Garai (coll. P. Gyulai); 9 males, 3 females, Dzhelkhats village, 3030 m, 23–24.IX.1998, P. Gyulai & A. Garai (coll. P. Gyulai); 3 males, 4 females, Deosai Plains, near Bubin village, 74°59'E, 35°12,6'N, 2910 m, 21–22.IX.1998, leg. P. Gyulai & A. Garai (coll. P. Gyulai); 3 males, 4 females, Deosai Plains, close to Bubin village, 3030 m, 24–25.IX.1998, leg. P. Gyulai & A. Garai (coll. P. Gyulai); 2 males, Bubin valley, 3000 m, 29–31.VII.2011 (coll. P. Gyulai); 2 males, 1 female, Deosai plateau, Deosai pass, 4200 m, 1.VIII.2011 (coll. P. Gyulai); 2 males, 1 females, Kaghan valley, Jalkhat village, 3800 m, 19.VII.2011 (coll. P. Gyulai); 1 male, 2 females, Deosai NP, Chilam Sherkuli, 3600 m, 2.VIII.2011 (coll. P. Gyulai). Karakoram Mts. 1 female, Naltar valley, 3400 m, 20.VII.2011 (coll. P. Gyulai); 1 male, Deitar valley, 3000 m, 27.VII.2011 (coll. P. Gyulai); 1 female, Huru, Hispar valley, 3400 m, 23.VII.1994, leg. B. Herczig, Gy.M. László & G. Ronkay (coll. P. Gyulai). **India**. 1 male, Himachal Pradesh, Lahoul, Bhaga river valley, 3300 m, 32°37'N, 77°10'E, 12.X.1990, leg. H. Hacker, slide No.: RL 11456m (coll. HNHM).

Diagnosis. The new subspecies is possibly the easiest recognisable taxon of the *deplorata* species-complex by its very characteristic colouration. It has unicolorous coffee-brown to cocoa-brown forewings with most often strong dark brown to blackish-brown basal dash and intracellular patches, while the crosslines are usually diffuse or obsolescent; the hindwings are pale brownish suffused ochreous-grey, with most often weak darker covering on veins. It is more unicolorous brownish than the greyish shaded Pakistani populations of *S. (S.) deplorata*; no records of *S. (S.) defuncta* are known from the range of the ssp. *theobroma*. It is on average larger in size than the typical ssp. *restricta*, having broader forewings, but a few surprisingly small specimens are also present in the large type-series. Wingspan (27)37–43 mm.

Distribution. Northwest Himalayan. The ssp. *theobroma* is known to occur in the Pakistani Himalayas (Deosai Mts, Kaghan valley) and the Karakoram Mts (Naltar, Hispar, and Deitar valleys). It lives in the rocky grasslands at medium-high and higher altitudes (between 2800–3500 m a.s.l.). The moths are on the wings in July-August.

Spaelotis* (*Spaelotis*) *deplorata deplorata (Staudinger, 1896)

(Plate 29, Figs 1–2; Plate 55, Figs 13–22; gen. fig. 109)

Agrotis deplorata Staudinger, 1896, *Deutsche Entomologische Zeitschrift. Gesellschaft Iris zu Dresden* **9**: 241. Type-locality: [Mongolia] Uliassutai. Lectotype: female, here designated, in coll. ZMHU.

Lectotype designation. Lectotype of *Agrotis deplorata* Staudinger, 1896, here designated: female, "Origin" (pink label), "Deplorata Stgr." (with the handwriting of Staudinger), "Uliassutai 94. Led." (green label), "Lectotypus| *Spaelotis deplorata* Staudinger| Ronkay, 1987" (label with red frames), "gen. prep. No. 2329♀ det. L. Ronkay", "Zool. Mus. Berlin" (yellow label), deposited in coll. ZMHU (Plate 55, Fig. 13).

Diagnosis. A strongly variable species, it can be confused with both sister species by its external features. As its area is widely overlapping with that of *S. (S.) defuncta* and partly also with *S. (S.) restricta*, the study of the genitalia is essential for the proper identification.

The subspecific splitting of the populations of *S. (S.) deplorata* is rather difficult, due to the large variation of the external features and the rather scarce material available outside from Mongolia. This is the reason why most populations are associated with the typical ssp. *deplorata* and only the most westerly distributed one (ssp. *nurataica*) is distinguished at subspecies level. Wingspan 36–42 mm.

The key feature in the male genitalia of *S. (S.) deplorata* is the dorsally positioned serrate carinal bar, with the end of its eversible part being rather distant from the small, finely spinose basal cornutus-plate. The sclerotised ventral part is much shorter and not elongated (bill-like) as the opposite side of the serrate carinal plate in the other two species.

In the females, *S. (S.) deplorata* has the smallest and most quadrangular sclerotisation in the posterior section of ductus bursae; this part is either broader cask-shaped (*S. (S.) defuncta*) or longer funnel-like (*S. (S.) restricta*) in the closely related species.

Distribution. Turkestanian-Mongolian. The typical subspecies occurs in the semi-arid regions of eastern Central Asia, from the Russian Altai Mts to eastern Mongolia, Transbaikalia, Chinese Turkestan, Tadjikistan, eastern Afghanistan, NW Pakistan and the northern frontier of the Tibetan plateau (China: Kun-Lun Shan). It lives in steppes, mountain steppes and semi-deserts; the adults fly in the summer period, from the end of June to the end of August.

***Spaelotis* (*Spaelotis*) *deplorata nurataica* ssp. n.**

(Plate 29, Figs 3–4; Plate 55, Figs 23–28; gen. fig. 110)

Holotype. Male, Uzbekistan, Nuratau Mts, Sarmitan, 40 km W of Farish, 1300 m, 11–13.VI.1994, leg. Lukhtanov (coll. P. Gyulai). **Paratypes**. **Uzbekistan**. 6 males, 5 females, with the same data as the holotype, slide Nos: GYP 4229m, GYP 4274m, GYP 4220f, GYP 4286f (coll. P. Gyulai).

Diagnosis. This small and supposedly fairly isolated population of *S. (S.) deplorata* has been recently discovered and distinguished from the externally similar but usually paler coloured *S. (S.) defuncta dominans*. It is somewhat darker and less distinctly marked than this taxon, but the separation of these two taxa requires the study of their copulatory organs. The ssp. *nurataica* is on average smaller and more short-winged than the typical ssp. *deplorata* (wingspan 33–39 mm), being usually paler ochreous-grey to ochreous-brown coloured, and the inner area of the hindwing is also paler, more ochreous-whitish than in the more eastern populations of *S. (S.) deplorata*.

Distribution. The new subspecies occurs in the Nuratau Mts, the westernmost isolate of the Alai massif. The specimens were collected relatively early in the year (mid-June), the adults probably have a shorter or longer aestivation period which is probably absent in most populations of the ssp. *deplorata*.

The ***sennina*** species-group

Diagnosis. The *sennina*-group comprises two allopatric sister species, displaying the following group features: medium-sized species (wingspan 37–40 mm) with slender body and elongate forewings; uniformly darkened forewing colouration and weak or reduced noctuid pattern; long, basally relatively broad valvae with long and tapering, strongly incurved apical portion; rather long, stick-like harpe; medium-long and thick aedeagus with relatively short and interruptedly but strongly dentate carinal bar projecting from the ventral end of aedeagus towards the dorsal part of vesica; cornutus-plate long, slender, strongly dentate, located oppositely with the dorsal portion of the carinal bar; antrum with slender, arcuate sclerotized ostial margin; posterior sclerotized section of ductus bursae long and wide, flattened, more or less calyciform, with variably strongly sclerotized patches; anterior membranous part of ductus bursae very short; appendix bursae located at anterior end of ductus bursae; distal part of corpus bursae long, tubular, membranous, proximal part of corpus bursae (fundus) elliptical-ovoid; and the signa are fine, long, thinly ribbon-like.

The two species of the *sennina*-group are often very similar to the species of *Amphitrota* and the *deplorata*-group, although the differences in their genital structures provide an easy distinction (see the diagnoses of the three lineages). Occasionally, dark and unicolorous specimens of certain *S. spania* populations also can be confused with the members of the *sennina*-group but the study of the genitalia of the problematic specimens undoubtedly can solve the problems.

The lineage is closest related to the *deplorata*-group but the above mentioned differences between the configuration of the aedeagus and the corresponding structures of the ductus bursae justify their distinction.

Distribution. Eastern Palaearctic.

Spaelotis* (*Spaelotis*) *sennina sennina Boursin, 1955

(Plate 29, Figs 5–6; Plate 55, Figs 29–36; gen. fig. 111)

Spaelotis sennina Boursin, 1955, *Zeitschrift der Wiener Entomologischen Gesellschaft* **40**: 237, pl. 22, figs 5–6; gen. pl. 24, fig. 8. Type-locality: Mongolia, Uliassutai. Lectotype: male, here designated, in coll. ZMHU.

Lectotype designation. Lectotype of *Spaelotis sennina* Boursin, 1955, here designated: male, "Origin" (pink label), "Deplorata ab. (?) Sennina Stgr." (with the handwriting of Staudinger), "Uliassutai 94. Led." (green label), "Lectotypus| *Spaelotis sennina* Staudinger| Ronkay, 1987" (label with red frames), "*Spaelotis sennina* Stgr., ♂ b. sp.! Boursin det." (with the handwriting of Boursin), "Préparation No. MB126 Ch. Boursin", "Zool. Mus. Berlin" (yellow label), deposited in coll. ZMHU (Plate 55, Fig. 29).

Diagnosis. The typical populations of *S. (S.) sennina* differ externally from *S. (A.) suecica* by their broader wings, darker and more unicolorous thorax and forewing with characteristic red-brownish collar and more concolorous hindwings with less discernible discal spot and dark covering of veins; from the members of the *S. (S.) deplorata* species-complex by its generally darker colouration and more indistinct noctuid pattern. It is important to mention that rarely much paler grey-brownish coloured specimens also can be found (see the Plate 55, Fig. 36) which are much closer in appearance to the western ssp. *tienshana*. Wingspan 37–40 mm.

In the problematic cases, the study of the genitalia provides an easy distinction, due to the characteristic armature of the carina penis and the basal part of vesica, and the longer and slenderer apical part of valva (males), and the size and sclerotisation of ductus bursae (females) which differ conspicuously from those of the taxa of the *deplorata*-group (and, of course, from those of the subgenus *Amphitrota*), see the Diagnosis of the species-group.

The comparison of *S. (S.) sennina* with its sister-species, *S. (S.) morgoencola*, is given under the Diagnosis of the latter taxon.

Distribution. Siberian-Pacific. The typical subspecies has a wide range extending from the Siberian high mountains (Russian and Mongol Altai) through eastern Siberia and Mongolia towards the Pacific area (Russian Far East and Korea) and the NE part of the Tibetan plateau (China: Qinghai).

Remarks. The taxon was originally recognised by Staudinger (1896) who described it as *Agrotis deplorata* ab. *sennina*. Subsequently, Boursin (1955) clarified the status of *sennina*, retaining the authorship of Staudinger as "*Spaelotis sennina* Stgr. (Iris, IX, 1896, p. 241.)", providing also the first diagnosis of the male genitalia. This statement was applied by Poole (1989) to change the authorship of the taxon, with the argumentation "Boursin is apparently the first person to raise a Staudinger aberration to a full species. Thus the name must be credited to him". Herewith we accepted the opinion of Poole, noting that this act is generally used for the aberration names given after 1901.

Spaelotis (*Spaelotis*) *sennina tienshana* ssp. n.

(Plate 29, Fig. 7; Plate 55, Figs 37–39; gen. fig. 112)

Holotype. Female, Kazakhstan, Prov. Almaty, Elsyn-Buyrik Mt., 10 km S of Karazas, 2000 m, 26.VIII.1997, leg. Z. Varga & A. Orosz, slide No.: RL 11590f (coll. G. Ronkay).
Paratypes. **Kazakhstan**. 1 male, Prov. Taldikurgan, Altyn Emel Pass, 44°19'N, 78°55'E, 14–15.VIII.1995, leg. Gy. Fábián & Z. Varga, slide No.: RL 11648m (coll. G. Ronkay). **Kirghisia**. 1 female, Kirghiz Mts, Chon-tor valley, Ala-Medin, 3200 m, 10–20. VII.1991, leg. A.V. Nekrasov, slide No.: RL 11589f (coll. G. Ronkay); 1 female, 5 km S of Enilchek, 5–10.VIII.1994, leg. A. Saldaitis, slide No.: GYP 4210f (coll. P. Gyulai); 1 female, Kirghisia, Terskei Alatau, Sary-Dzhaz, Tash-Koro, 2800 m, 6.VII.1984, leg. A.V. Nekrasov, slide No.: RL 11669f (coll. HNHM).

Diagnosis. The populations occurring in the Tien Shan massif are generally more short-winged (wingspan 36–38 mm) and paler coloured than the typical ones, although a few similarly coloured specimens are also known in the large material of the ssp. *sennina* from Mongolia.

In the male genitalia, the ssp. *tienshana* has shorter, less tapering and less curved apical valval section than in the typical subspecies; in the females, the antrum of the new species is proportionally longer, the tubular posterior part of corpus bursae is shorter than in the ssp. *sennina*.

Distribution. Turkestanian. The ssp. *tienshana* is known from the Kazakh and Kirghis parts of the Tien Shan massif.

Spaelotis (*Spaelotis*) *morgoencola* sp. n.

(Plate 29, Fig. 8; Plate 55, Fig. 40; gen. fig. 113)

Holotype. Male, China, Prov. Sichuan, 30 km E of Garze city, 3200 m, 19–23.VII.2005; slide No.: GYP 4212 (coll. P. Gyulai).

Diagnosis. The south-eastern sister-species of *S. (S.) sennina* differs externally from the typical populations of the latter species by its paler brown colouration and more reduced forewing markings. Wingspan 39 mm.

The specific feature of *S. (S.) morgoencola* is found in the configuration of the aedeagus. It has short lateral spinose carinal edge on the right side, being disconnected with the dorsal serrate cornutus-plate. This plate is as short as the ventral cornutus-plate; these two plates are both curved and similarly strongly dentate-serrate. In *S. (S.) sennina*, the dorsal cornutus-plate is fused with the carinal serrate bar and has only a few (usually two or three) large teeth, while the ventral cornutus-plate is shorter and straight, with four-six teeth (see the gen. figs 111–113).

Distribution. SE Tibetan. The unique specimen was collected in Sichuan, at medium-high altitude.

The *demavendi* species-group

Diagnosis. The *demavendi* species-group is distinguished from the closer related *deplorata-* and *sennina*-groups by the following diagnostic features: small to medium-sized species (wingspan 35–40 mm) with slender body and relatively short and broad forewings; wing pattern most often sharply defined, noctuid pattern usually complete; clasping apparatus relatively small; juxta broadly cordiform or half-moon-shaped, dorso-medial cleft large, broad; vinculum short and broad, rather V-shaped; valvae medium-long, apically tapering, apical portion usually shortly incurved; harpe variably strong, digitiform or stick-like; aedeagus short and thick, straight; carina with huge and heavily sclerotized, serrate-dentate lateral process on right side; vesica tubular, rather horseshoe-shaped, armed by a long row of strong teeth medially and a shorter but broader, dentate cornutus-plate distally; antrum broad, with broadly U-shaped or lyriform

sclerotized ribbon at ostial edge; sclerotized posterior part of ductus bursae as broad as antrum, more or less cup-shaped; anterior part of ductus bursae much thinner and longer, membranous, ribbed-rugose; appendix bursae located at anterior edge of ductus bursae; distal part of corpus bursae membranous, tubular, somewhat ribbed at posterior third; proximal part of corpus bursae ovoid or pyriform, with four relatively broad signum-stripes.

This lineage comprises two closely related, polytypic species which are usually hardly confused with other *Spaelotis* groups except *S. scotopsis olivascens* which may be sometimes very similar to *S. defuncta korshunovi* but is smaller in size and the genitalia of the two species-groups are strikingly different. On the other hand, the two, externally easily separable species show no such key feature in the genitalia which could be used to distinguish the two species; moreover, the group features vary between the different populations of both species, making the picture even more confusing. Thus, although considering the majority of specimens, the dorso-lateral sclerotised plate of the carina penis is smaller in *S. (S.) demavendi* and less pronounced distally than in *S. (S.) scotopsis*, and the large teeth are arranged more basally (anteriorly) in the males and the two parts of ductus bursae are differently shaped in the two species, there is a considerable overlap between the two species. As *S. (S.) demavendi* and *S. (S.) scotopsis* occur partly sympatrically in certain areas of Iran, they are treated here as distinct species.

Certain populations of *S. demavendi* are somewhat similar to *Chersotis semna* (Püngeler, 1906) but the forewing veins are never whitish covered, the antemedial crossline is stronger and more medial, and the hindwing is not clear white as in *C. semna*; the genitalia of the two species are rather dissimilar.

Distribution. Trans-Palaearctic.

Spaelotis* (*Spaelotis*) *demavendi demavendi (Wagner, 1937)

(Plate 30, Figs 1–2; Plate 56, Figs 1–8; gen. fig. 114)

Rhyacia demavendi Wagner, 1937, *Zeitschrift der Arbeitsgemeinschaft Oesterreichischen Entomologen* **22**: 61. Type-locality: Iran, Elburs Mts, Demavend. Lectotype: female, here designated, in coll. NHMW.

Lectotype designation. Lectotype of *Rhyacia demavendi* Wagner, 1937, here designated: female, "TYPE" (with red letters), "Persia s. – Elburs, Rehne-Demavend, ca. 2700–3600 m, 20.–27.VII., Coll. Wagner, Wien", deposited in coll. NHMW (Plate 56, Fig. 5).

Diagnosis. Both subspecies of *S. (S.) demavendi* can be distinguished from the externally most similar *S. (S.) scotopsis* by their much paler, ochreous-whitish hindwings, and the darker forewings with more prominent paler filling of the stigmata and the double antemedial and postmedial crosslines. *Spaelotis (S.) demavendi* is easily separable from the more or less similarly sized and marked populations of *S. (S.) senna* by the differently coloured hindwings (they are dark grey-brown in the latter species) and from *S. (S.) spania* by the conspicuously more complex forewing pattern and the much lighter hindwings. Wingspan 35–40 mm.

The genitalia of *S. (S.) demavendi* differ strikingly from those of the latter two species in both sexes. The key features in the male genitalia are presence of the huge dentate-spinose lateral carinal plate and two long rows of large spines/teeth which are missing from both *S. (S.) senna* and *S. (S.) spania*; in the female genitalia, *S. (S.) demavendi* has broadly calyculate and sclerotised posterior part of ductus bursae, small appendix bursae, and long tubular posterior part of corpus bursae. In the other two species the posterior part of ductus bursae is much weaker sclerotized and differently shaped, the appendix bursae is larger and stronger ribbed or cristate, and the corpus bursae is not calabash (wine-taster) shaped, its posterior part is shorter and broader than in *S. (S.) demavendi*.

Distribution. North-western Iran. The typical populations occur in the Elburs Mts, at rather high altitudes (2300–3600 m a.s.l.); the adults are on the wing in the midsummer period.

Spaelotis (*Spaelotis*) *demavendi anthracina* ssp. n.

(Plate 30, Figs 3–4; Plate 56, Figs 9–20; gen. fig. 115)

Holotype. Male, Armenia, 40 km E of Yerevan, Geghard, 1700 m, 7–10.VII.1967, leg. Vartian (coll. NHMW).
Paratypes. **Armenia**. 1 male, with the same data as the holotype (coll. NHMW). **Turkey**. Prov. Erzincan. 2 females, Aşkale, 1700 m, 39°50'N, 40°34'E, 8.VIII.1988, leg. P. Gyulai, M. Hreblay, G. Ronkay & L. Ronkay, slide No.: RL 11637f (coll. G. Ronkay); 1 male, 5 km SW of Sakaltutan pass, 2300 m, 39°48'N, 39°11'E, 12.VII.1989, leg. P. Gyulai & M. Hreblay (coll. P. Gyulai). Prov. Agri. 1 female, 7 km W of Aydintepe, 2200 m, 39°49'N, 42°30'E, 20–22.VII.1990, leg. Gy.M. László & G. Ronkay (coll. G. Ronkay); 4 males, 5 females, 7 km E of Aydintepe, 1800 m, 39°49'N, 42°30'E, 20–16.VII.1989, leg. P. Gyulai & M. Hreblay (coll. P. Gyulai); 2 males, from the same locality, 5–6.VIII.1988, leg. M. Hreblay, P. Gyulai, G. Ronkay & L. Ronkay (coll. HNHM); 4 males, 6 females, 5 km E of Sariçan, 1800 m, 39°49'N, 42°32'E, 17–16.VII.1989, leg. P. Gyulai & M. Hreblay (coll. P. Gyulai & HNHM); 2 males, 2 females, Tahir pass, 1800 m, 39°55'N, 42°25'E, 15.VII.1989, leg. P. Gyulai & M. Hreblay (coll. P. Gyulai); 1 male, Tahir pass, 2650 m, 39°52'N, 42°21'E, 28.VII.1984, leg. H. Hacker (coll. P. Gyulai); 1 male, Küçük Agri Dagi, 20–21.VII.1993, leg. M. Róth (coll. G. Ronkay). Prov. Gümüshane. 1 male, Kop Pass, 2300 m, 19.VII.1989, leg. M. Fibiger & N. Esser (coll. G. Ronkay). Prov. Erzurum. 1 male, 1 female, 10 km S of Erzurum, 2200 m, 20.VII.1989, leg. M. Fibiger & N. Esser (coll. G. Ronkay); 3 females, 20 km E of Cat, 2300 m, 39°40'N, 41°07'E, 22–14.VII.1989, leg. P. Gyulai & M. Hreblay (coll. P. Gyulai). Prov. Kayseri. 1 male, 5 km NW of Erciyas Dagh, 2000 m, 22.VII.1986, leg. M. Fibiger, slide No.: RL 2583m (coll. G. Ronkay); 3 males, 2 females, Erciyas Dagh, 30 km N of Develi, 2300 m, 38°52'N, 35°29'E, 26.VII.1989, leg. P. Gyulai & M. Hreblay (coll. P. Gyulai). Prov. Sivas. 1 male, Gürün, 1500 m, 38°45'N, 37°12'E, 16.VII.1990, leg. Gy.M. László & G. Ronkay. Prov. Bitlis. 1 male, 2 females, Kuskunkiran pass, 2300 m, 38°17'N, 42°46'E, 22–23.VII.1989, leg. P. Gyulai & M. Hreblay (coll. P. Gyulai). **Iran**. Prov. Zanjan. 4 females, Küh-e-Sendan, 20 km E of Zanjan, 1600 m, 30.VI.–1.VII.2000 (coll. P. Gyulai & G. Ronkay); 13 males, 13 females, from the same locality, 10.VII.2000 (coll. P. Gyulai & G. Ronkay); 4 males, 1 female, W Alborz range, Tarom village, 20 km NE of Zanjan, 2350 m, 15–16.VII.2010, leg. P. Gyulai & A. Garai (coll. P. Gyulai). Prov. Sharqi. 1 female, 45 km W of Miyane, 1600 m, 7–8.IX.2000, leg. P. Gyulai & A. Garai (coll. P. Gyulai). Prov. Yazd. 1 male, 3 females, Qohrud, Bonkahar, Aliabad, 2500 m, 3.VII.2005, leg. Hácz, Juhász & Petrányi (coll. P. Gyulai). Prov. Esfahan. 1 female, Qohrud Mts, Qamshar, 2600–2800 m, 5–6.VII.2005, leg. Hácz, Juhász & Petrányi (coll. P. Gyulai); 2 females, Zagros Mts, Golestan Kuh, 10 km S of Khansar, 14–15.VII.2010, leg. P. Gyulai & A. Garai, slide No.: GYP 4227f (coll. P. Gyulai). Prov. Boyerahmad-va-Kohgiluyeh. 10 males, 10 females, SE. Zagros Mts, Kuh-e-Dena, near Bijan pass, 6 km N of Sisakht, 3000 m, 13–14.VII.2010, leg. P. Gyulai & A. Garai (coll. P. Gyulai). Prov. Fars. 2 males, 1 female, on the road between Ardekan and Talochosroe, Comée (Barm-i-Firus), 3750 m, 12–20.VII.1937, leg. Brandt (coll. NRS); 1 female, on the road between Ardekan and Talochosroe, Comée, 3750 m, VII.1937, Brandt (coll. NRS); 1 female, Iran, Fars, on the road between Ardekan and Talochosroe, Comée (Barm-i-Firus), ca. 2600 m, VII.1937, leg. F. Brandt (coll. NRS); 2 males, "Comée", 1 male, "3" (coll. NRS).

Diagnosis. The new subspecies differs from the typical ssp. *demavendi* by its darker, deep grey-brown or blackish-brown forewings with stronger crosslines, darker covering on veins and the paler, more contrasting ochreous-whitish filling of the stigmata and the double crosslines. The hindwings are also lighter, with somewhat stronger grey-brown marginal area and veins; the brownish hindwing suffusion may be rather strong in the south-eastern populations. Wingspan 35–40 mm.

In the male genitalia, the ssp. *anthracina* has smaller and less dentate carinal plate and longer row of cornuti in the inner curve of vesica; in the female genitalia, the posterior part of ductus bursae is broader and the large lobe at left side is more rounded, less funnel-like than in the nominotypical subspecies.

A small population of *S. (S.) demavendi* is known from the Khorassan region which is somewhat different from the other two subspecies but the available material in insufficient for its proper taxonomic relegation.

Distribution. Anatolian-Iranian. The range of the ssp. *anthracina* is considerably larger than that of the typical ssp. *demavendi*, extending from eastern and north-eastern Turkey and Armenia to western and Central Iran. This taxon lives in the higher altitude mountain steppes and semi-deserts; the moths fly in the midsummer period.

Spaelotis (*Spaelotis*) *scotopsis scotopsis* Boursin, 1963

(Plate 30, Figs 5–6; Plate 56, Figs 21–28; gen. fig. 116)

Spaelotis scotopsis Boursin, 1963, *Bulletin Mensuel de la Société Linnéenne de Lyon* **32** (10): 295. Type-locality: Afghanistan, Paghman Mts, 2100 m, 30 km NW of Kabul. Holotype: male, in coll. NHMW.

Diagnosis. All populations of *S. (S.) scotopsis* differ from *S. (S.) demavendi* by their paler forewing ground colour, less distinct crosslines and darker ochreous-grey or ochreous-brown shaded hindwings; from *S. (S.) spania* and *S. (S.) senna* by their somewhat broader forewings with less convex outer margin, different elements of the dark noctuid pattern and the lighter hindwings. Wingspan 35–38 mm.

The differences between the genitalia of *S. (S.) scotopsis*, *S. (S.) spania* and *S. (S.) senna* are the same as between *S. (S.) demavendi* and the other two species. In the males, *S. (S.) scotopsis* has robust, strongly dentate dorso-lateral carinal plate (the two other species have smooth carinal surfaces), and the vesica is armed by two rows of rather large, tooth-like cornuti (*S. (S.) spania* has a single cornutus in the vesica while in *S. (S.) senna* the armature of the vesica is reduced to a minutely dentate-scobinate plate). In the females, the posterior part of ductus bursae is strongly dilated and sclerotised in *S. (S.) scotopsis*, and the appendix bursae is small, subconical, membranous-rugose; in the two other species the posterior part of ductus bursae is mainly membranous, more or less funnel-like, and the appendix bursae is larger (*senna*) or much larger (*spania*), more cristate-ribbed.

Distribution. The nominotypical subspecies occurs in Afghanistan, in the Central and eastern Hindukush. Two, somewhat different, more unicolorous and less distinctly patterned specimens are known from the Tadjik Pamir, this population is also associated here with the ssp. *scotopsis*. A xeromontane species, inhabiting the high altitude mountain steppes and semi-deserts; the adults are on the wing in July-August.

Spaelotis (*Spaelotis*) *scotopsis perscripta* ssp. n.

(Plate 30, Figs 7–8; Plate 57, Figs 9–16; gen. fig. 117)

Holotype. Male, Kirghisia, Kara Balta, 1450 m, 8.VII.1996, leg. I. Plyushch (coll. P. Gyulai).
Paratypes. **Kirghisia**. 1 female, Kirgiz Mts, Issyk Ata River, 1900 m, 26.VII.–10.VIII.1995, leg. Toropov (coll. P. Gyulai); 1 female, Alai Mts, Tengizbai river, 2200 m, 27.VII.1994, leg. Toropov (coll. P. Gyulai). **Uzbekistan**. 1 female, 150 km SE of Tashkent, Kamchik Pass, 7.VII.1991, leg. K. Gaskó (coll. P. Gyulai). **Kazakhstan**. 2 males, 1 female, Prov. Taldikurgan, Altyn Emel pass, 44°19'N, 78°55'E, 14–15.VIII.1995, leg. Gy. Fábián & Z. Varga (coll. G. Ronkay & Z. Varga); 3 males, 6 females, Karatau Mts, Tshymkent region, 650 m, 28.VI.–11.VII.1994, leg. I. Plyushch, slide No.: GYP 4206f (coll. P. Gyulai); 1 male, Prov. Almaty, 9 km N of Kegen, Kegen pass, 1700 m, 43°10'N, 79°13'E, 18.VII.2009, slide No.: GYP 4216m (coll. P. Gyulai). Slide Nos: VZ 8871m, VZ 8872m; RL 11639f.

Diagnosis. The north-eastern populations differ from the typical ssp. *scotopsis* by their somewhat paler ochreous-grey ground colour, sharper defined and most often less double antemedial and postmedial crosslines, and lighter, more ochreous shaded greyish hindwings. Wingspan 33–38 mm.

In the male genitalia, the large carinal plate is more evenly dentated in the ssp. *perscripta* than in the ssp. *scotopsis*, and the group of cornuti in the inner curve of vesica is more reduced; in the female genitalia, the ssp. *perscripta* has the narrowest and proximally most funnel-like posterior part and the shortest tubular anterior part of ductus bursae within the subspecies of *S. (S.) scotopsis*.

Distribution. This subspecies occurs in Kazakhstan, Uzbekistan and Kirghisia, in the western and central parts of the Tien Shan massif. Its area extends from the Karatau Mts (Kazakhstan) and the Kuramin Mts (Uzbekistan) to the Taldy-Kurgan area in the Central Tien Shan.

Spaelotis (*Spaelotis*) *scotopsis olivascens* ssp. n.

(Plate 31, Figs 1–2; Plate 56, Figs 37–44; gen. fig. 118)

Holotype. Male, Turkmenistan, Kopet-Dagh Mts, Dushak, 2200 m, 1–2.X.1991, leg. A. Podlussány, L. Ronkay & Z. Varga, slide No.: RL 11554m (coll. G. Ronkay).
Paratypes. **Turkmenistan**. 1 male, with the same data as the holotype (coll. G. Ronkay); 1 male, 2 females, Dushak, 2400 m, 37°57'N, 57°54'E, 9–10.VIII.1992, leg. M. Hreblay, Gy.M. László & G. Ronkay (coll. P. Gyulai & G. Ronkay); 3 males, 3 females, Kopet-Dagh Mts, 6 km S of Ipay-Kala, 1600 m, 38°17'N, 57°07'E, 16–23.VIII.1992, leg. M. Hreblay, Gy.M. László & G. Ronkay (coll. G. Ronkay); 3 males, 2 females, Kopet-Dagh Mts, 5 km S of Chuli, 700–800 m, 37°56'N, 58°01'E, 5.VIII.1992, leg. M. Hreblay, Gy.M. László & G. Ronkay (coll. P. Gyulai & G. Ronkay). Slide Nos: RL 11454m, RL 11455m, RL 11555f. **Iran**. Prov. Khorasan. 3 males, 5 females, Kopet-Dagh, 2300 m, 10 km N of Jevenly, Tandure NP, 27–28.VIII.2000, leg. P. Gyulai & A. Garai (coll. P. Gyulai); 2 males, 7 females, Kopet-Dagh, 10 km N of Jevenly, Tandure NP, 2300 m, 9–10.VII.2010, leg. P. Gyulai & A. Garai (coll. P. Gyulai); 1 female, Kuh-e- Binaloud, 40 km S of Mashad, near Moghan, 2000 m, 8–9.VII.2010, leg. P. Gyulai & A. Garai (coll. P. Gyulai); 1 male, 3 females, Kopet-Dagh, 80 km NE of Quacan, 2000 m, 14–15.VII.2000 (coll. P. Gyulai); 2 males, 2 females, Kouh-i-Binaloud (Meched), 3000–3300 m, 20–30.VII.1938, leg. F. Brandt (coll. NRS); 1 male, "Bnld" [= Binaloud] (coll. NRS); 2 males, 1 female, Kouh-i-Binaloud (Meched), 1800 m, 1938, leg. F. Brandt (coll. NRS). Prov. Semnan. 1 male, 2 females, SE. Alborz, 8 km S of Ali Chesmeh, near Damghan, 6–7.VII.2010, leg. P. Gyulai & A. Garai (coll. P. Gyulai).

Diagnosis. The ssp. *olivascens* is the externally most distant subspecies of *S. (S.) scotopsis* due to its pale, slate-grey shaded olive-brownish forewings with reduced, often obsolescent crosslines and rather diffuse blackish-grey basal dash and intracellular dark patches, and the silky ochreous-grey hindwings. This external appearance is often confusingly similar to that of *S. (S.) defuncta korshunovi* but the new subspecies of *S. (S.) scotopsis* is on average smaller in size (wingspan 34–37 mm) and the elements of the dark forewing pattern are more obsolescent. The study of the genitalia provides an easy separation of the two taxa, due to the striking differences between the two species in both sexes, see the gen. figs 102 and 118.

In the male genitalia, this subspecies has the strongest dentation of the carinal plate and the largest cornuti area in the inner curve of vesica within *S. (S.) scotopsis* while the female genitalia are most similar to those of the typical ssp. *scotopsis* but having longer and finer signa and somewhat longer, more cup-shaped posterior part of ductus bursae.

Distribution. The subspecies is restricted to both sides of the Kopet-Dagh Mts, occurring in also in the Semnan Mts in Iran. It lives in the highest altitude rocky grasslands, shrubby slopes and montane steppes; the moths are on the wing from July to October.

Spaelotis (*Spaelotis*) *scotopsis pallidifusca* ssp. n.

(Plate 31, Figs 3–4; Plate 56, Figs 29–36; gen. fig. 119)

Holotype. Male, Iran, Baluchistan, Kouh-i-Taftan (Khach), 2500 m, 3.VI.1938, leg. F. Brandt, slide No.: RL 11381m (coll. NHMW).
Paratypes. **Iran**. Baluchistan. 101 specimens from the same locality, 2.VI.1938 and "end of June 1938", leg. F. Brandt (coll. NRS); 2 females, Kouh-i-Taftan (Khach), 3000 m, 30.VI.1938, leg. F. Brandt, slide No.: RL 11380f (coll. NHMW and NRS).

Diagnosis. This subspecies is the closest related taxon of the typical ssp. *scotopsis*. It can be distinguished from the typical race by its on average larger size (wingspan 37–40 mm), somewhat broader forewings with paler and more variegated ground colour, more complex but less distinct dark markings, and the remarkably paler ochreous-grey hindwings.

The male genitalia of the ssp. *pallidifusca* are characterised by the long row of cornuti on the outer curve of vesica, being apparently the longest within the species; the female genitalia by the very broad and rather short posterior part of ductus bursae, similarly to that of the ssp. *hosseinrajaeii*.

Distribution. This subspecies is restricted to the high mountainous ranges of Iranian Baluchistan. It has been found at the medium-high regions of the Taftan Mts (between 2500–3000 m); all specimens of the large type-series were collected in June.

Spaelotis (*Spaelotis*) *scotopsis hosseinrajaeii* ssp. n.

(Plate 31, Figs 5–6; Plate 57, Figs 1–8; gen. fig. 120)

Holotype. Male, Iran, Prov. Fars, Khuh-e-Bul, 3700–4100 m, 13.VII.2001, leg. S. Nykl (coll. P. Gyulai).
Paratypes. Iran. Prov. Fars. 3 males, 1 female, Iran, Prov. Fars, Khuh-e-Bul, 3700–4100 m, 13.VII.2001, leg. S. Nykl, slide Nos: GYP 4214m, GYP 4232f (coll. P. Gyulai). Prov. Esfahan. 2 males, Fereidun Shahr, 3400 m, 30.VII.–1.VIII.2001, leg S. Nykl, slide No.: RL 11638m (coll. P. Gyulai & G. Ronkay); 2 females, Khounsar, 3100 m, 25.VI.2001, leg. S. Nykl (coll. P. Gyulai); 13 specimens, "vicinity of Shiraz, 1600 m, 1937, leg. F. Brandt" (coll. NRS); 22 specimens, on the road Shiraz and Kazeroun, Fort Mian Kotal, 2000 m, 1937, leg. F. Brandt (NRS).

Diagnosis. The westernmost subspecies of *S. (S.) scotopsis* resembles mostly *S. (S.) demavendi* by its only slightly darker, usually pale ochreous-grey hindwings with fine but visible marginal suffusion. It differs from the sympatrically occurring southern populations of *S. (S.) demavendi anthracina* by its generally larger size, broader forewings with paler ground colour, lighter costal stripe and less contrasting pattern. Wingspan 33–38 mm.

The male genitalia of ssp. *hosseinrajaeii* differ from the closest related ssp. *pallidifusca* by its broader but shorter valvae (especially its apical part is shorter and less curved), and the shorter row of cornuti on the outer curve of vesica. The female genitalia of the two subspecies are very similar but the posterior section of ductus bursae is somewhat less dilated, with more evenly rounded lateral lobe at left side, and the anterior part of ductus bursae is more constricted at junction to corpus bursae.

Distribution. The ssp. *hosseinrajaeii* is distributed in the Zaghros Mts in the provinces Esfahan and Fars. It occurs in the highest altitudes of the given area, between 3100–4100 m elevations; the moths are on the wing from June to the beginning of August.

Etymology. The new subspecies is dedicated to our friend, Hossein Rajaei, expert of the Palaearctic Geometridae.

The *nyctophasma* species-group

Diagnosis. A monobasic lineage with a number of features in the genitalia the combination of which is unique within the genus. The group features of the *nyctophasma*-group are as follows: medium-sized species (wingspan 42–46 mm) with rather stubby body and broad forewings; forewings reddish shaded light brown, with fine dark markings; clasping apparatus relatively small but strongly sclerotized. In the male genitalia, uncus short, rather strong; juxta broadly U-shaped; vinculum long, V-shaped; valvae narrow, elongate, apical third long and slender, not incurved apically; basal costal edge strongly sclerotized and prominently produced towards transtilla; harpe very long, finely arched, located at middle of valva; aedeagus short and thick, straight, carina somewhat stronger sclerotized but without teeth or process; and the vesica is short, globular, armed by two strong, dentate cornutus-plates. In the female genitalia, antrum broad, sclerotized ostial ribbon broad, strong; posterior part of ductus bursae calyculate, large and heavily though unequally sclerotized and partly ribbed-cristate; anterior part of ductus bursae very short, membranous; appendix bursae small, membranous, located at anterior end of ductus bursae; distal part of corpus bursae weakly membranous, tubular, anterior part (fundus) pyriform; and the signum-stripes are weakly sclerotized but broad and long.

Distribution. Central Asiatic.

Spaelotis* (*Spaelotis*) *nyctophasma Hacker, 1990

(Plate 26, Figs 7–8; Plate 53, Figs 11–18; gen. fig. 121)

Spaelotis nyctophasma Hacker, 1990, *Esperiana* **1**: 246, pl. B, fig. 5; gen. fig. 9. Type-locality: Pakistan, Himalaya Mts, Babusar Pass, North slope, 1650 m. Holotype: male, in coll. ZSM.

Diagnosis. This species has a very characteristic external appearance, being similar to certain smaller and unicolorously red-brownish coloured specimens of *S. ravida stabulorum*. *Spaelotis (S.) nyctophasma* has, however, somewhat broader wings with finer markings, better defined orbicular and reniform stigmata, and darker, more concolorous greyish-brown hindwings. It differs from the other externally somewhat similar species, *S. (S.) sinophysa*, by its narrower, darker, more reddish-brown coloured forewings with stronger crosslines, dark outlined orbicular and reniform stigmata and the long blackish basal dash.

The genitalia are conspicuously different from those of the two externally similar species in both sexes. The key features of the male genitalia are the wedge-shaped valvae with very long harpes, the smooth carinal sclerotisation on both surfaces and the small, globular vesica with two strongly sclerotised, dentate cornutus plates; those of the female genitalia are the large, heavily sclerotised and more or less calyciform posterior section of ductus bursae and the long, narrowly pear-shaped corpus bursae with four long but weakly sclerotised signa.

Distribution. The species has two, rather disjunct areas in Pakistan and one in India. The core area of *S. (S.) nyctophasma* lies in the south-western Himalayas (Pakistan: Nanga Parbat area, Kaghan valley, Murree Hills; India: Himachal Pradesh, Rohtang Pass), a more western area fragment is known from the Pakistani Baluchistan (Ziarat). The species inhabits the open wooded habitats at medium-high altitudes; the flight period appears as very long, extending from May to October.

The ***spania*** species-group

Diagnosis. The *spania*-group is closely related to the more westerly distributed *senna*-group (they occur sympatrically in Iran and Turkmenistan). The species of the two lineages are usually easily separable by their external features (*S. baltistana* and most populations of *S. spania* are generally more gracile and the forewings are less intensely marked than all known races of *S. senna*) but the strongly marked western subspecies of *S. spania*, *S. spania turcomana*, is often hardly distinguished from *S. senna ipaykala* and *S. senna iranica* without checking the genitalia of the problematic specimens.

The differences between the two lineages are clearly demonstrated in the different configuration of the vesica and certain features of the female genitalia (e.g. the sclerotization of ductus bursae and appendix bursae, and the strength of the signa). In the males, the *spania*-group has much longer and medially twisted vesica, with a large, sclerotized cornutus (the vesica is smaller in the *senna*-line and the armature is reduced to a distally located, minutely dentate patch). In the females, the ductus bursae is shorter and weaker, less sclerotized, the appendix bursae is proportionally larger, basally and laterally more sclerotized and ribbed, and the signum stripes are weaker and shorter, often barely traceable (the anterior part of ductus bursae is much stronger ribbed in the *senna*-group, the appendix bursae is rugose-ribbed but less sclerotized, and the signa are much stronger and longer, the lateral ones usually interrupted).

The general characterisation of the *spania*-group is as follows: medium-sized species (wingspan 34–41 mm) with relatively strong body and narrow, dark coloured wings; noctuid pattern complete but variably strong, often diffuse or obsolescent; clasping apparatus small but strongly sclerotized; uncus thin, short; juxta cordiform; vinculum rather short, V-shaped; valva relatively short, apical part less strongly tapering, apical portion arched and slightly incurved; sacculus broad, broader than basal dorsal part of valva; harpe long, straight, stick-like; aedeagus cylindrical, slender and arched; carina with stronger ventral sclerotization but without teeth or process; vesica large, as long or longer than aedeagus, inflated and medially twist-

ed; armature of vesica modified into an acute, basally smooth or dentate, cornutus; ovipositor long and finely pointed, apophyses posteriores relatively short, apophyses anteriores long, slender; antrum broad, with fine, arched ostial ring; posterior part of ductus bursae infundibular, weakly sclerotized; anterior part of ductus bursae relatively short, tubular and wrinkled, with dorso-lateral pouch; appendix bursae large, partly sclerotized and strongly rugose-ribbed, its apical section narrowly conical or tubular; corpus bursae elliptical-ovoid or discoidal, with short tubular distal section; signum-stripes fine, relatively short, often poorly visible.

Distribution. Central Asiatic.

Spaelotis* (*Spaelotis*) *baltistana Hacker & Peks, 1992

(Plate 31, Figs 7–8; Plate 57, Figs 17–24; gen. fig. 122)

Spaelotis baltistana Hacker & Peks, 1992, *Esperiana* **3**: 154, gen. fig. 10, in *Esperiana* **1**. Type-locality: Pakistan, Himalaya Mts, Babusar Pass, North slope, 1650 m. Holotype: male, in coll. ZSM.

Diagnosis. The species is confusingly similar to the partly sympatrically occurring *S. (S.) spania dardistana*, and although the hindwings of *S. (S.) baltistana* are most often darker and more concolorous, this feature is often insufficient for the satisfactory identification. Wingspan 35–39 mm.

In the male genitalia, the two species differ in the structure of the cornutus of the vesica which is slightly bulbed and smoothly thorn-like in *S. (S.) baltistana*, without lateral crest or smaller dentation which is always present in *S. (S.) spania*. In the female genitalia of *S. (S.) baltistana* the anterior part of ductus bursae is narrower and the appendix bursae is larger and proximo-laterally more lobate than in *S. (S.) spania*.

Distribution. Western Himalayan. The area of the species is restricted to the lower and medium-high altitude regions of the Pakistani Himalayas and the Karakoram (Baltistan, Kaghan valley, Swat: Gabral valley).

Spaelotis* (*Spaelotis*) *spania spania (Püngeler, 1906) **stat. rev.**

(Plate 32, Figs 1–2; Plate 57, Figs 25–40; gen. fig. 123)

Agrotis spania Püngeler, 1906, *Deutsche Entomologische Zeitschrift. Gesellschaft Iris zu Dresden* **19**: 84, pl. 6, fig. 9. Type-locality: [Kirghisia] Dsharkent. Holotype: female, in coll. ZMHU.

Diagnosis. A widespread polytypical species, with externally often conspicuously different populations. The peripheral populations in the Himalayas and the Kopet-Dagh are distinguished here as separate geographic subspecies while the Central Asiatic ones (which are, otherwise, locally often also remarkably different from each other) are unified into the typical ssp. *spania*. It is important to mention that this latter assembly is most probably a complex of distinct, stenochorous subspecies but further studies and more extensive material is necessary for their satisfactory delimitation.

The ssp. *spania* differs externally from *S. (S.) baltistana* and *S. (S.) spania dardistana* by its paler hindwings and more intense, better defined crosslines and stigmata; the best differential features between *S. (S.) spania spania* and the eastern populations of *S. (S.) senna* are the considerably paler hindwing and the more elongated forewing. It differs from the partly sympatrically occurring *S. (S.) sennina* by its narrower forewings and more complex and most often much sharper defined noctuid pattern, from the species of the *deplorata*-group by its smaller size and different wing shape, darker hindwings and different details of the forewing pattern. Finally, it can be distinguished from the western subspecies, ssp. *turcomana*, by its somewhat smaller size, paler hindwings and less distinct forewing pattern. Wingspan 35–41 mm.

The genitalia of *S. (S.) spania* are very similar to *S. (S.) baltistana* in both sexes, but in the males the cornutus of the vesica is always dentate basally (and sometimes also laterally); in the females the anterior

(membranous) part of ductus bursae is broader funnel-like and the appendix bursae is smaller with flat proximo-lateral lobe. The other externally similar species have conspicuously different genitalia; see the comparison with the *senna*-group above in the Diagnosis of the *spania*-group.

Distribution. Central Asiatic. The species occurs in the mountainous regions of the Hissaro-Pamir, the central and eastern Tien Shan, the eastern Hindukush and the southern Altai mountain systems. The flight period begins rather early in the year, in May-June.

Spaelotis (*Spaelotis*) *spania dardistana* Hacker & Peks, 1992 **stat. rev.**

(Plate 32, Figs 3–4; Plate 58, Figs 1–8; gen. fig. 124)

Spaelotis dardistana Hacker & Peks, 1992, *Esperiana* **3**: 154, gen. fig. 8, in *Esperiana* **1**. Type-locality: Pakistan, Karakoram Mts, Hunza, Nilt, 2000 m. Holotype: male, in coll. ZSM.

Diagnosis. The Pakistani subspecies of *S. (S.) spania* differs from the other populations of the species by its generally darker colouration and less prominent forewing markings. It is most similar externally to its sister-species, *S. (S.) baltistana*, the only recognisable difference is its somewhat paler and less concolorous hindwing. The dissection of the specimens is necessary for the proper separation of the two species; the differences between them are discussed above, in the Diagnosis of the ssp. *spania*.

Distribution. The ssp. *dardistana* is known to occur in the Pakistani part of the eastern Hindukush (no confirmed record is known from eastern Afghanistan, the specimens from the Paghman area are assigned to a rather distinct population being closer to the ssp. *turcomana*) and the western part of the Karakoram Mts (Hunza, Gilgit). The known localities display a wide altitudinal range between 2000–3500 m; the moths are on the wing from June to October.

Spaelotis (*Spaelotis*) *spania turcomana* **ssp. n.**

(Plate 32, Figs 5–6; Plate 58, Figs 11–20; gen. fig. 125)

Holotype. Female, Turkmenistan, Kopet-Dagh Mts, Ipay-Kala, valley of the rivers Ipay-Kala and Point-Kala, 800–1500 m, 38°13'N, 59°54'E, 30.VI.–4.VII.1992, Gy. Fábián, B. Herczig, A. Podlussány & Z. Varga (coll. G. Ronkay).
Paratypes. **Turkmenistan**. Kopet-Dagh Mts. 1 specimen, Ipay-Kala, valley of the rivers Ipay-Kala and Point-Kala, 800–1500 m, 38°13'N, 59°54'E, 30 VI.–4.VII.1992, leg. Gy. Fábián, B. Herczig, A. Podlussány & Z. Varga (coll. G. Ronkay); 11 specimens, Dushak, 2300 m, 6–8.VII.1992, leg. Gy. Fábián, B. Herczig, A. Podlussány & Z. Varga; slide Nos: RL 11553m, 11558m, 11587m; RL 11563f (coll. G. Ronkay); 28 specimens, Dushak, 1800 m, 23. VI.1992 and 30.VI.1992, leg. Danilevsky, slide Nos RL 11661f, RL 11663m, RL 11664m, RL 11665f, RL 11666m, RL 11667m (coll. P. Gyulai & HNHM); 1 female, 1 female, Karayalchi valley, 20 km E of Nochur, 800 m, 38°23'N, 57°12'E, 4.X.1991, leg. A. Podlussány, L. Ronkay & Z. Varga (coll. G. Ronkay). **Iran**. Prov. Khorasan. 1 male, 1 female, Kopet-Dagh, 70 km NE of Quacan, 2200 m, 12.V.2001 (coll. P. Gyulai); 3 males, 1 female, Binaloud Mts, 40 km SW of Mashad, Moghan-Pivejan site, 2000–2500 m, 6–7.VI.2001 (coll. P. Gyulai) 1 female, Mashad, 22.VII.1943, leg. Y. Shchetkin, slide No.: GYP 4247f (coll. P. Gyulai); 2 males, 1 female, Kouh-i-Binaloud (Meched), 1800 m, 1938, leg. F. Brandt (coll. NRS). Prov. Golestan. 14 males, 4 females, E. Elburz Mts, Khosyelaq, 2100 m, 3–6.VI.2010, slide No.: GYP 4207m (coll. P. Gyulai). Prov. Semnan. 1 female, 20 km W of Meyamei, 1300 m, 36°23'N, 55°29'E, 9.V.2001 (coll. G. Ronkay). Prov. Mazandaran. 1 male, C. Alborz, 2200 m, pass N of Geshlagh, 29.VIII.2000, leg. P. Gyulai & A. Garai, slide No.: GYP 4242m (coll. P. Gyulai).

Diagnosis. The populations occurring in the Kopet-Dagh Mts, the Binaloud Mts, and the eastern Elburs region are characterised by their long and narrow forewings with sharply defined crosslines and stigmata. A similar population lives in the Kugitang-Tau Mts and the few eastern Afghani specimens are also closer to this subspecies than to the other two races. Finally, a specimen of *S. (S.) spania* is known from the Central Elburs Mts (Geshlagh pass; the westernmost known locality of the species); the subspecific identity of this population is still to be clarified.

Certain specimens of the ssp. *turcomana* are very similar externally to the paler coloured specimens of the sympatrically occurring *S. (S.) senna ipaykala* but these two taxa are easily separable by the study of the genitalia (see the gen. figs 103, 125 and 130). The smaller examples of *S. (S.) defuncta persica* are also

similar externally to *S. (S.) spania turcomana* but have lighter hindwings than those of the new subspecies. Interestingly, *S. (S.) defuncta korshunovi*, which occurs sympatrically with *S. (S.) spania turcomana* in the Kopet-Dagh Mts, is more similar externally to *S. (S.) scotopsis olivascens* than to *S. (S.) spania turcomana* and *S. (S.) defuncta persica*.

Distribution. The western subspecies of *S. (S.) spania* occurs in north-eastern Iran and the Kopet-Dagh Mts in Turkmenistan.

The ***senna*** species-group

Diagnosis. The Asiatic taxa of the *senna*-group are sometimes hardly distinguished externally from the western subspecies of *S. spania* but the study of the genitalia provides an easy identification. The diagnostic features of the *senna*-group, besides other, smaller differences, are the configuration of the vesica with the reduced cornutus-plate in the males; the stronger sclerotized and ribbed anterior part of ductus bursae, the weaker sclerotized appendix bursae and the stronger signa in the females.

The group features of this lineage are the following: usually medium-sized moths (wingspan 36–42 mm) with rather strong body and broad forewings; wing pattern sharply defined, ground colour of both wings dark brown or grey-brown; juxta shield-like or cordiform; vinculum shortly V-shaped; valvae flattened, apical portion not or only slightly incurved; harpe medium-long or long, stick-like; aedeagus tubular, arched, with stronger ventral carinal plate but without teeth or process; vesica relatively long, basally inflated; armature of vesica reduced to a most often weakly sclerotized, finely dentate plate; ovipositor long, subconical, apophyses posteriores long, longer than in the *spania*-group; antrum broad, with wide sclerotized ostial margin; posterior part of ductus bursae membranous, weakly rugose; anterior part considerably longer and stronger ribbed, especially along the junction to appendix bursae; antero-lateral pouch usually well-developed; appendix bursae large, broadly conical, strongly ribbed-wrinkled but not sclerotized; corpus bursae pear-shaped, with relatively short tapering distal section; signa prominent, long and strong, lateral ones often interrupted.

Distribution. Western Palaearctic.

Spaelotis* (*Spaelotis*) *senna senna (Freyer, 1829)

(Plate 32, Figs 7–8; Plate 58, Figs 21–32; gen. fig. 126)

Noctua senna Freyer, 1829, *Beiträge zur Geschichte Europäischer Schmetterlinge* **3**: 55. Type-locality: no locality given (Europe).

Synonymy

Noctua senna Geyer, 1832, *in* Hübner, *Sammlung Europäischer Schmetterlinge* **4**: pl. 164, figs 771–772. Type-locality: Germany; Switzerland. A junior primary homonym of *Noctua senna* Freyer, 1829;

Rhyacia senna einsenbergeri Hartig, 1934, *Bollettino della Societa Entomologica Italiana* **66**: 230. Type-locality: Italy: Verona, Monti Lessini; Pagnella, Madonna di Campiglio near Trentino.

Diagnosis. An easily recognisable species, only the easternmost populations can be confused with other *Spaelotis* taxa. It resembles also, due to its smaller size and sharply defined forewing pattern, certain *Rhyacia* and *Chersotis* species but is different from all of them by the combination of the dark brown hindwing and the details of the forewing markings.

The subspecific splitting of the species is rather difficult, because of the relatively large intra-populational variation and the large but strongly fragmented area, especially in the western part of the Mediterranean. The populations occurring in the Alps and in the peninsular Italy are assigned to the typical ssp. *senna* (including *einsenbergeri*), but this statement is rather tentative and the subsequent, complex

morphological and molecular taxonomic studies may prove the distinctness of (some of) these populations from the ssp. *senna*.

Distribution. Holo-Mediterranean-Iranian. The nominotypical subspecies of *S. (S.) senna* occurs locally throughout the Alps and the Apennines, Sardinia and Corsica.

Spaelotis* (*Spaelotis*) *senna violetta (Schawerda, 1934)

(Plate 33, Figs 1–2; Plate 58, Figs 35–40; gen. fig. 127)

Rhyacia senna var. *violetta* Schawerda, 1934, *Internationale Entomologische Zeitschrift* **28**: 426. Type-locality: Spain, Teruel, Albarracin. Lectotype: female, here designated, in coll. NHMW.

Lectotype designation. Lectotype of *Rhyacia senna* var. *violetta* Schawerda, 1934, here designated: female, "*R. senna var. violetta* Schaw. | Cotype Dr. Schawerda" (pink label), "Hispan.-Aragon., Albarracin, 27.VIII.1927, Schwingenschuss", deposited in coll. NHMW (Plate 58, Fig. 35).

Diagnosis. The populations occurring in the Iberian peninsula differ from those of the ssp. *senna* by their rather uniform (less variegated), violet-grey to dark violet-brown irrorated grey-brown forewings (this feature is well visible on the fresh specimens but usually faded on the old ones), with less prominent crosslines and stigmata, especially the light filling of the double crosslines is weaker, and the otherwise dark grey-brown hindwings are also somewhat paler than in the nominotypical race. Wingspan 36–40 mm.

Distribution. The ssp. *violetta* occurs in the Iberian Peninsula.

Remarks. The few examples known from the High Atlas differ from the ssp. *violetta* by their generally smaller size, paler colouration and more diffuse pattern, but the material is insufficient for a more detailed microtaxonomic analysis.

Spaelotis* (*Spaelotis*) *senna contorta (Rebel & Zerny, 1931)

(Plate 33, Figs 3–4; Plate 59, Figs 1–12; gen. fig. 128)

Agrotis contorta Rebel & Zerny, 1931, *Denkschriften der Akademie der Wissenschaften in Wien. Mathematische-Naturwissenschaftliche Klasse* **103**: 89, fig. 21. Type-locality: Albania, Pashtrik. Lectotype: female, here designated, in coll. NHMW.

Lectotype designation. Lectotype of *Agrotis contorta* Rebel & Zerny, 1931, here designated: female, "Type" (pink label), "Alban. Exped., Pashtrik, 7–15.VIII.'18.", "Agrotis contorta Rbl. & Zerny. Type ♀" (red letters, with the handwriting of Rebel), deposited in coll. NHMW (Plate 59, Fig. 5).

Diagnosis. The populations of the northern and central parts of the Balkans are regularly more unicolorous than the typical subspecies, with only partly double and less sharply defined crosslines, most often without paler filling between the lines of the double crosslines and in and around the stigmata. Interestingly, the lectotype female specimen from Albania is one of the strongest marked individuals of the ssp. *contorta*. Wingspan 32–39 mm.

Distribution. Northern and Central Balkans. The ssp. *contorta* has been recorded from the countries of the former Yugoslavia, Albania, Bulgaria, and northern Greece.

Spaelotis* (*Spaelotis*) *senna iranica (Draudt, 1938)

(Plate 33, Figs 5–6; Plate 59, Figs 13–28; gen. fig. 129)

Agrotis senna iranica Draudt, 1938, *Mitteilungen der Münchner Entomologischen Gesellschaft* **28**: 29. Type-locality: [Iran] Elburs Mts, Vandarban. Neotype: male, North Iran, Demavend, here designated, in coll. NHMW.

Neotype designation. Neotype of *Agrotis senna iranica* Draudt, 1938, here designated: male, N Iran, Elburs Mts, Demavend, 25–26.IX.1965, leg. E. Vartian & A. Vartian; slide No.: RL 11402m; deposited in the Vartian collection (coll. NHMW) (Plate 59, Fig. 13).

Diagnosis. This subspecies is characterised by its rather narrow, generally dark blackish-brown irrorated dark grey-brown forewings, the intense pale ochreous-grey filling of the double crosslines and the orbicular and reniform stigmata, and the relatively strong ochreous-grey suffusion of the brown hindwings. It is less variegated and darker coloured than the most easterly distributed ssp. *ipaykala*. It can be distinguished from the sympatrically occurring *S. (S.) defuncta persica* by its on average smaller size (wingspan 35–41 mm), darker forewings with stronger, more double antemedial and postmedial crosslines and the darker hindwings; the genitalia of the two species are strikingly different in both sexes.

Distribution. Anatolian-Iranian. This subspecies is known from Turkey, Armenia, Georgia, Azerbaijan and the northern and southern parts of Iran, except the Kopet-Dagh area, the SE Elburs (prov. Golestan) and the Binaloud Mts.

Spaelotis (*Spaelotis*) *senna ipaykala* ssp. n.

(Plate 33, Figs 7–8; Plate 59, Figs 29–40; gen. fig. 130)

Holotype. Male, Turkmenistan, Kopet-Dagh Mts, Dushak, 2300 m, 6–8.VII.1992, leg. Gy. Fábián, B. Herczig, A. Podlussány & Z. Varga (coll. G. Ronkay).

Paratypes. **Turkmenistan**. Kopet-Dagh Mts. 58 specimens, with the same data as the holotype (coll. P. Gyulai, G. Ronkay & HNHM); 1 male, Dushak, 2300 m, 37°57'N, 57°54'E, 11–12.VIII.1992, leg. M. Hreblay, Gy.M. László & G. Ronkay (coll. G. Ronkay); 1 male, Dushak, 2400 m, 37°57'N, 57°54'E, 9–10.VIII.1992, leg. M. Hreblay, Gy.M. László & G. Ronkay (coll. G. Ronkay); 41 specimens, Dushak, 1800 m, 23–30.VI.1992, leg. Danilevsky (coll. P. Gyulai & HNHM); 21 specimens, Ipay-Kala, valley of the rivers Ipay-Kala and Point-Kala, 800–1500 m, 38°13'N, 59°54'E, 30.VI.–4.VII.1992, leg. Gy. Fábián, B. Herczig, A. Podlussány & Z. Varga (coll. P. Gyulai, G. Ronkay & HNHM); 3 specimens, Ipay-Kala valley, 15 km E of Nochur, 800 m, 38°15'N, 56°55'E, 26.VI.1992, leg. Gy. Fábián, B. Herczig, A. Podlussány & Z. Varga (coll. G. Ronkay); 2 females, Kurkulab, 6 km W of Germob, 38°04'N, 57°50E, 3.X.1991, leg. L. Ronkay & Z. Varga (coll. G. Ronkay); 2 specimens, Sayvana valley, 5 km SW of Sayvana, 1800 m, 38°17'N, 56°50'E, 28.VI.1992, leg. Gy. Fábián, B. Herczig, A. Podlussány & Z. Varga (coll. G. Ronkay); 1 male, 10 km S of Ai-dere, 1000 m, 38°14'N, 56°46'E, 27.VI.1992, leg. Gy. Fábián, B. Herczig, A. Podlussány & Z. Varga (coll. G. Ronkay); 9 specimens, 6 km S of Ipay-Kala, 1600 m, 38°17'N, 57°07'E, 16–23.VIII.1992, M. Hreblay, Gy.M. László & G. Ronkay (coll. P. Gyulai, G. Ronkay & HNHM). Slide Nos: RL 11378m, RL 11582m, RL 11584m; RL 11552f. **Iran**. Prov. Khorasan. 1 male, Garmab, W Kopet-Dagh, 800 m, 1.VI.1999, leg. Hácz & Kőszegi (coll. P. Gyulai); 7 males, 2 females, Kopet-Dagh, 2300 m, 10 km N of Jevenly, Tandure NP, 27–28.VIII.2000, leg. P. Gyulai & A. Garai (coll. P. Gyulai); 2 males, 1 female, Kopet-Dagh, 2100 m, 1 km W of Jevenly, Tandure NP, 27–28.VIII.2000, leg. P. Gyulai & A. Garai (coll. P. Gyulai); 2 males, Jozak NP, 2 km W of Jozak, 1350 m, 28–29.VIII.2000, leg. P. Gyulai & A. Garai (coll. P. Gyulai); 2 males, Kopet-Dagh, 55 km NW of Darregaz, 1100 m, 5.VI.2010 (coll. P. Gyulai); 1 male, 1 female, Kopet-Dagh, 40 km N of Quacan, 2000 m, 4–5.VI.2010 (coll. P. Gyulai); 3 females, Kuh-e- Binaloud, NE of Neyshapur, 1770 m, 7–8.VII.2010, leg. P. Gyulai & A. Garai (coll. P. Gyulai). Prov. Golestan. 3 males, 2 females, E. Elburz Mts, Khosyelaq, 2100 m, 3–6.VI.2010 (coll. P. Gyulai).

Diagnosis. The north-eastern isolate of *S. (S.) senna* differs from the most similar ssp. *iranica* by its somewhat paler ground colour of both sexes, and the strongly marked but less ochreous-grey defined crosslines and stigmata. It is often confusingly similar to *S. (S.) spania turcomana* but has somewhat broader forewings (wingspan 36–42 mm), usually sharper crosslines and darker hindwings but a part of the dark and small-sized *Spaelotis* specimens from the Kopet-Dagh can be satisfactorily identified only by the study of their genitalia.

The genitalia of *S. (S.) senna ipaykala* and *S. (S.) spania turcomana* are easily distinguished by the differently built vesica which is ample and banana-shaped in *ipaykala*, lacking the large cornutus which is typical of *turcomana* (males), and by the strongly cristate-ribbed anterior part of ductus bursae and the longer and stronger signa of *ipaykala* in the females.

Distribution. The new subspecies occurs in NE Iran and Turkmenistan, inhabiting the Kopet-Dagh massif and the SE Elburs Mts.