

**Onthophagus species (Coleoptera: Scarabaeidae) associated with the
Hungarian lesser blind mole-rat (*Nannospalax hungaricus*)
(Mammalia: Spalacidae)***

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Abstract – Two rare species of *Onthophagus* Latreille, 1802 associated with subterranean rodents were found in a nature protection area where the Hungarian lesser blind mole-rat, *Nannospalax hungaricus* (Nehring, 1898) is also present. *Onthophagus parmatus* Reitter, 1892 is reported as new to the fauna of Hungary. Occurrence of *Onthophagus kindermanni* Harold, 1877 is confirmed in Hungary. With 2 figures and one table.

Key words – *Onthophagus kindermanni*, *Onthophagus parmatus*, grasslands, new records, pholeophily, pholeobiont

INTRODUCTION

The Hungarian lesser blind mole-rat, *Nannospalax hungaricus* (Nehring, 1898) (magyar földikutya in Hungarian) is a very rare subterranean rodent endemic to the Pannonian biogeographical region (NÉMETH *et al.* 2013). Only five populations exist today, one in Serbia (Deliblatska peščara Special Nature Reserve), and four in Hungary (Kunmadaras, Mezőtúr, Battonya: Gulya-gyep and Battonya: Tompapuszta). The population in Serbia is the strongest, with approximately 5500 individuals; each of the Hungarian populations consists of less than 50 blind mole-rat specimens (CSORBA *et al.* 2015).

In 2013, a faunistic survey was carried out in the southern part of the Tiszántúl region (Csongrád and Békés counties), mainly in the area managed by

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the Körös–Maros National Park Directorate. The survey focused on the ground-dwelling beetles collected by pitfall traps. Most of the results were published by MERKL *et al.* (2014).

The investigated areas included one of the blind mole-rat sites, the loess grassland at Battonya-Tompapuszta, which is a strictly protected area of national importance (Tompapusztai Löszgyep Protected Area), and part of a site of community interest (Mezőhegyes–Battonyai gyepék, HUKM20009). This spot is one of the last remnants of the loess steppe in the lowlands of Hungary (Natura 2000 code and name: 6250 Pannonian loess steppic grasslands). The blind mole-rat population here counts merely 20 to 30 individuals.

The pitfall traps yielded many specimens of *Onthophagus* Latreille, 1802. Most of them belong to common and widely distributed species. However, two of them are important from the faunistic point of view: *Onthophagus kindermanni* was rediscovered in Hungary after 53 years, and *Onthophagus parmatus* proved to be new to the fauna of Hungary. Both are associated with burrows of small mammals, including blind mole-rats. A third species, *Onthophagus vitulus*, also inhabitant of such burrows, but much more common in Hungary, was also captured.

Abbreviation – HNHM = Hungarian Natural History Museum, Budapest.

MATERIAL EXAMINED

Onthophagus (Paleonthophagus) kindermanni Harold, 1877 (Fig. 1) – Békés county: Battonya, Tompapusztai löszgyep [= loess steppe], 14.IV.2013, leg. T. Deli & T. Danyik (3 specimens, HNHM); same, but 27.IV.2013 (1 specimen, HNHM); same, but 3.V.2013, (3 specimens, HNHM); Battonya, Tompapuszta, 26.IV.2014, leg. S. Ilniczky (2 specimens, collection of S. Ilniczky, Budapest); Mezőhegyes, Peregi-löszgyep, mezsgye [= loess steppe, road verge], 1.VI.2013 (1 specimen, HNHM). All identified by O. Merkl.

Onthophagus (Paleonthophagus) parmatus Reitter, 1892 (Fig. 2) – Békés county: Battonya, Tompapusztai löszgyep [= loess steppe], 9.VI.2013, leg. T. Deli & T. Danyik (1 specimen, HNHM). Identified by O. Merkl, confirmed by Stefano Ziani (Meldola, Italy).

RODENTS AND ONTHOPHAGUS

ZIANI & GUDENZI (2006, 2007, 2009) and ZIANI & MORADI GHARAKLOO (2010) published thorough revisions of the *Onthophagus* species associated with burrows of rodents that do not deposit their dung in the open but in the burrows, sometimes in special chambers. The association of the *Onthophagus* species

can be obligatory (pholeobionts) or facultative (pholeophiles). Pholeophile species prefer to develop in rodent droppings but can often be observed feeding on dung of carnivorous and omnivorous mammals, less frequently on dung of herbivores (S. Ziani, personal communication) or even on carcass (ZIANI & GUDENZI 2007). The pholeobionts are rare in collections because they spend little time outside the burrows, mainly while seeking mates or new breeding places (ZIANI & MORADI GHARAKLOO 2010).

In Hungary, four rodent-associated *Onthophagus* species occur. *O. semicornis* (Panzer, 1798) and *O. vitulus* (Fabricius, 1776) are pholeophiles; they are sporadic but widely distributed in the lower altitudes of Hungary, mainly in grasslands where European sousliks (*Spermophilus citellus*) are present (based on the material housed in the HNHM). In such places, these beetles can also be found in droppings of sheep, deer or horse. The pholeobiont *O. kindermanni* and *O. parmatius* are extremely rare in Hungary.

The distribution of *Onthophagus kindermanni* includes Greece, Turkey (also the Asian part), Ukraine, Romania, Moldova, Bulgaria, Macedonia and Hungary (ZIANI & GUDENZI 2006). The westernmost border of its distribution



Fig. 1. *Onthophagus kindermanni* Harold, 1877. Male head and pronotum, fronto-lateral view

is in the southern part of the Tiszántúl region of Hungary. An inhabitant of treeless grasslands and forest steppes, its host species are blind mole-rats (*Spalax* and *Nannospalax*), sousliks (*Spermophilus*) and bobaks (*Marmota bobak*) (S. Ziani, personal communication).

From *O. kindermanni* until now only one specimen was known from Hungary (Szeged, 1960), which was reported by ÁDÁM (2003), under the name "*Bubalonthophagus furciceps*". In 2013, several specimens were captured by pit-fall traps in two spots of the Körös–Maros National Park, in the above-mentioned Battonya-Tompapuszta and near Mezöhegyes (MERKL *et al.* 2014). One year later, Sándor Ilniczky amateur coleopterist (Budapest) collected two specimens in Battonya-Tompapuszta. These beetles were found sitting on the top of a mound built by blind mole-rats. In Tompapuszta, blind mole-rat is the only subterranean rodent, so *O. kindermanni* most probably breeds in the burrows of this species. However, at the site near Mezöhegyes, recent occurrence of blind mole-rat is unknown. Although Mezöhegyes is among the historical localities of the blind mole-rat (NÉMETH *et al.* 2009), there is no evidence of surviving populations there. The finding of a specimen of *O. kindermanni* at Mezöhegyes



Fig. 2. *Onthophagus (Paleonthophagus) parmatius* Reitter, 1892. Male head and pronotum, fronto-lateral view

might indicate the existence of this mammal. Its proposed Hungarian name: földikutya-trágyatúró.

O. parmatus was known to occur in Romania, Moldova, southern Russia, Turkey, Armenia, Azerbaijan, Iran and Syria (ZIANI & GUDENZI 2006). In Hungary, one male specimen (Fig. 2) was captured by pitfall trap in the Körös-Maros National Park, along with specimens of *O. kindermanni* and *O. vitulus*. Even the rediscovery of *O. kindermanni* was quite an unexpected event, therefore the discovery of *O. parmatus* seemed so unlikely, that the specimen was first misidentified as a small *O. kindermanni*. Obviously, this species may also breed in the burrows of blind mole-rats. Its proposed Hungarian name: legyezős trágyatúró.

The differences between the three large species are summarised in Table 1. For images of the diagnostic traits see ZIANI & GUDENZI (2006, available on-line). The fourth rodent-associated species, *O. semicornis* is much smaller, similar in size to the members of the *O. ovatus*-group, so not included in the comparison.

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Table 1. Comparison of diagnostic features of *Onthophagus kindermanni* Harold, 1877, *O. vitulus* (Fabricius, 1776) and *O. parmatus* Reitter, 1892

Feature	<i>O. kindermanni</i>	<i>O. vitulus</i>	<i>O. parmatus</i>
Occipital carina	wide, low, slightly raised at middle	narrow, low, not raised at middle	narrow, high, slightly raised at middle
Horns of major males	long, divergent, slightly incurved, flattened apically	short, straight	moderately long, slightly divergent
Pronotal gibbosities	one anteromedian (slightly bilobate); anterolateral ones only traceable	two anteromedian, two anterolateral	two anteromedian, two anterolateral in males, three in females (anteromedian not bilobate)
Bristles of elytra	slender, short, apex simple	slender, short, apex simple	strong, long, apex bifid or trifid
Two penultimate antennomeres	normal, 3× wider than long	normal, 3× wider than long	unusual, 4–6× wider than long

REFERENCES

- ÁDÁM L. 2003: Faunisztikai adatok a Kárpát-medencéből (Coleoptera: Scarabaeoidea). (Faunistic records from the Carpathian Basin (Coleoptera: Scarabaeoidea).) – *Folia historico-naturalia Musei Matraensis* 27: 101–136. Online: <http://www.matramuzeum.hu/Personal/fovia/27/KARPATMEDENCE.PDF> [Accessed 1 September 2014.]
- CSORBA G., KRIVEK G., SENDULA T., HOMONNAY Z. G., HEGYELI ZS., SUGÁR SZ., FARKAS J., STOJNIC N. & NÉMETH A. 2015: How can scientific researches change conservation priorities? A review of decade-long research on blind mole-rats (Rodentia: Spalacinae) in the Carpathian Basin. – *Therya* 6: in print.
- MERKL O., KÖDÖBÖCZ V., DELI T. & DANYIK T. 2014: Bogárfaunisztikai adatok a Dél-Tiszántúrról (Coleoptera). (Faunistic data to the beetles from the south-eastern Great Hungarian Plain (Coleoptera).) – *Crisicum* 8: 99–152.
- NÉMETH A., CSORBA G., FARKAS J., KRÁCS GY., MOLNÁR A., BOLDOGH G. & SZELÉNYI B. 2013: VM Környezetügyért Felelős Államtitkárság fajmegőrzési tervek. Kárpát-medencei Nyugati földikutya kistajok (*Nannospalax* (superspecies leucodon)). [Ministry of Rural Development, Department for Environmental Affairs, Species Protection Plans. Carpathian Basin's Lesser blind mole-rat species-complex (*Nannospalax* (superspecies leucodon)).] – Vidékfejlesztési Minisztérium, Környezetügyért Felelős Államtitkárság, Budapest, 69 pp. Online: http://www.termeszetvedelem.hu/_user/browser/File/FajmegorzesiTervek/foldikutya_fmt_2013.pdf [Accessed 1 September 2014.]
- NÉMETH A., RÉVAY T., HEGYELI ZS., FARKAS J., CZABÁN D., RÓZSÁS A. & CSORBA G. 2009: Chromosomal forms and risk assessment of *Nannospalax* (superspecies leucodon) (Mammalia: Rodentia) in the Carpathian Basin. – *Folia Zoologica* 58(3): 349–361. Online: http://fox.ivb.cz/fovia/58/3/349-361_MS1499.pdf [Accessed 1 September 2014.]
- ZIANI S. & GUDENZI I. 2006: Studies on palearctic *Onthophagus* associated with burrows of small mammals. I. *O. furciceps*, *O. kindermanni*, *O. vitulus* and closely related species (Coleoptera Scarabaeidae). – *Bollettino della Società Entomologica Italiana* 138(3): 207–248. Online: <http://molbiol.ru/forums/index.php?act=Attach&type=post&cid=138613> [Accessed 1 September 2014.]
- ZIANI S. & GUDENZI I. 2007: Studies on Palaearctic *Onthophagus* associated with burrows of small mammals. II. *O. semicornis* and closely related species (Coleoptera: Scarabaeidae: Onthophagini). – *Folia heyrovskyana, Series A* 15(2): 89–114.
- ZIANI S. & GUDENZI I. 2009: Studies on palearctic *Onthophagus* associated with burrows of small mammals. III. *O. aerarius* and closely related species (Coleoptera Scarabaeidae). – *Bollettino della Società Entomologica Italiana* 141(1): 29–44. Online: <http://molbiol.ru/forums/index.php?act=Attach&type=post&cid=138613> [Accessed 1 September 2014.]
- ZIANI S. & MORADI GHARAKHLOO. M. 2010: Studies on Palaearctic *Onthophagus* associated with burrows of small mammals. IV. A new Iranian species belonging to the *furciceps* group (Coleoptera, Scarabaeidae, Onthophagini). – *ZooKeys* 34: 33–40. <http://dx.doi.org/10.3897/zookeys.34.272>