

A new owlfly genus from Africa (Neuroptera: Myrmeleontidae: Ascalaphinae)

LEVENTE ÁBRAHÁM

Rippl-Rónai Museum, H-7400 Kaposvár, P.O. Box 70, Hungary
e-mail: labraham@smmi.hu, <https://orcid.org/0000-0002-8007-7117>

ÁBRAHÁM, L.: *A new owlfly genus from Africa (Neuroptera: Myrmeleontidae: Ascalaphinae).*

Abstract: This publication contains a description of the genus *Bellulula* (**gen. n.**) separated from the genus *Dicolpus* Gerstaecker, 1884. The new genus was compared with *Phalascusa* Kolbe, 1897, *Dicolpus* Gerstaecker, 1884 and *Proctarrelabris* Lefébvre, 1842. Among the type specimens kept in different collections, the lectotype specimen of the species (**present designation**) as *Bellulula sjostedti* (van der Weele, 1905) (**comb. n.**) was designated and moved to a new combination. New faunistic data and general distribution are documented. With 7 figures.

Keywords: ascalaphid, owlfly, new genus, distribution, Africa.

Introduction

Africa's owlfly fauna is the richest in species on Earth, with more than half of the valid species described from this continent (TJEDER 1972, 1980, 1986, 1989, 1992, HANSSON & TJEDER 1992, MITCHEL 1998). The number of new species increased significantly in the 21st century (ÁBRAHÁM 2010 (1 sp.), 2017 (1 sp.), BADANO & PANTALEONI 2012 (1 sp.), MICHEL 2012 (1 sp., 2019 (3 sp.), MICHEL & MANSELL 2018 (1 sp.), PROST 2013a,b (2 sp.), PROST & POPOV 2021 (1 sp.)) More new species are expected to be described in the future.

The phylogenetic status of the traditional family Ascalaphidae has changed significantly in recent years (MACHADO et al. 2018 and JONES 2019). The acceptance of this is not uniform (PROST & POPOV 2021).

TJEDER (1992) published a comprehensive monograph on the African Ascalaphids, in which he described many taxa, new tribes, new genera, and species even using the traditional taxonomic division. This work was completed by HANSSON & TJEDER (1992). In the monograph, there are several references to recognized but undescribed genera, some of which were indicated in the collections revised by Bo Tjeder, but the new taxon names are not valid (*nomen nudum*) in the absence of a description.

The name of the new genus to be described now also belongs to this group, therefore the author created the new genus description as a continuation of the work started by Tjeder, but not completed, and searched for the species designated as type specimens.

Material and methods

Over several years, many specimens of the examined species have been collected in West Africa. I used these male and female non-type specimens for the morphological examination. Of course, I checked the literature references for the species and requested high-quality photos of the type specimens from various collections. The new habitus photos were taken by Canon EOS 400 digital camera equipped with flashlight system (Sigma EM140 DM). The photo of the female genitalia was taken by using SZX9 Olympus stereomicroscope equipped with a ScopeTek DCM800 digital camera. The layers of photos were processed with Combine ZP image stacking and Adobe Photoshop software.

According to traditional methods, the caudal part of the abdomen was removed, treated with a 10% KOH solution, and heated for 15 minutes. After cooling, it was rinsed in distilled water. For taking the photo, the genitalia was placed in glycerine in a Petri dish. Finally, each genitalia was transferred into glycerine in a microvial for preservation.

Abbreviations of the collections:

John O'Dell's private collection – Hornsea, UK

MNHN – Muséum National d'Histoire Naturelle, Paris, France

NHRS – Naturhistoriska Riksmuseet, Stockholm, Sweden

SCMK – Rippl-Rónai Museum, (former Somogy County Museum), Kaposvár, Hungary

Abbreviations of the annotation:

Comb – New combination; Dist – Distribution; Mon – Monograph; Nom – Nomenclature;

Odescr – Original description; List – Faunal list.

Results and discussion

TJEDER (1992) designated the species *Dicolpus sjostedti* as the type species of two undescribed genera *Bellulula* (TJEDER 1992: 27 Figs. 63 and 70.), *Apodicolpus* (TJEDER 1992: 35 and 165.) are invalid names without descriptions of the genera. During the examination of the type species, therefore I chose the first described name from Tjeder's work and prepared the description of the genus below.

***Bellulula* Ábrahám & †Tjeder gen. n.**

Bellulula – Tjeder (1992) (Mon) nomen nudum without description.

Type species: *Theleproctophylla*? *Sjöstedti* van der Weele, 1905

Diagnosis: Monobasic African genus. Medium sized species. Sexual dimorphism present. Male little smaller in size, wings narrower than that of female, and pattern on wings reduced. Male pterostigma longer than that of female. Base of costal margin of female very prominent in hindwing. Hindwing triangular-shaped especially in female. Wing venation dense, with exception of costal margins. Extensive pattern on both wings. Hairs on head dense, hairs on thorax and abdomen sparse.

Head: Wider than thorax. Eye oval, divided by a furrow, equal. Vertex narrow. Vertex, frons, scapus with not dense hairs. Anterior tentorial pit and between scapes with long dense tuft of hairs. Gena, postorbital sclerite and occiput hairless. Base of mandible with

sparse hairs on lateral side. Antenna somewhat shorter than distance between base of forewing and pterostigma. Club large, subglobular shaped.

Thorax: with sparse moderate long hairs.

Legs moderate long and slender. Femora about as long as tibiae. Length of tarsi 1 variable on legs. Tarsi 2-4 equal, tarsi 5 somewhat shorter than tarsi 1-4 combined. Femora and tibiae with long bristles.

Wings: Wide, subtriangular shaped, apices rounded, anal area obtuse, anal margin straight. Venation dense. Apical area with 2 rows of cells. Pterostigma about as long as wide in forewing, wider than long in hindwing. Hindwing considerably shorter than forewing.

Abdomen: shorter than wings. Tergite 2-4 of male with long sparse hairs. Other tergites with short stiff hairs. Tergites on female only with short hairs. Sternite 1 short. Male ectoproct with long straight caudal processus curved inwards at ends. Parameres fused to arch-like gonarcus, pelta present, gonosetae moderate long (Tjeder 1992: Figs 63. and 70.). Female ectoproct oval plate, ventrovalvae hemispheric, distivalvae trigonous in lateral view, interdens not seen (Fig. 1).



Fig. 1: A female genitalia in lateral view, scale: 1 mm.

Remarks: The new genus resembles the genus of *Phalascusa* Kolbe, 1897. They also have a striking pattern on their wings. Their average size is smaller than that of the new genus. The venation is less dense, and the wing shape is more elongated.

The new genus differs from *Dicolpus* Gerstaecker, 1884 in several characteristics. The *Dicolpus* species have an elongated wing shape, the venation is not so dense as that of the genus *Bellulula*. Males have conspicuous stiff short spines on the hind margin of the forewing, wings are not patterned.

Regarding the wing shape and venation, it also shows a similarity to *Proctarrelabris* Lefébvre, 1842 but the genus is characterized by strong hairiness.

Etymology: According to OSWALD (2019) "*Unexplained, probably Bell- (from L. bellus, beautiful) + -ulula (from Ulula, an ascalaphid genus-group name, q.v.), in reference to the ascalaphid affinities and attractive wing patterning of the taxon that was to have been designated as its type species.*"

A redescription of the species is not necessary, as the original description by van der WEELE (1905-1907) was accurate and detailed, similar to the redescription in van der WEELE'S (1909a) monograph later.

***Bellulula sjostedti* (van der Weele, 1905) comb. n.**

Theleproctophylla? *Sjöstedti* van der Weele, 1905: 2 – (Odescr).

Dicolpus Sjöstedti (van der Weele, 1905) – van der Weele 1909a (Mon, Comb), 1909b (List).

Dicolpus Sjostedti (van der Weele, 1905) – Navás 1912 (Mon), 1924 (Dist).

Dicolpus sjoestedti van der Weele, 1905 – Tjeder 1992 (Mon).

Bellulula sjoestedti (van der Weele) – Tjeder 1992 (Mon), Ábrahám 2017 (Nom).

Dicolpus sjostedti van der Weele, 1906 – Prost et al. 2022 (Dist).

Type of *Bellulula sjostedti* (van der Weele, 1905)

When van der WEELE (1905-1907) described the species, he indicated the Stockholm museum as the type location, and later referred to it, too (van der Weele 1909a). The Naturhistoriska, Sweden (NHRS) has two female specimens with type labels.

Material examined: 1♀ / NHRS-JLKB / 000073640 [white label with capital letters] // Typus [red label with black margins and with printed capital black letters] // Camerun [white label with printed letters] // *Sjöstedt*. [white label with printed italic letters] // ♀ [printed white label] // *Suphalacsa* (?) [sic!] / *Sjöstedti* v d Weele [white label with with Weele's original handwriting in black letters] // *Theleproctophylla* (?) / *sjöstedti* n sp / v. d. Weele / Typ [with handwritten white label] // 31 [printed letters] 68 [handwritten in blue ink, in reddish label] // Riskmuseum / Stockholm [blue label with printed letters] // ♀ prep. [white label with Tjeder's handwriting] // 4135 / E94 + [green label with printed letters] // *sjoestedti* ♀ / paralectotype [white paper with Tjeder's handwriting] /. (Figs: 2 and 3).

Remarks: van der WEELE (1905-1907) mentioned only one type specimen from Cameroon („Kamerun”), there are 2 specimens designated as types in the museum collection. In the original publication van der WEELE (1905-1907: Fig. 3.) published a photograph of the type specimen. The morphological features of this prepared specimen, such as the angle and curvature of the antennae, the pattern of the wings, the relative position of the fore and hind wings, etc. seem to be clearly identified to the specimen in inventory number NHRS-JLKB 000073640. This is confirmed by the species name (*Suphalacsa* (?) *Sjöstedti*) given to the specimen in Weele's handwriting. van der WEELE (1905-1907) mentioned in the description that the genus classification of the species was uncertain because he did not have a male specimen available. In the original description, he already used the name *Theleproctophylla* (?) *Sjöstedti*. He was also uncertain when redescribed the species in his monograph (van der WEELE 1909a) since he examined only female specimens (e.g. in Paris 1907). NHRS-JLKB 000073640 specimen was examined by Tjeder, the label of the female genitalia belonging to this specimen bears a paralectotype label in Tjeder's handwriting. This information has not been published. This specimen is therefore the lectotype of the species (**present designation**). TJEDER (1992:27 Fig. 63 and 70) published a drawing of the male genitalia under the name *Bellulula sjoestedti* (ÁBRAHÁM 2017). The deposition of this male specimen is unknown.

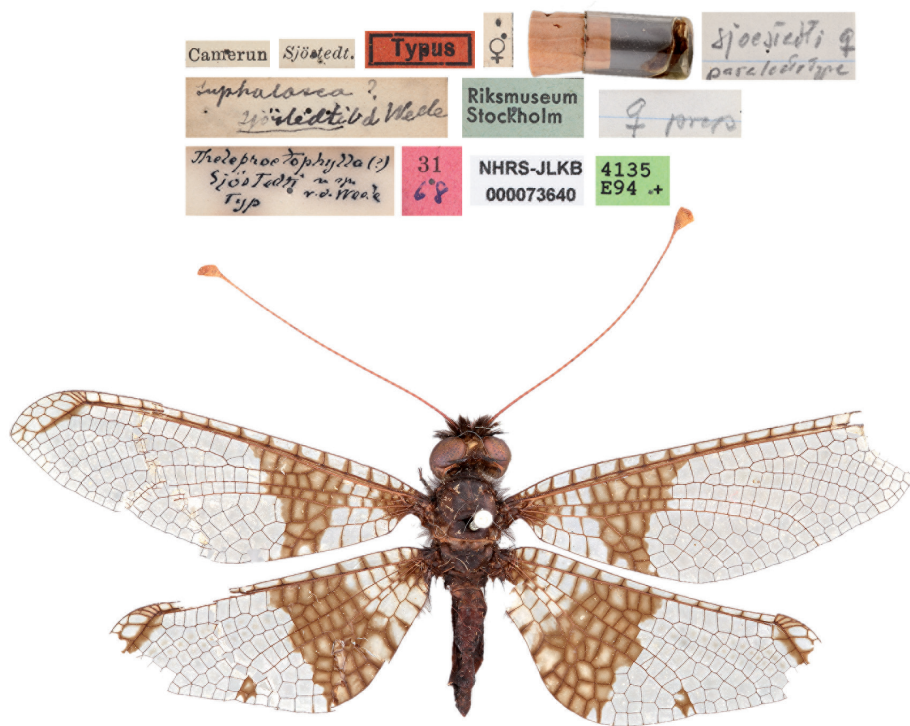


Fig. 2: Designated lectotype of *Bellulula sjostedti* (van der Weele, 1905) (NHRS-JLKB / 000073640 - in coll. NHRS, Stockholm), scale: 10 mm.

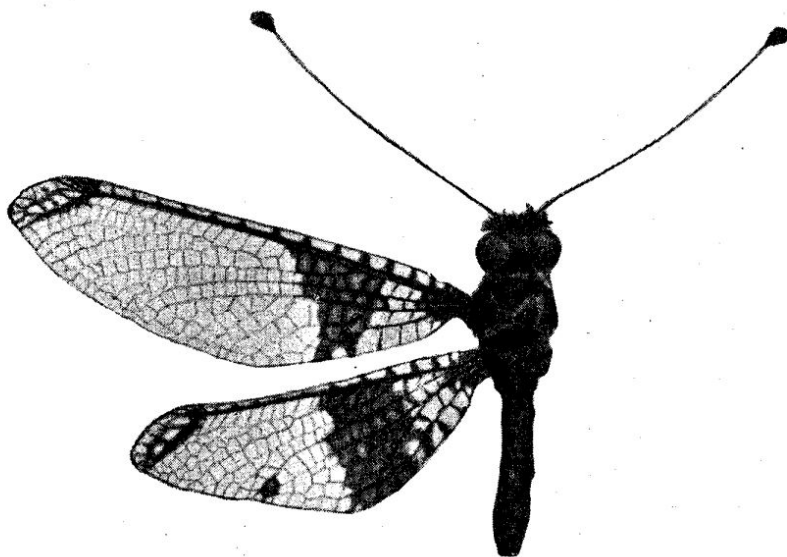


Fig. 3: Illustration of the type specimen included in the original description (van der Weele 1905-1907)

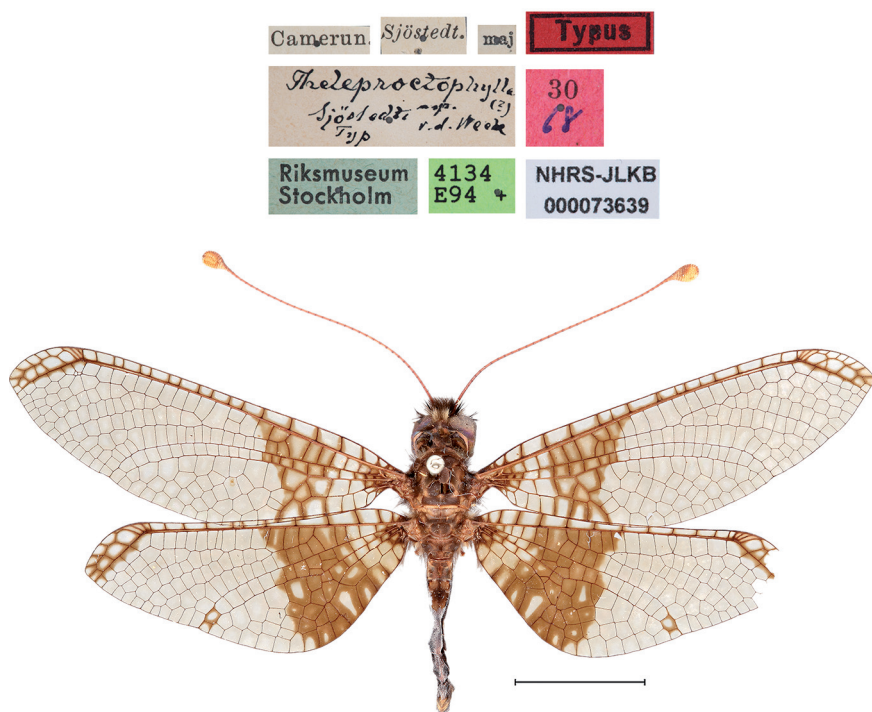


Fig. 4: Incorrectly labeled specimen as a type specimen (NHRS-JLKB / 000073639 - in coll. NHRS, Stockholm), scale: 10 mm.

Type condition: medium, the apices of the right fore and hindwing as well as the left hindwing are missing, and a small part in front of the pterostigma in the left hindwing is missing. The abdomen tip can be found in a genital vial in glycerine.

Material examined: 1♀ / NHRS-JLKB / 000073639 [white label with capital letters] // Typus [red label with black margins and with printed capital black letters] // Camerun [white label with printed letters] // Sjöstedt. [white label with printed italic letters] // Theleproctophylla (?) / sjöstedti n sp / v. d. Weele / Typ [with handwritten white label] // 30 [printed letters] 68 [reddish label with handwritten in blue ink] // Riskmuseum / Stockholm [blue label with printed letters] // 4134 / E94 + [green label with printed letters] /. (Fig: 4).

Remarks: It is not a type specimen, despite the fact that labeled as a type.

The specimen with the type label from the MNHN collection.

Material examined: 1♀ / Type [white label with printed capital and red letters] // Museum Paris / Bus-Ogooué / Entre Lamberéné et La Mer / E. Haug 1901 [greyish label with capital black letters] // Dicolpus sjöstedti vdW. / det vdW. 1907 [white label with double black margins and with Weele's original handwriting in black letters] /. (Fig: 5).

Remarks: The type label is incorrect, as the specimen was not published by van der WEELE (1906-07). This collecting place is located in Gabon, prov. Ogooué near Lamberéné. This does not match the published type locality "Kamerun" (Cameroon). van der WEELE (1909a) did not mention this locality and later in his ascalaphid mono-



Fig. 5: Incorrectly labeled specimen as a type specimen (in coll. MNHN, Paris), scale 10 mm.

graph. This is contradicted by the fact that van der WEELE (1909b) documented it as a type specimen in his later publication. When describing the species, van der WEELE (1905-1907) indicated the Stockholm museum as the locality of the type specimen. Consequently, it is not a type specimen, despite the fact that labeled as a type.

Additional non type material:

In coll. SCMK: 1♀ NeuAsc486 Ghana Central Region Abrafo Kakum Forest 02-04.11.2008 Leg: Sáfián Sz.; 1♀ NeuAsc487 Liberia Grand Gedeh County Mt. Sideh Putu Mountains 10-20.04.2011 Leg: Szaboles Sáfián, Márton Strausz; 2♀ NeuAsc488 Ghana Eastern Region Bunso Arboretum 19-20.X.2011 Leg: Sáfián Sz., Pühringer F. & Pöll N.; 2♂ NeuAsc489 Cameroon East Region Kagnol Haut Nyong District UFA Concession forest 3°44'34.05"N 13°23'51.97"E 02-06.V.2016 Leg: Sáfián Sz., Simonics G.; 1♀ NeuAsc1007 West Africa Republic of Guinea N'Zerekoré Region Mt.Nimba Ziela 535m N7.71559° W8.35710° 2017.10.18-11.03 Leg: Gergely Petrányi.; 1♂ NeuAsc3719 Liberia, Nimba Mountains, Zortapa FDH Headquarters 7°22'41"N 8°33'55"W 433m 23-30.VI.2020., 250W Blended bulb, Leg: Sáfián Sz.; 1♀ NeuAsc3720 Cameroon, Mount Cameroon 2016.05.03. (Figs. 5 -6)

In coll. J. O'Dell (UK): 1♀ Cameroon Ebogo Province du Centre, 8. 2016.

Remarks: It seems to be a rare species, females can be found in the museum collections more frequently than males. The typical habitat is a moist semi-deciduous forest and secondary growth and clearings. The flying time is from May to November. Imagoes are active in the daytime but are also attracted by light at night.

Distribution: Cameroon (van der WEELE 1909a), Gabon (as Französischer Congo - van der WEELE 1909b, as Congo français - NAVÁS 1912a), Ivory Coast (NAVÁS 1924), Benin (PROST & POPOV 2021). Based on the entomological collection of SCMK, it is a new record for the fauna of Ghana, Guinea, and Liberia.

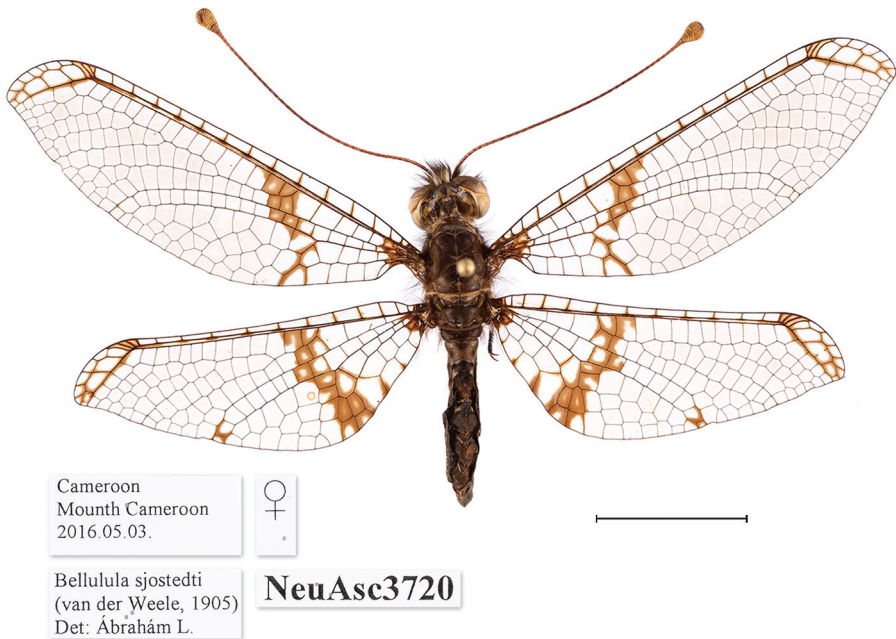


Fig. 6: A female specimen with a non-typical wing pattern (in coll. SCMK), scale: 10 mm.

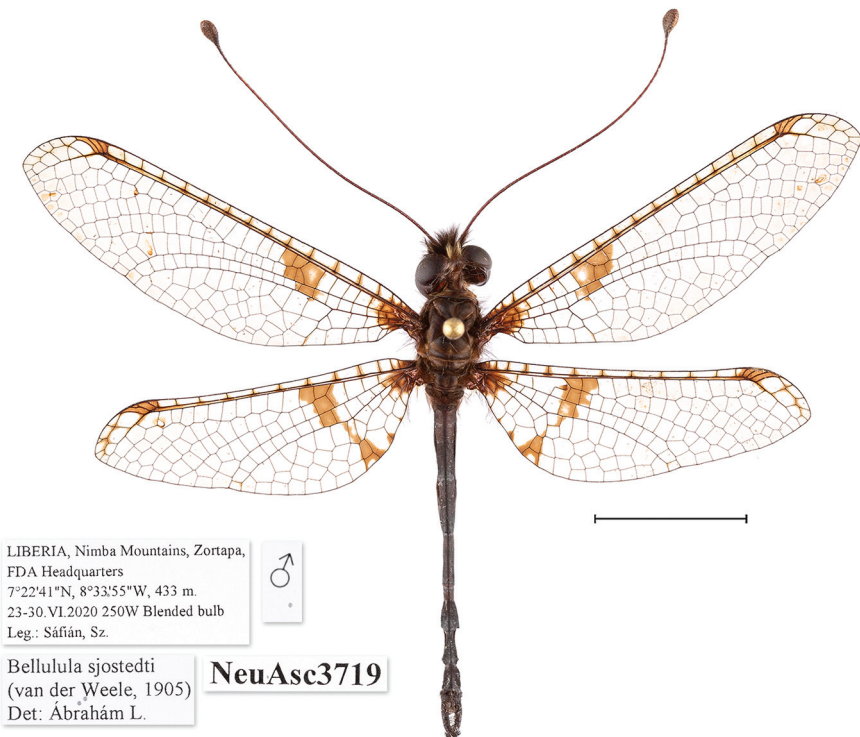


Fig. 7: The first published male illustration of the species (in coll. SCMK), scale: 10 mm.

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References

- ÁBRAHÁM, L. 2010: Ascalaphid studies VIII. A new Cirrops Tjeder, 1980 species from Morocco (Neuroptera: Ascalaphidae). - *Acta Phytopathologica et Entomologica Hungarica* 45:359-366.
<https://doi.org/10.1556/APhyt.45.2010.2.13>
- ÁBRAHÁM L. 2017: Ascalaphid studies XI. A new owlfly (Neuroptera: Ascalaphidae) from Kenya: *Afroasca doboszi* gen. and sp. nov. - *Annals of the Upper Silesian Museum in Bytom Entomology* 26: 1-6.
- BADANO, D.; PANTALEONI, R. A. 2012: *Agadirius trojani* gen. et sp. nov.: a new owlfly (Neuroptera: Ascalaphidae) from Morocco. *Zootaxa* 3270:51-57.
<https://doi.org/10.11646/zootaxa.3270.1.4>
- JONES, J. R. 2019: Total evidence phylogeny of the owlflies (Neuroptera, Ascalaphidae) supports a new higher level classification. - *Zoologica Scripta*, 48: 761-782.
<https://doi.org/10.1111/zsc.12382>
- MACHADO, R. J. P., GILLUNG, J. P., WINTERTON, S. L., GARZÓN-ORDUÑA, I. J., LEMMON, A. R., LEMMON, E. M., & OSWALD, J. D. 2018: Owlflies are derived antlions: anchored phylogenomics supports a new phylogeny and classification of Myrmeleontidae (Neuroptera). - *Systematic Entomology*, 44: 418-450.
<https://doi.org/10.1111/syen.12334>
- MICHEL, B. 1998: Description d'un nouveau genre et de deux nouvelles espèces d'Ascalaphes afrotropicaux (Neuroptera, Ascalaphidae). - *Bulletin de la Société Entomologique de France* 103:45-50.
<https://doi.org/10.3406/bsef.1998.17392>
- MICHEL, B. 2012: First record of the genus *Kimulodes* Tjeder & Hansson in West Africa with description of a new species (Neuroptera, Ascalaphidae). - *Zootaxa* 3497:37-40.
<https://doi.org/10.11646/zootaxa.3497.1.4>
- MICHEL, B. 2019: Revision of the genus *Disparomitrus* van der Weele, 1909 with descriptions of four new species (Neuroptera, Ascalaphidae). - *Zootaxa* 4551:1-39.
<https://doi.org/10.11646/zootaxa.4551.1.1>
- MICHEL, B.; MANSELL, M. W. 2018: A new genus and species of owlfly from eastern and southern Africa (Neuroptera: Ascalaphidae). - *European Journal of Entomology* 413:1-12.
<https://doi.org/10.5852/ejt.2018.413>
- NAVÁS, L. 1912: Sinopsis de los Ascaláfidos (Ins. Neur.). - *Arxius de l'Institut de Ciències, Institut d'Estudis Catalans, Secció de Ciències* 1:45-143.
<https://doi.org/10.5962/bhl.title.8510>
- NAVÁS, L. 1914: Notes sur quelques Névroptères du Congo Belge II. - *Revue de Zoologie Africaines, Bruxelles* 4: 91-100.
- NAVÁS, L. 1924: Névroptères d'Afrique. - *Annales de la Société Scientifique de Bruxelles* 43(pt. 1): 375-380.
- OSWALD, J. D. (chief editor) 2019: Lacewing Digital Library. Lacewing Digital Library module. <http://lacewing.tamu.edu/>. - Last accessed on 13rd December 2019.

- PROST, A. 2013a: *Phalascusa longistigma* (MacLachlan, 1871) : statut et redescription (Neuroptera, Ascalaphidae, Ascalaphinae). - Bulletin de la Société Entomologique de France 118:301-304.
<https://doi.org/10.3406/bsef.2013.3110>
- PROST, A. 2013b: The genus *Ascalaphus* (Fabricius, 1775) (Neuroptera, Ascalaphidae) in Africa. de Frias Martins, A. M. Mateus Ventura, M. d. A. (editors). - XI International Symposium on Neuropterology (13-15 June 2011, Ponta Delgada, Portugal). Açoreana, Revista de Estudos Açoreanos, Suplemento 9:57-72.
- PROST, A.; POPOV, A. 2021: A first comprehensive inventory of Ascalaphidae, Palparidae, and Myrmeleontidae (Insecta: Neuroptera) of Northeastern Nigeria with description of two new species and an overview of genus *Bankisus* Navás. - Historia Naturalis Bulgarica 43(5):51-77.
<https://doi.org/10.48027/hnb.43.051>
- VAN DER WEELE, H. W. 1905-1907: Über die von Prof. Dr. Y. Sjöstedt auf seiner Reise in Kamerun gesammelten Planipennia. - Arkiv för Zoologi 3(2):1-14.
<https://doi.org/10.5962/bhl.part.4542>
- VAN DER WEELE H. W. 1909a: Ascalaphiden monographisch bearbeitet. - Collection Zoologique Selys Longchamps 8: 1-326.
- VAN DER WEELE, H. W. 1909b: Catalogue des ascalaphides des collections du muséum. - Bulletin du Muséum National d'Histoire Naturelle, Paris (1)15:170-174.
- TJEDER, B. 1972: Two necessary alterations in long-established genus nomenclature in Ascalaphidae (Neuroptera). - Entomologica Scandinavica 3: 153-155.
<https://doi.org/10.1163/187631272X00238>
- TJEDER B. 1980: Ascalaphidae (Neuroptera) from Senegal and the Gambia. - Entomologica Scandinavica 11: 401-412.
<https://doi.org/10.1163/187631280794710006>
- TJEDER, B. 1989: A new genus and species of Ascalaphidae from south western Africa (Insecta: Neuroptera). - Journal of the Entomological Society of Southern Africa 52: 149-155.
- TJEDER, B. 1992: The Ascalaphidae of the Afrotropical Region (Neuroptera). 1. External morphology and bionomics of the family Ascalaphidae, and taxonomy of the subfamily Haplogleniinae including the tribes Proctolyrini n. tribe, Melambrotini n. tribe, Campylophlebini n. tribe, Tmesibasini n. tribe, Allocormodini n. tribe, and Ululomyiini n. tribe of Ascalaphidae. - Entomologica Scandinavica, Supplement 41: 3-169.
- TJEDER, B.; HANSSON, C. 1992: The Ascalaphidae of the Afrotropical Region (Neuroptera). 2. Revision of the tribe Ascalaphini (subfam. Ascalaphinae) excluding the genus *Ascalaphus* Fabricius. - Entomologica Scandinavica, Supplement 41: 171-237.