Zoology in the Middle East

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/tzme20

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To cite this article: Frank-Thorsten Krell (2021): Taxonomy and distribution of *Orubesa* in the Arabian Peninsula and surrounding areas (Coleoptera: Scarabaeoidea), Zoology in the Middle East, DOI: 10.1080/09397140.2021.1957209

To link to this article: https://doi.org/10.1080/09397140.2021.1957209

Published online: 20 Jul 2021.

Zoology in the Middle East, 2021
http://dx.doi.org/10.1080/09397140.2021.1957209

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Taxonomy and distribution of *Orubesa* in the Arabian Peninsula and surrounding areas (Coleoptera: Scarabaeoidea)

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(Received 25 May 2021; accepted 10 July 2021)

Occurrence records of the genus *Orubesa* Reitter, 1895, in the Arabian Penisula and surrounding areas are presented. Morphological study of types and additional specimens, for the first time considering endophallic sclerites, revealed that all northeast African and Arabian specimens belong to one taxon, *Orubesa plicifrons semenowi* (Arrow, 1911). The synonymy of both *O. sudanica* (Balthasar, 1871) and *O. linnavuorii* (Endrödi, 1970) with *O. plicifrons semenowi* is confirmed. The first records of *Orubesa* from Yemen are given.

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Keywords: *Dynamopus*; Dynamopodinae; Arabia; Iran; Iraq; Sudan; scarab beetles.

Introduction

Orubesa Reitter, 1895, formerly known as *Dynamopus* Semenov, 1896, is one of two or three genera forming the subfamily Dynamopodinae (Scarabaeoidea). It contains several poorly known, morphologically uniform species of 7 to 10.5 mm length, occurring from West and North Africa to Arabia and Central Asia. They are easily recognisable by the unique shape of meso- and metatibial terminal spurs (calcaria), which are roughly fringed at the apex, but species identification is less than straightforward. Nine nominal species have been described (Krajcik, 2012). Some of them turned out to be synonyms (Tauzin, 2016; Král & Batelka, 2017) or might well be synonymized in the future. This is because the authors describing new species had only singletons or a small number of specimens available from limited geographical provenance and because of the use of an alleged diagnostic character, namely the frontal carina being missing or present. In fact, all *Orubesa* specimens I have seen possess a frontal carina, and other alleged species-diagnostic characters vary even within populations. However, I have not seen the single type of *Orubesa luctator* (Semenov-Tian-Shanskij & Medvedev, 1929) from the Iraq-Iran border, which is described as having the clypeal suture to be without a carina ("ecarinata").

From the Arabian Peninsula, several nominal *Orubesa* species have been reported. *Orubesa semenowi* (Arrow, 1911) was recorded from Oman and Saudi Arabia by Král and Batelka (2017) and by Tigar and Osborne (1999) from Abu Dhabi, United Arab Emirates. Later, Gillett and Gillett (2005) report *Orubesa sudanica* (Balthasar, 1971) from Abu Dhabi, and Janikova et al. (n.d.) from Oman. Paulian (1948, 1980) and Abdel-Dayen et al. (2017: 28) recorded *Orubesa plicifrons* (Fairmaire, 1897) from Saudi Arabia. Al-Houty (1989) lists an unidentified *Orubesa* species from Kuwait. No *Orube-*

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Published online 20 Jul 2021

sa has been recorded from Yemen so far (Harten & Wagener, 1994; Král & Bezděk, 2016). Recent synonymizations (Tauzin, 2016; Král & Batelka, 2017) indicate that we have only one species in the Arabian Peninsula: *Orubesa plicifrons*.

Here I revisit these recent synonymizations by examining types of three of the species, discuss the validity and variability of some presumably diagnostic characters, and compile distribution data of *Orubesa* from the Arabian Peninsula and surrounding areas, including the first record for Yemen. This work focusses on the Arabian Peninsula as part of an ongoing revision of Dynastinae of that region (Krell & Král, 2017; Krell, unpubl.). Dynamopodinae sometimes are found in loans of Dynastinae because of their superficial similarity.

Material and Methods

Seventy-eight pinned specimens from the following collections were examined for this study: BSUB: Biologische Sammlung der Universität Bielefeld, Bielefeld, Germany. – MMUE: Manchester Museum, The University of Manchester, Manchester, U.K. – MZH: Finnish Museum of Natural History, University of Helsinki, Finland. – MGCB: Michael P.T. Gillett collection, Birmingham, U.K. – NHMUK: The Natural History Museum, London, U.K. – ZSM: Zoologische Staatssammlung, München, Germany. The studied specimens are listed under "Results" below.

To study the endophallic sclerites, the aedeagi were temporarily placed in pure clove oil (NOW Foods, Bloomingdale, IL) on a microscope slide under a cover slip and drawn with part transmitted, part incident illumination with a drawing attachment (camera lucida) on a Olympus SZX16. The drawings were edited in Photoshop CC 20.0.5. After the study, the aedeagi were immersed in ethanol to dissolve the clove oil and then glued on mounting cards with the water-soluble fish glue Syndetikon.

The distribution map was created with SimpleMappr (Shorthouse, 2010) based on examined material and all available records from literature.

Results

Distribution

The distribution of *Orubesa plicifrons semenowi* in the Arabian Peninsula and surounding areas is shown in Figure 1.

Arabian Peninsula. KUWAIT: Literature records: Sulabiya [29°17'N, 47°46'E] (Al-Houty, 1989). – OMAN: Literature records: Ad Dhahirah Governorate: near Mahdah, north of Al Buraimi, 24°22'N 56°00'E (Král & Batelka, 2017). Ash Sharqiyah Region: Al Saleel National Park [22°21'N 59°11'E] (Monks et al., 2019). – SAUDI ARABIA: Eastern Province: western al-Qa'amiyat, 18°27.5'N 47°07'E, 20.ii.1982, leg. G. Dowling and J. Mandaville (1♀, MMUE; Figure 6B). Jizan Province: Sabya [17°08'N 42°37'E], 04.ii.1937, leg. H.St.J.B. Philby (1♂, NHMUK; Figure 7C). Makkah Province: Al Lith [20°09'N 40°16'E], 08.xii.1945, to light among maritime vegetation, leg. D. V. Fitzgerald (1♀, NHMUK; Paulian, 1948). – Literature records: 'Asir Province: Al Namas Governorate [ca. 19°07'N 42°07'E] (Král & Batelka, 2017). Riyadh Province: Rawdhat Khorim National Park, 25°23'N, 47°17'E (Abdel-Dayem et al. 2017); Riyadh [ca. 24°38'N, 46°42'E] (Paulian 1980); Riyadh, Al-Urayja ("Araïda") [24°37'N, 46°39'E] (Paulian, 1980). – UAE: Abu Dhabi Emirate: Ain al-Faydah, 24°05'N 55°43'E, 11.ix.1992, leg. M. P. T. Gillett (1♂, MGCB; Figure 6F). Al Muwaiji, Al Ain, 24°12'N 55°45'E, 20.ix.1993, leg. M.P.T. Gillett (1♂ [Figures 6A, 7B], 2♀), 05.xi.1994, leg. C.P.D.T. Gillett (1♂ [Figures 2A–C, 6I, 7A], 1♀) (MGCB). Al-Oha, 24°21'N 55°49'E, 26.xi.1992, leg. M.P.T. Gillett (4♀, MGCB). – YEMEN (new country record): Al Hudaydah Governorate: Bajil [ca. 15°03'N 43°17'E], 18.v.1992, leg. R. Linnavouri

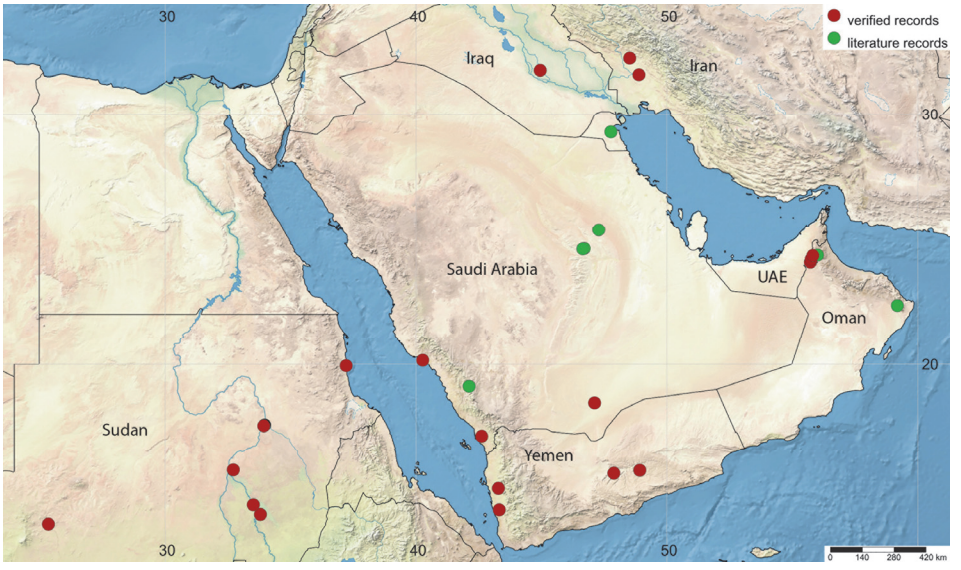

Figure 1. Distribution of *Orubesa plicifrons semenowi* (Arrow, 1911).

(1♂, MZH; Figure 7E); Zabid [14°12'N 43°19'E], 20.v.1992, leg. R. Linnavouri (1♀, MZH). Ma'rib Governorate: Wadi Rakhiya, [15°39'N 47°53'E], 14.viii.1936, leg. H.St.J.B Philby (1♂, [Figure 7D] 1♀, NHMUK). Hadramaut [about 15°46'N 48°55'E], 15–18.viii.1936, leg. H.St.J.B Philby (1♀, NHMUK; Figure 2D–F).

Western Asia. IRAN: Khuzestan Province: Shalgahī ("Shal Guhi"), 32°15'N, 48°31'E, 05.iv.1950, leg. Yusuf Lazar, Henry Field collection (1♀, NHMUK). Mollāsānī ("Molla Sani, Ahwaz"), 31°35'N, 48°53'E, 28.iv.1966 (8, Ordibehesht 1345), leg. Yeganeh (1♀, NHMUK); dto. ("Moll Sanis"), 09.ii.1945, leg. Tavakoli (1♀, NHMUK; Figure 6C). IRAQ: Al-Qādisiyyah Governate: 4.5 km N of Al-Hamzah, 31°45'40"N, 44°57'02"E (M. von Tschirnhaus, pers. comm), L2133, 30–31.iii.1965, leg. M. von Tschirnhaus (1♀, BSUB).

Northeast Africa. SUDAN: Al Baḥr al Aḥmar (State of Red Sea): Khor Arba'at delta, 19°56'N, 37°13'E, iv–v.1926, at light, leg. H. B. Johnston (1♂ [Figure 7F], 1♀, NHMUK, see Johnston, 1933). – Naḥr an Nīl (River Nile State): Ad-Dāmar ("Ed Damer"), 17°35'N, 33°58'E, 5–10.vii.1961 (paratypes of *Dynamopus linnavourii*, 2♂ [Figure 7H], 22 spm. [Figure 6G]), 16–18.vii.1961 (paratypes of *D. linnavourii*, 3♂, 9 spm.), leg. L. Linnavuori (MZH). Hudeiba, 17°33'N, 33°56'E, 18.vii.1962 (female holotype of *Dynamopus sudanicus* [Figures 5, 6E], PT of *D. sudanicus*, 2♀), 24.vii.1962 (paratype of *D. sudanicus*, 1♀), leg. R. Remane ZSM). – Wilāyat al-Karṭūm (State of Khartoum): Khartoum, 15°47'N 32°43'E, 25.viii.1923, leg. H. B. Johnston (1♀, NHMUK). – Al Ğazīra (Al Jazirah State): Wad Madanī (Wad Medani), 14°24'N, 33°31'E, 11.vi.1928, at light, leg. H. B. Johnston (1♀, NHMUK). Wad Madanī, 26–28.vi.1961 (paratypes of *D. linnavuorii*, 1♂ [Figure 7G], 2 spm.), leg. L. Linnavuori MZH).– Sannār (Sennar State): Wad az Zaki (Wad es Zaki), 14°01'N, 33°48'E, 10.v.1963, leg. Linnavuori (male holotype of *D. linnavuorii*, MZH; Figures 4, 6H). – Wilāyat Šamāl Dārfūr (North Darfur State): Al Fashir (El Fasher), 13°38'N 25°21'E, 06.iv.1920, leg. H. Lynes (1♀, NHMUK). – SUDAN/SOUTH SUDAN: White Nile, "62 72", leg. Petherick in the 1860s (female syntype of *Dynamopus semenowi*,

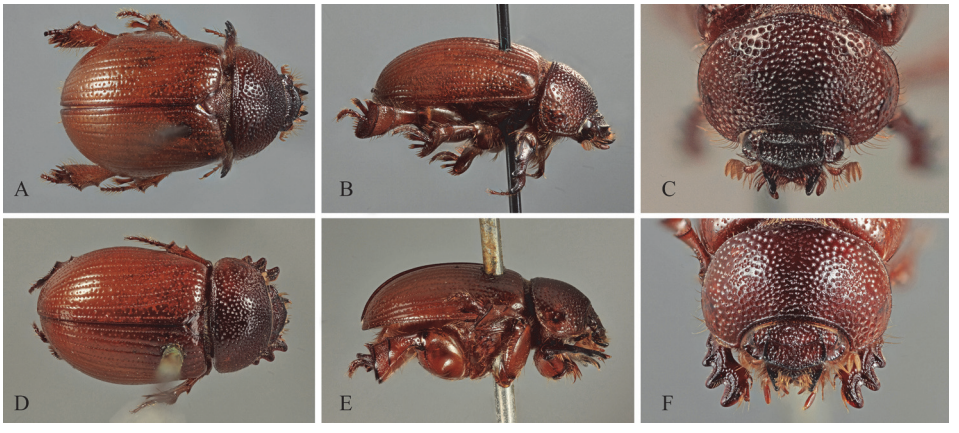

Figure 2. *Orubesa plicifrons semenowi* (Arrow, 1911). A–C) male. UAE, Al Muwaiji, 05.xi.1994, MGCB. A) dorsal. B) lateral (right side). C) head and pronotum, obliquely frontal. D–F) female. Yemen, Hadramaut, 15–18.viii.1936, NHMUK. D) dorsal. E) lateral (right side). F) head and pronotum, obliquely frontal.

NHMUK; Figures 3, 6D; not included in the map; Petherick travelled along the White Nile from Karthoum to Gondokoro and to the western tributaries; Petherick & Petherick, 1869).

Additionally, I studied three females from "Lyallpur, Punjab, India" (= Faisalabad, Pakistan; not marked in Figure 1), collected 1923 and 1925, from the NHMUK collection, which were sorted under *Orubesa athleta* Semenov, 1895, the only *Orubesa* species recorded from India. However, their hind tarsi are not as short as described and pictured by Semenov-Tian-Shanskij and Medvedev (1929). In these three specimens the last hind tarsomere is longer than the previous one and the first not longer than the following together. One male specimen from UAE, Al Muwaiji, has similarly short hind tarsi as the Lyallpur specimens. Determining the taxonomic status of the Indian *Orubesa* populations is beyond the scope of this study.

Allegedly species-diagnostic characters

Cranial carinae. The head of *Orubesa*, according to the literature (Semenov-Tian-Shanskij & Medvedev, 1929), bears one or two transversal carinae, a frontal carina and fronto-clypeal carina. The frontal carina, allegedly missing in several species (Semenov-Tian-Shanskij & Medvedev, 1929), is variable: It can be worn off, or be shallow, or, in one studied specimen from Shalgahī, Iran, narrowly interrupted in the middle by the coarse reticulate puncture, or, in one male specimen from Wadi Rakhiya, Yemen, formed like two horizontal parentheses with an angle in the middle, but is always clearly visible in all specimens used in this study (e.g., Figures 2C, 2F, 3C, 4C, 5C). Specimens from Arabia and Asia appear to have weaker frontal carinae, but this might represent a west-east clinal variation rather than distinct species-diagnostic character stages. The fronto-clypeal carina is always strong, but often subject to wear also.

Protibial denticles (Figure 6). The protibial denticles, including the basal, fourth one are not only subject to substantial abrasion, but also to phenotypic variation within *Orubesa*, and also at the species and population level. The expression of the basal denticle is not as constant intraspecifically and distinct between species as Semenov-Tian-Shanskij and Medvedev (1929) imply with their figures 10 to 13. In populations from the African

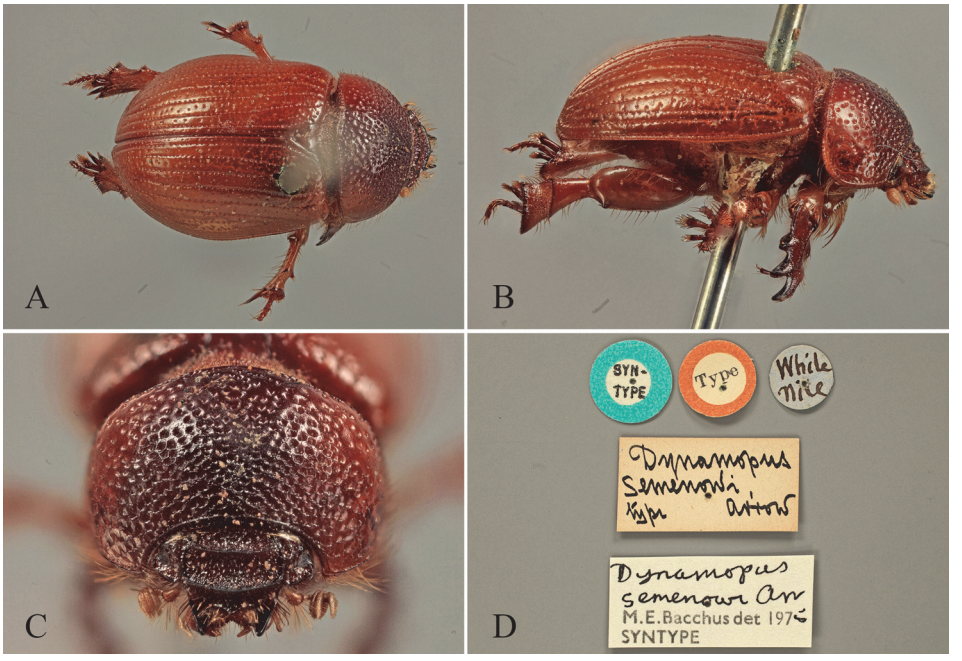

Figure 3. Female syntype of *Dynamopus semenowi* Arrow, 1911 (= *Orubesa plicifrons semenowi* (Arrow, 1911)), Sudan/South Sudan, White Nile, NHMUK. A) dorsal. B) lateral (right side). C) head and pronotum, obliquely frontal. D) Labels.

Figure 4. Male holotype of *Dynamopus linnavuorii* Endrödi, 1970 (= *Orubesa plicifrons semenowi* (Arrow, 1911)), Sudan, Wad az Zaki, 10.v.1963, MZH. A) dorsal. B) lateral (right side). C) head and pronotum, obliquely frontal. D) Labels.

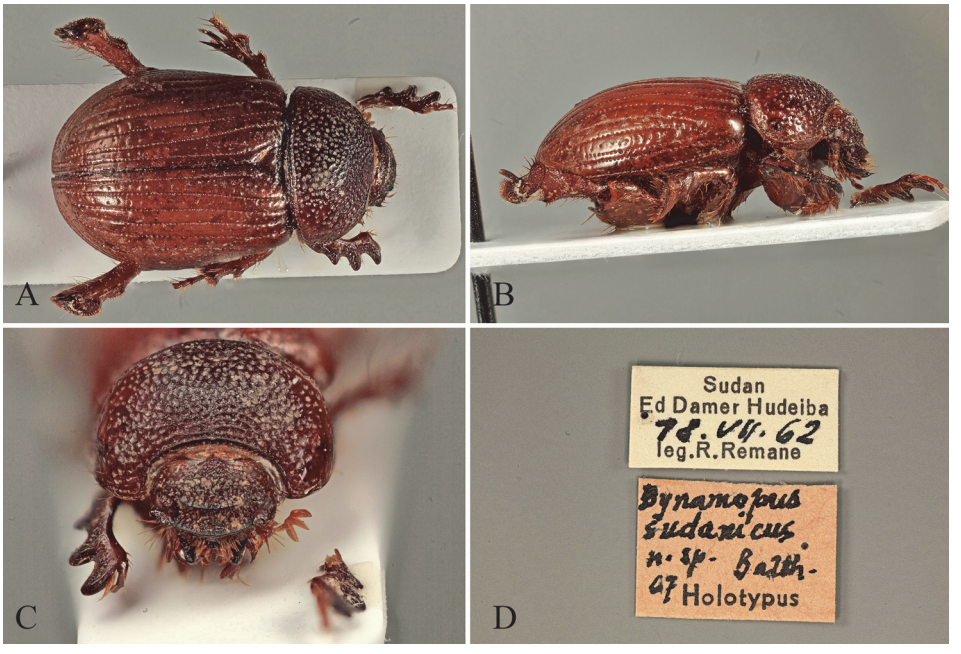

Figure 5. Female holotype of *Dynamopus sudanicus* Balthasar, 1971 (= *Orubesa plicifrons semenowi* (Arrow, 1911)), Sudan, Hudeiba, 18.vii.1962, ZSM. A) dorsal. B) lateral (right side). C) head and pronotum, oblique frontal. D) Labels.

continent, the basal denticle is not expressed as a denticle (Figure 6D, G, H), but might be represented by a broadly rounded precursor as in the type of *O. semenowi* (Figure 6D). In populations east of the Red Sea it is often, but not always (Figure 6F, I) present, from weakly expressed to distinct (Figure 6A–D, F, I). Among the ten specimens from UAE, we find six with a small, but distinct basal denticle (3 from Al-Muwaiji [Figure 6A], 2 from Al-Oha and 1 from Ain al Faydah) and four without distinct basal denticle (2 from Al-Muwaiji [Figure 6I], 2 from Al-Oha). The only Saudi specimen with a clear basal denticle is the one from the Eastern Province. The Hadramaut specimen might be considered having a tiny basal denticle, but this a borderline case. The two Iranian specimens from Mollāsānī possess a distinct basal tooth (Figure 6C); the specimen from Shalgahī does not. The apparently increasing portion of stronger basal denticles in eastern populations might also represent a west-east clinal variation.

Aedeagus and endophallic sclerites (Figure 7). The endophallus possesses two longitudinal rod-shaped sclerites; the one on the right side of the drawings is situated in front, the one on the left side behind the endophallus structures. Both rods might be connected apically, i.e., down on the drawing, but the sclerotization in this area is weak and difficult to interpret. These rods might be homologous with the *proximal endophallic sclerite* of *Melolontha* (Krell, 1996: 23) and/or with the elongated sclerites called *temones* by d'Hotman and Scholtz (1990). Deeper in the endophallus, i.e., inside the level of the *proximal endophallic sclerite* is one or several sclerites that probably get extruded with the endophallus during copulation. These sclerites might be homologous to the paired *apical endophallic sclerites* of *Melolontha* (Krell, 1996: 23). In *Orubesa*, these apical sclerites form a tube around the apical (when extruded) part of the endophallus.

Figure 6. *Orubesa plicifrons semenowi* (Arrow, 1911). Protibiae (right: A–F; left: G). A) male; UAE, Al Muwaiji, 20.ix.1993, MGCB. B) female; Saudi Arabia, Eastern Province: western al-Qa'amiyat, 20.ii.1982, MMUE. C) female; Iran, Mollāsānī, 09.ii.1945, NHMUK. D) female, syntype of *Dynamopus semenowi*; White Nile (Sudan/Southern Sudan), NHMUK. E) female; holotype of *D. sudanicus*; Sudan, Hudeiba, 18.vii.1962, ZSM. F) male; UAE, Ain al Faydah, 11.ix.1992, MGCB. G) unsexed paratype of *D. linnavuorii*; Sudan, Ad-Dāmar, 05–10.vii.1961, MZH. H) male, holotype of *D. linnavuorii*; Sudan, Wad az Zaki, 10.v.1963, MZH. I) male; UAE, Al Muwaiji, 05.xi.1994, MGCB.

The drawings show only one side, but also indicate structures of the back that are shining through, such as the bone-shaped structure in Figures 7E and 7H. This structure is on the "back' part of the tube and is more strongly sclerotized in some specimens than in others. It is visible from the "front" in some, but is present in all eight endophalli examined.

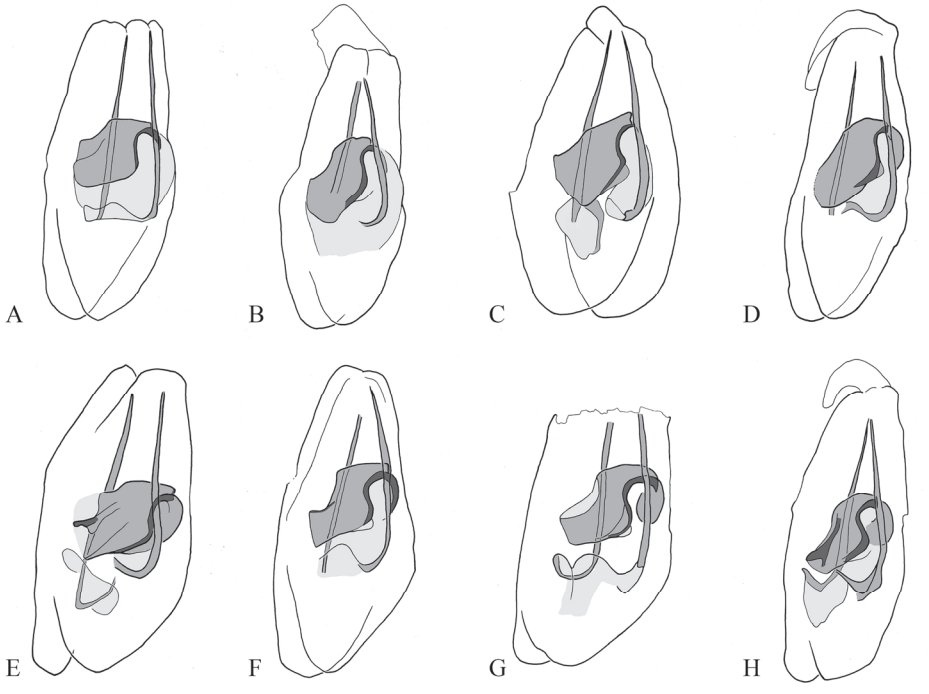

Figure 7. *Orubesa plicifrons semenowi* (Arrow, 1911). Aedeagus. A) UAE, Al Muwaiji, 05.xi.1994, MGCB. B) UAE, Al Muwaiji, 20.ix.1993, MGCB. C) Saudi Arabia, Sabya, 04.ii.1937, NHMUK. D) Yemen, Wadi Rakhiya, 14.viii.1936, NHMUK. E) Yemen, Al Hudaydah Bajil, 18.v.1992, MZH. F) Sudan, Khor Arba'at Delta, iv–v.1926, NHMUK. G) paratype of *Dynamopus linnavuorii*; Sudan, Wad Medani, 26–28.vi.1961, MZH. H) paratype of *D. linnavuorii;* Sudan, Ad-Dāmar, 05–10.vii.1961, MZH.

The general shape of the apical sclerite/s with a more strongly sclerotized loop structure on the right and to the left with a less sclerotized parallelogram-shaped sclerotized area with more or less emarginated upper left corner is similar in all eight endophalli studied. Apparent species-differentiating characters could not be determined.

Discussion

Distribution. While *Orubesa* can locally be abundant (Johnston, 1933; Endrödi, 1970), these unique beetles are not very frequent in collections and their ranges are far from comprehensively documented. Species of this genus occur from Senegal, through North Africa (Morocco, Libya) to Sudan, and through the Arabian Peninsula to central Asia eastward to Uzbekistan and Pakistan.

Taxonomy and synonymy. Exposed parts of the exoskeleton are often abraded indicating a digging life style. This common wear can hide the original shape of structures such as protibial denticles, or cranial carinae. The intraspecific variation of many characters that were used for species diagnoses in the past has been grossly underestimated or misinterpreted, particularly in species described from a single or very few specimens, namely

O. ata (Semenow-Tian-Shanskij & Medvedev, 1929), *O. luctator* (Semenov-Tian-Shanskij & Medvedev, 1929), and *O. sudanica* (Balthasar, 1971).

The head always has two carinae. Semenov-Tian-Shanskij and Medvedev (1929) were the first using this character in their key. They claimed that only *Orubesa athleta* and *O. ata* possessed a frontal carina. *O. plicifrons*, which they had not examined, and *O. semenowi* and their own *O. luctator* of which they had seen only one specimen each, were claimed to have a non-carinated frontal suture ("Caput sutura frontali ecarinata"). This they did although Fairmaire (1897) had described his *O. plicifrons* (as *Xanthelaeus plicifrons*) as having a frontal carina, albeit "plus courte, plus faible" than the fronto-clypeal carina, and Arrow (1911), in the paper describing *O. semenowi*, mentions the head having two transversal carinae.

Both Balthasar (1968, 1971) and Endrödi (1970) uncritically followed Semenov-Tian-Shanskij and Medvedev's key. Virtually simultaneously, Balthasar (1971) described *Dynamopus sudanicus* from "Sudan: Est Damer Hudeiba" [Ad-Dāmar Hudeiba, 17°33'N, 33°56'E] and Endrődi (1970) *Dynamopus linnavourii* from "Sudan: Blue Nile, Wad es Zaki" [Wad az Zaky, 14°01'N, 33°48'E] with paratypes from "Sudan: Wad Medani" [Wad Madani, 14°24'N, 33°31'E] and "Sudan, Ed Damer", the latter one being the same as the type locality of Balthasar's species. The main diagnostic features of both species was the carinated frons which both authors thought to be uncarinated in other species. Tauzin (2016), without having studied type material, synonymized *O. linnavuorii* (Endrödi, 1970) and *O. sudanica* (Balthasar, 1971) with *O. plicifrons* (Fairmaire, 1897) and declared *O. semenowi* (Arrow, 1911) to be a subspecies of that species. Paulian (1954) had already synonymized *O. semenowi* (Arrow, 1911) with *O. plicifrons* (Fairmaire, 1897), but later was no longer sure about it as he had found minor (likely individual) differences between two type specimens, one of each nominal species (Paulian, 1980). Without knowing Tauzin's work, Král and Batelka (2017) also synonymized *Orubesa sudanica* (Balthasar, 1971) with *O. semenowi* (Arrow, 1911) after comparing type material. My own conclusions concur with those proposed synonymizations.

Three or four protibial denticles, or something in between? The main differential-diagnostic character between *O. plicifrons/O. semenowi* and *O. ata* used by Semenov-Tian-Shanskij and Medvedev (1929) is the basal protibial denticle since all three taxa possess a frontal carina. The basal (fourth) denticle is allegedly present in *O. ata* and absent in the other two taxa (Semenov-Tian-Shanskij & Medvedev, 1929). The authors described *O. ata* on the basis of a single female from south-eastern Iran and did not examine *O. plicifrons*. They did examine one syntype of *O. semenowi* though. With the variability in the expression of the basal denticle in *Orubesa* as described above, determining differences between taxa based on single specimens is unreliable. The syntype of *O. semenowi* that I studied possesses a small, reduced, broadly rounded basal denticle (Figure 6D). On the basis of the variation seen in the material used in the present study, it seems possible that *O. ata* is another junior synonym of *O. plicifrons*, but without having seen the types of either species, I refrain from any definitive statement.

I wonder whether the "flachgebogene Verbreiterung" (shallowly curved widening) that *Orubesa gladiator* supposedly has instead of the basal protibial denticle (Balthasar, 1968) might in fact be only an abraded basal denticle or a shape that can occasionally be found in other populations, e.g., in Sudan (Figure 6D–E). Taxonomic interpretation of the species described from Asia east of the Arabian Peninsula is beyond the scope of the present study.

Aedeagus and endophallic sclerites. With external morphological characters being variable and frequently misinterpreted, studying the genitalia might provide hints for the taxonomic interpretation of the described nominal *Orubesa* species. As the tegmen is weakly sclerotized in *Orubesa*, differences in shape between specimens could not be determined. With this paper, we study the endophallic sclerites for the first time. They are complex and might present clues to taxonomic conclusions.

Females are more frequently collected than males though. When Endrödi (1970) described *O. linnavourii* from 59 specimens, he claimed them all to be female. Later, he found a male in another collection (Endrödi, 1979). However, due to the unusually weak sclerotization, the aedeagus might easily be overlooked or misinterpreted as five of Endrödi's alleged females in the Helsinki type series, including the holotype (Figure 4), had the aedeagus or the endophallus actually dissected and glued on the board in front of the beetle. The extremely weak sclerotization of the tegmen (phallobasis and paramera) makes it impossible to demarcate the phallobasis from the paramera in situ. Published illustrations of the *Orubesa* aedeagus look not very similar (Semenov-Tian-Shanskij & Medvedev, 1929; Endrödi, 1979) and were probably drawn from dried, somewhat disfigured objects. However, the aedeagi, including the endophalli, of our dissected specimens were all similar (Figure 7), showing the same general shapes and structures as described in the "Results" section, without revealing diagnosable differences.

Apparent differences in the endophallic sclerites in Figure 7A–H are all due to a varied degree of sclerotization and slightly different resting positions of the endophallus. The endophallus is a highly mobile organ that gets extruded during copulation to deposit the spermatophore in the female's genital tract and then is retracted again (Krell, 1996). While the resting position of the endophallus should generally be similar in all males of one species, there can always be a small variation in the degree of rotation or of the relative position of the sclerites. The degree of the sclerotization of the sclerites either can vary with maturity of the adult or is potentially individually genetically determined.

With the endophallus so uniform and external morphological characters being non-diagnostic, I cannot but conclude that all specimens with dissected aedeagus belong to one single species.

What name to choose? Having seen the types of *O. sudanica*, *O. linnavuorii*, and one syntype of *O. semenowi*, I concur with previously proposed synonymizations (Tauzin, 2016; Král & Batelka, 2017). While the synonymy of *Orubesa plicifrons* (Fairmaire, 1897) from Senegal and *O. semenowi* (Arrow, 1911) from the White Nile has been stated by Paulian (1954), I cannot, without having examined the type of the former, judge this statement. Without explanation, Tauzin (2016) treated Arrow's species as a subspecies of *O. plicifrons*, but had not studied Fairmaire's types either. Nevertheless, I follow his treatment here because it is the most conservative and inclusive nomenclature as long as the synonymy of those two species remains unresolved. There is a reasonable possibility after all, that the Arabian and North Eastern African populations indeed can be considered a subspecies distinct from the West African populations, just because of the vast distance between the two type localities.

At the species level, the current synonymy of *Orubesa plicifrons* is as follows:

Orubesa plicifrons (Fairmaire, 1897) Petrovitz, 1968

Dynamopus semenowi Arrow, 1911. – Synonymy proposed by Paulian (1954); currently used as subspecific name for the eastern populations.

?Dynamopus ata Semenov-Tian-Shanskij and Medvedev, 1929. – Possible synonym, see above.

Dynamopus linnavuorii Endrödi, 1970. – Synonymy proposed by Tauzin (2016) and confirmed in the present study.

Dynamopus sudanicus Balthasar, 1971. – Synonymy with *O. semenowi* proposed by Tauzin (2016) and Král and Batelka (2017); confirmed in the present study.

There is only one species in this genus described earlier than *O. plicifrons*, namely *O. perforata* Reitter, 1895, from north-western Afghanistan. The description is non-diagnostic, but Petrovitz (1958) and Barari (2001) recorded the species from south-eastern Iran, across the Strait of Hormuz from UAE and across the Gulf of Oman from Oman. If Reitter's species were conspecific with the Arabian populations, then Reitter's name would be the valid senior synonym. Until this is examined and resolved, Arabian *Orubesa* populations bear the species name *Orubesa plicifrons* (Fairmaire, 1897).

Acknowledgements

I am thankful to Michael Balke, Zoologische Staatssammlung München, Germany, Max Barclay and Malcolm Kerley, The Natural History Museum, London, UK, Michael Gillett, Birmingham, UK, Dmitri Logunov, Manchester Museum, Manchester, UK, Hans Silfverberg and Jaakko Mattila, Finnish Museum of Natural History, University of Helsinki, Finland, and Manfred Kraemer, Biologische Sammlungen der Universität Bielefeld, Germany, for their patience with my overdue loans. Michael von Tschirnhaus, Universität Bielefeld, Germany, provided the locality for the specimen he collected over fifty years ago in Iraq.

Disclosure Statement

No potential conflict of interest was reported by the author.

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