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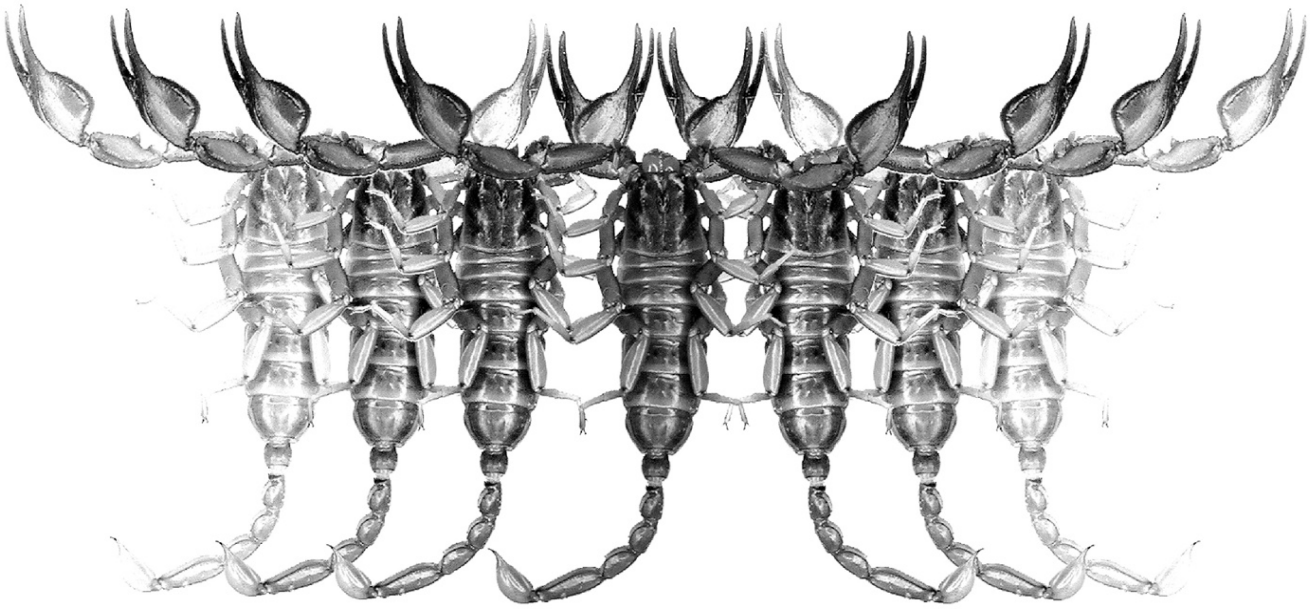

Taxonomic reassessment of the genera *Lychas*, *Mesobuthus*, and *Olivierus*, with descriptions of four new genera (Scorpiones: Buthidae)

František Kovařík

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Occasional Publications in Scorpiology

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Taxonomic reassessment of the genera *Lychas*, *Mesobuthus*, and *Olivierus*, with descriptions of four new genera (Scorpiones: Buthidae)

František Kovařík

P. O. Box 27, CZ-145 01 Praha 45, Czech Republic; http://www.scorpio.cz
Department of Zoology, Charles University, Viničná 7, CZ-128 44 Praha 2, Czech Republic

http://zoobank.org/urn:lsid:zoobank.org:pub:E927DDFB-B9A9-42B0-9572-FA005276E586

Summary

The diagnostic characters are reassessed and defined for the genera *Lychas* C. L. Koch, 1845, *Mesobuthus* Vachon, 1950, and *Olivierus* Farzanpay, 1987 (the latter is restored from synonymy with *Mesobuthus*). Four new genera are described: *Aegaeobuthus* **gen**. **n**. (type species *Buthus gibbosus* Brullé, 1832), *Afrolychas* **gen**. **n**. (type species *Isometrus burdoi* Simon, 1882), *Janalychas* **gen**. **n**. (type species *Lychas srilankensis* Lourenço, 1997), and *Spelaeolychas* **gen**. **n**. (type species *Isometrus hosei* Pocock, 1891). Type species are designated for subgenera *Lychas* (*Distotrichus*) Tikader & Bastawade, 1983 (type species *Isometrus nigristernis* Pocock, 1899), *Lychas* (*Alterotrichus*) Tikader & Bastawade, 1983 (type species *Scorpio mucronatus* Fabricius, 1793), and *Lychas* (*Endotrichus*) Tikader & Bastawade, 1983 (type species *Isometrus scaber* Pocock, 1893). All these three subgenera are now in synonymy with *Lychas* C. L. Koch, 1845. *Lychas kaimana* Lourenço, 2011 is synonymized with *Lychas shelfordi* (Borelli, 1904). Taxonomic position of *Lychas timorensis* Lourenço, 2018, which is a member of *Lychas variatus* (Thorell, 1876) complex, is discussed. The species and subspecies of *Mesobuthus* Vachon, 1950 are discussed, with seven subspecies elevated to species level: *Mesobuthus afghanus* (Pocock, 1889), **stat**. **n**., *M. bogdoensis* (Birula, 1896), **stat**. **n**., *M. haarlovi* Vachon, 1959, **stat**. **n**., *M. iranus* (Birula, 1917), **stat**. **n**., *M. mongolicus* (Birula, 1912), **stat**. **n**., *M. persicus* (Pocock, 1899), **stat**. **n**., and *M. thersites* (C. L. Koch, 1839), **stat**. **n**. Taxonomic changes are supported by 182 figures including the first published photographs of the syntypes of *Olivierus hainanensis* (Birula, 1904), **stat**. **n**., **comb**. **n**. and *O. przewalskii* (Birula, 1897), **comb**. **n**.

Introduction

For the last several years, a research team in the Charles University of Prague, Czech Republic, has been conducting a large-scale study of hundreds of scorpion specimens. These analyses demonstrated that some genera of Buthidae are paraphyletic, and in order to maintain monophyly, additional genera should be established. Recently, we diagnosed new buthid genera *Barbaracurus* Kovařík et al., 2018, *Teruelius* Lowe & Kovařík, 2019, and *Trypanothacus* Lowe et al., 2019, by identifying consistent differences in previously overlooked characters.

In this paper I establish two more genera in order to maintain monophyly of *Mesobuthus* Vachon, 1950: the genus *Olivierus* Farzanpay, 1987 is restored from synonymy, and a new genus, *Aegaeobuthus* **gen**. **n**., is described. I also found major morphological characters at the genus level within the genus *Lychas* sensu lato, according to which I establish three new genera: *Afrolychas* **gen**. **n**., *Janalychas* **gen**. **n**., and *Spelaeolychas* **gen**. **n**. This paper is not a detailed revision but just the first installment addressing the genus-level taxonomy of *Lychas* sensu lato. Descriptions of hemispermatophores, not presented here, will be a subject for another paper.

Methods, Material & Abbreviations

Nomenclature and measurements follow Stahnke (1971), Kovařík (2009), and Kovařík & Ojanguren Affilastro (2013), except for trichobothriotaxy (Vachon, 1974).

Specimen Depositories: FKCP (František Kovařík, private collection, Prague, Czech Republic); HNHM (Hungarian Natural History Museum, Budapest, Hungary), ZISP (Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia), ZMHB (Museum für Naturkunde der Humboldt-Universität, Berlin, Germany), ZMUH (Centrum für Naturkunde (CeNak), Center of Natural History Universität Hamburg, Zoological Museum, Hamburg, Germany).

Figures 1–**2**. *Lychas scutilus*, female from Thailand with newborns (1) and with juveniles after first ecdysis (2).

Systematics

Family Buthidae C. L. Koch, 1837

Genus *Lychas* C. L. Koch, 1845
(Figures 1–9, 13, 18–36, 46–65, 75–94)

= *Pilumnus* C. L. Koch, 1837: 38; junior homonym of *Pilumnus* Leach, 1815 (Crustacea), replaced by *Repucha* Fet, 1997, nec Francke, 1985: 4; type species *Lychas scutilus* C. L. Koch, 1845 by subsequent designation (Fet, 1997: 247) (syn. by C. L. Koch, 1850: 92).

Lychas (in part) C. L. Koch, 1845: 3; Tikader & Bastawade, 1983: 40–107, figs. 99–184, 216–239, 256–285; Fet & Lowe, 2000: 158–169 (complete references list until 2000); Kovařík & Ojanguren Affilastro, 2013: 194–210, figs. 1410–1414, 1419–1423, 1434–1436, 1439–1449, 1471–1498, 1509–1555, 1562–1592.

= *Archisometrus* Kraepelin, 1891: 75–76 (in part); type species by subsequent designation (L. E. Koch, 1977: 123) *Tityus marmoreus* C. L. Koch, 1845 (syn. by Pocock, 1900a: 35).

= *Lychas* (*Distotrichus*) Tikader & Bastawade 1983: 41; type species *Isometrus nigristernis* Pocock, 1899 (= *Lychas nigristernis* (Pocock, 1899)), **hereby designated** (syn. by Vachon, 1986: 848).

= *Lychas* (*Alterotrichus*) Tikader & Bastawade 1983: 52; type species *Scorpio mucronatus* Fabricius, 1793 (= *Lychas mucronatus* (Fabricius, 1798)), **hereby designated** (syn. by Kovařík, 1995: 188).

= *Lychas* (*Endotrichus*) Tikader & Bastawade 1983: 71; type species *Isometrus scaber* Pocock, 1893 (= *Lychas scaber* (Pocock, 1893)), **hereby designated** (syn. by Kovařík, 1995: 188).

Type species. *Lychas scutilus* C. L. Koch, 1845.

Diagnosis. Total length 20 mm (*L. rugosus*) –105 mm (*L. brehieri*). Carapace granular, lacking distinct carinae, flat, subrectangular with concave anterior margin. Median eyes on ocular tubercle in anterior half of carapace; usually with 4, or sometimes 5 pairs of lateral eyes (3 major ocelli, 1–2 minor ocelli). Sternum type 1, triangular in shape. Tergites I–VI granular, with single median carina, tergite VII with 5 carinae. Metasoma elongate, segment I with 10 carinae, II–IV with 8–10 carinae, lateral median carina can be lacking. Telson ellipsoidal in shape, with distinct subaculear tooth. Pectinal tooth counts 8–26. Pectines with conspicuous or inconspicuous fulcra, rarely without fulcra. Chelicerae with typical buthid dentition, fixed finger armed with single denticle on ventral surface. Pedipalps orthobothriotaxic, type Aβ, femur trichobothrium d_2 obviously internal, patella d_3 external to dorsomedian carina. Dentate margins of chela movable finger armed with 3 terminal (two subterminal and one distal) denticles, apical row composed of 3–7 denticles, and imbricated overlapping six rows of denticles, rows 1–5 terminated proximally flanked by two enlarged outer accessory denticles, and single inner accessory denticle displaced distally. Sixth row with one to four isolated outer accessory denticles midway along its length, no inner accessory denticles. Reduced to moderate tibial spurs present on leg III and leg IV, tibia and tarsus without bristle combs, ventral surfaces of tarsomeres II densely equipped with two rows of setae, ungues stout.

Subordinate taxa (32 species).
Lychas aareyensis Mirza & Sanap, 2010 (India)
Lychas aberlenci Lourenço, 2013 (Laos)
Lychas armasi Kovařík, 2013 (Papua New Guinea)
Lychas armillatus Gervais, 1841 (Philippines)
= *Isometrus infuscatus* Pocock, 1891
Lychas asper (Pocock, 1891) (Angola, Congo, Mozambique, Somalia, Tanzania, Zambia)
= *Lychas asper obscurus* Kraepelin, 1913
Lychas biharensis Tikader & Bastawade, 1983 (India)
Lychas brehieri Lourenço, 2017 (Myanmar)
Lychas buchari Kovařík, 1997 (Australia)
Lychas cernickai Kovařík, 2013 (Laos)
Lychas flavimanus (Thorell, 1888) (Indonesia, Malaysia)
Lychas gravelyi Henderson, 1913 (Myanmar)
Lychas hendersoni (Pocock, 1897) (India)
Lychas hillyardi Kovařík, 1997 (India)
Lychas inexpectatus Lourenço, 2011 (Laos)
Lychas kamshetensis Tikader & Bastawade, 1983 (India)
Lychas kharpadi Bastawade, 1986 (India)
Lychas krali Kovařík, 1995 (Thailand)
Lychas lourençoi Kovařík, 1997 (Indonesia)
Lychas marmoreus (C. L. Koch, 1844) (Australia, New Guinea)
= *Isometrus bituberculatus* Pocock, 1891
= *Lychas marmoreus lucienkochi* Fet, 1997, replacement name for *Lychas marmoreus obscurus* Kraepelin, 1916
= *Lychas marmoreus nigrescens* Kraepelin, 1916
= *Lychas marmoreus splendens* Kraepelin, 1916
= *Lychas jonesae* Glauert, 1925
Lychas mjobergi Kraepelin, 1916 (Australia)
Lychas mucronatus (Fabricius, 1798) (Cambodia, China, India, Indonesia, Laos, Malaysia, Myanmar, Philippines, Thailand, Vietnam)
= *Scorpio* (*Androctonus*) *curvidigitatus* Gervais, 1843
= *Tityus varius* C. L. Koch, 1844
= *Isometrus chinensis* Karsch, 1879
= *Isometrus atomarius* Simon, 1884
= *Lychas mentaweius* Roewer, 1943
= *Lychas baldasseronii* Caporiacco, 1947
= ?*Lychas nucifer* Basu, 1964
Lychas nigristernis (Pocock, 1899) (India, Pakistan)
= ?*Lychas decorata* Basu, 1964
Lychas obsti Kraepelin, 1913 (Ethiopia, Kenya, Somalia, Tanzania)
Lychas perfidus (Keyserling, 1885) (Melanesia: Viti Levu Island)
Lychas rackae Kovařík, 1997 (India)

Lychas rugosus (Pocock, 1897) (India)
Lychas santoensis Lourenço, 2009 (Vanuatu)
Lychas scaber (Pocock, 1893) (India)
Lychas scutilus C. L. Koch, 1845 (Andaman Islands, China, Indonesia, Keeling (Vovos) Islands, Malaysia, Myanmar, Thailand)
= *Isometrus weberi* Karsch, 1882
= *Isometrus mesor* Simon, 1884
= *Isometrus phipsoni* Oates, 1888
= *Archisometrus nigrimanus* Kraepelin, 1898
Lychas serratus (Pocock, 1891) (Mauritius: Round Island)
Lychas shelfordi (Borelli, 1904) (Indonesia, Malaysia, Philippines)
= *Lychas eliseanneae* Lourenço, 2011
= *Lychas kaimana* Lourenço, 2011 (Indonesia), **syn**. **n**.
Lychas variatus (Thorell, 1876) (Australia, Melanesia, New Guinea, Papua New Guinea)
= *Isometrus thorelli* Keyserling, 1885
= *Isometrus variatus* var. *papuanus* Thorell, 1888
= *Isometrus armatus* Pocock, 1891
= *Lychas marmoreus kimberleyanus* Kraepelin, 1916
= *Lychas spinatus* Kraepelin, 1916
= *Lychas spinatus* var. *besti* Glauert, 1925
= *Lychas spinatus* var. *pallidus* Glauert, 1925
= *Lychas lappa* Glauert, 1954
= ?*Lychas timorensis* Lourenço, 2018, **syn**. **n**.
Lychas variatus canopensis Lourenço & Qi, 2007

Comments. The correct date and designation of the type species *Lychas scutilus* C. L. Koch, 1845 for both genera *Lychas* and *Pilumnus* were discussed in detail by Fet (1997), Francke (1985) and Kovařík (1995). L. E. Koch (1977) subsequently designated Australian *Tityus marmoreus* (= *Lychas marmoreus*) as type species for genus *Archisometrus*. Tikader & Bastawade (1983) divided *Lychas* into three subgenera: *Distotrichus*, with species *L. gravelyi* and *L. nigristernis*; *Alterotrichus*, with species *L. hendersoni*, *L. mucronatus*, and *L. rugosus*; and *Endotrichus*, with species *L. albimanus*, *L. bihariensis*, *L. kamshetensis*, *L. laevifrons*, *L. scaber*, and *L. tricarinatus*. In discord with the ICZN, they did not address the nominotypic subgenus *Lychas*, and no type species were designated for their none of their new subgenera. These subgenera were differentiated by the position of pedipalp chela trichobothria *dt*, *db*, *et*, and *est* (Tikader & Bastawade, 1983; Vachon, 1986). The distinction was doubted by Vachon (1986) and Kovařík (1995), and all three subgenera were synonymized by these authors. Here, I designate *L. nigristernis* as type species for the subgenus *Distotrichus*; *L. mucronatus* as type species for the subgenus *Alterotrichus*; and *L. scaber* as type species for the subgenus *Endotrichus*.

Species *Lychas buchari* Kovařík, 1997 and *L. mjobergi* Kraepelin, 1916 from Australia are still placed in the genus *Lychas* sensu stricto. However, their morphological difference shows a possibility that these two species could form another separate genus; this issue requires a further detailed study.

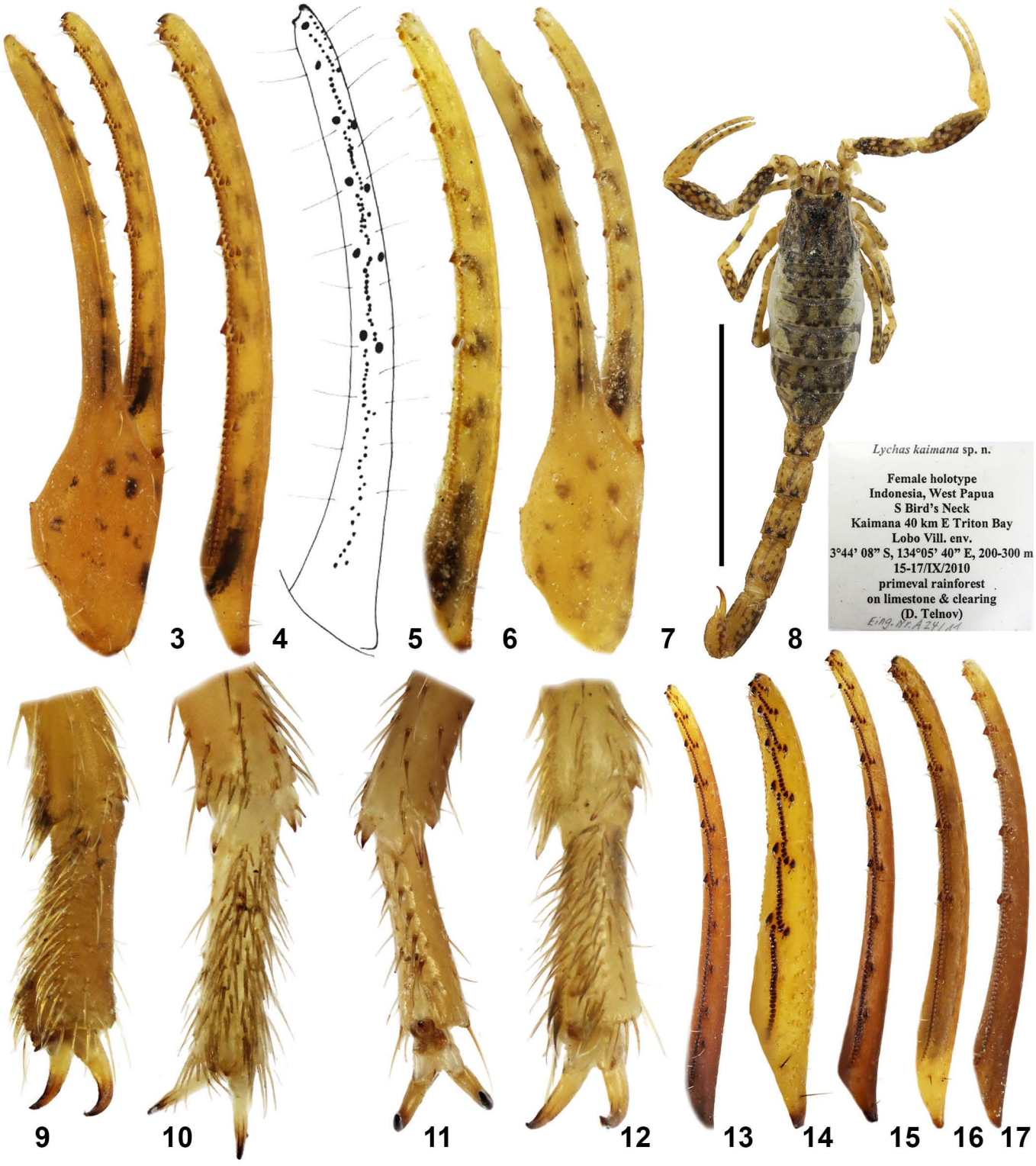
Taxonomic position of *Lychas kaimana* Lourenço, 2011

Lychas kaimana was described by Lourenço (2011) from Indonesia, West Papua, according to the holotype declared by the author as a female. In reality, it is a juvenile, 21 mm long. Unfortunately, the original description lacks sufficient information about specific taxonomic characters that we consider to be important both for differentiating between species within *Lychas*, and for unequivocally establishing its generic placement according to our revised diagnosis. One of the important characters distinguishing the species of *Lychas* is the number of outer and inner denticles along the sixth row of denticles on the movable finger of pedipalp. Unfortunately, Lourenço has repeatedly described and illustrated this character incorrectly (see also Kovařík, 2018). According to his figure 12 in the original description (Lourenço, 2011: 322), the holotype of *L. kaimana* has the sixth row of denticles on the movable finger of pedipalp without any outer and inner denticles, and the entire row is abnormally irregular. The character is so incredible that I studied the holotype personally. Figure 5 shows the original figure published by Lourenço (Lourenço, 2011: 322, fig. 12), and Figure 6 shows a photograph of the actual specimen. It is evident that the original figure is incorrect. The rows of denticles on the movable finger of pedipalp are regular, and the sixth row of denticles has one outer denticle present.

Apart from the above points, the holotypes of *Lychas kaimana* and *L. shelfordi* (Figs. 3–8) match each other precisely in the following key characters: trichobothrial pattern, structure of sternum and genital operculum, pectinal tooth count and lamellar structure, proportions, setation, carination and sculpture of pedipalps, carapace, tergites, sternites, and metasoma, shape and armature of the telson, as well as armature of chelicerae and pedipalp fingers. The inevitable conclusion is that *Lychas kaimana* Lourenço, 2011 is a junior synonym of *Lychas shelfordi* (Borelli, 1904).

Taxonomic position of *Lychas timorensis* Lourenço, 2018 and *Lychas variatus* (Thorell, 1876)

Lychas timorensis was described by Lourenço (2018) from East Timor, Manufahi, W. Pualaca according to the male holotype. Unfortunately, the original description lacks sufficient information about specific taxonomic characters that we consider to be important both for differentiating between species within *Lychas*, and for unequivocally establishing its generic placement according to our revised diagnosis. The situation is similar to that in *L. kaimana* (see previous section) since according to fig. 10 in Lourenço (2018: 34), *L. timorensis* has six rows of denticles on the movable finger of pedipalp without outer accessory denticles but its diagnosis says: "Dentate margins of fixed and movable finger of pedipalp chela with 6–7 almost linear rows of granules [*denticles, in our terminology–FK*]; one inconspicuous external accessory granule [=*outer accessory denticle*] next to the basalmost row of granules [=*denticles*]." Which of these statements in the description is correct? I



Figures 3–**17**: **Figures 3**–**8**: *Lychas shelfordi* (Borelli, 1904). **Figures 3**–**4**. Female, Malaysia, Busuanga Island , FKCP, pedipalp chela, dorsal (3) and dentition of pedipalp chela movable finger (4). **Figures 5**–**8**. Juvenile holotype of *Lychas kaimana* Lourenço, 2011 (Indonesia, West Papua, S Bird´s Neck, Kaimana, 40 km E Triton Bay, Lobo Village env., 3°44'08"S 134°05'40"E, 200–300 m a.s.l., ZMUH No. A24/11), dentition of pedipalp chela movable finger published in Lourenço, 1999: 86 (5) and photograph of actual specimen (6), pedipalp chela dorsal (7), dorsal view of the holotype (8), and original label. **Figures 9**–**12**: Tarsomere II of leg III. **Figures 13**–**17**: Pedipalp movable finger dention. **Figures 9**, **13**. *Lychas scutilus*, male, Malaysia, Kedah, FKCP. **Figures 10**, **14**. *Janalychas srilankensis* **comb**. **n**., male, Sri Lanka, Northern Province, Jaffna District, 09°42'51.6"N 080°04'44.8"E, 19 m a.s.l., FKCP. **Figures 11**, **15**. *Spelaeolychas hosei* **comb**. **n**., male, Malaysia, Sarawak, Niah cave, 3°48'50.00"N 113°46'53.00"E, FKCP. **Figures 12**, **16**. *Afrolychas burdoi* **comb**. **n**., female, Tanzania, FKCP. **Figure 17**. *Afrolychas braueri* **comb**. **n**., female lectotype.

think that the fig. 10 in Lourenço (2018: 34) is incorrect; and, of course, no species of *Lychas* has the movable finger with 7 rows of denticles. Judging from the photographs in figs. 2–3 in Lourenço (2018: 34), *L. timorensis* is a synonym of *L. variatus* sensu lato, the species which Lourenço did not mention in his paper. The status of *L. variatus* itself, however, is not clear. It is possible that it is a complex of cryptic species and that some of the names so far listed as synonyms are in fact valid taxa (Kovařík & Ojanguren Affilastro, 2013: 210). Only a detailed revision and DNA analysis can confirm the taxonomic position of *L. variatus*, its eight synonyms, *L. v. canopensis*, and *L. timorensis*.

Affinities. Kovařík (2009) used seven characters, which in combination differentiate *Lychas* sensu lato from all other buthids: pedipalps orthobothriotaxic, type Aβ (*beta*-configuration); legs III and IV with tibial spurs; pedipalp movable fingers with six imbrigated rows of denticles; carapace flat; cheliceral fixed finger with a single ventral denticle; telson with a distinct subaculear tooth; metasoma V smooth or granulated without punctate.

To distinguish the genera within *Lychas* sensu lato I introduce additional four characters:

A) Elongated tibial spurs present (Figs. 38–43, A1) versus reduced to moderate tibial spurs present on leg III and leg IV (Figs. 18–37, 44–45, A0).
B) Sixth row without outer accessory denticles (Figs. 14, 16–17, B1) versus sixth row with 1–4 outer accessory denticles (Figs. 13, 15, B0).
C) Ventral surfaces of tarsomeres II of legs densely equipped with two rows of setae (Figs. 9–10, 12, 18–36, 38–45, C1), or this surface with only 5–7 spiniform setae in two rows (Figs. 11, 37, C0).
D) Telson in male laterally strongly bumpy with a developed longitudinal furrow (Figs. 96, 99–100, D1; the character is not verified for *Janalychas albimanus* **comb**. **n**.) versus telson smooth or granulated with the furrow absent or only indicated (Figs. 74–94, 101, D0).

Afrolychas **gen**. **n**.	A0-B1-C1-D0
Janalychas **gen**. **n**.	A1-B1-C1-D1
Lychas C. L. Koch, 1845	A0-B0-C1-D0
Spelaeolychas **gen**. **n**.	A0-B0-C0-D0

Genus *Janalychas* gen. n.

(Figures 10, 14, 38–43, 66–71, 95–100, 102–103)

http://zoobank.org/urn:lsid:zoobank.org:act:D3B3A7AA-9947-48FD-A49E-0CDAA4C3A4C3

Lychas (in part) C. L. Koch, 1845: 3; Tikader & Bastawade, 1983: 40–107, figs. 185–215, 240–255; Fet & Lowe, 2000: 158–169 (complete references list until 2000); Kovařík & Ojanguren Affilastro, 2013: 194–210, figs. 1424–1431, 1437–1438, 1450–1470, 1557–1558, 1593–1600.

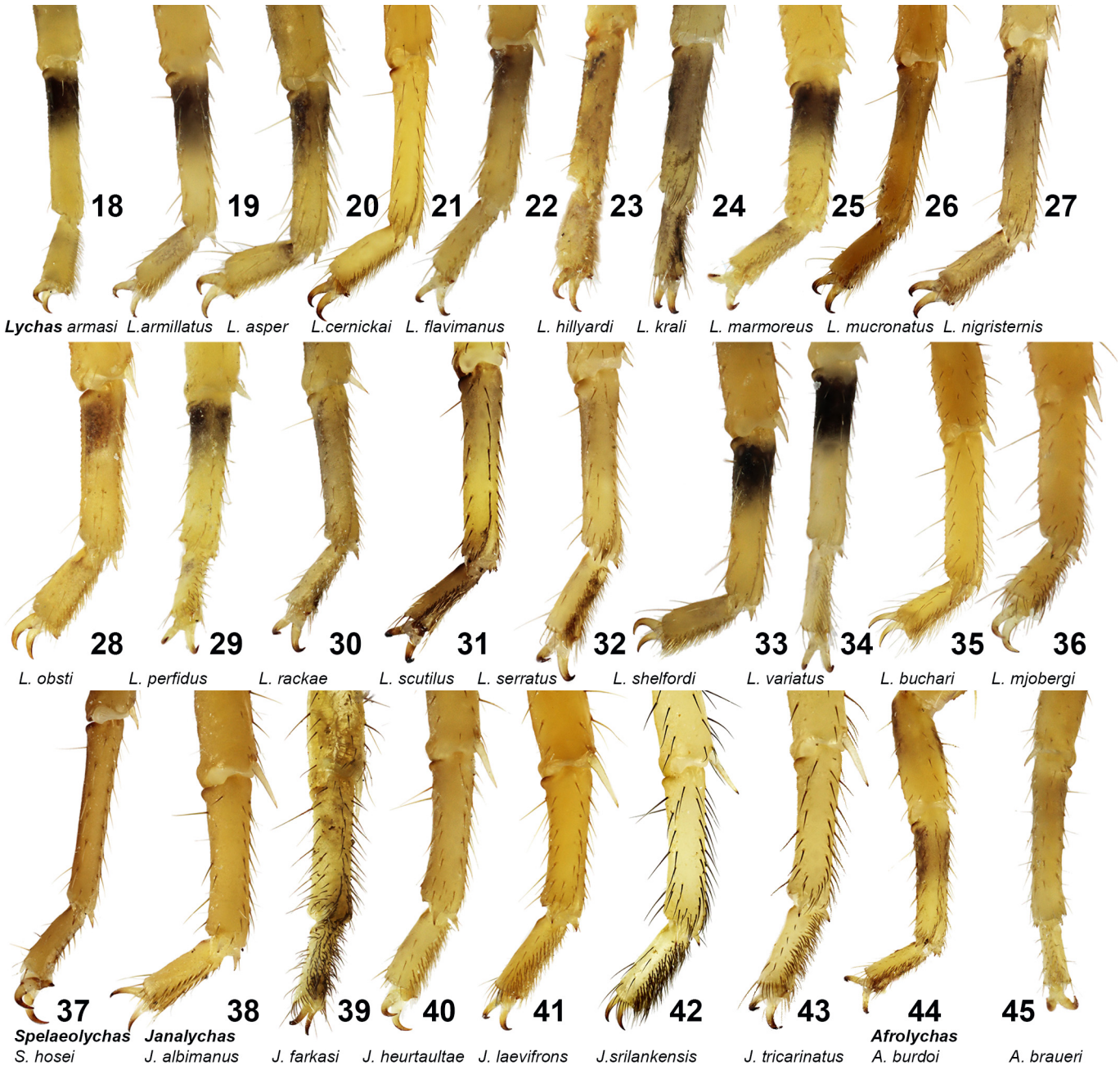
Type species. *Lychas srilankensis* Lourenço, 1997.

Etymology. The generic name is a matronym honoring Jana Štundlová (née Plíšková) (Prague, Czech Republic) for her contributions to scorpion systematics, especially by applying karyotype study.

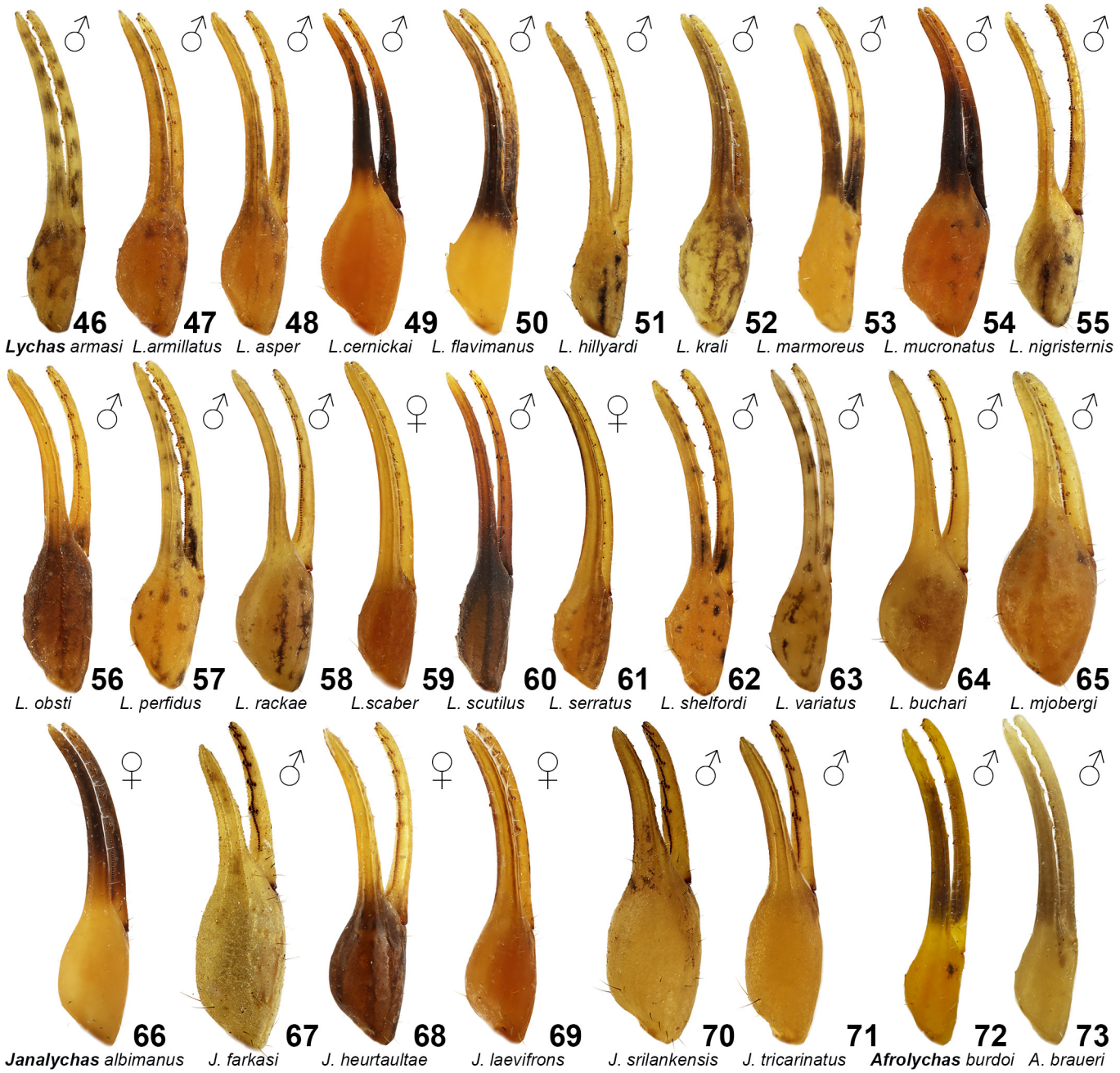
Diagnosis. Total length 30–65 mm. Carapace granular, lacking distinct carinae, flat, subrectangular with concave anterior margin. Median eyes on ocular tubercle in anterior half of carapace; usually with 4, or sometimes 5 pairs of lateral eyes (3 major ocelli, 1–2 minor ocelli). Sternum type 1, triangular in shape. Tergites I–VI granular, with single median carina, tergite VII with 5 carinae. Metasoma elongate, segment I with 10 carinae, II–III with 8–10 carinae, IV with 8 carinae. Telson ellipsoidal in shape, with distinct subaculear tooth. Pectinal tooth counts 21–26. Pectines with fulcra. Chelicerae with typical buthid dentition, fixed finger armed with single denticle on ventral surface. Pedipalps orthobothriotaxic, type Aβ, femur trichobothrium d_2 obviously internal, patella d_3 external to dorsomedian carina. Dentate margins of chela movable finger armed with 3 terminal (two subterminal and one distal) denticles, apical row composed of 3–7 denticles, and imbricated overlapping six rows of denticles, rows 1–5 terminated proximally flanked by two enlarged outer accessory denticles, and single inner accessory denticle displaced distally. Sixth row without outer and inner accessory denticles. Elongated tibial spurs present on leg III and leg IV, tibia and tarsus without bristle combs, ventral surfaces of tarsomeres II densely equipped with two rows of setae, ungues stout.

Subordinate taxa (7 species).
Janalychas albimanus (Henderson, 1919), **comb**. **n**. (India)
Janalychas farkasi (Kovařík, 1997), **comb**. **n**. (Nepal)
Janalychas heurtaultae (Kovařík, 1997), **comb**. **n**. (Nepal)
Janalychas laevifrons (Pocock, 1897), **comb**. **n**. (India, Nepal)
Janalychas shoplandi (Oates, 1888), **comb**. **n**. (Myanmar)
= ?*Isometrus feae* Thorell, 1889
Janalychas srilankensis (Lourenço, 1997), **comb**. **n**. (Sri Lanka)
= *Lychas ceylonensis* Lourenço & Huber, 1999
Janalychas tricarinatus (Simon, 1884), **comb**. **n**. (India)

Comments. *Janalychas srilankensis* **comb**. **n**. was originally described as *Lychas* by Lourenço (1997) where it was also placed so far (e. g. Fet & Lowe, 2000; Kovařík & Ojanguren Affilastro, 2013; Kovařík et al., 2016). Morphological characters cited in the diagnosis above indicate that this placement was not correct, and this species, together with six other species from India, Nepal, and Myanmar, represents a separate new genus related to Sri Lankan species of *Reddyanus* Vachon, 1972 and *Isometrus* Ehrenberg, 1828 (see Kovařík et al., 2016).



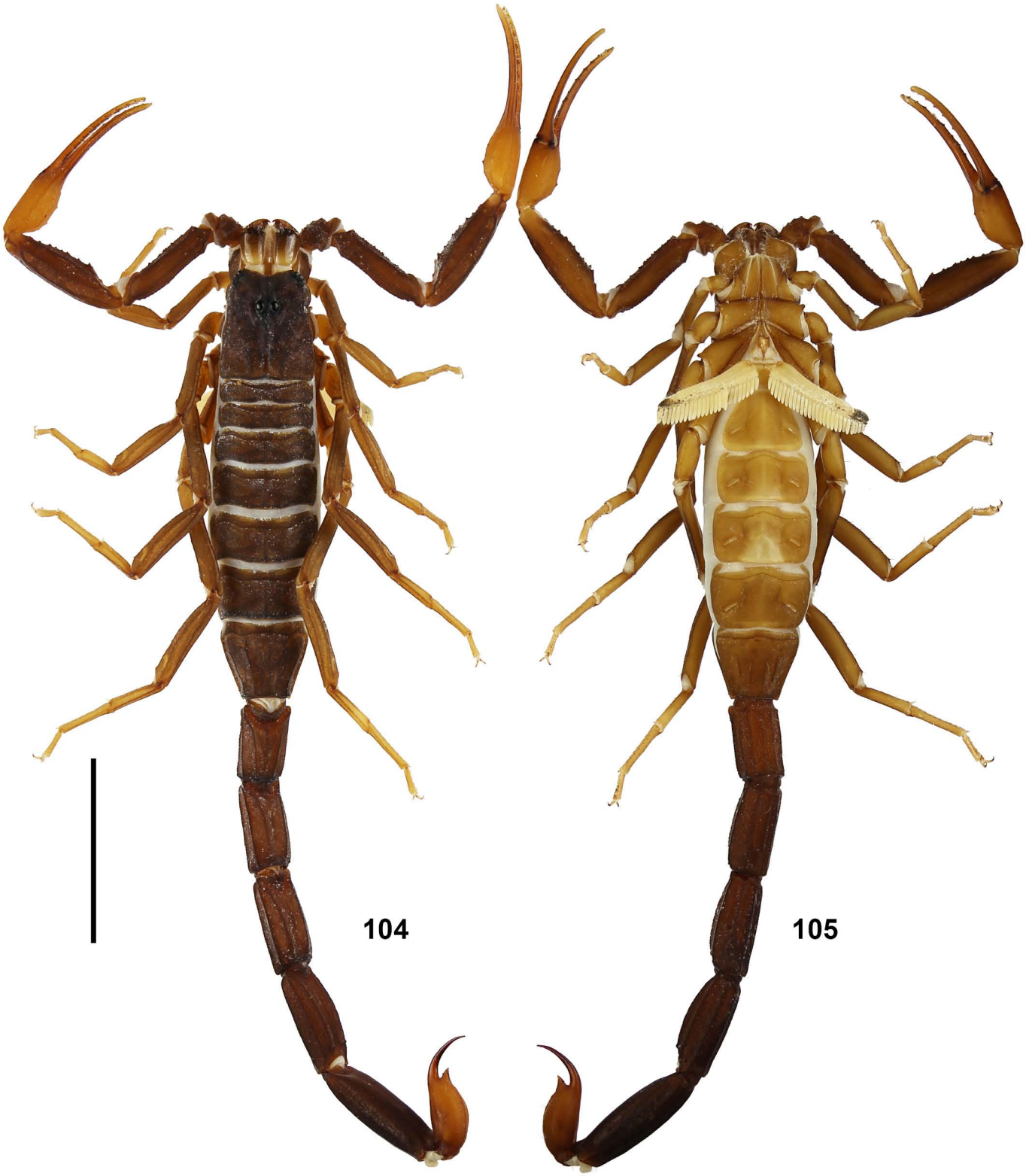
Figures 18–45: Tarsomeres I and II and part of tibia of legs III, retrolateral views. **Figures 18–36**: *Lychas*. **Figure 18**. *L. armasi*, male holotype, FKCP. **Figure 19**. *L. armilatus*, male, Philippines, Negros island, FKCP. **Figure 20**. *L. asper*, male, Mozambique, Tette, FKCP. **Figure 21**. *L. cernickai*, male holotype, FKCP. **Figure 22**. *L. flavimanus*, male, Indonesia, Sumatra, Padang, FKCP. **Figure 23**. *L. hillyardi*, male holotype, FKCP. **Figure 24**. *L. krali*, male, Thailand, Doi Inthanon, 18.54268°N 98.57882°E, FKCP. **Figure 25**. *L. marmoreus*, male, Australia, NSW, Kandallilla, FKCP. **Figure 26**. *L. mucronatus*, male, Laos, Attapu Province, 15 km SE of Ban Houaykong, 15°02'N 106°35'E, 800 m a.s.l., FKCP. **Figure 27**. *L. nigristernis*, male, India, Uttar Pradesh State, Karnaprayag env., 770 m a.s.l., FKCP. **Figure 28**. *L. obsti*, male, Tanzania, Mombo, FKCP. **Figure 29**. *L. perfidus*, male, Melanesia, Solomon Islands, Guadalcanal, Mt. Austen, FKCP. **Figure 30**. *L. rackae*, male holotype, ZMUH. **Figure 31**. *L. scutilus*, male, Thailand, Trang, FKCP. **Figure 32**. *L. serratus*, female, Mauritius, Round Island, HNHM. **Figure 33**. *L. shelfordi*, male, Malaysia, Busuanga Island, FKCP. **Figure 34**. *L. variatus*, male, Papua New Guinea, Madang Province, Wanang vill., 05°15'S 145°16'E, 100 m a.s.l., FKCP. **Figure 35**. *L. buchari*, male, Australia, Midwest Kirkalocka, 28°34.684'S 118°06.292'E, 443 m a.s.l., FKCP. **Figure 36**. *L. mjobergi*, male, Australia, Yulara, 25°14'S 130°59'E, 496 m a.s.l., FKCP. **Figure 37**. *Spelaeolychas* **gen**. **n**., *S. hosei* **comb**. **n**., male, Malaysia, Sarawak, Niah Cave, 3°48'50.00"N 113°46'53.00"E, FKCP. **Figures 38–43**: *Janalychas* **gen**. **n**. **Figure 38**. *J. albimanus* **comb**. **n**., female, India, Kerala state, Ponmudi, 900 m a.s.l., FKCP. **Figure 39**. *J. farkasi* **comb**. **n**., male, Nepal, FKCP. **Figure 40**. *J. heurtaultae* **comb**. **n**., female, allotype, NMPC. **Figure 41**. *J. laevifrons* **comb**. **n**., female, India, Adhya Pradesh State, Salur env., FKCP. **Figure 42**. *J. srilankensis* **comb**. **n**., male, Sri Lanka, Northern Province, District Jaffna, 09°42'51.6"N 080°04'44.8"E, 19 m a.s.l., FKCP. **Figure 43**. *J. tricarinatus* **comb**. **n**., male, India, Kerala State, Vithura, 200 m a.s.l., FKCP. **Figures 44–45**: *Afrolychas* **gen**. **n**. **Figure 44**. *A. burdoi* **comb**. **n**., male paralectotype of *Babycurus ornatus*, ZMUH. **Figure 45**. *A. braueri* **comb**. **n**., female lectotype, ZMHB.



Figures 46–73: Pedipalp chela dorsal views. **Figures 46–65**: *Lychas*. **Figure 46**. *L. armasi*, male holotype, FKCP. **Figure 47**. *L. armilatus*, male, Philippines, Negros island, FKCP. **Figure 48**. *L. asper*, male, Mozambique, Tette, FKCP. **Figure 49**. *L. cernickai*, male holotype, FKCP. **Figure 50**. *L. flavimanus*, male, Indonesia, Sumatra, Padang, FKCP. **Figure 51**. *L. hillyardi*, male holotype, FKCP. **Figure 52**. *L. krali*, male, Thailand, Doi Inthanon, 18.54268°N 98.57882°E, FKCP. **Figure 53**. *L. marmoreus*, male, Australia, NSW, Kandallilla, FKCP. **Figure 54**. *L. mucronatus*, male, Laos, Attapu Province, 15 km SE of Ban Houaykong, 15°02'N 106°35'E, 800 m a.s.l., FKCP. **Figure 55**. *L. nigristernis*, male, India, Uttar Pradesh state, Karnaprayag env., 770 m a.s.l., FKCP. **Figure 56**. *L. obsti*, male, Tanzania, Mombo, FKCP. **Figure 57**. *L. perfidus*, male, Melanesia, Solomon Islands, Guadalcanal, Mt. Austen, FKCP. **Figure 58**. *L. rackae*, male holotype, ZMUH. **Figure 59**. *L. scaber*, female, India, Bombay env., FKCP. **Figure 60**. *L. scutilus*, male, Thailand, Trang, FKCP. **Figure 61**. *L. serratus*, female, Mauritius, Round Island, HNHM. **Figure 62**. *L. shelfordi*, male, Malaysia, Busuanga Island, FKCP. **Figure 63**. *L. variatus*, male, Papua New Guinea, Madang Province, Wanang vill., 05°15'S 145°16'E, 100 m a.s.l., FKCP. **Figure 64**. *L. buchari*, male, Australia, Midwest Kirkalocka, 28°34.684'S 118°06.292'E, 443 m a.s.l., FKCP. **Figure 65**. *L. mjobergi*, male, Australia, Yulara, 25°14'S 130°59'E, 496 m a.s.l., FKCP. **Figures 66–71**: *Janalychas* **gen**. **n**. **Figure 66**. *J. albimanus* **comb**. **n**., female, India, Kerala State, Ponmudi, 900 m a.s.l., FKCP. **Figure 67**. *J. farkasi* **comb**. **n**., male, Nepal, FKCP. **Figure 68**. *J. heurtaultae* **comb**. **n**., female, allotype, NMPC. **Figure 69**. *J. laevifrons* **comb**. **n**., female, India, Adhya Pradesh State, Salur env., FKCP. **Figure 70**. *J. srilankensis* **comb**. **n**., male, Sri Lanka, Northern Province, District Jaffna, 09°42'51.6"N 080°04'44.8"E, 19 m a.s.l., FKCP. **Figure 71**. *J. tricarinatus* **comb**. **n**., male, India, Kerala State, Vithura, 200 m a.s.l., FKCP. **Figures 72–73**: *Afrolychas* **gen**. **n**. **Figure 72**. *A. burdoi* **comb**. **n**., male paralectotype of *Babycurus ornatus*, ZMUH. **Figure 73**. *A. braueri* **comb**. **n**., male paralectotype, ZMHB.

Figures 74–101: Telson, lateral views. **Figure 74**. *Spelaeolychas* **gen**. **n**., *S. hosei* **comb**. **n**., male, Malaysia, Sarawak, Niah cave, 3°48'50.00"N 113°46'53.00"E, FKCP. **Figures 75–94**: *Lychas*. **Figure 75**. *L. armasi*, male holotype, FKCP. **Figure 76**. *L. armilatus*, male, Philippines, Negros island, FKCP. **Figure 77**. *L. asper*, male, Mozambique, Tette, FKCP. **Figure 78**. *L. cernickai*, male holotype, FKCP. **Figure 79**. *L. flavimanus*, male, Indonesia, Sumatra, Padang, FKCP. **Figure 80**. *L. hillyardi*, male holotype, FKCP. **Figure 81**. *L. krali*, male, Thailand, Doi Inthanon, 18.54268°N 98.57882°E, FKCP. **Figure 82**. *L. marmoreus*, male, Australia, NSW, Kandallilla, FKCP. **Figure 83**. *L. mucronatus*, male, Laos, Attapu Province, 15 km SE of Ban Houaykong, 15°02'N 106°35'E, 800 m a.s.l., FKCP. **Figure 84**. *L. nigristernis*, male, India, Uttar Pradesh State, Karnaprayag env., 770 m a.s.l., FKCP. **Figure 85**. *L. obsti*, male, Tanzania, Mombo, FKCP. **Figure 86**. *L. perfidus*, male, Melanesia, Solomon Islands, Guadalcanal, Mt. Austen, FKCP. **Figure 87**. *L. rackae*, male holotype, ZMUH. **Figure 88**. *L. scaber*, female, India, Bombay env., FKCP. **Figure 89**. *L. scutilus*, male, Thailand, Trang, FKCP. **Figure 90**. *L. serratus*, female, Mauritius, Round Island, HNHM. **Figure 91**. *L. shelfordi*, male, Malaysia, Busuanga Island, FKCP. **Figure 92**. *L. variatus*, male, Papua New Guinea, Madang Province, Wanang vill., 05°15'S 145°16'E, 100 m a.s.l., FKCP. **Figure 93**. *L. buchari*, male, Australia, Midwest Kirkalocka, 28°34.684'S 118°06.292'E, 443 m a.s.l., FKCP. **Figure 94**. *L. mjobergi*, male, Australia, Yulara, 25°14'S 130°59'E, 496 m a.s.l., FKCP. **Figures 95–100**: *Janalychas* **gen**. **n**. **Figure 95**. *J. albimanus* **comb**. **n**., female, India, Kerala State, Ponmudi, 900 m a.s.l., FKCP. **Figure 96**. *J. farkasi* **comb**. **n**., male, Nepal, FKCP. **Figure 97**. *J. heurtaultae* **comb**. **n**., female, allotype, NMPC. **Figure 98**. *J. laevifrons* **comb**. **n**., female, India, Adhya Pradesh state, Salur env., FKCP. **Figure 99**. *J. srilankensis* **comb**. **n**., male, Sri Lanka, Northern Province, District Jaffna, 09°42'51.6"N 080°04'44.8"E, 19 m a.s.l., FKCP. **Figure 100**. *J. tricarinatus* **comb**. **n**., male, India, Kerala State, Vithura, 200 m a.s.l., FKCP. **Figure 101**. *Afrolychas* **gen**. **n**., *A. burdoi* **comb**. **n**., male paralectotype of *Babycurus ornatus*, ZMUH.

Figures 102–**103**: *Janalychas srilankensis* **comb**. **n**.. **Figure 102**. Male after 5th ecdysis at locality (Sri Lanka, Northern Province, Jaffna District, 09°42’51.6”N 080°04’44.8”E, 19 m a.s.l.). **Figure 103**. Female with juveniles after first ecdysis (Sri Lanka, North Central Province, Puttalam District, Eluwankulam, 08°12’35.1”N 079°51’32”E, 52 m a.s.l.).



Figures 104–**105**: *Spelaeolychas hosei* **comb**. **n**., male, Malaysia, Sarawak, Niah Cave, 3°48’50.00”N 113°46’53.00”E, FKCP in dorsal (104) and ventral (105) views. Scale bar: 10 mm.

Genus *Spelaeolychas* gen. n.

(Figures 11, 15, 37, 74, 104–127)

http://zoobank.org/urn:lsid:zoobank.org:act:B7312D3F-91DA-4497-8061-4F6931CAAE88

Isometrus: Pocock, 1891: 436–438, pl XI, fig. 2.

Lychas: Fet & Lowe, 2000: 162 (complete references list until 2000); Kovařík & Ojanguren Affilastro, 2013: 202, figs. 1499–1508, 1556.

Type species. *Isometrus hosei* Pocock, 1891.

Etymology. The genus name indicates the ecology of its only species; all specimens were collected at the cave entrances.

Diagnosis. Total length 45–70 mm. Carapace granular, lacking distinct carinae, flat, subrectangular with concave anterior margin. Median eyes on ocular tubercle in anterior half of carapace; usually with 4, or sometimes 5 pairs of lateral eyes (3 major ocelli, 1–2 minor ocelli). Sternum type 1, triangular in shape. Tergites I–VI granular, with single median carina, tergite VII with 5 carinae. Metasoma elongate, segment I with 10 carinae, II–IV with 8 carinae. Telson smooth, ellipsoidal in shape, with distinct subaculear tooth. Pectinal tooth counts 18–24. Pectines with inconspicuous fulcra. Chelicerae with typical buthid dentition, fixed finger armed with single denticle on ventral surface. Pedipalps orthobothriotaxic, type Aβ, femur trichobothrium d_2 internal, patella d_3 external to dorsomedian carina. Dentate margins of chela movable finger armed with 3 terminal (two subterminal and one distal) denticles, apical row composed of 4–6 denticles, and imbricated overlapping six rows of denticles, rows 1–5 terminated proximally flanked by two enlarged outer accessory denticles, and single inner accessory denticle displaced distally. Sixth row with three isolated outer accessory denticles midway along its length, no inner accessory denticles. Moderate tibial spurs present on leg III and leg IV, tibia and tarsus without bristle combs, ventral surfaces of tarsomeres II of legs with 5–7 spiniform setae in each of two rows, ungues stout.

Subordinate taxa (1 species).

Spelaeolychas hosei (Pocock, 1891), **comb**. **n**. (Malaysia)

= *Lychas tweediei* Kopstein, 1937

= *Lychas hosei cavernicola* Lourenço, 2007

Comments. *Spelaeolychas hosei* **comb**. **n**. was originally described as *Isometrus* by Pocock (1891), and since 1985 (Vachon & Lourenço, 1985) it was placed in genus *Lychas* by all the recent authors (e. g. Fet & Lowe, 2000; Kovařík & Ojanguren Affilastro, 2013). Morphological characters cited in the diagnosis above indicate that the placement was incorrect, and this species represent a separate new genus.

Genus *Afrolychas* gen. n.

(Figures 12, 16–17, 44–45, 72–73, 101, 128–133)

http://zoobank.org/urn:lsid:zoobank.org:act:67C5FACA-26D6-44C4-B2A7-9BA51D25AA5C

Lychas (in part) Fet & Lowe, 2000: 158–169 (complete references list until 2000); Kovařík & Ojanguren Affilastro, 2013: 194–210, figs. 1415–1418, 1432–1433, 1559–1561.

Type species. *Isometrus burdoi* Simon, 1882.

Etymology. The generic name reflects geographic distribution of this genus.

Diagnosis. Total length 25–40 mm. Carapace granular, lacking distinct carinae, flat, subrectangular with concave anterior margin. Median eyes on ocular tubercle in anterior half of carapace; usually with 4, or sometimes 5 pairs of lateral eyes (3 major ocelli, 1–2 minor ocelli). Sternum type 1, triangular in shape. Tergites I–VI granular, with single median carina, tergite VII with 5 carinae. Metasoma elongate, segment I with 10 carinae, II with 8 or 10, III–IV with 8 carinae. Telson ellipsoidal in shape, smooth or granulated with the furrow absent or only indicated, with distinct subaculear tooth. Pectinal tooth counts 13–18. Pectines with fulcra. Chelicerae with typical buthid dentition, fixed finger armed with single denticle on ventral surface. Pedipalps orthobothriotaxic, type Aβ, femur trichobothrium d_2 internal, patella d_3 external to dorsomedian carina. Dentate margins of chela movable finger armed with 3 terminal (two subterminal and one distal) denticles, apical row composed of 1–3 denticles, and imbricated overlapping six rows of denticles, rows 1–5 terminated proximally flanked by two enlarged outer accessory denticles, and single inner accessory denticle displaced distally. Sixth row without outer and inner accessory denticles. Moderate tibial spurs present on leg III and leg IV, tibia and tarsus without bristle combs, ventral surfaces of tarsomeres II densely equipped with two rows of setae, ungues stout.

Subordinate taxa (2 species).

Afrolychas braueri (Kraepelin, 1896), **comb**. **n**. (Seychelles: Praslin and Mahé Islands)

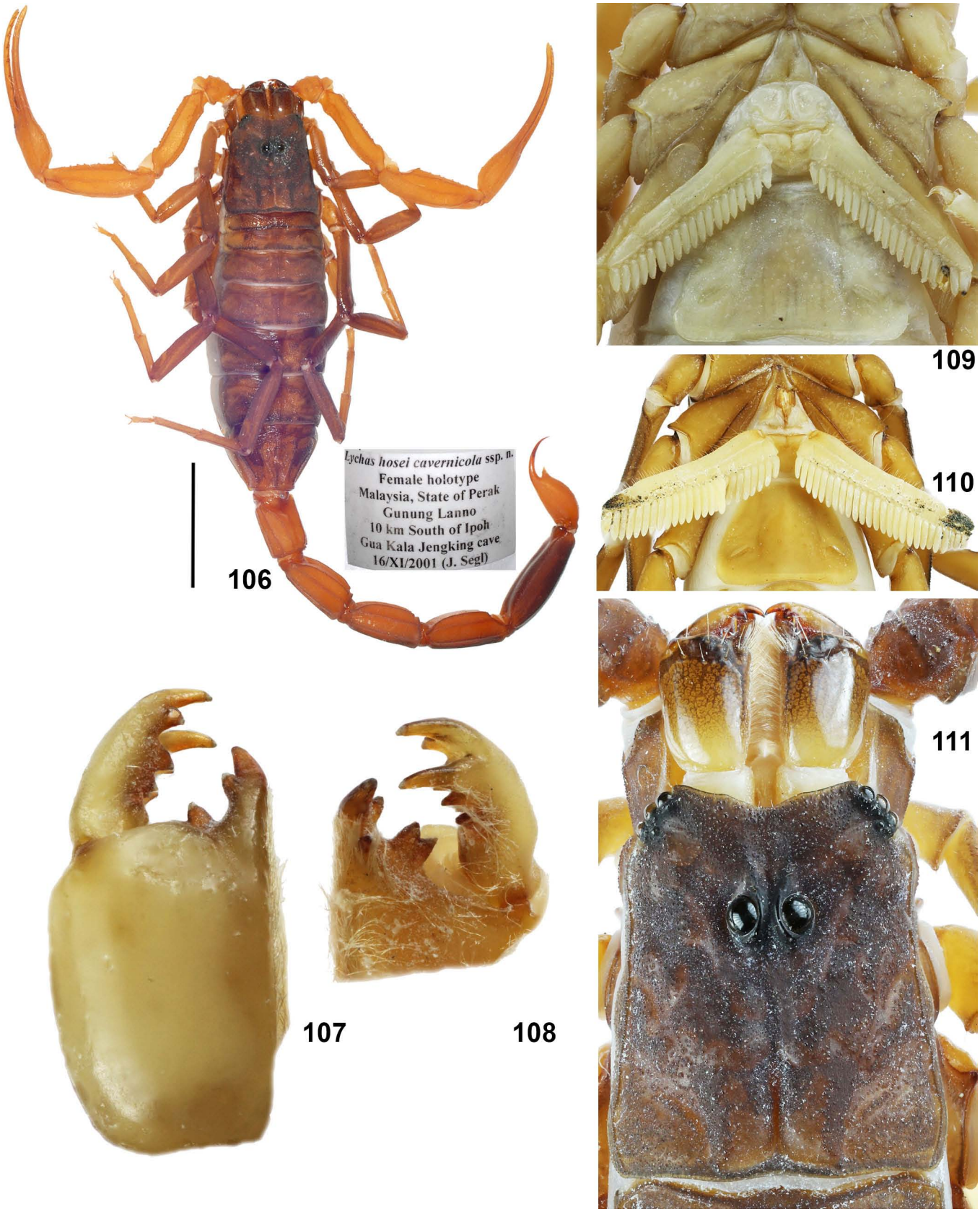
Afrolychas burdoi (Simon, 1882), **comb**. **n**. (Central African Republic, Democratic Republic of Congo, Kenya, Malawi, Mozambique, Tanzania, Zambia, Zimbabwe)

= ?*Lychas burdoi rugulosus* Birula, 1915

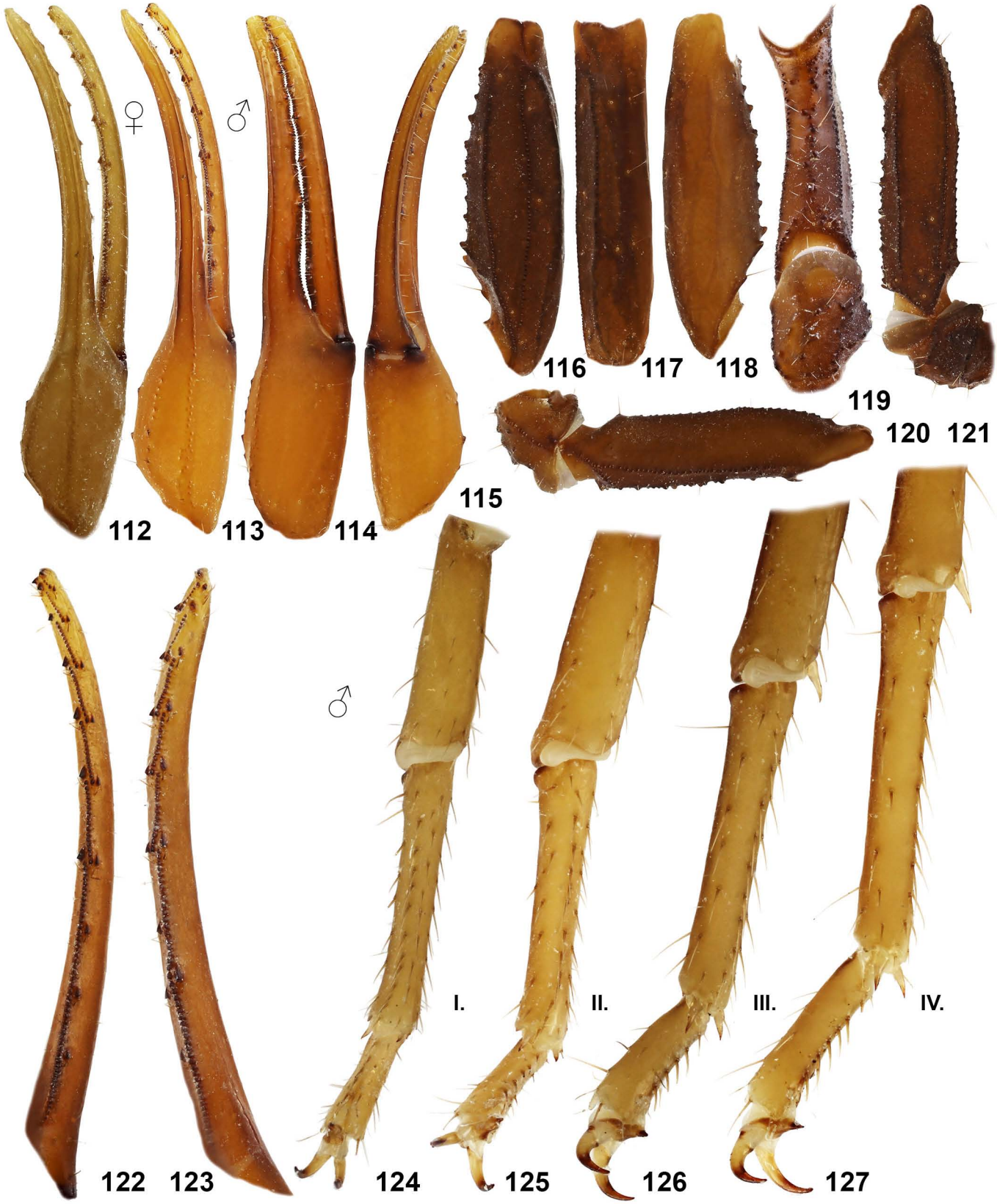
= *Lychas burdoi rhodesianus* Lawrence, 1938

= *Babycurus ornatus* Werner, 1936

Comments. *Afrolychas burdoi* **comb**. **n**. was originally described as *Isometrus* by Simon (1882) and since 1902 (Purcell, 1902) it was placed in genus *Lychas* by all the recent authors (e. g. Fet & Lowe, 2000; Prendini, 2005; Kovařík & Ojanguren Affilastro, 2013). Morphological characters cited in the diagnosis up indicate that this species, together with *A. braueri* **comb**. **n**., represents a separate new genus, more related to the African genus *Pseudolychas* Kraepelin, 1911 than to the species of genus *Lychas* sensu stricto.



Figures 106–111: *Spelaeolychas hosei* **comb. n. Figure 106**. Female holotype of *Lychas hosei cavernicola* Lourenço, 2007 in dorsal view including original label. Scale bar: 10 mm. **Figures 107–109**. Female from Malaysia, Malacca, ZMHB, left chelicera dorsal (107) and ventral (108) views, and sternopectinal region (109). **Figures 110–111**. Male from Malaysia, Sarawak, Niah Cave, 3°48’50.00”N 113°46’53.00”E, FKCP, sternopectinal region (110), and carapace and chelicerae (111).



Figures 112–127: *Spelaeolychas hosei* **comb**. **n**. **Figure 112**. Female from Malaysia, Malacca, ZMHB, pedipalp chela dorsal view. **Figures 113–127**. Male from Malaysia, Sarawak, Niah Cave, 3°48'50.00"N 113°46'53.00"E, FKCP, pedipalp chela, dorsal (113), externodorsal (114), and ventrointernal (115) views. Pedipalp patella, dorsal (116), external (117) and ventral (118) views.Pedipalp femur and trochanter, internal (119), internal (120), and dorsoexternal (121) views. Movable (122) and fixed (123) fingers. Tarsomeres I and II and part of tibia of legs I–IV, retrolateral views (124–127).

Figures 128–129. *Afrolychas burdoi* **comb. n.**, female from Tanzania with newborns (128) and with juveniles after first ecdysis (129).

Figures 130–133: *Afrolychas braueri* **comb**. **n**. **Figures 130–131**. Male paralectotype in dorsal (130) and ventral (131) views. **Figures 132–133**. Female lectotype in dorsal (132) and ventral (133) views. Scale bars: 10 mm.

Genus *Mesobuthus* Vachon, 1950
(Figures 134–137, 148, 161–163, 171–172)

Mesobuthus (in part) Vachon, 1950: 152–152 (1952: 324–325); Fet & Lowe, 2000: 169–181 (complete references list until 2000).

Type species. *Androctonus eupeus* C. L. Koch, 1839.

Diagnosis. Medium-sized buthids, adults 35–60 mm. Sternum type 1 (Soleglad & Fet, 2003), various degrees of an irregular pentagon in shape. Pedipalps orthobothriotaxic, type Aβ (Vachon, 1974, 1975), femur trichobothrium d_2 dorsal, patella d_3 dorsal of dorsomedian carina. Chelal trichobothrium *db* usually located between *est* and *esb*, or may be on level with trichobothrium *est*. Trichobothrium *eb* clearly on fixed finger of pedipalp. Pectines with fulcra. Dentate margin of pedipalp-chela movable finger with distinct denticles divided into 11–12 linear rows and 5 terminal denticles. Chelicerae with typical buthid dentition (Vachon, 1963, figs. 32–33), fixed finger armed with two denticles on ventral surface. Tergites I–VI granular, with three carinae, tergite VII with 5 carinae. Carapace with distinct carinae, entire dorsal surface nearly flat. First sternite with two granulated lateral stridulatory areas, which however may be reduced in some species. Metasoma elongate, segment I with 10 carinae, segments II-III with 8–10 carinae, segment IV with 8 carinae. Ventrolateral carinae of metasomal segment V posteriorly usually with several large lobated denticles. Telson elongated or bulbous, bumpy and granulated, without subaculear tooth. Legs III and IV with well developed tibial spurs. No sexual dimorphism in shape of metasoma.

Subordinate taxa (12 species).

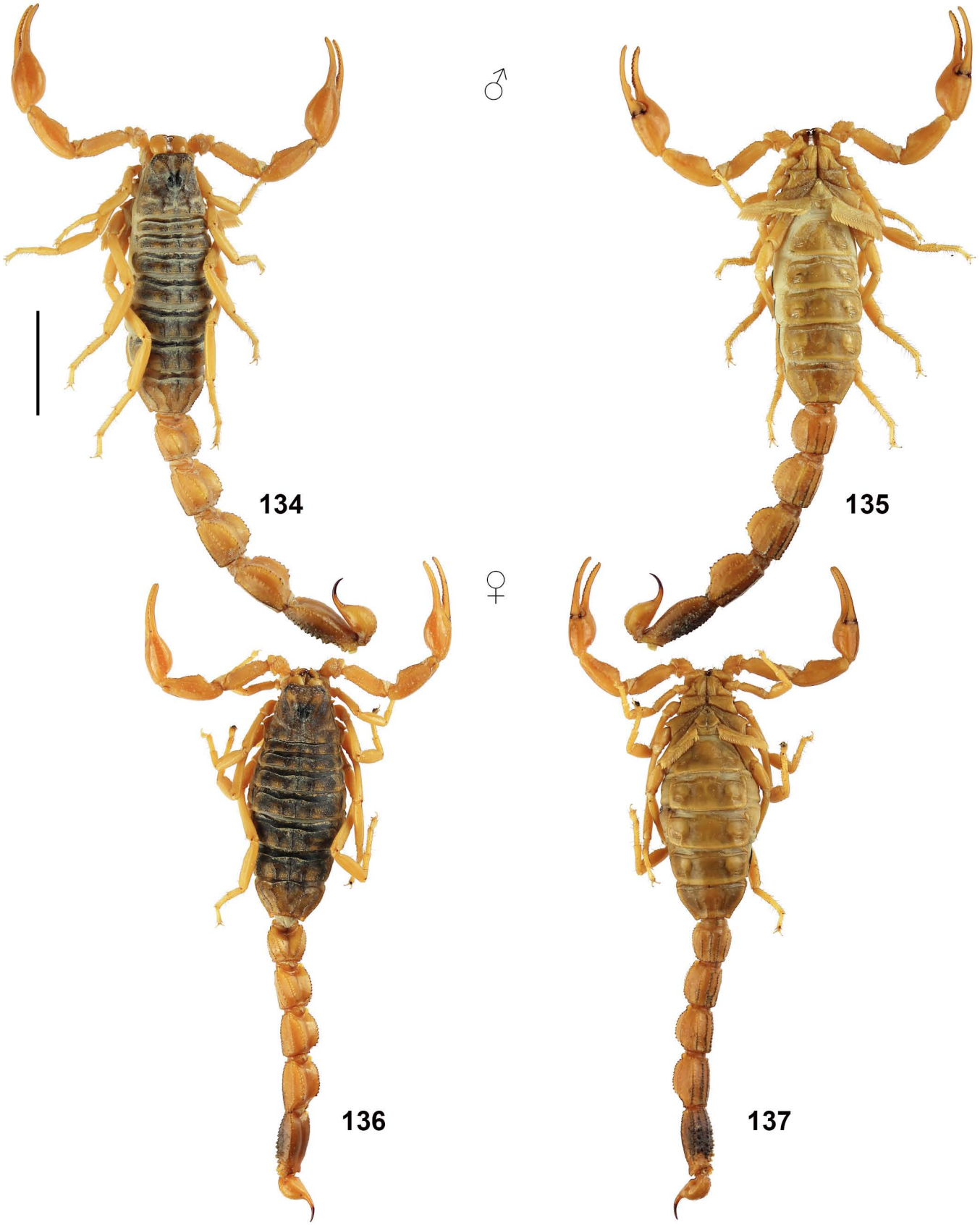
Mesobuthus afghanus (Pocock, 1889), **stat**. **n**. (Afghanistan, Iran, Turkmenistan)
Mesobuthus agnetis (Werner, 1936) (Iran)
Mesobuthus bogdoensis (Birula, 1896), **stat**. **n**. (Kazakhstan, Russia)
Mesobuthus eupeus (C. L. Koch, 1839) (Armenia, Azerbaijan, Georgia, Iraq, Iran, Syria, Turkey)
= *Androctonus ornatus* Nordmann, 1840
= *Buthus cognatus* L. Koch, 1878
= *Buthus eupeus philippovitschi* Birula, 1905
Mesobuthus haarlovi Vachon, 1959, **stat**. **n**. (Afghanistan)
Mesobuthus iranus (Birula, 1917), **stat**. **n**. (Iraq, Iran)
Mesobuthus macmahoni (Pocock, 1900) (Iran, Pakistan)
Mesobuthus mongolicus (Birula, 1912), **stat**. **n**. (China, Mongolia)
Mesobuthus persicus (Pocock, 1899), **stat**. **n**. (Iran)
= ?*Buthus eupeus kirmanensis* Birula, 1900
= *Buthus pachysoma* Birula, 1900
Mesobuthus phillipsii (Pocock, 1889) (Iran, Iraq, Syria, Turkey)
= *Buthus eupaeus mesopotamicus* Penther, 1912
Mesobuthus thersites (C. L. Koch, 1839), **stat**. **n**. (?China, Iran, Kazakhstan, Kyrgyzstan, Russia, Tajikistan, Turkmenistan, Uzbekistan)
= ?*Buthus eupeus barszczewskii* Birula, 1904
Mesobuthus vesiculatus (Pocock, 1899) (Iran)

Comments. Gantenbein et al. (2003, 2005) published the first DNA-based phylogeny for *Mesobuthus*, which revealed three complexes of species inside the genus (see also Fet et al., 2018). However, without a detail comparison with other buthid genera it still appeared that the *Mesobuthus* is a monophyletic genus. Only a detailed comparison with related genera (a revision in preparation by our research group) demonstrated that these three complexes constitute three separate genera, of which *Mesobuthus* sensu stricto and *Olivierus* are very close sister taxa, while *Aegaeobuthus* **gen**. **n**. is more closely related to the genus *Compsobuthus* than to both *Mesobuthus* and *Olivierus*. For morphological differences among these three genera we can use the characters used in Fet et al. (2018: 54) and other major characters cited here. While genus *Olivierus* was recently revised (as "*Mesobuthus caucasicus* complex"; Fet et al., 2018), both other genera, mainly *Mesobuthus* sensu stricto, require a detailed revision.

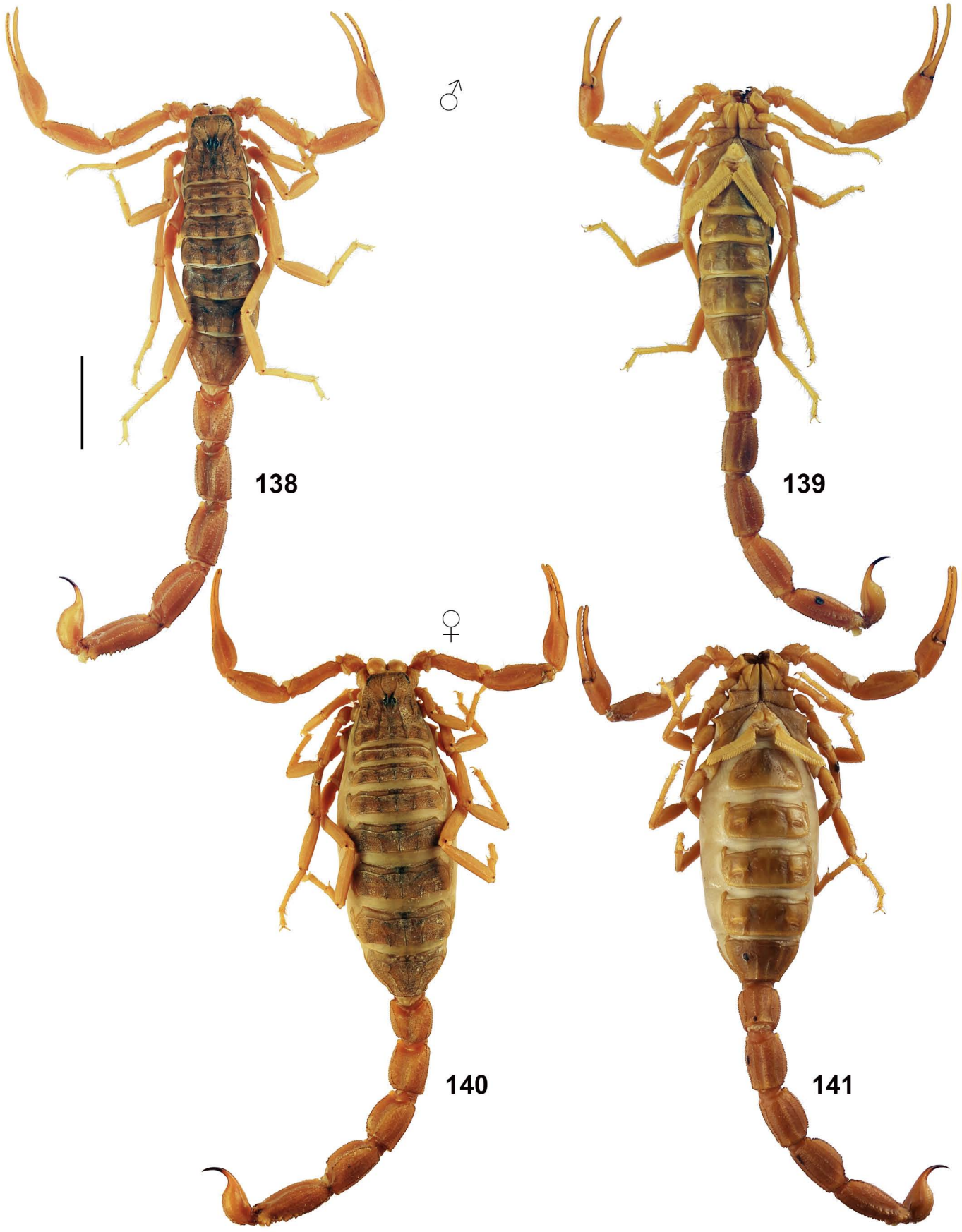
Most species of the genus *Mesobuthus* were traditionally considered the subspecies of *Mesobuthus eupeus*. Mirshamsi et al. (2011: 15) elevated *Mesobuthus phillipsii* to the species level based on DNA analysis. Other subspecies are elevated here to the species level according to morphological characters presently studied for a detailed genus-level revision (in preparation by our research group). In my opinion, subspecies rank is not supported in this genus (as in most scorpion genera when subspecies have been revised), and all described *Mesobuthus* taxa are either species or synonyms.

Affinities. Kovařík (2009) used nine characters, which in combination differentiate *Mesobuthus* sensu lato from all other buthids: pedipalps orthobothriotaxic, type Aβ (*alfa*-configuration); legs III and IV with well developed tibial spurs; cheliceral fixed finger with two denticles on ventral surface; trichobothrium *eb* located on fixed finger of chela; tergites I–VI with 3 carinae; dentate margin of pedipalp-chela movable finger with distinct denticles divided into 11–14 linear rows and 5 terminal denticles; tarsomeres of legs with paired ventral spines or setae; carinae of carapace forming a lyre-shaped configuration; ventrolateral carinae on metasoma V with irregular denticles.

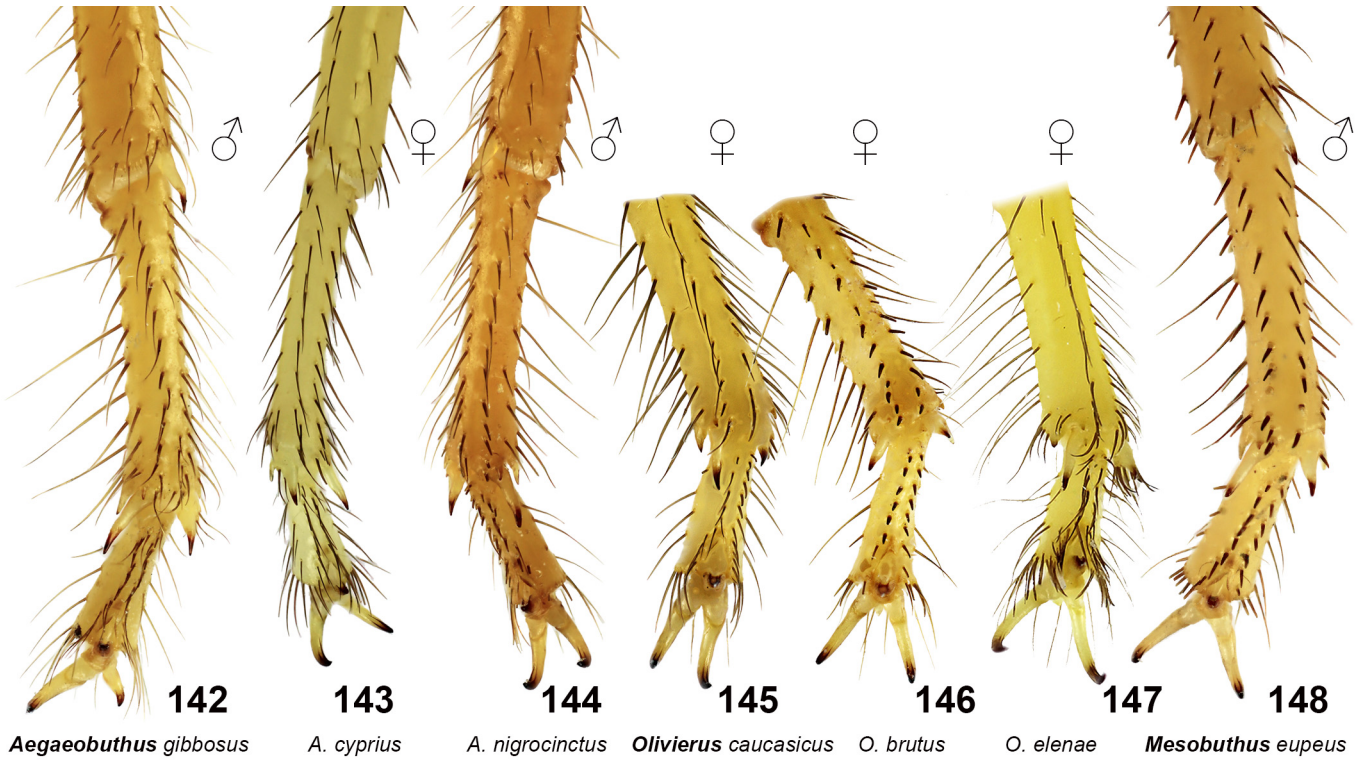
The main trait that differentiates the genus *Aegaeobuthus* **gen**. **n**. from both *Olivierus* and *Mesobuthus* is the presence of sexual dimorphism. The males of *Aegaeobuthus* **gen**. **n**. have longer and narrower metasomal segments than females, with a rather elongate telson (Figs. 164–168) while in *Olivierus* and *Mesobuthus* there is no sexual dimorphism in the shape of metasomal segments (Figs. 168–172). The second major difference is presence of ventrolateral carinae



Figures 134–137: *Mesobuthus eupeus*, Georgia, FKCP. **Figures 134–135**. Male, dorsal (134) and ventral (135) views. **Figures 136–137**. Female, dorsal (136) and ventral (137) views. Scale bar: 10 mm.



Figures 138–**141**: *Aegaeobuthus gibbosus* **comb**. **n**., Greece, Zakynthos Island, S of Zakynthos, FKCP. **Figures 138**–**139** Male, dorsal (138) and ventral (139) views. **Figures 140**–**141**. Female, dorsal (140) and ventral (141) views. Scale bar: 10 mm.



Figures 142–148: *Aegeobuthus* **gen**. **n**., *Olivierus*, and *Mesobuthus*, tarsomeres of third leg, FKCP. **Figure 142**. *Aegeobuthus gibbosus* **comb**. **n**., male, Greece, Zakynthos Island. **Figure 143**. *A. cyprius* **comb**. **n**., female No. 1576, Cyprus, Episkopi. **Figure 144**. *A. nigrocinctus* **comb**. **n**., male, Turkey, Gaziantep, 1 km S of Eski Şarkaya village. **Figure 145**. *Olivierus caucasicus* **comb**. **n**., female, Turkey. **Figure 146**. *O. brutus* **comb**. **n**., male holotype. **Figure 147**. *O. elenae* **comb**. **n**., female holotype. **Figure 148**. *Mesobuthus eupeus*, male, Georgia.

on metasoma IV in *Aegaeobuthus* **gen**. **n**. (Figs. 164–168) and their absence in *Olivierus* and *Mesobuthus* (Figs. 169–172).

Aegaeobuthus **gen**. **n**. includes more similar species, which are hard to differentiate morphologically from each other since several characters which help to differentiate species within other genera exhibit only intraspecific variability here. I can mention the number of denticle rows on movable finger, which were, for example, used by Ythier (2018) as the main character to support a new species he described from Crete (validity of which should be further confirmed). In reality, within *Aegaeobuthus* **gen**. **n**. there is variability from 11 to 14 rows of these denticles even within a population (see Figs. 150–151). On the contrary, this character can help to distinguish *Olivierus* from *Mesobuthus*. Genera *Olivierus* and *Mesobuthus* are more similar to each other, and validity of *Olivierus* was repeatedly discussed in the past (Gantenbein et al., 2003). *Olivierus* includes rather larger species, adults of 49–90 mm in size, while the genus *Mesobuthus* includes adults of 35–60 mm in size.

Genus *Aegaeobuthus* gen. n.

(Figures 138–144, 149–155, 164–168)

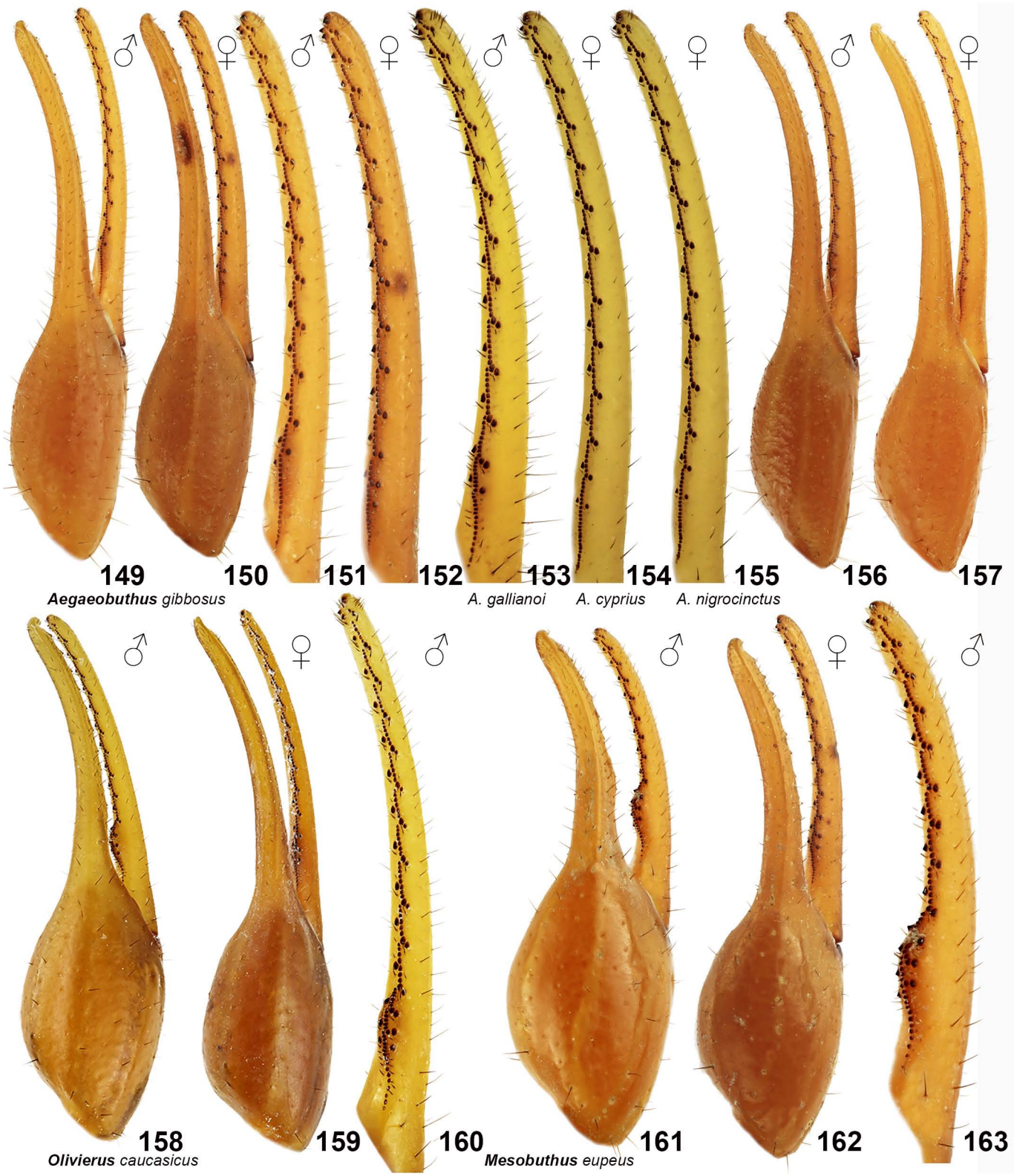
http://zoobank.org/urn:lsid:zoobank.org:act:17F20C9A-C0CF-4B03-994B-2BF1C057060E

Mesobuthus (in part) Vachon, 1950: 152–152 (1952: 324–325); Fet & Lowe, 2000: 169–181 (complete references list until 2000).

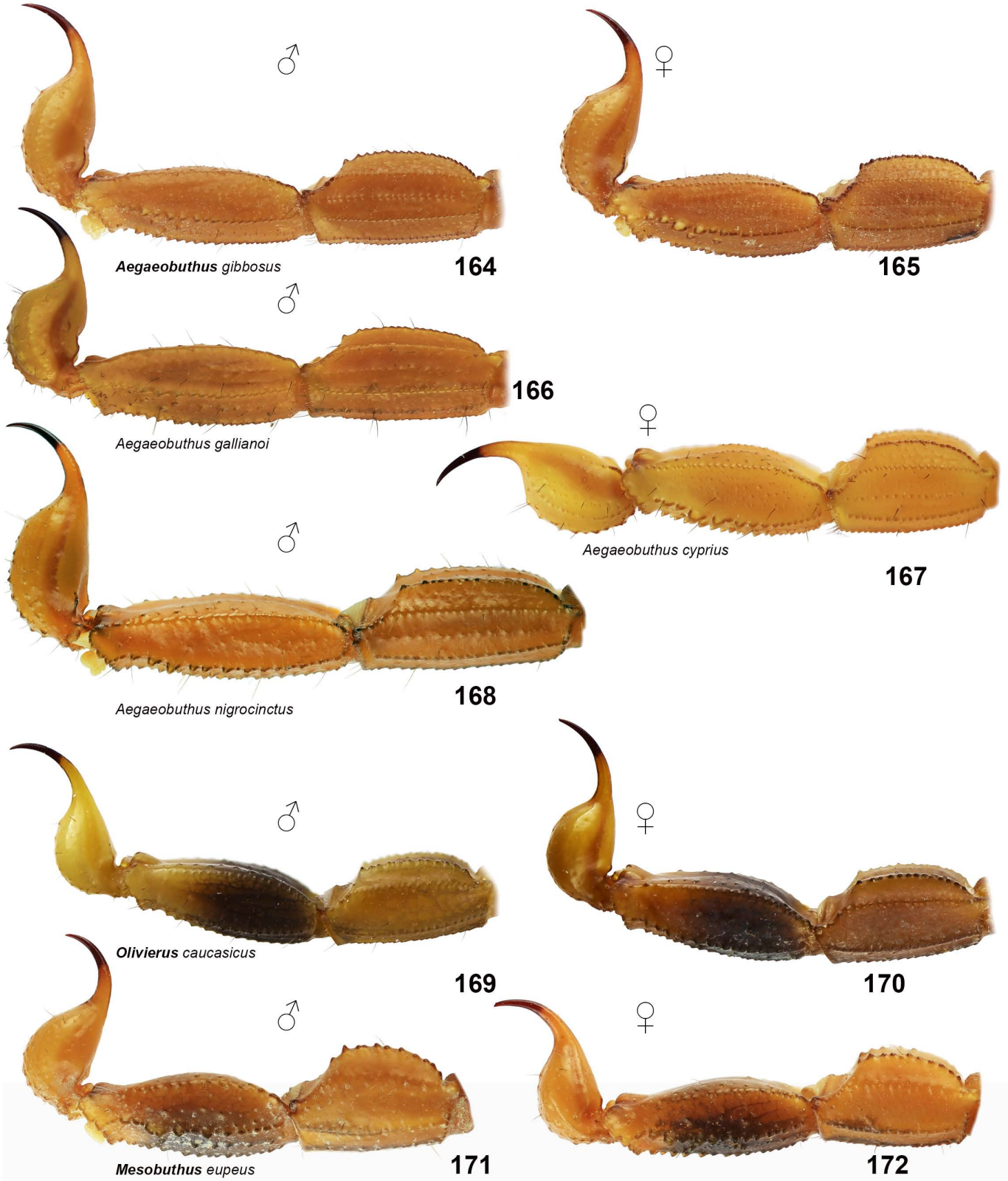
Type species. *Buthus gibbosus* Brullé, 1832.

Etymology. The genus name reflects geographic distribution of its type species across the Aegean Sea basin.

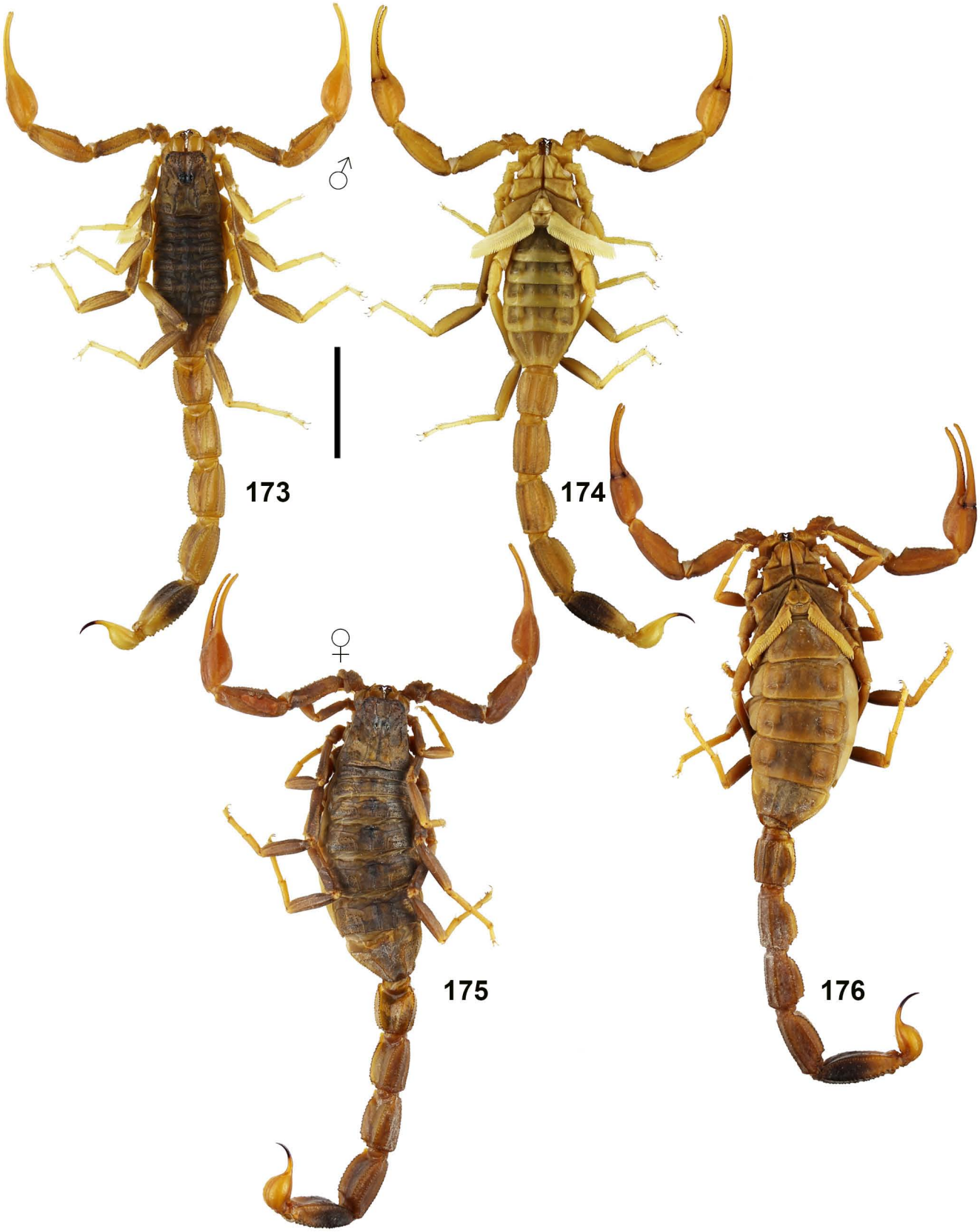
Diagnosis. Large buthids, adults 55–90 mm. Sternum type 1 (Soleglad & Fet, 2003), various degrees of an irregular pentagon in shape. Pedipalps orthobothriotaxic, type Aβ (Vachon, 1974, 1975), femur trichobothrium d_2 dorsal, patella d_3 dorsal of dorsomedian carina. Chelal trichobothrium *db* usually located between *est* and *esb*, or may be on level with trichobothrium *est*. Trichobothrium *eb* clearly on fixed finger of pedipalp. Pectines with fulcra. Dentate margin of pedipalp-chela movable finger with distinct denticles divided into 11–14 linear rows and 5 terminal denticles. Chelicerae with typical buthid dentition (Vachon, 1963, figs. 32–33), fixed finger armed with two denticles on ventral surface. Tergites I–VI granular, with three carinae, tergite VII with 5 carinae. Carapace with distinct carinae, entire dorsal surface nearly flat. First sternite with two granulated lateral stridulatory areas, which however may be reduced in some species. Metasoma elongate, segment I with 10 carinae, segments II-IV with 10 carinae. Ventrolateral carinae of



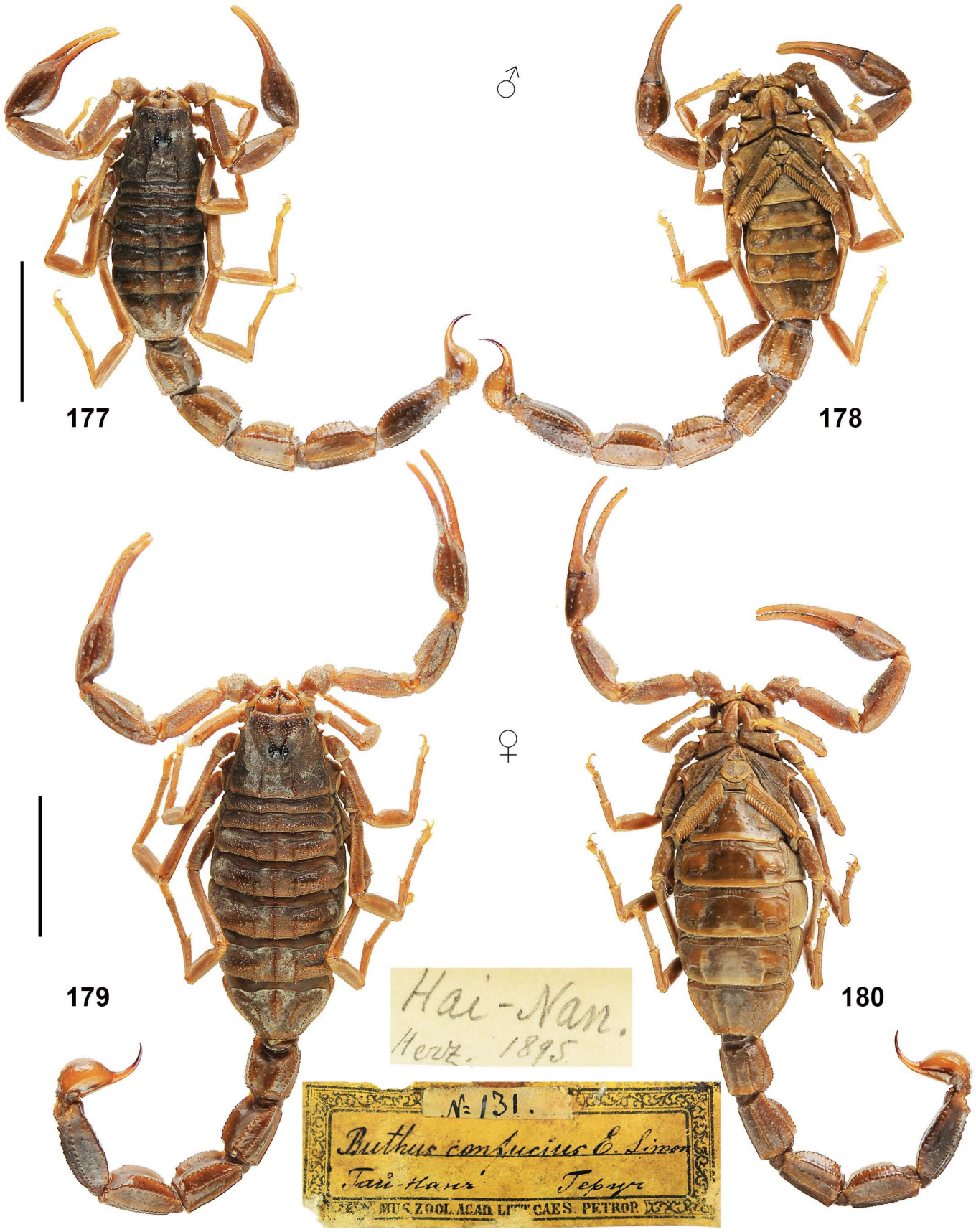
Figures 149–**163**: *Aegaeobuthus* **gen**. **n**., *Olivierus*, and *Mesobuthus*, chela dorsal (149–150, 156–159, 161–162) and pedipalp movable finger (151–155, 160, 163), FKCP. **Figures 149**–**152**. *Aegaeobuthus gibbosus* **comb**. **n**., male (149, 151) and female (150, 152), Greece, Zakynthos Island. **Figure 153**. *A. galianoi* **comb**. **n**., male, Crete, Xerokambos. **Figure 154**. *A. cyprius* **comb**. **n**., female No. 1576, Cyprus, Episkopi. **Figures 155**–**157**. *A. nigrocinctus* **comb**. **n**., male (156) and female (155, 157), Turkey, Gaziantep, 1 km S of Eski Şarkaya Village. **Figures 158**–**160**. *Olivierus caucasicus* **comb**. **n**., male (158, 160) and female (159), Turkey. **Figures 161**–**163**. *Mesobuthus eupeus*, male (161, 163) and female (162), Georgia.



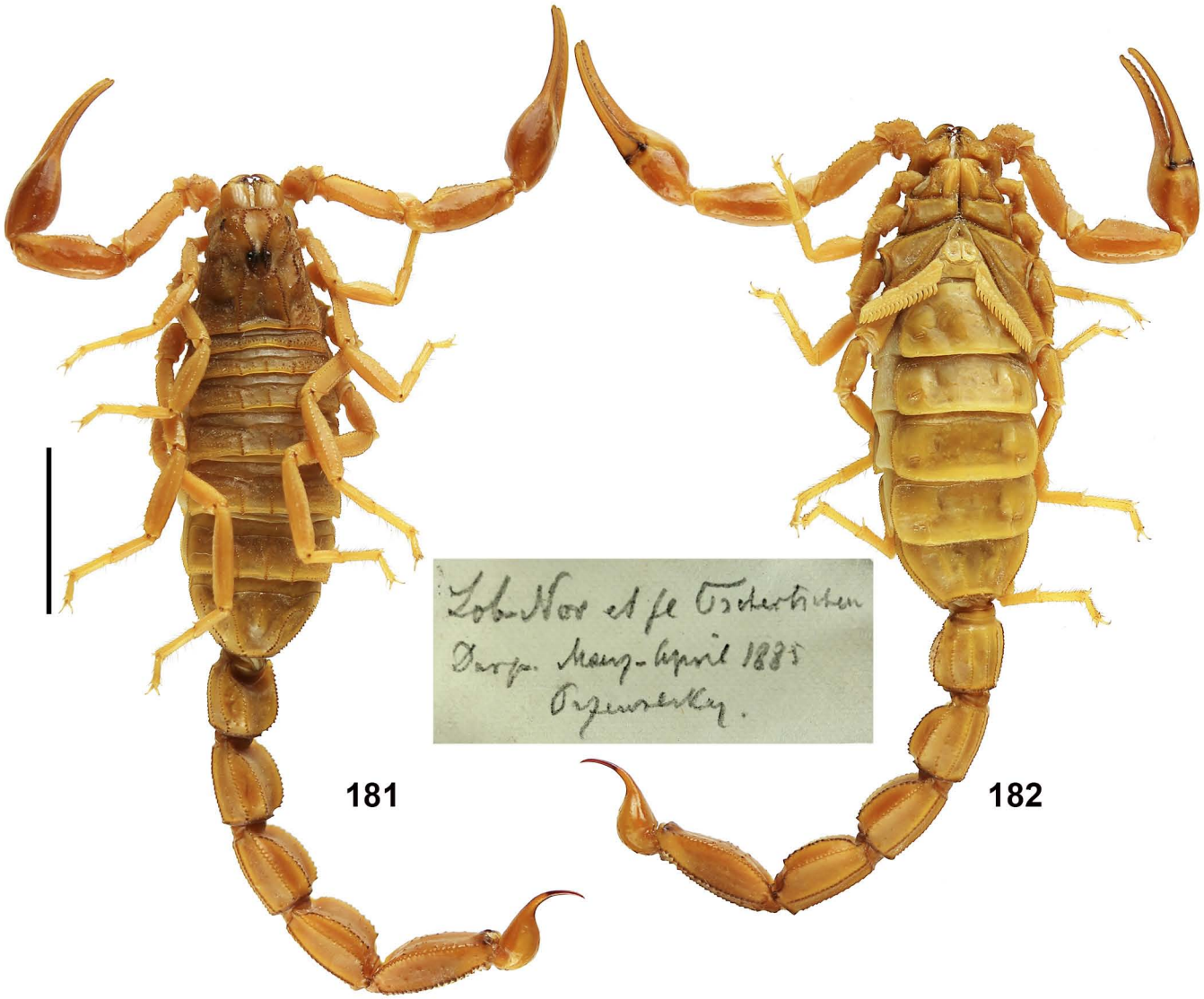
Figures 164–172: *Aegaeobuthus* **gen**. **n**., *Olivierus*, and *Mesobuthus*, metasoma IV–V and telson lateral views, FKCP. **Figures 164–165**. *Aegaeobuthus gibbosus* **comb**. **n**., male (164) and female (165), Greece, Zakynthos island. **Figure 166**. *A. galianoi* **comb**. **n**., male, Crete, Xerokambos. **Figure 167**. *A. cyprius*, **comb**. **n**., female No. 1576, Cyprus, Episkopi. **Figures 168**. *A. nigrocinctus* **comb**. **n**., male, Turkey, Gaziantep, 1 km S of Eski Şarkaya Village. **Figures 169–170**. *Olivierus caucasicus* **comb**. **n**., male (169) and female (170), Turkey. **Figures 171–172**. *Mesobuthus eupeus*, male (171) and female (172), Georgia.



Figures 173–**176**: *Olivierus caucasicus* **comb**. **n**. **Figures 173**–**176**. Male, Turkey, Iğdir Province, Melekli Village, FKCP, dorsal (173) and ventral (174) views. **Figures 175**–**176**. Female, Turkey, Iğdir Province, Gürgen Village, FKCP, dorsal (175) and ventral (176) views. Scale bar: 10 mm.



Figures 177–180: *Olivierus hainanensis* **stat. n., comb. n.**, syntypes and original labels, ZISP. **Figures 177–178**. Male, dorsal (177) and ventral (179) views. **Figures 179–180**. Female, dorsal (179) and ventral (180) views. Scale bars: 10 mm.



Figures 181–182. *Olivierus przewalskii* **comb**. **n**., female syntype and the original label, ZISP, dorsal (181) and ventral (182) views.

metasomal segment V posteriorly usually with several large lobated denticles. Telson elongated, more in male, bumpy and granulated, without subaculear tooth. Legs III and IV with well developed tibial spurs. Metasoma narrower and longer in male than in female.

Subordinate taxa (4 species).

Aegaeobuthus cyprius (Gantenbein & Kropf, 2000), **comb**. **n**. (Cyprus)

Aegaeobuthus gallianoi (Ythier, 2018), **comb**. **n**. (Greece: Crete)

Aegaeobuthus gibbosus (Brullé, 1832), **comb**. **n**. (Albania, Bulgaria, North Macedonia, Greece, Turkey)

= *Androctonus peloponnensis* C. L. Koch, 1836

= *Androctonus stenelus* C. L. Koch, 1840

= *Vaejovis schuberti* C. L. Koch, 1840

= *Buthus gibbosus anatolicus* Schenkel, 1947

Aegaeobuthus nigrocinctus (Ehrenberg, 1828), **comb**. **n**. (Israel, Lebanon, Syria, Turkey)

Genus *Olivierus* Farzanpay, 1987

(Figures 145–147, 158–160, 169–170, 173–182)

Mesobuthus (in part) Vachon, 1950: 152–152 (1952: 324–325); Fet & Lowe, 2000: 169–181 (complete references list until 2000); Gantenbein et al., 2003: 417; Fet et al., 2018: 1–77, figs. 1–327, tables 1–6.

Olivierus Farzanpay, 1987: 156; Fet & Lowe, 2000: 189–192 (complete references list until 2000).

Afghanobuthus Lourenço, 2005: 111–114, figs. 1–9 (syn. by Fet et al., 2018: 3).

Type species. *Androctonus caucasicus* Nordmann, 1840.

Diagnosis. Large buthids, adults 49–90 mm. Sternum type 1 (Soleglad & Fet, 2003), various degrees of an irregular pentagon in shape. Pedipalps orthobothriotaxic, type Aβ (Vachon, 1974, 1975), femur trichobothrium d_2 dorsal, patella d_3 dorsal of dorsomedian carina. Chelal trichobothrium

db usually located between *est* and *esb*, or may be on level with trichobothrium *est*. Trichobothrium *eb* clearly on fixed finger of pedipalp. Pectines with fulcra. Dentate margin of pedipalp-chela movable finger with distinct denticles divided into 12–14 linear rows and 5 terminal denticles. If there are only 12 rows of denticles, the 12th row is always with outer and inner denticle. Chelicerae with typical buthid dentition (Vachon, 1963, figs. 32–33), fixed finger armed with two denticles on ventral surface. Tergites I–VI granular, with three carinae, tergite VII with 5 carinae. Carapace with distinct carinae, entire dorsal surface nearly flat. First sternite with two granulated lateral stridulatory areas, which however may be reduced in some species. Metasoma elongate, segment I with 10 carinae, segments II-III with 8–10 carinae, segment IV with 8 carinae. Ventrolateral carinae of metasomal segment V posteriorly usually with several large lobated denticles. Telson elongated or bulbous, bumpy and granulated, without subaculear tooth. Legs III and IV with well developed tibial spurs. No sexual dimorphism in shape of metasoma.

Subordinate taxa (18 species).

Olivierus bolensis (Sun, Zhu & Lourenço, 2010), **comb**. **n**. (China)

Olivierus brutus (Fet et al., 2018), **comb**. **n**. (Iran: Qazvin)

Olivierus caucasicus (Nordmann, 1840), **comb**. **n**. (Armenia, Azerbaijan, Georgia, Iran, Russia, Turkey, Ukraine)

= *Buthus cognatus* Simon, 1889

= *Buthus caucasicus fischeri* Birula, 1905

Olivierus elenae (Fet et al., 2018), **comb**. **n**. (Tajikistan, Uzbekistan)

Olivierus extremus (Werner, 1936), **comb**. **n**. (?China, type from Singapore)

Olivierus fuscus (Birula, 1897), **comb**. **n**. (Tajikistan, Uzbekistan)

Olivierus gorelovi (Fet et al., 2018), **comb**. **n**. (Kazakhstan, Turkmenistan, Uzbekistan)

Olivierus hainanensis (Birula, 1904), **stat**. **n**., **comb**. **n**. (China)

Olivierus intermedius (Birula, 1897), **comb**. **n**. (Tajikistan, ?Uzbekistan, ?Kyrgyzstan)

Olivierus karshius (Sun & Sun, 2011), **comb**. **n**. (China)

Olivierus kaznakovi (Birula, 1904), **comb**. **n**. (Tajikistan, Uzbekistan)

Olivierus kreuzbergi (Fet et al., 2018), **comb**. **n**. (Tajikistan, Uzbekistan)

Olivierus longichelus (Sun & Zhu, 2010), **comb**. **n**. (China)

Olivierus martensii (Karsch, 1879), **comb**. **n**. (China, North Korea, South Korea, Mongolia)

= *Buthus confucius* Simon, 1880

Olivierus mischi (Fet et al., 2018), **comb**. **n**. (Afghanistan)

Olivierus nenilini (Fet et al., 2018), **comb**. **n**. (Uzbekistan, ?Kyrgyzstan)

Olivierus parthorum (Pocock, 1889), **comb**. **n**. (Afghanistan, Iran, Turkmenistan)

= *Afghanobuthus naumanni* Lourenço, 2005

Olivierus przewalskii (Birula, 1897), **comb**. **n**. (China, Mongolia)

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