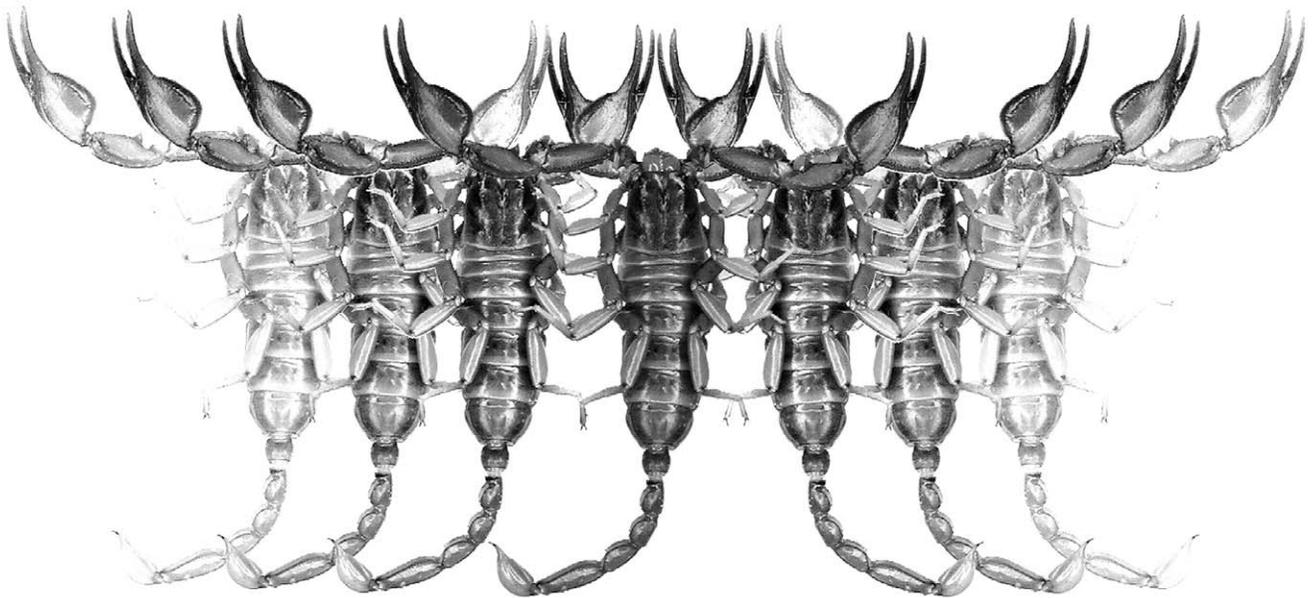


Euscorpius

Occasional Publications in Scorpiology



Notes on the Genera *Buthacus*, *Compsobuthus*, and *Lanzatus* with Several Synonymies and Corrections of Published Characters (Scorpiones: Buthidae)

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Euscorpius

Occasional Publications in Scorpiology

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Notes on the genera *Buthacus*, *Compsobuthus*, and *Lanzatus* with several synonymies and corrections of published characters (Scorpiones: Buthidae)

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<http://zoobank.org/urn:lsid:zoobank.org:pub:135FD61B-8E80-4C86-A629-2EF2EAAD19DD>

Summary

The taxonomic position of *Buthacus armasi* Lourenço, 2013, *B. clevai* Lourenço, 2001, *B. huberi* Lourenço, 2001, *B. maliensis* Lourenço & Qi, 2007, *B. nigerianus* Lourenço & Qi, 2006, *Compsobuthus andresi* Lourenço, 2004, *C. simoni* Lourenço, 1999, *C. tassili* Lourenço, 2010, *C. tofti* Lourenço, 2001, *C. williamsi* Lourenço, 1999, and *Sabinebuthus elegans* Lourenço, 2001 is revised and fictitious characters in their original descriptions are discussed and corrected.

Buthacus armasi Lourenço, 2013 is synonymized with *Buthacus leptochelys* (Ehrenberg, 1829) **syn. n.**, *B. huberi* Lourenço, 2001 is confirmed to be a synonym of *Buthacus occidentalis* Vachon, 1953, *B. maliensis* Lourenço & Qi, 2007 is synonymized with *Androctonus aleksandrplotkini* Lourenço & Qi, 2007 **syn. n.**, *Compsobuthus williamsi* Lourenço, 1999 is synonymized with *Compsobuthus matthiesseni* (Birula, 1905) **syn. n.**, and *Sabinebuthus elegans* Lourenço, 2001 is confirmed to be a junior synonym of *Lanzatus somalicus* Kovařík, 2001.

Introduction

Wilson Lourenço is the most prolific contemporary scorpion systematist in terms of publication output, and has described more than 410 scorpion species, either as sole author or as first coauthor. It is evident that he has made major contributions to the field. Nevertheless, some of his publications may not meet the highest standards of research in scorpiology. Authors have had difficulties identifying some of his taxa. In South America, for example, Ochoa et al (2013: 108) wrote about descriptions of *Chactopsis yanomami* Lourenço et al., 2011: “*The original diagnosis and description of this species are uninformative and do not permit a satisfactory comparison with its congeners*”. Outside the South American continent, Lourenço described ca. 250 scorpion species as author or first coauthor, but 31 of them (12%) are currently in synonymy and the status of several dozen others are unclear and occasionally cited as *nomina dubia*. His contributions to scorpion taxonomy could be improved by more attention to detail in preparing manuscripts for publication. Of course, journal editors and reviewers also bear some responsibility for quality control of published literature, and peer review appears to have been insufficient in several instances.

For example, in the description of *Chactas bonito* Lourenço, 1998 (now in synonymy with *Chactas exsul*

(Werner, 1939)) figs. 5–6 were titled *Chactas bonito* (family Chactidae) but actually they show the buthid, *Tityus mongei*, in illustrations recycled from Lourenço, 1996. Another case of peer review failure is the published description of *Tibetiomachus himalayensis* Lourenço & Qi, 2006 (which is probably a synonym of *Liocheles nigripes* (Pocock, 1897)). The genus *Tibetiomachus* was allegedly characterized by the absence of trichobothrium *dt* as the primary differentiator from *Liocheles* Sundevall, 1833 (Lourenço & Qi, 2006: 291), yet trichobothrium *dt* was explicitly illustrated twice in the original description (figs. 20 and 21, Lourenço & Qi, 2006: 293) (see Kovařík, 2009: 6).

In practice, published works are almost never perfect and some mistakes inevitably occur, as might be expected in regular scientific activity of exploring new horizons. Inaccuracies in papers are a normal occurrence and we can likely find errors in publications of every author, including our own. But it is essential that authors recognize and correct these errors. For example, Kovařík et al. (2015) redescribed the male of *Alloscorpiops wongpromi* Kovařík et al., 2013 in detail because the male holotype cited in the original publication (Kovařík et al., 2013) was in reality only a subadult after the fifth ecdysis. Unfortunately, it is also commonplace that authors have difficulty acknowledging their own errors, even in the face of direct evidence. In competitive activ-

ities like science, this is a probably unavoidable consequence of human ego, but it can spark fierce clashes of personalities, precipitate conflicts between competing teams, and have corrosive long term effects on scientific progress.

In this context, the author cites a typical derogatory response to an error correction that he published: “*It can only be assumed that Kovařík’s reaction reflects a personal frustration at not getting recognition B. mahraouii shows very small external accessory granules which possibly are not illustrated precisely in my figure.*” (Lourenço, 2006: 62–63).

Here, it is preferred to not engage in such dramatic polemics (see for example Teruel et al., 2017: 6), and instead to focus on systematically analyzing and correcting a number of technical errors in recent papers, that happened to be authored by Lourenço. These errors can be grouped into three types:

(i) Specimens are not recognized as juveniles and are described as adults of new species or genera. As one example, it is shown below that *Buthacus maliensis* Lourenço & Qi, 2007 is a junior synonym of *Androctonus alexandrplotkini* Lourenço & Qi, 2007 **syn. n.**. If a juvenile is viewed as an adult, then size may become an inappropriate diagnostic character, and may even serve as evidence for being the smallest species in a genus. For example *Hottentotta mateui* Lourenço et al., 2012 was based on a juvenile 25.2 mm long, which the authors mistook for an adult female. This is apparent from their figs. 50–52 (Lourenço et al., 2012: 324), especially from the size and shape of the genital operculum and telson. It is evident that *H. mateui* is a junior synonym of *H. minax occidentalis*, whose known presence in the region was ignored by the authors.

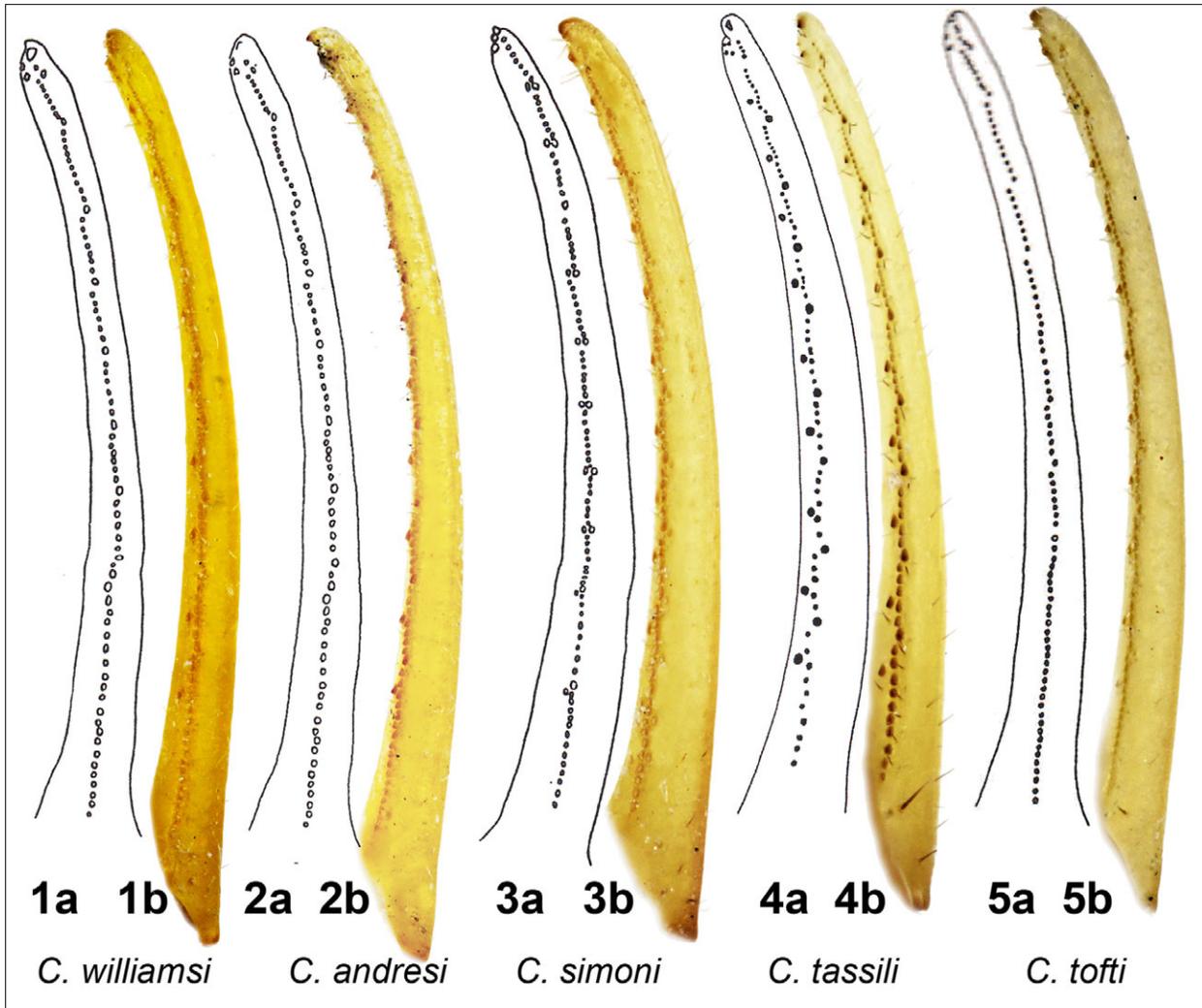
If a juvenile scorpion is regarded as an adult, then it may be also evaluated on the basis of juvenile characters absent in adults, for instance on coloration or shape of pedipalp chelae (see figs. 44 and 45 in Kovařík et al., 2015). This is quite apparent from several descriptions of *Chaerilus* species, e. g. *C. kampuchea* Lourenço, 2012 in which “*a paler coloration with distinct variegated pigmentation*” is used to define the species, although it is well known that the young of *Chaerilus* are variegated even in species whose adults are uniformly brown or black (see fig. 765 versus fig. 761 in Kovařík & Ojanguren, 2013: 288). Based on these indications, and on examination of types of some species described by Lourenço, it is reasonable to suspect that the type is a juvenile and that clarification of the status of this species will require examination of other specimens. The species *Chaerilus sabinae* Lourenço, 1995 was described from a holotype declared to be an immature male 8 mm long. In actuality, it is a juvenile instar after the first or second ecdysis (Kovařík & Ojanguren, 2013: 140) and the characters of the adult

remain to be determined, and it could well be up to 40–60 mm long.

Examples of invalid genera clearly based on juveniles include the monotypic genera *Afghanobuthus* Lourenço, 2005 (the holotype of type species *A. naumanni* is a juvenile of *Mesobuthus parthorum* (Pocock, 1889); see Fet et al., 2018: 4–7) and *Riftobuthus* Lourenço, Duhem & Cloudsley-Thompson, 2010 (the holotype of type species *R. inexpectatus* is a juvenile of *Parabuthus pallidus* Pocock, 1895; see Kovařík et al., 2016: 4–6).

(ii) Trichobothrial patterns are incorrectly reported or analyzed. Vachon (1974) characterized the fundamental numbers and patterns of trichobothria on the pedipalps that are conserved across different scorpion taxa, devised a nomenclatural system for them, and recognized the taxonomic utility of basic patterns, as well as of the presence of additional trichobothria or loss of basic trichobothria (see also Soleglad & Sissom, 2001). However, Lourenço often seems to misinterpret basic patterns and confuse homology with nomenclature. Reported locations of trichobothria are frequently unreliable or erroneous. A typical error that epitomizes the problem is fig. 35 in Lourenço et al. (2011: 71) which maps a trichobothrium to the pedipalp chela *movable* finger of the holotype of *Teuthraustes newaribe* Lourenço et al., 2011., a trichobothrial position unknown in any scorpion, extant or fossil, and only found in Order Pseudoscorpiones. This together with the fact that legends in the paper are associated with wrong figures (i.e. fig. 35 does not show the holotype of *Teuthraustes newaribe* Lourenço et al., 2011 but the holotype of *Chactopsis yanomami* Lourenço et al., 2011) and other basic mistakes, is symptomatic of systemic failure at all levels, from authors and illustrators, to reviewers and editors.

Another example is in the diagnosis of a subgenus *Laoscorpiops* Lourenço, 2013 (now in synonymy with *Alloscorpiops* Vachon, 1980) based on a fictitious character created by renaming the manus trichobothrium V_4 to eb_1 and ignoring the fact that additional ventral trichobothria are merely *additional accessory* trichobothria. This misinterpretation becomes obvious upon inspection of figs. 88–99 and figs. 112–118 in Soleglad & Sissom (2001). Although this issue was explained clearly (cf. Kovařík et al., 2013: 1–2 including figs. 13–15; repeated in Kovařík et al., 2015: 10–11), Lourenço still did not comprehend the basic trichobothrial pattern in the family Euscorpiidae, as indicated by his recent opinion: “*the trichobothrial nomenclature proposed by Vachon, was globally well accepted by most scorpion experts. However, it must not be accepted as a dogma, but rather as one useful model that may yet require several adjustments. The new genus proposed here could*



Figures 1–5: *Compsobuthus*, dentition of pedipalp chela movable finger. **Figure 1.** *C. williamsi* Lourenço, 1999, male holotype, fig. 2 published in Lourenço, 1999: 86 (1a) and photograph of actual specimen (1b). **Figure 2.** *C. andresi* Lourenço, 2004, male holotype, fig. 1 published in Lourenço, 2004: 159 (2a) and photograph of actual specimen (2b). **Figure 3.** *C. simoni* Lourenço, 1999, female holotype, fig. 3 published in Lourenço, 1999: 86 (3a) and photograph of actual specimen (3b). **Figure 4.** *C. tassili* Lourenço, 2010, male holotype, fig. 7 published in Lourenço, 2010: 152 (4a) and photograph of actual specimen (4b). **Figure 5.** *C. tofti* Lourenço, 2001, juvenile holotype, fig. 2 published in Lourenço, 2001: 316 (5a) and photograph of actual specimen (5b).

probably be rejected by several "philatelic taxonomists"..." (Lourenço, 2017: 356–357).

(iii) Dentition patterns of the pedipalp chela movable finger are incorrectly reported or analyzed. The arrangement of dentate granules on the fingers is a stable character that is important for taxonomy at both genus and species levels. It was previously shown that Lourenço had difficulty correctly illustrating dentition in the genus *Buthacus* (cf. Kovařík, 2005: 6, and Lourenço, 2006: 62–63). Another case is Lourenço & Huber (1999), where not only the figure showing the genus *Lychas* but also the associated text were incorrect (cf. fig. 7 in Lourenço & Huber, 1999: 24, and text on p. 26

versus figs. 1464–1465 in Kovařík & Ojanguren, 2013: 364, and text on p. 209). Several other cases are discussed below.

Methods, Material & Abbreviations

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

Figures referenced in the text are written with capitalized first letter (Figs.) if they are published in this paper, and with lower case first letter (figs.) if they are only cited here as published in another paper.

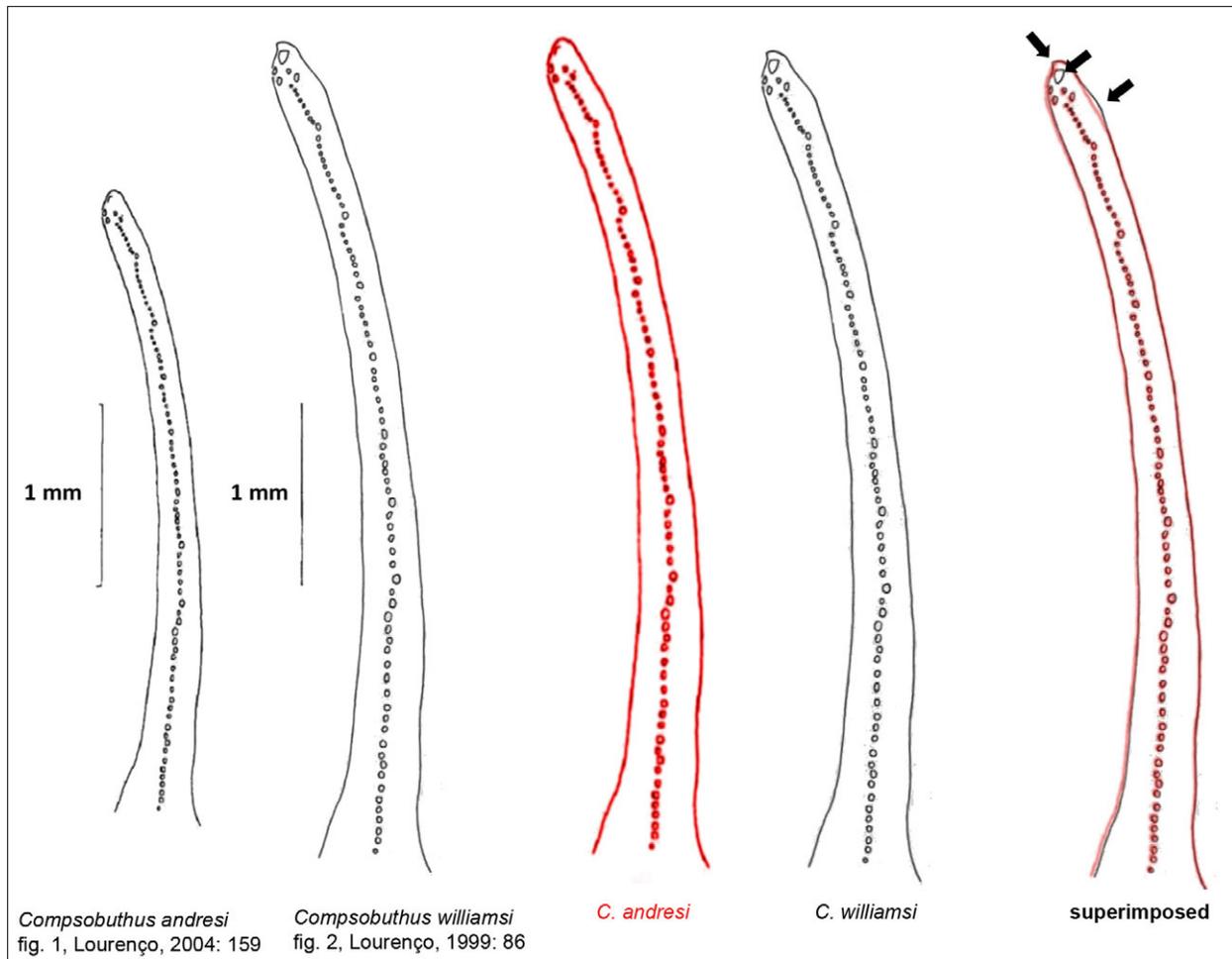


Figure 6: Comparison of figures originally published by Lourenço in 2004 and 1999 as part of descriptions of *C. andresi* and *C. williamsi*. Strangely, they are virtually identical but there are different length scales on the two figures. If Lourenço were illustrating the same specimen, the scales should be the same. Furthermore, the duplicated illustrations are incorrect for both species *C. andresi* and *C. williamsi*; see Figs. 1 and 2.

Specimen depositories: BNHS, Bombay Natural History Society, Mumbai, India; MNHN, Muséum National d'Histoire Naturelle, Paris, France; SMTD, Staatliches Museum für Tierkunde, Dresden, Germany; and ZMUH, Centrum für Naturkunde (CeNak), Center of Natural History Universität Hamburg, Zoological Museum, Hamburg, Germany.

Systematics

Family Buthidae C. L. Koch, 1837

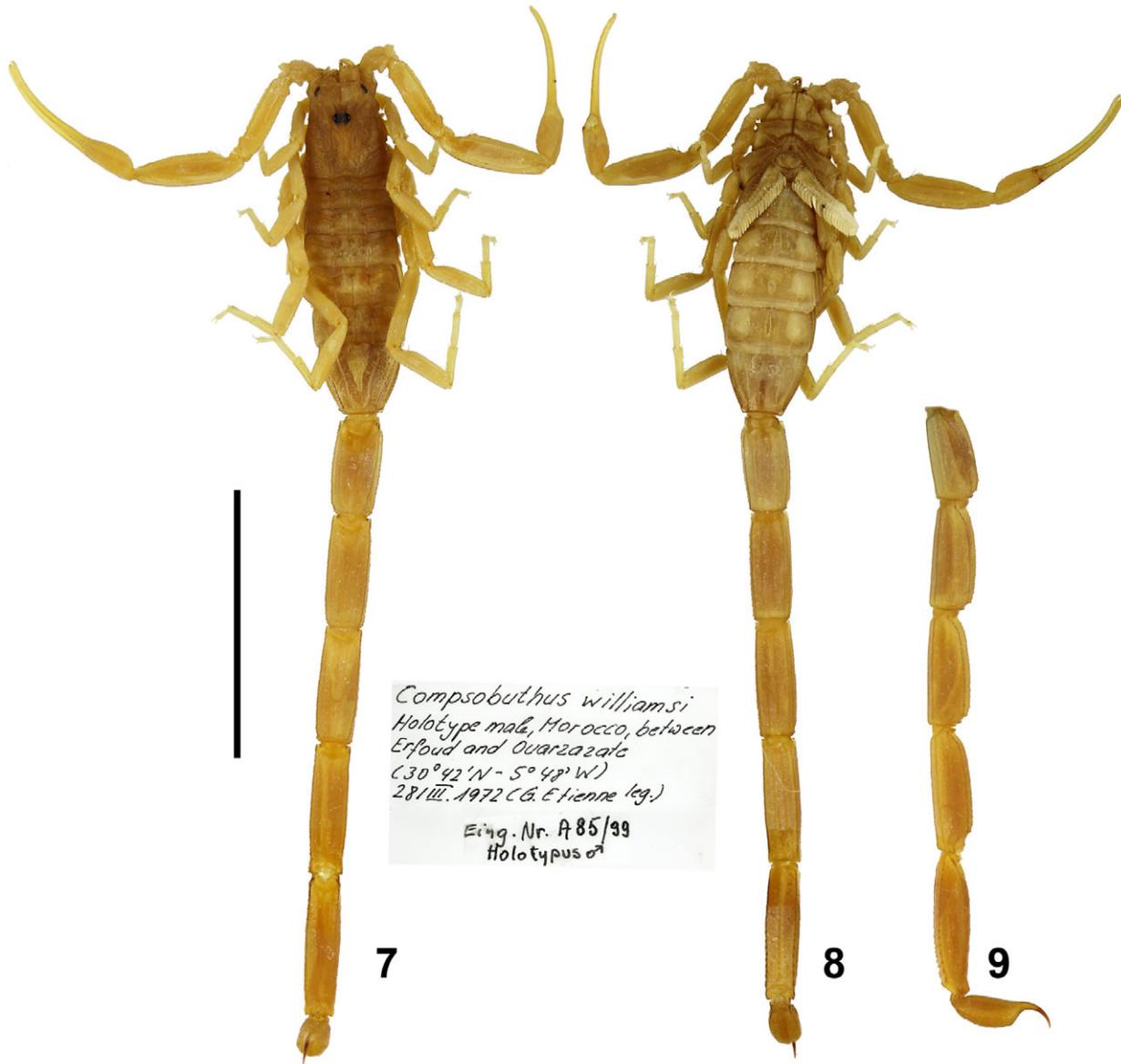
Compsobuthus Vachon, 1949 (Figs. 1–9)

TYPE SPECIES. *Buthus acutecarinatus* Simon, 1882.

DIAGNOSIS. Total length 20–55 mm; dorsal trichobothria of femur arranged in *beta*-configuration; trichobothrium

db on chela of pedipalp basal to *est*; trichobothrium *eb* located on fixed finger of chela; pectines with fulcra; pectinal teeth number 9–34; tibial spurs present on third and fourth legs; cheliceral fixed finger with two ventral denticles; carapace with distinct carinae; central lateral and posterior lateral carinae of carapace connected to form continuous linear series of granules extending to posterior margin; carapace in lateral view with entire dorsal surface horizontal or nearly so; dentate margin of movable finger of pedipalp with 8–14 rows of granules, each row equipped with one internal accessory granule, and with (*C. wernerii* group) or without (*C. acutecarinatus* group) one external accessory granule, 4 terminal and one basal terminal granules present; tergites I–VI of mesosoma bear three carinae projecting beyond posterior margin as distinct spiniform processes.

COMMENTS. Lourenço described 12 species in the genus *Compsobuthus*. The types of 5 of these species are de-



Figures 7–9: *Compsobuthus williamsi*, male holotype, dorsal (7), ventral (8), and metasoma and telson lateral (9). Scale bar: 10 mm. In the plate the original labels are also shown.

posited in ZMUH and were loaned for this study (*Compsobuthus andresi* Lourenço, 2004, *C. simoni* Lourenço, 1999, *C. tassili* Lourenço, 2010, *C. tofti* Lourenço, 2001, and *C. williamsi* Lourenço, 1999). The types of 7 other *Compsobuthus* species described by Lourenço are deposited in MNHN which refused to loan them to the author several years ago. We can only hope that in future MNHN will change their policy and allow outside scientists to examine the types and independently evaluate the taxonomic positions of these species. As will be shown here, descriptions of the species whose types are deposited in ZMUH were usually based on erroneous characters, so it is questionable

whether the descriptions of species whose types are lodged in MNHN are any more reliable.

Figs. 1a–5a show that none of the ZMUH types were described correctly and that all figures of dentition of pedipalp chela movable fingers published by Lourenço are in error. All *Compsobuthus* species have a pedipalp chela movable finger with 4 terminal granules and one basal terminal granule (five in total) as correctly shown only in Fig. 1a. Other figures shown by Lourenço show the number of granules 4, 12, 9, and 8 incorrectly. All *Compsobuthus* species have a pedipalp chela movable finger with internal granules which are also present in all these types but are completely omitted in Figs. 1a–

3a, 5a. In addition, in Figures 3a and 5a there are also external granules that were ignored. Even more striking is that, for example, in the description *C. williamsi* Lourenço, on p. 91 it is written: "Movable finger with 9 almost linear rows of granules, without internal or external accessory granules", and this was used as a key character for comparison with other species (see figs. 1–3 in Lourenço, 1999: 86). However, in Fig. 1b we can see that in reality the type of *C. williamsi* does in fact have internal granules. Curiously, Figs. 1a and 2a are virtually identical (see also comparison in Fig. 6) in spite of Fig. 2a (holotype of *C. andresi* from India) being published in 2004 (Lourenço, 2004a) whereas Fig. 1a (holotype of *C. williamsi* from "Morocco") was published in 1999. Perhaps unsurprisingly, these suspiciously duplicated figures do not accurately portray the finger dentitions of either *C. andresi* or *C. williamsi*.

Taxonomic position of *Compsobuthus andresi* Lourenço, 2004

C. andresi is probably a valid species in the *C. acutecarinatus* group, close to *C. matthiesseni*, as characterized by Fig. 2b with its atypically narrow, elongated telson.

Taxonomic position of *Compsobuthus simoni* Lourenço, 1999

C. simoni is a valid species from the *C. wernerii* group, as characterized by Fig. 3b which shows that the pedipalp chela movable finger bears 12 rows of granules, all of them with external and internal accessory granules. The original description includes the erroneous statement: "Movable finger with 10/11 almost oblique rows of granules, with only some vestigial internal accessory granules." (Lourenço, 1999: 92).

Taxonomic position of *Compsobuthus tassili* Lourenço, 2010

C. tassili is a valid species from the *C. acutecarinatus* group, as characterized by Fig. 4b.

Taxonomic position of *Compsobuthus tofti* Lourenço, 2001

C. tofti is probably a valid species from the *C. wernerii* group, but it is based on a juvenile which Lourenço incorrectly declared as a male in the original description. Accessory external granules are present but poorly visible on Fig. 5b which is common in juveniles. Of course, there are also internal accessory granules that were ignored by Lourenço in the original description and in his Fig. 5a. In his figure 4 (Lourenço, 2001b: 316)

there are also incorrectly located trichobothria *Et*, *Est*, and *Esb* on the chela manus.

Taxonomic position of *Compsobuthus williamsi* Lourenço, 1999

C. williamsi was based on two males from Morocco. The type locality between Erfoud and Ouarzazate is a very popular site with naturalists, especially Czech entomologists who frequently collected insects and arachnids in the area over 30 years. The author visited this locality twice and collected scorpions by UV detection. Nevertheless, other specimens of *Compsobuthus* have never been collected there. Study of the types shows that several characters cited by Lourenço in the original description are inaccurate. The pedipalp chela movable finger bears 10 rows of granules with internal, but without external accessory granules (Fig. 1b), not 9 rows of granules without internal accessory granules shown by Lourenço, 1999 (Fig. 1a). The third metasomal segment has 8 carinae (Fig. 9) and not 10 carinae as was reported in the original description (Lourenço, 1999: 87). It is here determined that the types *C. williamsi* and *Compsobuthus matthiesseni* (Birula, 1905) match each other precisely in the following key characters: trichobothrial pattern, pedipalp finger dentation, pectinal tooth count and lamellar structure, proportions, setation, carination and sculpture of pedipalps, carapace, tergites, sternites, and metasoma, shape of the telson (Fig. 9), as well as armature of chelicerae and pedipalp fingers. The logical conclusion is that *Compsobuthus williamsi* Lourenço, 1999 is a junior synonym of *Compsobuthus matthiesseni* (Birula, 1905) **syn. n.** and the types of *C. williamsi* bear an incorrect locality label.

Buthacus Birula, 1908 (Figs. 19–22)

TYPE SPECIES. *Androctonus (Leirus) leptochelys* Ehrenberg, 1829.

DIAGNOSIS. Total length 40–90 mm (except *B. villiersi* Vachon, 1949 and *B. clevai* Lourenço, 2001); carapace trapezoidal, in lateral view preocular area not distinctly inclined towards anterior margin, level with or higher than postocular area; surface of carapace conspicuously granular, with only anterior median carinae developed, anterior part of carapace glossy; ventral aspect of cheliceral fixed finger with two denticles; tergites with three carinae of which lateral pair on I and II inconspicuous; pectines with fulcra, hirsute; hemispermatophore flagelliform, capsule with 4 lobes, lobes separated from flagellum, basal lobe small, knob-like; sternum subtriangular; metasomal segments I–III with 8–10 carinae; metasoma II as wide as other metasomal segments; metasoma V with enlarged "lobate" dentition on ven-

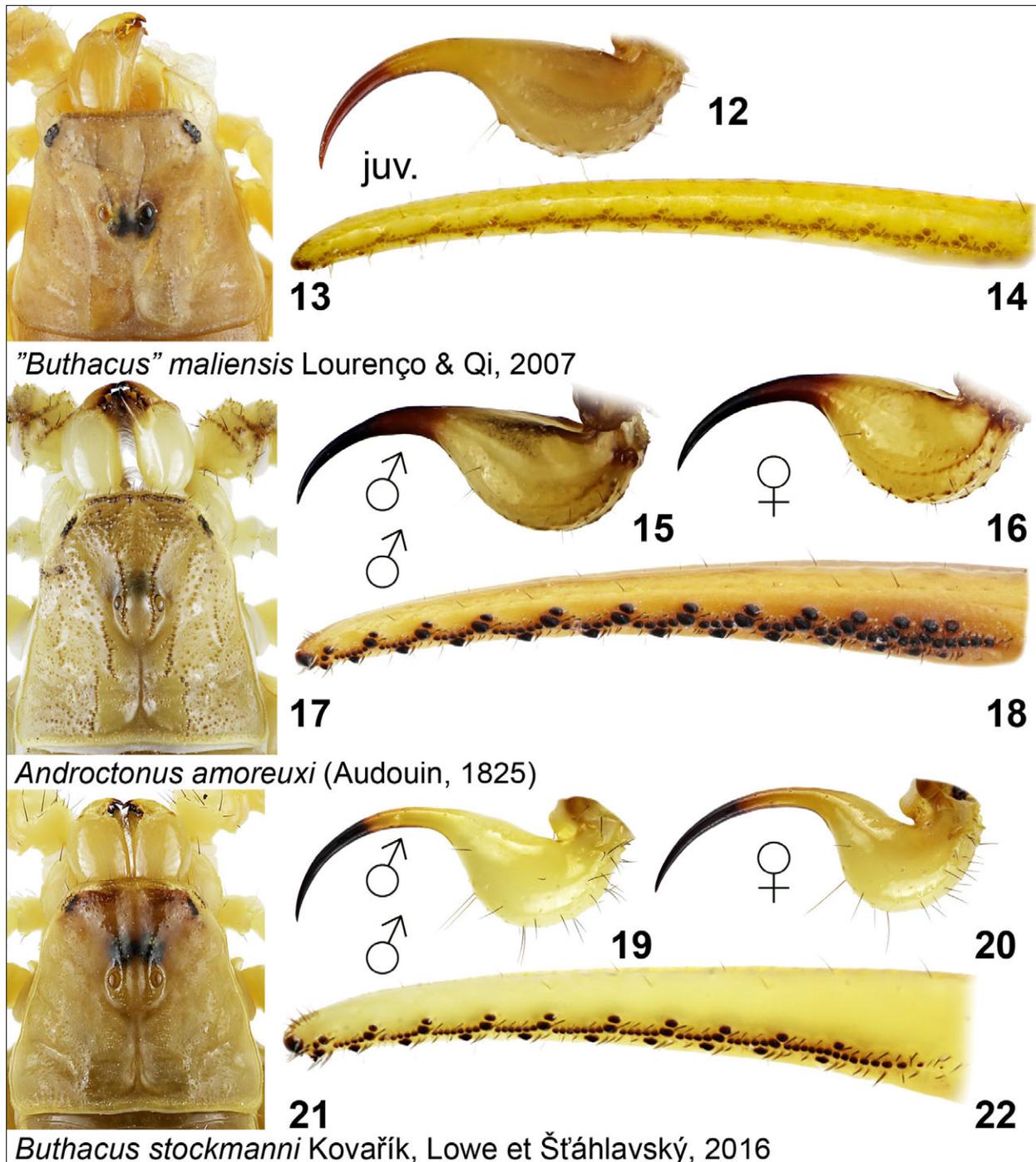


Figures 10–11: *Buthacus maliensis*, juvenile holotype, dorsal (10) and ventral (11) views. Scale bar: 10 mm. In the plate the original labels are also shown.

trolateral carinae; telson without subaculear tubercle, with long curved aculeus, longer than vesicle (except *B. buettikeri* Hendrixson, 2006); all segments of metasoma hirsute, with long setae in both sexes, dentate margin of movable finger of pedipalp with 9–12 rows of granules, each row equipped with one internal accessory granule, and with (*B. leptochelys* group) or without (*B. arenicola* group) one external accessory granule, 4 terminal and one basal terminal granules present; trichobothrial pattern orthobothriotaxic type A; dorsal trichobothria of femur arranged in β -configuration; pedipalp patella with 7 external trichobothria; pedipalp femur with trichoboth-

rium d_2 on dorsal surface; d_2 of pedipalp patella present; patella trichobothrium d_3 internal to dorsomedian carina; tibial spurs present on legs III–IV but could be reduced or absent on leg III.

COMMENTS. Lourenço described 16 species of genus *Buthacus* as author or coauthor. The types of five of these species are deposited in ZMUH and were loaned for this study (*Buthacus armasi* Lourenço, 2013, *B. clevai* Lourenço, 2001, *B. huberi* Lourenço, 2001, *B. maliensis* Lourenço & Qi, 2007, and *B. nigerianus* Lourenço & Qi, 2006). The types of 11 other *Buthacus*



Figures 12–22: Comparison of three characters that differentiate genera *Androctonus* Ehrenberg, 1828 and *Buthacus* Birula, 1908. Telson with long curved aculeus, longer than vesicle in *Buthacus* (19–20) versus standard Buthidae telson with aculeus approximately as long as vesicle in *Androctonus* (12, 15–16). Carapace with carinae reduced (only anterior median developed) in *Buthacus* (21) versus carapace with carinae well developed in *Androctonus* (13, 17). Pedipalp chela movable finger with 9–12 rows of granules, 4 terminal and one basal terminal granules in *Buthacus* (22) versus 13–16 rows of granules, 3 terminal and one basal terminal granules in *Androctonus* (14, 18). **Figures 12, 15–16, 19–20:** Telson in lateral views of holotype of *Buthacus maliensis* (12), male and female of *Androctonus amoreuxi* (Audouin, 1825) from Morocco (15–16), and male holotype and female paratype of *Buthacus stockmanni* Kovařík et al., 2016 (19–20). **Figures 13, 17, 21:** Carapace of holotype of *Buthacus maliensis* (13), male of *Androctonus amoreuxi* from Morocco (17), and male holotype *Buthacus stockmanni* Kovařík et al., 2016 (21). **Figures 14, 18, 22:** Pedipalp chela movable finger of *Buthacus maliensis* (14), male of *Androctonus amoreuxi* from Morocco (18), and male holotype *Buthacus stockmanni* Kovařík et al., 2016 (22).

species are deposited in MNHN (9), BNHS (1), and SMTD (1). Among these, the two species *Buthacus mahraouii* Lourenço, 2004 and *B. algerianus* Lourenço, 2006 are in synonymy with *B. zieglerei* Lourenço, 2000 (Kovařík, Lowe & Šťáhlavský, 2016b). Lourenço et al. (2017) rejected the synonymy and expressed an unsupported opinion that the genus *Buthacus* includes "micro-endemic species" where different species can occur in almost every locality. This hypothesis needs to be critically tested by studies of comparative morphology and/ or DNA analyses. Lourenço never published any such analyses, and on the contrary has difficulty even with simple taxonomic questions like distinguishing *Buthacus* specimens from other buthid genera. For example, it is evident that *B. maliensis* is undeniably a member of the genus *Androctonus*, and also that *Buthacus agarwali* Zambre & Lourenço, 2010 from India (Rajasthan) does not belong to *Buthacus* (see Kovařík, Lowe & Šťáhlavský, 2016b: 2).

Taxonomic position of *Buthacus armasi* Lourenço, 2013

It is here determined that the types *Buthacus armasi* and *B. leptochelys* (Ehrenberg, 1829) match each other precisely in the following key characters: trichobothrial pattern, pedipalp finger dentation, pectinal tooth count and lamellar structure, proportions, setation, carination and sculpture of pedipalps, carapace, tergites, sternites, and metasoma, shape of the telson, as well as armature of chelicerae and pedipalp fingers. In the original descriptions, Lourenço neglected to compare these two species. The undeniable conclusion is that *Buthacus armasi* Lourenço, 2013 is a junior synonym of *Buthacus leptochelys* (Ehrenberg, 1829) **syn. n.**

Taxonomic position of *Buthacus clevai* Lourenço, 2001

B. clevai is a valid species in the *B. leptochelys* group.

Taxonomic position of *Buthacus huberi* Lourenço, 2001

B. huberi is a synonym of *Buthacus occidentalis* Vachon, 1953. See Kovařík, Lowe & Šťáhlavský (2016b: 4–5) where it is discussed in detail how Lourenço (2001a: 257–258) declared the juvenile male holotype as an adult female and made an unfounded speculation about how many teeth must be present in the male pectines.

Taxonomic position of *Buthacus maliensis* Lourenço & Qi, 2007

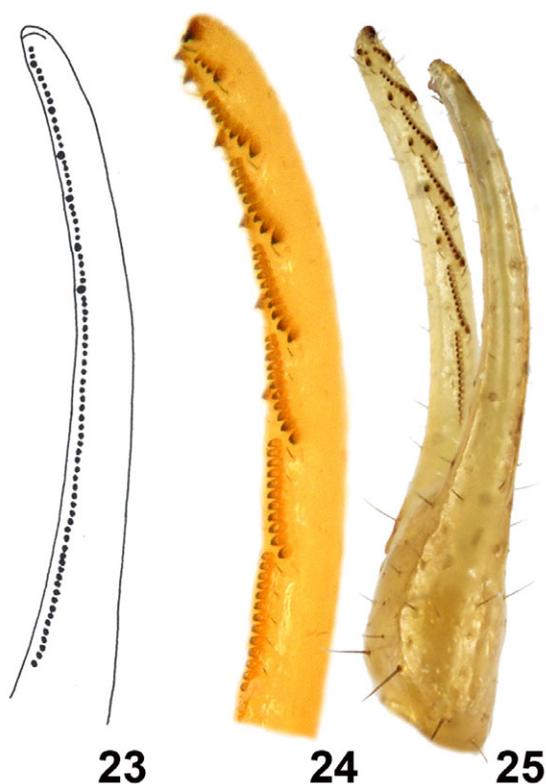
B. maliensis was described from Mali from a juvenile specimen (Figs. 10–14) that was incorrectly identified by the original authors as a male. Lourenço never provided a formal generic diagnosis for the genus *Buthacus* in his papers (Lourenço, 2001a, 2004b, 2004c, 2006, Lourenço et al., 2017). The description of *B. maliensis* ignores one of the basic characters of *Buthacus*, i.e. the distinctive shape of the telson. The telson has a long curved aculeus, longer than the vesicle, (Figs. 19–20), that differs markedly from the telson profile commonly seen in most other Buthidae, i.e. with an aculeus approximately as long as the vesicle, e.g. see the telson of *Androctonus* (Figs. 15–16), which appears similar to the telson of the holotype of *B. maliensis* (Fig. 12).

Two other key characters were incorrectly interpreted by Lourenço & Qi (2007). The original description of *B. maliensis* states: "*Carapace carinae weak to moderate; anterior median carinae weak; central median, posterior median and central lateral carinae weak*" (Lourenço & Qi, 2007: 389). In reality, the carinae of the carapace are reduced (only anterior median carina developed) in *Buthacus* (Fig. 21) whereas carinae of the carapace are well developed in *Androctonus* and in the holotype of *B. maliensis* (Figs. 17 and 13). The pedipalp chela movable finger dentition of the holotype of *B. maliensis* was also incorrectly described: "*Pedipalps with 11-11/12 rows of granules on the fixed and movable fingers.*" In reality, the holotype of *B. maliensis* has 14 rows of granules (Fig. 14). The pedipalp chela movable finger has 9–12 rows of granules, 4 terminal and one basal terminal granules in *Buthacus* (Fig. 22) versus 13–16 rows of granules, 3 terminal and one basal terminal granules in both *Androctonus* and the holotype of *B. maliensis* (Figs. 18 and 14). There are several other key differences in characters often used for generic diagnosis of buthids, for example in the granulation of carinae on metasomal segments and spination/ setation of legs. The undeniable conclusion is that *Buthacus maliensis* Lourenço & Qi, 2007 (published on 1st July 2007) is a junior synonym of *Androctonus aleksandrplotkini* Lourenço & Qi, 2007 (published on 30th April 2007), **syn. n.**

Taxonomic position of *Buthacus nigerianus* Lourenço & Qi, 2006

B. nigerianus is probably a valid species from the *B. leptochelys* group, close to *Buthacus foleyi* Vachon, 1948.

Taxonomic position of *Buthacus striffleri* Lourenço, 2004



Figures 23–25: Dentition of pedipalp chela movable finger. **Figure 23.** *Sabinebuthus elegans*, male holotype, fig. 4 published in Lourenço, 2001: 19. **Figure 24–25.** *Lanzatus somalilandus*, female paratype.

B. striffleri is a valid species from the *B. leptochelys* group close to *B. macrocentrus* (Ehrenberg, 1828). These two species can be easily distinguished by the shape of the pedipalp chela which in *B. striffleri* males is narrower than in *B. macrocentrus*.

***Lanzatus* Kovařík, 2001**
(Figs. 23–25)

TYPE SPECIES. *Lanzatus somalicus* Kovařík, 2001.

DIAGNOSIS. Total length 17.9–27.6 mm. Pedipalps orthobothriotaxic type A; dorsal trichobothria of femur arranged in β -configuration; trichobothrium d_2 of femur internal to dorsointernal carina; d_3 of patella internal to dorsomedian carina, when carina present; V_2 on chela manus located behind V_1 ; *it* on distal fixed finger; pectines with fulcra; pectine teeth number 18–24; basal middle lamella of pectines in females not dilated; sternum subtriangular; tibial spurs absent on legs I–IV; cheliceral fixed finger with one ventral denticle, margins of fingers with standard pattern of buthid dentition; carapace without distinct carinae, in lateral view with entire dorsal surface horizontal, or nearly so; lateral eyes

number 5 pairs; pedipalp chela movable finger with distinct granules divided into 7 diagonal rows; tergites I–VI smooth to finely granulated with one indicated carina or acarinate; stigmata are narrow slits; metasomal segments all elongate, smooth, acarinate; telson elongate, smooth, without subaculear tubercle, aculeus shorter than vesicle.

COMMENTS ABOUT SYNONYMY. Lourenço (2001d: 174) stated that *Lanzatus somalicus* Kovařík, 2001 is a junior synonym of *Sabinebuthus elegans* Lourenço, 2001. He provided no evidence whatsoever that *S. elegans* and *L. somalicus* are the same species. The published descriptions of these two genera/ species include substantial differences indicating that they belong to separate genera (see Figs. 23–25).

Kovařík, Lowe & Šťáhlavský (2016a: 2) noticed that according to the ICZN, if only the month is given in a publication, then the last day of that month, not the first, is the recognized publication date. Consequently, *Sabinebuthus elegans* was described on 31st March 2001, after *Lanzatus somalicus* which was described on 30th March 2001. Lourenço (2016) published a paper in which he confirmed that these two genera/species are synonyms and claimed that the paper with a description of *Sabinebuthus elegans* had priority of order in publication and was already accessible on 1st March 2001. In his 2016 paper, Lourenço launched personal attacks against the author (which are disregarded here), but he addressed neither the relevant taxonomic characters of the genera, nor inconsistencies between published figures of the movable finger dentitions of *Lanzatus* (Figs. 24–25) versus *Sabinebuthus* (Fig. 23).

The author believes that these two genera are in fact synonyms and that figure 4 (Fig. 23) published by Lourenço (2001c: 19) is probably incorrect, like the many other cases of erroneous figures of pedipalp finger dentition. The author contacted the journal in which the description of *Lanzatus somalicus* was published, and was advised by the publisher that the paper was already in print and accessible by February 2001. So, if the description published by Lourenço (2001c) is incorrect and the description of *Lanzatus somalicus* Kovařík, 2001 was published earlier according to the official date of publication and true printing date, then *Sabinebuthus elegans* Lourenço, 2001 is necessarily a junior synonym of *Lanzatus somalicus* Kovařík, 2001.

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