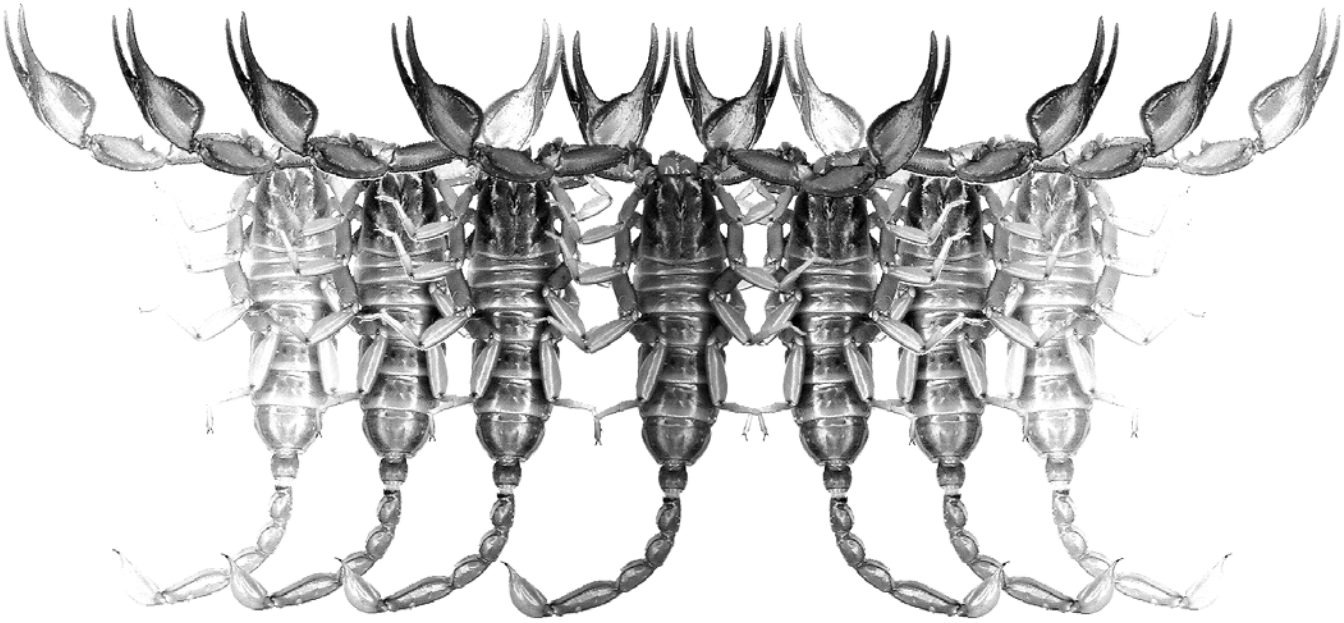
Euscorpius

Occasional Publications in Scorpiology



Eight New Species of the Genera *Scorpiops* Peters, *Euscorpiops* Vachon, and *Chaerilus* Simon (Scorpiones: Euscorpiidae, Chaerilidae) from Tibet and Yunnan, China

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Derivatio Nominis

The name *Euscorpius* Thorell, 1876 refers to the most common genus of scorpions in the Mediterranean region and southern Europe (family Euscorpiidae).

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- **ZISP**, Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia
- **WAM**, Western Australian Museum, Perth, Australia
- **NTNU**, Norwegian University of Science and Technology, Trondheim, Norway

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Eight new species of the genera *Scorpiops* Peters, *Euscorpiop*s Vachon, and *Chaerilus* Simon (Scorpiones: Euscorpiidae, Chaerilidae) from Tibet and Yunnan, China

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Summary

Eight new species belonging to the genera *Scorpiops* and *Euscorpiop*s (Euscorpiidae: Scorpiopinae) and *Chaerilus* (Chaerilidae) are described from China. These are: *Scorpiops atomatus* **sp. n.**, *Scorpiops langxian* **sp. n.**, *Scorpiops luridus* **sp. n.**, *Scorpiop*s *pococki* **sp. n.**, *Euscorpiop*s *vachoni* **sp. n.**, *Euscorpiops shidian* **sp. n.**, *Euscorpiop*s *karschi* **sp. n.**, and *Chaerilus tessellatus* **sp. n.** New records are also reported for these three genera, and the taxa are redescribed. Descriptions and redescriptions are based mainly on the material collected in Tibet Autonomous Region and Yunnan Province. Checklists and identification keys for Chinese species of the genus *Chaerilus* and the subfamily Scorpiopinae are provided.

Introduction

Inventory studies on Chinese scorpions are rare (Lourenço et al., 2005a, 2005b). To date, five families, nine genera and 23 species and subspecies have been reported from China (Fet et al., 2000; Zhu et al., 2004). However, descriptions of new species or citations for new records were, in most cases, done by researchers outside China (Karsch, 1879; Simon, 1880; Birula, 1904; Pocock, 1900; Kraepelin, 1899; Hirst, 1911; Kishida, 1939; Kovařík, 1994, 2000, 2005b; Lourenço et al., 2005a, 2005b).

Xianwen Wu (1936) was the first local researcher who studied scorpions from China, and he reported four species belonging to two families and four genera, based mainly on the specimens deposited in the Museums of the Biological Laboratory of the Science Society of China and the National Research Institute of Biology, Academia Sinica.

Much of the early descriptions on Chinese scorpions were rather simple and sometimes repetitive, and largely based on color patterns and some external morphological characters, such as structure of carinae or pectinal tooth count variation. Many studies of Chinese scorpions have only focused on a single widespread species, *Mesobuthus martensii* (Karsch, 1879) (family Buthidae) and thus its morphology, behavior, biology, and toxins have been extensively studied (Song et al., 1982; Li, 1991; Lu et al., 2001; Jiang et al., 2002; Chen et al., 2003). Recently, Qi et al. (2004) provided a more detailed and precise redescription for *Mesobuthus martensii.* With the exception of the redescription and the description of new species by Kovařík (1994, 2000b, 2005b) and Lourenço *et al*. (2005a, 2005b), no other known Chinese species have been properly described and/or redescribed.

In this paper, we describe eight new species of the genera *Scorpiops* Peters and *Euscorpiops* Vachon (Euscorpiidae), and *Chaerilus* Simon (Chaerilidae) from China. We also provide checklists and keys for the Chinese species of these three genera. The map (Fig. 144) at the end of this paper shows the distribution of these species.

Methods

Standard terminology for scorpion morphology is used. All measurements are given in millimeters. Type specimens are deposited in Museum of the College of Life Sciences, Hebei University (MHBU), Baoding, China. Some paratypes are deposited in the Muséum

National d'Histoire Naturelle, Paris, France (MNHN). Trichobothrial nomenclature is according to Vachon (1974, 1975).

Family Euscorpiidae Laurie, 1896
Subfamily Scorpiopinae Kraepelin, 1905
Tribe Scorpiopini Kraepelin, 1905

Comments. The subfamily Scorpiopinae was first proposed by Kraepelin (1905) as Scorpiopsinae, a subfamily of Vaejovidae. The correct latinized family name derived from the type genus *Scorpiops* is Scorpiopinae, and the spelling was corrected by Fet (2000b). Stockwell (1992) raised Scorpiopsinae to the family level as Scorpiopsidae, and Lourenço (1998) agreed with this decision. Fet (2000b) listed the family Scorpiopidae. Subsequently, Soleglad & Sissom (2001) downgraded Scorpiopidae to a subfamily of Euscorpiidae, grouped its Asian genera into tribe Scorpiopini, and also included in this subfamily the North American genus *Troglocormus* (tribe Troglocormini). The subfamily currently forms a monophyletic group within Euscorpiidae, and does not share any synapomorphies with North American Vaejovidae (Soleglad & Sissom, 2001). The tribe Scorpiopini includes six Asian genera, mainly from the south and southeast of the continent.

Vachon (1980) revised the genus *Scorpiops*, and described three subgenera, *Alloscorpiops*, *Euscorpiops*, and *Neoscorpiops*, in addition to the nominotypic subgenus *Scorpiops*. These four subgenera were later elevated to generic level by Lourenço (1998), accompanying two monotypic genera *Parascorpiops* Banks 1928 and *Dasycorpiops* Vachon, 1974, thus bringing the total number of genera to six. Kovařík (2000a) revised the family Scorpiopidae and distinguished five genera: *Alloscorpiops*, *Dasyscorpiops*, *Neoscorpiops*, *Parascorpiops*, and *Scorpiops*. Kovařík (2000a: 164) also separated *Scorpiops* into three groups: *S. leptochirus* species group, *S. hardwickii* species group, and *S. petersii* species group. Kovařík (2000a) synonymized *Euscorpiops* with *Scorpiops*, suggesting that the genus as defined by Vachon (1980) should be considered invalid as there was a difference only in one external trichobothrium on the patella. However, Soleglad & Sissom (2001) restored the genus *Euscorpiops* based of the position of chela trichobothrium Eb_3 and the presence of an annular ring on the telson (Soleglad & Sissom, 2001: 52, figs. 114, 115). Kovařík (2005b) accepted this division, and considered *Euscorpiops* a valid genus. So far, six species of Scorpiopinae have been reported from China (five species of the genus *Scorpiops*, and one of *Euscorpiops*).

Genus *Scorpiops* Peters, 1861

Scorpiops Peters, 1861: 510; Kraepelin, 1899: 179 (in part); Pocock, 1900: 64 (in part); Vachon, 1980: 143 (in part); Tikader & Bastawade, 1983: 403 (in part); Lourenço, 1998: 246 (in part); Kovařík, 2000a: 163-166 (in part); Fet, 2000: 491 (in part); Soleglad & Sissom, 2001: 93; Kovařík, 2005b: 8.

Diagnosis. Trichobothrium Eb_3 on the external aspect of the chela located basally to trichobothrium *Dt.* Annular ring at vesicle/aculeus juncture absent. Three pairs of lateral eyes. 17–19 external trichobothria on pedipalp patella. Ventral aspect of patella with 6–18 trichobothria. Four trichobothria on the ventral aspect of the chela manus.

Scorpiops luridus Zhu, Lourenço et Qi, **sp. n**.
(Figs. 1–15)

Diagnosis. In accordance with the grouping of species proposed by Kovařík (2000a) for the genus *Scorpiops*, the new species, which has nine trichobothria on the ventral surface of the patella, has to be placed in the *Scorpiops leptochirus* group. The new species differs from other members of the group in having larger size and yellow color, and a pair of small median eyes, which are even slightly smaller than the lateral eyes (Fig. 13).

Comments: *Scorpiops luridus* **sp. n.** can be distinguished from other *Scorpiops* species, and in particular from *Scorpiops petersii* Pocock, 1893, the most geographically close species of the genus, by the following features: (a) entire carapace surface is densely covered with fine compact granules; (b) the ventral patella of pedipalps is armed with 9 trichobothria; (c) sternite V of mesosoma is granular, with one pair of well-expressed carinae and one pair of carinal traces; (d) tergites are densely covered with very fine granules and a few scattered large granules.

Material: 1♂ holotype, Tibet, Lang district (29°02' N, E.93°08' E), 2 August 2002, Ming-Sheng Zhu leg. (Deposited in MHBU). Paratypes: 2 ♀, same data as holotype (One is deposited in MHBU, the other in MNHN) .

Etymology: The specific name refers to the pale color of tergites.

Description (based on male holotype):
Coloration: Basically yellow. Carapace is mahogany, with some black coloration near the eyes. Tergites are from sandy beige to brown. Metasomal segments are sandy beige and paler than tergites; vesicle is yellow, with the end of the aculeus dark mahogany. Pedipalps are dark mahogany except for black margin and carinae. The carinae of patella are black or dark mahogany, and the fingers are mahogany. Chelicerae is yellow, with fingers pale brown. Legs are yellowish. Venter and sternites are yellowish.

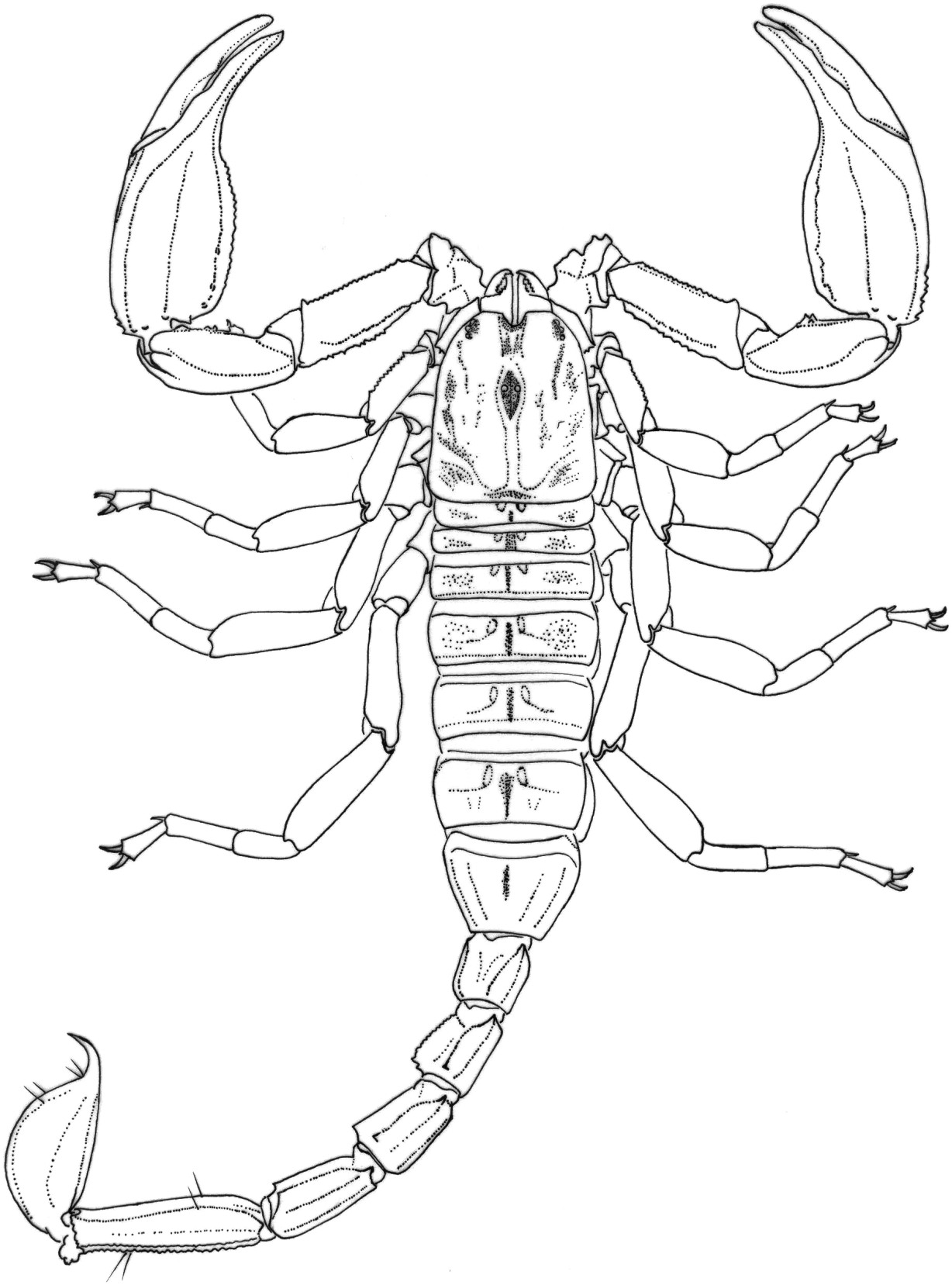
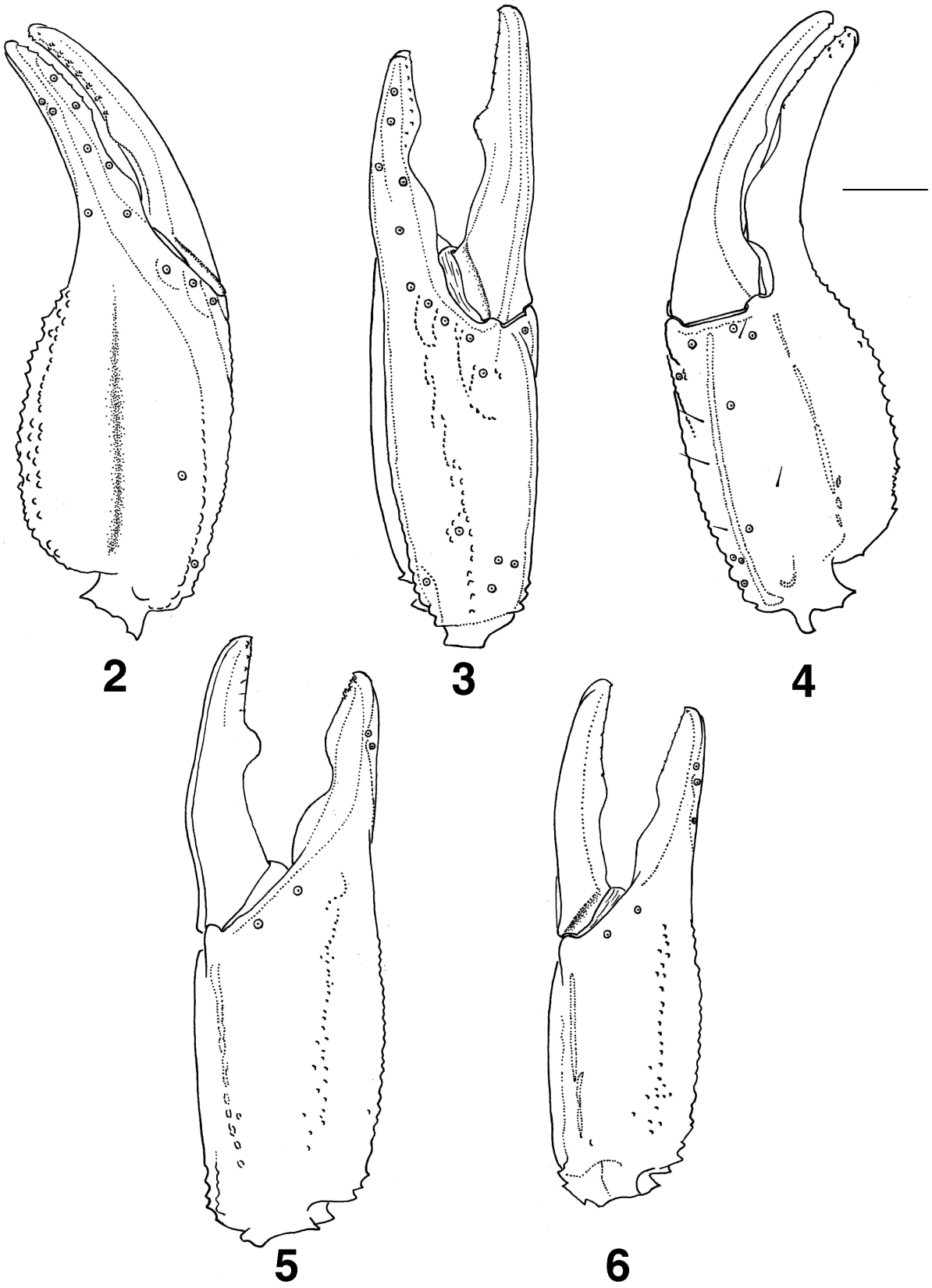
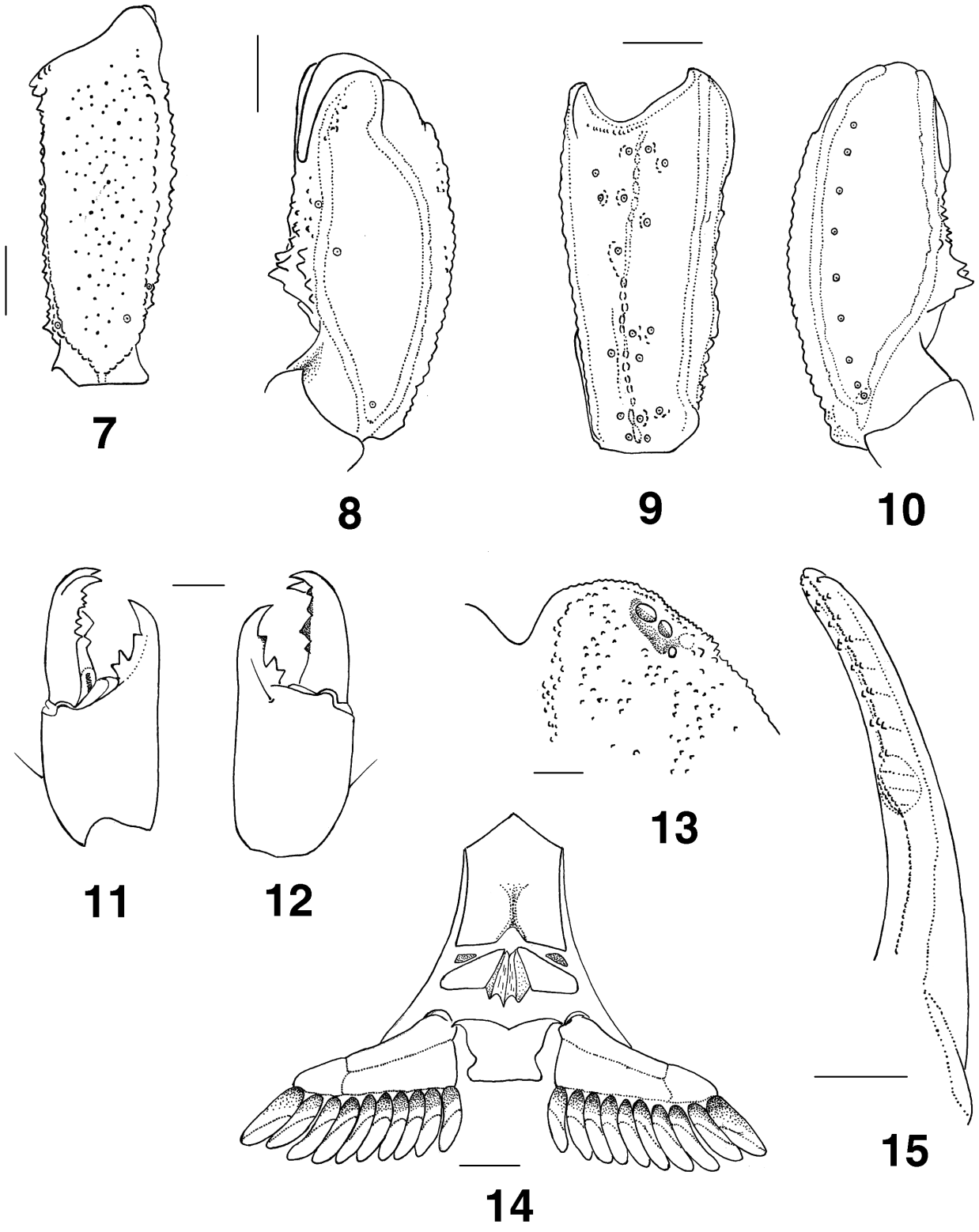


Figure. 1: *Scorpiops luridus* **sp. n.**, male holotype, habitus. Total length 86.72 mm.



Figures 2–6: *Scorpiops luridus* **sp. n.**, male holotype. **2–5.** Chela dorsoexternal, external, ventral and internal aspects. **6** same as **5**, female paratype. Scale = 3 mm.



Figures 7–15: *Scorpiops luridus* **sp. n.**, male holotype. **7.** Femur dorsal aspect. **8–10.** Patella dorsal, external and ventral aspects. **11-12.** Chelicera, ventral and dorsal aspects. **13.** Lateral ocular region, in detail, dorsal aspect. **14.** Sternum, genital operculum and pectines. **15.** Dentate margin of the pedipalp chela movable finger. Scales = 1 mm.

Morphology: Carapace surface is densely covered with fine compact granules, lateral furrow broad and flat, posterior median furrow well-expressed. Three pairs of lateral eyes, median eyes are small and almost smaller than lateral eyes, anterior to the center of the carapace. Sternum is pentagonal, longer than wide. Tergites are acarinate, smooth and shiny, with sparse small punctuations except for segment VII which has four carinae. Pectinal tooth count 10-10, fulcra absent. Sternites are smooth and shiny, segment VII with four very weak carinae. Metasoma segments II to V are longer than wide; segment V is clearly longer than others, and more than two times longer than the segment II; segments I to V have 10-10-10-8-7 carinae; all the carinae of segments I-IV have pointed serration, only ventral carinae with finely obtuse serration; all carinae of segment V with pointed serration. Vesicle with scattered smooth granules.

Pedipalps are crenulate; tegument is weakly granular; femur with dorsointernal, dorsoexternal, ventrointernal and ventroexternal carinae, all of which are serrated; patella with an interior carina irregularly granulated, the external carina with smooth and irregular granules, two spinoid granules present on the internal aspect, the interoventral spinoid granule being much larger than the interodorsal one; tegument punctated. Chela bears dorsal marginal, external secondary, and ventral internal carinae, with moderately to strongly smooth granulation; all carinae well developed. Fingers are short, shorter than manus. The cutting edge of the finger bears two rows of fine granules. Trichobothriotaxy type C (Vachon, 1974). Chela exhibits four ventral trichobothria; patella with 17 external and nine ventral trichobothria.

Female paratype. Coloration and morphology are very similar to that of the male holotype. Some of the segments are slightly bulkier than that of the male. Pectinal tooth count 8-8.

Measurements (male holotype/female paratype). Total length, 86.72/75.12. Carapace: length, 11.73/10.20; anterior width, 4.97/4.08; posterior width, 10.58/9.18. Metasomal segment I: length, 4.34/4.08; width, 4.46/4.08. Metasomal segment V: length, 12.75/9.56; width, 3.19/2.68; depth, 3.32/2.81. Vesicle: width, 4.59/3.95; depth, 4.59/3.83. Pedipalp: femur length, 10.20/8.93, width, 3.83/3.70; patella length, 9.56/8.29, width, 4.46/4.08; chela length, 11.99/10.20, width, 7.27/6.38, depth, 5.74/4.59; movable finger length, 11.48/9.82.

Scorpiops atomatus Qi, Zhu et Lourenço, **sp. n**.
(Figs. 16–31)

Diagnosis. In accordance with the grouping of species proposed by Kovařík (2000a) for the genus *Scorpiops*, the new species, which has nine trichobothria on the ventral surface of the patella (Fig. 25), has to be placed in *Scorpiops leptochirus* group. The new species is also slightly smaller that the other members of the group. Carapace surface is coarse. There are three pairs of lateral eyes with the first two pairs larger than the third eye. Median ocular tubercles are smooth with a pair of small median eyes, which are almost the same size as the first two pairs of lateral eyes (Figs. 16, 31). Pectines with fulcra (Fig. 30).

Comments. *Scorpiops atomatus* **sp. n.** can be distinguished from other *Scorpiops* species, and in particular from *S. pachmarhicus* Bastawade, 1992, the most geographically close species of the genus by the following features: (a) pectinal tooth count 9-11; (b) manus dorsally almost smooth; (c) tergite VII of mesosoma with two granulated lateral carinae.

Material. 1♂ holotype, Tibet, Lang district (29.02° N, 93.08° E), June to August 2004, Ai-Min Shi and Yi-Bin Ba leg. (MHBU). Paratypes: 3 ♀, 1 ♂, same data as holotype (2 ♀ in MHBU, 1 ♀ and 1 ♂ in MNHN); 1♂, Tibet, Chayu district, Xia Zayü town (28.4° N, 97.0° E), 7 August 2002, Ming-Sheng Zhu leg. (MHBN); 2 ♀ , Tibet, Lang district (29.02° N, 93.08° E), 20 August 2002, Ming-Sheng Zhu leg. (MHBN); 1 ♂, Tibet, Gyaca district (29.1° N, 92.7° E), 21 August 2002, Ming-Sheng Zhu leg. (MHBN); 1 ♂, 1♀, 22 August 2002, other data same as above (MHBN).

Etymology. The specific name refers to the spots on tergites.

Description (based on male holotype):

Coloration: Basically brown. Carapace is dark brown, with some black coloration near the eyes. Tergites are dark brown. Metasoma segments are black brown with pale stripes; vesicle brown with a yellowish aculeus. Chelicerae are black brown; with the fingers dark brown and gradually lighter toward the tip, which is yellow. Pedipalps are dark brown; and the fingers are dark yellow. Legs are brown with yellow spots. Venter and sternites are yellowish.

Morphology: Carapace is coarse, with dense, minute granules; lateral furrow broad and flat; posterior median furrow deep, slit-shaped. Median eyes are anterior to the center of the carapace; three pairs of lateral eyes, the third eye being vestigial. Sternum is pentagonal and longer than wide. Tergites are almost everywhere densely covered with fine granules; the trace of median carina first appears on tergite III, and gradually becomes a distinct carina; on the tergite VII, the middle one is only a little protuberant, and its two lateral carinae are granulated. Pectinal tooth count 11-11, fulcra present. Sternites are smooth and shiny, segment VII with four very weak carinae. Metasoma segments II to V are longer than wide; segments I to V have 10-10-10-8-7 carinae. All dorsal carinae are granular on segment I,

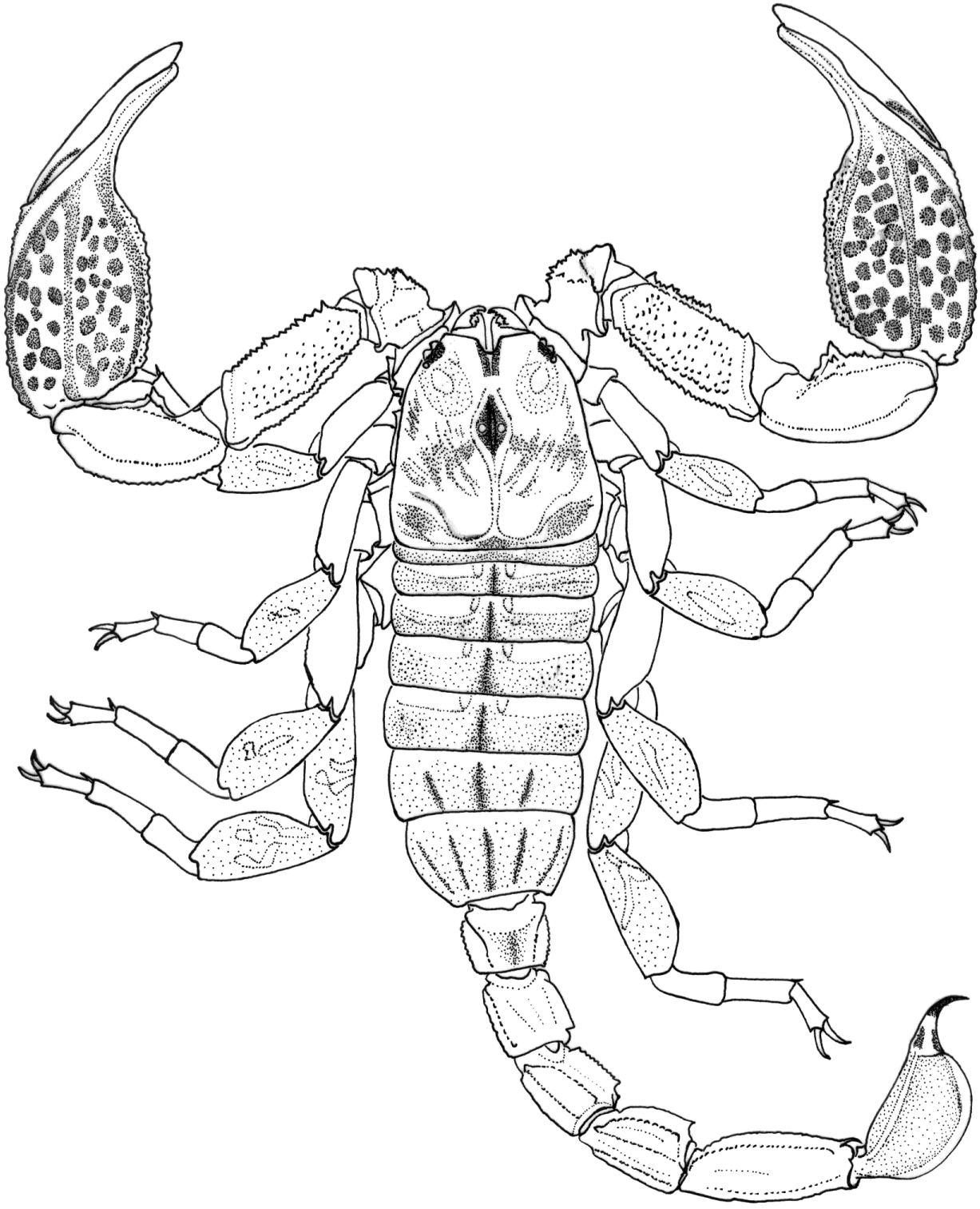
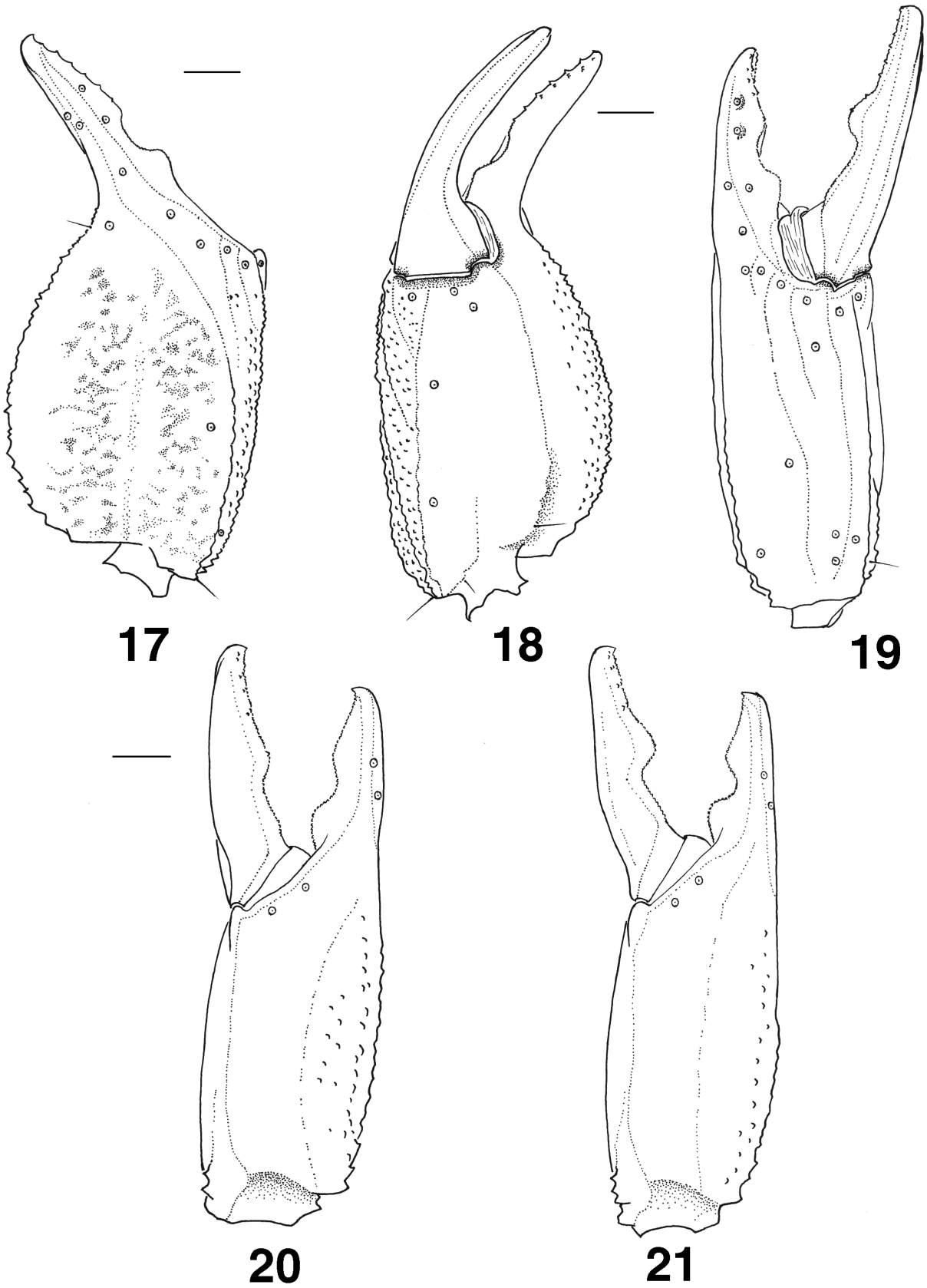
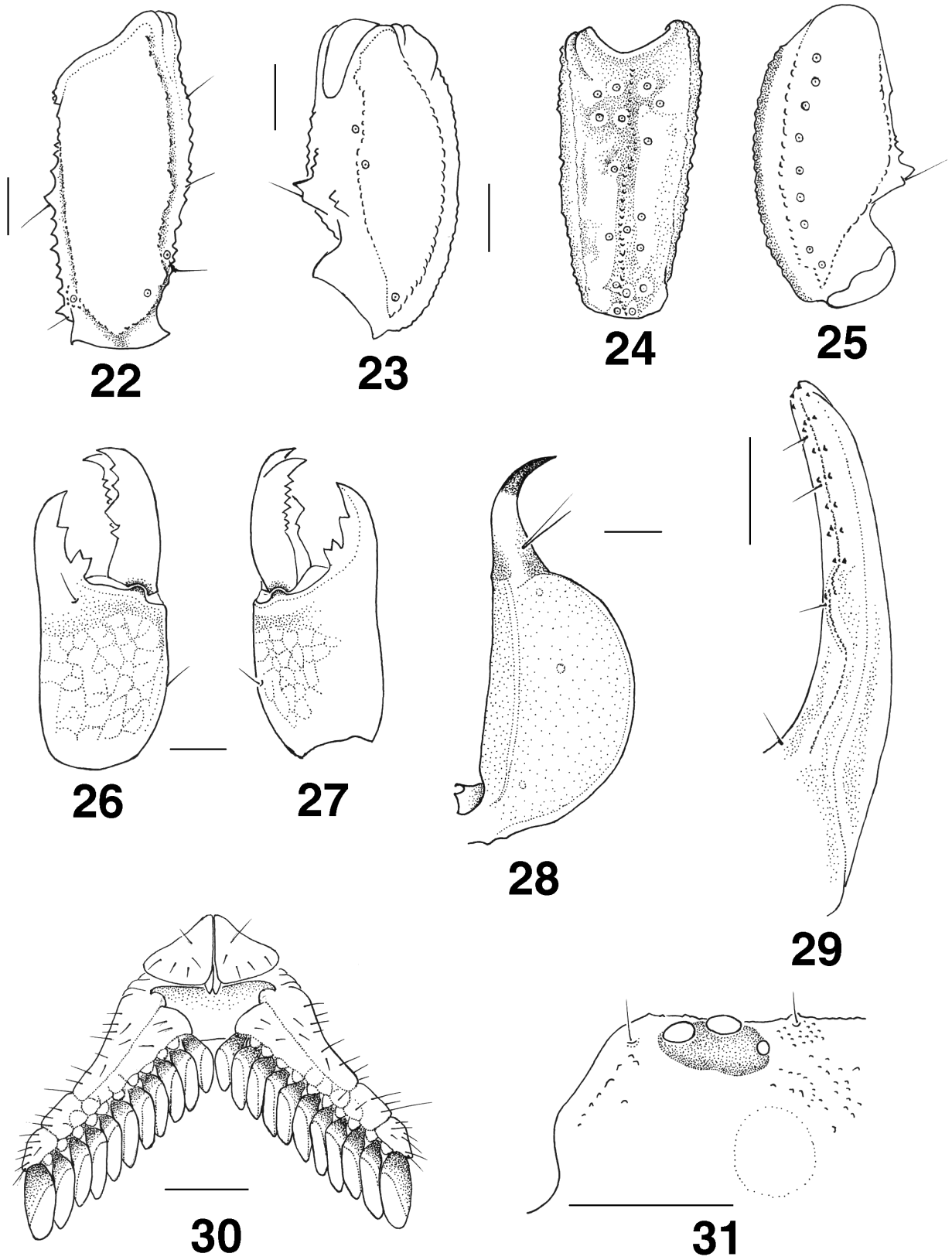


Figure 16: *Scorpiops atomatus* **sp. n.**, male holotype, habitus. Total length 34.94 mm.



Figures 17–21: *Scorpiops atomatus* **sp. n.**, male holotype. Chela, dorsoexternal, ventral, external and internal aspects. **21** same as **20**, female paratype. Scales = 1 mm.



Figures 22–31: *Scorpiops atomatus* **sp. n.**, male holotype. **22.** Femur, dorsal aspect. **23–25.** Patella, dorsal, external and ventral aspects. **26–27.** Chelicera, dorsal and ventral aspects. **28.** Telson, lateral aspect. **29.** Dentate margin of the pedipalp chela movable finger. **30.** Genital operculum and pectines, ventral aspect. **31.** Lateral ocular region, in detail, dorsal aspect. Scales = 1 mm.