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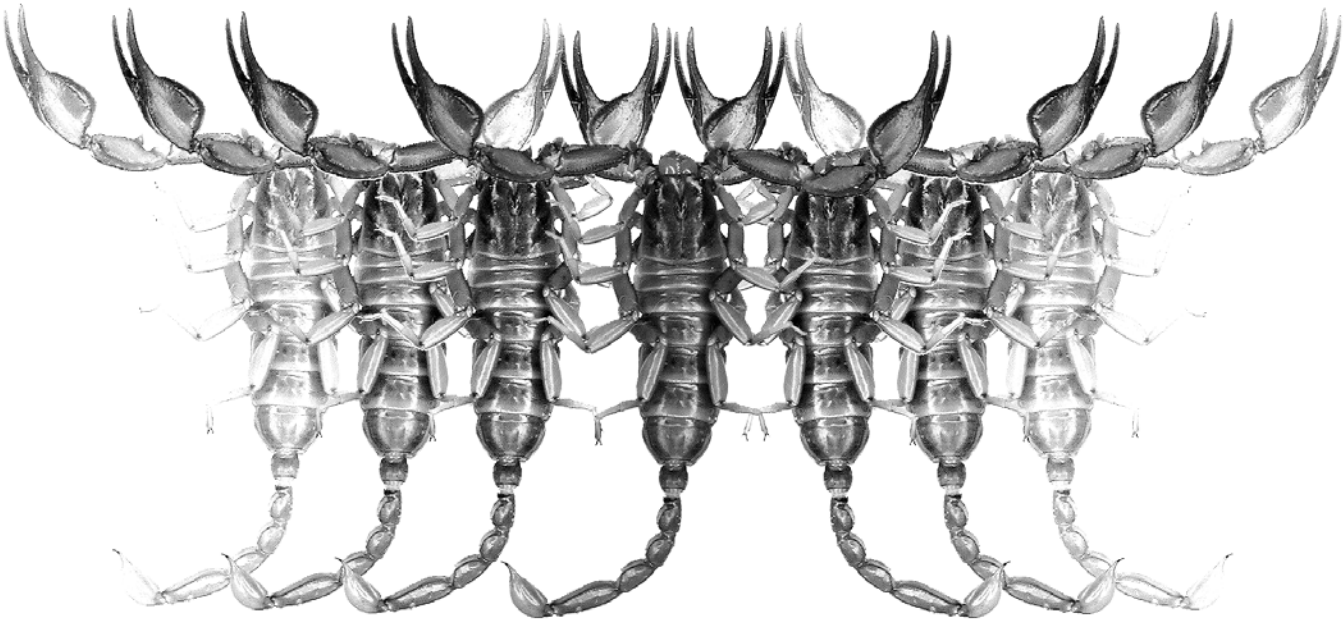

A Review of the Genus *Heterometrus* Ehrenberg, 1828, with Descriptions of Seven New Species (Scorpiones, Scorpionidae)

František Kovařík

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- **WAM**, Western Australian Museum, Perth, Australia
- **NTNU**, Norwegian University of Science and Technology, Trondheim, Norway

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A review of the genus *Heterometrus* Ehrenberg, 1828, with descriptions of seven new species (Scorpiones, Scorpionidae)

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Summary

The genus *Heterometrus* is revised and a key is presented to all species except *H. tristis*. Subgenera *Chersonesometrus* Couzijn, 1978, *Gigantometrus* Couzijn, 1978, *Javanimetrus* Couzijn, 1981 and *Srilankametrus* Couzijn, 1981 are synonymized with the subgenus *Heterometrus* Ehrenberg, 1828. Seven new species of *Heterometrus* are described: *H. beccaloniae* **sp. n.**, *H. mysorensis* **sp. n.**, *H. rolciki* **sp. n**., and *H. ubicki* **sp. n**. from India, *H. nepalensis* **sp. n.**, from Nepal, *H. sejnai* **sp. n.** from Thailand, and *H. cimrmani* **sp. n**. from Thailand and Vietnam. The following species and subspecies are synonymized: *H.* (*Chersonesometrus*) *fastigiosus* Couzijn, 1981 with *H. bengalensis* (C. L. Koch, 1841); *H.* (*Srilankametrus*) *indus laevitensus* Couzijn, 1981 with *H. gravimanus* (Pocock, 1894); *H. liophysa madoerensis* Kopstein, 1921 and *H. laevifrons* Roewer, 1943 with *H. liophysa* (Thorell, 1888); *H.* (*H.*) *longimanus belitungensis* Couzijn, 1981 and *H.* (*H.*) *longimanus tarawakanensis* Couzijn, 1981 with *H. longimanus* (Herbst, 1800); *H.* (*Chersonesometrus*) *granulomanus* Couzijn, 1981 with *H. madraspatensis* Pocock, 1900; *Palamnaeus phipsoni collinus* Pocock, 1900 with *H. phipsoni* (Pocock, 1893); *H.* (*H.*) *malapuramensis* Tikader & Bastawade, 1983 with *H. scaber* (Thorell, 1876); *H.* (*Gigantometrus*) *swammerdami titanicus* Couzijn, 1981 with *H. swammerdami* Simon, 1872; and *H.* (*Chersonesometrus*) *pelekomanus* Couzijn, 1981 with *H. wroughtoni* (Pocock, 1899). *H. thorellii* (Pocock, 1892) **comb. n**. is recognized as valid species. Lectotypes are designated for *H. xanthopus* (Pocock, 1897) and for *H. bengalensis* (C. L. Koch, 1841), which invalidate Couzijn's (1981) neotype designation. *H. bengalensis* (C. L. Koch, 1841) is for the first time recorded from Orissa, *H. fulvipes* (C. L. Koch, 1837) from Mysore, Uttar Pradesh, and West Bengal, *H. kanaraensis* (Pocock, 1900) from Goa, *H. phipsoni* (Pocock, 1893) from Orissa, *H. scaber* (Thorell, 1876) from Mysore and Pondichery, *H. swammerdami* Simon, 1872 from Mysore, and *H. wroughtoni* (Pocock, 1899) from Mysore (all states of India).

Introduction

Three studies can be considered essential for our present knowledge of the genus *Heterometrus*. The first unquestionably is a series of papers by Pocock (1892–1900), who described the most species and established the basic criteria for their recognition. The second is the work of Couzijn (1981), who based his analysis on as many as 131 characters. And the third is Tikader & Bastawade (1983), who treated the Indian species in detail and drew attention to Couzijn's errors by re-validating several species synonymized by him (see also Fet, 2003). Although Couzijn's extensive character set gives the impression of a definitive work, at a closer examination the inclusion of many of his characters and the weight given to many others invite considerable doubt. Surprisingly, Couzijn applied virtually none of the characters established by Pocock. The approach used in this review differs markedly from that of Couzijn. Most of his morphometric characters are abandoned because of their substantial intraspecific variation, and his opinion is concurred with only as to the importance of the form and surface of the chela of pedipalps (granulation, punctation, carinae) and to some extent the granulation of the carapace. Of the characters neglected by Couzijn,s the greatest emphasis is placed on sexual dimorphism, but attention is paid also to the color of the legs and development of carinae on the metasomal segments. For the sake of brevity, descriptive trivia of no direct value to species recognition are omitted. Tikader & Bastawade (1983) attempted to differentiate species of *Heterometrus* by means of trichobotriotaxy, which unfortunately cannot be done in this genus.

ABBREVIATIONS. The institutional abbreviations listed below and used throughout are mostly after Arnett, Samuelson & Nishida (1993).

BMNH – The Natural History Museum, London, United Kingdom;
CASC – California Academy of Sciences, San Francisco, California, USA;

FKCP – František Kovařík Collection, Praha, Czech Republic;
HNHM – Hungarian Natural History Museum, Budapest, Hungary;
MCSN – Museo Civico de Storia Naturale "Giacomo Doria", Genoa, Italy;
MNHN – Muséum National d´Histoire Naturelle, Paris, France;
MZUF – Museo Zoologico de "La Specola", Firenze, Italy;
NHRS – Naturhistoriska Riksmuseet, Stockholm, Sweden.
NMPC – National Museum (Natural History), Praha, Czech Republic;
NZSI – National Collection, Zoological Survey of India, Calcutta, India;
SMFD – Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt am Main, Germany;
SOFM – National Museum of Natural History, Sofia, Bulgaria;
ZMHB– Museum für Naturkunde der Humboldt-Universität zu Berlin, Germany;
ZMUH – Zoologisches Institut und Zoologisches Museum, Universität Hamburg, Germany.

Other abbreviations are: ♂: male; ♀: female; im.: immature; juv.: juvenile.

Heterometrus Ehrenberg, 1828
(Figs. 1–7)

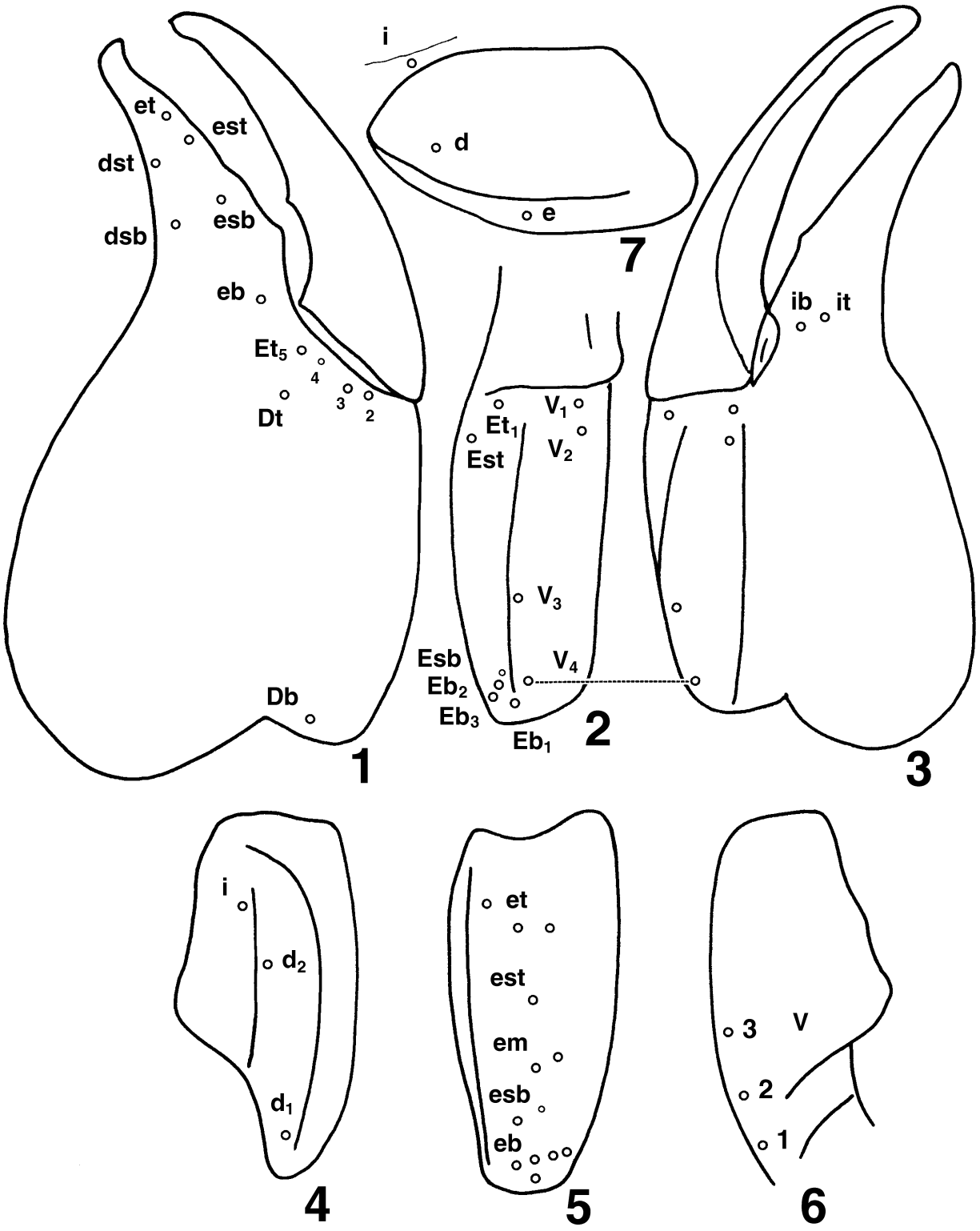
Buthus (*Heterometrus*) Ehrenberg in Hemprich & Ehrenberg, 1828: pl. 1, figs 1–2 (part, only fig. 2); Hemprich & Ehrenberg, 1829: 351; Hemprich & Ehrenberg, 1831: 2.
Buthus: C. L. Koch, 1836: 73; C. L. Koch, 1837: 36; C. L. Koch, 1837: 25; C. L. Koch, 1837: 45 (in part); Agassiz, 1846: 7 (in part); C. L. Koch, 1841: 1 (in part); C. L. Koch, 1850: 87 (in part).
Scorpio Linné, 1758: 624 (in part).
Heterometrus: Ausserer, 1880: 466; Kraepelin, 1905: 344; Kraepelin, 1913: 165; Kopstein, 1921: 128; Werner, 1934: 277; Couzijn, 1978: 327; Couzijn, 1981: 73; Tikader & Bastawade, 1983: 518; Sissom, 1990: 136; Fet, 2000: 431; Prendini, 2000: 44; Soleglad & Fet, 2003: 88.
Pandinus: Thorell, 1876b: 199 (in part); Karsch, 1892: 307.
= *Centrurus* Ehrenberg in Hemprich & Ehrenberg, 1829: 350 (TS: *Centrurus galbineus* C. L. Koch, 1838); C. L. Koch, 1837: 38; C. L. Koch, 1838: 110 (see Fet, 2000: 431).
= *Palamnaeus* Thorell, 1876a: 13 (TS: *Palamnaeus petersii* Thorell, 1876); Karsch, 1892: 307; Pocock, 1897: 114; Pocock, 1896: 77; Pocock, 1900: 84 (syn. by Karsch, 1879: 20; Kraepelin, 1899: 107).
= *Heterometrus* (*Chersonesometrus*) Couzijn, 1978: 330 (TS: *Buthus fulvipes* C. L. Koch, 1837); Couzijn, 1981: 131; Tikader & Bastawade, 1983: 573; Fet, 2000: 438. **Syn. n.**
= *Heterometrus* (*Gigantometrus*) Couzijn, 1978: 330; (TS: *Heterometrus swammerdami* Simon, 1872); Couzijn, 1981: 159; Tikader & Bastawade, 1983: 561; Fet, 2000: 443. **Syn. n.**
= *Heterometrus* (*Javanimetrus*) Couzijn, 1981: 124 (TS: *Buthus cyaneus* C. L. Koch, 1836); Fet, 2000: 444. **Syn. n.**
= *Heterometrus* (*Srilankametrus*) Couzijn, 1981: 120 (TS: *Scorpio indus* DeGeer, 1778); Fet, 2000: 446. **Syn. n.**

TYPE SPECIES. *Buthus* (*Heterometrus*) *spinifer* Ehrenberg, 1828, by subsequent designation (Karsch, 1879: 20).

DIAGNOSIS: Pedipalp femur with three trichobothria, of them only one on internal surface. Patella of pedipalp with 19 trichobothria, three on ventral and 13 on external surface. Chela of pedipalp with 26 trichobothria. Retrolateral pedal spurs absent. Lateroapical margins of tarsi produced into rounded lobes. Metasomal segments I to IV with paired ventral submedian carinae. Stridulatory organ located on opposing surfaces of pedipalp coxa and first leg. Total length 60 to 180 mm.

COMMENTS. Couzijn (1978, 1981) described four subgenera but gave no characters that would permit to unequivocally distinguish them from the nominotypical subgenus. The invalidity of his subgenera is also clear from the below listed synonymizations of species across them, and I therefore regard all of them as synonyms. The only subgenus that could possibly be upheld is *Gigantometrus*, which comprises closely related species easily distinguishable from others. However, the genus *Heterometrus* contains more of such groups (e.g. *H. madraspatensis* and *H. gravimanus*, or *H. petersii* and *H. laoticus*), and in my opinion they have the character of species groups rather than of subgenera.

I have found two characters in *Heterometrus* that could serve to justify subgeneric divisions. One of them is sexual dimorphism, which Couzijn for some reason did not include in his analysis. However, after examination of a majority of the species it has become clear that this character evolved in the genus more than once, because it differentiates otherwise closely related species that definitely cannot be placed in separate subgenera. As examples can serve *H. liophysa*, *H. longimanus*, *H. spinifer* and *H. cimrmani* sp. n., whose females and juveniles are virtually indistinguishable and the species can be reliably identified only on males. The other character is the genital operculum which comes in



Figures 1–7: *Heterometrus wroughtoni* (Pocock, 1899), specimen labeled as paratype of *Heterometrus* (*Chersonesometrus*) *pelekomanus* Couzijn, 1981 syn. n. In Figs. 1 to 3 the first capital letters denote trichobothria situated on the manus, and the first lower-case letters denote those situated on the fixed finger of pedipalp. Figs. 4 to 6 show the distribution of trichobothria on the patella of pedipalp. Fig. 7 shows the distribution of trichobothria on the femur of pedipalp. Explanation: First letters: D, dorsal, E, external, I, internal, V, ventral. Second or second plus third letters: b, basal, sb, suprabasal, m, medial, st, subterminal, t, terminal, v, ventral. Numerals distinguish individual trichobothria of the same classification. Designation and description of trichobothria after Vachon (1974). Morphological terminology after Stahnke (1970).

two basic shapes, but they cross some of the species-group boundaries. I therefore believe that subgeneric divisions within the genus *Heterometrus* are not justified.

Heterometrus barberi (Pocock, 1900)
(Fig. 8)

Palamnaeus barberi Pocock, 1900: 95.
Heterometrus barberi: Takashima, 1945: 94.
Heterometrus (*Chersonesometrus*) *barberi*: Tikader & Bastawade, 1983: 614; Fet, 2000: 441.
Heterometrus (*Chersonesometrus*) *phipsoni phipsoni*: Couzijn, 1981: 149 (in part).

TYPE LOCALITY AND TYPE REPOSITORY. Tinnevelly in S. India; BMNH.
TYPE MATERIAL EXAMINED. **India**, Tinnevelly District, in the western Gháts, Kannikatti evergreen forest, 2500 ft., 1♀, holotype, leg. C. A. Barber, BMNH No. 1899.9.24.1. No other material.

DIAGNOSIS. Adult holotype female 124 mm long. Base color uniformly black, only manus of pedipalps orangish yellow. Pectinal teeth number 11–12. Chela not lobiform, its length to width ratio equals 2.2. Entire manus rugate (merging blunt granules) and without carinae. Patella of pedipalps without pronouced internal tubercle. Carapace with disc smooth, at margins granulate. Spine formula of third legs 4:6, of fourth legs 4:6–7. Telson bulbous, vesicle longer than aculeus.

COMMENTS. Couzijn (1981: 149) considered *Palamnaeus barberi* Pocock, 1900 a synonym of *H. phipsoni* (Pocock, 1893). However, these two species are very different (see diagnosis and key), which was pointed out already by Tikader & Bastawade (1983: 614) who regarded *Heterometrus* (*Chersonesometrus*) *barberi* (Pocock, 1900) as a valid species. The BMNH register lists the holotype of *Palamnaeus barberi* Pocock, 1900 as *Palamnaeus flavimanus* Pocock, 1900.

DISTRIBUTION. India: Tamil Nadu (Pocock, 1900: 96).

Heterometrus beccaloniae **sp. n.**
(Fig. 9)

TYPE LOCALITY AND TYPE REPOSITORY. India, Tamil Nadu, Javadu Hills, Vellore Dist., Kavalore; FKCP.
TYPE MATERIAL. **India**, ***Tamil Nadu***, Javadu Hills, Vellore Dist., Kavalore, 2000 ft. TRSN coll., V.2003, 1♀ (holotype); Tamil Nadu, Nilgiri hills, Mudumalai n. p., 6.V.2000, 1im.7juvs. (paratypes), leg. J. Rolčík.

ETYMOLOGY. Named after Janet Beccaloni of the Natural History Museum, London, in appreciation of her kind help.

DIAGNOSIS. Adult female holotype 115 mm long. Color uniformly black, only telson reddish yellow. Pectinal teeth number 14–16. Chela of pedipalp length to width ratio 2.38 (holotype). Dorsal surface of manus granulate and/or tuberculate, with carinae. Patella of pedipalp granulate, without pronounced internal tubercle and with five carinae. Femur of pedipalp unusually wide, granulated and convex. Carapace with smooth disc and granulose margins. Mesosoma smooth. Telson hirsute, bulbous (in adults), vesicle longer than aculeus. Genital operculum large, in female about as wide as or slightly wider than long.

DESCRIPTION: The adult female holotype is 115 mm long. Measurements of the carapace, telson, segments of the metasoma and segments of the pedipalps, and numbers of pectinal teeth are given in Table 1. The male is unknown.
COLORATION: The color is uniformly black, only the telson is reddish yellow (adults) or yellow (juveniles). Sternites and pectens are lighter-colored (brownish).
MESOSOMA AND CARAPACE: The mesosoma lacks carinae, is smooth, and the carapace is either entirely granulate or with the disc smooth. Sternites are smooth, entirely without granules, only the seventh sternite may bear four smooth carinae. Pectinal teeth number 14–16.
METASOMA AND TELSON: The metasoma is smooth. The first to fourth segments bear eight smooth carinae. The fifth segment bears seven carinae. The ventral carinae of this segment consist of pointed granules, whereas the dorsal carinae are smooth. The telson is bulbous and hirsute, dorsally without granules and ventrally with four rows of granules. The vesicle is longer than the aculeus, in the adult female bulbous and in the juveniles elongate.
PEDIPALPS: The femur has three granulose carinae and its dorsal surface is convex and granulate. The patella is granulose, ventrally tuberculate, with five granulate carinae, and on the internal surface with scattered pointed minute granules that do not form a conspicuous internal tubercle. The dorsal surface of the manus is granulate or tuberculate, with six carinae, which are in part smooth and in part granulate. The chela is sparsely hirsute and its external surface is granulate and tuberculate, with two granulate carinae and a smooth space between them. The movable finger bears six straight rows of granules and internal and external granules.
LEGS: The legs bear solitary long and short setae. The third and fourth leg spine formula is 5–6:6–7.

AFFINITIES. The described features distinguish *H. beccaloniae* sp. n. from all other species of the genus.

Figure 8: *Heterometrus barberi*, dorsal view, female holotype.

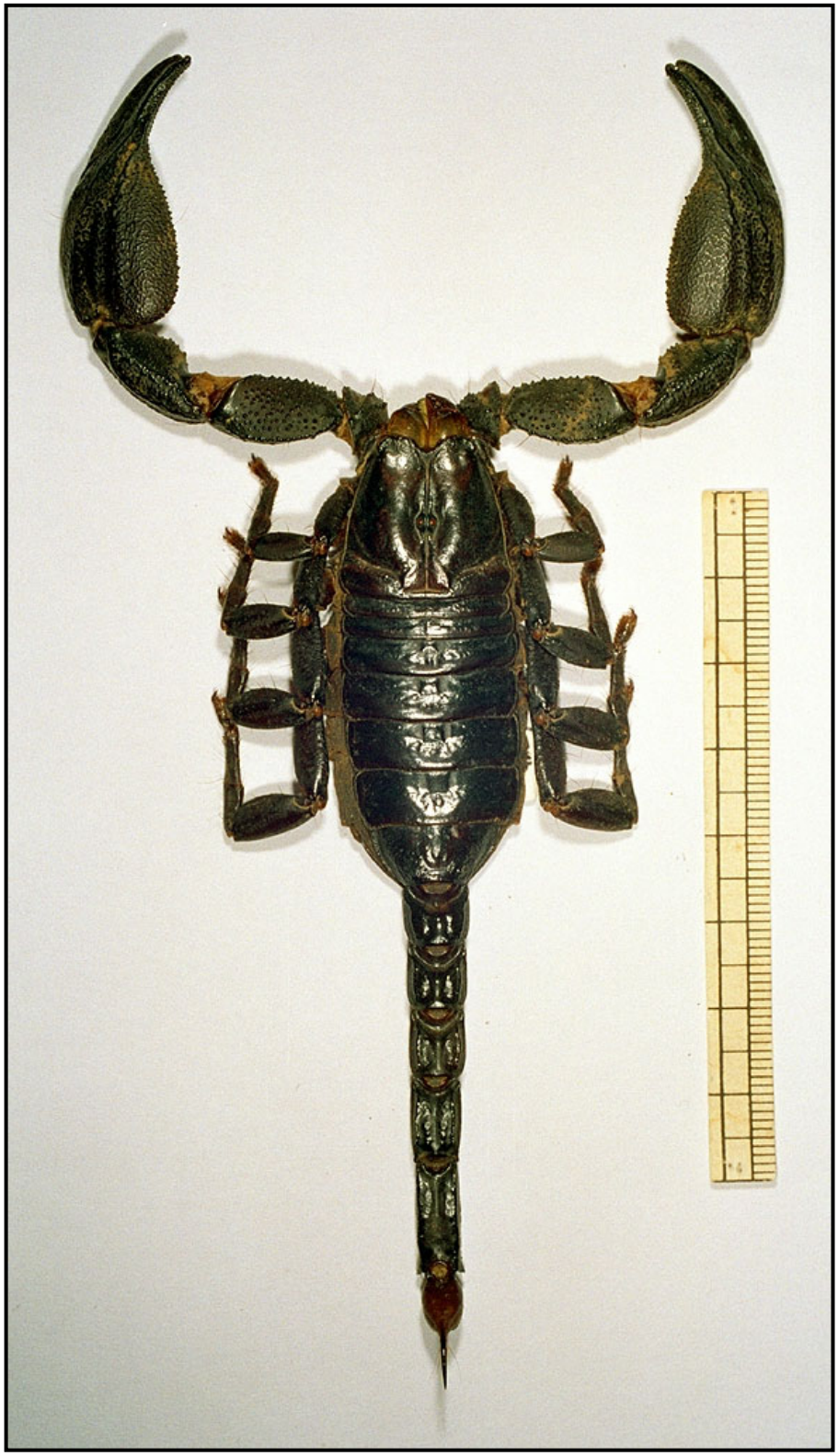


Figure 9: *Heterometrus beccaloniae*, sp. nov., dorsal view, female holotype.

		H. becaloniae	*H. cimrmani*		*H. mysorensis*	*H. nepalensis*	*H. rolciki*		*H.sejnai*	*H. ubicki*	
		female	male	female	male	male	male	female	male	male	female
		HT	HT	AT	HT	HT	HT	AT	HT	HT	AT
Total	length	115	111.3	98	118.7	83	100	91	78	89	77
Carapace	length	18.3	17.4	16.0	17.6	13.5	12.5	12.2	12.8	12.7	13.1
	width	19.0	16.0	14.7	17.8	12.0	11.4	13.5	12.5	13.1	13.1
Metasoma and telson	length	57.8	61.2	52.0	63.7	43.0	47.0	47.0	42.7	46.8	40.9
segment I	length	7.0	6.5	5.7	6.8	5.0	5.6	5.1	4.7	4.7	4.5
	width	7.7	7.3	6.8	7.1	6.2	6.0	6.1	6.4	5.8	5.6
segment II	length	7.4	7.0	6.2	7.7	5.5	6.1	6.1	5.5	5.5	4.8
	width	6.9	7.1	6.4	6.7	6.0	5.7	5.6	5.8	5.6	5.2
segment III	length	8.0	8.1	7.0	8.2	6.0	6.5	6.4	6.0	6.0	5.3
	width	6.6	6.5	5.9	6.3	5.7	5.2	5.0	5.5	5.2	4.9
segment IV	length	9.1	9.8	8.6	9.6	6.7	7.5	7.5	6.8	6.9	6.3
	width	5.7	5.8	5.3	5.9	5.3	4.5	4.7	5.1	4.6	4.3
segment V	length	13.0	14.1	12.4	13.6	9.5	10.4	10.3	9.8	9.7	9.0
	width	5.1	5.3	4.8	5.2	4.5	4.4	4.2	4.6	4.1	3.9
telson	length	13.3	15.7	12.0	13.8	9.6	10.5	10.6	9.7	11.0	8.8
Pedipalp femur	length	15.9	16.1	11.8	19.0	10.2	9.7	9.6	11.6	14.7	10.5
	width	7.9	5.8	5.6	6.7	4.7	4.3	4.4	4.7	4.5	4.4
patella	length	15.7	18.6	13.7	20.2	11.9	10.6	10.4	11.9	13.3	11.3
	width	7.6	6.2	5.4	6.9	4.8	4.9	4.9	4.8	4.8	4.8
tibia	length	32.5	35.5	28.5	35.5	22.2	20.2	20.1	22.6	25.7	20.8
	width	13.6	12.5	12.1	12.5	9.8	8.7	8.6	10.2	7.6	9.2
finger mov.	length	18.5	20.0	18.4	19.1	12.9	12.6	12.2	13.2	13.6	10.8
Pectinal teeth		15:16	16:17	15:16	17:16	14:15	11:11	10:10	13:14	16: ?	14: ?

Table 1: Measurements (in milimetres) of type specimens of seven new *Heterometrus* species.

They are recounted in the key below. *H. beccaloniae* sp. n. is close to *H. wroughtoni* (Pocock, 1899) but has a less lobiform, more granulose and more tuberculate chela. *H. beccaloniae* sp. n. is unique in the genus in having a very wide femur of pedipalp, which is convex and only twice longer than wide.

Heterometrus bengalensis (C. L. Koch, 1841) (Fig. 10)

Buthus bengalensis C. L. Koch, 1841: 3, fig. 696; C. L. Koch, 1850: 88.
Palamnaeus bengalensis: Pocock, 1892: 39; Pocock, 1900: 94; Kanungo, 1954: 536; Moritz & Fischer, 1980: 310.
Scorpio bengalensis: Pocock, 1893: 310; Pocock, 1894: 72; Kraepelin, 1895: 51.
Heterometrus bengalensis: Kraepelin, 1899: 114; Werner, 1902: 601; Kraepelin, 1913: 166; Borelli, 1915: 463; Lampe, 1918: 198; Roewer, 1943: 228; Takashima, 1945: 93; Minnocci, 1974: 38; Brignoli, 1985: 415; Hjelle, 1990: 51; McCormick & Polis, 1990: 298.
Heterometrus (*Scorpio*) *bengalensis*: Kraepelin, 1901: 271.
Heterometrus (*Heterometrus*) *bengalensis*: Couzijn, 1981: 117 (in part); Tikader & Bastawade, 1983: 539; Kovařík, 1998: 137 (in part); Fet, 2000: 432 (in part); Kovařík, 2002: 17.
= *Palamnaeus costimanus glaucus* Thorell, 1876b: 219 (syn. by Couzijn, 1981: 117).
= *Heterometrus* (*Chersonesometrus*) *fastigiosus* Couzijn, 1981: 140; Tikader & Bastawade, 1983: 587; Kovařík, 1998: 136; Fet, 2000: 438; ? Bastawade, 2002: 295; Kovařík, 2002: 17. **Syn. n.**

TYPE LOCALITY AND TYPE REPOSITORY. Ostindien, Bengalen; ZMHB.
TYPE MATERIAL EXAMINED. **India**, Bengal, 1♂ (lectotype hereby designated), ZMHB No. 70/2, 1♂ (paralectotype of *Buthus bengalensis* and paratype of *Heterometrus fastigiosus*), ZMHB No. 70/1, 1♀ (paralectotype of *Buthus bengalensis* and paratype of *Heterometrus fastigiosus*), ZMHB No. 70/3, 1♂ (paralectotype of *Buthus bengalensis*), ZMHB No. 70/4, 1♂ (paralectotype of *Buthus bengalensis*), ZMHB No. 70/5, 1♀ (paralectotype of *Buthus bengalensis*), ZMHB No. 70/6, 1im. ♀ (paralectotype of *Buthus bengalensis*), ZMHB No. 70/7; Assam, 1♂1♀1juv. (holotype and

Figure 10: *Heterometrus bengalensis*, dorsal view, male lectotype.

paratypes *Heterometrus* (*Chersonesometrus*) *fastigiosus* Couzijn, 1981), SMFD No. 8886/228.

OTHER MATERIAL EXAMINED. **India**, Mizgapur Banaras, 1♂, CASC; ***Orissa***, Nagpur-Keonjahr Dist., Daitari, II.1974, 1♂1♀, FKCP; ***West Bengal***, Midnapore, 19.III.1960, 1♂, leg. C. L. Kau, CASC; 30 m from Kharpur, 28.IX.1960, 1juv., 20.VI.1960, 1♂1juv., 28.IX.1960, 2♂2♀1juv., 5.X.1960, 2♀1im., 6.X.1960, 1im., 1.III.1961, 1juv., 24.III.1961, 1juv., 9.V.1961, 2juvs., leg. J. Singh, CASC; 30 m from Kharpur, 17.II.1961, 1♀, 27.II.1961, 1♀, leg. C. L. Kau, CASC; 5 m from Kharpur, roots of Polash tree, 9.V.1961, 1juv., leg. B. Singh, CASC; 4.III.1961, 1juv., VI.1961, 1♂2juvs., 18.VI.1962, 1♀ (im.) , CASC; before 13.III.1968, Zafer´s Export Centre, 5♂5♀2ims. (labeled as *Heterometrus fastigiosus* and *Heterometrus bengalensis*), CASC, 14♂20♀ 20ims.7juvs. , CASC, 1♂1♀1im., FKCP; Calcutta, 17.VIII.1965, 1♀, leg. P. K. Sina, CASC.

DIAGNOSIS. Adults 95–115 mm long. Color of adults uniformly reddish brown to light brown. Pectinal teeth number 14–17 in both sexes. Male with chela, femur and patella of pedipalp relatively narrower and longer than in female. Chela not lobiform, its length to width ratio about 3.0 in male and 2.2 in female. Much of manus sparsely tuberculate, uneven, but without discrete granules and carinae, especially in male. Patella of pedipalp without pronounced internal tubercle. Carapace smooth, with granules only at margins. Third and fourth leg spine formula 4–5:5–6. Telson hirsute, bulbous, vesicle longer than aculeus.

COMMENTS. This species was based on seven syntypes deposited at ZMHB. Couzijn (1981: 120 and 142) stated that these syntypes were destroyed during WW2, although he saw two of them and speculated that in reality they were not the syntypes of *Buthus bengalensis* but a different species which he described as *Heterometrus fastigiosus*. He thus designated the two examined syntypes of *Buthus bengalensis* as paratypes of *Heterometrus fastigiosus*, and for *Heterometrus bengalensis* designated a neotype deposited at MNHN. I consider this taxonomic move entirely invalid and incomprehensible. All seven syntypes of *Buthus bengalensis* are preserved at ZMHB and I hereby designate one of them as lectotype to assure the stability of the species. In accordance with ICZN Article 75.8, it invalidates Couzijn‘s designation of the neotype. I examined the holotype and paratypes of *Heterometrus fastigiosus* from SMFD and found them to be the same species. Therefore, *Heterometrus fastigiosus* Couzijn, 1981 is a synonym of *Heterometrus bengalensis* (C. L. Koch, 1841).

DISTRIBUTION. India: West Bengal (C. L. Koch, 1841: 5; Pocock, 1894: 72), Orissa (first report). I presume also occurrence in Bangladesh and other states of India. However, the records listed by Tikader & Bastawade (1983: 543) from Uttar Pradesh, Madhya Pradesh, Assam, Meghalaya and Maharashtra are due to confusion with other species doubtful and require verification.

Heterometrus cimrmani sp. n.
(Fig. 11)

Heterometrus (*Heterometrus*) *spinifer*: Kovařík, 1998: 137 (in part); Fet, 2000: 438 (in part).
Heterometrus (*Heterometrus*) *spinifer spinifer* (in part): ? Couzijn, 1981: 89; Kovařík, 1995: 203; ? Le Xuan Hue et al., 1998: 7.

TYPE LOCALITY AND TYPE REPOSITORY. Thailand, Trang env.; FKCP.

TYPE MATERIAL. **Thailand**, Trang env., 1♂1♀ (holotype and allotype), FKCP. Holotype and allotype were bred by the author; the holotype died on 16.V.1992, and the allotypic paratype gave birth, on 29.VIII.1992, to 18 juvs. of which paratypes are 2juvs. after 1st ecdysis, 1juv. after 2nd ecdysis, 1juv. after 3rd ecdysis, 1juv. after 4th ecdysis, 2ims. after 5th ecdysis, and 4♀ after 6th ecdysis, reared by F. Kovařík, FKCP; Trang env., 1♂, 1980, FKCP; Khao Chong (Trang), X.1998, 4♀ (paratypes), leg. V. Šejna, FKCP; Trang-Kao Chong, 1juv., 10.IX.1993, leg. M. Veselý, FKCP; Thaleban, 30 km SW near Satun, 1♂ (paratype), 20.IX.1993, FKCP; Ban Huai Phan env., pr. Nakhon Si, Thammarat, 7–12.VI.1996, 1♀ (im.) (paratype), leg. F. Kantner, FKCP; 20 km E. of Trang, 1999, 1♀ (paratype – juv. born on 3-IX-1999), leg. Komzík, FKCP. **Vietnam**, Saigon, 1940, 1♀ (paratype), FKCP.

ETYMOLOGY. Named after Jára Cimrman, a well known Czech renaissance man. Jára Cimrman bred large *Heterometrus* from Thailand and Malaysia and in his log noted that they must be two species with different sexual dimorphism (*Heterometrus spinifer* and the species described here). Regrettably, he has not published the observation.

DIAGNOSIS. Adults 90–115 mm long. Base color of adults uniformly black to greenish black. Pectinal teeth number 15–18 in both sexes. Male has longer but not narrower femur and patella of pedipalp, and longer and narrower chela of pedipalp. Chela slightly lobiform, its length to width ratio 2.8–3.0 in male and 2.1–2.4 in female. Male fixed fingers of pedipalp shorter than manus. Much of manus smooth, with punctae arranged in rows. Patella of pedipalp with pronounced internal

Figure 11: *Heterometrus cimrmani*, sp. nov., dorsal view, male holotype.

tubercle. Carapace with disc smooth and margins granulate. Telson hirsute, elongate, vesicle longer than aculeus.

DESCRIPTION: The adult male holotype is 111.3 mm long, other adults are 90–115 mm long. Measurements of the carapace, telson, segments of the metasoma and segments of the pedipalps, and numbers of pectinal teeth are given in Table 1. Sexual dimorphism is expressed in the length of the femur, patella and chela of pedipalp, and also in the width of the chela.
COLORATION: The color is uniformly black to greenish black.
MESOSOMA AND CARAPACE: The mesosoma lacks carinae, is smooth, and the carapace has disc smooth and margins granulate. Sternites are smooth, entirely without granules, only the seventh sternite may bear smooth carinae. Pectinal teeth number 15–18 in both sexes.
METASOMA AND TELSON: The metasoma is smooth and sparsely hirsute. The first to fourth segments bear eight carinae, of which the ventral are smooth and the dorsal consist of rounded or pointed granules. The fifth segment bears five complete carinae and two additional lateral carinae developed on only two-thirds of the segment. All carinae of this segment consist of minute rounded or pointed granules and the spaces between them are finely granulate ventrally and smooth dorsally. The telson is elongate and hirsute, dorsally smooth and ventrally with four rows of minute granules. The vesicle is longer than the aculeus.
PEDIPALPS: The femur has three granulose complete carinae and its dorsal surface is smooth. The patella is smooth, dorsally and externally slightly tuberculate, with five smooth carinae, and on the internal surface with scattered pointed minute granules that form a conspicuous internal tubercle. The dorsal surface of the manus is in internal parts tuberculate, without carinae. The chela is hirsute and its external surface is smooth, with two carinae composed of widely spaced granules. The movable finger bears six or seven straight rows of granules.
LEGS: The legs bear solitary long and short setae. The third and fourth leg spine formula is 4–5:6–7.

AFFINITIES. The described features distinguish *H. cimrmani* sp. n. from all other species of the genus. They are recounted in the key below. *H. cimrmani* sp. n. is close to *H. spinifer,* from which it differs primarily in the expression of sexual dimorphism.

Heterometrus cyaneus (C. L. Koch, 1836) (Fig. 12)

Buthus cyaneus C. L. Koch, 1836: 75, fig. 225; C. L. Koch, 1850: 88,
Scorpio indicus: Pocock, 1893: 311 (in part); Pocock, 1894: 95; (in part) Kraepelin, 1895: 53; ? Kraepelin, 1898: 439.
Pandinus indicus: Thorell, 1876b: 208; Karsch, 1887: 68; Thorell, 1888: 412 (in part); Thorell, 1893: 380 (in part); Pavesi, 1898: 1.
? *Scorpio afer* (in part) Linné, 1758: 624; Latreille, 1803: 267; (syn. by Thorell, 1893: 380).
Buthus (*Heterometrus*) *afer*: Sundevall, 1833: 32.
Scorpio (*Buthus*) *afer*: Gervais, 1844b: 60 (in part).
Scorpio afer: Lönnberg, 1897: 178 (in part); Lönnberg, 1898: 85 (in part).
Heterometrus cyaneus: Simon, 1872: 98; Kraepelin, 1899: 115; Werner, 1902: 602; Domaniewski, 1913: 251; Borelli, 1915: 463; Lampe, 1918: 198; Kopstein, 1921: 133; Kopstein, 1923: 185; Kopstein, 1926: 111; Kopstein, 1927: 102; Giltay, 1931: 6; Kästner, 1931: 738; Werner, 1932: 576; Werner, 1934: 278; Giltay, 1935: 1; Fage, 1936: 181; Werner, 1936: 186; Fage, 1944: 71; Takashima, 1945: 93; Roewer, 1943: 226; Bücherl, 1959: 269; Rosin & Shulov, 1963: 568; Sreenivasa-Reddy, 1968: 760.
Heterometrus (*Scorpio*) *cyaneus*: Kraepelin, 1901: 271.
Palamnaeus cyaneus: Kraepelin, 1898: 439.
Heterometrus (*Heterometrus*) *cyaneus*: Couzijn, 1978: 330.
Heterometrus (*Javanimetrus*) *cyaneus*: Vachon & Abe, 1988: 27; Kovařík, 1992: 185; Kovařík, 1997: 183; Kovařík, 1998: 137; Fet, 2000: 444; Kovařík, 2002: 17.
Heterometrus (*Javanimetrus*) *cyaneus cyaneus* Couzijn, 1981: 126; ? Le Xuan Hue et al., 1998: 8; Fet, 2000: 446.
Heterometrus (*Javanimetrus*) *cyaneus sumatrensis* Couzijn, 1981: 130; Kovařík, 1998: 137; Fet, 2000: 446.
Heterometrus (*Javanimetrus*) *cyaneus insulanus* Couzijn, 1981: 131; Kovařík, 1998: 137; Fet, 2000: 446.
= *Buthus defensor* C. L. Koch, 1837: 3, fig. 254 (TL: Mexico); C. L. Koch, 1850: 87 (syn. by Kraepelin, 1899: 115; Couzijn, 1981: 126).
Pandinus defensor: Karsch, 1887: 68.
= *Buthus heros* C. L. Koch, 1837: 1, fig. 253 (TL: Africa); C. L. Koch, 1850: 87 (syn. by Kraepelin, 1899: 115; Couzijn, 1981: 126).
Pandinus (*Buthus*) *heros*: Karsch, 1879: 128.
= *Buthus reticulatus* C. L. Koch, 1837: 25, fig. 265 (TL: Java); C. L. Koch, 1850: 88 (syn. by Simon, 1872: 98).
= ? *Buthus setosus* C. L. Koch, 1841: Fig. 657; C. L. Koch, 1841: 87 (TL: unknown); Gervais, 1844b: 458; C. L. Koch, 1850: 88 (syn. by Kraepelin, 1899: 115).
Pandinus setosus: Karsch, 1887: 67.
= *Heterometrus* (*Heterometrus*) *petersii luzonensis* Couzijn, 1981: 99; Kovařík, 1998: 137; Fet, 2000: 437 (syn. by Kovařík, 2002: 3, 17).

Figure 12: *Heterometrus cyaneus*, dorsal view, female holotype of *Heterometrus petersii luzonensis*.

TYPE LOCALITY AND TYPE REPOSITORY. Java – holotype lost, neotype from Indonesia, Java, Banjuwangi, Kali Baru designated by Couzijn (1981: 129); RMNH.
TYPE MATERIAL EXAMINED. **Philippines**, Luzon, Mt. Maquiling, 1♂1♀ (holotype and paratype of *Heterometrus petersi luzonensis* Couzijn, 1981), SMFD No. 8882/224.

OTHER MATERIAL EXAMINED. **Indonesia**, Java, 1♂1im., MZUF; Java, Matang, 1♀, SMFD No. 6705/112; Java, Idien-geb, 2♂2♀, SMFD No. 6743/150; Java, 1♂1♀, col. V. Frič, NMPC, Java, Vulcan, 2♀, leg. Gurda, NMPC; Sumatra, Fort de Kock, 1♀, SMFD No. 8814/183; Sumatra, Deli, 2♀3ims., leg. Heyden, SMFD No. 5316; Java, Buitenzorg, 3♀, SMFD No. 8884/226; Java, 1906, 1♀, leg. Urbánková, NMPC; W. Java, Djasinga, 1929, 1♂2♀, leg. Wolf, SMFD No. 5362; Java, 1933, 1juv., leg. F. Ohaus, SMFD; Java, 4.X.1961, 4ims., SMFD; Java, 1♀F, 1870, leg. J. Xantus, HNHM Nos. 2005 and 2035; Java, 1♀, 1855 ?, leg. Doleschal, HNHM No. 2033; Nias, 1896, 2♂1♀, leg. S. Raap and Knuth, ZMHB No. 5705/37; Java, Buitenzorg, 1.I.–1.VII.1902, 4♂5♀2juvs., ZMHB; Java, 1♂, 1931, leg. Matysovszky, HNHM No. 2321; Sumatra, 1♀, CASC; Pt Karya Tangan Indah, Br. Baturning, Desa Mambal, abian semal, 2♀, from Cynthia Hardy, CASC; Bogor, purchase from Royal Botanical Garden, VI.1980, 1im., leg. Victoria Selmier, CASC; Java, 14♂10♀1im., 1993, FKCP; Java, Bogor, 2♀, VIII.1994, leg. I. Gyerjdy, HNHM; Java, 1♂8♀3juvs., HNHM Nos. 2000, 2004, 2011, 2013, 2020, and 2030; Sumatra, 1♂1im., leg. Dr. Machik, HNHM No. 648/1883; Java, Bogor, The Botanical Garden, ca 300 m, 26.VIII.1995, 3♀5ims.4juvs., leg. P. Beron et T. Ivanova, SOFM. **Japan**, Nagasaki, 1♀1juv., 1870, leg. J. Xantus (error or introduced), HNHM. **Singapore**, 1♂2♀2juvs., HNHM Nos. 2001, 2009, 2018, 2019. **?**, Usambara (loc. in error), 1♀, SMFD No. 6707/114.

DIAGNOSIS. Adults 95–117 mm long. Base color of adults uniformly black to greenish black, only telson may be reddish brown. Pectinal teeth number 12–16 in both sexes. Sexual dimorphism in proportions of pedipalps not noticeable. Chela lobiform, its length to width ratio in adults between 2.0 and 2.3 in both sexes. Dorsal surface of manus tuberculate. Carinae weakly indicated. Patella of pedipalp without pronounced internal tubercle. Carapace with disc smooth, at sides may be granulate. Telson hirsute, bulbous, vesicle longer than aculeus.

COMMENTS. Couzijn (1981: 130 and 131) described two subspecies, *H. c. sumatrensis* and *H. c. insulanus*, which I have not studied and thus cannot discuss their status.

DISTRIBUTION. Indonesia (C. L. Koch, 1836: 78), Borneo (Sabah) (Kopstein, 1921: 133), Lesser Nicobar Islands (Couzijn, 1981: 130), Philippines (Couzijn, 1981: 99). A record from Vietnam (Le Xuan Hue et al., 1998: 8) most likely concerns *H. petersii,* which was confused with *H. cyaneus* also by Couzijn (1981: 99 see Kovařík, 2002: 3, 17). The above list of other older names and citations (see also Fet, 2000: 445) explains many erroneous records from Africa and Asia.

Heterometrus flavimanus (Pocock, 1900)
(Fig. 13)

Palamnaeus swammerdami flavimanus Pocock, 1900: 87.
Heterometrus (*Gigantometrus*) *flavimanus*: Tikader & Bastawade, 1983: 568; Tikader, 1987: 36; Kovařík, 1998: 137; Fet, 2000: 443.
Heterometrus (*Gigantometrus*) *swammerdami flavimanus*: Couzijn, 1981: 164.

TYPE LOCALITY AND TYPE REPOSITORY. Coimbatore, India; BMNH.
TYPE MATERIAL EXAMINED. **India**, *Tamil Nadu*, Coimbatore, 1♀ (lectotype), 1♂ (paralectotype), leg. W. Brady, BMNH No. 1899.11.2.292-3.

OTHER MATERIAL EXAMINED. **India**, ***Tamil Nadu***, Coimbatore, VI.1954, 1im., VI.1955, 1juv.,17.XI.1957, 1im., XI.1957, 1im.1juv., VII.1958, 1juv., XII.1958, 1im.1juv., VI.1963, 1♂, leg. P. Susai Nathan, CASC; Madras, X.1971, 1juv., collector unknown, CASC; Coimbatore env., 1990, 1♂1♀, FKCP.

DIAGNOSIS. Adults 110–150 mm long. Base color uniformly reddish brown, manus of pedipalp, legs and telson reddish to yellow. Pectinal teeth number 19–22. Sexual dimorphism in proportions of pedipalps not noticeable. Chela strongly lobiform, its length to width ratio about 1.7 in both sexes. Entire manus covered by large, rounded granules that do not form true carinae. Patella of pedipalp without pronouced internal tubercle. Carapace usually with disc smooth and all margins granulate and tuberculate (in some specimens entire carapace sparsely granulate). Fifth segment of metasoma longer than femur of pedipalp, fourth segment of metasoma approximately as long as femur of pedipalp. Telson bulbous, vesicle longer than aculeus.

COMMENTS. Couzijn (1981: 164) designated the type male as "allolectotype" and the type female as "hololectotype". Following the Code, I call these specimens paralectotype and lectotype.

DISTRIBUTION. India: Tamil Nadu (Pocock, 1900: 87).

Figure 13: *Heterometrus flavimanus*, dorsal view, male paralectotype.

Heterometrus fulvipes (C. L. Koch, 1837) (Fig. 14)

Buthus fulvipes C. L. Koch, 1837: 45, fig. 278; C. L. Koch, 1850: 87.
Pandinus fulvipes: Karsch, 1887: 67; Thorell, 1888: 329; Simon, 1905: 161.
Scorpio fulvipes: Simon, 1885: 23; Kraepelin, 1895: 44; Pocock, 1893: 304.
Palamnaeus fulvipes: Pocock, 1900: 87; Henderson, 1919: 381; Cekalovic, 1982: 191.
Heterometrus fulvipes: Kraepelin, 1899: 112; Masi, 1912: 124; Kraepelin, 1913: 166; Kopstein, 1921: 133; Kopstein, 1923: 186; Kopstein, 1926: 111; Kopstein, 1927: 104; Giltay, 1931: 9; Werner, 1934: 277; Takashima, 1945: 91; Brignoli, 1985: 415; Hjelle, 1990: 26; Root, 1990: 354; Simard & Watt, 1990: 419; Sissom, 1990: 133; Warburg & Polis, 1990: 229; Pointer, 1991: 24; Dupré, Lambert & Gérard, 1998: 13.
Heterometrus (*Scorpio*) *fulvipes*: Kraepelin, 1901: 271.
Heterometrus (*Chersonesometrus*) *fulvipes*: Couzijn, 1978: 330; Couzijn, 1981: 133 (in part); Tikader & Bastawade, 1983: 599; Kovařík, 1997: 183; Kovařík, 1998: 136; Fet, 2000: 439; Bastawade, 2002: 296; Kovařík, 2002: 17.
= *Palamnaeus fulvipes bombayensis* Pocock, 1900: 89 (syn. by Couzijn, 1981: 133).

TYPE LOCALITY AND TYPE REPOSITORY. India, Maharashtra, Násik; BMNH.
TYPE MATERIAL EXAMINED. **India**, ***Maharashtra***, Násik, 1♀ (syntype of *Palamnaeus fulvipes bombayensis* Pocock, 1900 and neotype of *Buthus fulvipes* C. L. Koch, 1837, designated by Couzijn, 1981: 134), BMNH No. 1913.1.6.27.

OTHER MATERIAL EXAMINED. **India**, 2♀(ims.), leg. Kolle, ZMHB; east, X.1888, 1juv., HNHM; east, 1950, 2♀, FKCP; Tharigoppula, 8.II.1967, 1♀, 8.III.1967, 1juv., leg. A. L. Slater, CASC; ***Andhra Pradesh***, Podili, 9.I.1967, 2♂7♀4juvs., 16.I.1967, 1♀1♂, 13.II.1967, 1♂10♀1im., leg. D. E. Johnson, CASC; ***Gujarat***, Ahmedabad, 2♂, leg. Manning, BMNH No. 1930.4.11.1-2; 4 mi. E. Godhra, 175 m., 12.I.1962, 1im., CASC; Ahmedabad, 4.IV.1967, 3ims., 26.VII.1966, 1♂, IX.1966, 1♂, 18.XI.1966, 1juv., 20.XII.1966, 1♂1♀, leg. M. S. Dubale, CASC, Ahmedabad, 1967, 2♂1♀A, FKCP; ***Karnataka***, Hassan env., 2ims., 15–16.VI.1994, leg. R. Sauer, FKCP; ***Madhya Pradesh***, Khaighat, 200 m., 18.I.1962, 1♀, CASC, 3 miles from Damoh, 20.VII.1965, 1im., leg. S. N. Banerjee, CASC; ***Maharastra***, 17 mi. NE. Malegaon, 400 m., 15.I.1962, 1juv., leg. E. S. Ross and D. Q. Cavagnaro, CASC; Ajanta Caves, 500 m., 28.I.1962, 1♀(im.), leg. E. S. Ross and D. Q. Cavagnaro, CASC; 3 mi. W. Edalabad, 240 m., 28.I.1962, 3juvs., leg. E. S. Ross and D. Q. Cavagnaro, CASC; 3 mi. W. Sakoli, 220 m., 30.I.1962, 2juvs., leg. E. S. Ross and D. Q. Cavagnaro, CASC; Bombay, 6.III.1967, 1♀, leg. S. R. Sane, CASC; ***Mysore***, 6 mi NE Ramanagaram, 750 m, 25.II.1962, 1im., leg. E. S. Ross & D. Cavagnaro, CASC; ***Rajasthan***, Alwar district, Naranimata env., 27°05,46 N 76° 17,17 E, 380 m, VI–VIII.2002, 1♂, leg. P. Šrámek, FKCP; ***Uttar Pradesh***, Agra, 43 Kandhari Road, 9.III.1964, 1im.6juvs., leg. S. Sina, CASC; Agra, 9.III.1964, 19juvs., leg. S. Sina, CASC; ***West Bengal***, Calcutta, VI.1966, 1♂(im.), leg. N. Das, CASC.

DIAGNOSIS. Adults 70–100 mm long. Color of adults uniformly reddish brown to black, legs and telson yellow to yellowish or reddish brown, always lighter colored than body. Pectinal teeth number 12–18 in both sexes. Male has longer femur and patella of pedipalp. Chela lobiform, its ratio between 1.7 and 1.9 in both sexes. Male and female chela of different shape but approximately same width. Entire manus covered by large, rounded granules but devoid of carinae. Patella of pedipalp without pronouced internal tubercle. Carapace of juveniles and some females with disc smooth, at margins granulate and anteriorly tuberculate. Males and some females with entire carapace sparsely granulate. Telson hirsute, vesicle longer than or as long as aculeus.

DISTRIBUTION. India: Andhra Pradesh, Bihar, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Rajasthan, and Tamil Nadu (Pocock, 1900: 89, Couzijn, 1981: 134, Tikader & Bastawade, 1983: 603); Mysore, Uttar Pradesh, and West Bengal (first report). The type locality originally given as Java (C. L. Koch, 1837: 46) is considered erroneous (see Fet, 2000: 439). Also erroneous are records from Sri Lanka (Pocock, 1900: 88) and Myanmar (Kopstein, 1921: 133).

Heterometrus gravimanus (Pocock, 1894) (Fig. 15)

Scorpio gravimanus Pocock, 1894: 75.
Pandinus gravimanus: Simon, 1905: 161.
Palamnaeus gravimanus: Pocock, 1900: 90; Henderson, 1919: 381.
Heterometrus gravimanus: Takashima, 1945: 94; Root, 1990: 354.
Heterometrus (*Srilankametrus*) *gravimanus*: Tikader & Bastawade, 1983: 550; Kovařík, 1998: 137; Fet, 2000: 446.
Heterometrus (*Srilankametrus*) *indus indus* (in part): Couzijn, 1981: 121.
= ? *Heterometrus* (*Srilankametrus*) *indus laevitensus* Couzijn, 1981: 124; Kovařík, 1998: 137; Fet, 2000: 447. **Syn. n.**

Figure 14: *Heterometrus fulvipes* dorsal view, female neotype.

TYPE LOCALITY AND TYPE REPOSITORY. India, Ceylon; BMNH.

MATERIAL EXAMINED. **India**, south, Tanjore, 1♂, leg. E. P. Popert, BMNH No. 1896.7.30.121. S**ri Lanka**, Southern prov., Galle, IV.1994, 1♂, leg. P. Senft, FKCP.

DIAGNOSIS. Adults 80–110 mm long. Color of adults uniformly reddish brown, legs and telson usually lighter colored than body. Pectinal teeth number 12–15 in both sexes. Male has slightly longer femur and patella of pedipalp. Chela lobiform, its length to width ratio between 2.0 and 2.2. Entire manus covered by rounded granules and with five carinae mainly in anterolateral part. Patella of pedipalp smooth, without pronouced internal tubercle. Carapace smooth and glossy. Third and fourth leg spine formula 4:5–6. Telson elongate, vesicle shorter than aculeus.

COMMENTS. This species is based on a male from Sri Lanka, which ought to be at BMNH but cannot be found. It was not seen by the previous revisers (Couzijn, 1981: 121, Tikader & Bastawade, 1983: 550) either. Available is only a male from Tanjore, which was assigned to this species by its author (Pocock, 1900: 91). Couzijn lists *Scorpio gravimanus* Pocock, 1894 as a synonym of *Heterometrus* (*Srilankametrus*) *indus* (Geer, 1778) and says the specimen from Tanjore could be *Heterometrus* (*Srilankametrus*) *indus laevitensus* Couzijn, 1981 (Couzijn, 1981: 125). Tikader & Bastawade (1983: 550–555) examined the specimen from Tanjore and correctly concluded that it is *Heterometrus gravimanus*, which they considered valid (see also Fet, 2000: 447). Like Pocock, I have had an opportunity to examine the specimen from Tanjore as well as the one from Sri Lanka and am convinced that both populations belong to the same species, which differs from *H. indus* in smaller size, narrower chela of pedipalp and the presence of five carinae on the manus of pedipalp.

DISTRIBUTION. India: Tamil Nadu. Sri Lanka (Pocock, 1894: 77; Pocock, 1900: 91).

Heterometrus indus (Geer, 1778)
(Fig. 16)

? *Scorpio indicus* (in part) Linné, 1754 (syn. by Kraepelin, 1899: 113).
= *Scorpio afer* Linné, 1758: 624 (in part); Linné, 1767: 1038; Linné, 1775: 1091; Fabricius, 1775: 399; Fabricius, 1781: 550; Fabricius, 1787: 348; Fabricius, 1793: 434; Herbst, 1800: 38; Latreille, 1804: 120 (syn. by De Geer, 1778: 341; Kraepelin, 1895: 53).
Scorpio (*Buthus*) *afer*: Gervais, 1844b: 60 (in part).
Heterometrus afer: Simon, 1872: 99.
Scorpio indus De Geer, 1778: 341; Lönnberg, 1898: 551.
Pandinus indicus: Pavesi, 1881: 556 ?; Thorell, 1888: 412 (in part); Thorell, 1893: 381 (in part).
Heterometrus indus: Kraepelin, 1899: 113; Werner, 1902: 601; Lampe, 1918: 198; Roewer, 1929: 612; Giltay, 1931: 8; Werner, 1934: 277; Roewer, 1943: 226; Takashima, 1945: 92; Bücherl, 1959: 269; Root, 1990: 354; Lourenço & Cloudsley-Thompson, 1996: 140.
Heterometrus (*Scorpio*) *indus*: Kraepelin, 1901: 271.
Heterometrus (*Heterometrus*) *indus*: Couzijn, 1978: 330.
Heterometrus (*Srilankametrus*) *indus*: Couzijn, 1981: 121; Kovařík, 1992: 185; ? Kovařík, 1997: 183; Kovařík, 1998: 137; Fet, 2000: 446; Kovařík, 2002: 17.
Heterometrus (*Srilankametrus*) *indus indus*: Couzijn, 1981: 121; Vachon, 1982: 79; Fet, 2000: 447.
Palamnaeus indus: Pocock, 1900: 96.
Scorpio indicus: Pocock, 1893: 311(in part); Kraepelin, 1895: 53.
= *Scorpio ceylonicus* Herbst, 1800: 83; Kraepelin, 1895: 46; Lönnberg, 1897: 186 (syn. by Kraepelin, 1899: 113; Pocock, 1900: 96).
Scorpio (*Buthus*) *ceylanicus*: Gervais, 1844b: 62.
Scorpio ceylonicus: Lönnberg, 1898: 83.
Pandinus ceylonicus: Karsch, 1887: 69; Karsch, 1892: 307.
Palamnaeus ceylonicus: Kraepelin, 1898: 439.
= *Buthus megacephalus* C. L. Koch, 1836: 73, fig. 224; C. L. Koch, 1850: 88 (syn. by Thorell, 1876b: 168; Lönnberg, 1898: 83).
Bathus megacephalus [sic]: C. L. Koch, 1836 (content).
Pandinus megacephalus: Thorell, 1876b: 203; Thorell, 1893: 381.
Scorpio megacephalus: Pocock, 1893: 311.
= *Buthus caesar* C. L. Koch, 1841: 6, fig. 697; C. L. Koch, 1850: 87; Moritz & Fischer, 1980: 311 (syn. by Simon, 1872: 99).
Pandinus caesar: Thorell, 1876b: 205; Karsch, 1887: 68.
Scorpio caesar: Pocock, 1893: 311; Pocock, 1894: 73.
Heterometrus caesar: Kraepelin, 1899: 114; Roewer, 1943: 229; Takashima, 1945: 92; Brignoli, 1985: 415.
Heterometrus (*Scorpio*) *caesar*: Kraepelin, 1901: 271.
Palamnaeus caesar: Pocock, 1900: 97.
= *Scorpio crassimanus* Becker, 1880: 140 (syn. by Kraepelin, 1899: 113; Couzijn, 1981: 121).
= *Palamnaeus serratus* Pocock, 1900: 97 (syn. by Couzijn, 1981: 121).
Heterometrus serratus: Takashima, 1945: 94.
Heterometrus (*Srilankametrus*) *serratus*: Tikader & Bastawade, 1983: 555; Fet, 2000: 448.

TYPE LOCALITY AND TYPE REPOSITORY. India; NHRS.
TYPE MATERIAL EXAMINED. **Sri Lanka**, Ceylon, 1♂ (holotype of *Palamnaeus serratus*), leg. Dr. Ondaatje, BMNH No. 1888.55.

Figure 15: *Heterometrus gravimanus*, dorsal view, male from India (BMNH).

Figure 16: *Heterometrus indus*, dorsal view, male holotype of *Palamnaeus serratus*.

OTHER MATERIAL EXAMINED. **Sri Lanka** (Ceylon), Peradeniya, 2♂, leg. Uzel, NMPC; 1847, 1♀1juv., leg. G. Worms, SMFD No. 5319; Ceylon, 1912, 1♀1♂1juv., leg. A. Hansen, SMFD No. 5317; Ceylon, IV.1914, 1♂2♀, leg. J. Mastbaum, SMFD No. 5318; Kandy, 1.V.1982, 1♂, leg. R. C. Drewes, CASC; 1900, 1♀, FKCP; 1994, 1♂, FKCP; Kandy, Paradeniya, 30.III.1902, 1♂, IV.1994, 2♂1im.5juvs., 1♀ (gave birth to 8 juvs. in 10–19.VII.1994, ♀ died 28.VI.1996, reared by F. Kovařík), 1♀ after seventh ecdysis (5th 29.VII.1994, 6th 1.IV.1996, 7th ecdysis 1.IX.1996, rearing F. Kovařík), 1♂ after seventh ecdysis (3rd 1.VIII.1994, 4th 26.V.1995, 5th 17.VIII.1995, 6th 10.IV.1996, 7th 13.IX.1996, reared by F. Kovařík), leg. P. Senft, FKCP. **?**, Hyderabad, Banjara Road, 1931, 1♀, leg. S. Mirza, SMFD No. 5367; 1im., NMPC; ? Java (loc. in error ?), Mus. Leiden, 1♀, SMFD No. 5321.

DIAGNOSIS. Adults 90–130 mm long. Color of adults uniformly reddish black to greenish black. Pectinal teeth number 11–15 in both sexes. Sexual dimorphism in proportions of pedipalps not noticeable. Chela hirsute, lobiform, its adult length to width ratio between 1.7 and 2.0. Entire manus covered by rounded granules that may merge and appear as rows. Patella of pedipalp without pronouced internal tubercle. Carapace usually smooth and glossy, occasionally with granules at margins. Second metasomal segment longer than wide. Vesicle of telson usually longer than aculeus.

COMMENTS. *Palamnaeus serratus* Pocock, 1900 was synonymized by Couzijn (1981: 121) with *H. indus*, whereas Tikader & Bastawade (1983: 555) considered it a valid species. Examination of the holotype convinces me that it is a synonym of *H. indus.*

DISTRIBUTION. Sri Lanka (Herbst, 1800: 83, 84; Pocock, 1900: 96). This species has been repeatedly listed from India (see name and type locality), but it appears that in reality it is confined to Sri Lanka. It was also incorrectly reported from Java (Lönnberg, 1897: 187) and Mozambique (Pavesi, 1881: 556).

Heterometrus kanaraensis (Pocock, 1900)

Palamnaeus scaber kanarensis Pocock, 1900: 93.
Heterometrus (*Chersonesometrus*) *phipsoni kanaraensis* Couzijn, 1981:151; Kovařík, 1998: 136.
Heterometrus (*Chersonesometrus*) *kanaraensis*: Tikader & Bastawade, 1983: 636; Fet, 2000: 441; Bastawade, 2002: 296.

TYPE LOCALITY AND TYPE REPOSITORY. India, Kanara; BMNH.

TYPE MATERIAL EXAMINED. **India**, Kanara, Bombay, 1♂1♀ (lectotype and paralectotype), leg. T. R. D. Bell, BMNH No. 1897.11.5.29-30.

OTHER MATERIAL EXAMINED. **India**, 1♀ without locality, CASC; ***Goa***, Portuguese India, 18.X.1943, 1im., leg. J. L. Gressitt, CASC; ***Maharashtra***, Karwa, North Kanara, 1980, 2♀, FKCP.

DIAGNOSIS. Adults 120–150 mm long. Base color of adults uniformly reddish brown to black, only manus and telson may be lighter colored or occasionally black. Pectinal teeth number 13–14 in male and 10–13 in female. Male has as long but narrower chela of pedipalp than female. Other segments of pedipalps do not show sexual dimorphism. Chela length to width ratio 2.35 in male anda 2.1–2.25 in females. Chela lobiform and covered with dense, long setae. Dorsal surface of pedipalp manus relatively smooth, with effaced tubercles, without carinae. Patella of pedipalp without pronounced internal tubercle. Carapace usually smooth and glossy, occasionally with sparse marginal granules and anterior tubercles. Third and fourth leg spine formula 4:6. Telson densely hirsute, elongate, vesicle shorter than the aculeus.

DISTRIBUTION. India: Maharashtra (Pocock, 1900: 93), Karnataka (Tikader & Bastawade, 1983: 641), Goa (first report).

Heterometrus keralaensis Tikader & Bastawade, 1983

Heterometrus (*Heterometrus*) *keralaensis*: Tikader & Bastawade, 1983: 528; Kovařík, 1998: 137; Fet, 2000: 432; Bastawade, 2002: 295.

TYPE LOCALITY AND TYPE REPOSITORY. India, Kerala, Meenmutty, New Amaranbalan; NZSI,

COMMENTS. I was unable to examine this species and had to include it in the key solely on the data published by Tikader & Bastawade (1983: 528–533). I believe it is related to *H. thorellii* Pocock, 1892, from which it differs (apart from the characters given in the key) in having the dorsal surface of the chela reticulated.

DISTRIBUTION. India: Kerala (Tikader & Bastawade, 1983: 533), Maharashtra (Bastawade, 2002: 295).

Heterometrus laoticus Couzijn, 1981

Heterometrus (*Heterometrus*) *laoticus* Couzijn, 1981: 94; Kovařík, 1995: 202; Kovařík, 1997: 183; Kovařík,

1998: 137; Le Xuan Hue et al., 1998: 8; Fet, 2000: 433; Kovařík, 2002: 17.
Heterometrus (*Heterometrus*) *spinifer*: Kovařík, 1992: 185.

TYPE LOCALITY AND TYPE REPOSITORY. Laos; MNHN.

MATERIAL EXAMINED. **Cambodia**, Takeo, 1984, 2♀, leg. Frühbauer, FKCP and NMPC. **Laos**, 1♀, FKCP; Karen-Dorf, ca 8 km SE Luang Prabang, 18.XII.1964, 1♀, SMFD; Bolikhamsai prov., Ban Nok env., alt. 220 ± 50m, N 18°08'7 E 104°28'1, 9–14.V.1998, 2♂, leg. E. Jendek & O. Šauša. **Thailand**, Lampun N., Siam, leg. Daly, 1♂, BMNH; Tha-Manao, 30 km NW Kanchanaburi, 145 km NW Bangkok, leg. W. Thielen, 3♂3♀, ZMUH; Chiang Mai, leg. W. Schmidt, 1♂, ZMUH; Krachong For., near Trang, 100m, 2.VII.1962, 1juv., leg. E. S. Ross and D. Q. Cavagnaro, CASC; Khorat, 19.VI.1963, 1♂, leg. R. H. Nave, CASC; Nakhon Phanom, 17.IX.1965, 3ims., leg. Jim Foote, CASC; Chiang Rai Prov., 4.V.1966, 1♂, leg. Paul Soderberg, CASC; Chiang Mai Prov., VI.1966, 1♀2juvs., leg. Terry W. Taylor, CASC; 50 miles N. Bangkok, 1.XII.1968, 1♂, CASC; Udon Thani, 24.XII.1970, 2♂2♀10juvs., leg. Jim Foote, CASC; Chain mai, 20.XI.1986, 1♀, leg. Leslie Saul; Doi Pui, (near Chain mai), 1400 m, 20.VIII.1989, 1♂, leg. E. S. Ross, CASC; I.2002, 4♂7♀, CASC; 29.I.2002, died 22.VIII.2002, 1♂, CASC; Ban Saen near Chonburi, 3.VI.1991, 1♂, leg. D. Král (reared by F. Kovařík, 6th ecdysis 12.X.1991); Khorat, 180 km NE of Bangkok (purchase from Bangkok), VI.1991, 7♀4♂4juvs., 1994, 1♀2juvs. before first.ecdysis and 9 juvs. after first ecdysis; Khao Yai nat. park, XII.1997, 1♂, leg. K. Petrželka; Khao Khieo Wildlife and Nature Sanctury (Chan Buri), II.1994, 1juv. after 4th ecdysis, leg. S & L. Mahunka, HNHM. **Vietnam**, QuiNhon, 5.VIII.1965, 1♂, leg. L. J. Barrier, CASC.
Specimens born and reared in captivity (Locality **Thailand**, Khorat), 1juv. after first ecdysis, 1juv. after 2nd ecdysis, 8juvs. after 3rd ecdysis, 1juv. after 4th ecdysis, 1im. after 5th ecdysis, 1M1F after 6th ecdysis, reared by F. Kovařík, FKCP.

DIAGNOSIS. Adults 90–125 mm long. Base color of adults uniformly black, only manus and telson may be reddish brown. Pectinal teeth number 15–19 in both sexes. Sexual dimorphism in proportions of pedipalps not noticeable. Chela lobiform, its length to width ratio 2–2.3 in both sexes. Manus smooth, with or without smooth carinae, sparsely and finely punctate. Patella of pedipalp without pronounced internal tubercle. Carapace and mesosoma, smooth without granules. Telson hirsute, elongate, vesicle longer than aculeus.

COMMENTS. This species is often mistaken for *H. petersii* (Thorell, 1876), whose distribution overlaps. Apart from sexual dimorphism, *H. laoticus* differs in having a smooth carapace without granules and usually also a smooth manus of pedipalp with more apparent punctae.

DISTRIBUTION. Cambodia, Laos, Thailand, Vietnam (Couzijn, 1981: 94).

Heterometrus latimanus (Pocock, 1894)

Scorpio latimanus Pocock, 1894: 74.
Palamnaeus latimanus: Pocock, 1900: 90.
Heterometrus latimanus: Kraepelin, 1899: 113; Takashima, 1945: 92; Minnocci, 1974: 38.
Heterometrus (*Srilankametrus*) *latimanus*: Tikader & Bastawade, 1983: 545; Fet, 2000: 448.
Heterometrus (*Srilankametrus*) *indus*: Couzijn, 1981: 121 (in part).

TYPE LOCALITY AND TYPE REPOSITORY. India; BMNH.

MATERIAL EXAMINED. **India** oriental, 1960, 2♀, collector unknown, FKCP.

DIAGNOSIS. Adults 70–105 mm long. Color of adults uniformly reddish brown to black. Legs may be lighter colored than body. Pectinal teeth number 13–15. Chela lobiform, rounded and convex, its adult female length to width ratio 1.6–1.7. Entire manus covered by rounded granules, without carinae. Patella of pedipalp without pronouced internal tubercle. Carapace usually smooth and glossy, but granules always present anteriorly and occasionally on other margins. Vesicle of telson usually shorter or as long as aculeus.

COMMENTS. *Scorpio latimanus* Pocock, 1894 was synonymized by Couzijn (1981: 121) with *H. indus*, whereas Tikader & Bastawade (1983: 545–550) considered it a valid species. *H. latimanus* differs from *H. indus* in the shape of the pedipalp chela, which is also convex and lacks setae. In *H. indus* the anterior portion of the carapace is not granulated.

DISTRIBUTION. India (Pocock, 1894: 74). Unfortunately, neither the types nor the specimens in my colection bear precise locality data.

Heterometrus liophysa (Thorell, 1888) (Fig. 17)

Palamnaeus liophysa Thorell, 1888: 415.
Scorpio longimanus liophysa: Kraepelin, 1895: 41.

Figure 17: *Heterometrus liophysa*, dorsal view, male.

Heterometrus liophysa: Kraepelin, 1899: 112; Werner, 1916: 91; Lampe, 1918: 198; Kopstein, 1921: 131; Kopstein, 1923: 184; Takashima, 1945: 91.
Heterometrus (*Heterometrus*) *liophysa*: Kovařík, 1998: 137; Fet, 2000: 433; Kovařík, 2002: 17.
Heterometrus liophysa liophysa: Giltay, 1931: 9.
Heterometrus (*Heterometrus*) *liophysa liophysa* Couzijn, 1981: 111; Fet, 2000: 433
= *Heterometrus liophysa madoerensis* Kopstein, 1921: 132; Giltay, 1931: 9. **Syn. n.**
Heterometrus (*Heterometrus*) *madoerensis* Couzijn, 1981: 116; Kovařík, 1998: 137; Fet, 2000: 436.
= *Heterometrus laevifrons* Roewer, 1943: 228. **Syn. n.**
Heterometrus (*Heterometrus*) *liophysa laevifrons*: Couzijn, 1981: 114; Kovařík, 1998: 137; Fet, 2000: 433; Kovařík, 2002: 17.
Heterometrus (*Heterometrus*) *liophysa separatus* Couzijn, 1981: 115; Kovařík, 1998: 137; Fet, 2000: 433.
Heterometrus (*Heterometrus*) *liophysa spartanicus* Couzijn, 1981: 115; Kovařík, 1998: 137; Fet, 2000: 434.

TYPE LOCALITY AND TYPE REPOSITORY. Indonesia, Sumatra, Ajer Mancior – syntypes MCSN probably lost; neotype from Indonesia, Sumatra, Padang designated by Couzijn (1981: 111); RMNH.
TYPE MATERIAL EXAMINED. **Indonesia**, Mentawei Islands, Siberut, 2juvs. (♂ holotype and ♀ paratype of *Heterometrus laevifrons* Roewer, 1943), SMFD No. 8883/225.

OTHER MATERIAL EXAMINED. **Indonesia**, Sumatra, Padang, 2♂(ims.), SMFD No. 5278; Sumatra, Bunga Bondar, 1911, 1♂, 28.X.1911, 2♂, leg. Schütze, SMFD No. 5323 and 18158; Sumatra, Nias, 1♀, leg. P. Beyer, SMFD No. 5322; Padang env., 1♂1♀, 1980, FKCP; Mentawai islands, Suberut Island, Muarasiberut, 0–150 m, 15–20.VIII.1995, 2juvs., leg. P. Beron & T. Ivanova, SOFM Nos 180 and 182.

DIAGNOSIS. Adults 110–140 mm long. Base color of adults uniformly black to reddish black. Pectinal teeth number 13–18 in both sexes. Male with chela, femur and patella of pedipalp narrower and longer than in female. Male fingers of pedipalp very long. Fixed finger longer or at least as long as manus. Chela slightly lobiform, in male widest basally and markedly narrowing toward fingers, its length to width ratio ca. 3.0 in male, ca. 2.2 in female. Much of manus smooth. Patella of pedipalp with pronounced internal tubercle. Carapace granulate. Telson hirsute, elongate, vesicle longer than aculeus.

COMMENTS. *H. laevifrons* Roewer, 1943 was based on juveniles (examined), which cannot be distinguished from the nominotypical subspecies. Couzijn (1981) described two more subspecies, *H. l. separatus* from Weh and *H. l. spartanicus* from Babi. I have not been able to verify the status of these two taxons.
Couzijn (1981: 116) elevated *H. l. madoerensis* Kopstein, 1921 to species, although it is known only by an immature female from Madura (Indonesia). I have not been able to study this specimen, but I have seen many females of *H. cimrmani* sp. n., *H. liophysa*, *H. longimanus*, and *H. spinifer* and have to say that distinguishing these valid taxa on solitary, lest immature, females is very difficult and often impossible. For this reason I place *H. madoerensis* in synonymy of *H. liophysa.*

DISTRIBUTION. Indonesia – Sumatra and Mentawei, Nias, Babi, Batu and Weh Islands (Thorell, 1888: 415; Couzijn, 1981: 111–116; Fet, 2000: 433–434).

Heterometrus liurus (Pocock, 1897) (Fig. 18)

Palamnaeus liurus Pocock, 1897: 114; Pocock, 1900: 91.
Heterometrus liurus: Kraepelin, 1899: 115; Roewer, 1929: 613; ? Fage, 1936: 181; Roewer, 1943: 228; Fage, 1944: 71; Takashima, 1945: 93; Minnocci, 1974: 38; Kovařík, 2002: 20.
Heterometrus (*Chersonesometrus*) *liurus*: Couzijn, 1981: 153; Tikader & Bastawade, 1983: 604; Kovařík, 1998: 136; Fet, 2000: 442.

TYPE LOCALITY AND TYPE REPOSITORY. Gwalior, Central India; BMNH.
TYPE MATERIAL EXAMINED. **India**, Gwalior (Dane), 1♀ (lectotype), 2♀1im. (paralectotypes), BMNH No. 1896.12.15.20-25, No. 995 (lectotype) and 992, 994, and 987 (paralectotypes).

DIAGNOSIS. Adults less than 80 mm long. Color uniformly reddish brown, legs and telson yellow to yellowish or reddish brown, always lighter colored than body. Pectinal teeth number 10–14. Chela slightly lobiform, hirsute, its length to width ratio 2.2–2.5. Dorsal surface of pedipalp manus without carinae, with large, rounded granules of uneven size, some of which may merge. Patella of pedipalp without conspicuous internal tubercle. Carapace smooth and glossy, on margins sometimes sparsely granulose and anteriorly tuberculate. Third and fourth leg spine formula 4–5:5–6. Telson hirsute, bulbous, with vesicle markedly longer than aculeus. Genital operculum large, approximately as wide as long.

COMMENTS. Couzijn (1981: 153) designated the female lectotype as „hololectotype“ and the male paralectotype as „allolectotype“. Those designation are brought into compliance with the Code.

Figure 18: *Heterometrus liurus*, dorsal view, female paralectotype.

DISTRIBUTION. India: Madhya Pradesh (Pocock, 1897: 114). The record for Sri Lanka (Roewer, 1943: 228) was a mistaken determination (see Kovařík, 2002: 20).

Heterometrus longimanus (Herbst, 1800) (Fig. 19)

Scorpio longimanus Herbst, 1800: 42; Latreille, 1804: 122; Kraepelin, 1895: 34; Kraepelin, 1897: 537; Lönnberg, 1897: 186; Kraepelin, 1908: 191.
Buthus longimanus: C. L. Koch, 1840: Fig. 595; C. L. Koch, 1841: 1; C. L. Koch, 1850: 88.
Scorpio (*Ischnurus*) *longimanus*: Gervais, 1844b: 69.
Palamnaeus longimanus: Simon, 1893: 328; Simon, 1899: 79; Pocock, 1900: 97 (in part); Simon, 1901: 78; Schultze, 1927: 375; Auber, 1963: 273.
Palamnaeus (*Scorpio*) *longimanus*: Pavesi, 1898: 2.
Heterometrus longimanus: Kraepelin, 1899: 111; Werner, 1902: 601; Masi, 1912: 123; Kraepelin, 1913: 166; Lampe, 1918: 197; Kopstein, 1921: 129; Kopstein, 1923: 186; Kopstein, 1926: 111; Kopstein, 1927: 104; Banks, 1928: 505; Werner, 1932: 576; Werner, 1934: 277; Werner, 1936: 186; Roewer, 1943: 228; Vachon, 1948: 57(1952: 37); ? Bücherl, 1959: 269; Rosin & Shulov, 1963: 570; Vachon, Roy & Condamin, 1970: 426; Stockmann, 1979: 405; Francke & Sissom, 1984: 12; Casper, 1985: 281; McCormick & Polis, 1990: 301; Polis & Sissom, 1990: 187; Pointer, 1991: 24; Soleglad & Fet, 2003: 8.
Heterometrus (*Scorpio*) *longimanus*: Kraepelin, 1901: 271.
Heterometrus (*Heterometrus*) *longimanus*: Vachon & Lourenço, 1985: 9; Kovařík, 1992: 185; Kovařík, 1994: 197; Kovařík, 1997: 183; Kovařík, 1998: 137; Fet, 2000: 434; Kovařík, 2002: 17; Soleglad & Fet, 2003: 5.
Heterometrus longimanus typicus: Masi, 1912: 123.
Heterometrus longimanus longimanus: Giltay, 1931: 3; Giltay, 1935: 2; Takashima, 1945: 90.
Heterometrus (*Heterometrus*) *longimanus longimanus*: Couzijn, 1981: 100; ?Tikader & Bastawade, 1983: 522; Fet, 2000: 435.
= *Buthus costimanus* C. L. Koch, 1837: 27, fig. 266; C. L. Koch, 1850: 88 (syn. by Kraepelin, 1895: 34).
Palamnaeus costimanus: Thorell, 1876b: 217; Thorell, 1888: 329.
Palamnaeus costimanus borneensis Thorell, 1876b: 217; Thorell, 1888: 414.
Heterometrus (*Heterometrus*) *longimanus borneensis*: Couzijn, 1981: 104; Kovařík, 1997: 183; Kovařík, 1998: 137; Fet, 2000: 435
= *Centrurus galbineus* C. L. Koch, 1838: 110; C. L. Koch, 1850: 89; Pocock, 1902: 365; Braunwalder & Fet, 1998: 33 (syn. by Kraepelin, 1895: 34).
= *Palamnaeus angustimanus* Thorell, 1876b: 211 (syn. by Simon, 1901: 78).
Palamnaeus longimanus angustimanus: Simon, 1901: 78.
Heterometrus (*Heterometrus*) *longimanus angustimanus*: Couzijn, 1981: 103; Kovařík, 1998: 137; Fet, 2000: 435.
= *Pandinus humilis* Simon, 1877: 94 (syn. by Kraepelin, 1895: 34).
Heterometrus (*Heterometrus*) *longimanus humilis* Couzijn, 1981: 109; Kovařík, 1998: 137; Fet, 2000: 435.
= *Heterometrus* (*Heterometrus*) *longimanus belitungensis* Couzijn, 1981: 105; Kovařík, 1998: 137; Fet, 2000: 435; Kovařík, 2002: 17. **Syn. n.**
Heterometrus (*Heterometrus*) *longimanus bengkalitensis* Couzijn, 1981: 106; Kovařík, 1998: 137; Fet, 2000: 435.
Heterometrus (*Heterometrus*) *longimanus marmoratus* Couzijn, 1981: 109; Kovařík, 1998: 137; Fet, 2000: 436.
Heterometrus (*Heterometrus*) *longimanus paris* Couzijn, 1981: 106; Kovařík, 1998: 137; Fet, 2000: 436.
= *Heterometrus* (*Heterometrus*) *longimanus tarawakanensis* Couzijn, 1981: 108; Kovařík, 1998: 137; Fet, 2000: 436. **Syn. n.**

TYPE LOCALITY AND TYPE REPOSITORY. Africa – incorrect type locality – holotype lost, neotype from Indonesia, Sumatra, Talang, Gunung designated by Couzijn (1981: 100); RMNH.
TYPE MATERIAL EXAMINED. **Indonesia**, Bangka, 2♀2juvs. (paratypes of *Heterometrus* (*Heterometrus*) *longimanus belitungensis* Couzijn, 1981), SMFD No. 5330.

OTHER MATERIAL EXAMINED. **Indonesia**, Java, Idiengeb, 3♀, SMFD No. 6743/150; Sumatra, Padang, 1♂, SMFD No. 6702/109; Sumatra, 2juvs., leg. S. Auer, SMFD No. 5291; Sumatra, Fort de Kock, 1♂1♀, SMFD No. 8814/183; Sumatra, Padang, 1♂, leg. Tiefsee, ZMHB No. 98/99 and 882/1914; Borneo, 1♂4♀3juvs., leg. Vráz, NMPC; Sumatra, 3♂, leg. Hildebrandt, NMPC; Java, 2juvs., 1870, leg. J. Xantus, HNHM; Borneo, Matang, 1870, 8♂1♀36juvs.17juvs. before first ecdysis, leg. J. Xantus, HNHM Nos. 2024, 2031, 2032, and 2039; Sumatra, Deli, 1879, 2♂1♀, leg. V. Schauler, SMFD No. 5328; Sumatra, 1882, 2♀, HNHM Nos. 2015 and 2036, 1883, 2♂, leg. Dr. Machik, HNHM Nos. 2021 and 2026; Sumatra, 1886, 1♀, leg. Hochwiesner, SMFD No. 5329; Sumatra, Deli, 1892, 2♂2♀1im., leg. Benecke, SMFD No. 5348; West Borneo, Pontianak, 1893, 2♂2♀6juvs., leg. F. Will, SMFD No. 5324; Halmahera, 1894, 5♂5♀4ims., leg. Kükenthal, SMFD No. 5350; Borneo, Baramfluss, 1894, 3ims.13juvs., leg. Kükenthal, SMFD Nos 5325 and 5326; Nias, 1896, 2♂ (ims.)1♀, leg. S. Raap and Knuth, ZMHB No. 5705/37; Linga Island, VII.1899, 1♂, leg. W. L. Abbott, probably Pulau Lingga, 0º12'S 107º35'E, CASC; Sumatra, 1900, 1♀1im., leg. V. Guer, SMFD No. 5327; E. Sumatra, Kateman river, 20.VIII.1903, 1♂, 1.IX.1903, 1im.,

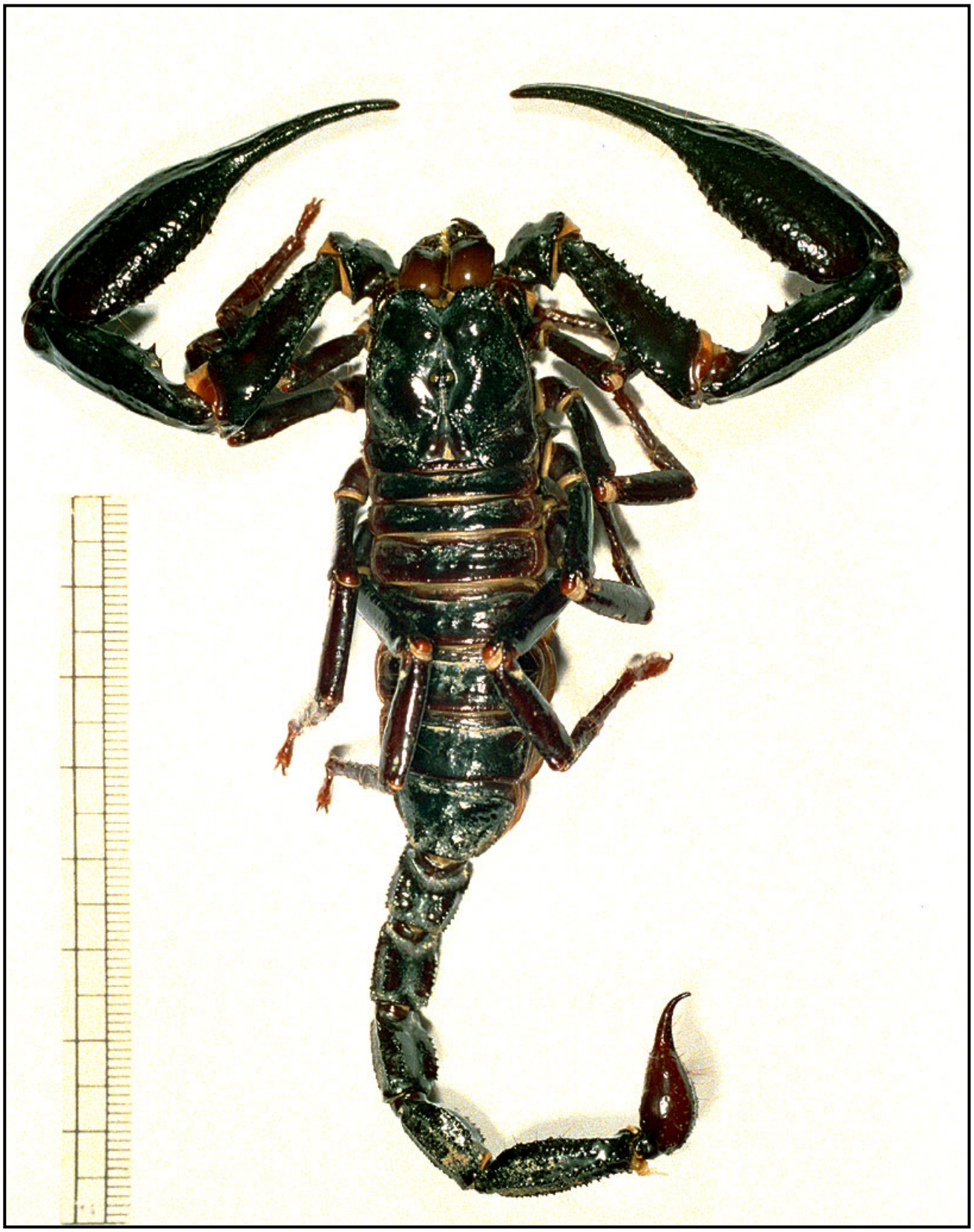


Figure 19: *Heterometrus longimanus*, dorsal view, male.

CASC; Sumatra, 9.II.1902, 1♂, ZMHB; Sumatra, 22.IV.1905, 1♂, leg. G. Studt, ZMHB No. 491/05; Sumatra, Kahat, X.1925, 1♂1im., CASC; Borneo, XI.1926, 1im. ♂ 2juvs., leg. Stebbing, BMNH No. 1926.XI.18.10-11; Sumatra, Takengon, 21.I.1929, 1♂1♀, leg. H. R. Rookmaaker, ZMHB No. 405D/29; Mentaus, 3♀, ZMHB No. 1198/07; Sumatra, Hügelland Boelaeh Blang-Cra, Lho Seumawe, Atjeh, 1929, 1♂2♀1juv., leg. Rookmaaker, SMFD No. 5368; Sumatra, Tandjong, Morava, 1931, 9♂3♀1juv., leg. Kleinkay, HNHM No. 2316; Sumatra, Lippisches Landes, 26.VII.1954, 4♂3♀5juvs., SMFD; 1992, 2♂1♀2juvs., FKCP; Timur Nunukan, rain forest, 15–17.IX.1995, 1♀2juvs., leg. P. Beron & T. Ivanova, SOFM No. 177; Sumatra, S. Medan, Brastago, VI.1997, 1im., leg. R. Sauer, FKCP; Borneo, 1♂1♀, FKCP; Borneo, Nanga Pinoh distr, Tontang, 26.VII.1993, 1juv., leg. J. Schneider, FKCP; W. Sumatra, Japannli bay, 2.I.2002, 1♂, CASC. **Malaysia**, Sarawak, Kuching, VIII.1993, 1♂, leg. J. Schneider, FKCP; Sarawak, Sebong, distr. Kapit, 9–20.III.1994, 1♂2juvs., leg. P. Bílek, FKCP. ***Sabah***, Tamparuli, 3.V.1996, 2juvs., leg. S. Snäll, FKCP. **Philippines**, Palawan, Puerto Princese, 1980, 1♀, FKCP; Mindanao Island, Misamis Occidental, 21.XII.1955, 2♀, leg. B. Marapao, CASC; Sulu island, Tawi Tawi, Tarawakan Farm District, 11.VII.1957, 1im., CASC; Palawan island, Puerto Princesa, V–VI.1961, 2♀, leg. Angel C. Alcala, CASC. **Singapur**, XII.1897, 3♂, leg. L. Biró, HNHM.

DIAGNOSIS. Adults 90–140 mm long. Base color of adults uniformly black, only manus and telson may be reddish brown. Pectinal teeth number 12–18 in both sexes. Male with chela, femur and patella of pedipalp narrower and longer than in female. Male fingers of pedipalp very long. Fixed fingers longer or at least as long as manus of pedpalp. Chela not lobiform in male, slightly lobiform in female, its length to width ratio 3.3–4.4 in male, ca. 2.4. in female. Much of manus smooth, sparsely tuberculate. Patella of pedipalp with pronounced internal tubercle. Carapace usually with disc smooth and margins granulate, but sometimes entire surface granulate. Telson hirsute, elongate, vesicle as long as or longer than aculeus.

COMMENTS. This species is known under a number of older names and as many as eight subspecies. I have studied the paratypes of *H. l. belitungensis* Couzijn, 1981 and specimens from nearly the entire area of known distribution of the species, and have not found any morphological differences indicating the existence of any subspecies. I have examined also CASC specimens from the type locality of *H. l. tarawakanensis* Couzijn, 1981 and have not found them to differ in any way from the nominotypical subspecies. However, I have not studied the types of all the subspecies.

DISTRIBUTION. Indonesia (L. Koch, 1837: 29), Malaysia (Kraepelin, 1895: 39), Philippines (Simon, 1877: 95), Singapore (Fet, 2000: 434). Apart from the original type locality (Africa), as erroneous must be regarded also all records for Cambodia (Kraepelin, 1895: 39), India (Kraepelin, 1901: 271; Tikader & Bastawade, 1983: 527), Laos (Kraepelin, 1901: 271), Myanmar (Kraepelin, 1895: 39, Kraepelin, 1913: 166), Thailand (Kraepelin, 1901: 271) and Vietnam (Kraepelin, 1901: 271).

Heterometrus madraspatensis Pocock, 1900 (Fig. 20)

Palamnaeus fulvipes madraspatensis Pocock, 1900: 88.
Heterometrus (*Chersonesometrus*) *madraspatensis*: Tikader & Bastawade, 1983: 630; Fet, 2000: 440.
Heterometrus (*Chersonesometrus*) *fulvipes*: Couzijn, 1981: 133 (in part).
= *Heterometrus* (*Chersonesometrus*) *granulomanus* Couzijn, 1981: 142; Tikader & Bastawade, 1983: 577; Kovařík, 1998: 136; Fet, 2000: 439; Kovařík, 2002: 17. **Syn. n.**

TYPE LOCALITY AND TYPE REPOSITORY. India, Madras; BMNH.
TYPE MATERIAL EXAMINED. **India**, ***Tamil Nadu***, Madras, 2♂ (lectotype and paralectotype hereby designated), BMNH; Palni-Hills, Kadai-canal, 1♂ (paratype of *Heterometrus* (*Chersonesometrus*) *granulomanus* Couzijn, 1981), SMFD No. 5332.

OTHER MATERIAL EXAMINED. **India**, Madireddy Palem, 11.VII.1966, 1im., 20.XI.1966, 1♂1♀2juvs., 21.XI.1966, 1juv., 1.I.1967, 1♂2♀3ims., 16.I.1967, 1♂3juvs., leg. Dorothy E. Johnson, CASC, 1.I.1967, 1♂1♀, FKCP; ***Andhra Pradesh***, Addanki env., 1♂, FKCP; Podili, VII.1966, 1juv., 6.VII.1966, 1juv., 20.VII.1966, 1♂1im.1juv., 21.VII.1966, 1juv., 23.XI.1966, 1im., 1.I.1967, 1♀, 13.II.1967, 1juv., leg. D. E. Johnson, CASC. ***Tamil Nadu***, Madras area, 1965, 2♂3♀, CASC; Vellore, 11.VIII.1966, 2♂, 26.IX.1966, 1im., 16.VIII.1967, 1♂, 15.IX,1966, 1♂, 24.IX.1966, 2♂, 25.IX.1966, 1♂1♀, VIII.1967, 2juvs., leg. C. Varadarajan, CASC; Madras (Chennai), II.1993, 2♀1im., leg. M. Veselý, FKCP, near Vellore, 30.X.1997, 1♂, leg. K. Werner, FKCP.

DIAGNOSIS. Adults 70–100 mm long. Color of adults uniformly reddish brown to black, legs and telson yellow to yellowish or reddish brown, always lighter colored than body. Pectinal teeth number 12–18 in both sexes. Male has longer femur and patella of pedipalp than female. Chela lobiform, in male narrower than in female, its length to width ratio 1.7–1.9 in females and 2.0–2.5 in males. Entire manus covered by large, rounded granules but devoid of carinae. Patella of pedipalp without

Figure 20: *Heterometrus madraspatensis*, dorsal view, male lectotype.

pronouced internal tubercle. Carapace of juveniles and some females with disc smooth and margins granulate and anteriorly tuberculate. Adult males and some females with entire carapace sparsely granulated. Third and fourth leg spine formula 4:5–6. Telson hirsute, vesicle as long as or longer than aculeus.

COMMENTS. Couzijn (1981: 133) suggested that *Palamnaeus fulvipes madraspatensis* Pocock, 1900 is a synonym of *H. fulvipes*. However, Tikader & Bastawade (1983: 630) correctly elevated this subspecies to a species. The two species are distinguishable on the shape of the male chela (see Fig. 25 in Pocock, 1900: 88), but problems may arise in identification of the females. Couzijn (1981: 142) also described a new species, *Heterometrus* (*Chersonesometrus*) *granulomanus,* which in my opinion is a synonym of *H. madraspatensis* Pocock, 1900. The lectotype of *H. madraspatensis* Pocock, 1900 is hereby designated in order to stabilize the nomenclature.

DISTRIBUTION. India: Andhra Pradesh and Tamil Nadu (Pocock, 1900: 89).

Heterometrus mysorensis sp. n.
(Fig. 21)

TYPE LOCALITY AND TYPE REPOSITORY. India, Mysore, Maddur env., cca 900 m; FKCP.
TYPE MATERIAL. **India**, ***Mysore***, Maddur env., ca. 900 m, 1983, 1♂ (holotype), collector unknown, FKCP.

ETYMOLOGY. Named after the state of occurrence.

DIAGNOSIS. Adult male 118 mm long. Female unknown. Color uniformly reddish brown, only telson and leg tarsomeres reddish yellow. Pectinal teeth number 16 and 17. Male assumed to have femur, patella and chela of pedipalp longer than female. Chela slightly lobed and strongly hirsute, its length to width ratio 2.8. Dorsal surface of pedipalp manus bears rounded granules of varying size that form elevated rows. Patella of pedipalp without conspicuous internal tubercle. Disc of carapace smooth and glossy, margins finely granulose and anteriorly slightly tuberculate. Telson hirsute, with vesicle as long as aculeus.

DESCRIPTION: The male holotype is an adult 118 mm long. Measurements of the carapace, telson, segments of the metasoma and segments of the pedipalps, and numbers of pectinal teeth are given in Table 1. Sexual dimorphism is presumably expressed in the length of the femur, patella and chela of pedipalp, and probably also in the width of the chela. Although the female is not known, morphology of other species makes this assumption fairly safe.

COLORATION: The color is uniformly reddish brown, only the telson and leg tarsomeres are reddish yellow. Also the sternites are lighter colored, and the pectens are yellow.
MESOSOMA AND CARAPACE: The mesosoma lacks a carina. Both the mesosoma and carapace are smooth except for minute granules on the margins and low tubercles on the anterior part of the carapace. The sternites are smooth, entirely without granules. The pectinal teeth number 16 and 17.
METASOMA AND TELSON: The metasoma is smooth and hirsute. The first to fourth segments bear eight carinae, of which the ventral are smooth and the dorsal consist of minute, rounded granules. The fifth segment bears five complete carinae and two additional lateral carinae developed only in the anterior half. The three ventral carinae of this segment consist of pointed granules and the spaces between them are finely granulate. The dorsal carinae consist only of minute, rounded granules. The telson is hirsute, dorsally without granules, and ventrally with four rows of granules. The vesicle is as long as the aculeus.
PEDIPALPS: The femur has granulose carinae and its dorsal surface is slightly granulated. The patella is smooth, dorsally and externally slightly tuberculate, with four smooth carinae and on the internal surface with scattered pointed granules substituting for two additional carinae; they do not form a conspicuous internal tubercle otherwise characteristic for the genus. The chela is slightly lobed and strongly hirsute. The dorsal side of the manus bears rounded granules of varying size, which do not cover the entire surface and form elevated rows. The external surface of the chela is smooth, with two long carinae. The movable fingers bear six straight rows of granules without internal and external granules.
LEGS: The legs bear solitary long and short setae. The third and fourth leg spine formula is 5–6:6–7.

AFFINITIES. The described features distinguish *H. mysorensis* sp. n. from all other species of the genus. They are recounted in the key below. *H. mysorensis* sp. n. is close to *H. phipsoni,* but has conspicuous rows of granules (carinae) on the chela and only slightly tuberculate patella of pedipalp, whereas in *H. phipsoni* the chela is strongly granulose.

Heterometrus nepalensis sp. n.
(Fig. 22)

TYPE LOCALITY AND TYPE REPOSITORY. Nepal, Royal Chitwan National Park, Island Jungle Resort; FKCP.
TYPE MATERIAL. **Nepal**, Royal Chitwan National Park, Island Jungle Resort, VI.1993, 1♂ (holotype), leg. Csorba; FKCP.

Figure 21: *Heterometrus mysorensis*, sp. nov., dorsal view, male holotype.

Figure 22: *Heterometrus nepalensis*, **sp. nov**., dorsal view, male holotype.

ETYMOLOGY: Named for the country of occurrence. It is the first species found in Nepal.

DIAGNOSIS. Adult male holotype 83 mm long. Color uniformly reddish black, only telson lighter colored. Pectinal teeth number 14–15. Sexual dimorphism in proportions of pedipalps probably not noticeable. Chela hirsute, lobiform, its adult length to width ratio 2.2. Entire manus covered by rounded granules. Patella of pedipalp without pronouced internal tubercle. Carapace smooth, with granules only at margins. Second metasomal segment of male wider than long. Telson bulbous, vesicle longer than aculeus.

DESCRIPTION: The adult male holotype is 83 mm long. No other specimens are known. Measurements of the carapace, telson, segments of the metasoma and segments of the pedipalps, and numbers of pectinal teeth are given in Table 1. Sexual dimorphism in proportions of pedipalps is probably not noticeable. Although the female is not known, morphology of other species makes this assumption fairly safe.

COLORATION: The base color of holotype is uniformly reddish black, only the telson is reddish brown. Sternites are yellowish brown and pectens are yellow.

MESOSOMA AND CARAPACE: The mesosoma lacks carinae. Both the carapace and mesosoma are smooth, with granules only at margins. The sternites are smooth, without granules. Pectinal teeth number 14–15.

METASOMA AND TELSON: The entire surface of the metasoma is finely granulate and hirsute. The first to fourth segments bear eight carinae of which the ventral are partly smooth and the dorsal consist of conspicuous but sparse pointed granules. The fifth segment bears five carinae. All carinae on this segment consist of pointed granules. Apart from the just noted carinae, all metasomal segments bear two additional carinae present only in the anterior half on the fifth segment and the posterior halves of the first to fourth segments. The first and second segments are wider than long, whereas the remaining segments are longer than wide. The telson is hirsute and bulbous, dorsally without granules and ventrally with four rows of granules; the vesicle is longer than the aculeus.

PEDIPALPS: The femur has three inconspicuous granulose carinae with spaces between them also bearing granules. The patella has four smooth carinae, is ventraly smooth, dorsally and externally slightly tuberculate, without granules or tubercles on the internal surface. The dorsal surface of the manus is covered by rounded granules. The chela is slightly lobiform and strongly hirsute, and its internal surface is tuberculate, with two carinae. The movable fingers bear six straight rows of granules.

LEGS: The legs bear long and short solitary setae. The third and fourth leg spine formula is 4:5.

AFFINITIES. The described features distinguish *H. nepalensis* sp. n. from all other species of the genus. They are recounted in the key below. *H. nepalensis* sp. n. is close to *H. indus* but has shorter and wider metasomal segments. Moreover, *H. indus* occurs only in Sri Lanka, whereas *H. nepalensis* sp. n. is the first species found in Nepal.

Heterometrus petersii (Thorell, 1876)
(Fig. 23)

Heterometrus megacephalus (nec *Buthus megacephalus* C. L. Koch, 1836: 73): Simon, 1872: 97.
Palamnaeus petersii Thorell, 1876a: 13; Pocock, 1892: 39; Pocock, 1900: 84.
Heterometrus (*Heterometrus*) *petersi*: Kovařík, 1998: 137.
Heterometrus (*Heterometrus*) *petersii*: Fet, 2000: 437; Kovařík, 2002: 17.
Heterometrus petersii: Soleglad & Fet, 2003: 5, 8.
Heterometrus petersii petersii: Warburg & Polis, 1990: 225.
Heterometrus (*Heterometrus*) *petersii petersii*: Couzijn, 1981:96; Le Xuan Hue et al., 1998: 7; Fet, 2000: 437.
Heterometrus (*Heterometrus*) *petersii mindanaensis* Couzijn, 1981: 97 (TL: Mindanao; MNHN); Kovařík, 1998: 137; Fet, 2000: 437.
Palamnaeus spinifer (in part): Pocock, 1892: 40; Pocock, 1893: 316.
Heterometrus longimanus (in part): Kraepelin, 1895: 34; Kraepelin, 1899: 111.
Heterometrus longimanus petersi: Kraepelin, 1905: 199; Giltay, 1931: 4; Fage, 1933: 25; Fage, 1936: 181; Fage, 1944: 71; Takashima, 1945: 90.
= *Palamnaeus silenus* Simon, 1884: 361; Flower, 1901: 35; Simon, 1904: 293 (syn. by Pocock, 1900: 84).
Scorpio longimanus silenus: Kraepelin, 1895: 41; Kraepelin, 1899: 111; Kraepelin, 1901: 271; Kraepelin, 1905: 199; Masi, 1912: 123.

TYPE LOCALITY AND TYPE REPOSITORY. Cochinchina (Vietnam); MNHN.

MATERIAL EXAMINED. **Thailand**, Bangkok, 1.VI.1957, 1♂ (det. ?), leg. J. Hunyard, CASC; Prachin Buri, 4.I.1966, 1♀, leg. Y. Siah, CASC. **Vietnam**, Quan Toi, 29.IX.1969, 1♂, leg. W. Horan, CASC; Khank Hoa prov., Nha Trang env., Xuan Son, 30 m, 23.I.1994, 1♀, leg. K. Petrželka, FKCP; prov. Dong Nai, 80 km NE Saigon, valley Ma Da, Tri An dam, 10°56'N– 107°20'E, IV.1995, 1♂, VII.1995, 1juv., 27.IV.1996, 2ims.3juvs., 7.VI.1996, 1juv., 1997, 1♂, V.1998, 1juv., leg. K. Petrželka, FKCP. **?,** 1im., no location, CASC; Cochinchina, V.1872, 1♀, SMFD No. 5331.

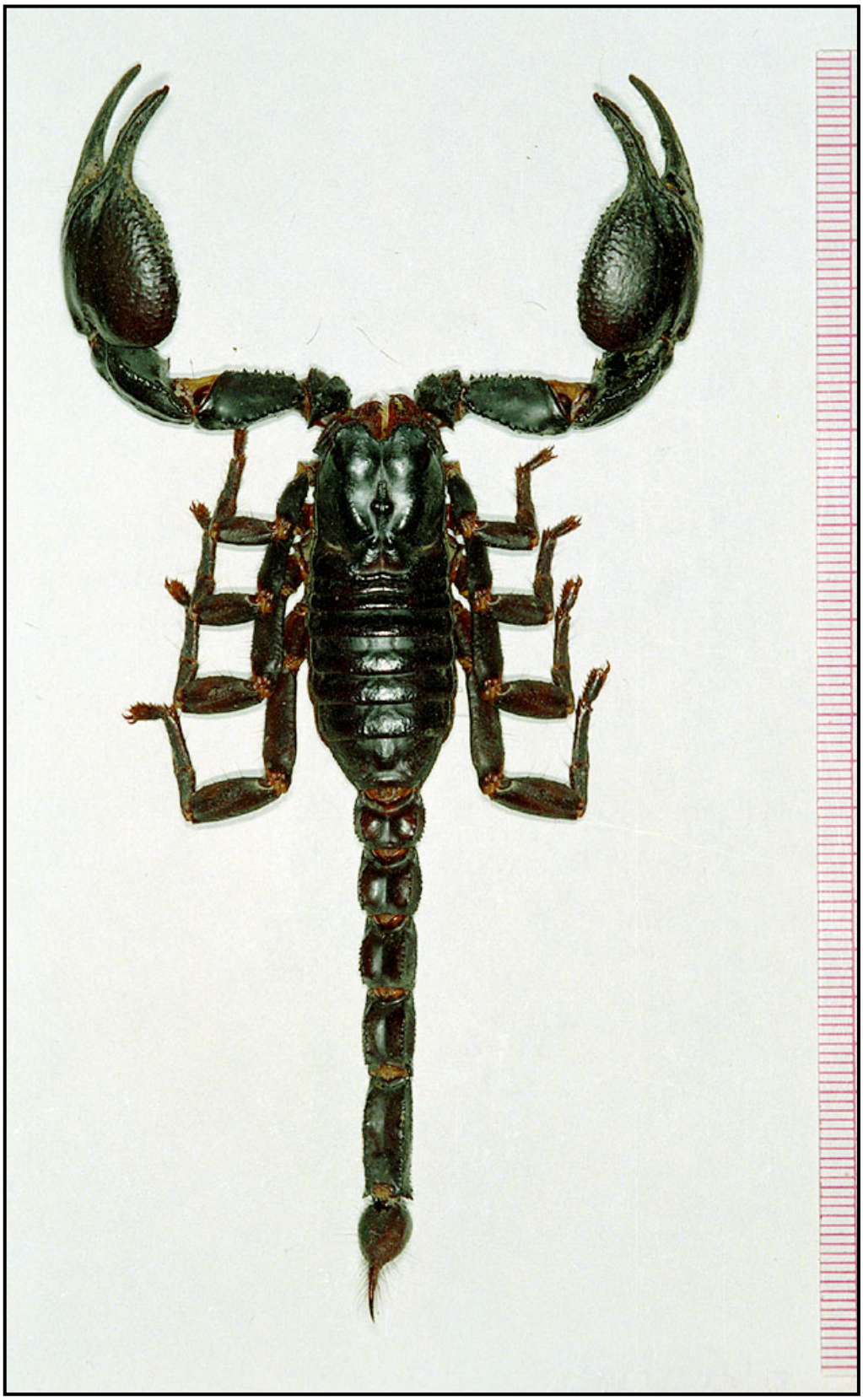


Figure 23: *Heterometrus petersii*, dorsal view, male from Vietnam (FKCP).

DIAGNOSIS. Adults 90–125 mm long. Base color of adults uniformly black, only manus and telson may be reddish brown. Pectinal teeth number 15–19 in both sexes. Sexual dimorphism in proportions of pedipalps not noticeable. Male has more pronounced tooth on movable fingers of pedipalp. Chela rounded, its length to width ratio 2–2.4 in both sexes. Much of manus smooth, with smooth carinae mainly on margins. Patella of pedipalp without pronounced internal tubercle. Carapace with disc smooth and margins granulate. Telson hirsute, elongate, vesicle longer than aculeus.

COMMENTS. Couzijn (1981) described the Philippine subspecies *H. p. mindanaensis,* whose holotype I have not been able to examine, and *H. p. luzonensis*, which has been synonymized with *H. cyaneus* (C. L. Koch, 1836) (see Kovařík, 2002: 3, 17). Sexual dimorphism (tooth on movable fingers of pedipalp more pronounced in male than in female) distinguishes this species from *H. laoticus* Couzijn, 1981.

DISTRIBUTION. Cambodia (Kraepelin, 1901: 271), Laos (Kraepelin, 1901: 271), Philippines (Couzijn, 1981: 97) and Vietnam (Thorell, 1876a: 13, Kraepelin, 1899: 112). Thailand and Malaysia records (Kraepelin, 1901: 271) are doubtful, as they could well pertain to *H. laoticus* Couzijn, 1981 and *H. spinifer* (Ehrenberg, 1828).

Heterometrus phipsoni (Pocock, 1893)

Scorpio phipsoni Pocock, 1893: 307; Pocock, 1894: 73.
Palamnaeus phipsoni: Pocock, 1900: 94.
Heterometrus phipsoni: Kraepelin, 1899: 114; Kraepelin, 1913: 166; Roewer, 1929: 612; Werner, 1936: 186; Roewer, 1943: 228; Takashima, 1945: 92; Pointer, 1991: 24.
Heterometrus (*Scorpio*) *phipsoni*: Kraepelin, 1901: 271.
Heterometrus (*Chersonesometrus*) *phipsoni*: Couzijn, 1978: 330; Tikader & Bastawade, 1983: 646; Kovařík, 1992: 185; Kovařík, 1998: 136; Fet, 2000: 442; Bastawade, 2002: 296.
Heterometrus (*Chersonesometrus*) *phipsoni phipsoni*: Couzijn, 1981: 149 (in part).
= *Palamnaeus phipsoni collinus* Pocock, 1900: 95. **Syn. n.**
Heterometrus (*Chersonesometrus*) *collinus*: Couzijn, 1981: 155; Tikader & Bastawade, 1983: 625; Kovařík, 1998: 136; Fet, 2000: 441.
Palamnaeus phipsoni carnaticus (lapsus calami): Pocock, 1900: 95.

TYPE LOCALITY AND TYPE REPOSITORY. India, Madras; BMNH.

TYPE MATERIAL EXAMINED. **India**, Tamil Nadu, Madras, 1♂ (holotype), Sheverey Hills, 1♀ (paratype), BMNH No. 1979.7.3.2,3; Nilgiri Hills, 2♀ (holotype and paratype of *Palamnaeus phipsoni collinus* Pocock, 1900), leg. W. M. Daly, BMNH No. 1894.8.21.4-7.

OTHER MATERIAL EXAMINED. **India**, Yercaud, 6.III.1962, 1im.2juvs., leg. E. S. Ross & D. Cavagnaro, CASC; ***Adhya Pradesh***, 6 mi. W. Palmaner, 725 m., 26.II.1962, 1im. (det. ?) , CASC; Podili, 16.I.1967, 1♂ (im.), leg. D. E. Johnson, CASC; ***Orissa***, 13 mi SE Pottangi, 550 m, 11.IV.1962, 1♂ (im.), leg. E. S. Ross & D. Cavagnaro, CASC; ***Maharashtra***, Bhiwandi, 15 mi N. Bombay, XII.1964, 2♀3ims., leg. F. B. Steiner, CASC; Bombay, 1965, 2♂3♀, FKCP; Bombay, 6.III.1967, 4♂8♀12ims.24juvs., leg. S.R. Sane, CASC; ***Tamil Nadu***, south, Devala, V.1961, 5♂, leg. P. Sushai Nathan, CASC; Western Gháts, Pandalur env., 1998, 1♂, FKCP.

DIAGNOSIS. Adults 85–130 mm long. Color of adults uniformly reddish brown to black. Pectinal teeth number 12–16 in males and 10–15 in females. Male has longer but not narrower femur and patella of pedipalp and longer, usually narrower chela than female. Chela slightly lobiform and strongly hirsute, its length to width ratio 2.5–3 in males and 2.2–2.5 in females. Dorsal surface of manus of pedipalp with large, rounded granules of uneven size, which may merge but do not form carinae. Patella of pedipalp without internal tubercle. Carapace smooth and glossy, only anterior part slightly tuberculate and margins occasionally with sparse granules. Telson hirsute, elongate, vesicle as long as or longer than aculeus.

COMMENTS. Pocock (1900: 95) distinguished *Palamnaeus phipsoni collinus* from *Palamnaeus phipsoni* by its shorter metasoma. The holotype female makes this impression because it was apparently killed shortly after feeding and thus has a relatively larger mesosoma. However, another (paratype) female of the same size (metasoma and pedipalps) has a markedly shorter mesosoma.
Couzijn (1981: 149) incorrectly regarded *Palamnaeus barberi* Pocock, 1900 as a synonym of *Scorpio phipsoni* Pocock, 1893. These two species are very different (see diagnosis and key), as was pointed out by Tikader & Bastawade (1983: 614).

DISTRIBUTION. India: Tamil Nadu (Pocock, 1900: 95; Pocock, 1893: 307), Kerala, Madhya Pradesh, Maharashtra, West Bengal (Couzijn, 1981: 149; Tikader & Bastawade, 1983: 646), Orissa (first report).

***Heterometrus rolciki* sp. n.**
(Fig. 24)

TYPE LOCALITY AND TYPE REPOSITORY. India, Tamil Nadu state, Nilgiri hills, 15 km SE of Kotagiri, Kunjappanai env., 76°56E 11°22N, ca 900 m; FKCP.
TYPE MATERIAL. **India**, Tamil Nadu state, Nilgiri hills, 15 km SE of Kotagiri, Kunjappanai env., 76°56E 11°22N, ca 900 m, 7–22.V.2000, leg. J. Rolčík, 1♂ (holotype) ecdysis 29.I.2001 and 30.V.2001, killed VIII.2004, reared by F. Kovařík, 22–30.V.1999, 1♂1im. (paratypes), leg. Z. Kejval & M. Trýzna, FKCP; Tamil Nadu, near Kotagiri, 27.X.1997, 1♀2juvs. (allotype and paratypes), leg. Werner, FKCP.

ETYMOLOGY: Named after Jakub Rolčík, who collected the holotype.

DIAGNOSIS. Adults 80–100 mm long. Base color of adults uniformly reddish brown to black; telson may be lighter colored. Pectinal teeth number 10–12 in both sexes. Sexual dimorphism in proportions of pedipalps not noticeable. Chela slightly lobiform and covered with long setae, its adult length to width ratio 2.3 in both sexes. Dorsal surface of manus of pedipalp smooth and uneven to slightly rugate, without granules and carinae. Patella of pedipalp without conspicuous internal tubercle, but with several small tubercles. Carapace and metasoma with entire surface granulate. Telson hirsute and elongate, vesicle as long as aculeus.

DESCRIPTION: The adult male holotype is 100 mm long. Measurements of the carapace, telson, segments of the metasoma and segments of the pedipalps, and numbers of pectinal teeth are given in Table 1. There is no noticeable sexual dimorphism in the proportions of pedipalps.
COLORATION: The base color of adults is uniformly reddish brown to black, only the telson is reddish brown. Sternites are also reddish brown to black, and the pectens are yellow.
MESOSOMA AND CARAPACE: The mesosoma lacks carinae. Both the carapace and mesosoma have the entire surface granulate, more strongly in the mesosoma. The sternites are smooth, without granules. Pectinal teeth number 10–12 in both sexes.
METASOMA AND TELSON: The metasoma is hirsute and has the entire dorsal surface granulate. The first to fourth segments bear eight carinae of which the ventral are smooth and the dorsal consist of conspicuous but sparse pointed granules. The fifth segment bears five carinae. All carinae on this segment consist of pointed granules. Apart from the just noted carinae, all segments bear two additional carinae present only in the anterior half of the fifth segment and the posterior halves of the first to fourth segments. The telson hirsute and elongate, dorsally without granules and ventrally with four rows of granules; the vesicle is as long as the aculeus.
PEDIPALPS: The femur has four granulose carinae with spaces between them ventrally smooth, but other surfaces bear several granules. The patella is ventrally smooth, dorsally and externally slightly tuberculate or granulate, with four partly granulated carinae and several pointed granules on the internal surface in place of granules, which do not form a conspicuous internal tubercle characteristic of other species. The dorsal surface of the manus is smooth and uneven to slightly rugate, without granules and carinae. The chela is slightly lobiform and strongly hirsute, and its internal surface is tuberculate, with two carinae. The movable fingers bear six straight rows of granules.
LEGS: The legs bear long and short solitary setae. The third and fourth leg spine formula is 4:6.

AFFINITIES. The described features distinguish *H. rolciki* sp. n. from all other species of the genus. They are recounted in the key below. *H. rolciki* sp. n. is close to *H. scaber,* but its smaller size accounts for some morphological differences.

Heterometrus scaber (Thorell, 1876)
(Fig. 25)

Heterometrus afer (err., non Linné, 1758): Simon, 1872: 51 (see by Kraepelin, 1895: 58).
Pandinus scabro Thorell, 1876b: 202; new name for *Heterometrus afer* sensu Simon, 1872.
Scorpio scaber: Kraepelin, 1895: 58.
Pandinus scaber: Simon, 1905: 161.
Heterometrus scaber: Kraepelin, 1899: 116; Kraepelin, 1913: 166; Lampe, 1918: 198; Takashima, 1945: 93; Garnier & Stockmann, 1971: 13; Cloudsley-Thompson, 1990: 484; Hjelle, 1990: 54; Polis & Sissom, 1990: 166; Simard & Watt, 1990: 419; Bastawade, 1992: 221.
Palamnaeus scaber: Pocock, 1900: 93; Rosin & Shulov, 1963: 566.
Heterometrus (*Scorpio*) *scaber*: Kraepelin, 1901: 271.
Heterometrus (*Chersonesometrus*) *scaber*: Tikader & Bastawade, 1983: 619; Kovařík, 1998: 136; Fet, 2000: 440.
Heterometrus (*Chersonesometrus*) *scaber scaber*: Couzijn, 1981: 144; Fet, 2000: 440.
Heterometrus (*Chersonesometrus*) *scaber obscurus* Couzijn, 1981: 147 (TL: India, Maharashtra, Mathéran, near Bombay; MNHN); Kovařík, 1998: 136; Fet, 2000: 440.
Heterometrus (*Chersonesometrus*) *scaber rugosus* Couzijn, 1981: 146 (TL: India, Kerala, Malabar coast; MNHN); Kovařík, 1998: 137; Fet, 2000: 441.
= ? *Heterometrus* (*Heterometrus*) *malapuramensis* Tikader & Bastawade, 1983: 533 (TL: Malapuram,

Figure 24: *Heterometrus rolciki*, **sp. nov**., dorsal view, male holotype.

Figure 25: *Heterometrus scaber*, dorsal view, male.

Poonus estate, Kozhikode distr., Kerala, India; NZSI); Kovařík, 1998: 137; Fet, 2000: 436. **Syn. n.**

TYPE LOCALITY AND TYPE REPOSITORY. Bengal – type locality uncertain – holotype lost, neotype from India, Kerala, Mahé designated by Couzijn (1981: 145–146); MNHN.

MATERIAL EXAMINED. **India**, 18 mi.NE Mattanur, 75 m, 23.II.1962, 1♂, leg. E. S. Ross and D. Q. Cavagnaro, CASC; ***Karnataka***, Malabar, 1♀, FKCP; Ghats, Mangalore, 3♂2♀, Battie col., BMNH No. 1896.7.30.139-142; ***Mysore***, 12 mi.N Balehonnur, 760, 19.II.1962, 1♀, leg. E. S. Ross and D. Q. Cavagnaro, CASC; 12 mi.E Virajpet, 850, 24.II.1962, 1♀, leg. E. S. Ross and D. Q. Cavagnaro, CASC; Jog Falls, 525 m., 17.XI.1962, 1♀, leg. E. S. Ross and D. Q. Cavagnaro, CASC; Shimoga dist., Agumbe ghat, 2000 ft., T.R.S.N. coll., V. 2001, 1♂2♀, VI.2004, 1♂3♀, FKCP; ***Pondichery***, Karaikal, T.R.S.N. coll., 2002, 1♀, FKCP.

DIAGNOSIS. Adults 100–130 mm long. Base color of adults uniformly reddish brown to black; manus and telson may be lighter colored or manus may be black. Pectinal teeth number 7–12 in both sexes. Sexual dimorphism in proportions of pedipalps not noticeable. Chela lobiform and covered with long setae, its adult length to width ratio 1.7–2.0 in both sexes. Dorsal surface of manus of pedipalp relatively smooth, with effaced tubercles, without granules and carinae. Patella of pedipalp without conspicuous internal tubercle. Carapace and mesosoma with entire surface granulate, only sternites smooth. Telson hirsute, vesicle as long as or longer than aculeus.

COMMENTS. Couzijn (1981: 146 and 147) described two subspecies, *H. s. obscurus* and *H. s. rugosus*, which I have not been able to examine and therefore cannot comment on their status. Neither have I been able to study the types of *H.* (*H.*) *malapuramensis* Tikader & Bastawade, 1983, but the characters included in their description cause me to believe that this species is a synonym of *H. scaber*.

DISTRIBUTION. India: Karnataka, Kerala, Maharashtra, Tamil Nadu (Pocock, 1900: 93, Tikader & Bastawade, 1983: 624; Fet, 2000: 440), Mysore, and Pondichery (first report).

Heterometrus sejnai sp. n.
(Fig. 26)

TYPE LOCALITY AND TYPE REPOSITORY. Thailand, Thaleban n. p., Satun; FKCP.

TYPE MATERIAL. **Thailand**, Thaleban n. p., Satun, X.1998, leg. V. Šejna, 1♂ (holotype), 1♀ (allotype – still alive) 3ims. (paratypes – still-alive offspring of the allotype), FKCP.

ETYMOLOGY: Named after Vladimír Šejna, who collected the types.

DIAGNOSIS. Adult male holotype 78 mm long. Other adults 95–117 mm long. Base color of adults uniformly reddish black with telson reddish brown; metasoma may be lighter colored than body. Pectinal teeth number 13–14 in both sexes. No noticeable sexual dimorphism in proportions of pedipalps. Chela lobiform, its length to width ratio ca. 2.2 in adults of both sexes. Dorsal surface of manus tuberculate, without carinae. Patella of pedipalp without pronounced internal tubercle. Carapace either entirely granulate or disc smooth. Telson hirsute, bulbous, vesicle as long as aculeus.

DESCRIPTION: The adult male holotype and female allotype are 78 mm long. Measurements of the carapace, telson, segments of the metasoma and segments of the pedipalps, and numbers of pectinal teeth are given in Table 1. There is no noticeable sexual dimorphism in the proportions of pedipalps.

COLORATION: The base color of adults is uniformly reddish black, only the telson is reddish brown and the metasoma may be lighter colored than the body. Sternites are brown and pectens are yellow.

MESOSOMA AND CARAPACE: The mesosoma lacks carinae. Both the mesosoma and carapace are slightly granulated. Sternites are smooth, without granules. Pectinal teeth number 13–14 in both sexes.

METASOMA AND TELSON: The metasoma is generally smooth, hirsute, and without granules. The first to fourth segments bear eight carinae of which the ventral are smooth and the dorsal consist of conspicuous but sparse pointed granules. The fifth segment bears five carinae, with two additional carinae present only in its anterior half. All carinae on this segment consist of pointed granules. The telson is bulbous, hirsute, dorsally without granules and ventrally with four rows of granules; the vesicle is as long as the aculeus.

PEDIPALPS: The femur has three granulose carinae with spaces between them smooth, but the dorsal surface may bear several granules. The patella is smooth, dorsally and externally slightly tuberculate, with four smooth carinae and several pointed granules on the internal surface in place of two additional carinae, none of which forms a conspicuous internal tubercle characteristic of other species. The dorsal surface of the manus is tuberculate, without carinae. The chela is slightly lobiform and strongly hirsute, and its internal surface is smooth, with two carinae. The movable fingers bear six straight double rows of granules.

LEGS: The legs bear solitary long and short setae. The third and fourth leg spine formula is 3:4.

Figure 26: *Heterometrus sejnai*, **sp. nov**., dorsal view, male holotype.

AFFINITIES. The described features distinguish *H. sejnai* sp. n. from all other species of the genus. They are recounted in the key below. *H. sejnai* sp. n. is close to *H. cyaneus* but its smaller size causes some morphological differences. The two species also differ in geographic distribution.

Heterometrus spinifer (Ehrenberg, 1828) (Fig. 27)

Buthus (*Heterometrus*) *spinifer* Ehrenberg in Hemprich & Ehrenberg, 1828: pl.1, fig. 2; Hemprich & Ehrenberg, 1829: 352; Hemprich & Ehrenberg, 1831: 3; Moritz & Fischer, 1980: 324; Braunwalder & Fet, 1998: 32.
Buthus spinifer: C. L. Koch, 1837: 36.
Scorpio (*Buthus*) *spinifer*: Gervais, 1844a: 210; Gervais, 1844b: 60.
Palamnaeus spinifer: Pocock, 1892: 40; ? Pocock, 1894: 96; Pocock, 1894: 316.
Heterometrus longimanus: Kraepelin, 1895: 34 (in part); Kraepelin, 1899: 111(in part); ? Kopstein, 1921: 129; Takashima, 1945: 90 (in part).
Heterometrus longimanus longimanus: Giltay, 1931: 3 (in part).
Heterometrus spinifer: Karsch, 1879: 16; Ausserer, 1880: 466; Mahsberg, 1990: 271; Pointer, 1991: 24; Delfosse, 1998: 30; Dupré, Lambert & Gérard, 1998: 63; Robert, 1999: 19.
Heterometrus (*Heterometrus*) *spinifer*: Couzijn, 1978: 330; Kovařík, 1998: 137 (in part); Fet, 2000: 438 (in part); Prendini, 2000: 44.
Heterometrus (*Heterometrus*) *spinifer spinifer* (in part): Couzijn, 1981: 89; Kovařík, 1995: 203; Le Xuan Hue et al., 1998: 7; Fet, 2000: 438.
Heterometrus (*Heterometrus*) *spinifer solitarius* Couzijn, 1981: 93; Vachon, 1982: 78; Kovařík, 1998: 137; Fet, 2000: 438.
= *Palamnaeus laevigatus* Thorell, 1876b: 221; Keyserling, 1885: 39 (syn. by Kraepelin, 1895: 34).
= *Palamnaeus oatesii* Pocock, 1900: 98; Flower, 1901: 34; Schultze, 1927: 375 (syn. by Couzijn, 1981: 89).
Heterometrus oatesi: Kraepelin, 1913: 167; Giltay, 1931: 4; Takashima, 1945: 94.

TYPE LOCALITY AND TYPE REPOSITORY. India (probably incorrect); ZMHB.
TYPE MATERIAL EXAMINED. **India**, 1♂ (im.) (holotype), ZMHB No. 67. **?**, 3♂2♀1 juv. without locality labels, probably syntypes of *Palamnaeus oatesii* Pocock, 1900, BMNH.

OTHER MATERIAL EXAMINED. **Malaysia**, Malay Penninsula, Pulo Aov, Endan River, Johare, 30.VI.1902, 1im., CASC; Pahang, 400 ft., 1F, leg. Nevnay, BMNH No. 1932.6.14.2 and No. 79; 1.X.1936, 1♂, Terry Taylor, CASC; Perak, 10–20 km Ne of Tapah, 152–610 m, 1983, 1♂, CASC; Pahang, Hutan Lipur Menchali, 16 km S of Merchang, 1VI.1983, 1♀, leg. E. S. Ross, CASC; 16 km A of Kuala Rompin, cca 50 m., 16.VII.1989, 2juvs., leg. E. S. Ross, CASC; Pulo Kundur, Rhio archipelago (S.E. end of Malay Penninsula), 19.VI., 1im. , CASC; Gulf, Goh Samui Island, w. side, coconut groves w. and s. of Aangtong Village, 9º31'15 N–99º56'22E to 9º31'15 N–99º56'37E, 8.XI.1957, 1♂1♀1im., leg. H. A. Fehlman and R. R. Rofen, CASC; Tung Song, 75 m., 4.VII.1962, 2juvs., leg. E. S. Ross & D. Cavagnaro, CASC; Genting Highland, 1100–1700 m, II–X.1990, 1♂, leg. P. Butti, MZUF; Cameron Highlands, 1992, 2♀1juv., FKCP; Pahang, Johor Endau-Rompin n. park, 100 m, Salendang, 28.II–12.III.1995, 1♀, leg. M. Štrba & R. Hergovits, FKCP; NE, Jelawang Jungle, near Dabong, 29.VI.1995, 1♀, leg. S. Bečvář, FKCP; Cameron Highlands, Ringlet, 1000 mnm, VII.2000, 1♂, leg. A. Burda, FKCP. **Thailand,** 50 miles N. Bangkok (? error locality), 1.XII.1968, 1♂, CASC; Phang Nga, 18.XI.1984, 1juv. after 3rd ecdysis, leg. P. Beron & St. Andreev, SOFM No. 102; Phang Nga, 19.XI.1984, 2juvs. after 2nd ecdysis, leg. P. Beron & St. Andreev, SOFM No. 100; south, Betong, IV.1993, 1♂, leg. J. Strnad, FKCP.

DIAGNOSIS. Adults 100–135 mm long. Base color of adults uniformly black, only manus and telson may be reddish brown. In juveniles base color reddish brown, telson may be yellow. Pectinal teeth number 15–19 in both sexes. Sexual dimorphism in proportions of pedipalps not noticeable. Chela slightly lobiform, its adult length to width ratio 2.4–2.6 in both sexes. Much of manus smooth, with smooth carinae forming irregular reticulation. Patella of pedipalp with pronounced internal tubercle. Carapace with disc smooth and margins granulate. Telson hirsute, elongate, vesicle longer than aculeus.

COMMENTS. Couzijn (1981: 91) stated that the holotype could not be found and had apparently been destroyed during WW2. For that reason he designated a neotype. However, the holotype was not destroyed, it is preserved at ZMHB and I have been able to borrow it for study. It is an immature male. In accordance with ICZN Article 75.8, Couzijn's neotype designation is invalid.
Since it is impossible to ascertain that the BMNH specimens of *Palamnaeus oatesii* Pocock, 1900 really are syntypes, I do not designate a lectotype. The specimens were apparently first kept dry and then transferred to alcohol with the determination label *Palamnaeus oatesii*, but without any other data. No other specimens so labeled could found at BMNH.
The distribution of this species can be verified only for Malaysia and southern Thailand. Other records are

Figure 27: *Heterometrus spinifer*, dorsal view, male, syntype of *Palamnaeus* (= *Heterometrus*) *oatesii*.

misidentifications that concern primarily *H. cimrmani* sp. n. and *H. petersii*.

DISTRIBUTION. ? Cambodia, Malaysia, Thailand, ? Vietnam (Couzijn, 1981: 89–90). The type locality „India" must be regarded as erroneous. Couzijn (1981: 93) lists one female (the holotype of *H. spinifer solitarius* Couzijn, 1981) from Sri Lanka, but also that record should be regarded as doubtful.

Heterometrus swammerdami Simon, 1872
(Fig. 28)

Heterometrus swammerdami Simon, 1872: 56; Kraepelin, 1899: 112; Werner, 1902: 601; Kraepelin, 1913: 166; Borelli, 1915: 463; Lampe, 1918: 198; Roewer, 1929: 612; Werner, 1934: 278; Werner, 1936: 186; Roewer, 1943: 228; Takashima, 1945: 91; Minnocci, 1974: 38; Hjelle, 1990: 49; Root, 1990: 367; Warburg & Polis, 1990: 229.
Heterometrus swammerdammi: Pointer, 1991: 24.
Scorpio swammerdami: Simon, 1885: 39; Pocock, 1890: 237; Kraepelin, 1895: 42; Pocock, 1893: 304; Lönnberg, 1897: 186.
Heterometrus (*Scorpio*) *swammerdami*: Kraepelin, 1901: 271.
Pandinus swammerdami: Thorell, 1893: 379; Simon, 1905: 161.
Pandinus (*Heterometrus*) *swammerdami*: Karsch, 1879: 127.
Palamnaeus swammerdami: Pocock, 1900: 86; Tikader, 1987: 37.
Heterometrus (*Gigantometrus*) *swammerdami*: Couzijn, 1978: 330; Tikader & Bastawade, 1983: 562; Sissom, 1990: 131; Kovařík, 1992: 185; Kovařík, 1997: 183; Kovařík, 1998: 137; Fet, 2000: 443; Prendini, 2000: 44; Bastawade, 2002: 295; Kovařík, 2002: 17; Lourenço & Huber, 2002: 273.
Heterometrus (*Gigantometrus*) *swammerdami swammerdami*: Couzijn, 1981: 162; Fet, 2000: 444.
= *Heterometrus* (*Gigantometrus*) *swammerdami titanicus* Couzijn, 1981: 165; Vachon, 1982: 79; Kovařík, 1997: 183; Kovařík, 1998: 137; Fet, 2000: 444. **Syn. n.**
Heterometrus (*Gigantometrus*) *titanicus* Lourenço & Huber, 2002: 273.
Buthus ceylonicus (non Herbst, 1800): C. L. Koch, 1841: 9, fig. 698 (Kraepelin, 1895: 42).
Buthus ceylanicus: C. L. Koch, 1850: 88.
= *Pandinus asper* Thorell, 1876b: 199 (syn. by Pocock, 1890: 237).
= *Pandinus kochii* Karsch, 1879: 127; Karsch, 1887: 68; Karsch, 1892: 307; Moritz & Fischer, 1980: 316 (syn. by Pocock, 1890: 237).
= *Scorpio lucidipes* Simon, 1885: 38 (syn. by Pocock, 1890: 237).

TYPE LOCALITY AND TYPE REPOSITORY. East Indies; MNHN.

MATERIAL EXAMINED. **India**, ***Karnataka***, Malabar, Puddapoddy, 1♀, leg. O. Lotichius, SMFD No. 5333; Malabar-Küste, 1♂1♀, SMFD No. 8885/227; Lanooli, 1911, 1♀1juv., leg. Low-Beck, SMFD No. 5320; ***Madhya Pradesh***, Muki Balagath, 27.VIII.1957, 1♀, Deutsche Indien-Expedition 1955–57, ZMUH No. 688; ***Mysore***, Shimoga dist., Agumbe ghat, 2000 ft., T.R.S.N. coll., V. 2001, 1♀, FKCP; ***Orissa***, Daitari, Jaypur-Keonýahr District, 3.XII,1967, 1♀, leg. G. Topál, HNHM No. 1011; ***Pondichery***, Karaikal, III.1962, 1juv., IV.1962, 1♂2ims., VI,1962, 4juvs., VII,1963, 1juv., leg. P. Sushai Nathan, CASC; Karaikal, T.R.S.N. coll., 2001, 5♂6♀, 2002, 2♂3♀6ims., 2003, 1♂1♀, X.2003–V.2004, 2ims., FKCP. ***Tamil Nadu***, Madras, 1889, 1♂, leg. Th. Kolb, SMFD No. 5334; Madras, 2.II.1993, 1♀, leg. M. Veselý, FKCP; Podhigai Hills, Papanasam, Tirunelveli Dist., 2000 ft., T.R.S.N. coll., V.2004, 1im., FKCP. **Sri Lanka**, 1♂2ims., leg. Nonfried, NMPC; Kala Werva, 1896, 1im., leg. Madarász G. HNHM; Ceylon, Paradenya, 2juvs., No. SMFD 8853/195; Ceylon, Estata Beriturdi, 24.I.1914, 1juv., leg. J. Mastbaum, SMFD No. 5304; North Western prov., Puttalam, IV.1994, 1♂1♀1juv. after 4th ecdysis, FKCP. **?**: 1♂, MZUF; Anuradhapura, I. 1889, 1juv., leg. Friasted, MZUF; Ceylon, Kandy, 1♂, SMFD No. 6703/110;
Specimens born and reared in captivity (Locality Sri Lanka, North Western prov., Puttalam), 1juv. after 3rd ecdysis, 1juv. after 4th ecdysis, 1juv. after 5th ecdysis, 1im. after 6th ecdysis, 1♂ after 7th ecdysis, reared by F. Kovařík, FKCP.

DIAGNOSIS. Adults 130–176 mm long. Base color uniformly reddish brown to reddish black. Juveniles may be red with yellow telson. Pectinal teeth number 16–20. Sexual dimorphism in proportions of pedipalps not noticeable. Chela strongly lobiform, its length to width ratio 1.6– 1.8 in both sexes. Entire manus covered by large, rounded granulae that do not form true carinae. Patella of pedipalp without pronouced internal tubercle. Carapace with disc smooth, margins and posterior portion granulate, and anterior portion granulate and tuberculate; occasionally entire surface sparsely granulate. Fifth segment of metasoma longer than femur of pedipalp, fourth segment of metasoma approximately as long as femur of pedipalp. Telson bulbous, vesicle as long as or longer than aculeus.

COMMENTS. This species occurs in much of India and in Sri Lanka. Couzijn (1981: 165) described the Sri Lankan population as *H. s. titanicus*, and Lourenço & Huber

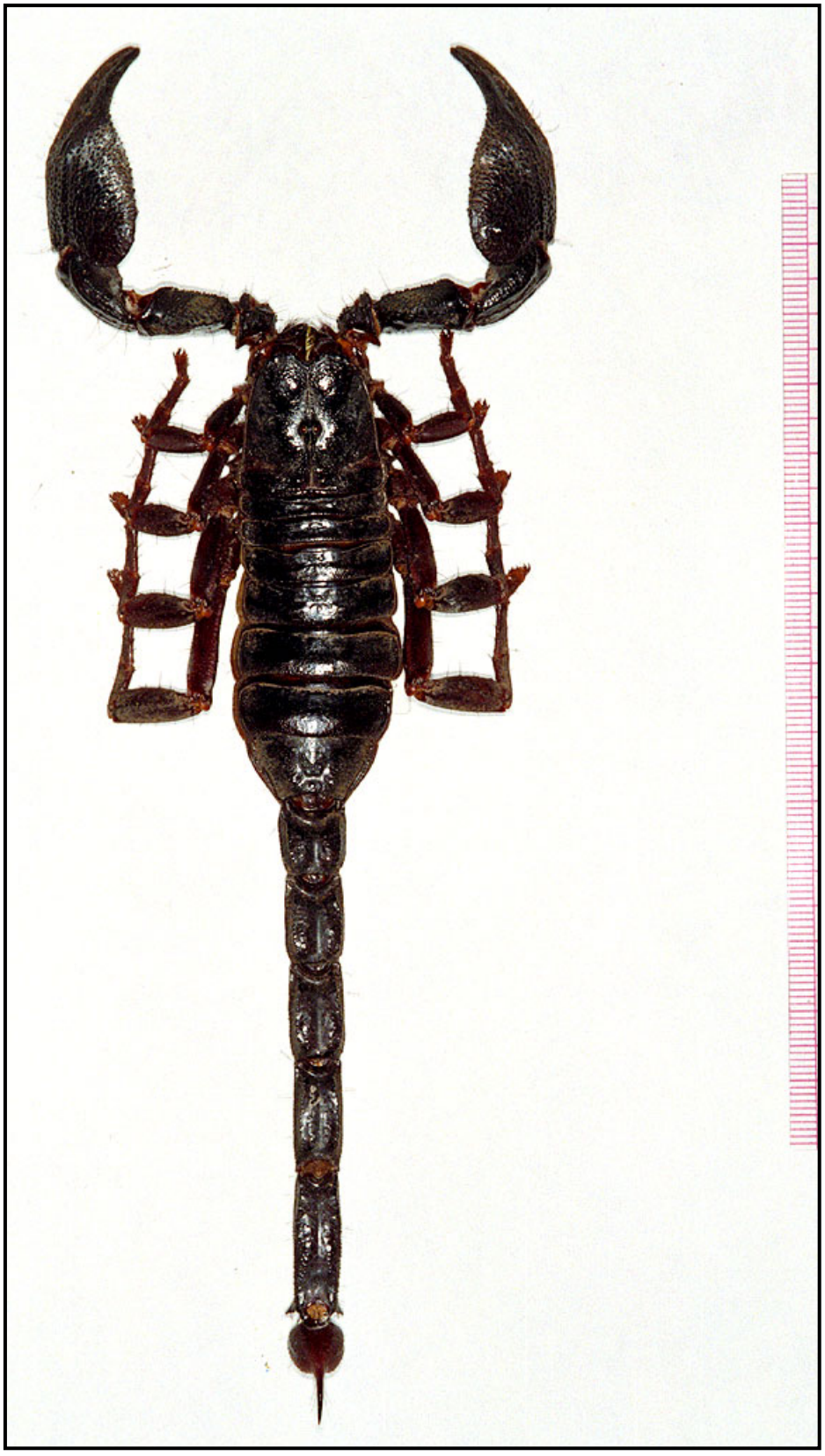


Figure 28: *Heterometrus swammerdami*, dorsal view, male.

(2002: 273) elevated this subspecies to species on geographic grounds, without any morphological justification. Examination of vast numbers of specimens from both India and Sri Lanka convinces me that they all are *H. swammerdami*.

DISTRIBUTION. Sri Lanka; India: Andhra Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Pondichery, Tamil Nadu, Uttar Pradesh, West Bengal (Karsch, 1892: 307, Pocock, 1900: 87, Couzijn, 1981: 162; Tikader & Bastawade, 1983: 567, Fet, 2000: 444), Orissa (Kovařík, 1997: 183), and Mysore (first report).

Heterometrus thorellii (Pocock, 1892) **comb. n.** (Fig. 29)

Palamnaeus bengalensis: Simon, 1884: 36–38 (360–362); Simon, 1887: 112.
Heterometrus (*Heterometrus*) *bengalensis*: Couzijn, 1981: 117 (in part); Kovařík, 1998: 137 (in part); Fet, 2000: 432 (in part); Kovařík, 2002: 17.
Palamnaeus thorellii Pocock, 1892: 40; Laurie, 1896a: 193; Laurie, 1896b: 127; Weidner, 1959: 103.
Scorpio longimanus thorellii: Kraepelin, 1895: 40.
Palamnaeus longimanus: Pocock, 1900: 97 (in part).

TYPE LOCALITY AND TYPE REPOSITORY. Burma, now Myanmar; BMNH.

MATERIAL EXAMINED. **Myanmar**, Prome, 1♀ (det. Couzijn, 1977 as *Heterometrus bengalensis*), SMFD No. 7986/160; Burma, Shayetunyo, 3ims. 13juvs, BMNH; Birmania, Mandalay, 1885–1889, 1♂, leg. L. Fea, MZUF No. 1014; Bago Division, Bago Yoma, A 18.81670, E 96.08504, 10.XII.1998, 1♂1♀6ims.6juvs., leg. J. B. Slowinski, H. E. Robeck, and K. D. Wiseman, CASC; Malun, 19.VIII.1974, 1♂1♀, leg. J. Dostál, FKCP; XI.1984, 1♂, FKCP; Division Magwe (Upper Minhla), Malyn Camp., IX–X.1985, 1♂, leg. M. Veselý, FKCP; W. Mandalay division, Bagan (Pagan)-Nyaung-U, 29–31.V.1997, 1♂, leg. J. Rejsek, FKCP.

DIAGNOSIS. Adults 90–120 mm long. Base color of adults uniformly brownish to black, only manus and telson may be reddish brown. Pectinal teeth number 13–18 in both sexes. Male with chela, femur and patella of pedipalp narrower and longer than in female. Chela not lobiform in male, slightly lobiform in female, its length to width ratio 3.8–5.5 in male, 2.6–3.1 in female. Much of manus reticulate, sparsely punctate and with smooth carinae, without granules. Patella of pedipalp with pronounced internal tubercle. Carapace usually with disc smooth and margins granulate. Telson hirsute, elongate, vesicle longer than aculeus.

COMMENTS. The taxonomy of this species has a rather complex history. First Simon (1884: 36–38) believed it to be *P. bengalensis*; then Pocock (1892: 40) described it as *P. thorellii* and distinguished it from the very similar *P. longimanus*, but subsequently (1900) he placed it in the synonymy of *P. longimanus*. This species can be easily distinguished from *H. bengalensis* on having a pronounced internal tubercle on the patella of pedipalp. It is more similar to *H. longimanus*, but has a different geographic distribution. The morphological differences between these species are given in the key below. Although Couzijn (1981: 117) was aware of some of the differences, he refused to accept the authenticity of the original type series of *H. bengalensis* and based on it his new species, *H.* (*Chersonesometrus*) *fastigiosus* Couzijn, 1981 (see comments under *H. bengalensis*). For that reason most references to and identifications of *H. bengalensis* between 1981 and 2002 are mistaken and in reality pertain to *H. thorellii* (Pocock, 1892) comb. n.

DISTRIBUTION. Myanmar (Simon, 1884: 38; Pocock, 1892: 40).

Heterometrus tristis (Henderson, 1919)

Palamnaeus tristis Henderson, 1919: 380.
Heterometrus tristis: Takashima, 1945: 94.
Heterometrus (*Chersonesometrus*) *tristis*: Couzijn, 1981: 157; Tikader & Bastawade, 1983: 582; Kovařík, 1998: 137; Fet, 2000:442.

TYPE LOCALITY AND TYPE REPOSITORY. India, Tirupati Hills, North Arcot District, NZSI.

COMMENTS. Unfortunately, I have not been able to examine this species and to include it in the key. Couzijn (1981: 157) stated that it is similar to *H. phipsoni* and gave its size as up to 120 mm. Tikader & Bastawade (1983: 582) stated that the holotype male is 75.5 mm long and the paratype female 98.5 mm long, however according to Henderson (1919: 380) the holotype male is 116 mm long and the paratype is also a male. Henderson further considers *H. tristis* closely related to *H. fulvipes* and *H. gravimanus*, which appears to be supported by its yellowish legs. From fig. 3 of Henderson (1919: 380) I suspect this species to be closest, or identical with, *H. gravimanus* Pocock, 1900, with which it shares the shape of pedipalps and the presence of carinae on the chela.

DISTRIBUTION. India: Andhra Pradesh and Tamil Nadu (Henderson, 1919: 380, Fet, 2000:442).

Figure 29: *Heterometrus thorellii*, dorsal view, male.

Heterometrus ubicki sp. n.
(Fig. 30)

TYPE LOCALITY AND TYPE REPOSITORY. India, Pondichery, Karaikal; FKCP.

TYPE MATERIAL. **India**, ***Pondichery***, Karaikal, T.R.S.N. coll., 2003, 1♂1♀ (holotype and allotype), 2002 and 2003, 9♂2♀ (paratypes), X.2003–V.2004, 8♂15♀2ims. 1juv. (paratypes), FKCP; Karaikal Territory, Kurumbargum P. O. Tanjore District, leg. P. Sushai Nathan, I.1954, 1♀ (paratype), VII.1954, 3juvs. (paratypes), 12.VIII.1954, 1♀ (paratype), CASC; Karaikal, Madras, leg. P. Sushai Nathan, VIII.1962, 2♀ (paratypes), IX.1962, 1♀ (paratype), X.1962, 1♀ (paratype), VI,1963, 1♂ (paratype), VII,1963, 4♀ (paratypes), VIII,1963, 2♀ (paratypes), VIII,1964, 1♀ (paratype), CASC; 1♀ (paratype) without data, CASC.

ETYMOLOGY. Named after Darrell Ubick of the California Academy of Sciences, San Francisco, USA, in appreciation of his kind help.

DIAGNOSIS. Adult male holotype 89 mm long. Other adults 77–90 mm long. Color uniformly reddish brown to black, legs yellow and telson yellow to reddish yellow. Pectinal teeth number 14–17 in females and 15–19 in males. Male has femur, patella and chela of pedipalp longer than female. Chela hirsute, its length to width ratio ca. 3.3 in males and 2.2 in females. Dorsal surface of manus tuberculate, without carinae. Patella of pedipalp without pronounced internal tubercle. Carapace either entirely granulate or disc smooth. Telson hirsute, bulbous, vesicle longer than aculeus. Genital operculum large, in female about as wide as long or slightly wider than long.

DESCRIPTION: The adult male holotype is 89 mm long, other adults are 70–90 mm long. Measurements of the carapace, telson, segments of the metasoma and segments of the pedipalps, and numbers of pectinal teeth are given in Table 1. Sexual dimorphism is expressed in the length of the femur, patella and chela of pedipalp, and also in the width of the chela.
COLORATION: The color is uniformly reddish brown to black, only legs are yellow and telson is yellow to reddish yellow. Sternites and tergites are of the same color (reddish brown to black), and pectens are yellow.
MESOSOMA AND CARAPACE: The mesosoma lacks carinae, is smooth, and the carapace is either entirely granulate or with disc smooth. Sternites are smooth, entirely without granules, only the seventh sternite may bear four smooth carinae. Pectinal teeth number 14–17 in females and 15–19 in males.
METASOMA AND TELSON: The metasoma is smooth and sparsely hirsute. The first to fourth segments bear eight carinae, of which the ventral are smooth and the dorsal consist of minute, rounded granules. The fifth segment bears five complete carinae and two additional lateral carinae developed only in the anterior half. All carinae of this segment consist of minute rounded or pointed granules and the spaces between them are finely granulate ventrally and smooth dorsally. The telson is bulbous and hirsute, dorsally without granules and ventrally with four rows of granules. The vesicle is longer than the aculeus.
PEDIPALPS: The femur has three granulose carinae and its dorsal surface is slightly granulated. The patella is smooth, dorsally and externally slightly tuberculate, with four smooth carinae (two of them on the external surface are often lacking), and on the internal surface with scattered pointed minute granules that do not form a conspicuous internal tubercle otherwise characteristic of the genus. The dorsal surface of the manus is tuberculate, sometimes with indistinct smooth carinae. The chela is hirsute and its external surface is smooth, with two carinae. The movable finger bears five or six straight rows of granules and internal and external granules.
LEGS: The legs bear solitary long and short setae. The third and fourth leg spine formula is 5–6:6–7.

AFFINITIES. The described features distinguish *H. ubicki* sp. n. from all other species of the genus. They are recounted in the key below. *H. ubicki* sp. n. is close to *H. thorellii* (Pocock, 1892) comb. n. but has yellow legs and lacks the pronounced internal tubercle on the patella of pedipalp.

Heterometrus wroughtoni (Pocock, 1899)
(Figs. 1–7, 31)

Palamnaeus wroughtoni Pocock, 1899: 745; Henderson, 1919: 381.
Heterometrus wroughtoni Pocock, 1900: 89; Takashima, 1945: 93; Khatoon, 1999: 223.
Heterometrus (*Chersonesometrus*) *wroughtoni*: Couzijn, 1981: 158; Tikader & Bastawade, 1983: 593; Kovařík, 1998: 137; Fet, 2000: 443.
Heterometrus (*Chersonesometrus*) *wrongtoni*: Bastawade, 2002: 296.
= *Heterometrus* (*Chersonesometrus*) *pelekomanus* Couzijn, 1981: 137; Tikader & Bastawade, 1983: 641; Kovařík, 1998: 136; Fet, 2000: 440; Bastawade, 2002: 296; Kovařík, 2002: 17. **Syn. n.**

TYPE LOCALITY AND TYPE REPOSITORY. India, Belgaum; BMNH.

TYPE MATERIAL EXAMINED. **India**, ***Karnataka***, Belgaum, 1♀ (lectotype) 3♂4juvs. (paralectotypes), leg.

Figure 30: *Heterometrus ubicki*, **sp. nov**., dorsal view, male holotype.

Figure 31: *Heterometrus wroughtoni*, dorsal view, male paralectotype.

W. A. Talbor, BMNH No. 1897.9.17.1-4.11.20; ***Maharshtra***, Deccan, Nilgiris, 2♂ (holotype and paratype of *Heterometrus* (*Chersonesometrus*) *pelekomanus* Couzijn, 1981), SMFD No. 1088/19, Bombay, Deccan, 1♂2♀18juvs. (paratypes of *Heterometrus* (*Chersonesometrus*) *pelekomanus* Couzijn, 1981), SMFD No. 329.

OTHER MATERIAL EXAMINED. **India**, ***Maharshtra***, Decan, 1920, 2ims., FKCP; ***Mysore***, 6 mi. NE Ramanagaram, 750 m., 25.II.1962, 1im., leg. E. S. Ross & D. Cavagnaro, CASC; Bandipur, 950 m, 18.III.1962, 1im., leg. E. S. Ross & D. Cavagnaro, CASC.

DIAGNOSIS. Adults 95–130 mm long. Color of adults uniformly reddish brown. Juveniles lighter colored and usually with yellow legs. Pectinal teeth number 13–17 in both sexes. Sexual dimorphism in proportions of pedipalps not noticeable. Chela lobiform, its adult length to width ratio 1.8–2.0. Entire manus covered by rounded granules which may merge and dorsally form up to five usually incomplete rows. Patella of pedipalp without pronouced internal tubercle. Carapace with smooth disc, granulose margins and tuberculate anterior portion. Telson hirsute, elongate, vesicle usually shorter than aculeus.

COMMENTS. When describing *Heterometrus pelekomanus,* Couzijn (1981: 139) compared it with *H. fulvipes* which he regarded as similar to and considered *H. wroughtoni* Pocock, 1900 as related to *H. phipsoni* (see 1981: 158). He entirely diregarded differences in sexual dimorphism of these species. The males of *H. fulvipes* and *H. phipsoni* have longer femur, patella and chela of pedipalp than the females, whereas in *H. wroughtoni* this dimorphism is absent. Examination of types of *H. wroughtoni* and *H. pelekomanus* convinces me that there is only one species involved, and that *H. pelekomanus* is a synonym of *H. wroughtoni*.

DISTRIBUTION. India: Karnataka, Maharashtra (Pocock, 1899: 745), Andhra Pradesh, Tamil Nadu (Couzijn, 1981: 138, Fet, 2000: 440), Mysore (first report), and was cited also from Pakistan.

Heterometrus xanthopus (Pocock, 1897) (Fig. 32)

Palamnaeus xanthopus Pocock, 1897: 116; Pocock, 1900: 92.
Heterometrus xanthopus: Kraepelin, 1899: 115; Takashima, 1945: 93; Khatavkar & More, 1990: 79.
Heterometrus (*Chersonesometrus*) *xanthopus*: Couzijn, 1981: 136; Tikader & Bastawade, 1983: 609; Kovařík, 1998: 137; Fet, 2000: 441; Bastawade, 2002: 296.

TYPE LOCALITY AND TYPE REPOSITORY. Kadas Tal, Satara, S. Dekhan; BMNH.
TYPE MATERIAL EXAMINED. **India**, S. Dekhan, Bombay, Kadas Tal (Satara), 1♂ (lectotype hereby designated) 1♀2juvs. (paralectotypes), leg. A.D.Wilkins, BMNH No. 1896.9.26.88-981.

DIAGNOSIS. Adults 60–80 mm long. Color of adults uniformly reddish brown, legs and telson yellow to yellowish or reddish brown, always lighter colored than body. Pectinal teeth number 13–16 in both sexes. Male has longer femur and patella of pedipalp. Chela lobiform, in male narrower, its length to width ratio 2.1 in males and 1.6 in females. Entire manus covered by rounded minute granules that may merge but are devoid of carinae. Patella of pedipalp without pronouced internal tubercle. Carapace in juveniles with disc smooth, margins granulate and anterior portion tuberculate; in adults entire carapace sparsely granulated. Vesicle of telson as long as or longer than aculeus.

COMMENTS. Couzijn (1981: 136) stated that the type series consists of the holotype, allotype and three juveniles. However, he did not designate them, and they had not been designated by the original describer (Pocock, 1897: 116) either. Consequently, in order to stabilize the nomenclature of the species, I hereby designate one of the examined syntypes as the lectotype.

DISTRIBUTION. India: Maharashtra (Pocock, 1897: 116).

Following is a key to the species of genus *Heterometrus*. Consult Tables 2-3 for a synopsis of the geographical distribution of these species.

Key to species of *Heterometrus* (except *H. tristis*)

1. Dorsal surface of chela covered by pointed or rounded granules 2
- Dorsal surface of chela smooth, may be punctate or uneven but not granulate 16

2. Fifth segment of metasoma longer than femur of pedipalp, fourth segment of metasoma about as long as femur of pedipalps..... 3
- Fifth segment of metasoma about as long as femur of pedipalp, fourth segment of metasoma shorter than femur of pedipalps 4

3. Chela of pedipalp of adults colored similarly to body. ..... ***H. swammerdami*** Simon, 1872
- Legs and chela of pedipalp of adults yellow to yellowish or reddish brown, always lighter colored than body ..... ***H. flavimanus*** (Pocock, 1900)

Figure 32: *Heterometrus xanthopus*, dorsal view, female paralectotype.

	BO	CA	IN	ID	LA	NI	MA	MY	NE	PA	PH	SI	SL	TH	VI
H. barberi	–	–	X	–	–	–	–	–	–	–	–	–	–	–	–
***H. beccaloniae* sp. n.**	–	–	X	–	–	–	–	–	–	–	–	–	–	–	–
H. bengalensis	–	–	X	–	–	–	–	–	–	–	–	–	–	–	–
***H. cimrmani* sp. n.**	–	–	–	–	–	–	–	–	–	–	–	–	–	X	X
H. cyaneus	X	–	–	X	–	X	–	–	–	–	X	–	–	–	–
H. flavimanus	–	–	X	–	–	–	–	–	–	–	–	–	–	–	–
H. fulvipes	–	–	X	–	–	–	–	–	–	–	–	–	–	–	–
H. gravimanus	–	–	X	–	–	–	–	–	–	–	–	–	X	–	–
H. indus	–	–	–	–	–	–	–	–	–	–	–	–	X	–	–
H. kanaraensis	–	–	X	–	–	–	–	–	–	–	–	–	–	–	–
H. keralaensis	–	–	X	–	–	–	–	–	–	–	–	–	–	–	–
H. laoticus	–	X	–	–	X	–	–	–	–	–	–	–	–	X	X
H. latimanus	–	–	X	–	–	–	–	–	–	–	–	–	–	–	–
H. liophysa	–	–	–	X	–	–	–	–	–	–	–	–	–	–	–
H. liurus	–	–	X	–	–	–	–	–	–	–	–	–	–	–	–
H. longimanus	–	–	–	X	–	–	X	–	–	–	X	X	–	–	–
H. madraspatensis	–	–	X	–	–	–	–	–	–	–	–	–	–	–	–
***H. mysorensis* sp. n.**	–	–	X	–	–	–	–	–	–	–	–	–	–	–	–
***H. nepalensis* sp. n.**	–	–	–	–	–	–	–	–	X	–	–	–	–	–	–
H. petersii	–	X	–	–	X	–	–	–	–	–	X	–	–	–	X
H. phipsoni	–	–	X	–	–	–	–	–	–	–	–	–	–	–	–
***H. rolciki* sp. n.**	–	–	X	–	–	–	–	–	–	–	–	–	–	–	–
H. scaber	–	–	X	–	–	–	–	–	–	–	–	–	–	–	–
***H. sejnai* sp. n.**	–	–	–	–	–	–	–	–	–	–	–	–	–	X	–
H. spinifer	–	?	–	–	–	–	X	–	–	–	–	–	–	X	?
H. swammerdami	–	–	X	–	–	–	–	–	–	–	–	–	X	–	–
***H. thorellii* comb. n.**	–	–	–	–	–	–	–	X	–	–	–	–	–	–	–
H. tristis	–	–	X	–	–	–	–	–	–	–	–	–	–	–	–
***H. ubicki* sp. n.**	–	–	X	–	–	–	–	–	–	–	–	–	–	–	–
H. wroughtoni	–	–	X	–	–	–	–	–	–	?	–	–	–	–	–
H. xanthopus	–	–	X	–	–	–	–	–	–	–	–	–	–	–	–

Table 2: Geographical distribution of *Heterometrus* species: BO – Borneo (Sabah), CA – Cambodia, IN – India, ID – Indonesia, LA – Laos, NI – Lesser Nicobar Islands, MA – Malaysia, MY – Myanmar, NE – Nepal, PA – Pakistan, PH – Philippines, SI – Singapore, SL – Sri Lanka, TH – Thailand, VI – Vietnam.

4. Manus of pedipalp rounded and convex, transition of manus into fixed finger is an impressed smooth facet.....***H. latimanus*** (Pocock, 1894)
- combination not as in (4) 5

5. Chela with five or six carinae mainly in externolateral part 6
- Chela without carinae but may bear rows of granules 7

6. Entire dorsal surface of adult femur and patella of pedipalp covered by granules. Pedipalp femur of female very wide (only twice longer than wide) ..... ***H. beccaloniae* sp. n.**
- Pedipalp femur of female more than twice as long as wide. Dorsal surface of femur with few granules, patella of pedipalp usually smooth. ..... ***H. gravimanus*** (Pocock, 1894)

	AP	BI	GO	GU	KA	KE	MP	MA	MY	OR	PO	RA	TN	UP	WB
H. barberi	–	–	–	–	–	–	–	–	–	–	–	–	X	–	–
***H. beccaloniae* sp. n.**	–	–	–	–	–	–	–	–	–	–	–	–	X	–	–
H. bengalensis	–	–	–	–	–	–	–	–	–	X	–	–	–	–	X
H. flavimanus	–	–	–	–	–	–	–	–	–	–	–	–	X	–	–
H. fulvipes	X	X	–	X	X	–	X	X	X	X	–	X	X	X	X
H. gravimanus	–	–	–	–	–	–	–	–	–	–	–	–	X	–	–
H. kanaraensis	–	–	X	–	X	–	–	X	–	–	–	–	–	–	–
H. keralaensis	–	–	–	–	–	X	–	X	–	–	–	–	–	–	–
H. liurus	–	–	–	–	–	–	X	–	–	–	–	–	–	–	–
H. madraspatensis	X	–	–	–	–	–	–	–	–	–	–	–	X	–	–
***H. mysorensis* sp. n.**	–	–	–	–	–	–	–	–	X	–	–	–	–	–	–
***H. rolciki* sp. n.**	–	–	–	–	–	–	–	–	–	–	–	–	X	–	–
H. phipsoni	–	–	–	–	–	X	X	X	–	X	–	–	X	–	X
H. scaber	–	–	–	–	X	X	–	X	X	–	X	–	X	–	–
H. swammerdami	X	–	–	–	X	–	X	X	X	X	X	–	X	X	X
H. tristis	X	–	–	–	–	–	–	–	–	–	–	–	X	–	–
***H. ubicki* sp. n.**	–	–	–	–	–	–	–	–	–	–	X	–	–	–	–
H. wroughtoni	X	–	–	–	X	–	–	X	X	–	–	–	X	–	–
H. xanthopus	–	–	–	–	–	–	–	X	–	–	–	–	–	–	–

Table 3: Geographical distribution of *Heterometrus* species in India: AP – Andhra Pradesh, BI – Bihar, GO – Goa, GU – Gujarat, KA – Karnataka, KE – Kerala, MP – Madhya Pradesh, MA – Maharashtra, MY – Mysore, OR – Orissa, PO – Pondichery, RA – Rajasthan, TN – Tamil Nadu, UP – Uttar Pradesh, WB – West Bengal.

7. Legs of adults yellow to yellowish or reddish brown, always lighter colored than body…….. 8
- Legs of adults colored similarly to body 11

8. Total length of adults less than 80 mm 9
- Total length of adults more than 80 mm 10

9. Genital operculum always wider than long. Entire adult carapace sparsely granulated. Pectinal teeth number 13–16. ..... ***H. xanthopus*** (Pocock, 1897)
- Genital operculum large, about as wide as long. Adult carapace smooth and glossy, anteriorly may be slightly tuberculate and bear sparse granules at margins. Pectinal teeth number 10–14. ..... ***H. liurus*** (Pocock, 1897)

10. Male and female chela differently shaped but of about the same width, its length to width ratio 1.7–1.9 in both sexes..... ***H. fulvipes*** (C. L. Koch, 1837)
- Chela narrower in male than in female, its length to width ratio 2.0–2.5 in males and 1.7–1.9 in females ..... ***H. madraspatensis*** Pocock, 1900

11. Base color uniformly black, only manus of pedipalp orangish yellow…..... ***H. barberi*** Pocock, 1900
- Entire pedipalp uniformly colored 12

12. Male has markedly longer femur, patella and chela of pedipalp than female 13
- Sexual dimorphism in proportions of pedipalps not noticeable. 14

13. Granules on dorsal surface of chela do not form rows (carinae) ……..... ***H. phipsoni*** (Pocock, 1893)
- Granules on dorsal surface of chela form elevated rows (carinae) …….. ***H. mysorensis* sp. n.**

14. Granules on chela do not form rows, pedipalp strongly hirsute. Adult color uniformly reddish black to black. 15
- Granules on chela form rows, pedipalp sparsely hirsute. Adult color uniformly reddish brown. ...…..... ***H. wroughtoni*** (Pocock, 1899)

15. Second metasomal segment wider than long (only male known). Nepal. ……...***H. nepalensis* sp. n.**
- Second metasomal segment longer than wide. Sri Lanka ……..... ***H. indus*** (De Geer, 1778)

16. Male has longer and markedly narrower chela of pedipalp than female. Aso male femur and patella are longer. 23

- Sexual dimorphism in proportions of pedipalp not noticeable. 17

17. Entire carapace, mesosoma and dorsal surface of metasomal segments granulate ..……..... 18
- Carapace with disc smooth or granulate, but no granules on mesosoma and dorsal surface of metasomal segments 19

18. Total length of adults 100 mm or less. Width of chela of pedipalp less than 10 mm. Adult chela length to width ratio 2.3 in both sexes ..... ***H. rolciki*** **sp. n.**
- Total length of adults 100–130 mm. Width of chela of pedipalp in adults always greater than 10 mm. Chela length to width ratio 1.7–2.0 in both sexes. ..…..... ***H. scaber*** (Thorell, 1876)

19. Dorsal keels on fifth metasomal segment consist of sparse large and pointed granules. Chela lobiform 20
- Dorsal keels on fifth metasomal segment consist of minute, less noticeable granules. Chela rounded. 21

20. Dorsal surface of fingers tuberculate 22
- Much of dorsal surface of fingers smooth and punctate ..... ***H. spinifer*** (Ehrenberg, 1828)

21. Male has more pronounced tooth on movable fingers of pedipalp than female. Carapace margins often granulate. ..... ***H. petersii*** (Thorell, 1876)
- Movable fingers of pedipalp without noticeable sexual dimorphism. Carapace usually smooth, without granules. ..... ***H. laoticus*** Couzijn, 1981

22. Total length of adults less than 80 mm. .....…..... ***H. sejnai*** **sp. n.**
- Total length of adults more than 95 mm ..... ***H. cyaneus*** (C. L. Koch, 1836)

23. Legs of adults yellow or yellowish, always lighter colored than body ..... ***H. ubicki*** **sp. n.**
- Legs of adults colored similarly to body 24

24. Patella of pedipalp without pronouced internal tubercle 25
- Patella of pedipalps with pronouced internal tubercle 27

25. Entire dorsal surface of chelas tuberculate..... ***H. bengalensis*** (C. L. Koch, 1841)
Dorsal surface of chelas smooth, may be slightly uneven and/or punctate 26

26. Adults 120–150 mm long. Male chela length to width ratio less than 2.4 .... ***H. kanaraensis*** (Pocock, 1900)
- Adults 110 mm long. Male chela length to width ratio more than 2.5 .....…..... ***H. keralaensis*** Tikader & Bastawade, 1983

27. Dorsal surface of female chela smooth and punctate. External surface of chela in both sexes smooth or tuberculate. Male chela very narrow and long, its length to width ratio 3.8–5.5. ..... ***H. thorellii*** Pocock, 1892
- Dorsal surface of female chela tuberculate. External surface of chela in both sexes with pointed granules. Male chela narrow and long, its length to width ratio 3.3–4.4. 28

28. Male chela narrow and long, its length to width ratio greater than 3.3. ..... ***H. longimanus*** (Herbst, 1800)
– Male chela length to width ratio less than 3.1 29

29. Male fingers of pedipalp very long. Fixed fingers longer, at least as long as manus of pedipalp ..... ***H. liophysa*** (Thorell, 1888)
- Male fixed fingers of pedipalp shorter than manus of pedipalp …….. ***H. cimrmani*** **sp. n.**

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