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Salticidae from the Himalayas Genus *Menemerus* Simon, 1868 (Araneae: Salticidae)*

by P. Jastrzębski

Abstract: The genus *Menemerus* Simon, 1868 from Nepal, Bhutan and Indian Himalayas is studied. *M. bivittatus* (Dufour, 1831), *M. fulvus* (L. Koch, 1878) and *M. brachygnathus* (Thorel, 1887) are diagnosed, described and illustrated. *M. brachygnathus* is reinstated, *Stridulattus stridulans* Petrunkevitch, 1926, is synonymized with *M. bivittatus*.

Introduction

The genus *Menemerus* has been established by SIMON (1868). According to PRÓSZYNSKI (1990), it includes more than 50 nominal species described from different areas (PECKHAM & PECKHAM, 1896, 1909, BERLAND & MILLOT, 1941, CAPORIACCO, 1949, SCHENKEL, 1953, 1963, GALIANO, 1965, 1978, 1984, PRÓSZYNSKI, 1976, 1984, 1987, RITCHMAN, CUTLER, 1978, WESOŁOWSKA, 1981, WANLESS, 1983, ŻABKA, 1985, DAVIES & ŻABKA, 1989). The number of species seems overestimated and the generic status of many species should be verified.

The present study has been made thanks to Prof. J. Martens (Mainz), Dr. W. Wittmer (Basel), Dr. H. Dastyh (Hamburg), Dr. J. Gruber (Wien) and Dr. M. Grasshoff (Frankfurt a. M.) who provided specimens. Dr. M. Żabka (Siedlce) provided critical remarks on the typescript.

Abbreviations used:

AEW = anterior eye width, ag = accessory gland, AL = abdomen length, CH = cephalothorax high, CL = cephalothorax length, cm = cymbium, co = copulatory openings, CW = cephalothorax width, e = embolus, EFL = eye field length, id = insemination duct, PEW = posterior eye width, pc = cymbial process, pm = prolateral metatarsal spines, pr = maxillar process, pt = prolateral tibial spines, rm = retrolateral metatarsal spines, rt = retrolateral tibial spines, s = spermatheca, sr = seminal reservoir, ST = stridulating tubercles, ta = tibial apophysis, tg = tegulum.

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Collections studied:

NHMB = Naturhistorisches Museum, Basel (specimens collected by Drs W. Wittmer, O. Stemmler, C. Baroni-Urbani & M. Wurmli).

SMF = Naturmuseum und Forschungsinstitut Seckenberg, Frankfurt a M. (collected by Drs. J. Martens, W. Schawaller, A. Ausobsky, & B. Daams).

ZMH = Zoologisches Museum, Universität Hamburg.

NHMW = Naturhistorisches Museum, Wien.

Menemerus Simon

Figs 1–6.

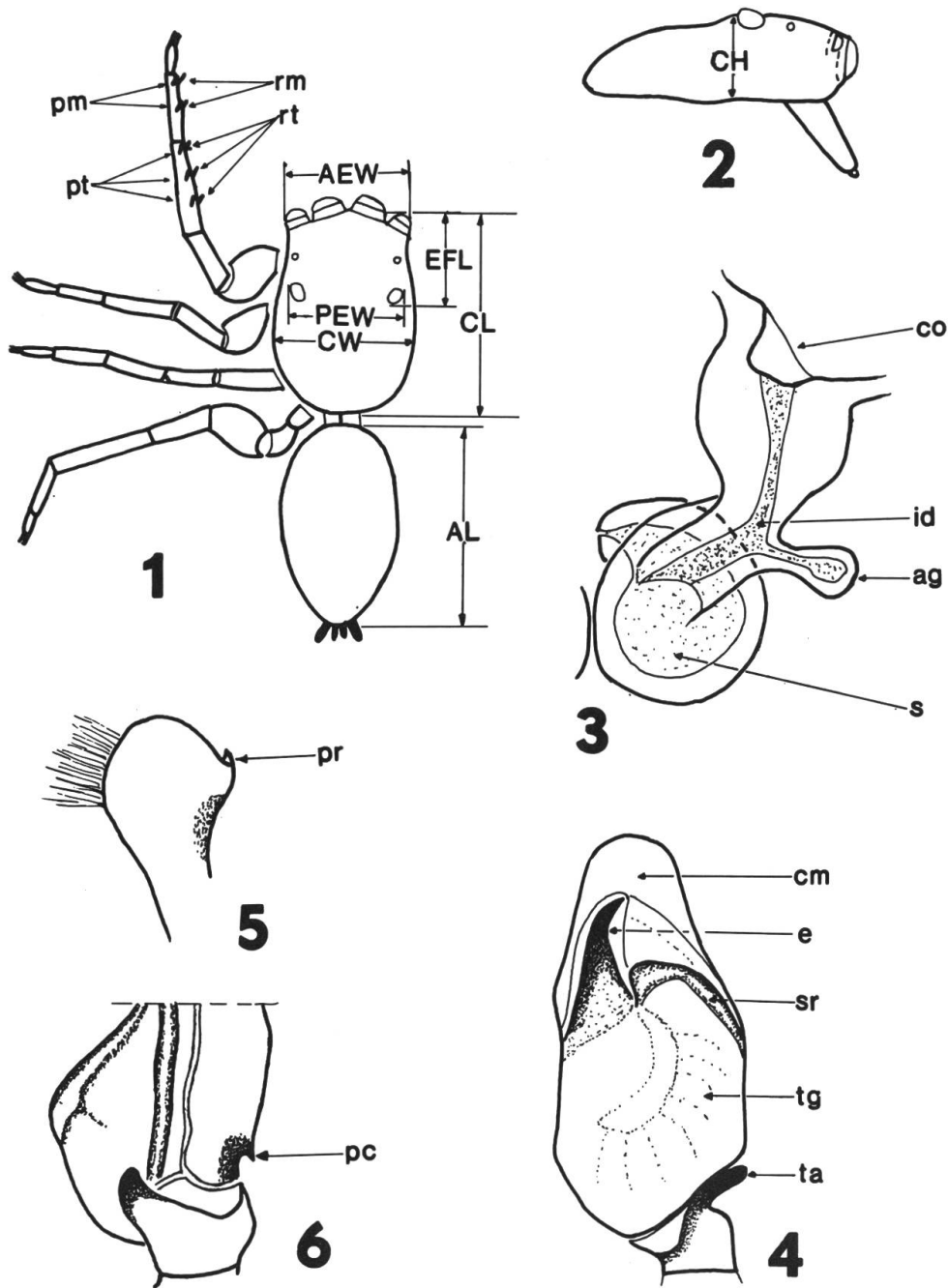
Menemerus SIMON, 1868, Ann. Soc. ent. Fr., 8: 11–72, 529–726.

Description (Figs 1–2). Medium spiders, 4.56 to 7.44 mm in length. The body flattened dorsoventrally. Cephalothorax longer than wide, eye field occupies less than 50 % of its total length. Posterior median eyes in the midway between anterior and posterior laterals. The lower margin fringed with white hairs. Abdomen oval, beige to grey and brown with darker stripes. Chelicerae of unident pattern, with 2 promarginal teeth and 1 retromarginal tooth. Male maxillae with lateral process (Fig. 5). Male palpal organ (Fig. 4) massive, cymbium with basal, lateral process (Fig. 6), seminal reservoir meandering, tibial apophysis single. Embolus usually accompanied by a membraneous conductor, flat and distinctive, its tip hooked. Female epigyne large and strongly sclerotized, with a median dam. Insemination ducts short, spermathecae rather small, one chambered, pear-shaped. Accessory glands distinctive (Fig. 3). Legs I the strongest. All femora with a few blackish bristles. Scopula absent. Leg formula: 4-1-2-3.

Diagnosis: The genus can be distinguished by flattened body form, fringe of white hairs along lower cephalothorax margin and by genitalia of both sexes.

Relationship and distribution:

PECKHAM & PECKHAM (1894) placed *Menemerus* into the *Marptusa* Group with few other genera. SIMON (1901) included it in *Marpisseae*, together with 15 genera, none of them closely related. PETRUNKEVITCH (1928) followed Simon's classification and added four other unrelated taxa. The largest number of nominal species (17) has been recorded from Africa, 10 from SE Asia and India, 11 from Central America and USA and 3 from S America. Single species have been found in Europe and Australia.



Figs 1–6: General characters of *Menemerus*: 1. dorsal aspect of male, 2. lateral view of males cephalothorax, 3. female genitalia, 4. male palpal organ, 5. maxillar process of cymbium. Abbreviations in the text.

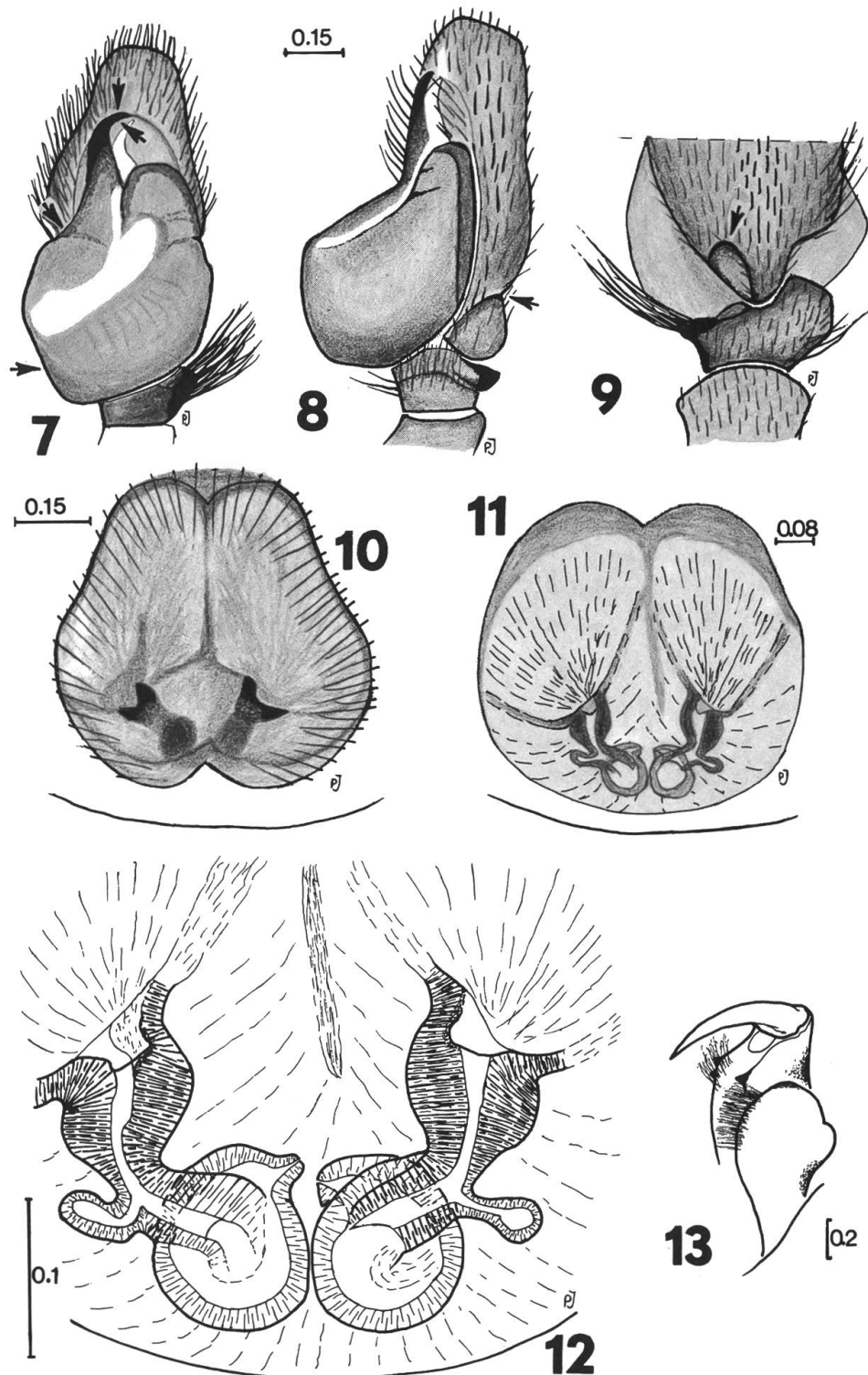
***Menemerus brachygnathus* (Thorell)**

Figs 7–13.

Tapinattus brachygnathus THORELL, 1887, Ann. Mus. civ. stor. nat. Genova, 5: 364.

Menemerus brachygnathus, Simon, 1901, Paris, 2: 381–668.

Menemerus brachygnathus, Żabka, 1985, Ann. zool. Warszawa, 39: 241:242.



Figs 7–13: *Menemerus brachygnathus* (Thorell): 7. ventral view of male palpal organ, 8. lateral view of male palpal organ, 9. dorsal view of tibial apophysis, 10. epigyne, 11. internal structures of female genitalia, 12. details of female genitalia, 13. cheliceral dentition and maxillar process.

Male (Figs 7–9). Eye field black brown with light sparse hairs; near anterior eyes and below eye field long dark brown bristles. Thorax brown with brown and light hairs. Lower margin with a fringe of white hairs. Abdomen with grey-brown pattern and beige spots, coated with dark hairs and with long white and brown bristles. Spinnerets brown. Clypeus brown, fringed with a white hairs. Chelicerae brown with transverse belt of white hairs making upside down “V” pattern. Maxillae and labium light brown, the first with lateral process (Fig. 13). Sternum similar with dirty coating. Venter grey, centrally darker. Palpal organ (Figs 7–9) brown with tufts of white hairs on dorsal femur and patella. Process of cymbium as shown in Fig. 9. Tegulum oval, weakly sclerotized in its central part. Embolus rather large, flat, its tip strongly curved. Tibial apophysis as in Figs 8–9. Legs brown, first ones the strongest. All coated with a few white hairs; femora with blackish dorsal bristles.

Spines formula: tI p1-1-1 r1-1-1, mI p1-1-1 r1-1-1 or tI p1-1-1 r0-1-1, mI p1-1 r1-1.

Dimensions: AEW 1.48, PEW 1.40, CW 2.03, EFL 1.08, CL 2.53, AL 2.87, CH 0.88.

Variability of males: Body colour of different intensity: cephalothorax from light brown to dark brown, eye field always darker, abdomen beige to dark grey, with irregular pattern, chelicerae, maxillae and labium brown to black, venter light beige to dark grey. Legs yellowish to brown, sometimes with darker joint area.

Female (Figs 10–12) similar to the male, abdomen lighter, beige, white hairs on clypeus less numerous, concentrated mostly in central part. White hairs on the chelicerae absent. Palps yellow orange with fringes of white hairs. Legs lighter than in male, yellow orange with dark grey joint area, coated with white and brown hairs. All femora with long dorsal bristles.

Epigyne as illustrated in figures 10–12.

Spines formula: tI p1-1-1 r0-1-1, mI p1-1 r1-1.

Dimensions: AEW 1.48, PEW 1.46, CW 2.04, EFL 1.06, CL 2.73, AL 2.73, AL 4.09, CH 0.87.

The females are morphologically identical to those of *M. fulvus*.

The species is reinstated because of wrong synonymisation with *M. fulvus* made by BOHDANOWICZ and PRÓSZYNSKI (1987). Both species differ in palpal organ structures as marked in Figs 7, 8, 9 and 14, 15, 16.

Material: Bhutan: 2 MM (NHMB), Changra 18 km S. Tongsa, 1900 m, 22.VI; 2 MM, 2 FF, 3 juv (NHMB), Smachi, 300 m, 7.–11.V.1972; India: 1 F (NHMB), Calcutta, 5.VII.1972; Nepal: 2 MM, Kathmandu City, 1350 m, Ganabahal, 17.–22.III.1980, Mar-

tens & Ausobsky; 1 M, 2 FF, Sankhua Sabha Distr., Arun Valley, Tunlingtar, 550 m, tree-rich cultural land near airport, 21.–22.VI.1988, Martens & Schawaller; 2 FF, 1 juv, Ilam Distr., nordl. Ilam, 1620 m, kulturland, 1.IV.1980, Martens & Ausobsky; 1 M, Kabre–Kirantichap–Zarangje Kholā, 18000–1160 m, 18.VI.1961, Janetschek; 1 M, Ilam Distr., n rdl. Ilam, 1250–1620 m, kulturl., 25.III.1980, Martens & Ausobsky; 1 F, Lamjung Distr., Marsyandi, 1150 m, Rinde von *Picus religiosa*, Nayagaon–Bahundanda, 10.IV.1980, Martens & Ausobsky; –1 M, Taplejung Distr., ascent to Kebang from Tada Kholā, 1500 m, sacred forest remnant, 25.IV.1988, Martens & Schawaller; 1 F, Ilam Distr., zw. Parbate und Mai Pokhari, kulturland, 1450–1700 m, 23.VIII.1983. Martens & Daams: 1 M, Sankhua Sabha Distr., Arun Valley, betw. Darapangma and Khandbari, 1400–1100 m, tree-rich cultural land, 21.VI., Martens & Schawaller.

Distribution: Burma (THORELL, 1887). Vietnam (ŽABKA, 1985), Indochina (SIMON, 1901), Japan (BOSENBERG & STRAND, 1906, BOHDANOWICZ & PRÓSZYNSKI, 1987), India, Nepal, Bhutan (here).

Diagnosis: The species differs from *M. fulvus* by the shape of tegulum, details of embolus and maxillar process as shown in Figs. 7, 8, 9, 13, 32 and 33.

Menemerus fulvus (L. Koch)

Figs 14–17.

Hasarius fulvus L. KOCH, 1878, Verh. zool.–bot. Ges. Wien 27: 782–784.

Menemerus confusus BOSENBERG & STRAND, 1906, Abh. senck. naturf. Ges., 30: 93–422.

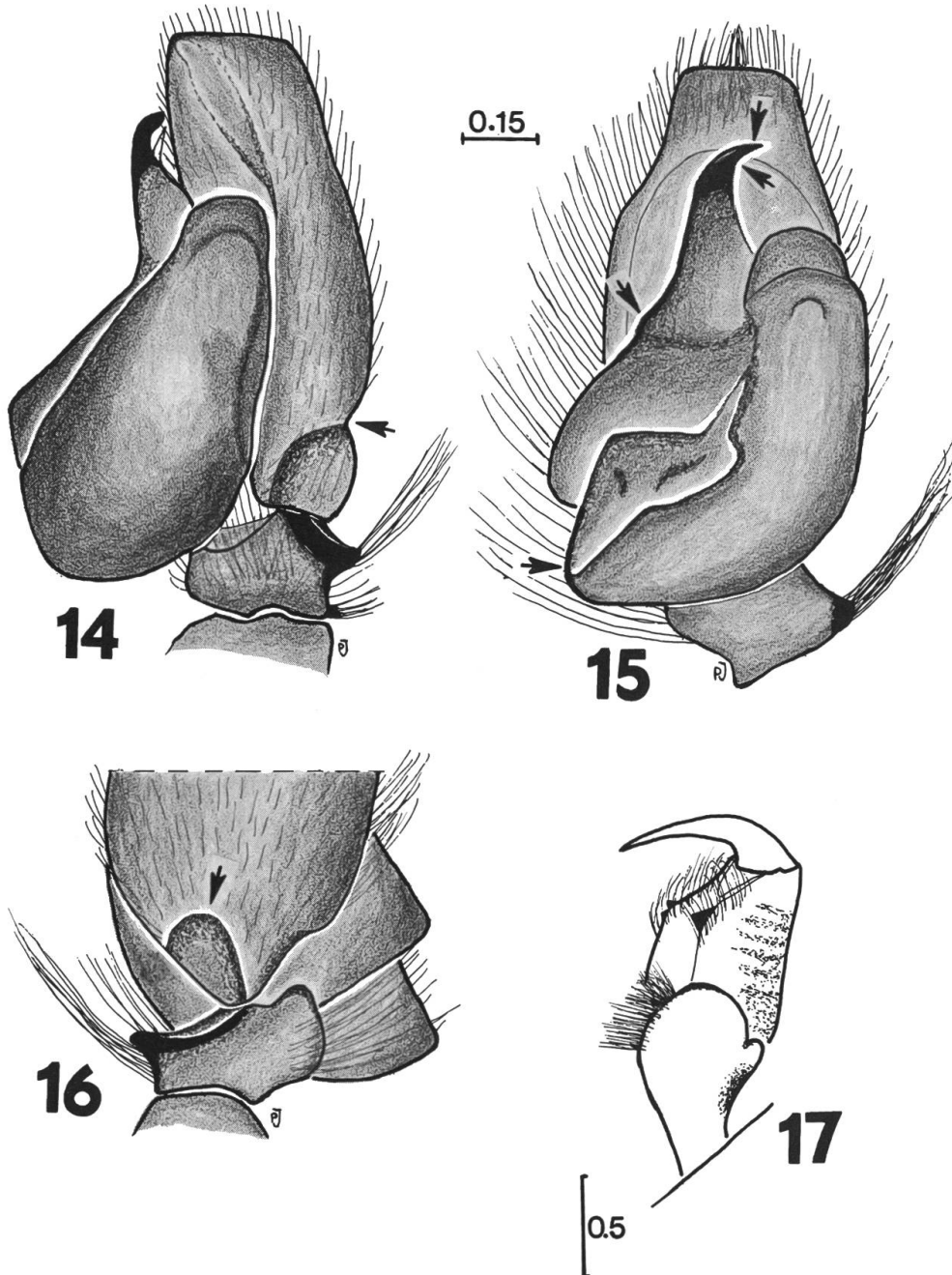
Menemerus confusus, WESOŁOWSKA, 1981, Ann. zool., 36: 147–149.

Menemerus fulvus, BOHDANOWICZ & PRÓSZYNSKI, 1987, Ann. zool. Warszawa, 41: 92–96.

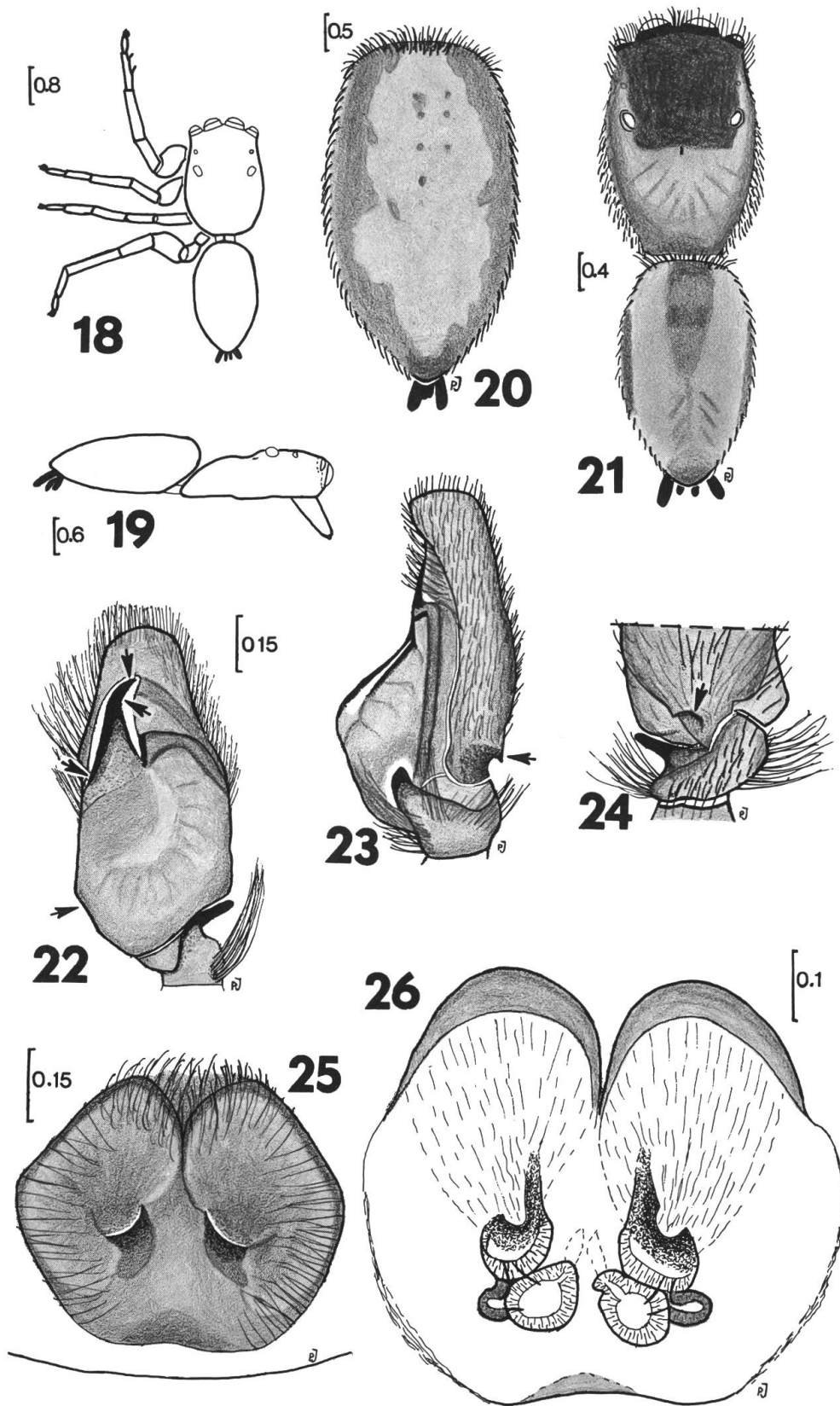
Male (Figs 14–17). Cephalothorax dark brown; surroundings of eyes black; along lower margin a fringe of white hairs, a few white and brown hairs scattered on the whole surface. Eye area with long, dark bristles. Abdomen generally grey-brown with dark anterior median belt, changing posteriorly in to herring bone pattern. Centrally symmetrical, beige markings. Sides with yellow spots. The whole surface covered with a few brown bristles and white hairs, more numerous marginally. Spinnerets dark brown. Clypeus as in previous species. Chelicerae light brown with a few white hairs; without distinctive transversal belt. Maxillae and labium chestnut brown, sternum darker, venter beige. Palpal organ (Figs 14–16) brown, covered with white and brown hairs, the first more numerous, especially on dorsal femora and tibiae. Process of cymbium as illustrated in Fig. 16. Tegulum bag-like, elongate, divided by a deep furrow (Fig. 15). Embolus rather large, flat, sloped; its tip not less bent than in *M. brachygnathus*, tapered. Tibial apophysis as shown in figs 14 and 16. Legs generally brown, segments darker around joints, three distal segments distinctly lighter centrally. Legs coated with white and brown hairs.

Spines formula : tI p1-1-1 r1-1-1, mI p1-1 r1-1 or tI p1-1-1 r0-1-1, ml p1-1 r1-1.

Dimensions: AEW 1.62, PEW 1.59, CW 2.31, EFL 1.26, CL 3.06, AL 3.27, CH 1.05.



Figs. 14–17: *Menemerus fulvus* (L. Koch): 14. lateral view of male palpal organ, 15. ventral view of male palpal organ, 16. dorsal view of tibial apophysis, 17. cheliceral dentition and maxillar process.



Material: Bhutan: 2 MM (NHMB), Wangdi Phodrang, 1300 m, 7.VI.1972.

Comparative material: *Hasarius fulvus* L. Koch SMF 2483. *Tapinatus brachygnathus* Thorell, 1 juv, paratype, Burma, Bhamo, ZMH. *Hasarius fulvus* L. Koch, lectotype; 1 M, Japan, NHMW.

Distribution: Japan (WESOŁOWSKA, 1981, BOHDANOWICZ & PRÓSZYNSKI, 1987), India, Nepal, Bhutan (here).

Diagnosis. This species differs from *M. brachygnathus* by the structure of tegulum, the shape of tibial apophysis, maxillar process and embolus as illustrated in Figs 14, 15, 16, 17, 30, 31.

Menemerus bivittatus (Dufour)

Figs 18–29.

Salticus bivittatus DUFOUR, 1831, Ann. sci. nat. Zool. Paris, 22: 355–371.

Marptusa marita KARSCH, 1879, Z. Naturw. Berlin, 358.

Menemerus bivittatus, SIMON, 1901, Paris, 2: 381–668.

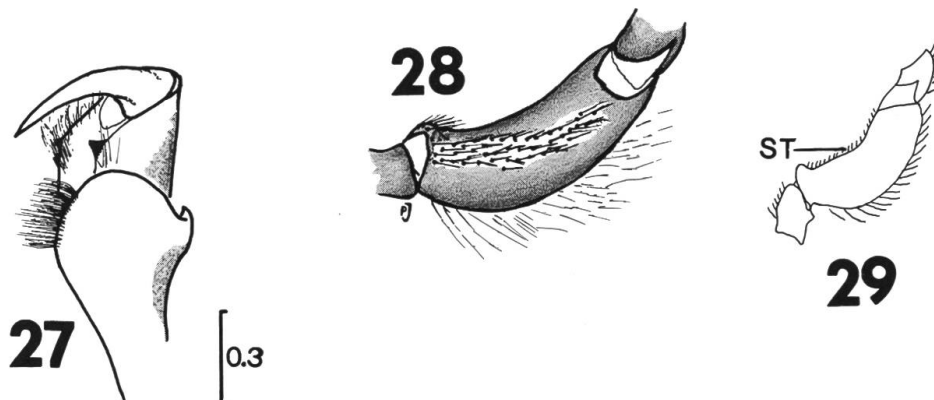
Menemerus bivittatus, BERLAND et MILLOT, 1941, Mem. Mus. Nat. Hist. Natur. Paris, 12: 297–424.

Menemerus bivittatus, WANLESS, 1983, Ann. Mus. roy. Afr. centr., Tervuren (Ser. 8) 241: 78.

Menemerus bivittatus, ŻABKA, 1985, Ann. zool. Warszawa, 39: 240–241.

Stridulattus stridulans PETRUNKEVITCH, 1926, Trans. Conn. Acad. Arts. Sci. New Haven, 28: 21–78.

Male (Figs 18, 19, 21–24, 27–29). Eye field dark brown, thorax lighter, lower margin with a fringe of white hairs. Hairiness scantier than in the previous species, also the abdomen lighter, with dark anterior median belt and beige and dark pattern. Hairiness as in the previous



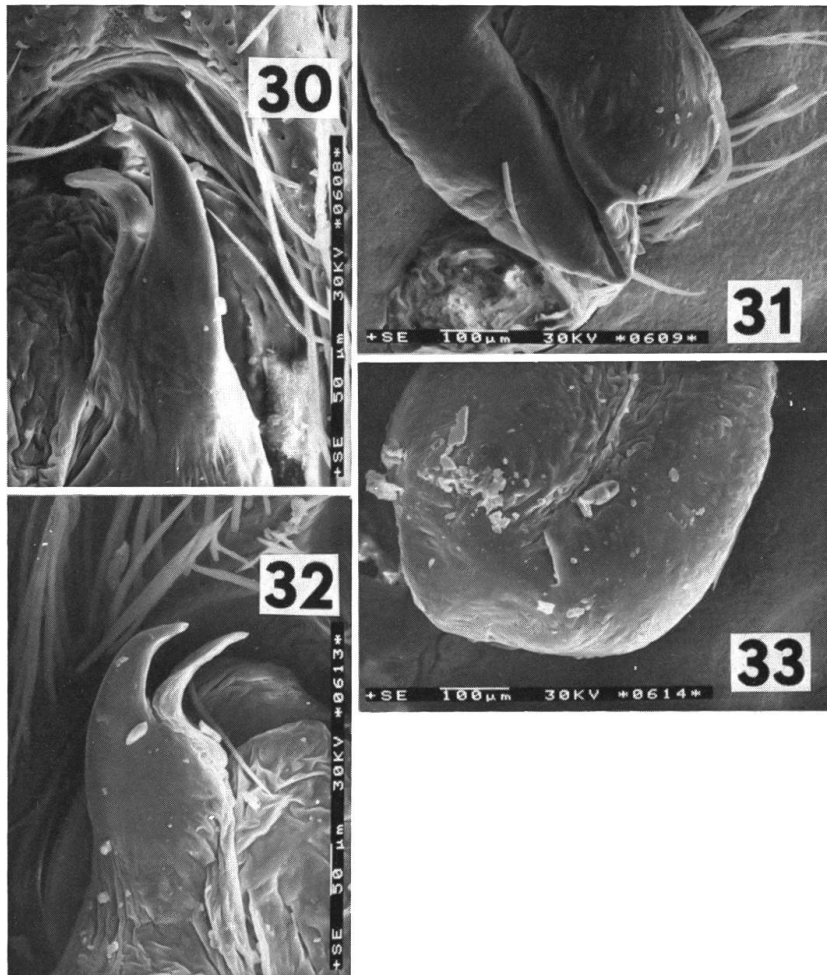
Figs 18–29: *Menemerus bivittatus* (Dufour): 18. dorsal aspect of male, 19. lateral view of male, 20. dorsal markings of females cephalothorax, 21. dorsal markings of male, 22. ventral view of male palpal organ, 23. lateral view of male palpal organ, 24. dorsal view of tibial apophysis, 25. epigyne, 26. internal structures of female genitalia, 27. cheliceral dentition and maxillar process, 28. on the palp femur, 29. original drawing of stridulating tubercles by Petrunkevitch.

species. Spinnerets grey. Clypeus and chelicerae as in *M. brachygnathus*. Maxillae and labium grey orange, the first with lateral process (Fig. 27). Sternum dirty brown. Venter light, centrally darker. Ventral palpal femora with stridulatory (?) tubercles (Fig. 28). Palpal organ (Figs 22–24) light brown, haired as in *M. fulvus* but differ in details marked with arrows. Legs I greyish orange, darker around joints. Other legs much lighter; hairiness scantier than in the previous species, light and brown. Scopula absent.

Spines formula: tI p1-1-1 rI-11, mI p1-1 r1-1.

Dimensions: AEW 1.44, PEW 1.38, CW 1.74, EFL 1.08. CL 2.40, AL 2.16, CH 0.78.

Female (Figs 20, 25, 26). Eye field darker, thorax brown, darkening marginally, fringed with white hairs. Whole surface with brown hairs



Figs 30–33: Males palpal organs: 30–31. *Menemerus fulvus*, 32–33. *M. brachygnathus*, 30, 32. details of embolus and conductor, 31, 33. basal part of tegulum.

longer and more numerous around eyes. Abdomen generally light, with brown margin; lateral surface and venter yellow; whole with brown and white hairs. Spinnerets grey yellow. Clypeus light brown with white and yellowish hairs. Chelicerae dark brown. Maxillae and labium brown. Sternum yellow, darker anteriorly. Palps yellow orange with fringes of light hairs. Epigyne and internal genitalia as illustrated in figures 25 and 26, almost identical to *M. brachygnathus*. Copulatory openings semicircular, diagonal. Insemination ducts very short. Accessory glands distinctive, mace-like. Spermathecae oval. Legs I greyish orange, next lighter and lighter, IV light yellow. All legs lighter ventrally.

Spines formula: tI p2-1-1 r0-1-1, mI p1-1 r1-1.

Dimensions: AEW 1.68, PEW 1.68, CW 2.28, EFL 1.20, CL 3.06, AL 4.38, CH 1.02.

Remark: *Stridulattus stridulans* described by PETRUNKEVITCH (1926) is synonymised on the basis of original description and drawings.

Material: Nepal: 1 M, 1 F, 5 juv, Bargo Terai, westlich Lestrung–Staus, 1900 m, 3.IV.1980.

Distribution: pantropical (e.g. ŽABKA 1985).

Diagnosis. This species can be recognized by the shape of tibial apophysis, details of embolus and shape of maxillar process as in Figs 22, 23, 24 and 27.

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