

The genus *Tenagogonus* Stål in the Collections of the Zoological Museum of Copenhagen (Hemiptera : Gerridae)

by
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Introduction.

During a visit to the Zoological Museum of Copenhagen in the winter of 1961 the author found a very interesting collection of the genus *Tenagogonus* Stål among unidentified Gerrids in the collection of Hemiptera. Among the specimens were two species which appeared, in the opinion of the author, to be new. The collection was subsequently sent to the late Dr. H. B. Hungerford of the University of Kansas, U. S. A., for further examination. He confirmed the identifications and requested me to describe the new species and publish the new distributional records for some of the other species.

The material constitutes 35 specimens distributed on 8 species. The specimens were all collected by Danish expeditions, chiefly by the Danish frigate "Galathea" during its circumnavigation of the Globe in 1845—47, or present in B. W. Westermann's collection.

Genus *Tenagogonus* Stål, 1853.

Hungerford & Matsuda revealed in their monograph (1958) that *Tenagogonus* Stål and *Limnometra* Mayr, though treated as distinct genera, constitute a natural group. At a later date (1960) the same authors reduced *Limnometra* to a subgenus in *Tenagogonus*, and this classification is followed in the present work.

Subgenus *Tenagogonus* Stål **s. str.**, 1853.

Two species are represented in the material.

Tenagonus (s. str.) albovittatus Stål.

- 1855 *Tenagonus albovittatus* Stål, Öf. Vet. Acad. Förh. 12(1), p. 45. (Described from Natal).
- 1940 *non Tenagonus albovittatus* Stål. Poisson, Bull. Mus. Roy. Hist. Nat. Belg. 16(40), p. 5—7, fig. 4—5. (= *Tenagonus zambezinus* (Pois.)).
- 1954 *Tenagonus* (subgen. *Tenagonus s. str.*) *albovittatus* Stål. Poisson, Institute des Parcs Nationaux du Congo Belge. Exploration du Parc Nat. de l'Upemba 31, p. 3—4.
- 1958 *Tenagonus albovittata* Stål. Hungerford & Matsuda, Univ. Kansas Sci. Bull. 39 (9), p. 382—383, pl. 1 fig. 1, pl. 7 fig. 1. (Quoting Gabon, Sangmelina, West Africa, and Cameroons).

Data on distribution: 1 winged male labeled "St. Thomas Mus. Westermann"; I cannot find such a place in or near Africa. 2 winged females labeled "Luashediriver, Gube. St. nr. 19, date 20-1-1947. On the watersurface. Univ. Centralafr. Exped. 1946—1947"; the locality is situated in Congo, 70 km. east of Faradje. Gallery forest surrounded by savannah.

Tenagonus (s. str.) nicobarensis sp. nov.

(Figs. 1—9).

Size: Wingless male 6.24 mm. long; width across mesoacetabula 2.00 mm.; width across head 1.32 mm. A larger wingless male is 6.62 mm long; width across mesoacetabula 2.23 mm.; width across head 1.38 mm. Wingless female 6.93 mm. long; width across mesoacetabula 2.52 mm.; width across head 1.40 mm. Winged male 7.18 mm. long; width across mesoacetabula 2.08 mm.; width across head 1.26 mm. Winged female 7.62 mm. long; width across mesoacetabula 2.53 mm.; width across head 1.39 mm.

Colour, wingless male: Light yellowish brown with dark reddish brown to black figures. Dorsal surface of head with a short dark median band at its base which splits into two diverging bands that converge and often unit before the base of clypeus; lateral margins of head with a longitudinal dark band reaching from base of head to point in front of anterior level of the eyes, not reaching the inner margin of the eyes; clypeus and antennal tubercles dark reddish brown; antennae reddish brown, first segment darker towards apex. Pronotum yellowish brown to light reddish brown; in the middle with a longitudinal dark band reaching from the anterior margin to the apex of the posterior lobe, somewhat broader on the anterior lobe and bor-

dered by broad light reddish brown bands on the posterior lobe to the level of the humeri; lateral dark bands on the anterior lobe broad, turning inwards and then upwards at the posterior margin of the anterior lobe; the posterior lobe with a slender submarginal dark line to the humeri where it first broadens, then tapers and is bordered by a pale line around the apical lobe which sometimes fades out before reaching the median dark band. Metanotum with a short median dark band which broadens posteriorly, but does not reach the posterior margin, and two broad lateral dark bands. Dark band on propleuron behind eye continued as two broad bands on mesopleuron; the lower one broader, ending at the level of the humeri; the upper one narrower and divides into two at the level of the humeri (the lower one of which ends before reaching the band above the metaacetabulum, the upper one usually continued on connexivum). A large ventero-lateral dark spot or band on mesopleuron, usually extending forwards as a more or less narrow band; a large dark spot before the mesoacetabular cleft; the anterior acetabula with dark apical margin; the middle acetabula with two curved spots, one of them at the apical margin; the posterior acetabula with a small dark curved spot. The abdominal tergites yellowish brown, each segment with broad dark lateral markings; the dorsal surface of the eighth segment, whole ninth segment, and the anal conus reddish brown; eighth segment yellowish underneath. Connexivum above with broad dark outer half. Venter light yellowish, almost white; underside of connexivum brownish.

Colour, wingless female: Ground colour yellowish brown to light reddish brown. The dark markings usually more distinct than in male. The rostrum on lower surface with a more or less visible longitudinal dark band. Mesopleural bands broader; the two dark spots on the middle acetabula often fused. Each abdominal tergite with a median pale spot bordered by more or less visible dark reddish brown to black spots. The apex of connexival spines blackish.

Colour, winged male and female: The hemelytron yellowish brown with dark reddish brown veins.

Structure, wingless male: All the wingless males and females slightly brachypterous, the wing-pads usually too short to be exposed: Proportional length of the antennal segments: 1st: 2nd: 3rd: 4th: :27:25:32:42 (?curved*); total length of

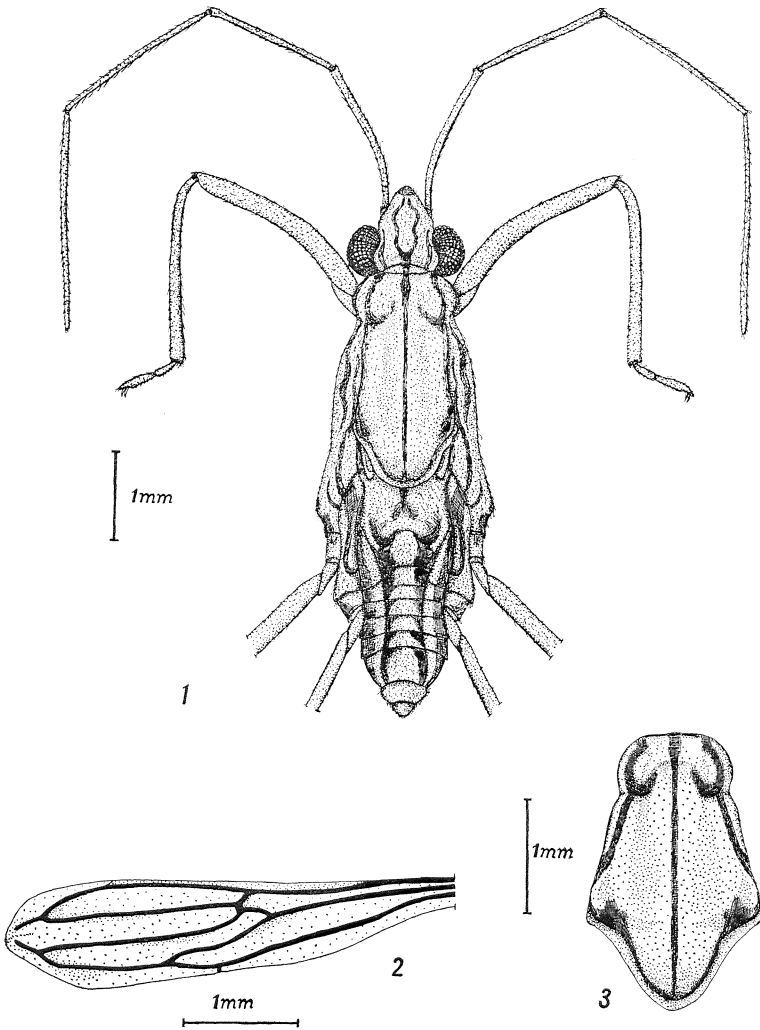
*) 1 unit equal to 0.063 mm.

antenna 7.94 mm., much longer than the body (6.24 mm.). Rostrum moderately slender, covering less than one third of mesosternum; proportional length of the rostral segments: 1st: 2nd: 3rd: 4th: :8:3:24:6. Pronotum almost parallel-sided, slightly broadened across the humeri, the ratio of the length and width across humeri 42:19 (in a larger wingless male paratype 45:19). Mesosternum in the middle deeply sulcated, producing a narrow groove that widens greatly posteriorly; metasternum with fairly distinct omphalial protuberance. Front femur slightly thicker than middle femur, basal third somewhat thicker, becoming curved. — Proportional length of the leg segments as follows:

	Femur	Tibia	First tarsal segment	Second tarsal segment
Front leg ...	38	35	4	7
Middle leg ..	98	72	30	7
Hind leg	98	?	?	?

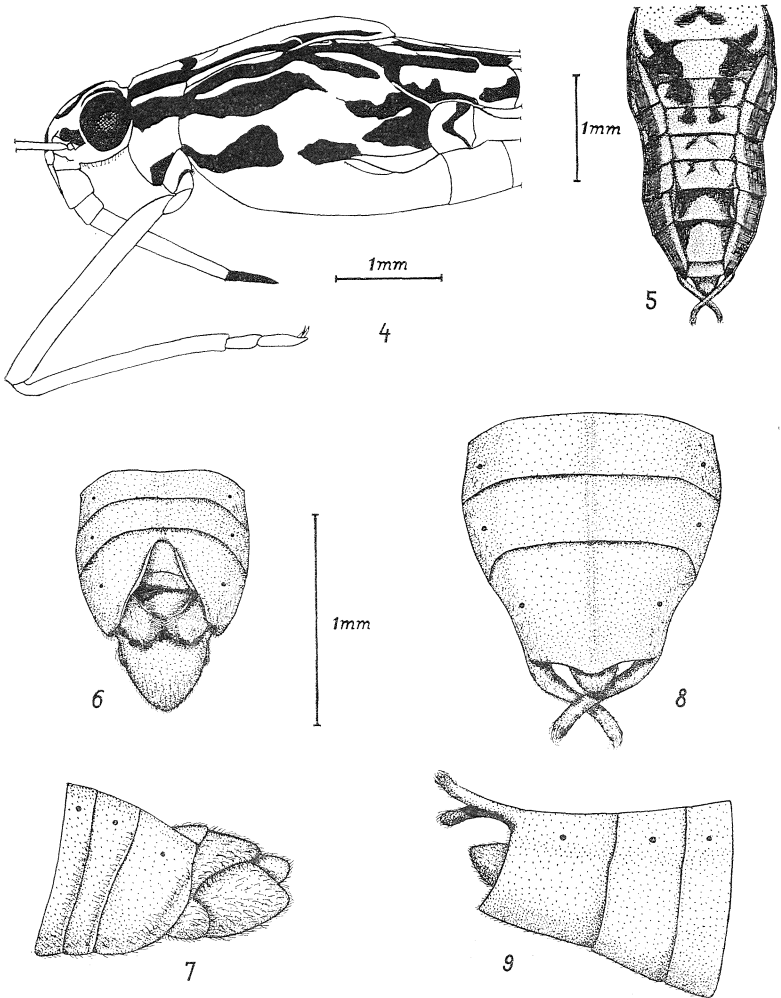
One wingless male paratype has proportional length of the leg segments as follows (femur, tibia, first tarsal segment, second tarsal segment): Front leg: 44:38:5:7; middle leg: 111:83:33:8; hind leg: 110:52:10:8. Connexivum broad and upper margin sinuated; without connexival spines. Abdominal tergites fairly short, last one not as long as the preceding two. Hind coxae reaching the rear margin of third ventral abdominal segment; last ventral abdominal segment as long as the preceding two segments, and together with the genital segments longer than the rest of the abdomen. Posterior margin of the seventh abdominal sternite with a large V-shaped impression; the dorsal surface of the eighth abdominal segment longer and roof-like, reaching over the ventral margin; dorsal margin of the eighth segment rounded, ventral margin W-shaped; ventral surface of the eighth segment with a median groove, widened anteriorly. No hair tufts present on the genital capsule.

Structure, wingless female: Antennal formula: 1st: 2nd: 3rd: 4th: :25:21:29:35 (?curved); antennae only slightly longer, if at all, than the body (6.94 mm. compared to 6.93 mm.). Rostrum longer than in male, covering more than one third of mesosternum. Pronotum relatively broader than in male. Front femur not thicker in the basal third and only slightly curved. Connexivum with the outer angles produced into long spines, the right usually overlapping the left. Hind coxae reaching



Figs. 1—3. *Tenagonus (s. str.) nicobarensis* sp. nov.

1. Dorsal view of wingless male holotype; 2. Hemelytron and 3. prothorax, both in winged male.



Figs. 4—9. *Tenagogonus (s. str.) nicobarensis* sp. nov.

4. Lateral view of head and thorax and 5. dorsal view of abdomen, both in wingless female allotype; 6. and 7. ventral and lateral view of the tip of abdomen in wingless male holotype; 8. and 9. ventral and lateral view of the tip of abdomen in wingless female allotype.

beyond the rear margin of the third ventral abdominal segment. Last ventral abdominal segment tubular, shorter than the two preceding segments and together with the genital segments shorter than the rest of the abdomen.

Structure, winged male and female: Shape of pronotum and venation of hemelytron as shown in Figs. 3 and 2.

Described from wingless male holotype and wingless female allotype labeled "Nangkovri. Galatea". 2 wingless males labeled "Kar Nicobar. Galatea", 2 winged males, 2 winged females, and 1 wingless female labeled "Nangkovri. Galatea", and 2 winged females labeled "Small Nicobar. Galatea" are paratypes. The types are in the collections of the Zoological Museum, Copenhagen. Two paratypes are now included in the collections of the University of Kansas.

Closely related to *Tenagonus (s. str.) pravipes* Bergroth and its subspecies *T. pravipes bergrothi* Hungerford & Matsuda. As in these subspecies, the basal third of the front femur in the male is somewhat thicker and then becomes curved. The modification of the last ventral abdominal segment in the male and the overlapping connexival spines in the female separates the new species from *T. pravipes bergrothi* H. & M. The types of *T. pravipes* Bergroth can not be located but if they had had the distinct characters of my species these would certainly have been noted by Bergroth.

Known only from the type series from the Nicobar Islands.

Subgenus **Limnometra** Mayr, 1865.

Six species are represented in the material.

Tenagonus (Limnometra) minutus (Mayr).

(Figs. 10–12).

- 1865 *Limnometra minuta* Mayr, Verh. Zool.-bot. Vereins, Wien 15, p. 444.
(Described from Sambelong, Nicobar Islands).
- 1865 *Limnometra minuta* Mayr, Hemiptera in Novara Expedition, Zoolog. Theil, Wien 2(1), p. 175, 176–177, pl. 5 fig. 54a–54b.
- 1958 *Limnometra minuta* Mayr. Hungerford & Matsuda, Univ. Kansas Sci. Bull. 39(9), p. 397–398, pl. 2 fig. 13, pl. 10 fig. 14.

Data on distribution: Until now this small species was only known from the winged male type from the Nicobar Islands. I have examined 3 winged males and 4 winged females labeled

"Small Nicobar. Galatea." Two of these specimens are now in the collections of the University of Kansas.

Notes on the male: One winged male is 7.95 mm. long; width across humeri 1.45 mm.; width across mesoacetabula 2.15 mm. Proportional length of the antennal segments (1st: 2nd: 3rd: 4th): 34:27:36:44 (?curved), whole antenna 8.88 mm. long, thus longer than the body. Hungerford & Matsuda (1958, p. 398) state that the antenna is shorter than the body; it therefore seems to be a matter of individual variation. Proportional length of the leg segments (femur, tibia, first tarsal segment, second tarsal segment): Front leg: 42:38:5:6; middle leg: 107:95:33:8; hind leg: 124:49:11:?. Another winged male measures 8.27 mm. long; width across humeri 1.47 mm.; width across mesoacetabula 2.17 mm. The antenna are missing. Proportional length of the leg segments (femur, tibia, first tarsal segment, second tarsal segment): Front leg: 40:38:5:6; middle leg: 105:92:31:?. hind leg: 120:48:10:6.

Description of the winged female:

Size: 9.54 mm. long; width across humeri 1.64 mm.; width across mesoacetabula 2.58 mm.

Colour: As in male.

Structure: Longer and stouter than the male. Proportional length of the antennal segments (1st: 2nd: 3rd: 4th): 34:24:30:46; the whole antenna 8.44 mm., thus shorter than the body (9.54 mm.). Front femur not twice as thick as the tibia and only slightly thicker, if at all, than middle femur; only slightly curved (Fig. 11). — Proportional length of the leg segments as follows:

	Femur	Tibia	First tarsal segment	Second tarsal segment
Front leg ...	49	43	7	8
Middle leg ..	126	111	37	10
Hind leg ...	139	65	14	8

Metasternum slightly shorter than the first two abdominal segments. Genital segments only half as long as the last ventral abdominal segment. Connexival spines short, pointed, not triangular as in the male (Fig. 12), and not reaching beyond, but sometimes reaching, the tip of abdomen.

The described female is in the Zoological Museum, Copenhagen.

Tenagonus (Limnometra) octopunctatus (Hungerford).

1955. *Limnometra octopunctatus* Hungerford, Journal Kansas Ent. Soc. 28(2), p. 67—68. (Described from N.E. Sumatra).

1958 *Limnometra octopunctata* Hungerford. Hungerford & Matsuda, Univ. Kansas Sci. Bull. 39(9), p. 400—401, pl. 4 fig. 22, pl. 10 fig. 13.

Data on distribution: Known only from the wingless types from N. E. Sumatra. I have examined 1 winged male labeled "Pulo Penang. Mus. Westermann". Pulo Penang is an island in the Malacca-strait and is a new locality for the species.

Notes on the winged male: 11.93 mm. long; width across humeri 2.08 mm.; width across mesoacetabula 3.15 mm. Proportional length of the leg segments (femur, tibia, first tarsal segment, second tarsal segment): Front leg: 70:56:10:10; middle leg: 186:177:53:10; hind leg: 195:104:17:9. The venter faintly carinated in the middle.

Tenagonus (Limnometra) fluviorum (Fabricius).

1798 *Gerris fluviorum* Fabricius, Ent. Syst. Suppl. 543. 2. (Described from Tranquebar in Tanjore Dist., India).

1840 *Gerris armata* Spinola, Essai sur les Insectes Hémiptères, p. 65. (Described from Bombay, India).

Data on distribution: 2 males and 1 female labeled "Tranquebar. Mus. Westermann", and 1 male labeled "Trankebar. Mus. Colsmann"; all winged.

Tenagonus (Limnometra) anadyomene (Kirkaldy).

1901 *Gerris (Limnometra) anadyomene* Kirkaldy, Entomologist 34, p. 117. (Described from Punduloya, Ceylon).

Data on distribution: 1 wingless female labeled "Koh Chang. Jan. 1900. Th. Mortensen". Koh Chang is a small island in the Gulf of Siam.

Notes on structure: This specimen has the antennal formula (1st: 2nd: 3rd: 4th): 35:25:34:47; the fourth segment being the longest. Hungerford & Matsuda (1958, p. 403) state that the first segment is the longest in the female. The connexival spines reaches slightly beyond the abdominal tip; Hungerford & Matsuda (loc. cit.) state that this is never so in the female. The species therefore appears to be somewhat variable.

Tenagonus (Limnometra) hungerfordi sp. nov.

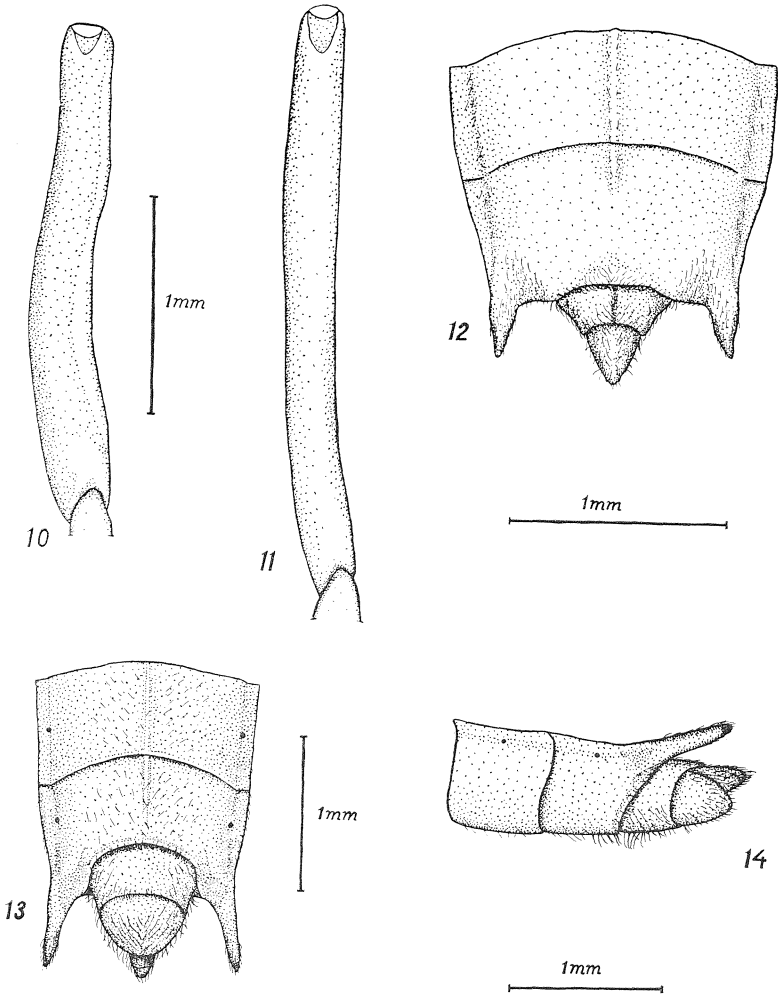
(Figs. 13—18).

Size: Winged male 10.72 mm. long; width across humeri 1.76 mm.; width across mesoacetabula 2.74 mm.

Colour, winged male: Light reddish brown above, lighter underneath, with dark reddish brown to black markings. Head with faint light reddish brown line near inner margin of eyes and broader light reddish brown median band, which is wider anteriorly and connected with the dark reddish brown clypeus by a darker narrow band. The three pairs of setae on the head inserted in dark spots; a dark band between the base of eye and antenna; the base of antenna black and shiny; the antennal segments a uniform reddish brown. The dark median longitudinal band on pronotum slender; the submarginal band on pronotum separated from the lateral and caudal margins by a pale, almost white, line; on the anterior lobe, on either side, between the dark lines, a light brown streak that fades out before the level of humeri. A dark band on propleuron behind the eye disappears before reaching a dorso-lateral streak on mesopleuron, which in turn ends at the spiracle. There is a dark lateral streak on mesopleuron and between this and the dorso-lateral streak a paler, almost white band. One curved spot on the anterior acetabulum; two curved spots on the middle and posterior acetabula, embracing a paler spot; a dark spot before the mesoacetabular cleft. Middle and hind coxae with a dark spot; middle and hind trochanter with a brown streak on the ventral surface; the leg segments reddish brown, parts of tibia and tarsi a darker colour. The hemelytron reddish brown, the veins lighter. Venter light, almost white.

Structure, winged male: Antennae slender; proportional length of antennal segments: 1st: 2nd: 3rd: 4th: 37:25:35:44; the total length of antenna is 8.88 mm., the entire insect being 10.72 mm. Rostrum moderately slender, not covering quite one third of mesosternum; the proportional length of the rostral segments: 1st: 2nd: 3rd: 4th: :9:4:28:9; ventral surface of head covered with rather long, erect, and dense pubescence. Pronotum rather long; the ratio between length in the middle and width across humeri being 61:28. Front femur thicker than middle femur, but not twice as thick as the tibia, slightly broader beyond the middle.— The proportional length of the leg segments as follows:

	Femur	Tibia	First tarsal segment	Second tarsal segment
Front leg . . .	59	51	9	8
Middle leg . .	159	133	31	8
Hind leg	167	101	20	6

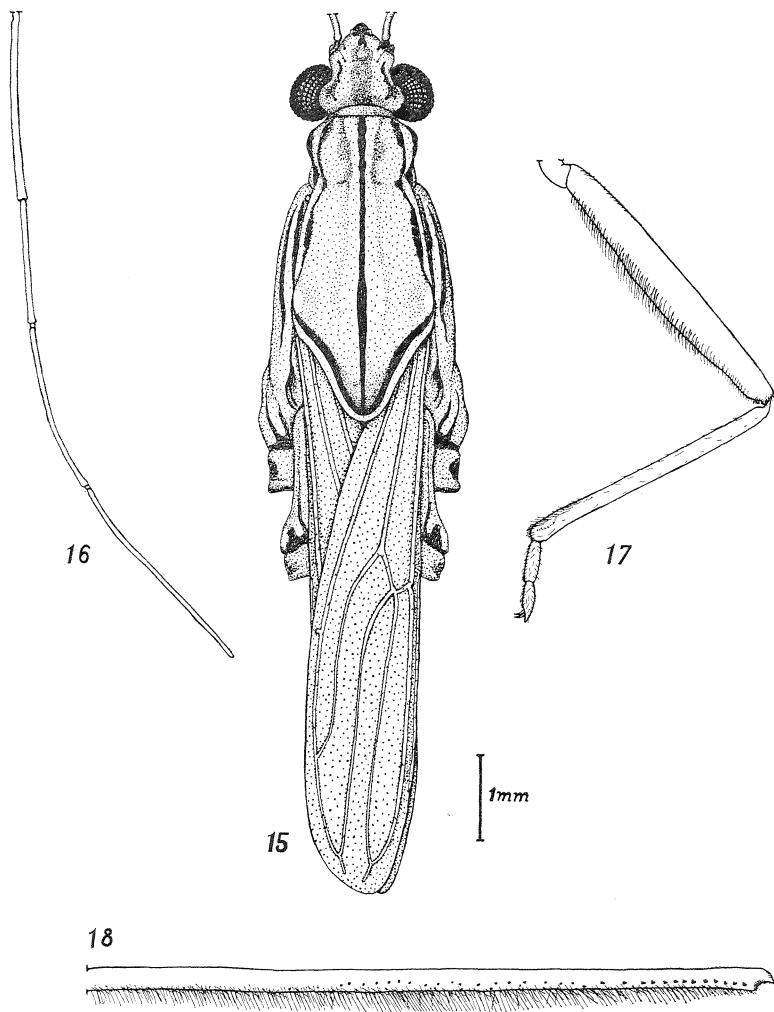


Figs. 10—12. *Tenagogonus (Limnometra) minutus* (Mayr).

10. and 11. ventral view of front femur in winged male (10) and female (11); 12. Ventral view of the tip of abdomen in winged female.

Figs. 13—14. *Tenagogonus (Limnometra) hungerfordi* sp. nov.

13. Ventral view and 14. lateral view of the tip of abdomen in winged male holotype.



Figs. 15—18. *Tenagogonus (Limnometra) hungerfordi* sp. nov.

15. Dorsal view. 16. Antenna. 17. Front leg. 18. Lateral view of middle femur. All in winged male holotype.

Front and middle femur with long cilia on the ventral surface, shorter at the apex and continued on middle tibia; two or three rows of small pegs on the ventral surface of the middle femur; laterally, on both sides of the apical part of the ventral surface of the middle femur, 9—13 larger pegs; on the ventral surface of the basal fourth of the middle tibia, two rows of small pegs. A small, but distinct and shiny tubercle near the posterior margin of propleuron and at the lateral margin of pronotum. Sternum, the ventral abdominal segments, and the genital segments with rather long cilia, longer and more densely distributed on meso- and metasternum; all the ventral abdominal segments, except the second sternite, faintly carinated in the middle; last ventral abdominal segment slightly shorter than the preceding segment. The connexival spines reaching the tip of abdomen.

Described from 1 winged male holotype labeled "Isle Palaos. Philippines. Mus. Westermann". The type is in the collections of the Zoological Museum, Copenhagen.

It appears to be most closely related to *Tenagogonus (Limnometra) borneensis* Hungerford & Matsuda and *T. (Limnometra) rossi* H. & M. It is about the size of *T. borneensis* but differs in the armament of the middle femur and the ciliated mesosternum. It differs from *T. rossi* in the larger size.

Tenagogonus (*Limnometra*) ciliatus (Mayr).

1865 *Limnometra ciliata* Mayr, Verh. Zool.-bot. Vereins, Wien 15, p. 444.

1865 *Limnometra inermis* Mayr, Verh. Zool.-bot. Vereins, Wien 15, p. 444.

Data on Distribution: Hungerford & Matsuda (1958, p. 409—412) gives the distribution as follows: Malay Peninsula, Thailand, Sumatra, Java, Lesser Sunda Isles, Borneo, Philippines, Celebes, Moluccas, New Guinea, New Britain, Solomon Islands, Fiji Islands, Guam. I am now able to add the Nicobar Islands. I have examined 1 male and 2 females, all winged, labeled "Kar Nicobar. Galatea"; the male very small, 12.56 mm., the females 12.60 mm. and 12.08 mm. respectively. Previously *T. (Limnometra) minutus* (Mayr) was the only *Limnometra* from the Nicobars. I also have seen 5 males and 1 female, all winged, labeled "Manila. Galatea"; the average size of the males being 14 mm., the female measuring 12.72 mm.

Acknowledgements.

I wish to express my sincere appreciation to Dr. S. L. Tuxen of the Zoological Museum of Copenhagen, whose advice and interest has made this study possible and to Mrs. M. Goodfellow who has commented on the manuscript from a linguistic viewpoint.

Bibliography.

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3. —, 1960: Keys to Subfamilies, Tribes, Genera and Subgenera of the Gerridae. — Ibid. 41(1), p. 3—24, 64 figs.
4. Matsuda, R., 1960: Morphology, Evolution and a classification of the Gerridae (Hemiptera-Heteroptera). — Ibid. 41(1), p. 25—632, 1151 figs.

Anmeldelse.

Hans-Jürgen Stammer (ed.): **Beiträge zur Systematik und Ökologie mitteleuropäischer Acarina.** Band II. **Mesostigmata 1.** Leipzig (Akad. Verlagsges., Geist & Portig) 1963. 804 Sider.

I Fortsættelse af Behandlingerne af Tyroglyphidae og Tarsonemini (anmeldt her i Tidsskriftet Bd. 28 p. 174 og Bd. 29 p. 371) er nu første Bind af Mesostigmaterne kommet, vel nogle af de allervanskeligst tilgængelige af alle Mider. Endnu engang har Stammer inspireret Elever til at binde an med noget saa utaknemmeligt og "kedeligt" som en systematisk Bearbejdelse af en vanskelig Gruppe; Fritz Bernhard og Irmgard Westerboer er de modige Forfattere. De bygger deres Arbejde paa Hirschmanns Konstatning af det, han kalder "udviklingsfaste" Karakterer — som er ens hele Udviklingen igennem — og Beskrivelsen kommer derved til at bygge meget paa bestemte Haar og andre meget smaa Karakterer. Beskrivelserne er omhyggelige og Tegningerne gode, men Bestemmelsestabeller mangler endnu dels til Familierne, dels til Arterne; kun Slægtstabeller findes. Indtil hele Bindet er afsluttet er man altsaa endnu henvist til Owen Evans' Nøgler (Linnean Society's Journal Zoology, 1957), som det desværre endnu er vanskeligt at bringe i Overensstemmelse med den systematiske Opfattelse i det af Stammer redigerede Værk.

S. L. Tuxen.
