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NOTES ON THE GENUS ANISOPS IN BISHOP MUSEUM

(Hem.: Notonectidae)

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This paper is principally concerned with material from Netherlands New Guinea. Four new species (*A. depressa*, *A. gressitti*, *A. lundbladiana* and *A. megalops*) are described from this area plus one new subspecies (*A. fijiensis rotumai*) from Rotuma Island. Distribution notes are given for other species, the majority of these records are extensions to their known range.

I wish to acknowledge the assistance of the staff of the Bishop Museum for material for study and for a grant-in-aid towards the cost of the illustrations.[1]

A. batillifrons Lundblad, 1933, Ann. Mag. Nat. Hist., ser. 12 (10): 463, fig. 8.

Ryukyu Islands, Ishigaki, 25 to 30–XI–1952, G. Bohart: 1 ♂: Thailand (NW) Chiangmai, 420 m 28–III–1958, ex standing water, T. C. Maa Coll. No. 393: 2 ♂♂.

British North Borneo, Sensuron, 9 to 11–I–1959, T. C. Maa: 3 ♂♂, 1♀.

A. bouveri Kirkaldy, 1904, Wiener Ent. Ztg. **23**: 116, 132.

Thailand (NW) Chiangmai, 420m 28–III–1958, ex standing water, T. C. Maa Coll. No. 393: 2 ♂♂, 3 ♀♀: S. India, Karikal, VII–1956, P. Nathan: 3 ♂♂, 7 ♀♀, 10 nymphs.

A. cleopatra Distant, 1914, Nova Caledonia, Zoologie **1**: 386, pl. xi, fig. 8.

Samoa, Afiamalu, Upolo, various dates in 1940, 660 m, at light, Sweezy and Zimmerman: 3 ♂♂, 3 ♀♀.

A. doris Kirkaldy, 1904, Wiener Ent. Ztg. **23**: 112–32.

Australia, National Park, Helms Collection: 2 ♂♂: This seems to be a very rare species, very few authentic records in the literature (Brooks 1951).

A. fijiensis Brooks, 1951, Univ. Kansas Sci. Bull. **24**, pt. 1(8): 361–63, pl. xl, fig. 24.

S. Philippines, Taganak, 24–II–1957, Yoshio Kondo: 3♂♂, 7♀♀.

Anisops fijiensis rotumai Lansbury, n. subsp. Fig. 1.

This subspecies differs from the typical form in being larger and more slender. The chaetotaxy of the ♂ front leg differs considerably, see (Brooks *l. c.*) for typical *A.*

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fijiensis. The frontal carina and the rostral prong are similar in both forms. The ♀♀ from Rotuma Island are indistinguishable from the typical form. The following table summarises the differences between the ♂♂ of the two forms.

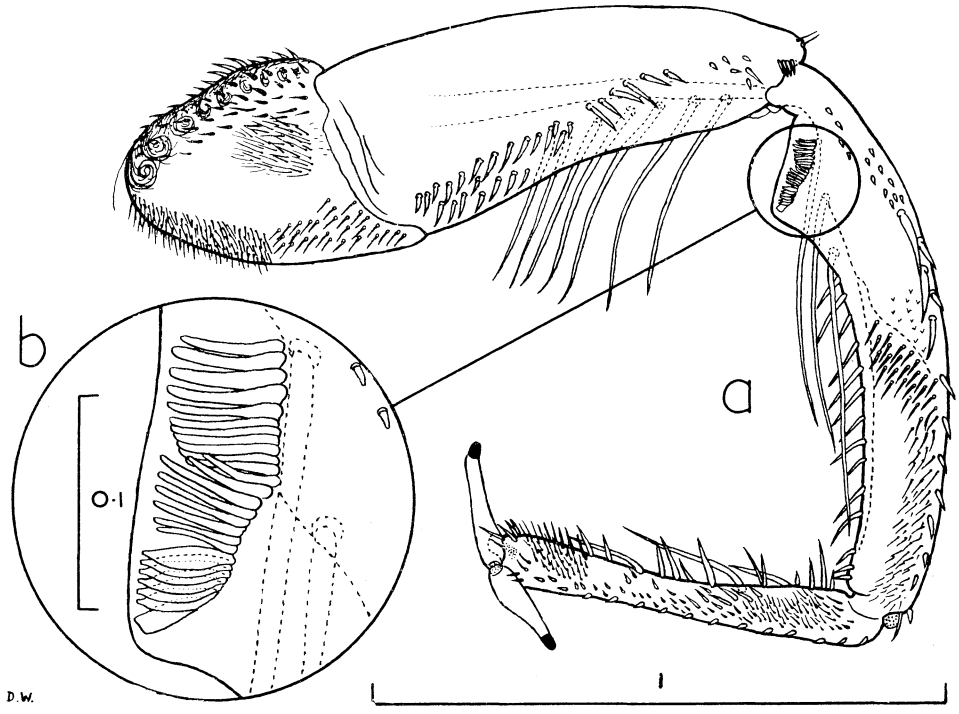

Fig. 1. *Anisops fijiensis rotumai* n. subsp. a, inner surface view of the ♂ fore leg; b, enlarged view of the stridulatory comb.

	fijiensis	*fijiensis rotumai*
Length of ♂	4.6–4.9 mm	5.5 mm
Greatest width of body	1.2–1.4 mm	1.25 mm
Greatest width of head compared with pronotal humeral width	9/10	10/11
Width of synthlipsis compared with anterior width of vertex	1/2	2/5
Median length of head compared with pronotum	3/4	4/5
Pronotal humeral width compared with median length	2×	18/19
Stridulatory comb	approx. 20 pegs	26 pegs

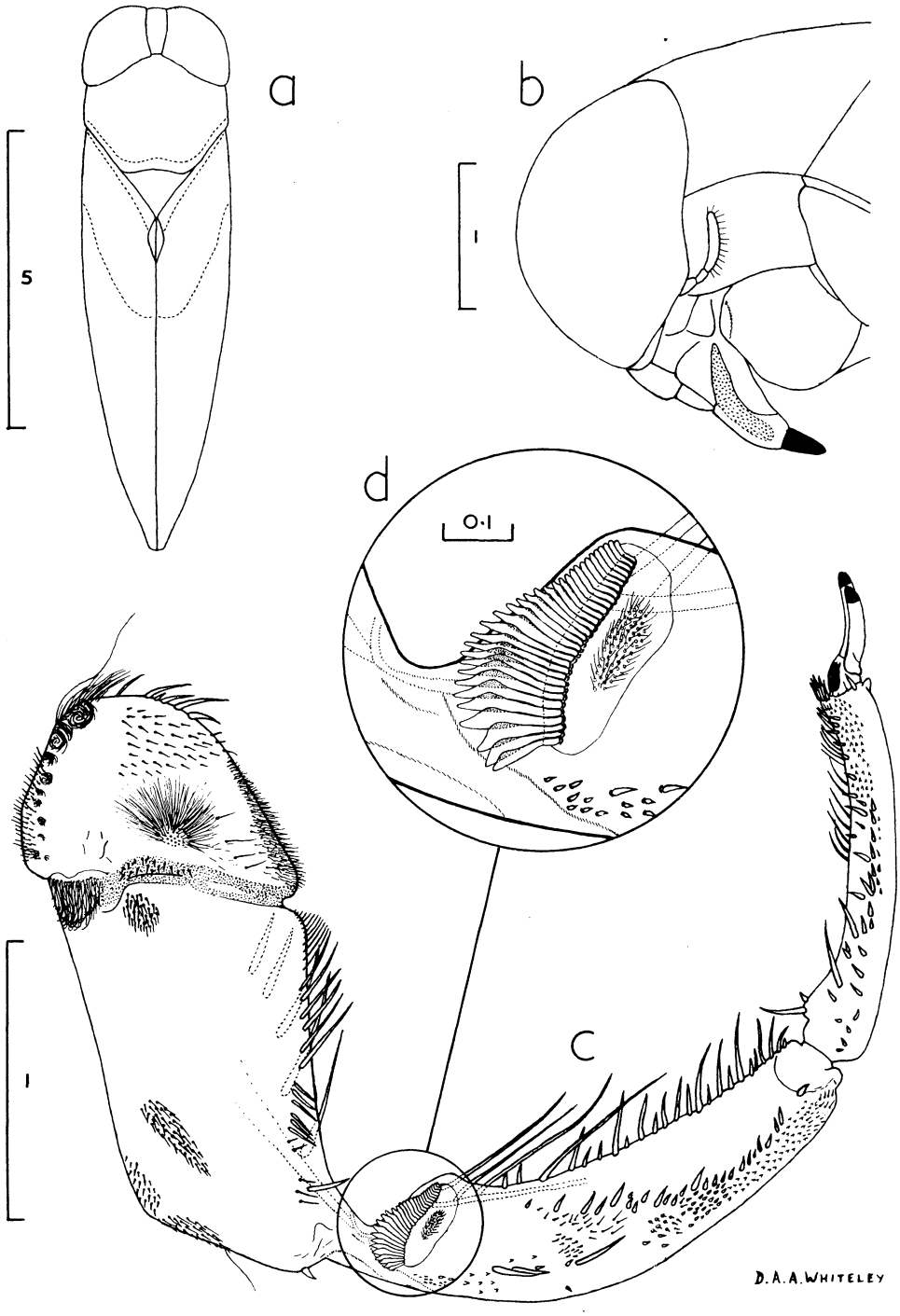

Fig. 2. *Anisops megalops* n. sp. a, outline of the ♂; b, profile of the head with rostral prong stippled; c, inner surface view of the ♂ fore leg; d, enlarged view of the stridulatory comb.

The relative lengths of the parts of the legs of the males are as follows:

	Femur	Tibia	Tarsus I	Tarsus II
Fore leg	100	110	91	—
Middle leg	100	74	38	25
Hind leg	100	83	28	32

Holotype ♂ (BISHOP 3144), Rotuma Island, Kongai, 12–VIII–1938, J. St. John: 1 ♂, 7 ♀♀. These records are the first for *A. fijiensis* outside the Fiji Islands. The ♂ from Rotuma Island is not typical and is described as a new subspecies.

A. tahitiensis Lundblad, 1934, Bishop Mus., Bull. **113**: 121–23, textfigs. 1–5. Guam, Mt. Chachao, 16–VII–1936, R. L. Usinger: 1 ♂.

A. kempi Brooks, 1951, Univ. Kansas Sci. Bull. **24**, pt. 1(8): 441–42, pl. li, fig. 75. S. India, Karikal, VII–1956, P. Nathan: 12 ♂♂, 9 ♀♀.

A. occipitalis Breddin, 1905, Natur. Mus. Hamburg, Mitteil. **20**: 152. S. Philippines, Taganak, 24–II–1957, Yoshio Kondo: 2 ♂♂, 1 ♀.

Anisops megalops Lansbury, n. sp. Fig. 2.

Size: ♂♂, length 9 mm, greatest width of body 2.5 mm; ♀♀, length 8.5 mm, greatest width of body 2.5 mm.

Shape: ♂♂ moderately slender with strongly tapering abdomen, greatest body width midway of total length; ♀♀ rather more robust, greatest body width at base of abdomen, for the outline of the ♂ see fig. 2a.

Color: General facies very pale yellow, hemelytra partially hyaline, appearing dark yellow due to the underlying pigmentation dorsally. Eyes dark brown, legs reddish brown. Abdominal venter black with keel and segmental margins of the connexivum pale yellow.

Male structural characteristics: Viewed from above the outline of the head is rounded with the anterior margin slightly convex. Greatest width of head slightly more than that of the pronotal humeral width and 8× the width of the anterior width of the vertex. Along the median longitudinal axis the head is approximately 1/3 the median pronotal length. Synthlipsis wide being 3/4 the anterior width of the vertex. Pronotum with its humeral width 2/7 greater than the median length, lateral margins almost straight and 3/7 the median length, posterior margin convex with a slight median emargination. Facial tubercle raised and rather bulbous. Labrum long, its median length just under 1½× its basal width. Rostral prong, see fig. 2b, stippled. Anterior femur resembling *A. thienemanni* Lundblad, stridulatory comb of 32 pegs, see fig. 2d. For general chaetotaxy of the ♂ front leg see fig. 2c. The relative lengths of the parts of the legs are as follows:

	Femur	Tibia	Tarsus I	Tarsus II
Fore leg	100	112	81	—
Middle leg	100	80	36	20
Hind leg	100	72	28	27

Female structural characteristics: Viewed from above the outline of the head is rounded with the vertex slightly extended beyond the anterior margins of the eyes; greatest width of head 9/10 the pronotal humeral width and 5½× the anterior width of the vertex. Synthlipsis wide, just over 3/4 the anterior width of the vertex. Along the median longitudinal axis the head is 1/2 the median pronotal length. Pronotum with its humeral width just over 1/3 greater than median length, lateral margins diverging and just under

1/2 the median length, posterior margin convex and medianly almost straight. The relative lengths of the parts of the legs are as follows:

	Femur	Tibia	Tarsus I	Tarsus II
Fore leg	100	122	55	32
Middle leg	100	81	33	20
Hind leg	100	75	38	25

Holotype, ♂ (BISHOP 3145), allotype, ♀, 27 ♂♂ and 25 ♀♀ paratypes. Dutch New Guinea, Wisselmeren, 1500 m, Itouda, Kamo Valley 14–VIII–1955, J. L. Gressitt. Two ♂♂ and 2 ♀♀ paratypes, Wisselmeren, Tage Lake, 1760 m, 4–VIII–1955, Gressitt.

Comparative notes: This species has close affinities with *A. thienemmani* from which it can be separated by the larger size, the chaetotaxy of the ♂ front leg, shape of the rostral prong; the ♀ can be distinguished by the very wide synthlipsis and almost straight posterior margin of the pronotum. *A. megalops* is known only from the type series.

Anisops depressa Lansbury, n. sp. Fig. 3.

Size: ♂♂, length 4.25–5.25 mm, greatest body width 1–1.5 mm; ♀♀, length 5.25–6 mm, greatest body width 1.5–1.75 mm.

Shape: ♂♂ short robust species, greatest body width at base of abdomen; ♀♀ short boat-shaped, greatest body width midway of total length. For outline of the ♂ see fig. 3a.

Color: PALE FORM: general facies yellowish to dark grey shining. Eyes brown flecked with black. Pronotum and hemelytra partially hyaline appearing dark due to underlying dorsal pigmentation. Scutellum varying, where partially hyaline the scutellum appears to be dark grey due to underlying pigment dorsally, in others the scutellum is orange.

DARK FORM: general facies head and eyes black, shining. Pronotum and central area of scutellum hyaline appearing very dark brown due to underlying dorsal pigmentation. Lateral margins of scutellum and hemelytral pit yellowish. Hemelytra distally hyaline appearing dark brown due to underlying dorsal pigment. Legs pale yellow. Abdominal venter black with keel and segmental margins of connexivum pale yellow.

Male structural characteristics: Viewed from above the outline of the head is rounded with the anterior margin curved, greatest width of head nearly the same as that of pronotal humeral, varying between 1/12 and 3/36 less than pronotal humeri, and between 8 and 9 × the anterior width of the vertex. Along the median longitudinal axis the head varies between 1/16 and the same length as the median pronotal length. Synthipsis wide, just under half as wide as the anterior width of vertex. Pronotum with its humeral width almost 2 × the median length; lateral margins diverging and just under 1/2 the median length, posterior margin convex and medianly emarginate. Disk of the pronotum with a circular median depression extending from anterior to posterior margins and across median 1/3 of pronotum. Facial tubercle simple with a few short pale hairs. Labrum with its basal width 1/4 greater than median length with numerous long erect pale hairs. Rostral prong, see fig. 3b, stippled. Stridulatory comb of 13 pegs see fig. 3d. Chaetotaxy of the ♂ front leg as shown fig. 3c. The relative lengths of the parts of the legs are as follows:

	Femur	Tibia	Tarsus I	Tarsus II
Fore leg	100	108	83	—
Middle leg	100	81	40	27
Hind leg	100	84	32	38

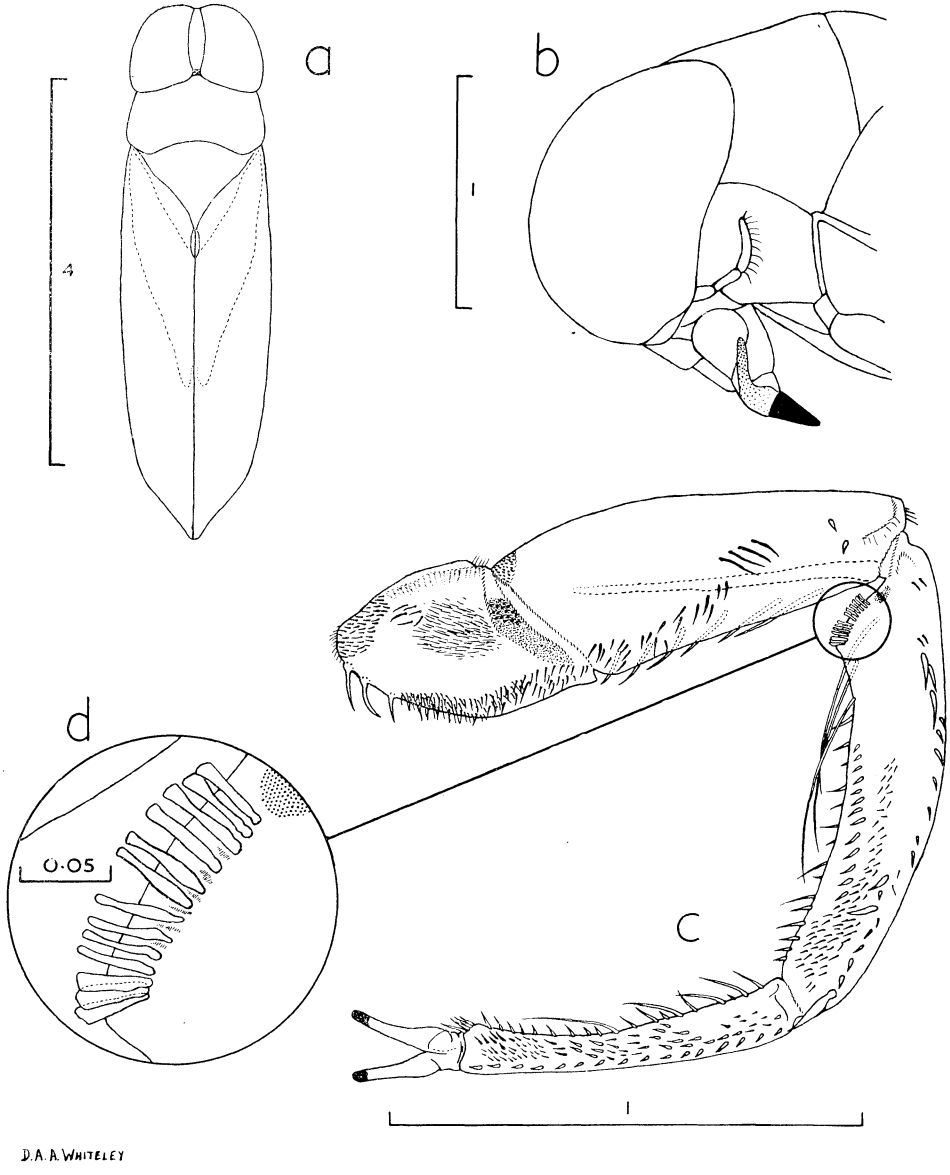

Fig. 3. *Anisops depressa* n. sp. a, outline of the ♂; b, profile of the head with rostral prong stippled; c, inner surface view of the ♂ fore leg; d, enlarged view of the stridulatory comb.

Female structural characteristics: Viewed from above the outline of the head is rounded with anterior margin of the vertex very slightly produced. Greatest width of the head approximately 11/12 that of the pronotal humeral width and 6–7 × anterior width of

the vertex. Synthlipsis wide, 1/2 the anterior width of the vertex. Along the median longitudinal axis the head is 5/6 the median pronotal length. Pronotum with its humeral width just over 2× the median length, lateral margins diverging and 1/2 the median length, posterior margin convex and medianly emarginate. The relative length of the parts of the legs are as follows:

	Femur	Tibia	Tarsus I	Tarsus II
Fore leg	100	117	57	28
Middle leg	100	82	41	26
Hind leg	100	78	32	31

Described from ♂ allotype, ♀ holotype, 14 ♂♂ and 8 ♀♀ paratypes, Dutch New Guinea, Wisselmeren, Tage Lake, 1760 m, 4–VIII–1955, Gressitt. Ten ♂♂ and 13 ♀♀ paratypes, Wisselmeren, 1500 m, Itouda, Kamo Valley, 14–VIII–1955, Gressitt. Three ♂♂ and 2 ♀♀ paratypes, Wisselmeren, Urapura, Kamo Valley, 1530 m, 10–VIII–1955, Gressitt. One ♀ paratype, Wisselmeren, Waghete, Tigi Lake, 1700 m, 18–VIII–1955, Gressitt. One ♀ paratype, Wisselmeren, Kamo-Debei Div., 1700 m, 14–VIII–1955, Gressitt. Two ♂♂ and 2 ♀♀ paratypes, Prauwbivak, Gamesi River, 1730 m, 18–VIII–1955, Gressitt.

A. depressa is known only from the type series.

Comparative notes: In Brooks' Key this species runs out to couplet 48, *A. depressa* can be separated from *A. philippinensis* Brooks by the shape of the rostral prong and the chaetotaxy of the ♂ front leg and from *A. cleopatra* Distant by the chaetotaxy of the ♂ front leg.

Anisops gressitti Lansbury, n. sp. Fig. 4.

Size: ♂♂, length 7.25 mm, greatest width of body 2 mm.

Shape: Short robust species, greatest width of body midway of abdomen, for the general shape of the ♂ see fig. 4a.

Color: General facies pale yellow, eyes and vertex dark brown. Pronotum, scutellum and hemelytra pale yellow, partially hyaline and shining. Legs dark yellow, abdominal venter dark brown with keel and segmental margins of the connexivum dark yellow.

Male structural characteristics: Viewed from above the outline of the head is rounded with the anterior margin slightly concave. Greatest width of head slightly more than that of the pronotal humeral width and 11× the anterior width of the vertex. Synthlipsis wide, 3/5 the anterior width of the vertex; along the median longitudinal axis the head is nearly as long as the pronotum. Pronotal humeral width about 2× the median length, lateral margins parallel, posterior margin convex and medianly emarginate. Pronotum with a circular depression extending from the anterior to posterior margins and across the median 1/3 of the pronotal disk. Facial tubercle slightly raised. Labrum with its median length about 1/8 greater than the basal width. Rostral prong, see fig. 4b, stippled. Stridulatory comb of 21 pegs, see fig. 4d. Chaetotaxy of the ♂ front leg as shown in fig. 4c. The relative lengths of the parts of the legs are as follows:

	Femur	Tibia	Tarsus I	Tarsus II
Fore leg	100	110	75	—
Middle leg	100	83	37	26
Hind leg	100	79	14	14

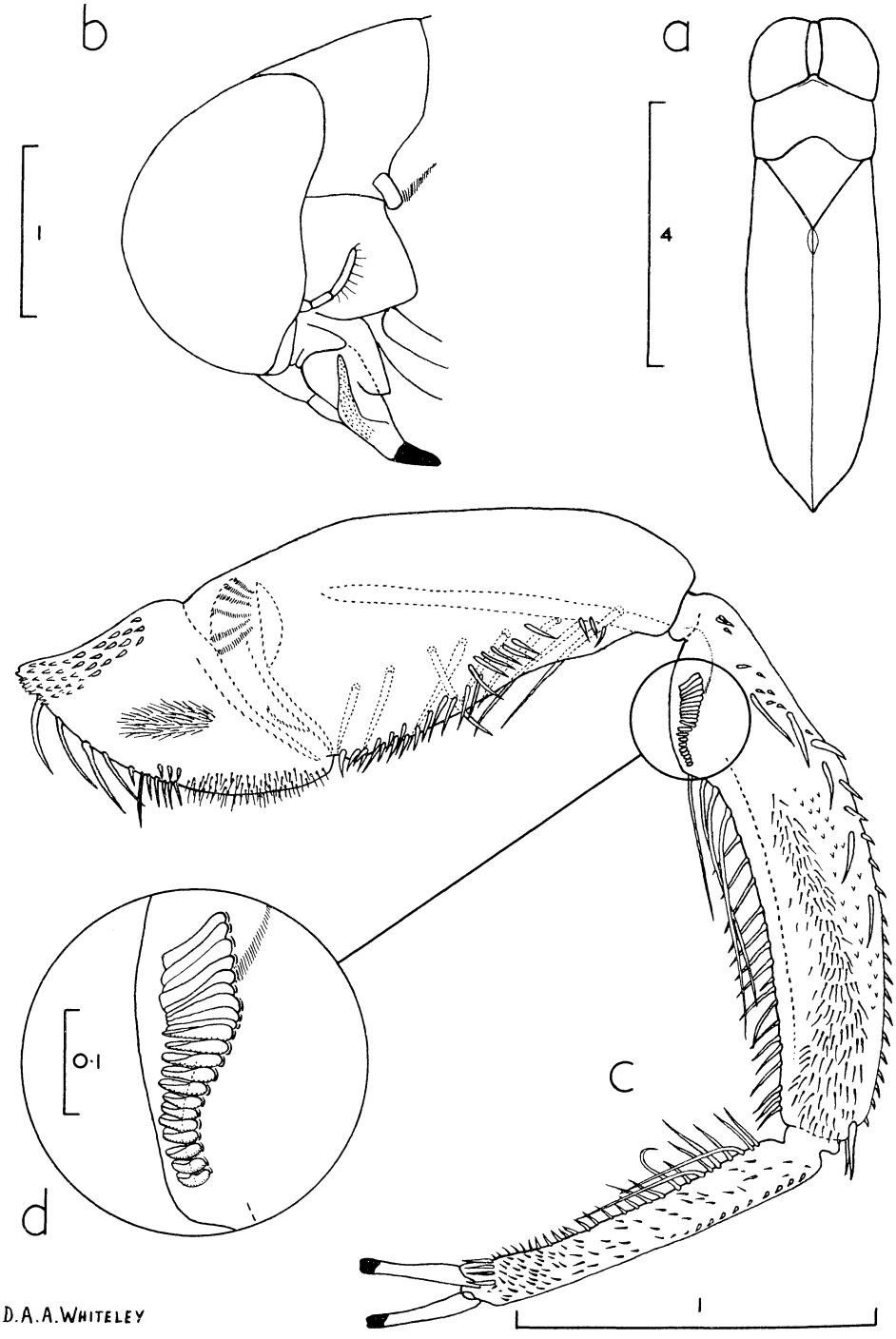

Fig. 4. *Anisops gressitti* n. sp. a, outline of the ♂; b, profile of the head with rostral prong stippled; c, inner surface view of the ♂ fore leg; d, enlarged view of the stridulatory comb.

The ♀ of this species has not been recognised.

Holotype ♂ (BISHOP 3146) and 6 ♂♂ paratypes, Neth. New Guinea, Wisselmeren, 1520 m, Prauwbivak, Gamesi River, 18–VIII–1955, Gressitt. This species is named in honour of Dr. J. L. Gressitt, the collector.

Comparative notes: This species closely resembles *A. leucothea* Esaki, from which it can be separated by the chaetotaxy of the ♂ front leg and the fact that the head of *A. gressitti* is almost the same length as the pronotum, whereas in *A. leucothea* the head is slightly more than 1/2 the length of the pronotum.

Anisops lundbladiana Lansbury, n. sp. Fig. 5.

Size: ♂♂ length 6–6.25 mm, greatest width of body 1.6 mm. ♀♀, length 6–6.25 mm, greatest width of body 1.6 mm.

Shape: Robust species, greatest body width across base of abdomen, for general shape of ♂ see fig. 5a.

Color: PALE FORM: eyes brown, vertex pale yellow. Pronotum, scutellum and most of the hemelytra hyaline, shining, pale orange, distally appearing darker due to the underlying dorsal pigmentation.

DARK FORM: eyes very dark bluish black, vertex dark yellow. Pronotum shining, anteriorly whitish, posteriorly black. Scutellum black shining, hemelytra shining, appearing bluish black due to the underlying dorsal pigmentation. Hemelytral pit and suture with numerous long straggly pale hairs. Legs pale yellow, abdominal venter dark with keel and segmental margins of the connexivum pale yellow.

Male structural characteristics: Viewed from above the outline of the head is rounded. Greatest width of head 8/9 the pronotal humeral width and 8× the anterior width of the vertex. Synthlipsis wide, 1/2 the anterior width of the vertex. Along the median longitudinal axis the head is approximately 4/5 the median pronotal length. Pronotal humeral width just over 2× the median length, lateral margins diverging and just over 1/3 the median length, posterior margin convex and medianly emarginate. Facial tubercle slightly raised. Labrum with its basal width equalling median length. Rostral prong, as shown in fig. 5b, stippled. Stridulatory comb of 19 pegs all of approximately the same size as shown in fig. 5d. Chaetotaxy of the ♂ front leg as shown in fig. 5c. The relative lengths of the parts of the legs are as follows:

	Femur	Tibia	Tarsus I	Tarsus II
Fore leg	100	120	80	—
Middle leg	100	87	40	30
Hind leg	100	87	32	33

Female structural characteristics: Viewed from above the outline of the head is rounded. Greatest width of the head just under 9/10 the pronotal humeral width and 6× the anterior width of the vertex. Synthlipsis wide, 4/7 the anterior width of the vertex. Along the median longitudinal axis the head is 2/3 the median pronotal length. Pronotal humeral width just under 2½ × the median length. Lateral margins diverging and 1/2 the median length, posterior margin convex and medianly emarginate. The relative lengths of the parts of the legs are as follows:

	Femur	Tibia	Tarsus I	Tarsus II
Fore leg	100	118	51	33
Middle leg	100	82	34	28
Hind leg	100	86	31	32

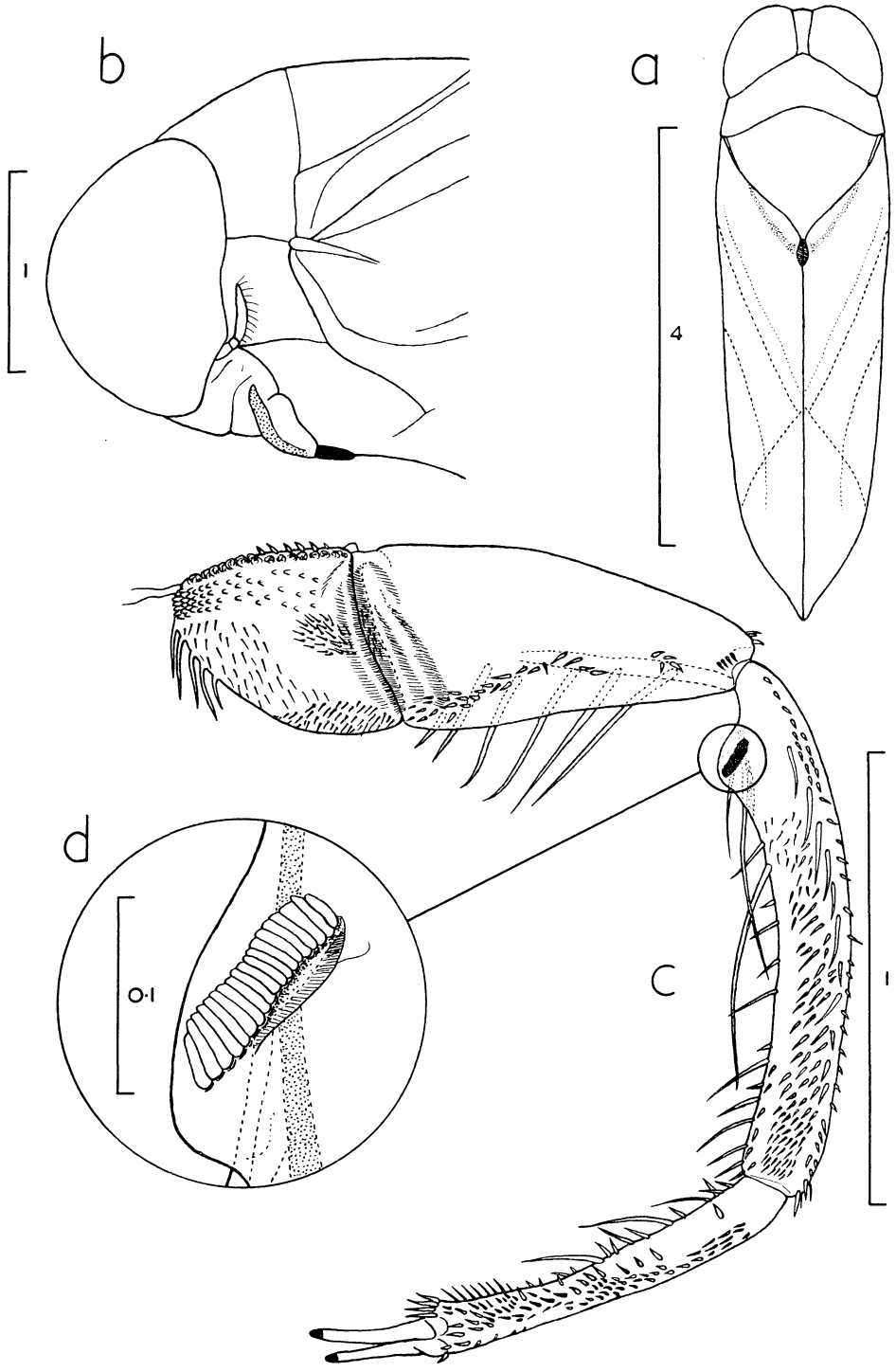

Fig. 5. *Anisops lundbladiana* n. sp. a, outline of the ♂; b, profile of the head with rostral prong stippled; c, inner surface view of the ♂ fore leg; d, enlarged view of the stridulatory comb.

Holotype ♂ (BISHOP 3147), allotype ♀, 2 ♂♂ and 3 ♀♀ paratypes, NE New Guinea, Kassam, 1350 m, 48 km E. of Kainantu, 28–X–1959, T. C. Maa. *A. lundbladiana* is known only from the type series. This species is dedicated to Prof. O. Lundblad in recognition of his monumental works on the aquatic Heteroptera of the Pacific area.

Comparative notes: This species runs out to couplet 48 in Brooks' Key and can be separated from *A. philippinensis* and *A. cleopatra* by the shape of the rostral prong and the chaetotaxy of the ♂ front leg.

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