

REVIEW OF TAXONOMIC POSITION OF AUSTRALIAN AND NEW GUINEAN SPECIES PREVIOUSLY ASCRIBED TO *MACRONEMA* (TRICHOPTERA: HYDROPSYCHIDAE)

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ABSTRACT: The taxonomic position of Australian and New Guinean species previously referred to the genus *Macronema* s.l. is reviewed and generic changes implemented. A new genus, *Baliomorpha*, is established for 4 Australian species (*banksi* (Mosely), *dubia* (Ulmer), *pulchripenne* (Tillyard), *urbana* sp. nov.) and 5 species (*loriai* (Navás), *caudicea* sp. nov., *chiloma* sp. nov., *echinata* sp. nov., *pezidion* sp. nov.) from New Guinea. Three closely related species (*saundersi* (McLachlan), *loriai* (Navás), *auriferum* sp. nov.) all from New Guinea, are placed in the genus *Macrostemum*; of these, *saundersi* is known also from Cape York Peninsula. The position of 2 other New Guinean species (*wallacei* McLachlan, *dulce* McLachlan) is unresolved.

Seven species names have been applied to the genus *Macronema* Pictet s.l. in Australia. Only 3 of these are now recognised as valid; and a fourth species, *saundersi* (McLachlan), previously known from New Guinea, is now recorded from northeastern Australia. Of these four species, 3 are placed in a new genus, *Baliomorpha*, together with a new Australian species (*urbana* sp. nov.), while the fourth, *saundersi*, is referred to *Macrostemum* Kolenati, as proposed by Flint and Bueno-Soria (1982).

Both genera are represented in New Guinea. Australian species are restricted to a narrow eastern belt more or less corresponding to the Great Dividing Range, from Cape York Peninsula to Victoria. None has been recorded from Tasmania.

McLachlan (1862) recognised *Monopseudopsis in-scriptus* Walker 1852 as a species of *Macronema*, and noted that the species name had already been used in the genus. He renamed it *Macronema australe* McLachlan. No further *M. australe* specimens have been recognised in subsequent studies, including the present in which extensive material was examined. This raised doubts about its identity and country of origin. A general literature check indicated close similarities in the wing pattern of the type of *australe* with that of the common North American species *Macrostemum zebratum* Hagen (Fig. 45). Dr Barnard of British Museum (Natural History), London, confirmed that "the wing pattern and genitalia of type (*australe*) both agree entirely with specimens of *zebratum* in our (BMNH) collection, and the label 'New Holland' must therefore be wrong" (Barnard in litt. 1983).

Wrong locality labels on specimens originating from the 'Entomological Club' and described by Walker have been recorded before—e.g. the type of *Notidobia* (= *Anisocentropus*) *latifascia* Walker bears the locality label 'North America', but was later found to be an Australian species.

As the name *in-scriptus* Walker 1852 was unavailable because of homonymy, and *zebratum* Hagen 1861 predates *australe* McLachlan 1862, the latter is suppressed to synonymy and removed from the list of Australian species.

Two other species names are also suppressed: *tristis* Banks 1939 preoccupied by *triste* Navás 1916 has been replaced by *banksi* Mosely 1953, and *torrenticola* Korboot 1964 is a new synonym of *banksi* Mosely 1953.

The general statement by Flint and Bueno-Soria (1982) that all Australian species listed in the Fischer Catalogue (1963, 1972) should be transferred to the genus *Macrostemum* is unacceptable and requires some amendments.

The Australian-New Guinea species complex belongs to two quite distinct groups (Tables 1 & 2), neither of which is accommodated entirely satisfactorily by the diagnoses of *Macronema* or *Macrostemum*. One of the groups is considered generically distinct as *Baliomorpha* which includes 4 Australian and 5 New Guinean species. The second group is retained in *Macrostemum*.

The Australian-New Guinean group of species now placed in *Macrostemum* differs in a number of features from the typical North American representatives. If these differences are shared by further species in the SE Asian-Sunda Archipelago area, it might be necessary to unite them into a separate genus. This is outside the scope of this paper. Two species, *dulce* McLachlan from Misool Island and *wallacei* McLachlan from New Guinea, unfortunately were not available for this study and their identity at this stage remains uncertain.

Dean (1984) reports that larval features of some Australian species, here referred to *Baliomorpha*, differ from both *Macronema* and *Macrostemum*.

The figures of the wing venation have been prepared with the aid of a camera lucida, where possible from detached wings, relaxed, denuded of hair and temporarily mounted on glass slides. Figures of genitalia were prepared from abdomens macerated and cleared in potassium hydroxide, then washed and transferred to glycerine for drawing and permanent storage. Dissected and figured specimens are identified by the author's notebook number with the prefix 'PT-'.

The following abbreviations are used for depository institutions: ANIC, Australian National Insect Collection, Canberra; BMNH, British Museum (Natural History), London; BPBM, Bernice P. Bishop Museum, Honolulu; MCG, Museo Civico di Storia Naturale,

Genova; MCZ, Museum of Comparative Zoology, Harvard University, Cambridge, Mass.; MNHP, Muséum National d'Histoire Naturelle, Paris; MVM, Museum of Victoria, Melbourne; QM, Queensland Museum, Brisbane; QU, Entomology Department, University of Queensland, St. Lucia; SAM, South Australian Museum, Adelaide.

Baliomorpha gen. nov.

DESCRIPTION: Head with antennae moderately to very long, in males greater than 2x length of forewing, in females shorter; vertex with a pair of large anterior warts usually extending to about half the width of eye, in place of posterior warts sometimes there is an elevated transversal ridge; frons flattened with scattered short setae; maxillary palpi long, segments 1 and 2 short, subequal, segment 3 about 3 to 4x the length of segment 2. Forewing elongate, rounded apically, Sc forked at apex, cross-vein sc-c absent; discoidal cell small but not minute, median cell slightly larger than discoidal cell; thyridial cell very long, narrow, distal end tapered, nygma at about middle; forks 1-5 present, fork 1 usually sessile, or sometimes with short footstalk. Hindwing broad, wider in males, discoidal cell absent, fork 1 usually present, costal margin evenly curved. Abdominal sternite 5 without lateral filament; male genitalia with tergite X short, simple; inferior appendages undivided or nearly so. Female abdominal sternite VIII formed by a pair of lateral lobes, rounded and free standing distally; entirely separated mid-ventrally; tergite IX, in dorsal view, bluntly triangular, proximal margin gradually curved or broadly incised; some species with oval patch of short, stout bristles on either side of tergite; segment X terminates with three pairs of short processes, the ventral pair situated close to the middle pair (cerci) (Fig. 43). Spurs 1:4:4.

TYPE SPECIES: *Macronema pulchripenne* Tillyard 1922.

REMARKS: The genus is distinguished from *Macronema* and *Macrostemum* by the characters shown in the preceding table. Four Australian and five New Guinean species are included in the genus.

KEY TO SPECIES OF *Baliomorpha*

- 1 Australian species 2
- New Guinea species 5
- 2 Forewings with variable size yellowish to golden spots, mostly between veins; phallus in ventral view broad at base, expanded mid-laterally, apex narrowly spatulate *banksi*
- Forewings other than with small yellow or golden hairy spots; phallus, in ventral view, rounded at apex 3
- 3 Forewing blackish with single oblique golden or yellowish streak at pterostigma *urbana*

- Forewing brownish or with large yellow or golden spots 4
- 4 Forewing brownish with irregular pale longitudinal mark along thyridial cell and at anastomosis *dubia*
- Forewing with distinctive yellow to golden spots of variable size on blackish background colour *pulchripenne*
- 5 Forewing with two pale yellowish spots at midwing, anterior one triangular, posterior one somewhat rectangular (known from female type only) *loriai*
- Forewing with more than two spots 6
- 6 Forewing with pale yellowish transversal band across midwing, pale spot at pterostigma, indistinctly pale apical margin; phallus in ventral view apically expanded into lateral flanges *pezidion*
- Forewing with yellow spots merging into irregular pattern; in male genitalia, apex of phallus with dorsally directed chitinous points, in ventral view not expanded into lateral flanges 7
- 7 Distal margin of sternite IX extended into broad lobe; apex of phallus in ventral view somewhat angular *chiloma*
- Distal margin of sternite IX not extended into broad lobe; phallus in ventral view rounded apically 8
- 8 Lateral lobe of segment IX indistinct; phallus in ventral view long, slender, apex rounded *caudicea*
- Lateral lobe of segment IX distinct; phallus in ventral view gradually widened to elongate oval apex *echinata*

Baliomorpha pulchripenne (Tillyard 1922) comb. nov.
Figs 1-3, 43, 44

- 1922 *Macronema pulchripenne* Tillyard, p. 83, pl. 24A, fig. 3.
- 1953 *Macronemum pulchripenne* (Tillyard); Mosely & Kimmins, p. 313, fig. 220.
- 1963 *Macronema pulchripenne* Tillyard; Fischer, p. 194.
- 1972 *Macronema pulchripenne* Tillyard; Fischer, p. 61.
- 1982 *Macrostemum pulchripenne* (Tillyard); Flint & Bueno-Soria, p. 369.

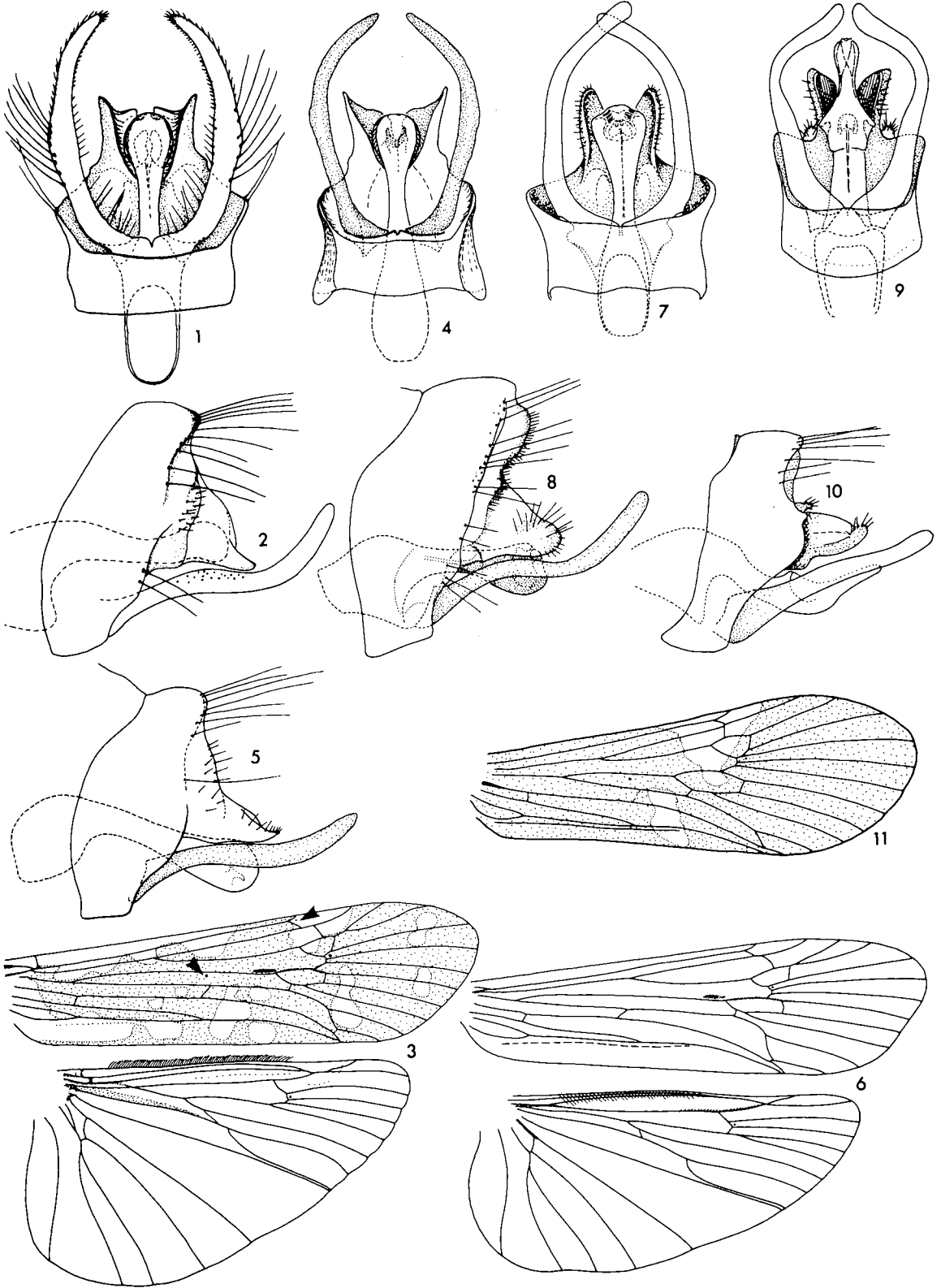
REMARKS: A distinctive Australian species with characteristic yellow to golden spots on blackish forewings, pattern somewhat variable. Male genitalia with segment X rather short, hood-shaped, lateral angles produced distally; phallus in ventral view straight, apex rounded, details as in Fig. 1.

Female abdominal tergite IX with oval mid-dorsal and elongate lateral patch of short setae; promixal margin evenly curved.

Length of anterior wing: ♂ ♀ 11-12.5 mm.

TYPE MATERIAL: Holotype ♀ – New South Wales, Stanwell Park, 24 April 1916 (Lyell) (BMNH);

Figs. 1-11 – *Baliomorpha* spp.: 1-3, *pulchripenne*; 1, male genitalia ventral; 2, lateral; 3, male, wing venation; 4-6, *urbana*; 4, male genitalia ventral; 5, lateral; 6, male, wing venation; 7-8, *dubia*; 7, male genitalia ventral; 8, lateral; 9-10, *banksi*; 9, male genitalia ventral; 10, lateral; 11, *loriai* (Navás, 1933), holotype female, forewing.



paratypes 2♀ same data, Cawthron Institute, New Zealand and Museum of Comparative Zoology, Harvard (not examined).

MATERIAL EXAMINED: New South Wales—1♀ Stanwell Creek, 23 April 1916 (label in G. Lyell's handwriting, undoubtedly one of the original series) (ANIC); 1♂ Colo Vale, 16 Jan. 1957, (Writh) (ANIC); 1♂ CSIRO Exp. farm Wilton, 8 May 1976 (Robinson) (ANIC); 1♂ Minnamurra Falls, 18 Dec. 1980 (Robinson) (ANIC); 1♂ Barrington Tops, 1400 m, 7 Dec. 1981 (Theischinger) (MVM); 1♀ Blundells, ACT, 6 Jan. 1961 (Riek) (ANIC). Victoria—1♂ Upper Buckland River, 30 Nov. 1964 (Neboiss) (MVM); 1♀ Snobs Creek, 15 Dec. 1955 (Hallgarten) (MVM); 7♀ Starvation Creek nr. Warburton, 22 Dec. 1976 (Dean and Cartwright) (MVM) (preparation PT-1327 figured); 2♂ 4♀ Cement Creek nr. Warburton, 22 Dec. 1976 (Dean and Cartwright) (MVM), (♂ genitalia preparation PT-694 figured); 1♀ Yea River, Gordon's Bridge, 6 Jan. 1954 (Neboiss) (MVM); 1♀ Eurobin Falls, Mt Buffalo Road, 3 Dec. 1982 (Neboiss) (MVM).

DISTRIBUTION: New South Wales; Victoria.

Baliomorpha urbana sp. nov.

Figs 4-6, 39-41

REMARKS: The species was recognized, and the single female specimen briefly described, by Mosely and Kimmins (1953). However, no species name was given. Additional material, including males, is now available.

DESCRIPTION: The dark, blackish-brown forewings with pale, sometimes golden oblique spot at pterostigma distinguishes the species. The pale yellowish colour is present in wing membrane as well as in hair cover. Maxillary and labial palpi pale yellow, the same colour as the legs, except the mid- and hind coxae which are dark blackish brown. The contrasting golden yellow and blackish colours fade quickly in alcohol to become dull brown.

Male genitalia short, phallus rounded at apex, similar to that in *pulchripenne* but differing in details as shown in Fig. 4.

Female abdominal tergite IX with distinct lateral setose patches, mid-dorsal patch broad, indistinct; proximal margin curved (Figs 39, 40).

Length of anterior wing: ♂ ♀ 8-9 mm.

TYPE MATERIAL: Holotype ♂ SE Queensland, Mt Nebo, 13 Dec. 1959 (Kerr) (MVM T-8057); paratypes 11♂ 7♀ collected with holotype (ANIC; BMNH; MVM), genitalia preparations ♂ PT-693 and ♀ PT-1329 figured.

OTHER MATERIAL EXAMINED: SE Queensland—1♀ Mt Greville, 17 Aug. 1975 (Lambkin) (MVM); 1♂ Lamington Nat. Park 25 May 1983 (Yule) (MVM).

DISTRIBUTION: SE Queensland.

Baliomorpha dubia (Ulmer 1905) comb. nov.

Figs 7, 8, 46, 47

- 1905 *Macronema dubium* Ulmer, p. 28, figs 15, 16
 1907 *Macronema dubium* Ulmer; Ulmer, p. 103, fig. 107
 1953 *Macronemum dubium* (Ulmer); Mosely & Kimmins, p. 308, figs 216, 217
 1972 *Macronema dubium* Ulmer; Fischer, p. 159
 1982 *Macrostemum dubium* (Ulmer); Flint & Bueno-Soria, p. 369.

REMARKS: Largest of the Australian species in the genus. Forewings brownish with pale brownish and yellowish markings mainly at midwing and near pterostigma; venation darker brown.

Male genitalia short, phallus gradually widened apically; inferior appendages slender, details as in Fig. 7.

Female abdominal tergite IX without lateral setose patches; proximal margin with broad, somewhat angular incision.

Length of anterior wing: ♂ 18-21 mm; ♀ 19-20 mm.

TYPE MATERIAL: Type ♂ 'Australia' without other data (MNHP) (not examined).

MATERIAL EXAMINED: SE Queensland—3♂ Browns Falls, Killarney, 13 Oct. 1973, Neboiss (MVM). New South Wales—16♂ 1♀ Boonoo Boonoo River, 11 Oct. 1973 (Neboiss) (MVM); (♂ genitalia preparation PT-1030 figured); 30♂ 16♀ Styx River 12 km S of Ebor, 17 Oct. 1973 (Neboiss) (MVM); 1♂ 18♀ Styx River, State Forest Camp, 28 Oct. 1981 (Wells and Carter) (MVM); 2♂ between Ebor and Dorrigo, 12 Nov. 1983 (Theischinger) (MVM); 2♀ Wilson River, Wauchope, 30 Oct. 1981 (Wells and Carter) (MVM); 1♂ Dorrigo Nat. Park, 20 Nov. 1973 (Moulds) (MVM); 1♂ Upper Allyn River, 8 Nov. 1960 (Common and Upton) (ANIC); 1♂ Minnamurra Falls, 16 Nov. 1960 (Common and Upton) ANIC; 1♂ 2♀ Upper Kangaroo Valley, 24 Nov. 1960 (Riek) (ANIC); 1♂ 48 km N of Singleton, 5 Oct. 1975 (Moulds) (MVM); 1♂ 2♀ Genova River, Rockton, 20 Nov. 1965 (Neboiss) (MVM) (♀ preparation PT-1328 figured). Victoria—1♂ Wonnangatta River, Hawkhurst 3 Dec. 1978, (Campbell) (MVM); 1♂ Cann River, Buldah, 17 Dec. 1976 (Neboiss) (MVM); 1♂ 1♀ Macalister-Barkly River Junction, Lyndon Flats, 6 Dec. 1977 (NMV Survey Dept.) (MVM).

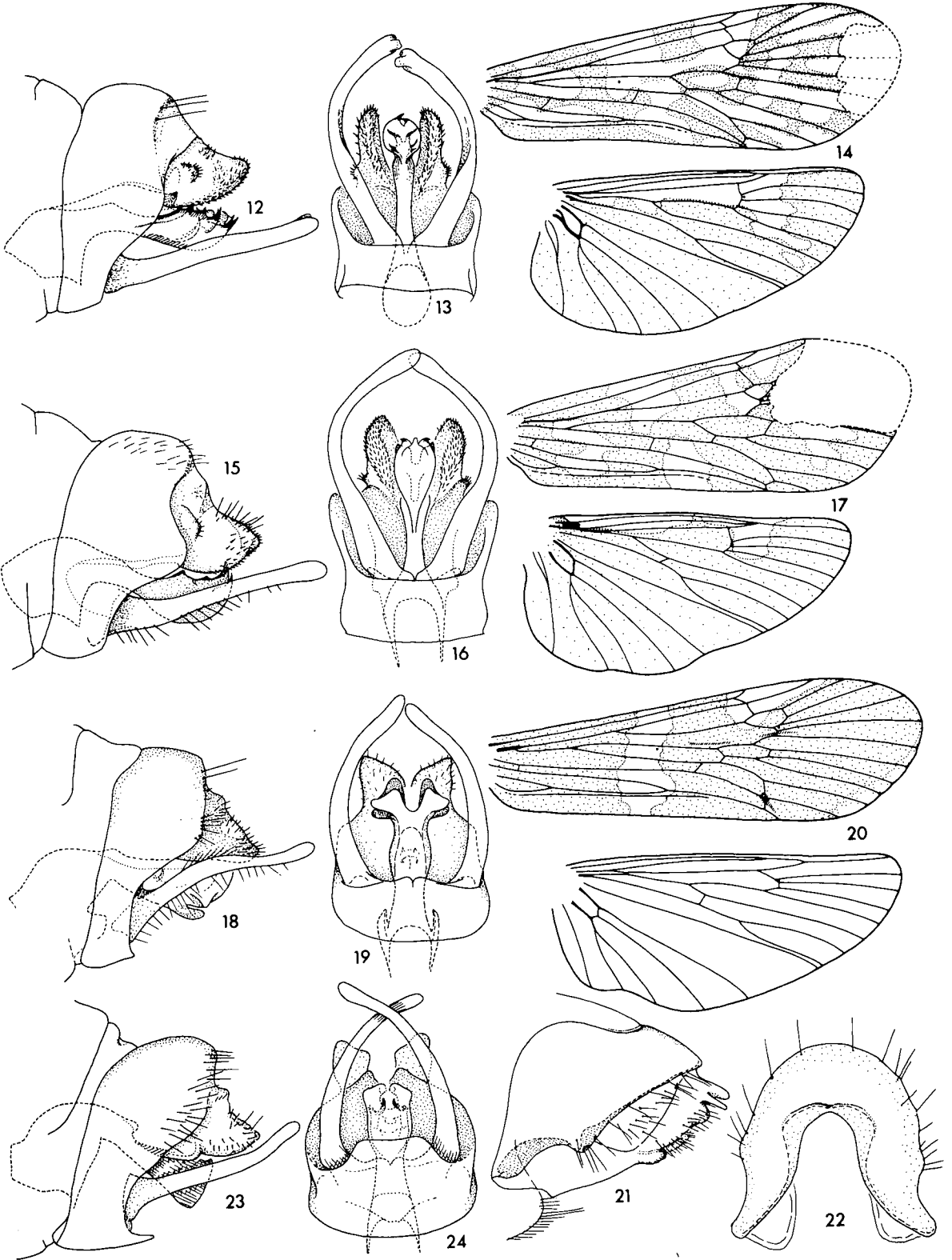
DISTRIBUTION: SE Queensland, E New South Wales, E Victoria.

Baliomorpha banksi (Mosely 1953) comb. nov.

Figs 9, 10, 35-38

- 1939 *Macronema tristis* Banks, (non *triste* Navás) p. 487 figs 58, 61.

Figs. 12-24—*Baliomorpha* spp.: 12-14, *caudicea*, holotype; 12, male genitalia lateral; 13, ventral; 14, wing venation; 15-17, *echinata*, holotype; 15, male genitalia lateral; 16, ventral; 17, wing venation; 18-22, *pezidion*; 18, male genitalia lateral; 19, ventral; 20, female (PT-1284), wing venation; 21, female, apex of abdomen lateral; 22, dorsal; 23-24, *chiloma*, holotype; 23, male genitalia lateral; 24, ventral.



1953 *Macronemum banksi*, Mosely in Mosely and Kimmins, p. 312 fig. 219.

1964 *Macronemum torrenticola* Korboot, p. 39 figs 58-78, syn. nov.

1982 *Macrostemum banksi* (Mosely); Flint & Buenosoria, p. 369.

REMARKS: According to the International Zoological Rules the species names replaced before 1960 due to preoccupation retain their status when transferred to another genus, therefore the replacement name *banksi* remains valid within the new genus *Baliomorpha*.

The species has two main areas of distribution, one in North Queensland associated with rainforests between Iron Range and Cairns, the other in the mountainous regions in SE Queensland. In both areas the species occur in small, rapidly flowing streams.

It is characterised by having dark, blackish wings, covered with numerous pale yellowish to golden irregular spots, mostly scattered between the veins and usually formed by golden pubescence. However, some spotting is also present on the wing membrane. Females usually are slightly smaller, their wings less ornate.

Head (Fig. 38), compared with that in *saundersi* rather short and broad, anterior warts large; palpi and legs brownish-grey; maxillary palpi with segment 5 longer than segments 1-4 together. The 'forked' tip of 'penis' as illustrated in the original figures (Banks 1939) apparently developed in the drying process. Phallus, in ventral view, expanded mid-laterally, apex upcurved, slightly spatulate.

Female abdominal tergite IX with lateral setose patches on oval translucent areas (Figs 35, 36), mid-dorsal setal patch absent, proximal margin with deep angular incision.

Length of anterior wing—♂ 9.5-11.5 mm; ♀ 7.5-8.5 mm.

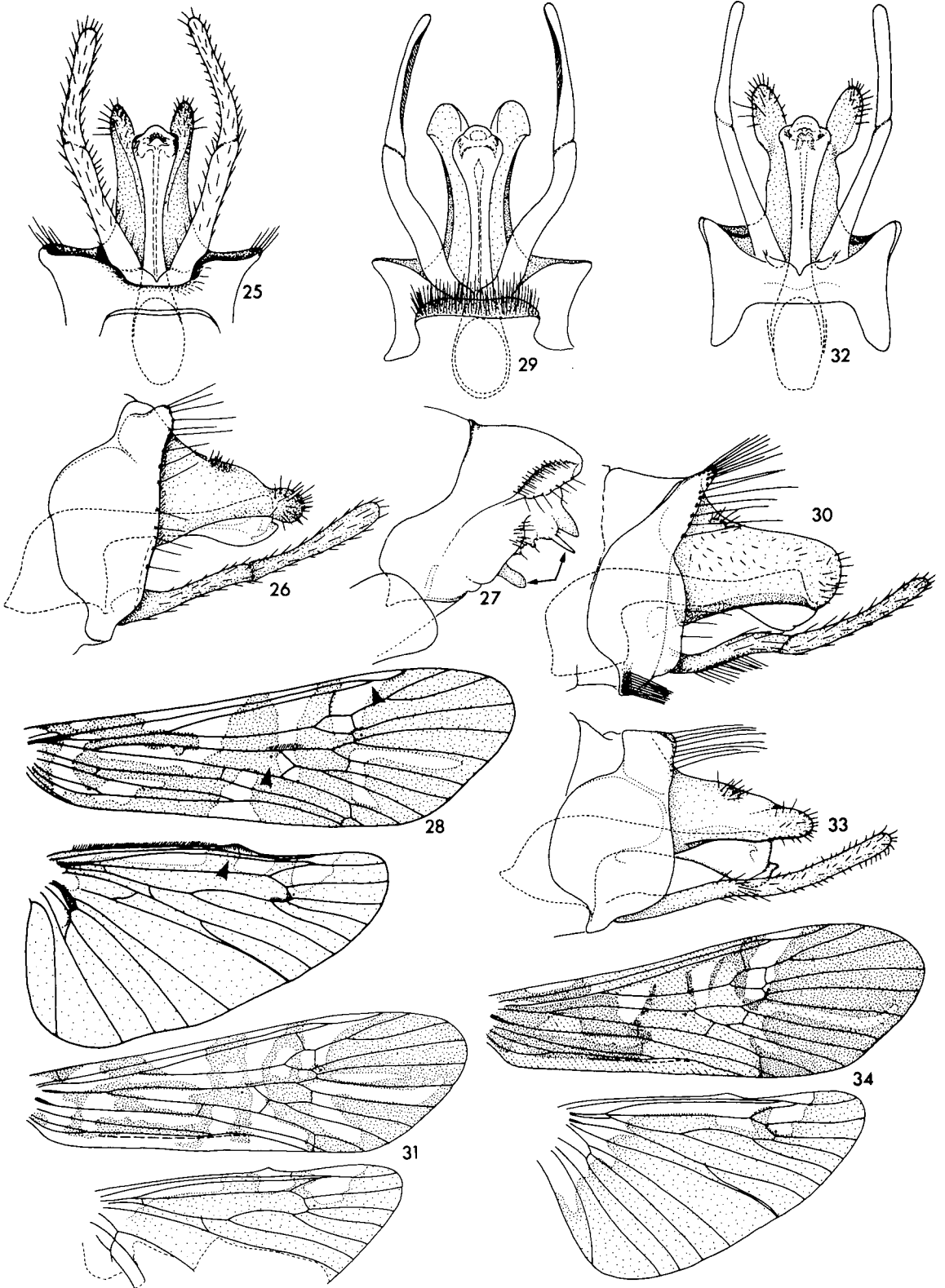
TYPE MATERIAL: Holotype ♂ of *Macronema tristis* Banks—Queensland, Atherton Tableland, Ravenshoe, 27 April (1932) (Darlington) (MCZ now transferred to ANIC); paratypes 2♂, North Queensland, Rock Scrub, McIlwraith Range, 17-29 June (1932) (Darlington) (MCZ now transferred to ANIC). Types examined. Type of *Macronemum torrenticola* Korboot: Holotype ♂ in alcohol with right side wings and abdomen removed; in the same vial one ♀ with head and right side wings detached and loose in vial; there is also present a cast pupal shell and the following labels: 'Montville. Q. Mar. 1962 K.K. sp.R/*macronemum* sp. nov. E. F. Riek det. 1962/*M. torrenticola* ♂ Holotype Korboot/QM reg. number ♂ Holotype T-6183; ♀ paratype T-6184'. The two microscope slides bearing the name *M. torrenticola* Holotype ♂, Korboot (in her handwriting) give

the locality 'Cedar Creek, Tamborine Mts. Q. 3 Oct. 1962'. The slide with wings reg. number T-6183a is of this species; the slide T-6183b however, contains the abdomen of *Smicrophylax* sp. ♂.

MATERIAL EXAMINED: N. QUEENSLAND—3♂ Mt Tozer, Iron Range 30 April 1973 (Monteith) (ANIC); 4♂ Cap Creek, Mt Finlayson Range S of Cooktown 23 Nov. 1974 (Moulds) (ANIC); 17♂ ♀ Mossman Gorge, 23 April 1967 (Colless) (ANIC); 7♂ same loc. 16 Nov. 1979 (Neboiss) (MVM); 2♂ Cape Tribulation, Nov. 1982 (Hinger) (MVM); 1♂ Mt Lewis Road off Mossman-Molloy road, 22 April 1967, (Colless) (ANIC); 1♀ Kuranda, 30 Mar. 1976 (Quick) (MVM); 1♂ Currunda Creek, Freshwater Creek tributary, Cairns district, 30 April 1979 (Wells) (MVM); 1♂ N Toohey Creek, Lake Barrine, 14 May 1936 (no collector) (ANIC); 1♂ 8 km N Bloomfield River, 7-9 May 1978 (Curtis) (ANIC); 1♂ Cairns May 1963 (Korboot) (QU); 5♂ Mt Edith Forest Road, 1.5 km off Danbulla Road, 6 May 1967 (Colless) (ANIC); 1♂ Whitfield Range forest reserve, Cairns 19 April 1967 (Colless) (ANIC); 8♂ 2♀ Fishery Falls, S of Gordonvale 29 June 1971 (Riek) (ANIC; MVM) (♂ genitalia preparation PT-678 figured); 4♂ 1♀ Mulgrave River W of Gordonvale, 29 April 1979 (Wells) (MVM); 1♂ 14♀ Little Mulgrave River 9 km SW of Gordonvale 17 Nov. 1979 (Neboiss) (MVM) (♀ preparation PT-1194 figured); 6♂ 1♀ same loc. 28 June 1971 (Riek) (ANIC); 2♂ The Boulders, Babinda 10 May 1967 (Colless) (ANIC); 1♂ Josephine Falls, SW of Babinda 15 Nov. 1979 (Neboiss) (MVM); 16♂ The Boulders, Babinda Creek 18 Nov. 1979 (Neboiss) (MVM); 2♂ Mt Bartle Frere 29 May 1963 (Shaw) (QU); 13♂ 25 km Gordonvale, Gillies H-way 4 Sept. 1979 (Moulds) (MVM); 6♂ Killama State Forest, 31 May 1971 (Riek) (ANIC); 1♂ Dinner Falls via Ravenshoe, May 1963 (Korboot) (QU); 1♀ Little Cedar Creek, nr. Townsville, 31 Jan. 1965 (no coll.) (QM); 1♂ Broken River, Eungella Nat. Park. 24 April 1979 (Wells) (MVM); 8♂ 35 km SW Ingham 30 May & 5 June 1961 (Straatman) (ANIC; MVM); 2♂ Finch Hatton Gorge, 60 km W of Mackay 14 Nov. 1982 (Hinger) (MVM). SE Queensland—1♂ Brookfield, 10 May 1964 (Dunwoody) (QU); 3♂ 2♀ Highvale 22 km NW of Brisbane 29 Nov. 1959 (Straatman) (ANIC; MVU); 3♂ same loc. April 1963 (Hunter) (QU); 2♂ Dawson Creek Highvale 6 Mar. 1963 (Breden) (QM); 1♂ 2♀ Ashgrove nr. Brisbane, Aug. 1960 (Korboot) (QU); 1♂ Cedar Creek Falls, Mt Tamborine 23 Feb. 1963 (Breden) (QM); 3♂ same loc. Mar. 1962 (Korboot) (QU); 1♀ Teviot Brook nr. Wilson's Peak, 153°31'E 28°13'S, 17 Nov. 1980 (Daniels & Schneider) (QU).

DISTRIBUTION: N and SE Queensland.

Figs. 25-34—*Macrostemum* spp.: 25-28, *saundersi*; 25, male genitalia ventral, holotype; 26, lateral; 27, female, apex of abdomen lateral (PT-1197, from Australia); 28, male wing venation (from Cape York, Australia); 29-31, *loriai* (Navás, 1930); 29, male genitalia ventral (PT-1244); 30, lateral; 31, male wing venation (PT-1244); 32-34, *auriferum*, holotype; 32, male genitalia ventral; 33, lateral; 34, male wing venation.



Baliomorpha lorai (Navás 1933) comb. nov.

Figs 11, 48

1933 *Macronema lorai* Navás (non 1930) p. 42, fig. 94
 1982 *Macrostemum lorai* (Navás); Flint & Bueno-Soria, p. 369.

REMARKS: There has been confusion in the past over the identity of the two species described in 1930 and 1933 under the same name and it was, therefore, important to re-examine both the type specimens, which were made available for this study by the Museum Giacomo Doria at Genova. Kimmins (1962) noted that *Macronema lorai* Navás 1930 is not the same species as *Macronema lorai* Navás 1933. In this revision these two species are placed in separate genera, the one described in 1930 is referred to *Macrostemum*, the other, described in 1933, to *Baliomorpha*. Thus both can retain their original species names.

Unfortunately the abdomen of the type female has been somewhat distorted (Fig. 48) in the drying process, nevertheless the close distance between cerci and lower tubercle pair, together with the wing venation, provide sufficient information for placement in the genus *Baliomorpha*. It should also be noted that the original illustration (Navás 1933, fig. 94) shows the forewing inverted with costa towards the bottom of page.

Female abdomen with distal margin of sternite VIII formed by two mesally separated lobes, segment IX in lateral view subtriangular; there appear to be no lateral setose patches present. Length of anterior wing ♀ 8.8 mm. Male unknown.

TYPE MATERIAL: Holotype ♀: 'New Guinea Mer.' without exact locality and date; collector L. Loria (MCG), preparation and forewing PT-1283 figured.

DISTRIBUTION: E New Guinea.

Baliomorpha caudicea sp. nov.

Figs 12-14

DESCRIPTION: Head vertex dark brown except for yellow lateral patch on anterior warts; posterior-transversal ridge interrupted at mid-line, frons and antennae yellow; forewing with extensive yellow pattern as shown in figure 14, distal section of veins beyond anastomosis accented with dark brown colour.

Male genitalia tergite X covered with scattered stout spines; inferior appendages with a small apical lobe; phallus in ventral view slender proximally, apex dilated, rounded with dorsally directed spines.

Length of anterior wing ♂ 12 mm. Female unknown.

TYPE MATERIAL: Holotype ♂ New Guinea: (Papua New Guinea) S Garaina 900-1800 m/8-14 Jan. 1968/ (Sedlacek) (BPBM), genitalia preparation and wings PT-1243 figured.

DISTRIBUTION: E New Guinea.

Baliomorpha echinata sp. nov.

Figs 15-17

DESCRIPTION: Head vertex entirely yellow, posterior transversal ridge broad, interrupted at mid-line, frons and antennae yellow, covered with dark pubescence; forewing (Fig. 17) with bold yellow blotches as illustrated, there is some darkening along veins. However, not as distinctive as in *caudicea*, also the pale areas are less extensive.

Male genitalia (Figs 15, 16) similar to *caudicea* with short scattered spines on apex and lower ridge of tergite X; inferior appendages smoothly rounded at apices; phallus gradually dilated apically with several dorsally directed spines.

Length of anterior wing ♂ 10.7 mm. Female unknown.

TYPE MATERIAL: Holotype ♂ New Guinea: (Papua New Guinea), Finnhafen 13 Apr. (no year) (Sedlacek) (BPBM), genitalia preparation and wing venation PT-1220 figured; 1 ♂ paratype Wareo, Finnhafen (Rev. Wagner) (SAM).

DISTRIBUTION: E New Guinea.

Baliomorpha pezidion sp. nov.

Figs 18-22

DESCRIPTION: Head with vertex distinctly bicolorous— anterior half blackish brown, posterior half, anterior warts and frons yellow, colour division along the elevated transversal ridge which is continuous across mid-line. Forewing (Fig. 20) with transverse pale yellow band at midwing and an elongate triangular spot at anastomosis, including part of discoidal cell; less distinct pale yellow colour is also present along the apex of the wing and at anal area.

Male genitalia (Figs 18, 19) with tergite X, in lateral view, short, triangular, ventral surface with scattered bristles; phallus deeply incised at apex, with two pairs of lateral lobes.

Two females from the same general area are provisionally referred to this species; in both specimens the yellow wing markings are more restricted than in the male, particularly along the anal margin. Abdominal tergite IX without lateral setose patches, proximal margin deeply incised mid-dorsally (Fig. 22).

Length of anterior wing ♂ ♀ 7.5 mm.

TYPE MATERIAL: Holotype ♂ New Guinea: (Papua New Guinea) Wau 1260 m 14 May 1965 (Sedlacek) (BPBM); without left forewing; holotype genitalia preparation PT-1223 figured.

Figs. 35-48—35-38, *Baliomorpha banksi*; 35, female, apex of abdomen lateral; 36, dorsal; 37, ventral; 38, male head, dorsal; 39-41, *Baliomorpha urbana*; 39, female, apex of abdomen lateral; 40, dorsal; 41, male head, dorsal; 42, *Macrostemum saundersi* holotype male, head dorsal; 43-44, *Baliomorpha pulchripennis*; 43, female, apex of abdomen lateral; 44, dorsal; 45, *Macrostemum zebrafatum* male head dorsal; 46-47, *Baliomorpha dubia*; 46, female, apex of abdomen lateral; 47, dorsal; 48, *Baliomorpha lorai* (Navás, 1933) holotype female, apex of abdomen ventral.

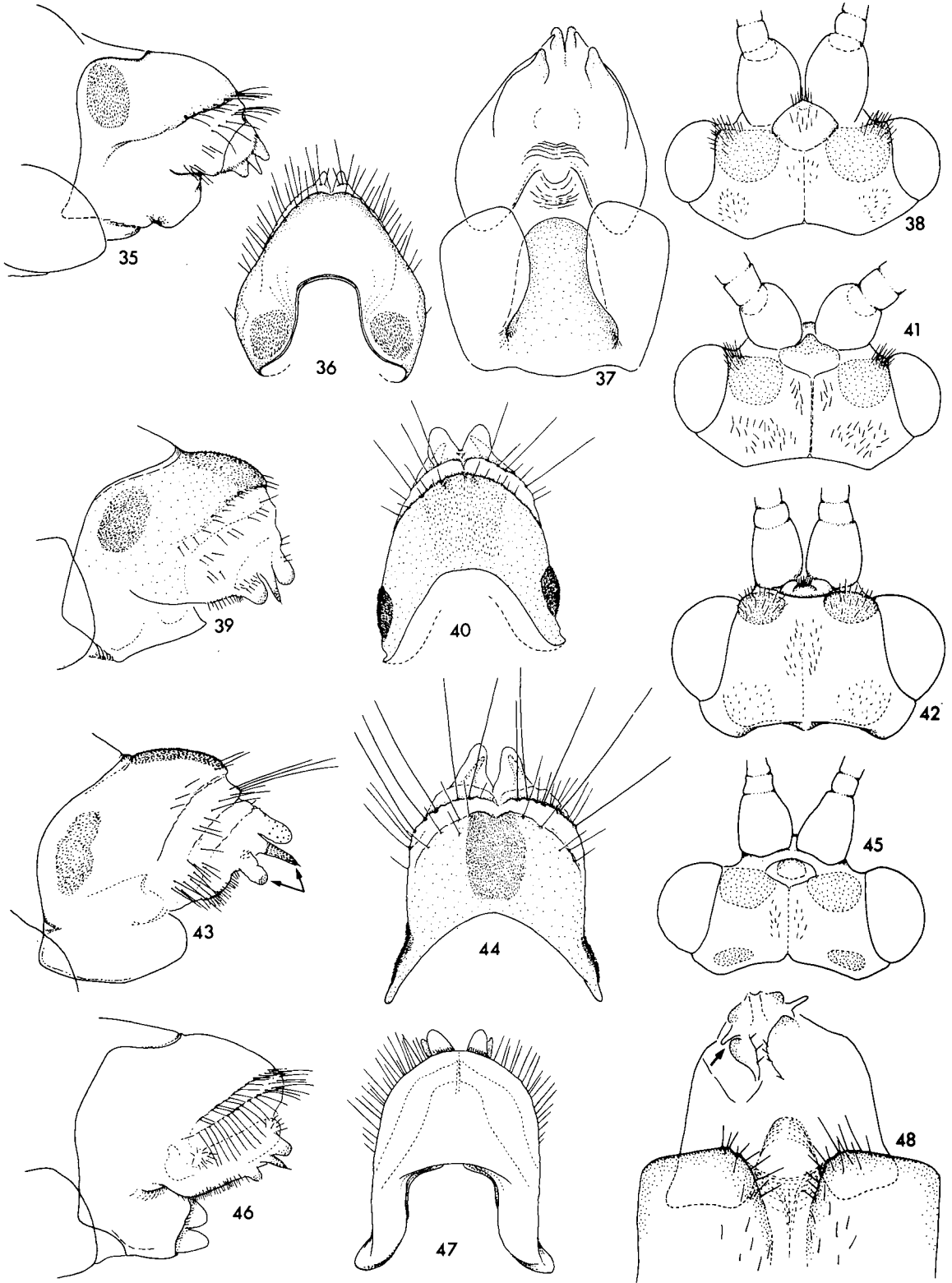


TABLE I
CHARACTER STATES SEPARATING *MACRONEMA* AND *BALIOMORPHA*

	<i>MACRONEMA</i> (Neotropical)	<i>BALIOMORPHA</i> (Australia, New Guinea)
HEAD:		
frons	without elevated pad	without elevated pad
warts on vertex	anterior pair large; posterior pair absent	anterior pair large; posterior pair absent
maxillary palp	segments 1 and 2 short, subequal; segment 3 very long	segments 1 and 2 short, subequal; segment 3 very long
SPURS:		
	0:4:4	1:4:4
ABDOMINAL STERNITE V		
	without lateral filament	without lateral filament
MALE GENITALIA:		
tergite X	short, broad, often with lobes or processes	short, simple
inferior appendages	undivided or nearly so	undivided
apex of phallus	often with lobes and processes	rounded, sometimes with lobes or spines
FOREWING:		
Sc	ending on costa	forked at end
cross-vein sc-c	one	absent
discoidal cell	minute	small
nygma of thyridial cell	at about middle of cell	at about middle of cell
distal end of thyridial cell	narrow	narrow
colour	dense, mostly due to scales	scale cover moderate to dense, colour due to scales or in membrane
HINDWING:		
costal margin	evenly curved	evenly curved
FEMALE		
ABDOMINAL SEGMENT X:		
distance between cerci and lower tubercle pair	(?)	less than length of tubercle

MATERIAL EXAMINED: New Guinea: (Papua New Guinea): 2 ♀ Wau, 1200 m. 22 Oct. 1965 (Sedlacek) (BPBM).

DISTRIBUTION: E New Guinea.

***Baliomorpha chiloma* sp. nov.**

Figs 23-24

DESCRIPTION: Head vertex dark brown except posterior margin which is yellowish, without posterior transversal ridge, frons yellow, antennae with scape yellowish,

subsequent segments become gradually darker; forewing dark brown except for a pale ovoid patch at costal margin near discoidal cell.

Male genitalia (Figs 23, 24) with segment IX produced mid-ventrally into a short, broad lobe, phallus apically somewhat angular with circular mesal incision, and a pair of dorsally directed, curved spines.

Length of anterior wing ♂ 8.5 mm. Female unknown.

TYPE MATERIAL: Holotype ♂: New Guinea: (Irian Jaya) Bokondini, 40 km N of Baliem Val. ca 1300 m, 16-23

TABLE 2
CHARACTER STATES SEPARATING *MACROSTEMUM* GROUPS

	<i>MACROSTEMUM</i> (N America, Africa)	<i>MACROSTEMUM</i> (Australia, New Guinea)
HEAD:		
frons	without elevated pad	with elevated setose pad
warts on vertex	anterior pair of medium size, posterior pair present, small to medium	anterior pair present, medium size, situated well forward, posterior pair absent
maxillary palp	segments 1 and 2 short, 3 slightly to distinctly longer than 2	segment 1 shorter than 2, 3 only slightly longer than 2
SPURS:		
	1:4:4 or 2:4:4	2:4:4
ABDOMINAL STERNITE V		
	without lateral filaments (filaments present in males of African species)	lateral filaments present in both sexes
MALE GENITALIA:		
tergite X	elongate, simple	elongate, simple
inferior appendages	distinctly 2-segmented	2-segmented, division indistinct
apex of phallus	generally bulbous, without special structures	bulbous
FOREWING:		
Sc	united with R ₁ apically or ending in fork whose ventral arm united with R ₁	united with R ₁ apically
cross-vein sc-c	several indistinct or none	absent
discoidal cell	small	small
nygma of thyridial cell	at distal end	at distal end
distal end of thyridial cell	broad	broad
colour	contrasting colour of membrane, scale cover sparse (setose, not scaly in African species)	contrasting colour of membrane, accented by cover of fine, dense pubescence
HINDWING:		
costal margin	excised before apex or evenly curved	excised before apex
FEMALE, ABDOMINAL SEGMENT X:		
distance between cerci and lower tubercle pair	greater than length of tubercle	greater than length of tubercle

Nov. 1961 (Quate) (BPBM), genitalia preparation PT-1219 figured.

DISTRIBUTION: W New Guinea.

Macrostemum Kolenati 1859

TYPE SPECIES: *Macronema hyalinum* Pictet (designated by Ulmer 1957, p. 339).

REMARKS: The generic diagnosis given by Flint and Bueno-Soria (1982) is based on typical North American species. Some amendments were made by Scott (1983) to include African species. Table 2 summarizes the different character states existing between the North American-African and the Australian-New Guinean species groups. The following generic diagnosis is

modified and refers to species of the Australian and New Guinea region only.

Head with antennae long, in males $2 \times$ length of forewing, in females shorter; vertex with a pair of moderate size anterior warts, situated close to the base of antennae, posterior pair of warts present in N-American species (Fig. 45). Frons with distinct elevated setose pad immediately below the base of antennae (not present in American or African species); maxillary palpi with segment 1 shorter than segment 2; segment 3 only slightly longer than 2. Forewing colour pattern present in wing membrane, accented by fine dense pubescence; costal cross-veins absent, Sc united with R_1 before wing margin; discoidal cell small but not minute, median cell larger than discoidal cell, thyridial cell long, nygma close to the rather broad distal end, forks 1-5 present, fork 1 with footstalk. Hind wing broad, costal margin excised before apex, partially bordered with hooked macrotrichia. Abdominal sternite V with lateral filament present in both sexes; male genitalia with tergite X comparatively slender, elongate; inferior appendages indistinctly divided in two segments; apex of phallus bulbous.

Female abdominal sternite VIII formed by a pair of elongate lateral lobes, rounded and free standing distally, separated mid-ventrally; tergite IX in dorsal view bluntly triangular, proximal margin gradually curved; segment X terminates with three pairs of short tubercles of which the ventral pair is separated from the middle ones (cerci) by a distance equal to, or greater than the length of a tubercle. Tibial spurs in both sexes 2:4:4.

At present only 3 Australian-New Guinean species (*saundersi*, *auriferum* and *loriai*) are referred to this group. Published information indicates that a number of other species of the Sunda Archipelago may belong here.

Macrostemum saundersi (McLachlan 1866)

Figs 25-28, 42

1866 *Macronema saundersii* McLachlan, p. 261, pl. 17, fig. 3; pl. 19, fig. 4.

1907 *Macronema saundersii* McLachlan; Ulmer, p. 103

1982 *Macrostemum saundersi* (McLachlan); Flint & Bueno-Soria, p. 369

REMARKS: The species is recognized by its distinct forewing pattern (Fig. 28) and details of male genitalia. The pale yellow areas in forewing are similar, but less extensive than in *loriai*.

Male abdominal segment IX rather broad dorsally; segment X in lateral view slender, tapering distally, in ventral view both lobes slightly divergent, gradually tapered to evenly rounded apices.

Length of anterior wing: σ 10-11.5 mm; ♀ 10-11 mm.

TYPE MATERIAL: Holotype σ loc. 'M' = Misool (Irian Jaya) (BMNH) genitalia preparation in glycerine, illustrated.

MATERIAL EXAMINED: New Guinea—1 σ Wau, Morobe district 1200 m 26 Oct. 1961 (Sedlacek) (PT-1242)

(BPBM), 1 ♀ 14.4 km W Lae 28-30 Oct. 1965 (Steffan & Huang) (BPBM). N Queensland—3 ♀ Bamaga, Cape York 30 Mar. 1964 (Common & Upton) (ANIC); 50+ σ ♀ Upper Jardine River (9 stations) 10-27 Oct. 1979 (Moulds) (MVM) (σ wings figured); 1 σ Claudie River (Iron Range) 20 May 1961 (Kerr) (MVM); 1 ♀ Iron Range 10 April 1964 (Common & Upton) (ANIC); 20+ σ ♀ Middle Claudie River Iron Range, 21 Sept.-23 Oct. 1974 (Moulds) (MVM) (♀ genitalia preparation PT-1197 figured); 20+ σ ♀ Gordon Creek, Iron Range 18 April-1 June 1975 (Moulds) (MVM); 25+ σ ♀ McIvor River N of Cooktown, 4 Jan. 1981 (Moulds) (MVM); 1 σ same loc. 15 Feb. 1982 (Moulds) (MVM); 1 ♀ 3.5 km S of Mt Lamond, Iron Range, 22 Dec. 1971 (McAlpine and Holloway) (AM).

DISTRIBUTION: New Guinea, N Australia (Cape York Peninsula).

Macrostemum auriferum sp. nov.

Figs 32-34

DESCRIPTION: A dominating golden coloured transverse band in the centre of anterior wing (Fig. 34), incorporating some small paler areas distinguishes this species.

Head black with metallic bluish lustre, anterior warts small, orange-brown.

Male genitalia (Figs 32, 33) similar to *saundersi*, but lobes of segment X in ventral view with distinct constriction before club shaped apices.

Females show the same colour pattern on wings as males.

Length of anterior wings: σ 9.5-11 mm; ♀ 10-11 mm.

TYPE MATERIAL: Holotype σ New Guinea (Irian Jaya) Bodem, 100 m 11 km SE Of Oerberfaren 10-17 July 1959, Maa) (BPBM) σ abdomen preparation PT-1218 figured; right side wings dry mounted and figured. Paratypes 4 ♀ collected with holotype (BPBM).

MATERIAL EXAMINED: New Guinea (Irian Jaya) 2 ♀ Nabire 5-50 m. 25 Aug.-20 Sept. 1962, Light trap in jungle (Holtman) (BPBM).

DISTRIBUTION: W New Guinea.

Macrostemum loriai (Navás 1930)

Figs 29-31

1930 *Macronema lorlai* Navás (not Navás 1933) p. 22, fig. 4

1962 *Macronema lorlai* Navás; Kimmins, p. 135

1982 *Macrostemum lorlai* (Navás); Flint & Bueno-Soria, p. 369

DESCRIPTION: Wing pattern similar to *saundersi*, but with yellow areas more extensive, and postero-apical mark along fork 3 tapered and extended into fork 2 at wing margin; a parallel mark is present between forks 2 and 3.

Abdomen with lateral process on sternite V long, robust, basal half thickened; hind tibia covered with fine long hairs. Male genitalia in lateral view with segment X

rather broad apically, postero-ventral margin of sternite IX densely covered with stiff bristles.

Length of anterior wings: ♂ ♀ 12-13 mm.

TYPE MATERIAL: Type ♂, New Guinea (Papua New Guinea) Haveri (147°35'E, 9°25'S, alt. 600 m. Astrolabe Mts) July-Dec. 1893; coll. by Loria (MCG) (type examined).

MATERIAL EXAMINED: New Guinea—1 ♂ Papua New Guinea, Lae, Singuawa Riv. 147°35'E, 6°45'S 30 m. 11 April 1966 (Wilkes) (BPBM) (♂ genitalia preparation PT-1244 figured), (wings mounted and figured); 1 ♂ Mt Lamington/NE Papua/1300-1500 ft. (McNamara) (SAM); 1 ♂ Wareo, Finchhafen New Guinea Rev. L. Wagner (SAM). Recorded by Kimmins (1962): 16 ♂ 3 ♀ Kokoda and 1 ♂ 4 (sex?) from Lake Sentani, Ifar (Irian Jaya) (specimens not seen).

DISTRIBUTION: New Guinea.

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