

A tribal classification of the Tropicuchidae (Homoptera: Fulgoroidea), with the description of a new species on tea in Malaysia

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Abstract

In a revised classification of the Tropicuchidae, which includes a number of species injurious to crops, the family is divided into 15 tribes, of which six (Cixiopsini, Eporini, Isporisini, Neommatissini, Remosini and Turneriolini) are proposed as new, two (Eutropistini and Tangiini) are given new status and seven are redefined. New subtribes (Clardeina, Neotangiina and Duriina) are erected in Eporini, Tangiini and Eutropistini, respectively, and Kazeruniina is given new status in the last. The genera *Chiotasa* and *Habrotasa* are transferred to Achilidae, *Dolia*, *Hiracia*, *Karna*, *Parahiracia*, *Sieberella* and *Gastrinia* to Issidae, and *Kruegeria* to Ricanidae, and *Dichoneura* is brought into Tropicuchidae from Delphacidae. *Biruga chariclo* Fennah is transferred to *Athestia* to form a new combination, and *Tambinia theivora* sp. n. is described from material that included examples collected on tea.

Introduction

The Tropicuchidae are found in all warm temperate and tropical regions of the world associated with herbaceous and woody dicotyledons, palms, grasses, rushes and ferns, and have adapted themselves to habitats ranging from rain-forest to macchia and semi-desert. Various species are known to feed on crop plants, such as *Mesepora onukii* (Matsumura) on fruit trees (Watanabe, 1937: 116), *Neotangia angustata* (Uhler) on coffee, *Tangia viridis* (Walker) on grapefruit and *Neurotmeta sponsa* (Guérin-Méneville) on guava (Wolcott, 1948: 133-134), *Alcestis ingens* Fennah on cacao (Fennah, 1982), *Swezeyaria viridana* Metcalf and *Leptovanua telamon* Fennah on breadfruit (Fennah, 1956: 192, 1971: 596, respectively), *Numicia viridis* Muir on sugar-cane (Dick, 1962: 869), *N. maculosa* (Distant) on sugar-cane and *N. graminivora* Ghauri on golf-turf grass (Ghauri, 1976) and *Biruga chariclo* Fennah on ornamental palm (Fennah, 1974), and there is growing evidence of their ability to reach pest status rapidly when conditions permit.

The tribal classification of the family proposed by Melichar (1914: 7) and followed with slight modification by later workers (Muir, 1923: 225; Metcalf, 1938: 381) is based on the length of the antennae, the consistency and venation of the tegmen and the occurrence of a cephalic process. However, a comparison of genera based on additional characters has shown that the current tribal definitions separate genera that in other respects appear to be allied. A new classification is accordingly here proposed in which the status and characterisation of existing tribes and subtribes are revised and new tribes

are erected. The genera attributed to each are listed. The key below should be used in conjunction with Table I and Fig. 1-26.

The following notes are offered to clarify the meaning of some of the expressions used in the definitions given in the key.

(a) The term 'tricarinate' refers strictly to the presence of three complete carinae on the disc of the frons, and not to the condition in which the frons has a single broad median carina and a pair of incomplete oblique carinae distally that do not unite with the basal (upper) margin.

(b) The second antennal segment varies in shape from globose to cylindrical, and bears disc-like plate organs (often surrounded with minute vertical setae), microsetae, which may be extremely short or fine and distally curved, and macrosetae, which are stout, stiff and relatively sparse. The plate-organs and microsetae may extend from the apex to the base of the segment, or almost do so, or may terminate at the middle, leaving the base bare, or with only one or two macrosetae.

(c) The post-coxal process is an outgrowth from the posterior surface of the post-coxa. In Tropicuchidae, it is stout and spine-like or thin, spatulate and papery. In a less common condition, the spine is longitudinally sulcate in its lower half, but is still classifiable as 'spine-like'. The form of the process is useful in separating genera, but of only limited value in distinguishing tribes.

(d) The first valvula of the ovipositor is narrow and slightly curved and tapers distad to end in 1-3 claw- or finger-like processes. The dorsal and ventral margins, independently of each other, may bear simple stout teeth, and a few minute teeth may be present on an oblique laterobasal ridge. The apical teeth are to be excluded when counting the dorsal or ventral teeth.

(e) The third valvula of the ovipositor, relatively narrow basally, abruptly and strongly widens before the middle then narrows to the apex. The upper margin is mainly formed by a stout tapering rod that ends close to the apex. The margin then curves down into the apical margin, which is subvertical and is beset with 5-6 stout incurved teeth that begin at the upper end and terminate at the lower. One or two teeth may encroach on the curve from the apical into the ventral margin, or the dentition may continue without interruption along the lower margin and involve a further five to eight teeth. Teeth are not counted as 'dorsal' or 'ventral' if they belong to the compact apical cluster.

(f) The paired genital styles usually resemble each other in size and shape, and in side view are usually 2.0-2.7 times as long as their greatest width, and lie juxtaposed along their ventral margins. However, according to tribe, they may be relatively longer; they may lie with their ventral margins markedly separated throughout, or contiguous basally but separated and parallel elsewhere; or they may be fused together along the ventral margin, and in this condition may be either bilaterally symmetrical or asymmetrical, with a long hook-like process ascending obliquely from the dorsal margin of one side. They usually extend directly posteriorly, but, bow-like, may curve laterad and recurve to meet apically; at the base of the curved ventral margin a small process may be present that, contiguous with its counterpart, forms a composite median process.

On the basis of the characterisation here used, certain genera hitherto regarded as tropiduchid must be transferred to other families. These are *Chiotasa* and *Habrotasa* (to Achilidae), *Dolia*, *Hiracia*, *Karna*, *Parahiracia*, *Sieberella* and *Gastrinia* (to Issidae) and *Kruegeria* (to Ricaniidae). Conversely, *Dichoneura* is transferred from Delphacidae to Tropicuchidae.

KEY TO THE TRIBES OF TROPIDUCHIDAE

- 1 Post-tibia typically with 4 or more spines laterally, but if 3, rostrum beyond labrum only about as long as an antenna; second antennal segment about 1.7 times as long as broad, tegmen fully 3.5 times as long as broad, and subapical cell R sinuately narrowing distad 2
 — Post-tibia with less than 4 spines laterally 3

- 2 Mesoscutellum not demarcated by a transverse groove. Rostrum distad of labrum much longer than an antenna. Second antennal segment subglobose or barrel-shaped, with plate organs and microsetae extending to base Cixiopsini
 — Mesoscutellum demarcated basally by a transverse groove. Rostrum distad of labrum short, about as long as an antenna. Second antennal segment relatively long (length: breadth 1.5:1), with plate organs and microsetae only in distal half Catullini
 3 Post-tibia typically with 2 spines laterally, but if 3, either nodal line in tegmen straight and strongly oblique or (in Neotropical species only) 3 large uneven subapical cells present; *Cu*₁ in macropterous tegmen meeting *M* basally 4
 — Post-tibia typically with 3 spines laterally; *Cu*₁ in macropterous tegmen not meeting *M* basally 7
 4 Apical segment of rostrum as broad as long or even broader. Vertex at least 1.5 times as broad as long and obtusely angulate anteriorly. Disc of frons ascending from lateral margins to median carina. Frons vertical or only weakly inclined ventrocaudad Trypetimorphini
 — Apical segment of rostrum relatively longer. Vertex less than 1.5 times as broad as long or frons strongly inclined ventrocaudad 5
 5 Tegmen with nodal line straight and very oblique Tambiniini
 — Tegmen with nodal line not oblique 6
 6 Posterior margin of mesoscutellum broadly rounding or U-shaped. Tegmen widening distad, or elongate and strap-like. Vertex obtusely angulate anteriorly Neommatissini
 — Posterior margin of mesoscutellum V-shaped. Tegmen relatively narrow, of same width throughout, or brachypterous. Vertex rounded anteriorly or elongate Turneriolini
 7 Second antennal segment with plate organs, microsetae and macrosetae only in distal half 8
 — Second antennal segment with microsetae and macrosetae, and usually plate organs, extending to base, or nearly so 11
 8 Post-coxal process spinose. Tegmen with costal cell and costal area short; *Sc*+*R* forked in basal third Alcestini
 — Post-coxal process spatulate, papery. Costal cell not short and costal area absent or long; *Sc*+*R* forked distad of middle 9
 9 Tegmen with a single row of transverse veinlets distad of nodal line Cyphoceratopini
 — Tegmen with 2-5 irregular ranks of transverse veinlets distad of nodal line .. 10
 10 Vertex more or less elongate. Tegmen with *M* forked twice before nodal line. Third valvula of ovipositor with more than 5 teeth on ventral margin .. Remosini
 — Vertex not elongate. Tegmen typically with *M* not forked twice before nodal line; if forked twice, then nodal line concave, nearest to base at *M* Tangiini
 11 Macropterous tegmen with *Sc* emitting an oblique vein to costa before nodal line; if not, subapical segment of rostrum more than 3 times as long as apical segment, or *Cu*₁ not forked before nodal line, and cell *Cu*_{1a} in membrane long and traversed by only a single cross-vein, and vein *Cu*_{1b} lying along hind margin .. Tropicuchini
 — Tegmen with *Sc* not emitting an oblique vein to costa before nodal line; subapical segment of rostrum less than 3 times as long as apical segment, or combined characters of vein *Cu*₁ in corium and cell *Cu*_{1a} and vein *Cu*_{1b} in membrane not as above 12
 12 Tegmen coriaceous, opaque or strongly pigmented. Frons tricarinate, or devoid of median carina, and with lateral discal carinae straight, at least in basal two-thirds, converging to meet basally, or frons flat and strongly inclined ventrocaudad Eutropistini
 — Tegmen not coriaceous, frons not as above, medially carinate at least in basal third 13

- 13 Pronotum with 2 distinct carinae on either side between eye and base of tegmen, separate from lateral discal carina of same side. Tegmen with cell *PCu* in clavus more than 5 times as long as its greatest width (Fig. 11) Eporini
- Pronotum with 1 distinct carina on either side between eye and base of tegmen; if apparently 2, upper carina a direct extension of lateral discal carina, and lower 'carina' a weak coarse ridge. Clavus with cell *PCu* less than 5 times as long as its greatest width 14
- 14 Tegmen markedly widening from base at least to distal quarter and broadly rounding apically. Mesoscutellum posteriorly rounded Paricanini
- Tegmen widening distad only feebly, widest at level of claval apex, and narrowly rounding apically. Mesoscutellum posteriorly angulate, more or less V-shaped Isporisini

Trypetimorphini Melichar

Frons with median carina distinctly projecting. Apical segment of rostrum broader than long. Tegmen with *R-M* and *M-Cu* only transverse veins present, or if not, a series of transverse veinlets rectangulately to costa from *Sc + R* and to posterior margin from *Cu_{1b}*. Post-tibiae with 2 spines laterally. First valvula of ovipositor with at least 4 teeth dorsally and 5-8 teeth ventrally. Third valvula devoid of teeth.

The nominal genera of this tribe are *Trypetimorpha*, *Trichoduchus*, *Ommatissus* and *Caffrommatissus*.

Ommatissus binotatus var. *lybicus* de Bergevin is known as a pest of date palm (Alfieri, 1934). A female of *Trichoduchus biermani* var. *hyalinus* Bierman in the British Museum (Nat. Hist.) is labelled as having been taken on mango (Bengal, Pusa, 19.i.09. D.P.S.).

Neommatissini trib. n.

Head much narrower than pronotum. Vertex about as long as broad, with anterior margin angulate. Frons medially carinate. Antenna II cylindrical, with microsetae extending to base. Apical segment of rostrum longer than broad. Tegmen with membrane as large as corium, clavus small; venation simple, with a single line of transverse veinlets, or 4 subapical cells; or tegmen reduced, long, narrow and strap-like. Post-tibiae with 2 spines laterally. Genital styles bilaterally symmetrical, not elongate. First valvula of ovipositor with 2 teeth on ventral margin and at least 4 teeth on dorsal margin. Third valvula with teeth at apex, not toothed on dorsal margin and with less than 5 teeth on ventral margin.

The nominal genera of this tribe are *Neommatissus*, *Paruzelia* and *Teramnon*.

Tambiniini Kirkaldy

Frons unicarinate with carina not markedly projecting basally, or devoid of carinae, or broadly callused at base and with an indication of 3 short carinae. Antenna II with microsetae extending to base. Apical segment of rostrum not broader than long. Post-tibia laterally 2-spined in Old World species, 3-spined in New World species. Posterior margin of mesoscutellum angulate. Tegmen with clavus long; *M* simple to nodal line; nodal line even, strongly oblique, if not, 3 uneven subapical cells present. Genital styles symmetrical, not elongate, separated except at base. First valvula of ovipositor with 3-5 minute teeth lateroventrally and at least 4 stout teeth on dorsal margin. Third valvula with teeth at apex, and without teeth on dorsal and ventral margins.

The nominal genera of this tribe are *Tambinia*, *Ossoides*, *Sumbana*, *Kallitaxila*, *Kallitambinia*, *Nesotaxila*, *Garumna*, *Paragarumna*, *Athestia* and *Biruga*.

Athestia chariclo (Fennah) comb. n. (= *Biruga chariclo* Fennah, 1974). This reassignment to *Athestia* is considered preferable on venational grounds.

Turnerioliini trib. n.

Frons unicarinate with carina markedly projecting basally. Antenna II with micro-

TABLE I. Distribution of certain genitalic characters among tribes of Tropiduchidae

	1*	2	3	4	5	6	7	8
Remosini	0	0	0	0	0	0	1	0
Tangiini	0	0	0	0	0	1	0	0
Cyphoceratopini	0	0	0	0	0	1	0	0
Alcestini	0	0	1	0	0	1	1	0
Catullini	0	1	1	1	0	1	1	1
Eporini	0	0	0	0	0	1	0	0
Neommatissini	0	0	0	0	0	1	2	0
Trypetimorphini	0	0	0	1	0	1	5-8	0
Tambiniini	0	0	1	0	0	1	0	0
Isporisini	0	1	0	0	0	0	4-8	1
Paricanini	0	0	0	0	0	0	4-8	0
Turnerioliini	0	0	1	1	1	1	0	0
Tropiduchini	1	0	0	0	0	0	2	0
Eutropistini	0	0	0	1/0	0	1	3-4	1
Cixiopsini	0	0	0	0	0	1	10	0

*Notes

Column 1. Genital styles bilaterally symmetrical—0; genital styles bilaterally asymmetrical, ventrally fused together in basal half and with an obliquely ascending hook-like process on one side—1.

Column 2. Genital style in side view not more than 2.7 times as long as broad, but if so, arcuate in ventral view—0; genital style elongate, straight, at least 3 times as long as broad, not arcuate in ventral view—1.

Column 3. Genital styles ventrally not distinctly separated to base when in repose—0; genital styles ventrally distinctly separated to base or almost to base—1.

Column 4. Third valvula of ovipositor furnished apically with stout incurved teeth—0; third valvula without teeth, or with numerous minute denticles in compact rows—1.

Column 5. Third valvula of ovipositor without teeth on dorsal margin unless at apex—0; third valvula with laterally-compressed teeth directed mesad on dorsal margin at or basad of middle—1.

Column 6. Third valvula of ovipositor with 5-11 teeth extending along ventral margin from apex—0; third valvula with less than 5 such teeth—1.

Column 7. Number of teeth on ventral margin of first valvula of ovipositor.

Column 8. First valvula of ovipositor with at least 4 teeth on dorsal margin—0; first valvula with less than 4 teeth on dorsal margin—1.

setae extending to base. Apical segment of rostrum not broader than long. Post-tibia laterally 2-spined. Posterior margin of mesoscutellum angulate. Tegmen macropterous, with principal veins straight, parallel, percurrent to apical margin, or brachypterous. Genital styles symmetrical, not elongate, narrowly separated to base. First valvula of ovipositor without teeth on ventral margin and with at least 4 teeth on dorsal margin. Third valvula without teeth at apex or on ventral margin and with a few laterally-compressed blunt teeth at or basad of middle of dorsal margin.

The nominal genera of this tribe are *Turneriola* and *Stenoconchyoptera*.

Paricanini Melichar

Frons unicarinate. Antenna II with microsetae extending to base. Apical segment of rostrum not broader than long. Post-tibia with 3 spines laterally. Posterior margin of mesoscutellum broadly rounded or bluntly angulate. Tegmen widest near apex, apical margin shallowly rounded, *M* not meeting *Cu₁* basally, nodal and subapical lines of transverse veins present, claval veins uniting at or basad of middle of clavus. Genital styles symmetrical, not elongate and with ventral margins not separated. First valvula of ovipositor with 0-6 teeth ventrally (but 10 distinguishable in large species of *Leusaba*), and 3-6 teeth dorsally. Third valvula with teeth at apex, and with 5-11 teeth on ventral margin.

The nominal genera of this tribe are *Leusaba*, *Paricana* and *Stacota*.

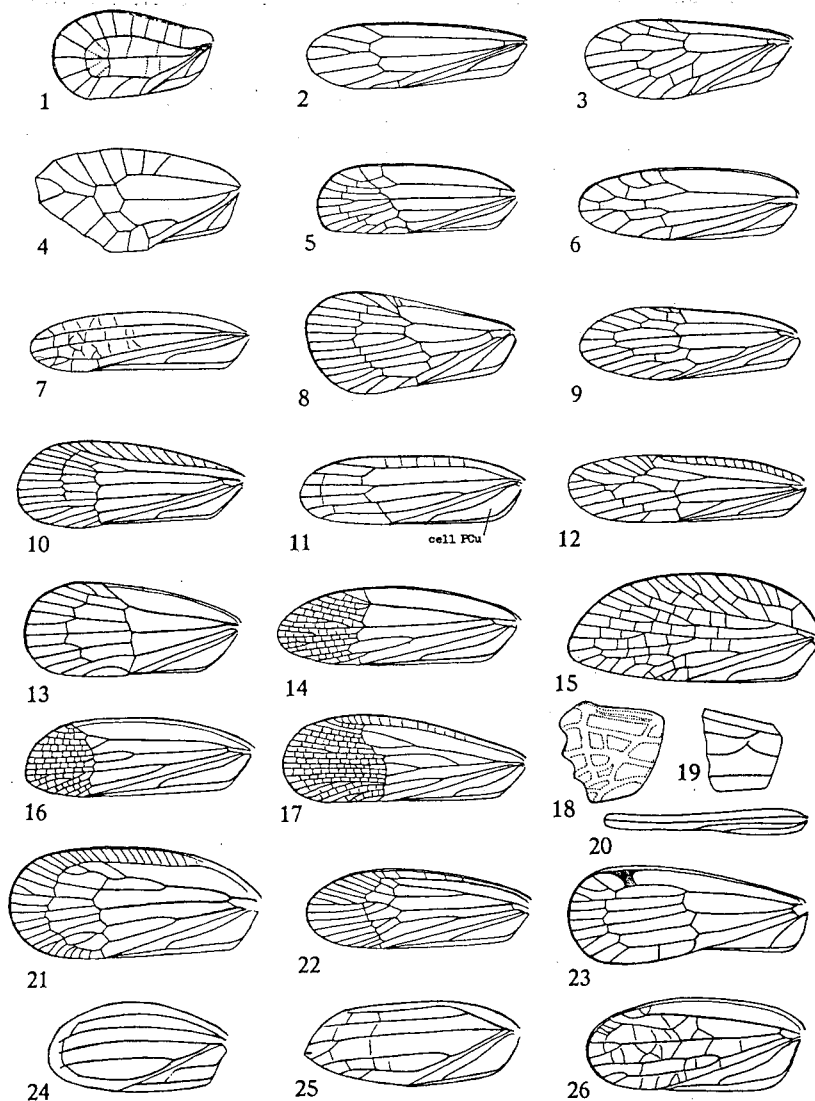


Fig. 1-26.—Tegmina of members of different tribes of Tropiciduchidae. 1-2, Trypetimorphini: 1, *Trypetimorpha japonica* Ishihara, 2, *Ommatissus binotatus* Fieber; 3-4, Neommatissini: 3, *Neommatissus formosanus* (Kato), 4, *Paruzelia psyllomorpha* Melichar; 5-6, Tambiniini: 5, *Tambinia pitho* Fennah, 6, *Athestia chariclo* (Fennah); 7, Turnerioliini: *Turneriola alicae* China; 8, Paricanini: *Paricana* sp.; 9, Isporisini: *Sogana extrema* Melichar; 10-11, Eporini: 10, (Eporina) *Epora laticeps* Fennah, 11, (Clardeina) *Idiomictus nigrostriatus* (Synave);

Isporisini trib. n.

Frons unicarinate or without a distinct carina. Antenna II with microsetae extending to base. Apical segment of rostrum not broader than long. Post-tibia with 3 spines laterally. Posterior margin of mesoscutellum angulate. Tegmen widest near middle, apical margin deeply rounding; *M* not closely associated with *Cu*₁ and simple to nodal line; nodal and subapical lines present, the latter stepwise; clavus not extending beyond middle of tegmen; claval veins uniting basad of middle of clavus. Genital styles symmetrical, elongate, tapering in distal half. First valvula of ovipositor with 4-6 teeth on ventral margin, and with less than 4 teeth on dorsal margin. Third valvula with teeth at apex and 5-11 teeth on ventral margin.

The nominal genera of this tribe are *Sogana*, *Isporisa*, *Isporisella* and *Eilithya*.

Eporini trib. n.

Frons unicarinate. Antenna II with microsetae extending to base. Apical segment of rostrum not broader than long. Post-tibia with 3 spines laterally. Posterior margin of mesoscutellum angulate. Tegmen macropterous or coelipterous; *M* in macropterous form not associated with *Cu*₁ basally, but in coelipterous form usually so; nodal and subapical lines present, the latter uniform in macropterous tegmen, stepwise in coelipterous tegmen; clavus extending for two-thirds of length of tegmen. Genital styles symmetrical, not elongate. First valvula of ovipositor devoid of teeth on ventral margin and with 2-4 teeth on dorsal margin. Third valvula with teeth at apex, and none on ventral margin.

The members of this tribe fall into two groups, which are here regarded as subtribes, separable as follows.

KEY TO SUBTRIBES OF EPORINI

- Vertex with posterior margin broadly concave. Frons with lateral margins parallel in basal three-fifths. Rostrum extending only to mesotrochanters. Tegmina amply surpassing apex of abdomen Eporina
- Vertex with posterior margin angulately excavate. Frons with lateral margins not parallel in basal three-fifths. Rostrum extending to post-trochanters. Tegmina not amply surpassing apex of abdomen Clardeina

EPORINA SUBTRIB. N.

Subtribal features as in key above. Males with anal segment long. Distribution: India, Sri Lanka and S.E. Asia.

The nominal genera of this subtribe are *Epora*, *Eporiella*, *Stiborus* and *Mesepora*.

CLARDEINA SUBTRIB. N.

Subtribal features as in key above. Males with anal segment short. Distribution, Madagascar, Mascarene Is. and Seychelles Is.

The nominal genera of this subtribe are *Clardea*, *Conchyoptera*, *Daradaxoides*, *Idiomictus*, *Aethomyctus*, *Cyrtomycta*, *Cuneiceps* and *Pseudoclardea*.

Catulliini Melichar

Frons unicarinate. Antenna II with microsetae not extending to base. Apical

12, Catulliini: *Eodryas melichari* (Distant); 13, Cyphoceratopini: *Dichoneura simoni* Lethierry; 14, Tangiini: (Neotangiina) *Neotangia angustata* (Uhler); 15, Alcestini: *Alcestis quadrata* Fennah; 16, Tangiini: (Tangiina) *Tangia viridis* (Walker); 17, Remosini: *Vanuoides pallescens* Metcalf; 18-19, Eutropistini (Kazeruniina): 18, *Kazerunia leguaniforma* Dlabola (re-drawn from Dlabola, 1977), 19, *Manganectes agenor* Fennah; 20, Neommatissini: *Teramnon stenopteryx* Fennah; 21-23, Tropiciduchini: 21, *Haliartus centralis* (Gerstaecker), 22, *Scenoma glabrio* Fennah, 23, *Pseudoparicana sanguinifrons* Muir; 24-25, Eutropistini: 24 (Duriina) *Durium* sp., 25 (Eutropistina) *Eutropistes callifer* Schaum; 26, Cixiopsini: *Padanda atkinsoni* Distant;

segment of rostrum very short, sometimes broader than long. Post-tibia with 4 spines laterally. Posterior margin of mesoscutellum broadly rounding. Tegmen more than 2.5 times as long as broad; *M* not associated with *Cu*₁ basally; subapical cell *R* relatively broad at base and narrowing, usually sinuately, to apex. Genital styles symmetrical, elongate, tapering in distal half, separated to base. First valvula of ovipositor with one tooth on ventral margin, and with less than 4 teeth on dorsal margin. Third valvula without teeth at apex or ventrally, longer than first valvula.

The nominal genera of this tribe are *Catullia*, *Catulliarina*, *Numicia*, *Barunoides*, *Catulloides* and *Eodryas*.

Cyphoceratopini Fennah

Frons unicarinate, rarely narrowly bicarinate. Antenna II with microsetae not extending to base. Apical segment of rostrum not broader than long. Post-tibia usually with 3 spines laterally, occasionally 2. Posterior margin of mesoscutellum angulate. Tegmen macropterous, rarely (*Grynia*) coelipterous; *M* in macropterous form not associated with *Cu* basally; nodal and subapical lines present; no supernumerary veins in membrane. Genital styles symmetrical, rarely elongate, and not separated to base. First valvula of ovipositor with one tooth on ventral margin and at least 4 teeth on dorsal margin. Third valvula with teeth at apex and 0–2 teeth on ventral margin. Carinae of head and thorax wholly or partly coloured differently (in orange, red, brown or black) from ground colour.

The nominal genera of this tribe are *Cyphoceratops*, *Chasmacephala*, *Colgorma*, *Arenasella*, *Ubis*, *Neorudia*, *Achilorma*, *Parahydriena*, *Tangiopsis*, *Tangyria*, *Dichoneura*, *Amapala*, *Amaclardea* and *Grynia*.

Tangiini Melichar stat. n.

Melichar, 1914: 12.

Frons unicarinate. Antenna II with microsetae not extending to base. Apical segment of rostrum not very short and not broader than long. Post-tibia with 3 spines laterally. Posterior margin of mesoscutellum angulate. Tegmen macropterous; *M* not associated with *Cu*, basally; *Sc + R* and *M* simple to nodal line, or both forked in distal half of corium; nodal line distinct, 3–7 ranks of irregular transverse veinlets in membrane. Genital styles symmetrical, not elongate and not separated ventrally. First valvula of ovipositor with one tooth or none on ventral margin (disregarding small rudiments of teeth), and at least 4 teeth on dorsal margin. Third valvula with teeth at apex and 0–4 teeth on ventral margin. Carinae of head and thorax concolorous with ground colour or almost so.

The members of this tribe fall into two groups, here recognised as subtribes and separable as follows.

KEY TO SUBTRIBES OF TANGIINI

- Tegmen with *Sc+R* and *M* forked before nodal line. Third valvula of ovipositor with 3–4 teeth on ventral margin Tangiina
- Tegmen with *Sc+R* and *M* not forked before nodal line. Third valvula of ovipositor with 0–3 teeth on ventral margin Neotangiina

TANGIINA SUBTRIB. N.

Characters of subtribe as in key above. Distribution: Greater Antilles; Lesser Antilles from Dominica northward.

The nominal genera of this subtribe are *Tangella*, *Ladella*, *Tangia* and *Ladellodes*.

NEOTANGIINA SUBTRIB. N.

Characters of subtribe as in key above. Distribution: Jamaica; Trinidad; Guyana; Lesser Antilles southward from Guadeloupe; south-eastern USA.

The nominal genera of this subtribe are *Neotangia*, *Tangidia*, *Dioxyomus*, *Dictyotangia*, *Aripora* and *Pelittropis*.

Alcestini Melichar

Frons broadly unicarinate, or also with oblique carinae distally, forming anchor-like elevation. Antenna II with microsetae not extending to base. Apical segment of rostrum not very short and not broader than long. Post-tibia with 3 spines laterally. Posterior margin of mesoscutellum angulate. Tegmen relatively broad; a costal area with cross-veins present, usually small; *Sc+R* fork near base; *Sc* and *R* together typically with more branches at margin than *M*; *M* not meeting *Cu*₁ basally; nodal line absent, subapical line near apical margin; supernumerary transverse veinlets present. Genital styles symmetrical, not elongate and not separated to base. First valvula of ovipositor with at most one tooth on ventral margin and at least 4 teeth on dorsal margin. Third valvula with teeth at apex and less than 5 teeth on ventral margin.

Distribution: Brazil to Trinidad. The nominal genera of this tribe are *Alcestis*, *Alcumena* and *Alphesiboena*.

Remosini trib. n.

Frons unicarinate, sometimes with supplementary incomplete oblique carinae in distal half. Vertex at least as long as broad, apically acute or deeply rounded. Antenna II with microsetae not extending to base. Apical segment of rostrum not very short and not broader than long. Post-tibia with 3 spines laterally. Posterior margin of mesoscutellum angulate. Tegmen more than 2.5 times as long as broad; *Sc+R*, *M* and *Cu*₁ forked before nodal line, *M* frequently forked twice in corium; 4–7 irregular ranks of transverse veinlets in membrane and 19–26 cells along margin between apex of costa and apex of clavus. Genital styles symmetrical, not elongate and not separated to base. First valvula of ovipositor with at most one tooth on ventral margin and at least 4 teeth on dorsal margin. Third valvula with teeth at apex and 5–11 teeth on ventral margin.

The nominal genera of this tribe are *Remosa*, *Rotunosa*, *Neurotmeta*, *Pseudotangia*, *Monopsis* and *Vanuoides*.

Tropiduchini Melichar

Frons unicarinate, sometimes broadly so and sometimes with supplementary incomplete oblique carinae in distal half. Antenna II with microsetae extending to base. Apical segment of rostrum not broader than long. Post-tibia with 3 spines laterally. Posterior margin of mesoscutellum angulate. Tegmen macropterous, rarely coelipterous; a costal area with oblique cross-veins usually present; *Sc* usually emitting an oblique vein to costa before nodal line, but if not, subapical segment of rostrum more than 3 times as long as apical segment, or *Cu*₁ not forked before nodal line, and cell *Cu*_{1a} in membrane long and traversed by only a single cross-vein. Genital styles asymmetrical, fused together at least in basal half and with an obliquely ascending process on one side. First valvula of ovipositor with 2 teeth at most on ventral margin, and at least 4 teeth on dorsal margin. Third valvula with teeth at apex and 5–11 teeth on ventral margin. Distribution: Old World tropics, including western Pacific.

The nominal genera of this tribe are *Tropiduchus*, *Montrouzierana*, *Peliodictya*, *Antabhoga*, *Daradax*, *Daradacella*, *Ficarasa*, *Vanua*, *Macrovanua*, *Rhinodictya*, *Thaumantia*, *Varma*, *Neocataira*, *Leptovanua*, *Oligaethus*, *Thymbra*, *Oechalina*, *Scenoma*, *Peggioga*, *Lavora*, *Nesotemora*, *Swezeyaria*, *Leptotambinia* and *Pseudoparicana*.

Melichar erected a tribe Peggigiini for two genera in which the vertex is exceptionally prolonged. These, *Peggioga* and *Remosa*, are not closely related, and the nearest relatives of *Peggioga* would seem to be *Oechalina* and *Scenoma*. The common features of these three seem too slight to justify recognition of a distinct subtribe for their accommodation.

Eutropistini Kirkaldy stat. n.

Eutropistidae Kirkaldy, 1906: 296.

Frons tricarinate throughout, with carinae uniting with basal margin, or without median carina and with intermediate carinae converging basad to meet in middle line before base, or with all three carinae distinct only in basal half, or median carina only present and greatly thickened basally, or all carinae absent and disc polished. Antenna II with microsetae extending to base. Apical segment of rostrum not broader than long. Post-tibia typically with 3 spines laterally. Posterior margin of mesoscutellum angulate. Tegmen coriaceous, only slightly surpassing apex of abdomen, venation reduced, or brachypterous with venation irregular or obscure; *Sc* and *R* separating at or very near base, *M* simple, *Cu*₁ forked about level with union of claval veins, *Cu*_{1b} sometimes weak or even obsolete; veins distally curving to form a submarginal vein that unites posteriorly with common claval vein; a series of short, weakly-defined apical cells between submarginal vein and apical margin. Genital styles symmetrical, fused together along ventral margins, and forming a relatively broad ventral surface, which is sometimes slightly indented medially; styles not elongate. First valvula of ovipositor with 3-4 teeth on ventral margin and less than 4 teeth on dorsal margin. Third valvula totally devoid of teeth or, uncommonly, with a shagreen surface at apex made up of several compact rows of minute denticles.

The Eutropistini comprise 3 groups of genera. These are here regarded as subtribes and are separable as follows.

KEY TO SUBTRIBES OF EUTROPISTINI

- 1 Frons subvertical or moderately inclined ventrad, usually tricarinate but rarely with these carinae obsolete, and disc convex and smooth. Pronotum with 3-5 coarse oblique incomplete carinae behind eye *Duriina*
 — Frons strongly inclined ventrad, but if subvertical, then bicarinate with carinae converging basad. Pronotum with not more than two carinae behind eye . . . 2
 2 Tegmen brachypterous; apical margin more or less excavate between veins. Pronotum with one carina laterally behind eye *Kazeruniina*
 — Tegmen coeliopterous; apical margin not excavate between veins. Pronotum with two carinae laterally behind eye *Eutropistina*

DURIINA SUBTRIB. N.

Subtribal characters as in key above. Post-tibia apically with 7-10 teeth, basal metatarsal segment with 6-9 teeth. Distribution: Africa south of the Sahara.

The nominal genera of this subtribe are *Durium*, *Heinsenina*, *Obedas*, *Spathocranus*, *Intandela*, *Gergithomorphus*, *Lagoana*, *Euhiracia*, *Diagrynia*, *Bananellodes* and *Pseudogergithus*.

KAZERUNIINA DLABOLA, STAT. N.

Subtribal characters as in key above. Post-tibia apically with 5-6 teeth, basal metatarsal segment with 6 teeth. Distribution: Iran and Somalia.

The nominal genera of this subtribe are *Kazerunia* and *Manganeutes*.

EUTROPISTINA SUBTRIB. N.

Subtribal characters as in key above. Post-tibia apically with 6 teeth, basal metatarsal segment with 6 teeth. Tegmen with interval areas finely rugulose, pustulate or bullate. Distribution: Tropical and southern Africa.

The nominal genera of this subtribe are *Eutropistes*, *Eucameruna*, *Camerunilla*, *Tropiduchodes* and *Kirongoziella*.

Cixiopsini trib. n.

Frons tricarinate. Antenna II with microsetae extending to base, plate-organs

distinct. Apical segment of rostrum distinctly longer than broad. Post-tibia with 4-5 spines laterally. Posterior margin of mesoscutellum angulate. Tegmen coeliopterous; *Sc*+*R*, *M* and *Cu*₁ simple in corium, or *Cu*₁ forked at about level of union of claval veins; 5-6 longitudinal veins reaching apical margin, nodal and subapical lines present, or distal transverse veinlets irregular and forming a reticulum. Genital styles symmetrical, not fused together and not separated to base. First valvula of ovipositor with 5-10 teeth ventrally and at least 4 teeth on dorsal margin. Third valvula with 7-8 teeth, 2-3 of them encroaching on dorsal surface of valvula at apex, remainder along apical margin. Distribution: Himalayas, China to Japan.

The nominal genera of this tribe are *Cixiopsis*, *Zema*, *Duriopisis*, *Padanda* and *Olontheus*. In all of these, the mesoscutellum is not divided from the mesonotum by a transverse groove.

Tambiniini**Tambinia** Stål

Tambinia theivora sp. n. (Fig. 27-36)

Female. Head with eyes narrower than pronotum (1:1.3). Vertex broader at base than long in middle (1.1-1.3:1) anterior margin convex, broadly callused; posterior

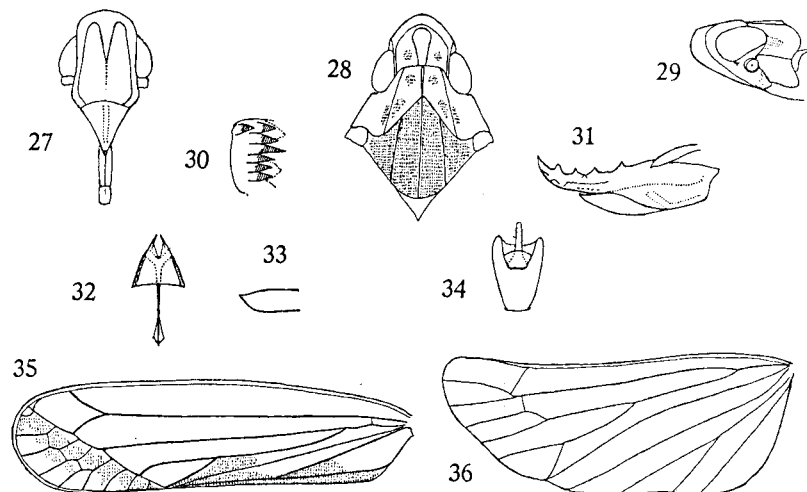


Fig. 27-36.—*Tambinia theivora* sp. n. 27, head, anterior view; 28, head and thorax, dorsal view; 29, head and pronotum, lateral view; 30, teeth of third valvula of ovipositor, posterior view (basal inner tooth not visible; broken line = membranous tissue); 31, first valvula of ovipositor, right side, inner ramus shown partly in transparency; 32, second valvulae of ovipositor, ventral view; 33, basal apodeme of second valvulae, right side; 34, anal segment of female; 35, tegmen; 36, wing.

margin transverse; median carina broad, spatuliform. Frons longer than broad (1.3:1), wider at widest part than at base (about 1.2:1) and at apex (1.5:1); lateral margins diverging to below level of antennae, callused; median carina present at least in basal

half, callused basally and narrowing distad. Rostrum attaining mesotrochanters; basal segment longer than broad in anterior view (1.3:1). Pronotum wider than long in middle (about 4.8:1); posterior margin subrectangulately excavate; median carina shorter than lateral discal carina (1:2.2-2.4); a single carina between eye and tegula. Post-tibia with 2 teeth laterally, 5 apically. Basal metatarsal segment with 5 teeth. Tegmen longer than broad (about 3.7:1); corium smooth; *Sc+R* forking slightly before apical fifth of tegmen; *Cu₁* forking slightly distad of middle of tegmen; *Cu_{1a}* with 2 branches apically, *Cu_{1b}* unbranched; cell *Sc* with a short cross-vein at its apical angle; membrane with about 9 apical cells and 3-4 subapical cells; length:width of subapical and apical cells of *M₂* about 1.6:1 and 2.4:1, respectively; claval veins uniting at about middle of clavus.

Body tawny yellow; a pair of spots on vertex, 2 pairs on disc of pronotum and a pair outside it; mesonotum entirely, or with a spot in each lateral field, dull red. Tegmen pale yellowish brown; irregular spots in membrane near nodal line, and sometimes a broad suffusion over posterior cell of clavus, dilute reddish brown.

Anal segment less than twice as long as broad, widening distad, apical margin shallowly concave; anal style narrow, cylindrical, moderately surpassing apical margin. Seventh abdominal sternite with posterior margin straight, transverse. First valvula of ovipositor dorsally with basal 3 teeth almost symmetrically pointed; a minute intercalary tooth between second and third tooth from base; a row of about 5 minute denticles laterally in distal half of valvula. Basal apodeme of united second valvulae (Fig. 33) blade-like, about 2.5 times as long as broad. Third valvula with a small tooth subapically on inner face, 6 short stout teeth apically, the middle one longest, and one outer tooth.

Length, 4.1-5.0 mm; tegmen, 5.2-5.3 mm.

Material examined. Holotype ♀, WEST MALAYSIA (Malay Peninsula): Cameron Highlands, 11.xi.1943, on tea (*R. Takahashi*) in British Museum (Natural History). Other material: 1 ♀, WEST MALAYSIA, same data as type; 1 ♀, Pahang, Fraser's Hill, 4000 ft, 4.iv.1933 (*H. M. Pendlebury*).

This species differs from all others of the genus in the callused basal and lateral margins and median carina of the frons, in the broad spatula-like form of the median carina of the vertex, and in the proportionately smaller area of tegminal membrane and the number and shape of its cells. The shortness of the head might indicate some affinity with *T. debilis* Stål or *T. languida* Stål, but the proportions and venation of the tegmen as well as structural details of the female genitalia keep *T. theivora* well apart from both.

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