

ON THE CLASSIFICATION OF THE TETTIGOMETRIDAE
(HOMOPTERA: FULGOROIDEA).

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INTRODUCTION.

The family Tettigometridae was erected by Germar (1821: 6) for the reception of a single genus, *Tettigometra* Latreille, with the species *obliqua* Panzer and *virescens* Panzer, and was distinguished by characters of the head and by general body form.

Signoret (1866) and Fieber (1865, 1876) described new species from Europe in this genus, and in 1912 Oshanin catalogued the species from the Palaearctic Region. Walker (1851) described a new genus (*Isthmia* = *Hilda* Kirkaldy) from Sierra Leone, and Distant (1907) reviewed the species from South Africa. In 1903 Melichar described a new genus (*Egropa*) from the Philippines, and to it were added further species by Bierman (1907), Distant (1908, 1909, 1916) and Baker (1924).

In 1912 Schmidt (1912: 459-462) described two new genera, *Megaloplastinx* and *Euphyonarthex*, and placed them in a new tribe, Megaloplastinxini, which he separated from the typical tribe (Tettigometrini) by the longer and relatively more slender legs.

The first comprehensive attempt to classify the family was that of Baker (1924), who divided it into three subfamilies, Tettigometrinae, Egropinae, and Megaloplastinxinae, separated principally by characters of the frons and vertex. The first of these included *Tettigometra*, together with Signoret's subgenera *Mitricephalus*, *Brachycephalus* and *Eurychila* recognised as separate genera; the second included *Hilda*, *Egropa*, *Mesegropa*, and *Nototettigometra*, and the third *Megaloplastinx*, *Euphyonarthex*, *Tembandumba* and *Raatsbrockmannia*.

Muir did not propose a classification of Tettigometridae, but made a fundamental contribution in drawing attention to the occurrence in the family of two different types of male genitalia, the tettigometrine and the egropine (1923, 1924, 1930).

A new classification of the family is proposed below, and has been developed along the line of approach suggested by Muir. In it three subfamilies are recognised, each based principally on a separate genitalic type, supported by external structural characters which appear to be significant. It has been found that the arrangement thus reached, which is believed to be natural, groups genera together quite differently from the classification of Baker: as a result the concept of the sub-family Egropinae discussed below bears little similarity to that hitherto accepted.

The writer's thanks are tendered to the authorities of the British Museum (Natural History) for the opportunity of examining material in the collection, and especially to Dr. W. E. China and Mr. R. J. Izzard for their ready assistance whenever it was sought.

2. KEY TO THE SUBFAMILIES OF TETTIGOMETRIDAE.

- | | | |
|---------|---|---------------------|
| (1) (2) | Vertex produced to extend in a cornice over base of frons; genitalic styles of male fused to form an elongate boat-shaped plate with a broad lobe on each side dorsally near base | |
| | | Hildinae subfam. n. |
| (2) (1) | Vertex short or produced, rarely forming a strongly projecting cornice above frons | (3) |
| (3) (4) | Frons in adult distinctly umbonate in middle near frontoclypeal suture, or strongly medially carinate; a long upwardly-curved spine in this position in nymph. Genitalic styles with connecting membrane broad, bilobate or convex on hind margin | Egropinae |
| (4) (3) | Frons not umbonate or extremely feebly so; head of nymph without a long upcurved medio-frontal spine; genitalic styles with connecting membrane very delicate, narrow, straight or concave on hind margin | Tettigometrinae |

3. EXTERNAL MORPHOLOGY.

The tettigometrid vertex is transverse, turbinate, parabolic, or triangular, with the disc usually flat or slightly hollowed, occasionally deeply excavate or, conversely, very slightly tumid (*Tettigometra brachycephala* Fieber). The frons is relatively broad and medially ecarinate (except in *Megaloplastinx*): a pair of fine lateral carinae bounds the frontal disc, either completely or from below the level of the ocelli to the frontoclypeal suture; they are almost straight and converge slightly distad. In some genera (*Hilda*) a crescentic transverse ridge may be developed in the region of the suture. There is no median ocellus: the lateral ocelli occupy a position on the genae anterior to, and slightly below, the eyes, and so closely adjacent to the lateral frontal carinae as to appear in most genera to lie directly above the basal end of the carina. In *Phalix*, described below, the ocelli lie just mesad of the apparent lateral carinae. This condition, in Fulgoroidea, is found only in Tettigometridae, where, however, it is not universal.

Almost as noteworthy is the unusual type of coordination between the form of the vertex and that of the frons. In most fulgoroid genera, as the vertex elongates, the frons elongates also; it retains a more or less plane surface and accommodates itself to the change by facing more ventrad: in Tettigometridae the subvertical apical half of the frons usually remains little altered, while the vertex advances independently, carrying the base of the frons forward with it.

The resulting profile may be not merely concave, but almost rectangulately so (*Raatzbrockmannia*, *Euphyonarthex*).

The clypeus is distinctive: as in myconine Achilidae the lateral pieces have turned to face anteriorly, and, in addition, have become tumid. The rostrum is of normal type, with the apical joint slightly longer than the subapical and rounded-conical at its tip, and usually terminates at some point between the mesotrochanters and the post-trochanters, though it may occasionally (*Tettigometra* subg. *Eurychila*) reach fully to the latter. The antennae show variation in length, but are comparatively uniform in structure, having a distinct ring-like basal joint and a cylindrical second joint, the latter studded conspicuously with exposed placoid sensillae, and bearing in a distinctly subapical position the minute third joint, which is prolonged in a closely "segmented" arista. It may be observed parenthetically that such segmentation of the arista is common, and possibly universal, in first-instar nymphal Fulgoroidea.

The eyes are of normal shape and size—though occasionally (some *Tettigometra*) the pigmented area appears rather small—and in dorsal view usually fit snugly into the sides of the head. In *Raatzbrockmannia* the eyes are more protuberant, while in *Megaloplastinx* and *Euphyonarthex* they are strikingly so. In most Tettigometridae the outline of the vertex and eyes, as seen from above, is carried almost without interruption to the lateral margin of the pronotum by the pronounced development of the side of the head which forms the posterior rim of the eye-socket: this is referred to below as the "post-ocellar callus." In *Tettigometra* a perfectly streamlined form of head and thorax has been attained at the expense of some loss of field of vision. The post-ocellar calli usually overhang the antennae closely and may cover them to the tip of the second joint. In *Megaloplastinx*, *Mesegropa*, *Euphyonarthex* and *Raatzbrockmannia* the antennae are remote from the eyes and project well out from the head.

The thorax is relatively unspecialised. Carinae are absent or only feebly indicated; the tegulae are well developed. The post-trochanters rock in a mesad-(and slightly ventrad)—laterad (and slightly dorsad) direction. The post-tibiae are unarmed laterally and bear distally about seven short black-tipped spines. The hind tarsus of the adult bears between five and ten spines on its distal border, while the second joint invariably bears two, one at each lateral angle. In about half of the genera and most of the species of the family the legs are usually short and relatively stout: in the remainder, with extraordinary abruptness, they appear greatly elongated and slender in relation to the general bodily size, and the pro- and mesotibiae are slightly curved. In *Euphyonarthex* a sparse down of long, very fine silky setae is present on the inner aspect of the distal part of the protibiae.

The tegmina are usually of the macropterous type, but may be brachypterous; they are always coriaceous and closely invest the body, and at most exceed it by very little. The costal margin near the base is inflected mesally. The venation is simple and reduced; Sc and R are fused to near the node, M forks once, usually in the distal half, and Cu I is simple; a claval suture is present in all macropterous tegmina, and the claval veins unite at or distad of the middle of the clavus. The veins are normally not prominent, and are often obscure distally, though occasionally they may be elevated. The dorsal surface is dull and covered with a bloom of wax; occasionally (*Tettigometra*

(*Brachycephs*) it is polished and distinctly punctate; in a few genera both surface textures are present in alternating fasciae.

The wings, when fully developed, are large and endowed with an ample posterior lobe. The venation is specialised, and Cu 1 is much thickened. With parallel examples from Issidae for comparison, it appears reasonable to presume that such specialisation has arisen in conformity with the requirement of folding the wing beneath the hard subconvex tegmen.

The abdomen is comparatively broad and moderately dorso-ventrally depressed. In the females of some species, and possibly in most, the intersegmental membrane can become substantially dilated, and the abdomen may expand until it exceeds the length of the macropterous tegmen. The abdominal spiracles, situated on lateral sclerites, are large and exposed.

In Tettigometrinae the anal segment of the male is short, subcylindrical and flattened below; in Hildinae the apical margin is greatly prolonged caudad in an upcurved spine. This modification recalls the similar, though much shorter, medial spine developed on the apical margin of the same segment in some Delphacini.

The pygofer is moderately short dorsally, but ventrally long, so that the genital foramen faces dorso-caudad. The ventral posterior margin is deeply and narrowly cleft in the middle line. The aedeagus and genital styles are wholly characteristic of the family, and fall into three main types.

In the tettigometrine type the aedeagus is suspended from the laterodorsal angles of the pygofer by a stirrup-shaped sclerite (fig. 2, D), and comprises a narrow sclerite, often with a dorsal median basal lobe (fig. 2, H, I), extended caudad below a large inflatable delicate membranous sac. The genital styles are paired, symmetrical, rod-like, and distally hamate, and are united by a thin unpigmented membrane which is transverse or concave on its posterior margin. The genital styles, as in all other Fulgoroidea with the exception of Derbidae, are connected by an apodeme to the base of the phallus.

In the second type, characteristic of Hildinae, the suspensory sclerite is longer than in Tettigometrinae, U-shaped and devoid of a transverse dorsal bar (i.e., not stirrup-shaped); it is more or less weakly united to the basal portion of the aedeagus, which assumes the form of a narrow sinuate sclerotised tube. At the distal extremity of this tube, on the obliquely lower aspect, there is a small membranous area. The genital styles are distinctive, and comprise only a pigmented trough-like sheath underlying the aedeagus, with a moderately large lobe on each side dorsally near the base.

In the tettigometrine genus *Mesohilda* (described below) occurs a most interesting transitional stage between the two preceding conditions. Here the basal suspension is stirrup-like, but forms an integral part of the phallus, and not a separate sclerite (fig. 4, E). The phallus is a narrow, simple tube with an apical pore (phallorema). The pigmented sclerite which supports the more delicate part of the tube overlies the latter; in *Tettigometra* the sclerite which supports the aedeagal sac lies below it. The genital styles comprise a pair of rod-like, distally hooked limbs, as in *Tettigometra*, but these are united near their mid-points to an unpaired scoop-like sclerite which lies between them. This is pigmented in the distal region between the styles, but basally becomes thinner and transparent and forms a trough-like sheath underlying the aedeagus to the point of its suspension.

The third type, found in Egropinae, differs from the hildine principally in the aedeagus. Here the sclerotised basal part has become greatly inflated, almost bulbous, and is suspended at its basal angles. No U-shaped cavity is developed between the points of attachment. At the distal end of this inflated organ is a relatively small, trapezoidal, usually unpigmented lobe, into which passes the aedeagal duct. The genital styles are as in Tettigometrinae, but differ in that the transparent connecting membrane is broad and its posterior margin is bilobate.

The steps by which the genital styles have changed from the tettigometrine to the hildine form can be seen to have followed a course closely similar to the existing sequence tettigometrine-egropine-*Mesohilda*-hildine. Muir's conjecture (1924: 221) that the lateral lobes of the hildine type correspond to the paired rod-like genital styles of *Tettigometra* is almost certainly correct.

The primitive aedeagus presumably took the form of a simple tube, of which the distal end was more or less flexible. This condition is similar to that in *Mesohilda*. The hildine aedeagus differs only in the suppression of the distal membranous portion, and the lengthening of the suspensory parts. In Egropinae the homologies are still evident: the swollen vesicle corresponds to the sclerotised pigmented part of the aedeagus of *Mesohilda*, and the transparent lobe at its distal end to the unpigmented distal portion. The homologies in *Tettigometra*, however, are not so clear: the superficial appearance suggests that the thin inflatable distal sac corresponds to the distal part of the primitive aedeagus. This may indeed be so; but in view of the fact that in Hildinae and *Mesohilda* the pigmented sclerite overlies the distal membranous portion, whereas in Tettigometrinae it supports it from below, it is not possible to derive one type from the other.

In all three subfamilies the basal apodemes to which the muscles are attached and which connect the genital styles to the base of the aedeagus, are comparatively uniform and of normal structure. This is perhaps fortunate for the comparative morphologist, since, apart from these, the aedeagus of *Tettigometra* is of strikingly heteropterous form.

The female genitalia vary little, and are characterised by great reduction of the appendages. The pregenital sternite (VII) is relatively narrow (little broader than long), and distinctly medially excavate posteriorly (fig. 3, F). The lateral sclerites of the eighth segment are contiguous medially, and each bears at the anteromesal angle a small lobe. These lobes represent the first valvulae of the ovipositor, and, by reason of the thinness of the membrane which unites them to the margin of the lateral sclerite, are moderately flexible. A pair of short and narrow lobate processes is developed near the ventral points of junction between the eighth and ninth segments: these are the third valvulae. In the middle line, above the posterior margin of the pregenital sternite, lies a small stout quadrate sclerite, the subvaginal plate (fig. 3, F, H). The vagina, like the bursa copulatrix and spermatheca to which it leads, is membranous; no sclerites are developed on the wall of either vagina or bursa copulatrix; the latter is closely studded with ring-ornamentation.

4. TAXONOMIC AFFINITIES OF TETTIGOMETRIDAE.

Muir (1930: 467), probably influenced by the combined characters of a bispinose second post-tarsal joint, the indication of a transverse groove across

the hind angle of the mesonotum, and—in broad comparison—by the form of the aedeagus, suggested that Tettigometridae have more affinity with the Tropiduchid group of families than with the Cixiid group.

If it be assumed that the family is a natural member, possibly nearest to Tropiduchidae, of that group in which the second metatarsal joint bears two spines, then it may be claimed that Tettigometridae could have evolved in this group parallel to the superficially similar Gengidae in the ricaniid group. This would mean that the ocellar characters, the reduced lateral frontal carinae, the specialisation of the wings, the reduction of the female genitalia and the profound modification of those of the male are to be considered as casual and phylogenetically late modifications. This is a formidably large postulate, though not impossible. If, on the other hand, it be assumed that the bispinose condition of the second metatarsal joint has arisen twice in Fulgoroidea, and that Tettigometridae have no natural affinity with the "bispinose" and, as it were, phylogenetically post-cixiid group of families, then difficulties of another kind have to be faced.

Muir (1923: 220, 221) expressed the view that "with the exception of the female genitalia . . . and the venation all the characters of this family are primitive," and listed the characters of the family which he considered to be cicadoidean: these are (1) a "segmented" antennal arista; (2) no lateral carinae between ocelli and frons; (3) lateral ocelli situated on frons; (4) antennae closer together than eyes, and not distinctly below them; (5) lorae visible in front view and forming a curve with "clypeal region"; (6) middle coxae allowing very little movement in a transverse direction; (7) in some species, genital plates well developed and free. The first character is widespread in early nymphal fulgoroidea, if not universal; the second does not hold in *Megaloplastinx*, and only applies to an obsolete, not an absent, structure; the third character is not strictly correct, the ocelli usually appear to be situated at the basal end of the lateral carinae of the frons,¹ and not mesad of them. In *Megaloplastinx* the ocelli lie distinctly laterad of the lateral carinae; only in *Phalix* do they lie mesad of the apparent lateral carina; the fourth character is variable, and weak at best; the fifth is found in myconine Achilidae; as for the sixth, there is more difference between the mesocoxae of *Euphyonarthez* and *Phalix* than there is between *Phalix* and an issid such as *Scantinius bruchoides* Walker; the last character is puzzling: a longitudinal median tract of the posterior ventral surface of the pygofer is more or less demarcated by a pair of grooves or wrinkles: laterad of this median tract the pygofer extends caudad in two lobes in some genera. These lobes are figured by Muir (1924: 221, fig. 5, *gi*) as the "anterior gonapophyses" which, he claims, are "large, flat and projecting" in *Tettigometra*. The writer considers such homology dubious, but, accepting it for the present, would point out that the condition of the posterior ventral margin of the pygofer of the achilid *Rhotala* far surpasses anything in Tettigometridae as far as the presence of paired free apophyses is concerned.

As it appears to the writer there is not a single convincing cicadoidean character which is present in all Tettigometridae and absent from all other Fulgoroidea, and, in view of the evidently nymphal structure of the antennae,

¹ The fact that the "frons" as recognised here is morphologically part of the vertex, and not homologous with the orthopterous frons, does not affect the argument.

it may be that some of the supposedly primitive characters are neoteinic. It is perhaps worth noting that one of the unusual characters found in Hildinae, the presence of a velvety-black transverse band across the frons, with a small round spot of pure wax on each side of the middle line, is strikingly paralleled by the condition found in the eurybrachyid *Gelastopsis insignis* Kirkaldy.

5. SYSTEMATIC ARRANGEMENT.

Subfamily Tettigometrinae.

Frons in profile smooth, very slightly convex, flat, or shallowly concave; apical joint of rostrum about as long as subapical; antennae with second segment about two and a half times as long as first, not surpassing eyes, and separated from them by a thick callus. Profemora not reaching as far as sides of body, post-tibiae with 7-9 spines at apex, basal metatarsal joint with 8 spines at apex. Anal segment of male usually with lateroapical angles very shortly acute. Aedeagus more or less stirrup-like at point of suspension from pygofer. Genital styles rod-like, recurved at tip, with a narrow or laterally compressed membrane uniting them below aedeagus. Nymphs with head not anteriorly produced, in general similar to adult.

Key to Genera of Tettigometrinae.

- (1) (2) Head with eyes wider than pronotum; frons about twice as broad as long; species more than 7 mm. long **Phalix** gen. n.
- (2) (1) Head with eyes narrower than pronotum; frons not twice as broad as long; species less than 7 mm. long (3)
- (3) (4) Post-ocellar calli in dorsal view with their posterior margin sub-parallel to posterior margin of eye; their width at lateral extremity at least equal to width at junction with margin of vertex **Tettigometra** Latreille
- (4) (3) Post-ocellar calli in dorsal view with their posterior margin not parallel to posterior margin of eye; their width at lateral extremity much less than at junction with margin of vertex **Mesohilda** gen. n.

Tettigometra Latreille.

Latreille, 1804: 312. Logotype, *Fulgora virescens* Panzer, 1799: 12.

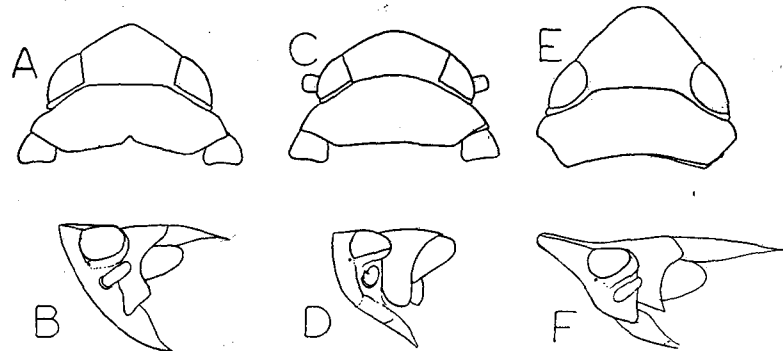


FIG. 1.—A, *Tettigometra virescens* (Panz.), vertex and pronotum; B, head in profile; C, *Brachycephalus brachycephalus* (Fieb.), vertex and pronotum; D, head in profile. E, *Tettigometra sulphurea* Muls. and Rey, vertex and pronotum; F, head in profile.

Tettigometra virescens Panzer (fig. 1, A-B; fig. 2, H).*Fulgora virescens* Panzer, 1799: 12.

The figures are of a specimen in the British Museum (Natural History).

Apart from the character given in the key, males of species of this genus may be recognised by the form of the genitalia, described above. Lindberg (1948) has recently partially revised the genus and figured the genitalia of a number of species. He re-defines the subgenera *Tettigometra* Latreille, *Mitricephalus* Signoret, *Eurychila* Signoret, and *Brachyiceps* Kirkaldy, and adds two more, *Micrometrina* Lindberg and *Macrometrina* Lindberg.

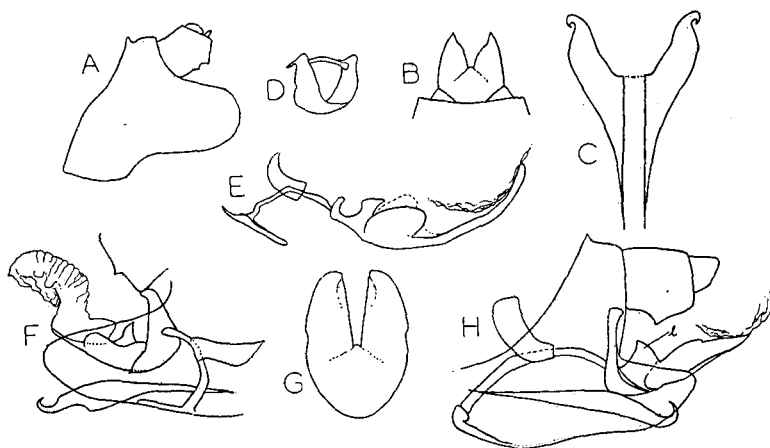


FIG. 2.—A, *Brachyiceps brachycephalus* (Fieb.), pygofer and anal segment, left side; B, pygofer, ventral view; C, genital styles, ventral view; D, basal suspensory sclerite of pygofer; E, aedeagus, left side, apical membrane shown only in part. F, *Tettigometra sulphurea* Muls. and Rey, aedeagus and right genital style, shown in relation to pygofer; G, pygofer, postero-ventral view. H, *Tettigometra virescens* (Panz.), anal segment, pygofer, and male genitalia seen by transparency, left side, with apical membranous sac of aedeagus omitted.

Phalix gen. n.

Head with eyes slightly wider than pronotum. Vertex between eyes 3-4 times as broad as long in middle, longer in middle than at inner margins of eyes, anterior margin broadly convex, posterior margin shallowly excavate, disc flat, slightly depressed basad of anterior margin, margins not carinate, a broad callus along apical margin between vertex and frons; frons 2-2 times as broad at widest part as long in middle line, basal margin convex, lateral margins sinuately narrowed and carinate from near ocelli to fronto-clypeal suture; disc smooth, ecarinate, slightly concave in profile; clypeus about as long as frons in middle line, ecarinate, loral areas markedly produced laterad at base, rostrum rather longer than clypeus in middle line, surpassing mesocoxae but not nearly reaching post-coxae, apical joint longer than subapical; antennae not surpassing exterior margin of eyes, second joint cylindrical,

4 times as long as broad and 3-3 times as long as first joint, ocelli facing anteriorly. Pronotum in middle line slightly longer than vertex, anteriorly shallowly convex, posteriorly very slightly concave, disc not depressed, smooth, ecarinate, mesonotum longer than vertex and pronotum combined, four-fifths as long as broad, disc smooth, shallowly convex; mesepimeral carina straight, diverging caudad from its counterpart on the opposite side; profemora 3-6 times as long as broad, not so long as to reach level of sides of body; post-tibiae 6 or 7-spined at apex, basal metatarsal joint with 7 spines at apex, second metatarsal

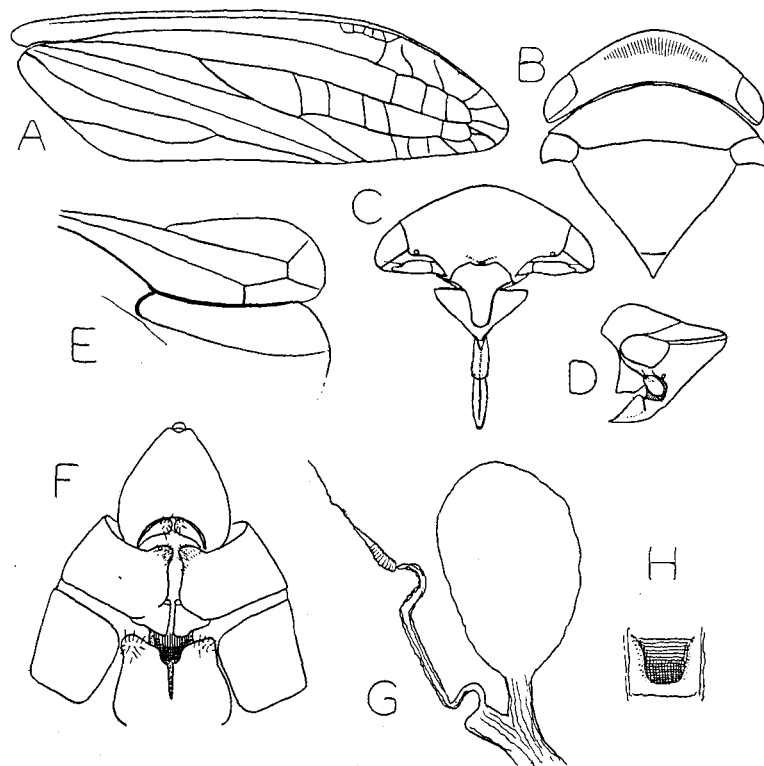


FIG. 3.—*Phalix titan* gen. et sp. n. A, tegmen; B, vertex, pro- and mesonotum; C, frons and clypeus; D, head in profile; E, anterior part of wing; F, female genitalia, ventral view; G, bursa copulatrix and spermatheca; H, subvaginal plate.

joint with a spine on each side. Tegmina 3-3 times as long as broad, costal and sutural margins subparallel, apical margin asymmetrically and acutely curved, Sc + R simple, M forked at level of union of claval veins, posterior branch lying along Cu for a short distance then separating. Wings well developed. Seventh abdominal sternite of female posteriorly transverse; valvulae of ovipositor minute, subvaginal plate quadrate. Type species: *Phalix titan* sp. n.

Phalix titan sp. n. (fig. 3, A-H).

Female: Length, 7.2 mm.; tegmen, 7.0 mm.

Integument smooth, very finely and slightly rugose, not punctate. Tegmina lightly punctate, surface of a dull waxy appearance.

Bright yellowish-green; a minute spot near middle of frontoclypeal suture, a band along basal margin of frons, third antennal joint, a minute spot at base of tegmen and another at apex of clavus piceous. Eyes red. Tegmina yellowish-green, costal margin narrowly creamy-yellow. Wings hyaline, powdered white.

Female genitalia as figured.

Holotype, ♀, UGANDA: Kawanda, 21. vi. 1940 (*H. Hargreaves*).

This species is provisionally referred to Tettigometrinae in the absence of a male. It is readily distinguished from all other genera in the family by the shape of the head, and from all other Tettigometrinae by its relatively great size, it being the largest tettigometrid yet described.

Mesohilda gen. n.

Form generally similar to that of *Tettigometra* (*Tettigometra*). Vertex broader than long, apical margin angulately rounded; disc of frons convex at base, becoming more weakly so near apex, and distinctly more vertical in apical half, as in *Hilda*; rostrum surpassing mesotrochanters but not attaining post-trochanters; apical joint longer than subapical. Post-tibiae laterally unarmed, apically 7 spined; basal metatarsal joint with six or seven spines on distal margin, second metatarsal joint with two spines. Post-ocellar callus behind each eye tapering laterad, its posterior margin not parallel to posterior margin of eye.

Anal segment of male devoid of a tooth-like eminence on lower lateral margin. Aedeagus with stirrup-like basal suspension, distally in form of a sinuate simple tube of sub-equal width throughout, the latter passing into basal suspensory portion without interruption. Genital styles generally similar to those of *Tettigometra*, a boat-shaped sclerite between them and connected to them dorsobasally; the sclerite continuing basad as a membranous sheath underlying the aedeagus. Type species: *Isthmia balteata* Distant.

Mesohilda balteata (Distant) (fig. 4, A-E).

Isthmia balteata Distant, 1907: 201.

The figures are of the holotype.

Subfamily Hildinae.

Frons concave, distinctly or even strongly produced anteriorly at base; apical joint of rostrum longer than subapical; antennae more or less surpassing margin of eyes, not separated from them by a callus, second segment about four times as long as first. Profemora attaining or surpassing margin of closed tegmina; protibiae exteriorly usually longitudinally sulcate throughout; post-tibiae with seven or eight teeth at apical margin, basal metatarsal joint with seven teeth apically. Anal segment of male produced caudally into a long median upcurved process. Genital styles comprising an unpaired median plate with a lobe on each side near base.

Key to Genera of Hildinae.

- (1) (2) Profemora not longer than width of head with eyes. Species usually less than 6 mm. total length including tegmina. Apex of vertex in dorsal view obtusely rounded; frons usually with a velvety black band between ocelli and a broad pallid band distally **Hilda** Kirkaldy

- (2) (1) Profemora longer than width of head with eyes. Species usually not less than 6 mm. total length including tegmina; apex of vertex in dorsal view strongly produced and acutely rounded or pointed; frons not as above (3)
- (3) (4) Vertex anteriorly acute, almost pointed at apex; produced portion in profile slender, tapering distally, pointed or very sharply rounded at tip **Euphyonarthex** Schmidt
- (4) (3) Vertex anteriorly more rounded, not nearly pointed at apex; produced portion in profile not slender, not or little tapering distally, rounded-truncate at tip **Raatzbrockmannia** Schmidt

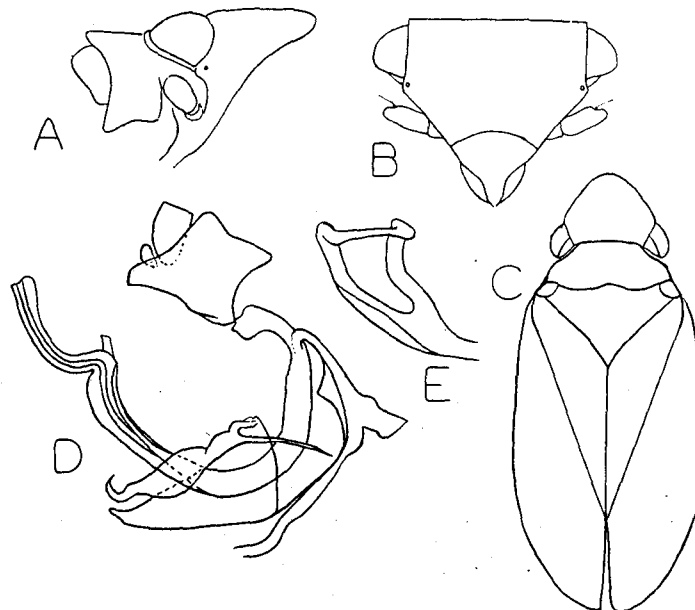


FIG. 4.—*Mesohilda balteata* (Dist.). A, head in profile; B, frons and clypeus; C, insect in dorsal view; D, anal segment, aedeagus and genital styles, right side; E, postero-lateral view of basal part of aedeagus.

Hilda Kirkaldy.

Isthmia Walker, 1851: 732 (*nec* Gray, 1821).

Hilda Kirkaldy, 1900: 243. Orthotype, *Isthmia undata* Walker, 1851: 732.

Nototettigometra Muir, 1924: 219. Haplotype, *N. beddini* Muir, 1924: 219.

It is not possible, on the basis of Muir's description and figures, to separate *Nototettigometra* from *Hilda*. The type locality of *N. beddini* is in doubt, and, as this species is extremely close to certain South African species (such as *Hilda patruelis* (Stål), the case in favour of its occurrence in South America (Peru) appears weak. Muir's comment that his genus "stands between *Tettigometra* Latreille and *Brachycephalus* Signoret (= *Brachycephalus* Kirkaldy, n. n.)" would suggest that in 1924 he was not acquainted with *Hilda*. His earlier references to *Hilda breviceps* Stål (1923: 221) refer, of course, to *Egropa*.

Hilda undata (Walker) (fig. 5, A-E).

Isthmia undata Walker, 1851: 732.

The figures are from material in the British Museum (Natural History).

Euphyonarthex Schmidt.

Schmidt, 1912: 461. Orthotype, *Euphyonarthex phyllostoma* Schmidt, loc. cit.
Tembandumba Distant, 1917: 186. Haplotype, *Tembandumba buruana* Distant.

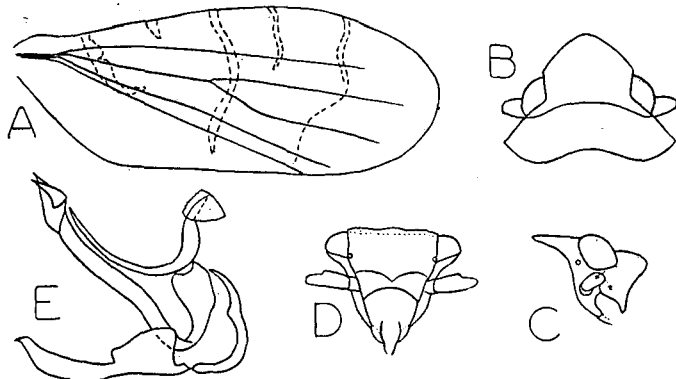


FIG. 5.—*Hilda undata* (Wlk.). A, tegmen; B, vertex and pronotum; C, head in profile; D, frons and clypeus; E, anal segment, aedeagus and fused genital styles, right side.

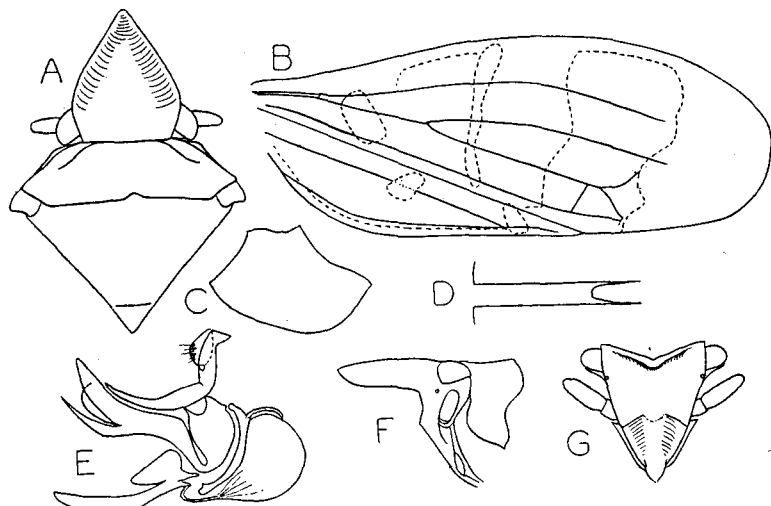


FIG. 6.—*Euphyonarthex buruana* (Dist.). A, head and thorax; B, tegmen; C, pygofer (not to same scale as preceding); D, medial cleft in posteroventral margin of pygofer; E, anal segment, aedeagus and fused genital styles; F, head in profile; G, frons and clypeus.

Euphyonarthex buruana (Distant) **comb. nov.** (fig. 6, A-G).

Tembandumba buruana Distant, 1917: 186.

The figures are of Distant's type. The position of M fork is slightly variable, and may occur only one fifth from the base.

The series of *Euphyonarthex* in the British Museum comprises eight specimens of *E. buruana* Distant, fourteen of *E. phyllostoma ugandana* Lallemand and two unnamed. As it was collected in various localities it is possible that this material belongs to the single species *phyllostoma*.

Raatzbrockmannia Schmidt.

Schmidt, 1924: 107. Orthotype, *Raatzbrockmannia inclinata* Schmidt.

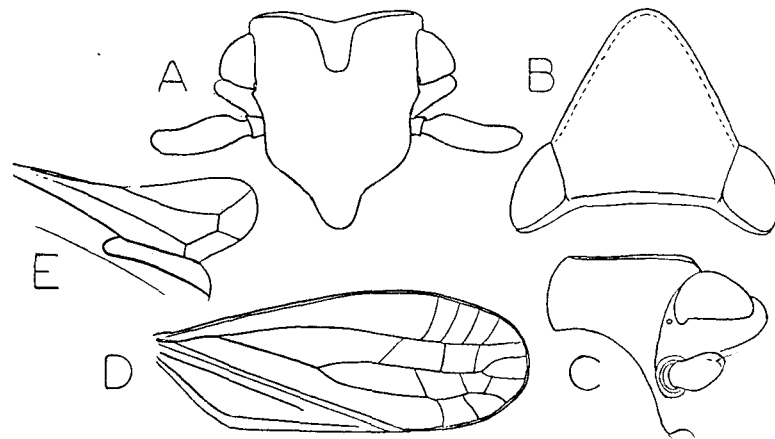


FIG. 7.—*Raatzbrockmannia inclinata* Schmidt. A, frons and clypeus; B, vertex; C, head in profile; D, tegmen (on smaller scale than preceding); E, anterior part of wing.

Raatzbrockmannia inclinata Schmidt (fig. 7, A-E).

Schmidt, 1924: 108.

The figures are of the female holotype.

This genus is closely allied to the preceding. *Raatzbrockmannia* is apparently known only from the type. In view of the considerable intrageneric plasticity of the tettigometrid head, the status of *Raatzbrockmannia* must for the present remain in doubt: *R. inclinata* may prove to belong to *Euphyonarthex*. The mesocoxae in these are relatively very short in comparison with *Tettigometra*.

Subfamily Egropinae.

Frons in profile not concave, produced at middle or medio-apically umbonate; apical joint of rostrum longer than subapical; antennae with second joint four times as long as basal joint, slightly surpassing eyes, and not separated from them by a callus. Profemora surpassing margin of closed wings; post-tibiae with 6 or 7 spines at apical margin; basal metatarsal joint with six or seven spines. Anal segment of male with lateroapical angles

not prominent. Phallobase of aedeagus inflated, phallosome situated in a small, laterally compressed distal lobe. Nymphs with head produced in a long curved process. Genital styles rod-like, distally recurved; between them a slightly sclerotised membranous plate deeply cleft medially on its posterior margin.

Key to Genera of *Egropinae*.

- (1) (2) Frons not umbonate, strongly medially produced and carinate; in profile apex of vertex forming most anterior portion of head **Megaloplastinx** Schmidt
 (2) (1) Frons umbonate near frontoclypeal suture, in profile frontal umbo usually forming most anterior portion of head (3)

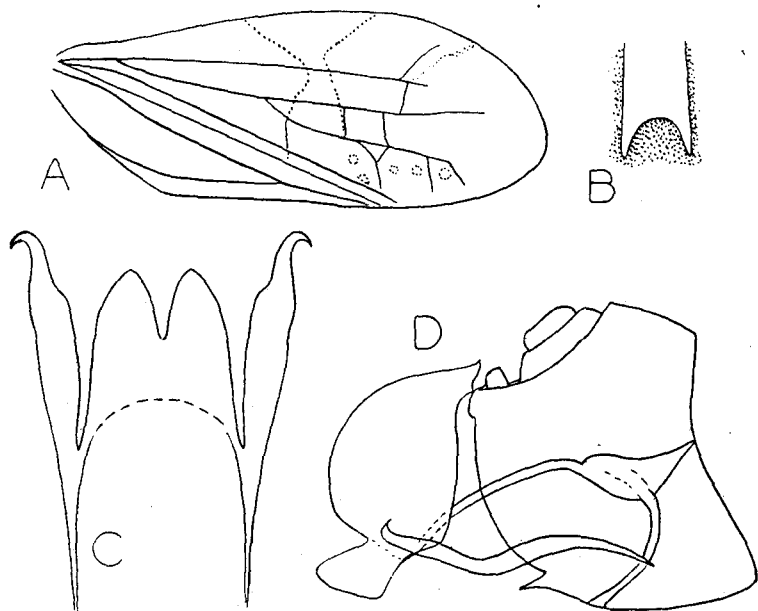


FIG. 8.—*Egropa malayensis* (Dist.). A, tegmen; B, base of cleft in posteroventral margin of pygofer; C, genital styles, ventral view; D, anal segment, pygofer and aedeagus, right side.

- (3) (4) Vertex more than twice as broad as long in middle, anteriorly shallowly rounded; antennae little projecting beyond eyes; profemora shorter than width of head with eyes **Egropa** Melichar
 (4) (3) Vertex less than twice as broad as long in middle, anteriorly obtusely angulate; antennae reaching far beyond eyes; profemora not shorter than width of head with eyes **Mesegropa** Baker

Egropa Melichar.

Melichar, 1903 : 82. Haplotype, *Egropa inusta* Melichar, 1903 : 82, pl. 3, figs. 13, a, b.

Egropa malayensis (Distant) (fig. 8, A-D).

Hilda malayensis Distant, 1909 : 41.

The figures are of the type.

The species of *Egropa* are comparatively uniform. The frontal eminence is a little variable within species, and slightly more so between them. Baker's figure of the head of *E. malayensis* (Distant) does not appear quite correct: in the holotype the anterior and posterior margins are almost parallel, and the vertex is only in the slightest degree longer in the middle than at the sides. The holotype of *E. tenasserimensis* Distant is a female. The statement by Baker that several dark subquadrate spots (sometimes with white centres) near the apex of the clavus are developed only in males does not hold good: they are, for instance, fully developed in the female type of *E. malayensis* Distant.

Mesegropa Baker.

Baker, 1924 : 98. Orthotype, *Mesegropa sumatrensis* Baker.

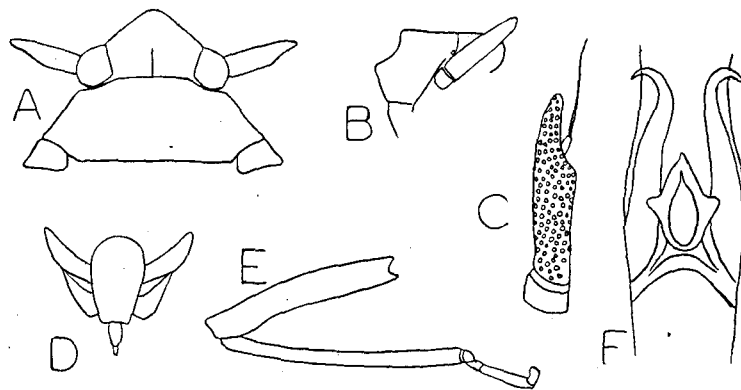


FIG. 9.—*Mesegropa sumatrensis* Baker. A, vertex and pronotum; B, head in profile; C, antenna; D, clypeal region, anterior view; E, leg; F, male genital styles, ventral view. (All figures after Baker.)

Mesegropa sumatrensis Baker (fig. 9, A-F).

Baker, 1924 : 99.

The figures are redrawn from Baker. This collection by Corporaal, still apparently unique, is most fortunate, as it throws light on the steps by which the transition from *Egropa* to *Megaloplastinx* has been achieved. As *Megaloplastinx*, *Mesegropa* and the hildine genera *Euphyonarthex* and *Raatsbrockmannia* are all of very large bodily size for Tettigometridae, it might appear that the extraordinarily disproportionate elongation of the legs and the upward carriage of the eyes has resulted simply from allometric growth. Such a possibility, however, is heavily discounted by the fact that *Phalix*, larger than them all, is of normal tettigometrid proportions. In *Mesegropa* elongation of the legs has not proceeded quite so far as in *Megaloplastinx*, while the head is unmodified from the condition found in *Egropa*.

Megaloplastinx Schmidt.

Schmidt, 1912 : 459. Orthotype, *Megaloplastinx carinifrons* Schmidt.

Megaloplastinx carinifrons Schmidt (fig. 10, A-F).

Schmidt, 1912 : 461, fig. 1.

The figures are of a specimen in the British Museum.

In this genus the ocelli are separated from the disc of the frons by the lateral marginal carinae. According to Muir (1924 : 22) the frons of the nymph is drawn out into a long process, as in other Egropinae. It is evident, from the general facies of the insect, that *Megaloplastinx* has evolved, in Egropinae, in an exactly parallel manner to *Euphyonarthex* and *Raatzbrockmannia* in Hildinae. If the profile of the latter genus is superimposed with a slight downward tilt on that of *Mesegropa*, with its characteristically egropine mediolateral frontal eminence, it will be seen that the conjugate profile so produced is closely comparable to that of *Megaloplastinx*. It is indeed not unreasonable to suppose that the shape of the head in this genus is determined by two different sets of growth factors—the fundamental egropine set of growth-determinants plus a further set of incurive “euphyonarthecoid” mutations.

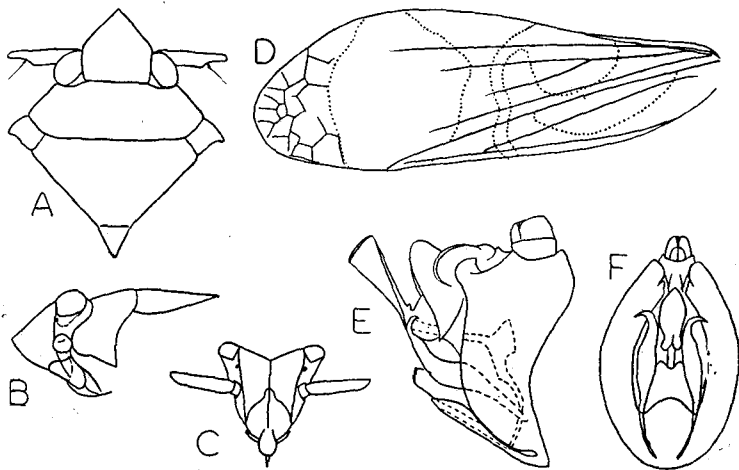


FIG. 10.—*Megaloplastinx carinifrons* Schmidt. A, vertex, pronotum and mesonotum; B, head in profile; C, frons and clypeus; D, tegmen; E, anal segment, pygofer and male genitalia, right side; F, ditto, posteroventral view. (E and F after Muir).

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