REVISIONARY NOTES ON THE CLASSIFICATION OF THE NOGODINIDAE (HOMOPTERA, FULGOROIDEA), WITH DESCRIPTIONS OF A NEW GENUS AND A NEW SPECIES

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ABSTRACT

The family Nogodinidae, the tribe Bladinini and the subtribe Gaetuliina are recharacterised, and in conformity with the new definitions the following genera are transferred to this subtribe from the Issidae: *Acrisius, Nubithia, Dyctidea, Dictyobia, Dictyonia, Osbornia, Neaethus, Dictyonyssus, Misodema, Dictyssa* and *Danepteryx* (New World); *Gamergus, Gamergomorphus, Paragamergomorphus, Johannesburgia* and *Mangola* (southern Africa); and *Alleloplasis* and *Bilbilis* (Australia). *Bilbilis caligula* sp. n. is described. A new tribe, Lipocalliini, is erected to accommodate *Lipocallia* and *Bilbilicallia*. The tribe Mithymnini is redefined and its genera are listed. *Monteira* is moved from the Mithymnini to the Epacriini, and *Afronias, Kiomonia* and *Gamergus africanus* Mel., for the reception of which a new genus, *Gamergomimus*, is proposed, are allocated to this tribe, the last two being transferred from the Issidae.

The following notes are concerned with the transfer of certain genera from the Issidae to the Nogodinid tribes Bladinini and Epacriini, and with the redefinition of the Mithymnini, the family appurtenance of which has had to await clarification from the findings of a study of genitalic structure in the Issidae.

The current definition of the Nogodinidae (Fennah, 1956: 51–53) has proved too restricted to accommodate certain genera that have recently been found to belong to the family, and accordingly a revised definition is here offered, as follows.

Family Nogodinidae

Muir, 1930: 466.

Fulgoroidea with lateral ocelli situated outside lateral margins of frons, antennal flagellum not segmented, genae relatively narrow, base of antenna usually well separated from lower margin of eye. Pronotum with anterior margin reaching and usually surpassing level of middle of eye, posterior margin concave or excavate, rarely straight. Mesonotum in macropterous forms long, with lateral margins converging caudad acutely; in forms with reduced wings, up to twice as broad as long, with mesoscutellum depressed, or demarcated by a shallow sulcus, or thickened and slightly elevated, rounded or triangular in outline, rarely acute. Post-tibiae laterally spinose. Second metatarsal segment with only two teeth. Tegmen with basal cell large, usually broad, costal margin simple basally, not produced and reflected, costal vein submarginal for at least part of length, except in forms with narrow tegmina or no claval suture; corium and clavus devoid of pustules. Wings when fully developed, with regular venation, very few transverse veinlets and no reticulate supernumerary venation. Female with ninth abdominal tergite long, depressed medially, tumid laterally then decurving, base of tergite in middle visible in dorsal view. Female genitalia in side view with first valvifer amply exposed, sometimes tumid. Ovipositor with third valvulae large, well exposed, rather elongate triangular and flattened, or more or less hemispherical or subovoid or wedge-shaped when apposed together, or furnished apically or externally with tracts of minute denticles. Anal segment of female relatively short, with anal foramen at or distad of middle; basal margin of segment compactly meeting apical

margin of ninth tergite or separated from it by a tract of thin membrane. Male with apposed genital styles in ventral view usually longer than broad, more or less flattened or even shallowly sulcate near inner margin.

Tribe Bladinini

Kirkaldy, 1907: 93.

Nogodinidae with third valvulae of ovipositor large, in posterior view completely filling area between seventh sternite and ninth tergite, hemispherical, subovoid or wedge-shaped when apposed; apical and ventromesal margin narrow, delicate, papery and sometimes with an ovate tract of minute denticles in upper two fifths.

Subtribe Gaetuliina

Fennah, 1978: 118.

Bladinini with claval veins of tegmen uniting in basal half of clavus. In species with fully-developed wings, tegmina glassy, with large polygonal cells in middle portion; in species with reduced wings, tegmina narrow and strap-like, with compressed longitudinal veins and a coarse reticulum of veinlets in intervenal areas, or relatively large, enclosing body but not extending beyond it, with more or less distinct reticulate venation between principal veins.

The flightless members of this subtribe can be distinguished from the hysteropterine Issidae by the antenna being distinctly separated from the lower margin of the eye, the subantennal part of the gena being relatively narrower and shorter, the hind margin of the pronotum being concave, the mesoscutellum not lying flush with the mesonotum and terminating in a narrowly acute point, the claval veins uniting basad of the middle of the clavus, the base of the ninth abdominal tergite in the female being visible in dorsal view, and the first valvifer of the ovipositor being visible in side view even from its base. Most species can also be distinguished by the structure of the second segment of the metatarsus, which usually bears apically an even transverse row of fine teeth between the outer pair, each tooth with a fine seta projecting beyond it.

On account of their conformity with the family, tribal and subtribal characterisation given above, and their non-conformity with much of the corresponding characterisation in the hysteropterine and issine Issidae with which they are currently associated (Melichar, 1906: 100–102) the following genera are here transferred to the Gaetuliina. *Acrisius* (from Issini), *Nubithia, Dyctidea, Dictyobia, Dictyonia, Osbornia, Neaethus, Dictyonyssus, Misodema, Dictyssa* and *Danepteryx* (New World); *Gamergus, Gamergomorphus, Paragamergomorphus, Johannesburgia* and *Mangola* (southern Africa); *Alleloplasis* and *Bilbilis* (Australia).

The male genitalia in *Bilbilis* have not so far been described, and in order to illustrate their structure a new species, based on a male specimen, is described below.

Genus *Bilbilis* Stål

Stål, 1861: 208. Type species, *Hysteropterum modestum* Stål, 1859: 279.

Bilbilis caligula sp. n.
(Figs 1–9)

Vertex broader than long in middle (2.9 : 1) and at sides (about 2 : 1). Frons longer in middle line than broad (about 1.3 : 1), lateral margins weakly diverging to level of

antennae, then shallowly incurving to frontoclypeal suture; disc tricarinate, with carinae almost parallel in basal two thirds. Rostrum attaining post-coxae with apical segment longer than broad (about 3 : 1).

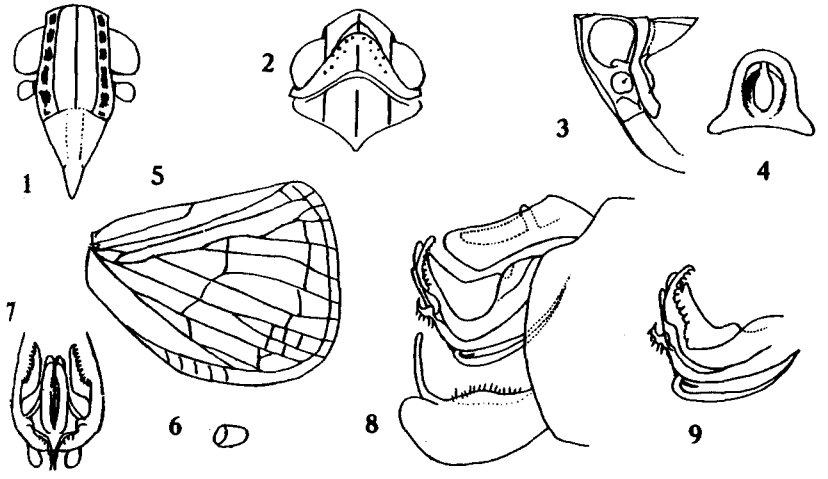
Pale reddish brown; a series of spots laterally on frons, a diffuse band submedially on each side of postclypeus, and a series of spots anteriorly on pronotum, dark reddish brown. Tegmina translucent, pale fawn, all veins bordered with minute reddish brown spots, a suffusion in basal third and a diffuse broad band at two-thirds from base reddish brown; costa and subcostal cell in basal half pallid.

Anal segment of male as long as genital style, rather narrow, with lateroapical angles slightly produced ventrolaterad; anal orifice at about a quarter from base; anal style long and narrow. Pygofer short, laterally compressed, with dorsolateral angles weakly obtusely produced, lateral margins weakly convex, no medioventral process present. Aedeagus deep dorsoventrally, upcurved distad; phallobase broadly tubular, curving upward distad and narrowing to apex; ventral margin comprising a pair of strap-like lobes, deeply rounded apically, reaching almost to apex; a pair of long transparent fimbriate processes extending dorsad lateroapically and a pair of transparent fimbriated lobes lateroventrally near apex, each emitting a short narrow limb that extends cephalad below aedeagus almost in middle line; phallus emitting two long relatively stout spinose processes ventrally below apex, both abruptly curving cephalad and lying below aedeagus, reaching almost to its base. Genital styles slightly more than twice as long as broad, with dorsal margin thickened and setose in basal two thirds and produced dorsad in a long slightly curved subspinose process; apical margin strongly rounded and separated by a groove at its upper end from base of apical process.

Male: length, 3.4 mm; tegmen, 3.3 mm.

Holotype ♂. WESTERN AUSTRALIA: Calingeri, 65 miles N. of Perth, 9.xii.1961, E.B. Britton, in British Museum (Nat. Hist.).

This species is very close to *Bilbilis dorsalis* (Wlk.) **comb. n.** (*Hysteroperum dorsale* Walker, 1851: 375), but differs in its relatively



Figs 1-9. – *Bilbilis caligula* sp. n.: 1, frons and clypeus; 2, head and thorax, dorsal view; 3, head and thorax, lateral view; 4, anal segment of male, posterior view; 5, tegmen; 6, spiracle and laterotergite of fourth abdominal segment; 7, aedeagus, posterior view; 8, male genitalia, right side; 9, aedeagus, right side.

shorter frons, the fewer longitudinal veins in the distal half of the tegmen, and the presence of a broad dark castaneous transverse band in the distal third. From *B. modesta* Stål, this species differs widely in the proportions of the head and thorax, the tegminal venation and coloration. The specific name is a noun in apposition.

The genus agrees with most of those in the subtribe Gaetuliina in the basal metatarsal segment being furnished with two outer teeth and an even row of small apical teeth, each with a seta extending beyond it, but differs in tegminal vein PCu being distinctly separated from Cu_2 basally.

Tribe **Lipocalliini** trib. n.

Tegmina steeply tectiform, with costal margin strongly produced anteriorly below eye, venation finely reticulate. Basal segment of metatarsus with two teeth and a dense pad of small setae. Male with genital styles relatively short ventrally and longer on apical margin, margin evenly rounded in posterior view. Ovipositor with third valvulae elongate triangular in side view, not strongly ascending distad, inner margin narrow, smooth, slightly callussed distally, with margins closely apposed throughout their length. Genital style with ventral margin as long as apical margin and in side view forming an almost even deeply convex curve with it, with surface of apposed styles in posteroventral view not medially or submedially depressed.

To this tribe belong *Lipocallia* and *Bilbilicallia*. The form of the ninth abdominal tergite of the female and the habitus in these genera suggest an affinity with *Bilbilis* (Bladinini), but the structure of the metatarsus and the genitalia in both sexes show that it is not close. The shape of the third valvula of the ovipositor resembles that in the Epacriini, but there is a marked difference in the conformation of the inner margin apically. The male genitalia are not of Epacriine pattern. The possibility of a close connection with the tongine Issidae appears to be excluded by the structure of the pronotum and mesonotum, as well as of the metatarsus. The absence of even an interrupted row of small teeth between the stout outer pair of teeth on the apical margin of the hind basitarsus excludes this tribe from any of the alternatives in the writer's key to tribes of Nogodinidae (Fennah, 1978: 114).

Tribe Mithymnini Fennah

Fennah, 1967: 697.

The characters used to define this tribe were subsequently found to occur singly or in various combinations in the Issidae, and uncertainty about the family affinity of the group led to its omission, pending further study, from the Nogodinidae considered by the writer ten years later. The habitus and even the detailed structure of the external parts other than the genitalia are within the range found in the hysteropterine Issidae, with the possible exception of the proportions of the basal cell of the tegmen. Nevertheless, a study of the genitalia has provided support for the view that this tribe is remote from the hysteropterine and issine Issidae and nearer to the Nogodinidae than to the tongine Issidae. A new definition of the tribe is needed, and is offered below.

Tegmen with costal vein submarginal throughout or at least in distal half; basal cell relatively large, broad. Ovipositor with first valvifer well exposed in upper half as a rounded or subquadrate plate. Third valvula large, in posteroventral view explanate, with lateral margins strongly convex; apical (mesal) margin with three curved tumid ridges, one inside the other, the outermost largest, polished and grey in colour; valvula in lateral view abruptly deeply and narrowly obliquely sulcate distally on upper margin. Genital style short with a simple spinose or subspinose process arising dorsoapically, or moderately long with a finger-like process arising on dorsal margin before apex. Hind basitarsus with no setose pad beyond apical teeth.

In the writer's key to tribes, if the wing characters are ignored, this tribe, as now defined, runs to couplet 3, where it differs from the alternatives, Epacriini and Bladinini, in the third valvula of the ovipositor not having the compressed triangular form and long even ventroapical margin of that in the former or the smooth subhemispherical form and narrow membranous apical margin of that in the latter.

The genera of Mithymnini are *Mithymna, Xosias, Telmessodes, Telmosias, Colmadona* and, tentatively, *Stilpnochlaena.*

Tribe Epacriini Fennah

Fennah, 1978: 114.

In consequence of the redefinition of the Mithymnini, it is necessary to transfer *Monteira*, one of the genera originally included, to the Epacriini, and the isolated genus *Afronias* is placed here, though with some hesitation. *Kiomonia* and the species *Gamergus africanus* Mel. must be transferred from the Issidae to this tribe. As no genus is available for the reception of the latter, a new genus is now proposed to accommodate it.

Gamergomimus gen. n.

Vertex broader than long in middle (about 4 : 1), anterior margin subtransverse, posterior margin shallowly excavate, disc flat, slightly depressed. Frons as long in middle line as broad, basal margin concave, lateral margins parallel to below level of antennae, then evenly incurved to frontoclypeal suture, apical margin shorter than basal margin, disc almost flat, slightly convex in profile, median carina percurrent; frontoclypeal suture angulate. Postclypeus medially carinate, lateral carinae indicated only at base. Rostrum surpassing post-trochanters, with subapical segment longer than apical segment. Antennae with second segment subglobose. Eyes slightly longer than broad; ocelli absent. Pronotum slightly wider than head with eyes, longer than vertex in middle line, anterior margin shallowly convex, carinate as far as tegulae, posterior margin shallowly concave, disc ecarinate, lateral lobes broadly rounding. Mesonotum with lateral carinae parallel, median carina absent, a fine transverse carina anteriorly. Legs moderately long, post-tibiae with 3 spines laterally, 9 apically, basal metatarsal segment with a tooth at each apical angle, 2 minute teeth on apical margin, and a pad of setae occupying most of sole. Tegulae almost concealed. Tegmina short, not covering sixth abdominal tergite, and distally not closely investing body; anterior margin straight, distally curving evenly into apical margin, which is oblique; anal angle broadly rounding; veins not prominent, a common Sc+R stem present in basal half, M simple, and Cu_1 simple to near apex; claval suture obsolete, common claval vein entering margin apically. Wings absent. Abdomen dorsally tectiform. Anal segment of male about twice as long as broad, with lateral

margins strongly decumbent. Pygofer with dorsolateral angles strongly roundly produced. Anal segment of female small, rounded. Ovipositor with third valvulae triangular, with posteroventral margin long, narrow and smooth.

Type-species: *Gamergus africanus* Melichar, 1906: 173.

This genus differs from its nearest allies, *Monteira* and *Diazanus*, in the shape of the frons and the subquadrate brachypterous tegmina. The latter are distinctive not only on account of their shape, but also of their smooth texture and inconspicuous venation.

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REVIEW

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