

REVISIONAL NOTES ON CLASSIFICATION OF THE TRIBE FLATINI
(HOMOPTERA, AUCHENORRHYNCHA, FLATIDAE)

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ABSTRACT

The tribe **Flatini** sensu Metcalf, contained 39 genera and 148 species in the subtribes **Scarpantina**, **Phyllyphantina**, **Lawanina**, **Flatina** and **Siphantina**. The tribe is redefined to include 31 genera and 141 species, based on a review of morphological characters of the head, tegmina, metatibial spines and female ovipositor. Changes in composition of the subtribes resulted from 6 synonymies, 10 new combinations, and 9 genera transferred to other tribes. The tribe is restricted to Oriental and African genera, except 3 American genera with 11 species that are retained provisionally in **Siphantina**.

KEY WORDS

Genera, Scarpantina, Phyllyphantina, Lawanina, Flatina, Siphantina.

INTRODUCTION

In addition to my research on the male genitalia of flatids, particularly historical type specimens, I have reviewed the suprageneric categories proposed by earlier workers and made a comparative study of the descriptive morphological characters on which concepts were based. These data and concepts were utilized in the classification proposed by Melichar (1923), and with relatively few modifications, were adopted by Metcalf (1957) in his catalog of the family. The Metcalf Catalog provides the only system of higher classification of the family known at present.

The characters discussed below provided the data base that was used to evaluate suprageneric categories. This resulted in considerable rearrangement of genera in the tribes and subtribes of Melichar and Metcalf. As an example, only the changes proposed in the Flatini are presented in this article.

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CHARACTERS USED IN FLATID CLASSIFICATION

Conventional characters relate mostly to the head, thorax, tegmina, metatibial spines, and genitalia. Considerable variation exists, often with gradation of character states between taxa. With so many options available, it is not surprising that difficulty can be experienced in delimiting the suprageneric categories.

The head has variations in length, width and convexity that are described as character states of the vertex and frons. The vertex may show a well defined anterior margin that is delimited from the frons by a ledge, a sharp carina or remnant of a carina. However, in many cases the dorsum of the head is not defined by an anterior margin, and the frons extends convexly or angularly across the dorsum of the head until reaching a transverse carina adjacent to, or covered by the anterior margin of the pronotum. Sharp carinate margins always separate the frons laterally from the genae. Ventrally, the margin between frons and clypeus is a transverse or convex suture. The shape and arrangement of certain longitudinal and transverse carinae on the head show considerable diversity.

In dorsal view, the anterior margin of the head is acutely conical to widely truncate, with varying degrees of convexity between the extremes. In lateral view, the anterior margin of the head is convex, angular or truncate. The frons protrudes beyond the genal margins to varying extent.

The pronotum is saddle shaped, with the dorsal surface normally at about the same horizontal plane as the head. The dorso-lateral margins are carinate, usually convexly downturned for a short distance, then lost at about the lower level of the compound eyes. The latero-ventrad extensions of the pronotum, possibly analagous to paranotal lobes, are more or less ridged and may show a conical or triangular postocular eminence.

The mesonotum is always longer than the pronotum. It may extend in a horizontal plane with the pronotum, or be elevated abruptly above the pronotum. A dorsal median longitudinal carina extends from the frons to the apex of the mesonotum, but has variable development. It may be reduced or lost, and weakly or strongly ridged, with various stages between the extremes.

The tegmina display a wide array of characters. I give considerable attention to the longitudinal veins arising from the node of the the basal stem, which are named Radius, Sector and Media (R, S, M). Most flatids have these 3 veins arising separately at the node. However, some species show a R+S or S+M stem arising from the node. Other character states are of interest, e.g., the position and branching of the Cubitus, Cu, in relation to the claval suture, and the post-

claval branching

Claval branching of Cu and M4 in relation to the various shapes of the sutural angle. Also, there are several different configurations of the submarginal and nodal lines that help in recognition of taxa.

I use a spine formula to record the number of spines of each species. For example, 1:6:8 denotes the metatibial pre-apical lateral spine, the metatibial apical spines, and the apical spines of the metatarsal basal segment, respectively. The number and position of the metatibial spines have been found constant in nearly all species examined.

Characters of the male genitalia have been used for precise identification of species. The extent to which this information can be integrated with concepts of higher categories has not yet been determined.

The characters of the female genitalia have been given cursory attention by most earlier workers. I reported that nearly all Australian and New Guinean species have a uniquely modified ovipositor (Medler, 1985). The anal segment, or wax plate, also provides important character states. Research on the morphology of female genitalia in all faunal regions is in progress.

PROPOSED NEW CLASSIFICATION OF FLATINI

The tribe Flatini of Melichar (1923) contained taxa characterized as having the apical margin of the tegmina truncate (not convex) and the sutural angle with a sharp point (more or less elongated). Melichar divided the tribe into 4 subtribes (using -ini terminology) according to the head shapes, which varied from truncate to elongate cone-like. These subtribes are the same as **SCARPANTINA**, **PHYLLYPHANTINA**, **LAWANINA**, and **SIPHANTINA** in Metcalf's Catalog. The subtribe **FLATINA** was added by Metcalf (1957) to accommodate Flata Linnaeus.

An analysis of the redefined subtribes showed that the genera erected by Distant (1906, 1910a, 1910b) provided the largest proportion of new combinations. Probably this was caused in large part by Melichar not having access to Distant's specimens, and his inability to interpret the data published by Distant.

1. SUBTRIBE FLATINA

Head; truncate or slightly convex; anterior margin of vertex not defined; **Tegmina**: R,S,M or R+S,M or R,S+M; postclaval margin slightly raised angulately or convexly, Y-stem present or absent, submarginal line present or absent; **Metatibial spines**: 2; **Ovipositor type**: ancestral; **Distribution**: Oriental, African.

Genus retained: Flata Fab.

Genera added: Cameruniola Strand, Cryptoflata,

Decipha Med., Flatomorpha Mel., Paranotus Karsch.
Genera excluded: Satapa Dist.

2. SUBTRIBE SCARPANTINA

Head: truncate, anterior margin of vertex not defined;
Tegmina: R,S,M, postclaval sutural margin raised, sutural angle angulate or convex; no submarginal line; **Metatibial spines:** 2 and 1; **Ovipositor type:** ancestral; **Distribution:** Oriental, African.

Genera retained: Scarpanta Stal, Colobesthes A & S, Scarpantina Mel.

Genera excluded: Circumdaksha Dist., Daksha Dist., Geraldtonia Dist., Neodaksha Dist., Paradaksha Dist., Eyllisana Metc. & B.

3. SUBTRIBE LAWANINA

Head: convex or acutely conical, anterior margin of vertex not defined; **Tegmina:** R,S,M, postclaval sutural margin raised, sutural angle sharply or bluntly acute, sometimes convex; with or without submarginal line; **Metatibial spines:** 2; **Ovipositor type:** ancestral; **Distribution:** Oriental, African.

Genera retained: Lawana Dist., Oryxa Mel., Phylliana Metc., Pseudoryxa Schmidt.

Genera added: Cromna Walk., Circumdaksha Dist., Neodaksha Dist., Eumelicharia Kirk., Neocromna Dist., Leptoflata Lalle.

Genera excluded: Arelate Stal, Flatopsis Mel., Phymoides Dist.

4. SUBTRIBE PHYLLYPHANTINA

Head: convex or acutely conical, anterior margin of vertex not defined; **Tegmina:** R+S,M or R,S+M, postclaval sutural margin raised, sutural angle acute or right angled, usually no submarginal line; **Metatibial spines:** 2 or 1; **Ovipositor type:** ancestral; **Distribution:** Oriental.

Genera retained: Phyllyphanta A & S, Neosalurnis Dist., Pulastya Dist., Salurnis Stal.

Genera added: Geisha Kirk., Unnata Dist.

Genera excluded: Mimophantia Mats., Neocromna Dist., Parasalurnis Dist., Pulaha Dist., Cromna Walk., Meulona Zia, Summanus Dist.

5. SUBTRIBE SIPHANTINA

Head: convex or obtusely conical; anterior margin of vertex defined by a sharp carina; **Tegmina:** R,S,M or R+S,M, postclaval sutural margin raised, sutural angle angulate or convex, without submarginal line; **Metatibial spine:** 1; **Ovipositor type:** derived; **Distribution:** Australian, New Guinean.

Genera retained: Siphanta Stal, Euphanta Mel., Euryphantia Kirk., Utakwana Dist., ? Carthaeomorpha Mel., ? Dakshiana Metc. & B, ? Hesperophantia Kirk.

Genera added: Lesabes Med., Geraldtonia Dist.,
Sanurus Mel., Aflata Mel., Burnix Med.,
Genera excluded: Hypsiphanta Jac., Siphantoides Dist.

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