The Phylogeny of the *Cerapachyinae*, *Dorylinae* and *Leptanillinae*, [Hym. Formicidae]

by B. D. W. Morley, F. R. E. S., F. R. H. S., etc.

The phylogeny of these three small sub-families is especially interesting in that all three sub-families are highly specialised, though closely related. This accounts for the numerous genera, which it is difficult to place in the phylogenetic tree, such as the sub-genus *Syscia* (See fig. 1), which is surely

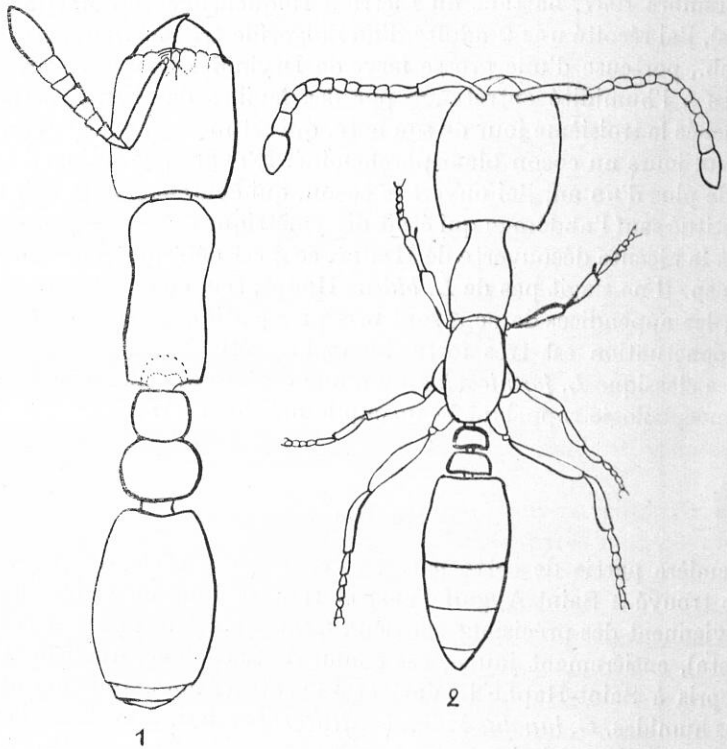

Fig. 1. — *Cerapachys* (*Syscia*) *cryptus* Mann. ♀ (after Mann).
Fig. 2. — *Leptanilla Révelierei* ♀ (after Wheeler and Forel).

extraordinarily similar to the genus *Leptanilla* (See fig. 2); yet actually this is impossible, since their habits are so different as to preclude all possibility of their having been closely related, and their sexual forms are very different. Also a more or less direct line of descent may be traced between the *Leptanillinae* and the *Dorylinae*, through the genus *Aenictus*. Thus it seems

that the sub-genus *Syscia* must be a very specialised dead end of the phylogenetic tree.

The *Cerapachyinae* are very primitive, both in their habits, and in their anatomical development, the gizzard being very primitive, whilst the sting is fairly well developed. They very much resemble the *Dorylinae*, and there was at one time considerable doubt whether the tribe *Cerepachii*, as it was then, should belong to the *Ponerinae*, or the *Dorylinae*. In connection with this

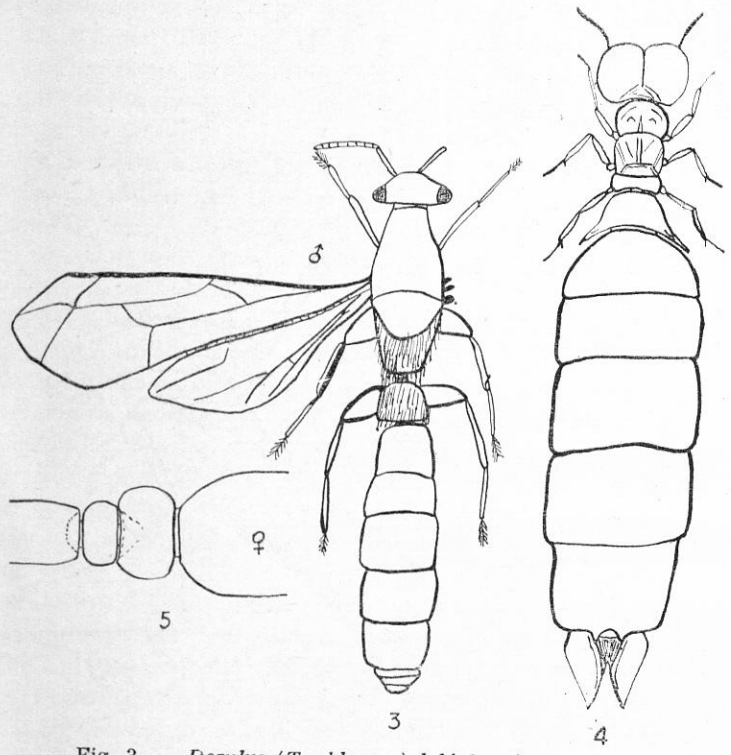

Fig. 3. — *Dorylus* (*Typhlopone*) *labiatus* ♂.
Fig. 4. — *Anomma Wilwerthi* ♀ (after Emery and Forel).
Fig. 5. — *Cerapachys* (*Syscia*) *cryptus* Mann ♀ (after Mann)

Forel pointed out that in the *Dorylinae* the ♂ and ♀ have an unarticulated petiole, highly specialised mandibles, etc. (See fig. 3, 4, 5, 6), whilst these are not found in the ♂ and ♀ of the *Cerapachii* (= *Cerapachyinae*). Also the worker of the genera *Aenictus* and *Ecilon*, which belong to the *Dorylinae*, has two segments to the petiole and has nothing similar to the male and female. In the *Cerapachii* there is a distinct relation in that the worker, male and female all have two segments to the petiole.

Again the eyes of the *Cerapachii* and the *Dorylinae* are different, those of

the former being nearer to those of the *Ponerinae* than to those of the *Dorylinae*. Thus, to quote FOREL's own words : « Il est fort probable que les *Dorylinae* sont dérivés du groupe *Cerapachyi* des *Ponerinae*. »

The Cerapachyine genus *Lioponera* is, I suggest, the connecting link between the *Ponerinae* and the *Cerapachyinae*, in this I am in agreement with FOREL. The *Cerapachyinae* appear to be very closely interrelated, there being no distinct, or well developed groups, as in most of the other sub-families. Certain genera such as *Sphinctomyrmex* are rather more specialised than the rest, but it is certainly true that the genus *Cerapachys* is so representative of the other Cerapachyine genera that it is convenient, and correct to take it

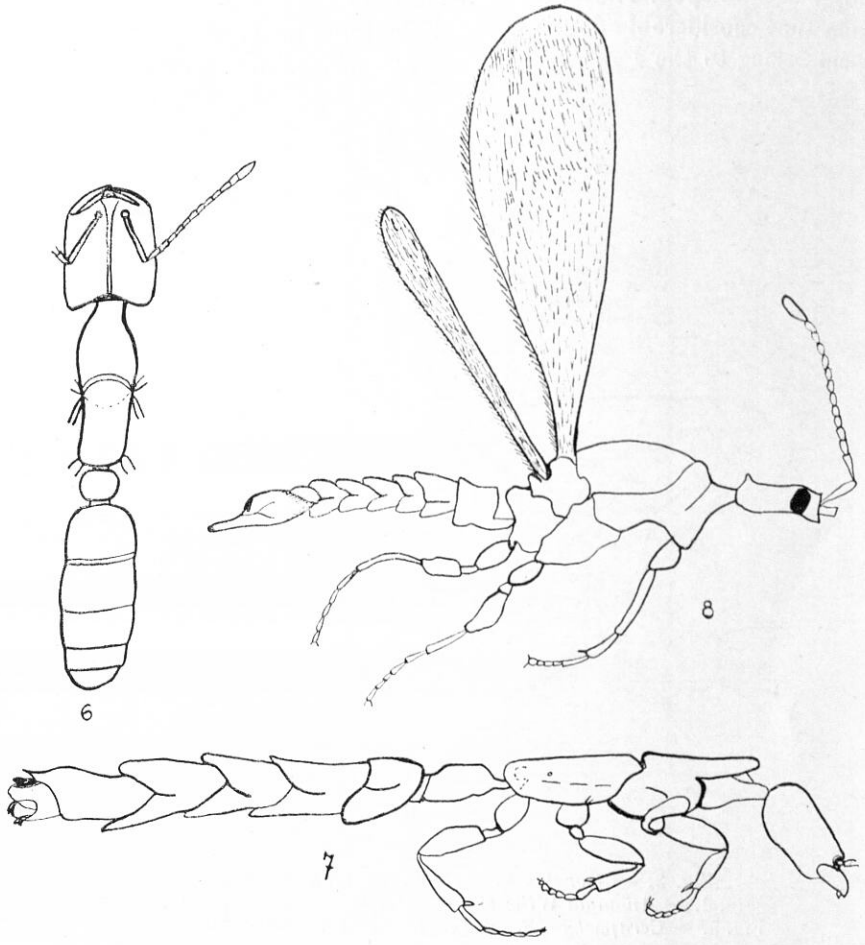

Fig. 6. — *Dorlus helvolus* L. (Min. ☿).
Fig. 7. — *Leptanilla Révelierei* ♀ (after EMERY and FOREL).
Fig. 8. — *Leptanilla minuscula* ♂ (after SANTSCHI andd FOREL).

as being the central connecting link between the two Cerapachyine genera *Lioponera*, and *Acanthostichus*, which surely form the link between the *Ponerinae* and the *Dorylinae*, through the *Cerapachyinae*. The female of the genus *Acanthostichus* is extremely like the female of the *Dorylinae*, and there seems little doubt that this genus does connect the *Cerapachyinae* to the *Dorylinae*.

The *Dorylinae*, thought by EMERY to be the oldest of the Formicine sub-families (though both WHEELER and FOREL held, as I do that the *Dorylinae*, though ancient, were descended from the *Ponerinae*) can be divided into two distinct groups, the *Dorylini* and the *Ecilini*, the former having in the worker only one segment to the petiole, while in the latter the worker has two segments to the petiole.

It seems doubtful whether the *Dorylini* are descended from the *Ecilini*, or vice versa, and I suggest that neither of these suggestions are correct, and that the *Dorylini* and *Ecilini* have descended separately from some common non-Doryline genus, possibly the genus *Acanthostichus*, not from one another.

Whether this be true, or not, it seems certain that the *Dorylinae*, as a whole, are descended from the *Cerapachyinae* ; on this point there is general agreement, except in the case of EMERY.

The remaining sub-family the *Leptanillinae*, consists of a single genus, the genus *Leptanilla* (See fig. 2, 7 et 8), which was until quite recently classed as a Doryline genus. It is certain that the *Leptanillinae* are closely related to the *Dorylinae*, since they have several features in common, such as the verticality of the frontal carinae, which do not cover the insertion of the antennae.

Undoubtably, WHEELER was right in separating the *Leptanillinae* from the *Dorylinae* because of such differences as the retractility and non-rectractility of the genitalia. There is, however, little doubt that the genera *Aenictus* (Doryline), and *Leptanilla*, are so similar as to make it seem probable that the *Leptanillinae*, are descended almost directly from the former genus.

The following table of similies extracted from FOREL's « The Social World of the Ants », is inserted here, in order, that confusion may be avoided, when considering the phylogeny of the *Dorylinae*, as put forward in this paper.

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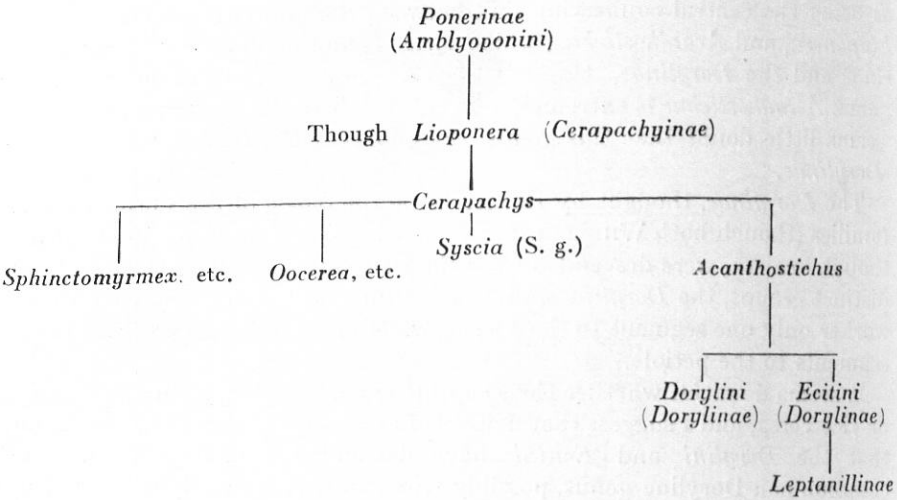
Dorylus F. ♂ = *Vespa* and *Mutilla* L. (partially) = *Typhlopone* Westw. ☿ = *DichthadiaGersl.* ♀.
Ecilon Latr. ☿ = *Labidus* Jurine ♂
Aenictus Shuckard ♂ = *Typhlatta* F. Smith. ☿.



A propos des *Porphyrophora* Brandt, nuisibles aux céréales dans le Bassin méditerranéen

[HEM. COCCIDAE]

par F. PICARD et A. BALACHOWSKY

La tribu des *Margarodini*, créée par COCKRELL et MORRISON (1) dans la superfamille des *Margarodidae*, comprend actuellement les genres *Margarodes* Guild., *Neomargarodes* (Green) Morr., *Porphyrophora* (Brandt) Silv., *Termitococcus* Silv. et *Eurhizococcus* Silv. (2).

Les *Margarodini* ont attiré depuis longtemps l'attention des biologistes en raison de leur développement postembryonnaire très particulier, qui passe par l'intermédiaire d'un stade larvaire apode (mâle et femelle) à métabolisme ralenti, susceptible de rester en diapause (kyste des auteurs) pendant plusieurs années consécutives puis de reprendre son évolution régulière sous l'influence de divers agents physiques.

Ces Cochenilles, à mœurs hypogées et radicicoles, renferment peu de représentants nuisibles aux plantes cultivées. GIARD (3) et VALERY-MAYET (4) ont signalé autrefois les dégâts commis au Chili par *Margarodes vitium* Giard

(1) MORRISON (H.). A classification of the higher groups and genera of the coccid family *margarodidae (U. S. Dpt. Agric. Techn.*, bull. 52, p. 71 et suiv., Washington D. C., 1928).
(2) Ces deux derniers genres comprennent des espèces termitophiles et myrmécophiles.
(3) GIARD (A.), *C. R. Soc. biologie*, séances du 10 février, 19 mai et 10 novembre 1894.
(4) VALERY-MAYET. La cochenille des vignes du Chili. *Ann. Soc. ent. France*, p. 419-435, Paris, 1896.