THE MOST PRIMITIVE *SCOLIIDAE*

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The genus *Campsoscolia* erected by Dr. J. G. Betrem in 1933 to include certain species previously placed, for the most part, in the subgenus *Trielis* of *Campsomeris,* is a genus of much wider extent than has hitherto been known. It includes not only three European species, two of which were originally included in it (*interrupta* F. = [*sex-maculata* F.] and *ciliata* F.) but also five or six species from northeastern Africa and paleartic Asia. All the species of the Africa continent and the two known from Madagascar that have hitherto been placed in *Trielis* are actually species of *Campsoscolia.* Finally, not only must all species of *Trielis* from the North American Continent be transferred to *Campsoscolia* as Dr. Betrem has indicated, but the only known neotropical likewise.

The genus is of particular interest because it stands phylogenetically at the extreme base of the scoliid line. In order to demonstrate that I shall discuss certain scoliid characteristics.

In the male genitalia of the scoliid archetype the lamina volsellaris is completely separated from the apical plate of the volsella, the cuspis or «pièce entrebuchet» of Boulangé. This is the case in *Campsoscolia,* in *Campsomeris* and in *Trisciloa.* In *Scolia,* including all of its subgenera, they have become completely fused, with no trace of a separating suture. This latter is an obviously more specialized condition.

The venation of the scoliid archetype is a represented by the usual type of *Campsoscolia.* Three «submarginal cells» and the second recurrent vein are present. This type of venation is carried into the primitive sections of all genera but there is a great ten-

dency (a) for the second recurrent vein to disappear by atrophy and (b) for the number of «submarginal cells» to be reduced to four. The former has occurred in occasional species of *Campsomeris* and in all *Scolia* except incompletely in two subgenera; the latter has occurred repeatedly in all genera. The crossvein that connects the two recurrent veins in *Triliacos* is not primitive, but a secondary development, without counterpart in other more primitive groups of *Hymenoptera*. Thus while the usual venation of *Campsomeris* is archetypal, the reduction in the number of submarginal cells due to loss of the «second transverse cubital vein» that occurs in some species is without significance, since it has been initiated independantly in numerous other instances and is often inconstant within the species.

The mesopleural structure described by Dr. Betrem for *Campsoscolia* is also archetypal. It is carried over into all species of *Scolia*. But in *Campsomeris* and in *Campsomeris* alone a modification has occurred.

The tibial spurs of the ♀ archetypal scoliid were sharp and pale in color. In primitive *Campsoscolia* and *Campsomeris* this is also true, and they are sharp in all *Scolia*. But in some *Campsoscolia* and many *Campsomeris* the apices become spatulate, especially marked in the longer spur, an their color in many species, as also in *Scolia*, is black.

In *Campsoscolia*, *Scolia* and *Trisciloa* the punctation of the terga of the ♀ is not so accumulated as to form on each a preapical row bearing a fringe of long setae. Such a preapical row of punctures and fringe is a distinctive and specialized condition of *Campsomeris*.

The simple base of the second abdominal segment characteristic of *Campsoscolia*, ventrally rounding without an angle and the first dorsally without a tubercle are also primitive conditions.

Finally there are the matters of antigeny and color-pattern. Apart from secondary sexual differences occurring throughout the family (in shape of antennae, legs, and other characters) the scoliid archetype had slender ♂♂, black, the head, thorax and legs marked with yellow and the abdominal segments banded with yellow, very much as in *Myzine*. The ♀♀ of the very most primitive forms have a similar coloration, but are much

stouter. The archetypal coloration is retained in certain *Campsoscolia* and in primitive *Campsomeris,* but neither it nor the extremely slender ♂♂ occur so clearly in *Scolia.*

In all of the above respects *Campsoscolia* is archetypal, and that is not the case with any of the other genera.

One character that is possessed by all but two of these species of *Campsoscolia* was not mentioned by Betrem, yet affords usually the most facile method of recognizing the genus. It is a smooth and polished band, usually sinuate and depressed, which traverses the front of the ♀ at the level of the sini oculares. It also occurs in the ♂♂ but is more feeble. It is easy to see why it was not referred to by Dr. Betrem, for by coincidence one of the two species that he originally included in the genus and mentioned by name is the principle exception, namely *C. ciliata* F.

There are six species that come within Betrem's definition of *Campsoscolia,* and which also possess the transverse frontal depressed band, that form a sub-group of their own. They are characterized in the female sex by having the spatium frontale, that is the entire area of the front between the antennae, the base of the clypeus, and the depressed transverse frontal band, strongly elevated, forming a platform. No such structure appears in other species or in fact in any other *Scoliidae.* For these five species I am erecting the new subgenus *Crioscolia.*

Two of these species occur in the Upper or Lower Sonoran Zones of the western United States, arid desert areas. One occurs in Algeria, one in Turkestan, one in South Africa, and one in East Africa and Madagascar. Such extremely discontinuous distribution is strong evidence of great antiquity and there are species in this subgenus that probably afford the nearest living approach to the scoliid prototype.

The single species *ciliata* F. is just as clearly a less ancient modification of the primitive type. Not only in having the frontal band replaced by a strip of erect dense setae, extending into the bottoms of the sini oculares, but in its abundant erect black and red or yellow hair and the complete loss of the third submarginal cell, it stands apart from all other species in a subgenus of its own.

The genitalia of the ♂ show little variation within the genus in the species that I have examined. Such modifications as occur

in some subgenera of *Scolia* are lacking. But these latter groups are comparatively highly specialized forms, and the fact that the characters by reason of which I have divided *Compsoscolia* into subgenera find no counterpart in the male genitalia is no reason, in my view, for discounting the value of the latter as actual phylogenetic groups.

The arrangement of the species into groups is tentative but will probably, in the main, prove natural.

The Proper Name for the Genus *Campsoscolia*

Everyone has overlooked the fact that Achille Costa (Prospetto degli imenotteri italiani. Parte seconda: pompilidei, dolicuridei, scoliidei· sapygidei, tifiidei e mutillidei. Naples, 1887, p. 104) founded *Heterelis* as a subgenus of «*Elis*», citing only one species, namely: «*E. villosa* Fab.» The first and only bibliographic reference that he gives to «*villosa* Fab.» is to «*Scolia villosa* Fab. Ent. syst., II, p. 227, 18». That reference is, however, incorrectly quoted. Fabricius did not write «*Scolia villosa*» but «*T. villosa*» and entered it under the heading «*Tiphia*». Schulz (Berl. ent. Zeitschr., 1912, p. 81) after having seen the types reported that the species is a true *Tiphia, not* a scoliid.

It is perfectly clear that Costa meant the common south European species, the ♂ of which Fabricius in the same work described as *Scolia quinquecincta,* and which has been incorrectly synomymized with his earlier *Sphex villosa,* so that it has commonly been known as *Scolia villosa* or *Elis villosa.* Costa cited *quinquecincta* in the synonymy of the ♂, and the characters apply to the ♀ of that species, in no manner to a *Tiphia.* But since his bibliographical reference is definitely to a *Tiphia,* it seems far better to take him at his word and let *Heterelis* remain as a synonym of *Tiphia.* The other course, to consider *Scolia quinquecincta* F. as type, by whatever name it is correctly known, will serve no good purpose, but would necessarily result in replacing *Campsoscolia* Betrem with *Heterelis* Costa. From a purely sentimental point of view the latter course would be just to neither Costa nor to Dr. Betrem. Costa founded his genus on inconsequential characters of no phylogenetic weight, namely on

the fact that the ♀ has two, the ♂ three submarginal cells. This in fact is generally, but not consistantly, true, and not true of the variety *abdominalis*. The character does not apply to other species of Betrem's *Campsoscolia*. Betrem, on the contrary, based his group on a fact of morphological significance, to which other characters may be added that will distinguish a natural phylogenetic genus.

But personal opinion is not adequate for a final decision. The International Commission on Zoological Nomenclature has requested that such cases be presented to them for review and this will have to be done. Meanwhile we shall use *Campsoscolia*.

CAMPSOSCOLIA Betrem

1933. *Campsoscolia* Betrem, Stett. ent Zeit., 94: 240, 259. Type-species: *Scolia sexmaculata* F., 1781, by original designation.

Key to the Subgenera

Females

a. A transverse, impunctate, polished band, usually impressed and somewhat sinuate, present on the front at the level of the sini oculares, but no transverse strip of erect hair between these; the body and legs without a bee-like covering of long hair; three submarginal cells usually present (*C. villosa* is an exception).

b. Surface of the spatium frontale strongly elevated, forming a platform..... ..... *Crioscolia* n. subg.

bb. Surface of the spatium frontale not elevated above the level of the front..... ..... *Campsoscolia* Betrem

aa. No transverse, impunctate, frontal band, but instead a strip of dense erect black setae, extending between the bottoms of the two sini oculares; bee-like, the thorax, legs and abdomen covered with long silky red or yellow erect hair; only two submarginal cells..... *Dasyscolia* n. subg.

Males

a. Not bee-like, the head and body not densely covered with conspicuously long erect hair; normally more than two submarginal cells; no transverse strip of erect hair on the front..... *Crioscolia* n. subg. and *Campsoscolia* Betrem

aa. Bee-like, the head, thorax, legs and abdomen covered with conspicuously long and erect silky hair; only two submarginal cells; a transverse strip of dense erect black hair extending between the bottoms of the two sini oculares. ..... *Dasyscolia* n. subg.

LIST OF THE DESCRIBED SPECIES OF *CAMPSOSCOLIA*

BIBLIOGRAPHICAL REFERENCES THAT APPEAR IN DALLA TORRE'S CATALOGUS HYMENOPTERORUM ARE OMMITTED

Subgenus **CRIOSCOLIA**, novum

Type: **Campsomeris (Trielis) flammicoma** Bradley

Group of **C. flammicoma**

1. **C. (Crioscolia)** flammicoma Bradley, n. comb.

1928. *Campsomeris (Trielis) flammicoma* Bradley, ♀, ♂. Trans. Amer. ent. soc., 54: 209, fig. 4 (map of distribution), and pl. XXII. figs. 10-13.

Southwestern United States and northwestern Mexico in the lower Sonoran Zone.

2. **C. (Crioscolia) alcione** Banks, n. com.

1917. *Trielis alcione* Banks, ♂. Bull. Mus. comp. zool., Harvard univ., 21: 212.

1928. *Campsomeris (Trielis) alcione* Bradley, ♀ ♂. Tran. Amer. ent. soc., 54: 212, fig. 4 (map of distribution), and pl. XXII, figs. 14-17.

Western United States north and west of the distribution of *flammicoma*, in the upper Sonoran Zone.

3a. **C. (Crioscolia) tartara tartara** (Saussure), n. comb., ♀ ♂.

Turkestan, Baluchistan.

3b. **C. (Crioscolia) tartara konowi** (Gribodo), n. comb.

1896. *Trielis konowi* Grib., ♀. Bull. Soc. ent. ital., 17: 225.

Turkestan: Chodschent.

4. **C. (Crioscolia) moricei** (Saunders), n. comb.

1901. *Scolia (Trielis) moricei* Saunders, ♀. Trans. Ent. soc. Lond., p. 538.

Algeria: Biskra.

Group of **C. punctum**

5. **C. (Crioscolia) punctum** (Saussure), n. comb., ♀.

Nyasaland, Rhodesia and Zanzibar. Madagascar.

6. **C. (Crioscolia) braunsi** (Turner), n. comb.

1912. *Scolia (Trielis) braunsi* Turn., ♀. Trans. Ent. soc. Lond., p. 742.

South Africa: Cape Province.

Subgenus **CAMPSOSCOLIA** Betrem

Group of **C. interrupta**

1. **C. (Campsoscolia) interrupta** (Fabr.) Betrem.

1871. *Scolia sexmaculata* Fabr., ♀ (nec *Vespa sexmaculata* Müller, 1766 = *Scolia sexmaculata* [Müller].

1781. *Scolia interrupta* Fabr., ♂.

S. Europe eastwards to east of Kharkov and to central Turkey (Adana).

1 var. **C. (Campsoscolia) interrupta** (Fabr.) var. **hybrida** Costa ♀.

Italy.

2. **C. (Campsoscolia) mongolica** (Morawitz) Betrem.

1896. *Trielis tartara* var. *mongolica* Morawitz, ♂.

1941. *Campsoscolia mongolica* Betrem. Notes d'ent. chinoise, 8: 50.

Mongolia, N. Japan (?) [1].

[7] A ♀ *Trielis* from the northern Japan, very similar to *octomaculata* Say, probably belongs to this species. If, however, the ♀ that Morawitz (Horae. Soc. ent. ross., 26 Mar. 1896, 30: 147) took to be the ♀ of his *mongolica*, and that caused him to rank *mongolica* as a variety of *tartara*, actually belongs to *mongolica*, then that species belongs to the subgenus *Crioscolia*, either as a species or as a subspecies of *tartara*.

3a. **C. (Campsoscolia) octomaculata hermione** (Banks), n. comb.

1912. *Trielis hermione* Banks. Can. ent. 44 : 200, ♂.
1928. *Campsomeris (Trielis) octomaculata hermione* Bradley, ♀, ♂. Trans. Amer. ent. soc., 54 : 205. Fig. 1 (map of distribution), Pl. XII, fig. 18.

Austral United States east of the Mississippi River.

3b. **C. (Campsoscolia) octomaculata octomaculata** (Say), n. comb.

1928. *Campsomeris (Trielis) octomaculata octomaculata* Bradley, ♀, ♂. Loc. cit., p. 202, fig. 1 (map of distribution).

U. S. east of Rockay Mts., west of Mississippi River and north of the range of subsp. *texensis*.

3c. **C. (Campsoscolia) octomaculata texensis** (Saussure), n. comb.

1928. *Campsomeris (Trielis) octomaculata texensis* Bradley, ♀, ♂. Loc. cit., p. 203, fig. 2 (map of distribution), pl. XXII, figs. 19-22.

Southwestern United States.

3d. **C. (Campsoscolia) octomaculata xantiana** (Saussure), n. comb. and new status.

1928. *Campsomeris (Trielis) xantiana* Bradley. Loc. cit., p. 207.

Lower California.

4. **C. (Campsoscolia) pollenifera** (Viereck), n. comb.

1906. *Elis (Trielis) pollenifera* Viereck, ♀, ♂. Trans. Amer. ent. soc., 32: 191.
1928. *Campsomeris (Trielis) pollenifera* Bradley. Loc. cit., p. 208, fig. 3 (map of distribution), pl. XXII, figs. 5-7.

Areas in the southwestern United States.

5. C. **(Campsoscolia) klugi** (v. d. Linden), n. comb., ♀.

Dalmatia; Russia, just north of the Crimea.

6. C. **(Campsoscolia) pardalina** (Gerstäcker), n. comb., ♀ ♂.

N. Rhodesia and Mozambique to South Africa.

7. **C. (Campsoscolia) mima** (du Buysson), n. comb.

1897. *Dielis mima* du Buysson. Ann. Soc. ent. France, p. 355, ♀.
1917. *Campsomeris (Trielis) bulawayoensis* Turner, ♀. Ann. and mag. nat. hist., 20: 355, new synonymy [1].

Southern Rhodesia and the Transvaal.

8. C. **(Campsoscolia) stigma** (Sauss.), n. comb., ♀.

Lourenço Marques, Cape Province, and S. W. Africa.

Group of **C. quinquecincta**

8a. **C. (Campsoscolia) quinquecincta quinquecincta** (Fabricius) [2], n. comb. var. **quinquecincta**, ♀ ♂.

Mediterranean subregion east to Taurus Mts. in Turkey.

8a. var. **C. (Campsoscolia) quinquecincta quinquecincta** (Fabr.), var. **abdominalis** Spin.

1806. *Scolia abdominalis* Spinola, ♀. Insect Liguriae, v. 1, p. 25, No. 10.
1807. *Scolia rubra* Jurine, ♀. Nouv. méth. class. Hymén. Pl. 9, gen. 12.

8b. **C. (Campsoscolia) quinquecincta maroccana** (Gribodo), n. comb.

1895. *Trielis villosa* var. *maroccana* Gribodo.

Morocco: Casa Blanca.

8c. **C. (Campsoscolia) quinquecincta rudaba** (Kirby), n. comb. ♂

Baluchistan: Chaman.

[1] I have examined the types of both *mima* and *bulawayoensis*.

[2] *Sphex villosa* Fabr. 1775 and *Tiphia villosa* Fabr. 1793 are neither of them *Scoliidae*. Mistaking them each for the ♀ of *quinquecincta* Dalla Torre in his catalogues incorrectly adopted the name *villosa* for this species, and most authors have since followed him.

9. **C. (Campsoscolia) carbonaria** (Klug), n. comb., ♀.

Egypt and Palestine (Algeria records known to me are not this species).

10. **C. (Campsoscolia) aliena** (Klug), n. comb., ♂.

Arabia, Egypt, Somaliland, Abyssinia (Kenya and Mozambique records are not this species).

11. **C. (Campsoscolia) siderea** (A. Costa), n. comb., ♀.

Tunis.

12. **C. (Campsoscolia) peringueyi** (Turner), n. comb.

1916. *Scolia (Trielis) peringueyi* Turner, ♀. Ann. S. Afr. mus., 15: 462.

Cape Province and South West Africa.

13. **C. (Campsoscolia) techowi** (Turner), n. comb.

1910. *Scolia (Trielis) techowi* Turner, ♀, ♂. Trans. Ent. soc. Lond., p. 400.

South West Africa.

14. **C. (Campsoscolia) litigiosa** (Smith), n. comb., ♀.

India (possibly actually Baluchistan).

Group of **C. elliotiana** [1]

15. **C. (Campsoscolia) elliotiana** (Saussure), n. comb., ♀

Madagascar.

[1] This group is probably subgenerically distinct.

SPECIES-GROUP UNCERTAIN

16. **C. (Campsoscolia) lugens** (Kirby), n. comb., ♂.

Brazil.

Subgenus **DASYSCOLIA** novum

Type: **Tiphia ciliata** Fabricius

1b. **C. (Dasyscolia) iliata araratica** (Radoszkowski), n. comb., ♀.

1933. *Campsoscolia ciliata* (Fabr.) Betrem. Stett. ent. Zeit., 94: 259.

Mediterranean Subregion.

1b. **C. (Dasyscolia) ciliata araratica** (Radoszkowski), n. comb., ♀.

1893. *Dielis ciliata fastuosa* Gribodo, n. synom., ♀ [1].

Turkey (Smyrna) to Iran (Mt. Ararat).

[1] I have studied the types of both *araratica* and of *fastuosa*.