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The Generic Composition of the Cyndroiulini

by

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Abstract: The relationships between the genera of the tribe Cyndroiulini are here discussed and analysed. Members of the tribe are frequently encountered by workers in Europe and the taxonomy is in a state of confusion. The present analysis seeks to clarify the situation and produce a result which will hopefully lead to consistency in future work. The genus *Allajulus* is one of considerable size and diversity at present, containing a large number of subgenera, many of which have been elevated to generic status at different times in the past. This genus forms the centre for the present study. *Allajulus* is here split, with a large number of species being placed in the genus *Cyndroiulus*, previously a subgenus and junior synonym. Various other changes are also made. — Full Publication: Ent. Scand. 21: 97 - 112. 1990.

1. Introduction:

According to HOFFMAN (1979: 110) the tribe Cyndroiulini VERHOEFF, 1930 consists of eight genera. One of these, *Allajulus* C.L. KOCH, 1847 contains over 100 species divided into 15 subgenera. One of these subgenera, *Cyndroiulus* VERHOEFF, 1894 has, in the past, been used extensively as a generic name, although it is a junior synonym.

The genus *Allajulus* has been defined as Julidae lacking frontal setae, with gonopods bearing a flagellum and with a deep, wide incision between the opisthomerite and a free mesomerite (ENGHOFF 1982 of *Cyndroiulus* = *Allajulus*). Other characters are variable, for example that of the presence or absence of metazonite setae which divides the genus (as it stands at present) into two groups. Those species with metazonite setae bear resemblances to the genus *Enantiulus* ATTEMS, 1894, also in the Cyndroiulini, which has metazonite setae but no gonopodal flagellum. Other genera in the tribe are represented by only one or two species.

The present revision was carried out in order to clarify the relationships between the genera. The classification of HOFFMAN (1979) was used as a base line for the study.

2. Methods:

Examination of a variety of species of *Allajulus* was made, including representatives of most subgenera, and all species with metazonite setae. Representatives of most other genera from the tribe (as listed by HOFFMAN 1979) were also seen. Characters examined included external ones, and those of the gonopods and vulvae. The analysis was carried out using cladistic principles therefore the apomorphic or derived character states were determined where possible.

3. Results:

A cladogram was produced (Fig. 1) using the characters observed. This group of millipedes is characterised by the absence of frontal setae and the presence of a free mesomerite in the gonopods. Within the group there are four lineages. One line leads to the tribe Schizophyllini (= Ommatoiulini

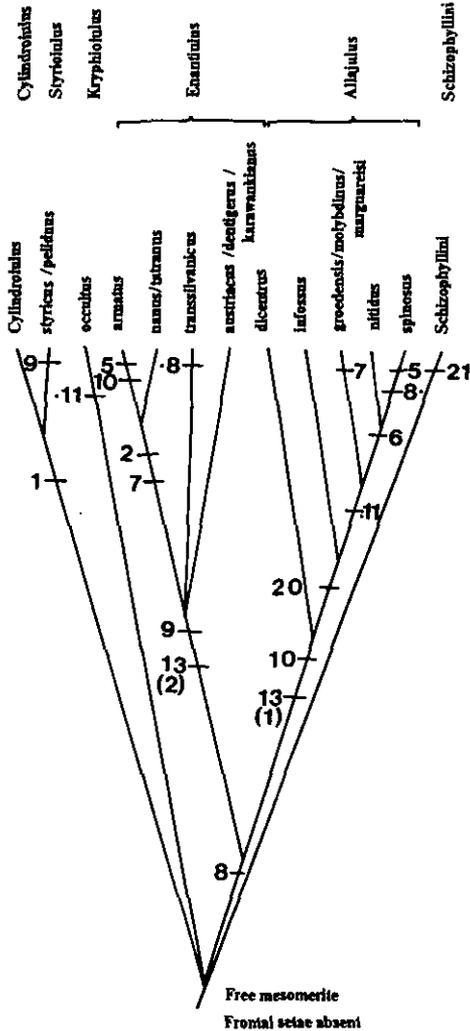


Fig. 1: Cladogram to show the relationships of the Cylindroiulini. Numbers represent characters used, the apomorphic state is indicated in brackets. A dot following the number indicates a character reversal. 1 Metazonite setae (absent); 2 Number of ocelli (reduced); 3 Limbus type (crenulate); 4 Pre-anal projection (upward directed); 5 Projecting ventral scale (present); 6 Projection on coxa 2 of male (present); 7 Expanded stipites (fully expanded); 8 Mesomerite (forked); 9 Flagellum (absent); 10 Opisthomerital membrane (present); 11 Paracoxal rim (present); 13 Brachite (present); (1) smooth, (2) spinose; 21 Leaf-like accessory claw in juveniles (present).

of HOFFMAN 1979). The three genera here are united by a leaflike accessory claw in the juvenile stages and have ozopores opening posterior to the suture. The remaining three lines are the Cylindroiulini.

Cylindroiulus and *Styrioiulus* VERHOEFF, 1928 are characterised by loss of metazonite setae (*Cylindroiulus* here is applied to the non setose species of HOFFMANs (1979) *Allajulus*).

Styrioiulus (containing *pelidnus* LATZEL, 1884, and *styricus* VERHOEFF, 1896, the latter formerly in *Enantiulus*) are distinguished by lack of gonopodal flagellum. *Cylindroiulus* contains a large number of species and has no convincing apomorphic character distinguishing it. (The division may in fact be false as reduction in flagellum length occurs many times in the genus *Cylindroiulus*).

The last major branch of the tetrachotomy is characterised by a forked mesomerite. Loss of flagellum and a brachite with cuticular projections designates *Enantiulus*, differences in male cheek plate expansion and telson shape separate the species. One species, *transsilvanicus* (VERHOEFF, 1899) has only a single mesomerite but in all other respects it is very similar to the other species in the group and must be regarded as having secondarily lost the forked mesomerite. *Allajulus* is characterised by the development of a membrane on the mesal surface of the opisthomerite (although also seen in *E. armatus* RIBAUT, 1909). With the exception of *infossus* VERHOEFF, 1930 a secondary loss of the paracoxal rim occurs. The position of *dicentrus* LATZEL, 1884 is somewhat uncertain. The gonopods are so condensed in shape and resemble *Enantiulus* as well as *Allajulus*. This species is also unusual as it has lost the metazonite setae except for the apodous segments. *Groeden-sis* ATTEMS, 1899, *molybdenus* C.L. KOCH, 1847 and *marguarezi* STRASSER, 1970 have expanded cheek plates in the males and are all rather similar. The remaining two species, *nitidus* VERHOEFF, 1891 and *spinus* RIBAUT, 1904, have similar gonopods and also have a coxal projection on the second leg pair in the male. *Spinus* presents a problem because it appears to be another example of secondary loss of the forked mesomerite. It does have the gonopodal membrane and in other respects is very similar to *nitidus*.

The final line is to *occultus* C.L. KOCH, 1847. This species has metazonite setae but not a forked mesomerite and therefore lacks apomorphies for either *Allajulus* or *Enantiulus*. In addition it has strong promerite spines and rather different gonopods as a whole. Therefore it must represent a separate line from the base and therefore is a different genus. A generic name is not available so that of *Kryphioiulus* is proposed.

Description of genera:

Allajulus C.L. KOCH, 1847:

A genus of small, pale species, with metazonite setae at least on apodous segments. Usually with a pre-anal projection and in the gonopods a forked mesomerite, a membrane on the mesal surface of the opisthomerite and a flagellum.

Cylindroiulus VERHOEFF, 1894:

This genus includes all the none setose species of HOFFMANs *Allajulus*. Variable in size and colouring, they are often larger and darker than *Allajulus*. Metazonites are without setae. Gonopods have a flagellum and a single mesomerite. The male cheek plate is expanded.

Enantiulus ATTEMS, 1894:

These are pale species, with metazonite setae. Gonopods lack a flagellum, but have a forked mesomerite and a spinose brachite.

Styrioiulus VERHOEFF, 1928:

These small pale species do not have metazonite setae. Gonopods lack a flagellum and have a single mesomerite.

Kryphioiulus READ, 1990:

The single species so far is small and pale with metazonite setae. It has no membrane on the opisthomerite but does have enlarged setae on the promerite.

Summary of changes made:

Removed from *Cylindroiulini* or of uncertain position:

Armeniohyllum LOHMANDER, 1932:

In HOFFMAN (1979) a "Julid of uncertain status". It remains as such.

Chaetoleptophyllum VERHOEFF, 1898:

Has frontal setae and ozopores posterior to the suture. Also rather different gonopods.

Leptophyllum simplex VERHOEFF, 1926:

Has frontal setae, ozopores posterior to the suture but has gonopods similar to *Enantiulus*. Position uncertain.

Sibiriulus GULICKA, 1963:

Has frontal setae, ozopores posterior to the suture and rather different gonopods.

Tachypodoiulus VERHOEFF, 1893:

Returned to the Schizophyllini for reason given above.

Placed/replaced into the genus *Cylindroiulus*:

Olistheroiulus LOHMANDER, 1936:

Fits into the *Caucasoius* group of *Cylindroiulus* despite rather extreme gonopods.

Dendroiulus BERLESE, 1884, *Micromastigoiulus* VERHOEFF, 1899, *Solaenoiulus* SCHUBART, 1932:

These last three genera have gonopods which are not sufficiently different from those of the main group of *Cylindroiulus* to warrant separate generic status for any of them.

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5. Literature:

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