

Taxonomic notes on the genus *Philhygra* Mulsant & Rey (Coleoptera, Staphylinidae)

Jyrki Muona

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The generic status of *Philhygra* Mulsant & Rey is emphasised and synapomorphies defining this genus are discussed. *Philhygra mahleri* n. sp. is described from Denmark and France. Three new synonyms are presented: *Hygroecia parca* Mulsant & Rey, 1874 is regarded a senior synonym of *Atheta nannion* Joy, 1931, the present combination being *Philhygra parca* (Mulsant & Rey), *Homalota rugulosa* Heer, 1839 is regarded a senior synonym of *Homalota brisouti* Harold, 1867, the present combination being *Philhygra rugulosa* (Heer), and *Atheta flavithorax* Benick, 1976 is regarded a junior synonym of *Atheta ripicola* H. K. Hanssen, 1932, the present combination being *Philhygra ripicola* (H. K. Hanssen). *Atheta (Philhygra) robustior* Benick, 1976 is transferred to the genus *Actophylla* Bernhauer. The secondary sexual characteristics of the previously unknown female of *Philhygra pinegensis* (Muona) are illustrated and discussed.

J. Muona, Finnish Museum of Natural History, P.O. Box 17, SF-00014 University of Helsinki, Finland.

1. The monophyly and generic status of *Philhygra* Mulsant & Rey, 1873

Traditionally the genus *Atheta* Thomson included numerous subgenera and this view was retained in most recent European check-lists (e.g. Pope, 1977; Silfverberg, 1992). Even though several genera have already been removed from "*Atheta*", there can be little doubt that the genus still is only an assemblage of species groups. Furthermore there is definite evidence suggesting that this assemblage is not a natural one (see especially Yosii & Sawada, 1976 and Sawada, 1984). Before removing "distinct" groups from within the genus *Atheta*, it should be remembered that the mere "distinctiveness" of a group is not in itself enough for its formal recognition. The nature of the characters defining the group has to be evaluated in order to distinguish natural groups based on apomorphic characters. A phylogenetic evaluation of the diagnostic characters is an essential part of defining genera. A good example of the problems involved can be found in Lohse (1971). He gave twelve diagnostic features (listed under six groups) that were used for defining his concept of *Atheta*. Two of these characters dealt with the ridges found on the pro- and metasternum. These may indeed turn out to be useful synapomorphies for *Atheta*, once they are studied from all the relevant taxa. One further character

used by Lohse, the short first metatarsomere 1, was most likely a feature defining the whole tribe Athetini – and if so, can not be used for defining *Atheta*. The remaining nine characters were in fact present in the tribe Oxypodini already – as well as in many other non-Athetini groups. They were plesiomorphies and of no use in defining a natural group within Athetini: 1) ligula divided in apical 1/3-2/3, 2) paraglossae poorly developed, 3) mandibles without teeth, 4) shape of clypeus, 5) structure of maxillae medially, 6) length of maxillae, 7) head with temporal ridge, 8) first three visible tergites with basal groove, and 9) spermatheca well developed.

The only comprehensive efforts to delimit *Atheta* and its allies were produced by Sawada (e.g. Yosii & Sawada, 1976; Sawada, 1972, 1974, 1984) and Seevers (1978). Lohse (1971) discussed this question as well, but the material he included was quite limited. None of these authors applied a definite theoretical framework in their studies. Because of this they proposed new groupings based on characters, whose phylogenetic value was not assessed.

Brundin (1943), in his masterful *Philhygra* (= "*Hygroecia*") revision discussed in depth the phylogenetic implications of the morphological structure of these beetles. In Brundin's (1943) view there was little doubt of the generic status of

Philhygra, as he was able to demonstrate several characters shared only by the *Philhygra* species. He refrained from formally proposing a generic status for *Philhygra*, because he suspected that the rest of the genus *Atheta* included the sister group of *Philhygra* – i.e. the rest of *Atheta* would be paraphyletic.

Sawada (1976) regarded *Philhygra* a subgenus as well, but his reasoning was based on a clear error. The character Sawada (1976) used for uniting *Philhygra* with other “*Datomicra* group” subgenera was the “0-0” type abdominal chaetotaxy. This was a symplesiomorphy defining a more inclusive group of aleocharines and thus in no way demonstrated common descent within Athetini.

Seevers (1978) regarded *Philhygra* a valid genus on the evidence given by Brundin (1943). Lohse (1971) shared this view as well, but did not formally recognise *Philhygra* as a separate genus. It should be noted, however, that Lohse’s view in this matter was inconsistent. In Benick & Lohse (1974) *Philhygra* was treated as a subgenus of *Atheta*, in Lohse & Smetana (1985) as a genus, in Lohse (1989) as a subgenus, and in Lohse *et al.* (1990) again as a genus.

When evaluating the existing evidence I found that *Philhygra* was not only a distinct group, but a demonstrably monophyletic clade as well. Consequently it should be regarded a genus. Within the Aleocharinae two aedeagal features, the aethine bridge and the oval compression plate, are only found in one large group of species (Seevers, 1978). These two characters are shared derived features defining the clade Seevers called the tribe Athetini. Further putative synapomorphies defining this group include the shortening of the metatarsomere 1, the absence of a frontal suture, the 4-5-5 tarsal formula and the absence of caelonic sensillae on the antennae. These additional characters have not been studied, however, from all the relevant groups and they may define more inclusive groups.

Once the monophyly of Athetini was demonstrated, the many diagnostic features of *Philhygra* could be shown to be shared derived characters defining the monophyly of this clade: the presence of two bundles of spines in the internal sack of the median lobe, the opening of the ductus receptaculi proximally to the vulva, the reduction of the spermatheca, the presence of specialised minute setae on the sternum 6 in the female, and the complex female genital segment. All these features are unique within the Athetini.

Of course, even after the removal of *Philhygra*,

Atheta will remain paraphyletic. I have not made an attempt to look for the sister group of *Philhygra* within *Atheta* sensu lato. It is of interest to note that on the basis of different data sets both Brundin (1943) and Sawada (1976) regarded *Microdota* Mulsant & Rey as the group being closest to *Philhygra*.

2. The identity of *Hygroecia parca* Mulsant & Rey, 1874

The study of a female syntype of *Hygroecia parca* Mulsant & Rey in the Rey collection (Musée Guimet, Lyons) revealed that it belonged to the species generally known as *Atheta nannion* Joy. I have seen syntypes of *Atheta nannion* Joy (Natural History Museum, London), and the identity of this species is well established. This synonymy was given in Lohse (1989: 212) based on information included in a letter I sent to him.

Hygroecia parca Mulsant & Rey, 1874 = *Atheta nannion* Joy, 1931, **new synonymy**. The present combination is *Philhygra parca* (Mulsant & Rey).

3. The identity of (*Philhygra*) *flavithorax* Benick, 1976

The study of the male holotype of *Atheta flavithorax* revealed that it was a teneral specimen of *Atheta ripicola* Hanssen, 1932. The peculiar structure of the aedeagus observed by Benick (1976) was simply due to the breaking off of the elongated apex of the organ. All the internal structures were identical with those of *A. ripicola*. Externally the specimen showed all the diagnostic features of *A. ripicola*. I have seen numerous syntypes of *Atheta ripicola* (coll. A. Strand, Bergen) and the identity of this species is well established.

Atheta ripicola H. K. Hanssen, 1932 = *Atheta flavithorax* Benick, 1976, **new synonymy**. The present combination is *Philhygra ripicola* (H. K. Hanssen).

4. The identity of *Homalota rugulosa* Heer, 1839

The study of the single female syntype of *Homalota rugulosa* Heer, 1839 in the Heer collection (Entomologisches Institut der ETH, Zürich) showed that this species was a senior synonym of *Homalota brisouti* Harold, 1867. I have designated the specimen as the lectotype. The pin with the remounted lectotype bears the following other labels: 1) the original card, 2) a red triangle, 3) a quadrate label

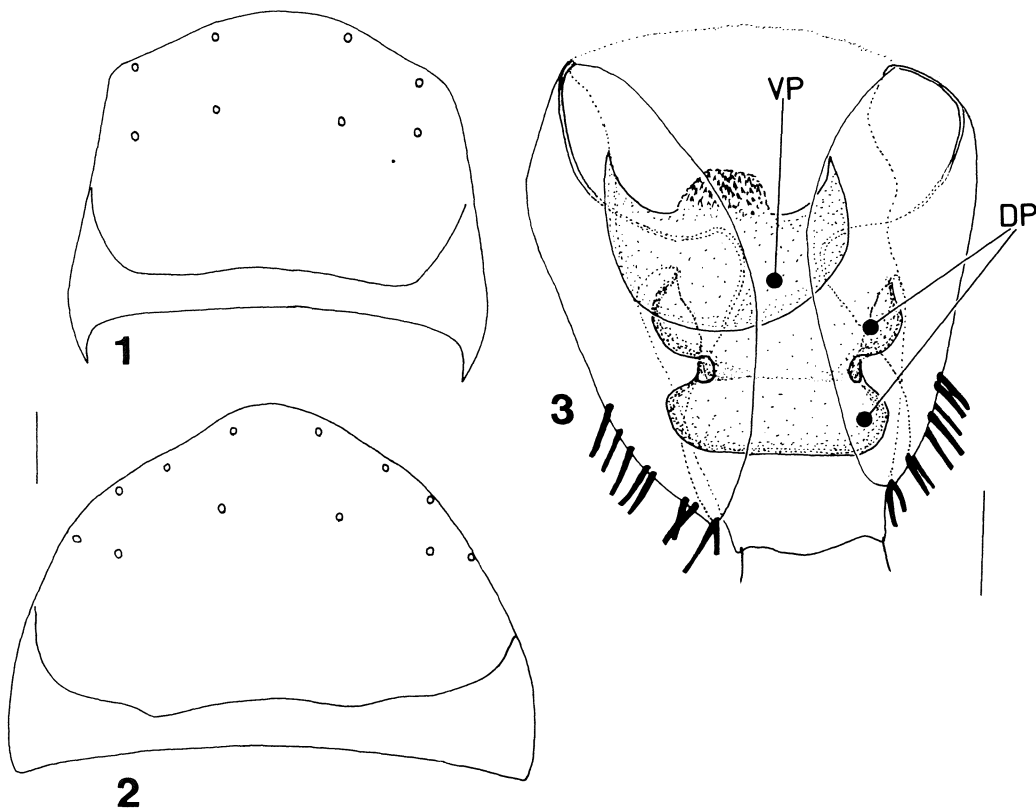


Fig. 1-3. *Philhygra pinegensis* (Muona), female. - 1, tergite 8; 2, sternum 6; 3, genital segment. DP = dorsal plates. VP = ventral plate. In 1 and 2 only attachment points of sexual hairs are marked. Scale 0.1 mm.

with "a", 4) a cellulose acetate card with the tergite 8, sternum 6 and the genital segment, 5) a label with "rugulosa Heer" in blue handwriting, 6) a handwritten label with "Homalota subrugosa Kies. d. Dr. Eppelsheim" and 7) my lectotype label. I have not been able to trace the syntypes of *Homalota brisouti* Harold. This synonymization is based on the generally agreed identity of that species.

The present combination is *Philhygra rugulosa* (Heer).

5. The female of *Philhygra pinegensis* (Muona, 1983)

Atheta pinegensis Muona was described from a single male from NW Russia (Muona, 1983). Another male was reported from the Oulanka National Park in Kuusamo, Finland by Mr P.

Rassi (communicated at the meetings of the Finnish Entomological Society, seen by me), and I caught one male and seven female specimens of this species with a car-net at the same location on June 8th, 1991.

The females measured 3.75-3.90 mm, the male 4.00 mm. A study of the new material suggested that the antennae of *P. pinegensis* were slightly stouter than those of *P. hygrotopora* (Kraatz), in all the females antennomere 10 was about 1.3 times as wide as long. *P. pinegensis* appeared to be on the average smaller than *P. hygrotopora*, all the known ten specimens being less than 4 mm long, the length of *P. hygrotopora* being mostly over 4 mm long (range 3.6-4.6 mm). Superficially the females of *P. pinegensis* were quite similar to those of *Philhygra hygrotopora*. The shape of the tergite 8 appeared identical (fig. 1), but the shape of the sternum 6 (fig. 2) seemed to be slightly different, more acutely produced than in *P. hygrotopora*. This

difference was small, however, and may prove to be unreliable.

The genital segments of the two species differed sharply. In *P. pinegensis* (fig. 3) the structures were similar to those in *P. luridipennis* (Manerheim) (see Brundin 1943, figs 7, 137) and quite unlike those of *P. hygrotopora* (Brundin 1943, figs 8, 139). The unique presence of the large dorsal plates in both *P. pinegensis* and *P. luridipennis* female genital segment is a fine synapomorphy for these two species. The overall similarity between *P. pinegensis* and *P. hygrotopora* thus turned out to be due to plesiomorphic features, whereas the internal structures of the females of *P. pinegensis* and *P. luridipennis* demonstrated sister species relationship. Already Brundin (1943) wondered about the presence of the "Paramerenkondyliten" in both *P. hygrotopora* and *P. luridipennis* males, as the females appeared to have quite different genitalia and the species were different superficially. The shared derived similarity between *P. pinegensis* and *P. luridipennis* indicates that the presence of the "Paramerenkondyliten" in all three species reflects common ancestry.

6. *Philhygra mahleri* n. sp.

Type material. Holotype female from Denmark, SJ: Gl. Frederikskog, 30.v.-5.vi.1990, V. Mahler leg. It will be deposited in the Zoological Museum of Copenhagen.

Paratype female from France, Normandy, Pontaubault, 1974-07-20, J. Muona leg. & coll.

Diagnosis. Closely related to *Philhygra britteni* (Joy), *Philhygra deformis* (Kraatz) and *Philhygra brachyptera* (Brundin). Body size smaller and colour paler than in these species. With respect to colour and size similar to *P. deformis*, with respect to elytral hairs and shape of female sternum 6 similar to *P. britteni*, and with respect to small eyes and stout antennae similar to *P. brachyptera*.

Elytral hairs directed laterocaudad as in *P. britteni* and *P. brachyptera*, not caudad as in *P. deformis*. Antennae with stout antennomeres, 4th 1.1-1.2 times as wide as long and thus similar to that of *P. brachyptera*, more transverse than that of *P. britteni* or *P. deformis*. Eyes very small, temples about 1.8-1.9 times as long as eyes, the ratio being about the same in *P. brachyptera*, 1.5-1.7 in *P. deformis* and around 1.5 in *P. britteni*. Female sternum 6 sharply produced in middle, similar to that of *P.*

britteni, not broadly rounded as in the two other species.

Description. Length 1.82-1.85 mm. Colour evenly pale yellowish brown, legs and antennae palest, eyes pigmented, dark. Microsculpture, punctuation and pronotal and tibial setae as in *P. britteni*. Vestiture slightly erect and moderately dense as in *P. britteni* and *P. brachyptera*, sparser and less delicate than in *P. deformis*.

Head flat, wide, eyes very small, ratio length of temple/length of eye 1.8-1.9. Antennae very similar to those of *P. brachyptera*, antennomeres pale yellowish in colour, antennomere 4 slightly transverse, 1.1-1.2 times as wide as long, antennomere 9 about twice as wide as long. Pronotum wider than long, ratio 1.21-1.23, slightly wider than head, ratio 0.92-0.93, sides narrowing caudad rectilinearly on basal half.

Elytra fairly long, sutural length equal to length of pronotum. Hind wings well developed. Female tergite 8 and sternum 6 as in figs 4 and 5. Shape of sternum 6 similar to that of *P. britteni*, clearly more acutely produced than in *P. deformis* or *P. brachyptera*. Female ventral plate similar to that of *P. scotica* (Elliman), evenly narrowing from base to apex, but with a slightly pigmented, irregular widening close to apex (fig. 6).

Brundin (1943) provided a key for the Palearctic species of *Philhygra* and Lohse (1974) one for the Central European species. Both keys are optimistic in using the width of the head as an important separating character within the genus *Philhygra*. However, to rectify this problem the keys will have to be completely revised. I have not attempted this in the present context but will simply indicate where the new species fits in the keys.

Philhygra mahleri n. sp. will run to couplet 10 in Lohse's key (Lohse, 1974: 139-140). It agrees with *P. britteni* in direction of elytral hairs and shape of female sternum 6. With respect to colour and eye structure it keys to *P. deformis*. From both these species it can be separated by small size, pale colour, very small eyes, and shape of female ventral plate. In Brundin's (1943: 178) key *P. mahleri* will run to couplet 18 together with *P. brachyptera*. From this, *P. mahleri* can be separated by long elytra, small size, pale colour, slightly less stout antennomere 4, shape of female sternum 6, and shape of female ventral plate. The female ventral plate of *P. brachyptera* was illustrated in Muona (1975), being unknown to Brundin (1943).

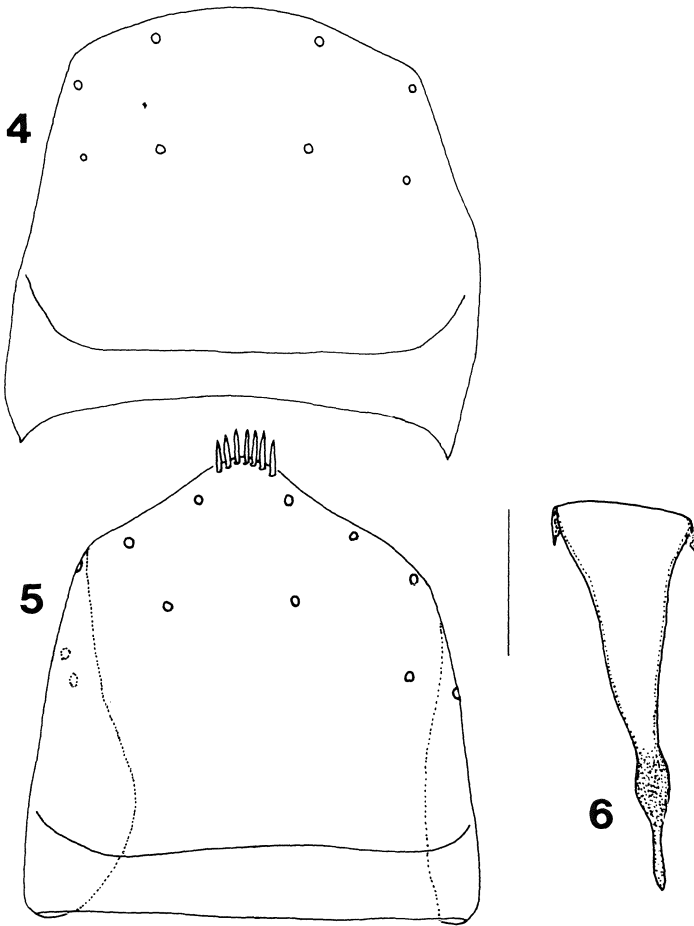


Fig. 4-6. *Philhygra mahleri* n. sp., female. - 4, tergite 8; 5, sternum 6; 6, ventral plate of genital segment. In 4 and 5 only attachment points for sexual hairs are marked. Scale 0.1 mm.

7. The identity of *Atheta* (*Philhygra*) *robustior* Benick, 1976

The study of the holotype female as well as an additional male specimen (Natural History Museum, Budapest) revealed that this species did not belong in *Philhygra*. It is very closely related with *Actophylla varendorffiana* (Bernhauer, 1908) and shows all the features typical of *Actophylla* (see Brundin 1952: 108). *A. robustior* differs from *A. varendorffiana* in 1) having a slightly narrower pronotum, 2) having a shorter, more robust spermatheca, and 3) having the apex of the male copulatory piece basally abruptly constricted, apically elongated, and very narrow, the apex being acutely produced in *A. varendorffiana*.

The presence of a pair of apparently vicariant sister species in the Baltic sea region and in the Mongolian highlands suggests intriguing biogeographical patterns.

The present combination is *Actophylla robustior* (Benick).

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