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The genus *Dimetrota* sensu auct. not Mulsant & Rey, 1873 (Coleoptera, Staphylinidae, Aleocharinae, Athetini)

Jyrki Muona

Abstract

The status of the genus group name *Dimetrota* Mulsant & Rey, 1873 is reviewed and it is shown to be a senior objective synonym of *Cadaverota* K. Sawada, 1976, the type species of both being *Homalota cadaverina* Brisout de Barneville, 1860 (= *Homalota tristicula* Mulsant & Rey, 1873). The genus *Dimetrota* Mulsant & Rey includes only three species, *D. cadaverina* (Brisout de Barneville, 1860), *D. hansseni* (Strand) and *D. shigae* K. Sawada, 1976.

Neodimetrota new genus, type species *Atheta lapponica* J. Sahlberg, 1876, is described to include the species formerly placed in *Dimetrota* sensu auct. not Mulsant & Rey, 1873.

The lectotype is designated for *Homalota immunda* Brisout de Barneville, 1860 and it is regarded as a subjective junior synonym of *Homalota cinnamoptera* Thomson, 1856, not of *Homalota picipennis* auct. not Mannerheim, 1843.

Three species formerly listed as junior subjective synonyms of *Homalota aeneipennis* sensu auct. not Thomson, 1856 are regarded as valid separate taxa and resurrected from synonymy: *Atheta laetipennis* Benick, 1982*, Homalota cursoria* Gemminger & Harold, 1868 and *Ischnopoda tenuiducta* Sawada, 1970.

The following new combinations are made: *Neodimetrota aeneipennis* (Thomson, 1856) (*Homalota*) NEW COMBINATION, *Neodimetrota altaica* (Bernhauer, 1901) (*Atheta*) NEW COMBINATION, *Neodimetrota cinnamoptera* (Thomson, 1856) (*Homalota*) NEW COMBINATION, *Neodimetrota cursoria* (Gemminger & Harold, 1868) (*Homalota*) NEW COMBINATION, *Neodimetrota episcopalis* (Bernhauer, 1910) (*Atheta*) NEW COMBINATION, *Neodimetrota europea* (Likowsky, 1984) (*Atheta*) NEW COMBINATION, *Neodimetrota laetipennis* (Benick, 1982) (*Atheta*) NEW COMBINATION*, Neodimetrota lapponica* (J. Sahlberg, 1876) (*Atheta*) NEW COMBINATION, *Neodimetrota leonhardi* (Bernhauer, 1911) (*Atheta*) NEW COMBINATION, *Neodimetrota nearctica* (Lohse, 1990) (*Atheta*) NEW COMBINATION, *Neodimetrota nikkoensis* (Sawada, 1989) (*Atheta*) NEW COMBINATION, *Neodimetrota* (*nobukii* Sawada, 1989) (*Atheta)* NEW COMBINATION, *Neodimetrota picipennis* (Mannerheim, 1843) (*Homalota*) NEW COMBINATION, *Neodimetrota picipennoides* (Hanssen, 1932) (*Atheta*) NEW COMBINATION, *Neodimetrota putrida* (Kraatz, 1856) (*Atheta*) NEW COMBINATION, *Neodimetrota reissi* (G. Benick, 1936) (*Atheta*) NEW COMBINATION, *Neodimetrota sachtlebeni* (Brundin), 1953 (*Atheta*) NEW COMBINATION, *Neodimetrota subrugosa* (Märkel & Kiesenwetter, 1848) (*Atheta*) NEW COMBINATION, *Neodimetrota tenuiducta* (Sawada, 1970) (*Ischnopoda*) NEW COMBINATION, *Neodimetrota yamamotoi* (Sawada, 1989) (*Atheta*) NEW COMBINATION.

Neodimetrota tenuiducta (Sawada, 1970) is the valid name for the circumpolar species *Atheta picipennis* auct. not Mannerheim,1843.

Key words

Coleoptera, Staphylinidae, Aleocharinae, Athetini, *Neodimetrota* new genus

Introduction

The first type species designation for the genus group name *Dimetrota* Mulsant & Rey, 1873 satisfying the requirements of the ICZN rules was published by Blackwelder (1952). Two species were included in the original description and one of these, *Homalota* (*Dimetrota*) *tristicula*, was designated as the type species. The previous designations by Fenyes (1918, with *Homalota marcida* Erichson) and Scheerpeltz (1928, with *Aleochara atramentaria* Gyllenhal) were both invalid as the species in question were not originally included. Lohse (1971) disagreed with Blackwelder, arguing that:"dabei ist in der Originalarbeit von Mulsant und Rey *Dimetrota marcida* Er. als erste Art der ersten Gruppe angeführt!" This claim was based on an incorrect assumption. Lohse (1971) referred to a later article, not the first one including the generic name *Dimetrota*. The order of publication of the relevant articles given in Blackwelder (1952) was correct and later verified with the secretary of the Société linnéenne de Lyon during a visit to the Natural History Museum Guimet, Lyon, where Rey's collection resided at the time (Muona, 1979a). The lectotype designation of *Dimetrota tristicula* confirmed that it was a junior subjective synonym of *Homalota cadaverina* Brisout de Barneville, 1860 (Muona, 1979a). As explained in detail in Yosii & Sawada (1976), *Homalota cadaverina* was not congeneric with the other species placed in *Dimetrota* sensu Brundin (1953). Sawada (in

Yosii & SAWADA, 1976) designated *H. cadaverina* as the type-species of his new genus *Cadaverota* SAWADA. As *Dimetrota* and *Cadaverota* have the same type species, *Cadaverota* is an objective junior synonym of *Dimetrota*. MUONA (1979b) listed it as such and placed *Homalota cadaverina* and *Atheta hansseni* Strand in the genus *Dimetrota* MULSANT & REY, leaving species belonging to *Dimetrota* sensu auct. in the subgenus *Atheta* s.str. LOHSE & Smetana (1985) ignored these arguments stating: "it is not known which paper was published first", but failed to present evidence showing why BLACKWELDER (1952) and MUONA (1979a) were wrong in claiming that the publication order was known. However, later LOHSE (1987) seemed to have accepted the publication order as correct, but insisted on claiming the designation was not correct as there was in his view no doubt that:"Es scheint jedoch zweifelsfrei, dass die Gattungsbeschreibung früher geschrieben ist als die *tristicola*-Beschreibung, die in einer anderen Veröffentlichung früher erschien, den anderfalls hätten die Auroren die *tristicola* nicht als *Dimetrota* bezeichnen können." Indeed, it seems reasonable to think this was the intention, but unfortunately it has no bearing on the way the rules of zoological nomenclature are applied. The first **published** publication is the one that matters, not the one **intended** to be the first, and the idea that one could figure out the actual writing order of manuscripts and decide names on the basis of this information is clearly not a practical one.

SCHÜLKE & SMETANA (2015) placed the type species of *Cadaverota* SAWADA, *Coproceramius* Gistel, *Dimetrota* Mulsant et Rey and *Dimetrota* sensu auct. not MULSANT & REY in the *Atheta* subgenus *Dimetrota* and thus avoided the problem of the correct name of this taxon. As *Dimetrota* has been regarded both as a genus (e.g. LOHSE & Smetana, 1985, LOHSE et al., 1990) and as a subgenus of *Atheta* (e.g. BRUNDIN, 1953; BENICK & LOHSE, 1974; MUONA, 1979b; SCHÜLKE & SMETANA, 2015; KLIMASZEWSKI et al., 2022) it certainly needs a valid name. SCHÜLKE & SMETANA (2015) listed five synonyms for *Dimetrota* auct. and in addition to these, a sixth one is discussed here as well. The structure of aedeagus, both medial lobe and parameres, offers important characters for separating genera and species. Especially the internal parts are seldom discussed and a short description is in place here. In Athetini the dorsal apical region has a transverse structure called athetine bridge (fig. 1A, 8A). During copulation the plate behind the bridge pressures the apical door-like structure open and forces the internal sac out (Fig. 8). The ductus ejaculatoris bringing the sperm in the system enters through the hole under median crest on the ventral side (fig. 8D) and is supported by the ductuslamells surrounding the opening in the internal sac (fig. 1). The structure of the ductuslamells varies greatly, but in the genera closely related to *Atheta* s.str. there are two main types. A uniform structure with slightly pointed (fig.1 E-G) or wide, flattened apex (fig. 1A) or a more complex structure with narrow pointed apex surrounded laterally by separate elongate structures (fig. 1B-D).
Perhaps the most important new character SAWADA (1976) discovered in his Aleocharinae studies was the variation in abdominal chaetotaxy. His classification was not the simplest possible and is here explained further. There were three basic types, listed as 0-0, 0-1 and 0-2. The problem with this classification was that whereas 0-1 and 0-2 referred to basal and apical rows of special large setae on abdominal tergite II and included no information about tergite III (fig. 2 C, D), type 0-0 referred to not having basal row of special large setae on abdominal tergites II and III (fig. 2A, B). Thus the difference between 0-0 type versus 0-1 and 0-2 types was that tergite III had no basal row of setae and 0-1 and 0-2 differed from each other in having one or two apical setae on tergite II. It is obvious that further character states could be extracted from this character complex, as different subsets of 0-0 types could be used (fig. 2A and 2B). However, this character is very useful, as types 0-1 and 0-2 do not seem to vary between species belonging to same clades. Type 0-2 is the rarest and occurs in *Dimetrota* auct. not MULSANT & REY [not in *Dimetrota* MULSANT & REY], *Boreophilia* BENICK, *Atheta* (s.str.) THOMSON, *Platarea* THOMSON, *Bessobia* THOMSON, *Traumoecia* MULSANT & REY and *Anopleta* MULSANT & REY.

Generic names associated with *Dimetrota* MULSANT & REY, 1873 and *Dimetrota* auct. not MULSANT & REY

(1) *Cadaverota* SAWADA, 1976.

Cadaverota is not related to the main body of species placed in *Dimetrota* sensu auct., and there can be no doubt about the separate generic status of *Cadaverota* – belonging to SAWADA's abdominal chaetotaxy group 0-1 – when all *Atheta* s.str. and *Dimetrota* sensu auct. species belong to group 0-2 (Yosii & SAWADA, 1976). *Cadaverota* K. SAWADA, 1976 is a junior synonym of *Dimetrota* MULSANT & REY, 1973, the type species of both being *Atheta cadaverina* BRISOUT DE BARNEVILLE, 1860 (= *Homalota tristicula* MULSANT & REY, 1873). This synonymy is of the type "subjective-objective" *sensu* BLACKWELDER (1952) as both genera have the same type species, but the identity of the species is based on a subjective synonymization of two different type-specimens. Here the two names are treated as objective synonyms.

Homalota marcida ERICHSON has been listed as the type species of *Dimetrota* MULSANT & REY, but this is clearly incorrect. In addition, this species does not belong to *Dimetrota* sensu auct. or *Dimetrota* MULSANT & REY! As discussed by Yosii & SAWADA (1976), it differs from *Dimetrota* sensu auct. species in several

major features. The most notable ones are the lack of the large lateral hooks in male internal sac characterizing all true *Dimetrota* auct. ("Haken"in Brundin, 1953) (fig. 3A), the absence of the paired striated api-cal fields ("Faltenbildungen" in Brundin, 1953) (fig. 3B), the unique secondary appendage on the median lobe (fig. 3A) and the peculiar deeply bifid proximal section of lateral lobes (fig. 3C; also figure 22 in Yosii & Sawada, 1976). All these distinct features indicate that *H. marcida* does not belong to either *Dimetrota* sensu auct. or *Dimetrota* Mulsant & Rey. It should be placed in *Atheta incertae sedis* for the time being.

(2) *Coproceramius* Gistel, 1857

The type species, *Bolitochara impressifrons* Mannerheim, 1830 is a subjective junior synonym of *Atheta atramentaria* (Gyllenhal, 1806). This species lacks two main features of *Dimetrota* sensu auct. species, the large hooks in internal sac ("Haken" in Brundin, 1953) and the paired striated apical fields ("Faltenbildungen" in Brundin, 1953) and does not belong to *Dimetrota* auct. It shares all the features defining *Atheta* s. str., aedeagus with a pair of secondary basal lamells and a set of complex apical lamells (fig. 6A; Muona, 2023), ductuslamells of complex structure (type fig. 1C) as well as the characteristics complex swirl of hairs on elytra (fig. 7A-C).

(3) *Dalotia* Casey, 1910.

This synonymy in Schülke & Smetana (2015) was surprising, as Gusarov (2003) had showed that the type species *Dimetrota* (*Dalotia*) *pectorina* Casey, 1910 did not belong to *Atheta* and was a junior subjective synonym of "*Atheta*" *coriaria* (Kraatz) and both Yosii & Sawada (1976, as "*Taxicera academica*", a synonym of "*Atheta*" *coriaria*) and Muona (1979b, as "not *Atheta*") had pointed out the aberrant nature of this taxon. *Dalotia* with bisetose ligula and highly complex internal sac of aedeagus is a separate genus in Athetini (fig, 5, 6).

(4) *Dimetrotina* Casey, 1911

Gusarov (2016) has shown that *Dimetrotina* (type species *Dimetrotina vaniuscula* Casey, 1911) is a valid genus group taxon in the Athetini, including among others the well-known widespread species *Atheta pasadenae* Bernhauer with numerous junior synonyms and the Palearctic *Atheta laticollis* (Stephens). *Dimetrotina* Casey is not related to *Dimetrota* auct. The closest relatives are to be found in *Mocyta* Mulsant & Rey, 1874 (e.g. Yosii & Sawada, 1976; Elven et al., 2012)

(5) *Engamota* Casey, 1910.

Casey (1910: 151-152) described the type species, *Acrotona* (*Engamota*) *absona* as an *Acrotona* with subfusoid, convex form, peculiar male secondary characteristics and first metatarsomere "a little longer than two to four, which are mutually equal." In all *Dimetrota* auct. species the first and second metatarsomeres are of equal length and the description "subfusoid, convex form" does not fit them either. Casey (1911: 143) changed his view and placed *Engamota* with *Dimetrotina* together with *Dalotia* as subgenera of *Dimetrota*. Seevers (1978: 102): wrote:" I am not at all certain that the species assigned here (i.e. as *Dimetrota*) by Casey belong to *Dimetrota*." *Dalotia* and *Dimetrotina* did not, but does *Engamota*? Nothing has been published on it after Seevers (1978). Luckily the type species has been studied, however, and Gusarov (in litt.) sent the author the following information: "I do not know why the 2015 catalogue lists *Engamota* as synonym of *Dimetrota*. It was a long time ago that I looked at the type of *Acrotona* (*Engamota*) *absona*, but back then I decided it fits *Acrotona* and should stay there pending a serious revision." As both other Casey names relate to taxa with *Acrotona-Mocyta* type pronotum as does the description of *Engamota*, and a major expert has so determined earlier, I reject the idea that *Engamota* Casey refers to *Dimetrota* auct. The male secondary sexual characteristics fit those of *Atheta laticollis* (Stephens) and as this species has been regarded as being close to the type species of *Dimetrotina*, there is good reason to suspect that *Engamota* belongs there as well.

Conclusions

The taxon including the great majority of the species placed in *Dimetrota* sensu auct. does not have an available, valid name. All the known synonyms for *Dimetrota* sensu auct. not Mulsant & Rey refer to type species belonging to other genus group taxa. A new genus group name has to be proposed for *Dimetrota* sensu auct. not Mulsant & Rey to clarify this long-lasting confusion.

On the basis of new character sets, Yosii & Sawada (1976) proposed the close relationship between *Dimetrota* sensu auct. not Mulsant & Rey and *Atheta* s.str. Brundin (1953) had already suggested this including a predominately arctic group of species not included in Yosii & Sawada (1976) in his concept of "*Dimetrota*". This Holarctic element was separated as the genus *Boreophilia* Benick later on. Neither Brundin (1953) nor Yosii & Sawada (1976) used a formal analytical method but the evidence they produced suggested the same relationships. For the present study I have been able to use the detailed drawings Brundin produced for his work and these contain further unused detail, the structure of the ductuslamells used here being an example (fig. 1). With respect to the validity of the present findings, additional information from different data sets is available, however. In two molecular analyses, Elven et al. (2010 and 2012) repeatedly showed

the same sister-group relationships here presented (*Atheta* (s.str.) ((*Dimetrota* sensu auct.) (*Boreophilia*)). Interestingly even the phenetic German **N**(eighbour-) **J**(oining) tree shows the *Atheta* s.str. – *Dimetrota* sensu auct. relationship as well (HENDRICH et al., 2015)). *Boreophilia* was not included in that sample, however.

Neodimetrota new genus

Type species: *Atheta lapponica* J. SAHLBERG, 1876 (fig. 12).

Diagnosis

This genus belongs to tribe Athetini, subtribe Athetina. Within the tribe Athetini, *Neodimetrota* [1] plesiomorphic diagnostic features are: tarsi 4-5-5; metatarsomere 1 as long as 2; ligula bifid halfway, without long setae; lateral areas of prementum with pseudopores; abdominal segments with smooth, not crenulate margins; spermathecal duct simple, without abruptly narrower sclerotized basal section; pronotum with midline hairs directed craniad. Subtribe Athetina [2] plesiomorpic diagnostic feature is the simple inverted U-formed ductuslamell around the opening of the ejaculatory duct (fig. 1A) and a synapomorphy is the abdominal tergite two with no anterior and two posterior macrosetae on both sides (fig. 2D). For the sister-groups *Neodimetrota* and *Boreophilia* LOHSE [3] a synapomorphy is the internal sac of aedeagus with large anchor-shaped lateral hooks. The *Neodimetrota* [4] synapomorphies are paired striated apical fields in internal sac (fig. 1A; BRUNDIN, 1954) and well developed macrosetae on body and tibiae. The synapomorphies for *Boreophilia* [5] are the deeply bifid ligula and strongly reduced macrosetae on body and tibiae.

Neodimetrota is closely related to *Atheta* s.str. and *Boreophilia* LOHSE, sharing the abdominal chaetotaxy type 0-2 with them. It can be separated from both of these by the paired striated apical fields in the internal sac, from *Atheta* s.str. by the anchor-shaped hooks in the internal sac of the aedeagus and simple ductuslamells (fig. 1A versus 1C) and from *Boreophilia* by the well-developed setae on body and tibiae and only halfway bifid ligula.

Descriptions

BRUNDIN, 1953: 391; Yosii & SAWADA, 1976: 59-64.

Notes on the taxonomy of *Neodimetrota* species

The identity of *Homalota picipennis* sensu auct. not MANNERHEIM, 1843

LOHSE & Smetana (1985) showed that the widespread species known as *Atheta picipennis* MANNERHEIM had been misidentified and the real *Atheta picipennis* was a Nearctic species. The Palearctic species required a new name and the oldest available synonym seemed to be *Homalota aeneipennis* THOMSON, 1856 (e.g. SCHÜLKE & SMETANA, 2015).

Unfortunately the type material of this species was not studied. KLIMASZEWSKI et al. (2022) finally did it and found out that part of the syntypes belonged to *Atheta picipennoides* H.K.HANSSEN, 1932 and the rest to *Atheta parapicipennis* BRUNDIN, 1954. Thus, *A. picipennis* sensu auct. did not have a valid name. In order to fix this, all the types of the putative younger synonyms needed to be studied.

(1) *Homalota aeneipennis* THOMSON, 1856

KLIMASZEWSKI et al. (2022) designated the lectotype for this species making it a senior subjective synonym of *Atheta parapicipennis* BRUNDIN, 1952.

(2) *Homalota cursor* MOTSCHULSKY, 1858, not MÄKLIN, 1852

This name is a junior primary homonym and thus permanently invalid. However, if the species in question is a subjective synonym of *A. picipennis* sensu auct. not MÄKLIN, a replacement name for the junior homonym *Homalota cursor* MOTSCHULSKY would be the correct name for *Atheta picipennis* sensu auct. not MANNERHEIM. SAWADA (1982) studied two syntypes of *H. cursor* MOTSCHULSKY and listed this species as a junior subjective synonym of *A. picipennis* MANNERHEIM (i.e. *A. picipennis* sensu auct. not MANNERHEIM). Several observations he listed contradicted this result, however. When describing *A. cursor* syntypes SAWADA noted that (1) pronotal macrosetae were inconspicuous, (2) abdominal macrosetae were short, (3) eyes were small, (4) abdomen was nearly parallel, (5) apices of lateral lobes were short and with four strong setae (fig. 4B) and the aedeagus was broad (fig. 8 E,F). The Japanese specimens of *Atheta picipennis* sensu auct. not MANNERHEIM SAWADA described earlier (Yosii & SAWADA, 1976) were identical to the European ones (BRUNDIN, 1954) and had long lateral pronotal and abdominal setae, eyes slightly longer than temples, abdomen with rounded sides, lateral lobes with elongate apices and one long and three reduced setae (fig. 4A) and aedeagus had parallel-sided apical part and elongate general form in ventral view as well as protruding, bent apex in lateral view (fig. A,B). It appears clear that SAWADA (Yosii & SAWADA, 1976) described *Atheta picipennis* sensu auct. not MANNERHEIM correctly when synonymizing it with *Ischnopoda tenuiducta* SAWADA, 1970. It is equally clear that the strikingly different description of *Homalota cursor* syntype male six years later cannot refer to the same species. The differences between the drawings in Yosii & SAWADA (1976) and SAWADA (1982) clearly support this view. This being the case *Atheta cursor* MOTSCHULSKY from India should be considered a valid species requiring an available, valid name, but this

name is not the replacement name for *A. picipennis* sensu auct. not Mannerheim.

(3) *Homalota immunda* Brisout de Barneville, 1860

Five syntypes of this species were deposited in the Natural History Museum in Paris (MNHN). Through the courtesy of Antoine Mantilleri I have been able to study excellent digital images of them. The size of the specimens alone, all about 2.2 – 2.4 mm in length, showed that they do not belong to *A. picipennis* sensu auct. not Mannerheim, a species invariably substantially larger, rarely under 3 mm in length. On the basis of the slender antennae, short elytra, transverse pronotum, strongly rounded abdominal sides and small size the syntypes of *Homalota immunda* Brisout de Barneville, 1860 belong to *Homalota cinnamoptera* Thomson, 1856 (fig. 10 A, C). *Homalota immunda* Brisout de Barneville, 1860 is removed from synonym with *Homalota picipennis* sensu auct. not Mannerheim, 1843.

The syntype male labelled "[MNHN, Paris/ EC19804] [Syntype/*Homalota*/*immunda* Brisout de/ Barneville, 1860] [SYNTYPE] [Muséum Paris/1930/ coll. C. Brisout]" is here designated as the lectotype (fig. 13) and the specimens labelled EC19800, EC19801, EC19802, EC19803 become paralectotypes.

(4) *Homalota cursoria* Gemminger & Harold, 1868

This name was proposed as a replacement name for the junior primary homonym *Homalota cursor* Motschulsky, 1858, not Mäklin, 1852. This is the valid name replacing the unavailable *Homalota cursor* Motschulsky, 1858, here regarded as a species propria, not a subjective synonym of *A. picipennis* sensu auct. not Mannerheim.

(5) *Ischnopoda tenuiducta* K. Sawada, 1970

This species was synonymized with *A. picipennis* sensu auct. not Mannerheim (Yosii & Sawada, 1976) and the description given there supports this decision.

(6) *Atheta laetipennis* G. Benick, 1982

Vogel (2004) placed this species as a junior subjective synonym of *A. aeneipennis* Thomson, assuming – as everyone else at the time – that this was the valid name for *A. picipennis* sensu auct. not Mannerheim. However, as shown by Klimaszewski et al. (2022), this was not the case. Whether one should regard Vogel's action as referring to the real *aeneipennis* or the assumed *picipennis-aeneipennis*, is of some theoretical interest, but unnecessary in practice and not discussed further here. In the original description the size of *A. laetipennis* was given as 2.5-2.7 mm and Benick compared his new species with the equal sized *A. cinnamoptera* Thomson. *A. picipennis* sensu auct. not Mannerheim is invariably substantially larger, usually over 3 mm in length. The decisive fact is that the aedeagus illustrated in the original description showed clearly that *A. laetipennis* is not a subjective synonym of *A. picipennis* sensu auct. not Mannerheim. The shape of the apex of the organ is quite different in the two species and the lateral hooks in the internal sack of *A. laetipennis* are much larger than in any described Palearctic species belonging to this species-group (fig. 9 B), including both *A. picipennis* sensu auct. not Mannerheim and *A. cinnamoptera* Thomson.
A. laetipennis G. Benick should be regarded as a valid species.

(7) *Dimetrota prudhoensis* Lohse, 1990

Klimaszevski et al. (2022) discussed the identity of *Atheta picipennis* snsu auct. not Mannerheim in detail. One of their conclusions was that Nearctic specimens of *Dimetrota prudhoensis* were identical with Finnish specimens of *Atheta picipennis* sensu auct. not Mannerheim, but they refrained from changing the name of the Nearctic species as there were several older synonyms available and their type material had not been studied. As shown here, the oldest available name for *A. picipennis* sensu auct. not Mannerheim is *A. tenuiducta* Sawada, 1970 and *Dimetrota prudhoensis* is thus a subjective junior synonym of that species.

Klimaszwski et al. (2022), when showing that *D. prudhoensis* was a junior synonym of *H. picipennis* sensu auct, not Mannerheim, based their argument originally on the fact that 70 Nearctic (obtained across the continent) *prudhoensis* and six Finnish *aeneipennis* specimens belonged to the same BOLD BIN. This same BIN included five Finnish specimens of *Atheta lapponica*. Klimaszewski et al. (2022) studied actual specimens of *prudhoesis* and *picipennis* sensu auct. as well as their genitalia and came to the conclusion that *prudhoensis* and *picipennis* sensu auct. were the same species. Now the inevitable question arises, were they synonymous with *A. lapponica* as well? Nothing is said about this and for obvious reasons. Anyone today can with one look see what Sahlberg saw in 1876 and Benick in the 1930s – there can be no doubt about the separate status of *Atheta lapponica*. This brings us to the fundamental structure of BOLD and its method of barcoding. Species are delimited in BINs with an unpublished algorithm, not by primary data as such. This leads to at least one serious problem. By increasing or decreasing the geographic area (and genetic variation when doing so), the limits of BINs change and there is no way of knowing, if these changes are related to species limits or not. In the present case it is clear that even in the best case – assuming all specimens were correctly identified in the first place - the wide Nearctic sampling of the species has revealed so much variation that a closely related second species sampled from only one small region was swallowed up in a BIN - even though it is easy to

separate in reality. The fact that BINned barcodes do not represent species remains obvious (see Meier et al., 2022).

Neodimetrota species associated with the name *Atheta picipennis* MANNERHEIM are as follows:

Neodimetrota picipennis MANNERHEIM, 1843 (*Homalota*) NEW COMBINATION
= *carlottae* CASEY, 1910 (subjective junior synonym) LOHSE & Smetana, 1985

Neodimetrota aeneipennis THOMSON, 1856 (*Homalota*) NEW COMBINATION
= *Atheta parapicipennis* BRUNDIN, 1954 (subjective junior synonym) KLIMASZEWSKI et al., 2022

Neodimetrota cinnamoptera THOMSON, 1856 (*Homalota*) NEW COMBINATION
= *Homalota immunda* BRISOUT DE BARNEVILLE, 1860 (subjective junior synonym) NEW SYNONYMY

Neodimetrota cursoria GEMMINGER & HAROLD, 1868 (*Homalota*) NEW STATUS, NEW COMBINATION
= *Homalota cursor* MOTSCHULSKY 1858 nec MÄKLIN, 1852 (junior homonym) GEMMINGER & HAROLD, 1868
= *Homalota aeneipennis* auct. not THOMSON, 1856 (incorrect identification) HERE

Neodimetrota laetipennis BENICK, 1982 (*Atheta*) NEW STATUS, NEW COMBINATION
= *Homalota aeneipennis* auct. not THOMSON, 1856 (incorrect identification) HERE

Neodimetrota picipennoides HANSSEN, 1932 (*Atheta*) NEW COMBINATION

Neodimetrota tenuiducta SAWADA, 1970 (*Ischnopoda*) NEW STATUS, NEW COMBINATION
= *Dimetrota prudhoensis* LOHSE, 1990 (subjective junior synonym) KLIMASZEWSKI et al., 2022
= *Homalota aeneipennis* auct. not THOMSON, 1856 (incorrect identification) KLIMASZEWSKI et al., 2022
= *Homalota picipennis* auct. not MANNERHEIM, 1843 (incorrect identification) LOHSE & Smetana, 1985

Other Holarctic species belonging to *Neodimetrota*
The following species, either included in BRUNDIN (1953) or discussed in SAWADA (1970, 1989) could be verified to belong to *Neodimetrota* as here defined: *Neodimetrota altaica* (BERNHAUER, 1901) (*Atheta*) NEW COMBINATION, *Neodimetrota episcopalis* (BERNHAUER, 1910) (*Atheta*) NEW COMBINATION, *Neodimetrota europea* (LIKOWSKY, 1984) (*Atheta*) NEW COMBINATION, *Neodimetrota lapponica* (J. SAHLBERG, 1876) (*Atheta*) NEW COMBINATION, *Neodimetrota leonhardi* (BERNHAUER, 1911) (*Atheta*) NEW COMBINATION, *Neodimetrota nearctica* (LOHSE, 1990) (*Atheta*) NEW COMBINATION, *Neodimetrota nikkoensis* (SAWADA, 1989) (*Atheta*) NEW COMBINATION, *Neodimetrota nobukii* (SAWADA, 1989) (*Atheta*) NEW COMBINATION, *Neodimetrota picipennis* (MANNERHEIM, 1843) (*Homalota*) NEW COMBINATION, *Neodimetrota putrida* (KRAATZ, 1856) (*Atheta*) NEW COMBINATION, *Neodimetrota reissi* (G. BENICK, 1936) (*Atheta*) NEW COMBINATION, *Neodimetrota sachtlebeni* (BRUNDIN, 1953) (*Atheta*) NEW COMBINATION, *Neodimetrota subrugosa* (MÄRKEL & KIESENWETTER, 1848) (*Atheta*) NEW COMBINATION, *Neodimetrota yamamotoi* (SAWADA, 1989) (*Atheta*) NEW COMBINATION

The following taxa probably belong to *Neodimetrota*, but this requires further study of the actual specimens.

Palearctic: Atheta *extensa* ASSING, 2011, Atheta *fuscicolor* G. BENICK, 1943, Atheta *georgii* Adam, 2008, *Atheta lebedvoensis* LIKOWSKY, 1984, *Atheta malleiformis* G. BENICK, 1975, *Atheta mongolica* G. BENICK, 1982, *Atheta sanghanensis* LIKOWSKY, 1984, *Atheta szechuaensis* BERNHAUER, 1933, *Atheta weisei* BERNHAUER, 1907

Nearctic: *Atheta brumalis* CASEY, 1910, *Atheta burwelli* LOHSE, 1990, *Atheta capsularis* KLIMASZEWSKI, 2005, *Atheta crenuliventris* BERNHAUER, 1907, *Atheta curvipennis* KLIMASZEWSKI & Langor, *Atheta districta* CASEY, 1911, *Atheta Fenyesi* BERNHAUER, 1907, *Atheta hampshirensis* BERNHAUER, 1909, *Atheta onthophilides* Newton, 2017, *Atheta pecki* KLIMASZEWSKI & Langor, 2011, *Atheta remulsa* CASEY, 1910, *Atheta stercoris* FENYES, 1920, *Atheta strigosula* CASEY, 1910 NEW, *Atheta terranovae* KLIMASZEWSKI & Langor, 2011

The following species do not belong to *Neodimetrota* n. gen. and should be placed in *Atheta* (s.str.):
Atheta atramentaria (Gyllenhal, 1810), *Atheta diversa* (Sharp, 1869), *Atheta* gelida J. SAHLBERG, 1887, *Atheta laevana* (MULSANT & REY 1852), *Atheta nigripes* THOMSON, 1856, *Atheta setigera* (Sharp, 1869)
The generic combinations for the following species remain unknown:
Atheta intermedia THOMSON, 1852, *Atheta marcida* (Erischson, 1837), *Atheta subilis* (Scriba, 1866)

Collection acronyms:

JMC J. MUONA collection, presently in Finnish Museum of Natural History, Helsinki;
MNHN Muséum national d'Histoire naturelle, Paris.

Acknowledgments

The late Lars Brundin donated his remaining Aleocharinae drawings to me in 1986. I am immensely thankful for this generous gift, a small part of which made this paper possible. I wish to recognize the valuable exchange I had with the late Gustav Adolf Lohse in former times – we did not agree always, but that was never a problem. Vladimir Gusarov very kindly sent me his notes concerning some Aleocharine types he had studied. Kohei Sawada kindly provided me with his profoundly important papers from the 1970s on. Antoine Mantilleri kindly provided digital images of the *Homalota immunda* syntypes. All digital images produced by the author were taken with the equipment available at the Finnish Biodiversity Information Facility (FBIF) in Finnish Museum of Natural History, Helsinki.

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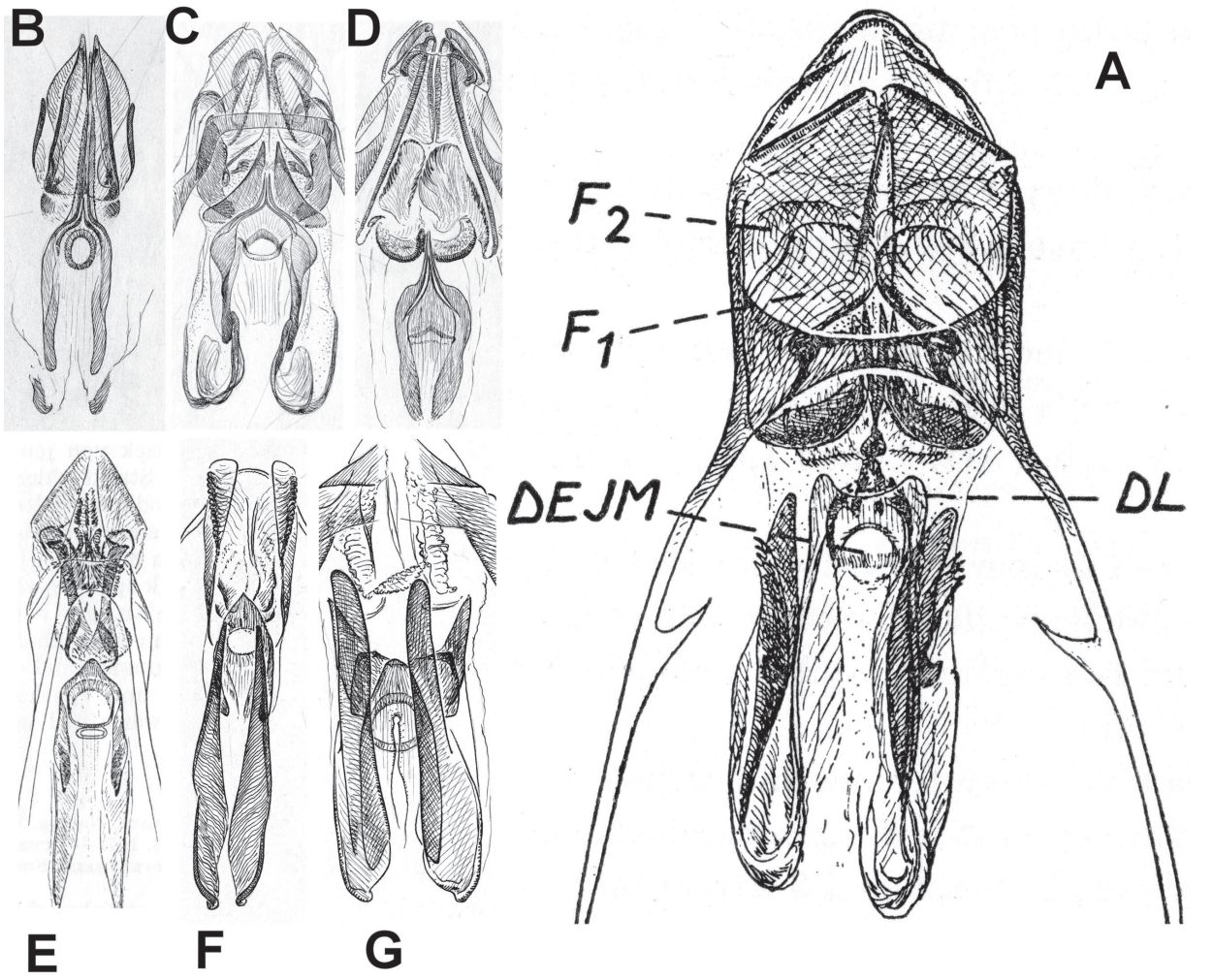


Figure 1. Internal sac of the aedeagus. A, position in rest inside apical half of median lobe; B – G, as if removed from median lobe capsule. A, *Neodimetrota tenuiducta* (Sawada), modified from Brundin, 1954. B, *Plataraea nigrifons* (Erichson), France, Auchel. C, *Atheta* (s.str.) *brunneipennis* (Thomson), Sweden, Jämtland, Hottön. D. *Liogluta micans* (Mulsant & Rey), Sweden, Abisko. E. *Atheta marcida* (Erichson). F, *Atheta zosterae* (Thomson), Sweden, Drottningholm. G, *Atheta thulea* Poppius, Russia, Siberia, Potapovo, 60 km South of Dudinka. All drawings by L. Brundin. DEJM= opening for ductus ejaculatoris to inside internal sac; DL= ductuslamells surrounding DEJM; F1, F2= striated apical lamells.

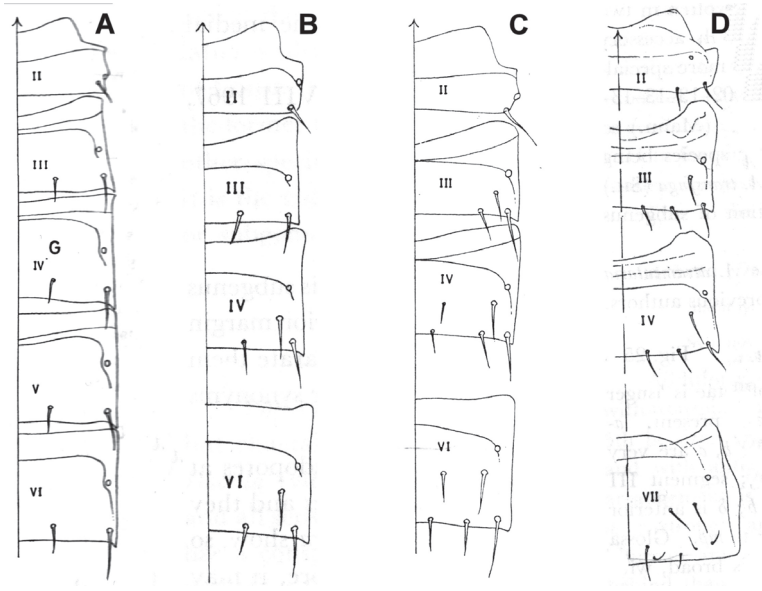


Figure 2. Abdominal tergites. A, 0-0 type, *Gnypeta carbonaria* (Mannerheim), Finland, Helsinki, no basal setae on any tergites. B, 0-0 type, *Philhygra palustris* (Kiesenwetter), Austria, no basal setae on tergites II, III. C, 0-1 type, *Badura macrocera* (Thomson), Germany, Lübeck, no basal and one apical seta on tergite II. D, 0-2 type, *Atheta* (s.str.) *graminicola* (Gravenhorst), Germany, Hamburg, no basal and two apical setae on tergite II. Roman numbers refer to the actual morphological order of abdominal tergites. Tergite II is the first visible one and without pleurites, tergite III is the second visible one and the first one with pleurites.
Drawings modified from Yosii & Sawada, 1976.

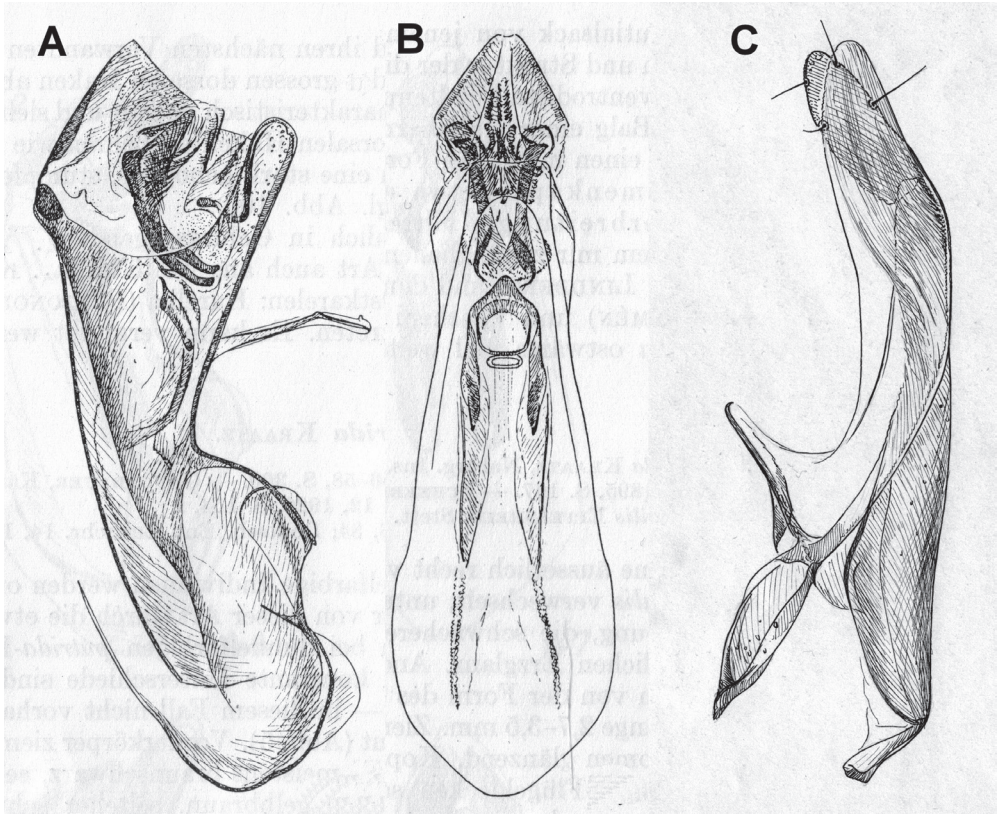


Figure 3. *Atheta marcida* (ERICHSON). A, median lobe, lateral view. B, Ventral view. A, B, modified from BRUNDIN, 1954. C, lateral lobe, Sweden, BRUNDIN del.

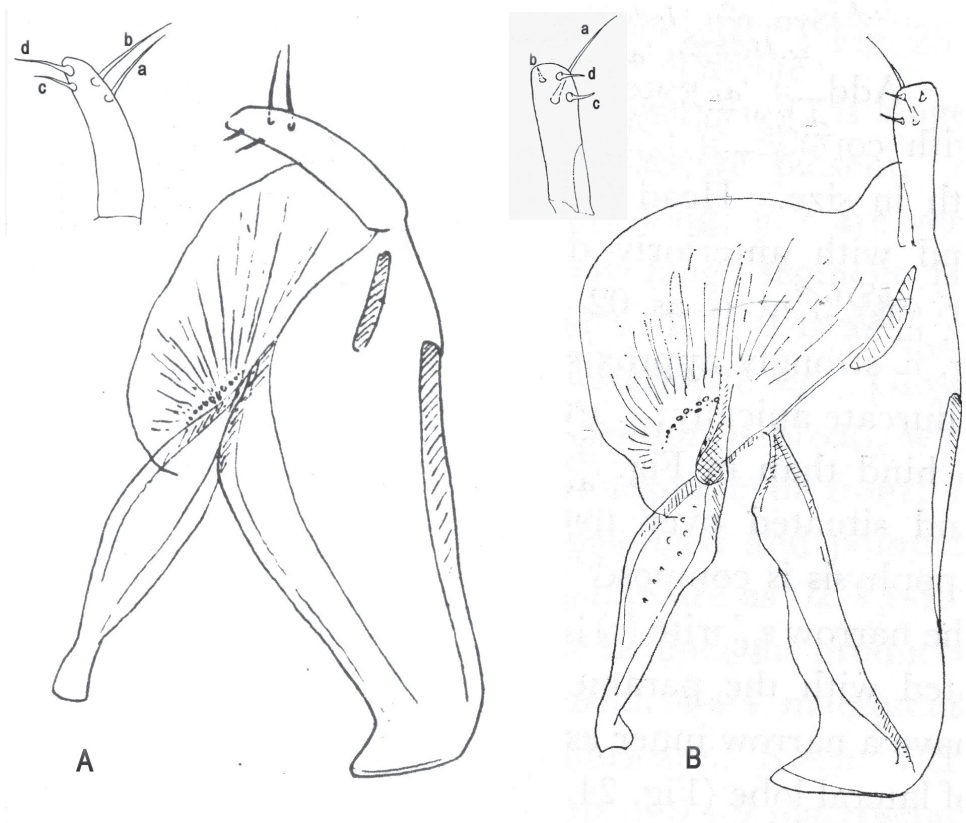


Figure 4. Lateral lobes. A, *Neodimetrota tenuiducta* (SAWADA), modified from SAWADA, 1976. B, *Neodimetrota cursoria* (GEMMINGER & HAROLD, 1868), modified from SAWADA, 1982.

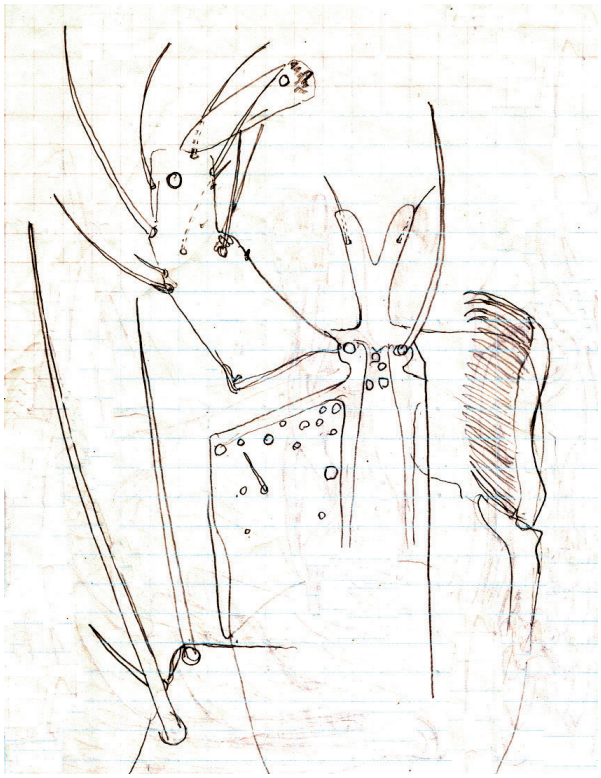


Figure 5. *Dalotia coriaria* (Kraatz). A. Mouthparts, ventral view, Finland, Helsinki. Right ventral side and left median macroseta removed, hypopharynx visible on right side.

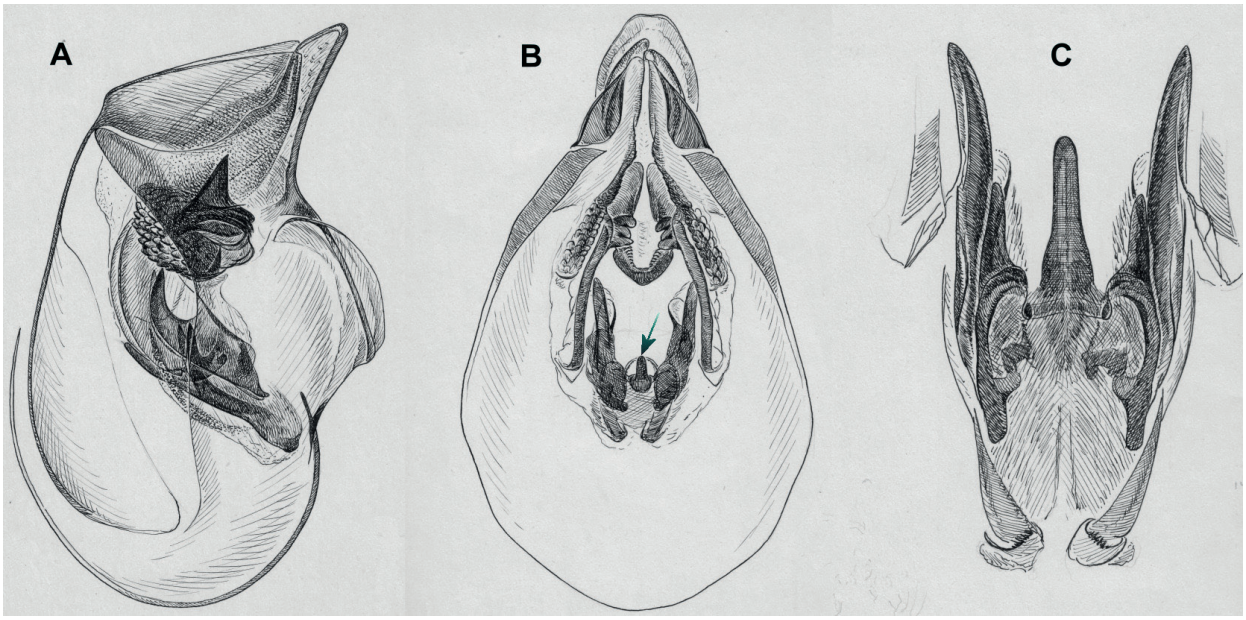


Figure 6. *Dalotia coriaria* (Kraatz). A. Median lobe, lateral view. B. Ventral view, arrow points at the extremely small ductuslamells. C. Basal part of internal sac greatly enlarged with ductuslamells and surrounding sclerites. Sweden. L. Brundin del.

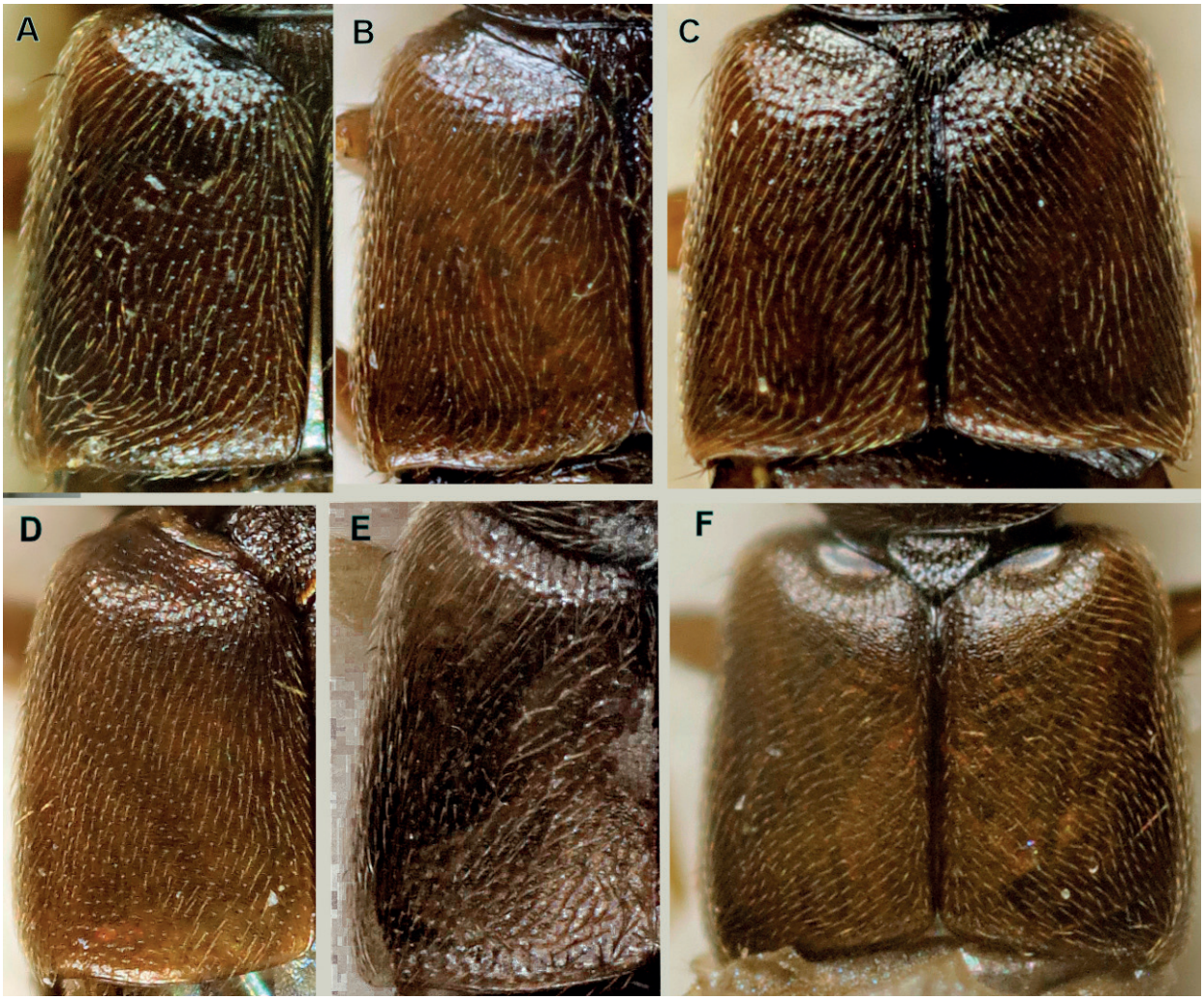


Figure 7. Athetini, elytral hair pattern. A, *Atheta* (s.str.) *graminicola* (Gravenhorst), Finland, Kuusamo. B. *Atheta* (s.str.) *brunneipennis* (THOMSON), Finland, Kuusamo. C, *Atheta* (s.str.) *ebenina* (MULSANT & REY), Finland, Siuntio. D. *Boreophilia eremita* (Rye), Finland, Kuusamo. E. *Neodimetrota lapponica* (J. SAHLBERG), Finland, Kuusmo. F, *Atheta procera* (ERICHSON), Finland, Kuusamo. All (JMC).

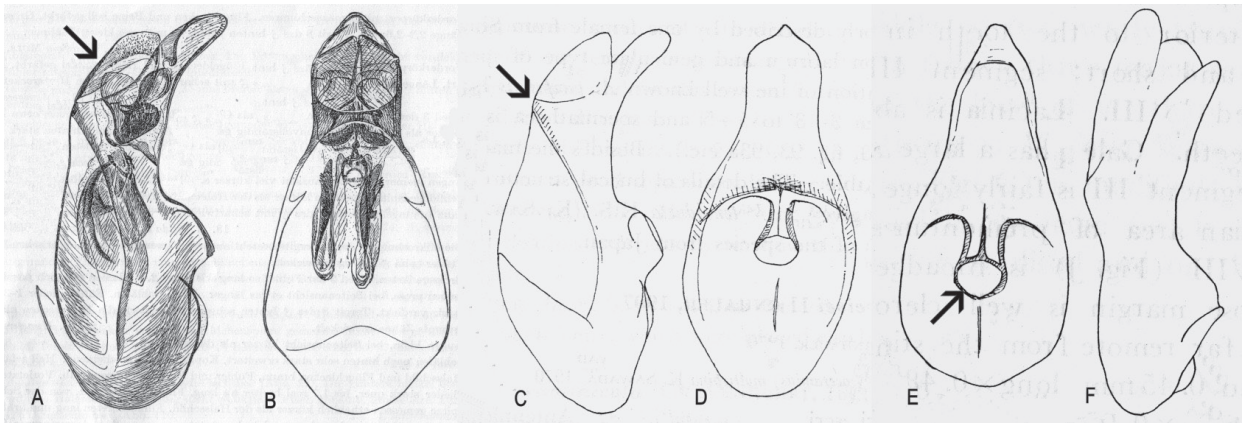


Figure 8. Median lobe. A, C, F, lateral view; B, dorsal view; D, E, ventral view. A, B, *Neodimetrota tenuiducta* (SAWADA) (= *Atheta picipennis* auct. not MANNERHEIM, 1843), arrow points at sclerite opening as door during copulation; modified from BRUNDIN, 1954. C, D, *Neodimetrota tenuiducta* (SAWADA), arrow points at athetine bridge; modified from SAWADA, 1970. E, F, *Neodimetrota cursoria* (GEMMINGER & HAROLD, 1868), arrow points at ventral capsule opening for ductus ejaculatoris; modified from SAWADA, 1982. Not in scale.

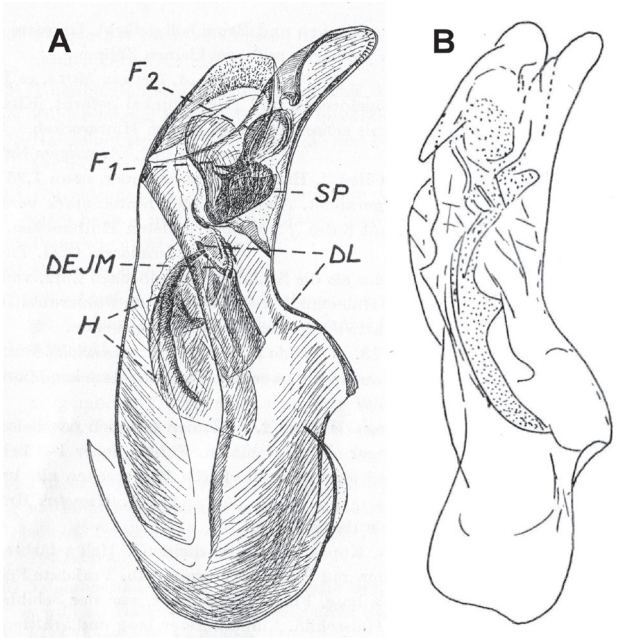


Figure 9. A. *Neodimetrota tenuiducta* (Sawada) (= *Atheta picipennis* auct. not Mannerheim, 1843), modified from Brundin, 1954. B, *Atheta laetipennis* G. Benick, holotype, median lobe, modified after Benick (1982).
DEJM= opening for ductus ejaculatoris to inside internal sac; DL= ductuslamells surrounding DEJM; F1, F2= striated apical lamells, H= anchor shaped hook in internal sac.

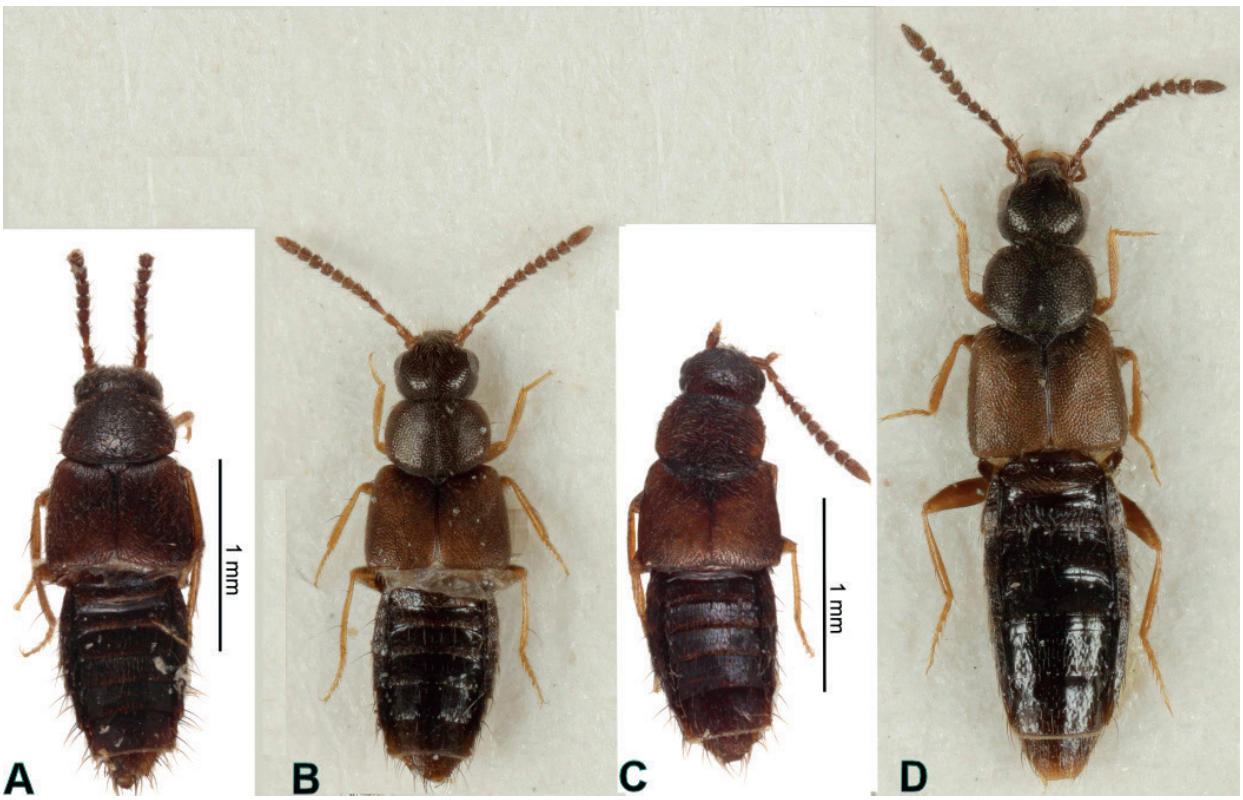


Figure 10. A, C. *Homalota immunda* Brisout de Barneville (MNHN). B, *Neodimetrota cinnamoptera* (Thomson), Finland N: Helsinki (JMC). D, *Neodimetrota tenuiducta* (Sawada), Finland. Ks: Kuusamo (JMC). A, paralectotype, C, lectotype.



Figure 11. *Homalota immunda* BRISOUT DE BARNEVILLE, lectotype labels (MNHN).



Figure 12. *Neodimetrota lapponica* (J. SAHLBERG, female, Finland, Ks: Kuusamo (JMC).