The Fennoscandian and Danish species of the genus Amischa Thomson (Coleoptera, Staphylinidae)

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Amischa andreasi n.sp. is described from NE Finland. The following new synonyms are established: *Aleochara apicalis* Stephens, 1832, *Homalota soror* Kraatz, 1858, *Homalota arata* Mulsant & Rey, 1873, *Homalota simillima* Sharp, 1869, and *Homalota sarsi* Munster, 1927, are all subjective junior synonyms of *Aleochara nigrofusca* Stephens, 1832—the present combination being *Amischa nigrofusca* (Stephens); *Bolitochara evanescens* Mannerheim, 1830, *Aleochara foveolata* Stephens, 1832, *Aleochara livipes* Stephens, 1832, *Aleochara littoralis* Stephens, 1832, and *Homalota contemta* Heer, 1841, are subjective junior synonyms of *Aleochara analis* Gravenhorst, 1802—the present combination being *Amischa analis* (Gravenhorst); *Homalota cavifrons* Sharp, 1869, is a subjective junior synonym of *Bolitochara bifoveolata* Mannerheim, 1830. Lectotypes are designated for the following species: *Aleochara apicalis* Stephens, 1832, *Bolitochara bifoveolata* Mannerheim, 1830, *Bolitochara evanescens* Mannerheim, 1830, *Aleochara nigrofusca* Stephens, 1832, and *Homalota arata* Mulsant & Rey, 1873. A key for separating the Fennoscandian and Danish *Amischa* species is given. The primary and secondary sexual characters are described and illustrated. *A. analis* is reported for the first time from Australia.

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Introduction

Palm (1968) reported four species of *Amischa* Thomson, 1858, from Fennoscandia: *A. analis* (Gravenhorst), *A. cavifrons* (Sharp), *A. sarsi* Munster and *A. decipiens* (Sharp). Williams (1969) synonymized *A. sarsi* with *A. simillima* (Sharp) and designated lectotypes for Sharp's *Homalota cavifrons, Homalota simillima* and *Homalota decipiens*. Strand (1971) suggested that both *A. simillima* and *A. sarsi* are synonymous with *A. soror* (Kraatz).

When discussing the identity of *A. analis* and *A. cavifrons* Strand (1951:221) wrote: "In any case, my attempts to draw a definite line of distinction between them have failed, also as regards the genitalia." Hansen (1954:123) and Palm (1968:101) have expressed similar doubts. Benick (1967:19) on the other hand regarded *A. cavifrons* to be "eine eindeutig gute Art", but added: "Schwieriger ist die Unterscheidung der langflügeligen Form von *cavifrons, simillima* Shp. von *analis*. Das ist im wesentlichen nur durch den tieferen Ausschnitt der 8. Dorsalsegment möglich." Benick (1967) described differences in the shape of the 8th tergite and the genitalia between males of *A. analis* and *A. cavifrons*. Later Benick & Lohse (1974:100) stated that the aedeagi were identical and the only difference between the males of the two species was that the tergite 7 and the sternum 8 of *A. analis* were narrower than those of *A. cavifrons*. These conflicting reports on the characters of the males together with the occasional difficulties in separating the females led me to synonymize *A. cavifrons* with *A. analis* (Muona 1979:25). However, further studies were clearly needed to clarify the problem.

Methods and material

Many aleocharines are known to vary in respect to proportions of the body, surface sculpture and colour. Primary and secondary sexual characters

(e.g. Brundin 1943) and the chaetotaxy of the mouthparts and the abdomen (e.g. Sawada 1972) have been shown to be constant within local populations, and therefore used in delimiting taxa. I tried to find discrete differences between the *Amischa* species using the following characters: structure of the capsule and the internal sack of the median lobe, structure of the spermatheca, shape and chaetotaxy of tergite 7 and sternum 8 and chaetotaxy of the mouthparts. When illustrating the spermathecae the basal coil is turned down and on the right side of the shaft (Figs 12–16).

I have examined all the primary types that could be traced. I studied some 2600 specimens, chiefly from Scandinavia and Finland. The following institutions and private collections provided material for study:

BMNH = British Museum (Nat. Hist.), London, UK, Dr P. Hammond, Mrs S. Shute; HB = Humboldt Universitet, Berlin, DDR, Dr M. Uhlig; MGL = Museum Gimet, Lyons, Mr J. Clary; MG = Museum d'Histoire Naturelle, Genf, Switzerland, Dr I. Löbl; PC = T. Palm (deceased), now in the University of Lund, Sweden; RC = I. Rutanen, Hyvinkää, Finland; SC = A. Strand (deceased), now in University of Bergen, Norway; ZMH = Zoological Museum, University of Helsinki, Dr. H. Silfverberg.

Results

According to the structure of the male genitalia there are four *Amischa* species in North Europe: *A. analis* (Gravenhorst), *A. nigrofusca* (Stephens), *A. decipiens* (Sharp) and *A. andreasi* n.sp. The secondary sexual characters of *A. decipiens* and *A. andreasi* are distinctive as well. The spermatheca of *A. decipiens* is different of that of other species—the female of *A. andreasi* is not known. The chaetotaxy of the mouthparts was very similar in all the species studied.

A. analis can be divided into two "forms" according to the secondary sexual characters and the shape of the spermatheca. These forms do not usually occur together and their distributions seem to differ. These facts suggest that they are two different species. As there is evidence supporting both views I have followed the traditional division and accepted *A. bifoveolata* (Mannerheim) as a separate species.

A. nigrofusca (Stephens) is externally highly variable. Two fairly distinct forms exist. One of them is dark brown in colour, has slender apical antennal segments and is slightly larger than the other one, which is mostly blackish in colour and has transverse apical antennal segments. Intermediate forms are common, however, and there are no constant differences characteristic of either of the forms in the secondary of primary sexual characters. There seems to be no justification for dividing this species further.

Key to males of Fennoscandian and Danish species of Amischa

1. Tergite 7 broadly caved or nearly straight (as in Fig. 8). Sternum 8 with 6–8 evenly spaced setae at hind margin (Figs 1, 2). Head feebly flattened ... 2
– Tergite 7 with median notch (Fig. 7). Sternum 8 with a median group of 4–11 setae (Figs 3–6). Head with median impression 3
2. Sternum 8 rounded with 8 inconspicuous long setae at hind margin (Fig. 1). Median lobe medium sized, apex with a distinct double curve in lateral view, median crest low (Fig. 18) .... *A. decipiens* (Sharp)
– Sternum 8 nearly straight with 6 black setae at hind margin (Fig. 2). Median lobe large, apex nearly straight in lateral view, space between base of apex and the high, rounded median crest exceptionally wide (Fig. 17) ..... *A. andreasi* n.sp.
3. Sternum 8 with 4 or 5 setae .... *A. nigrofusca* (Stephens)
– Sternum 8 with 6–11 (usually 8) setae 4
4. Sternum 8 wider (Fig. 6) .... *A. bifoveolata* (Mannerheim)
– Sternum 8 narrower (Fig. 5) .... *A. analis* (Gravenhorst)

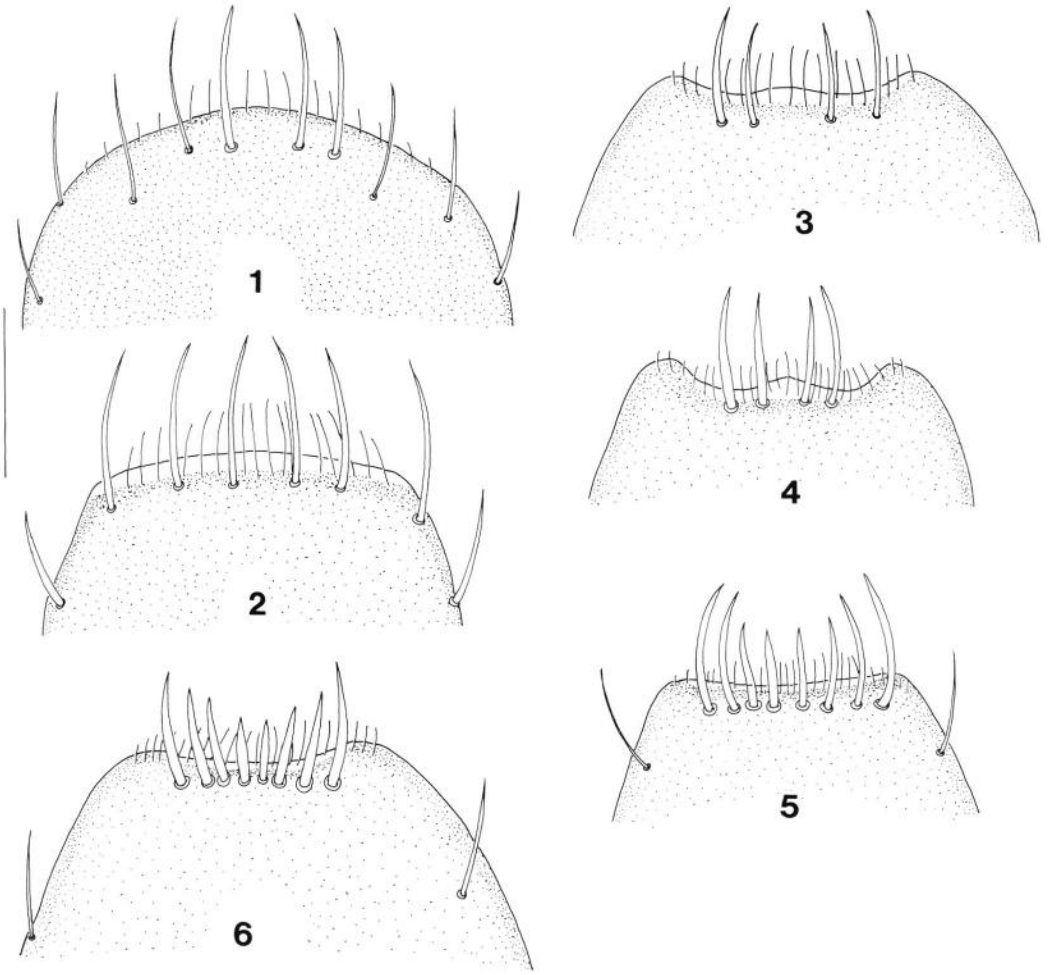
Key to females of Fennoscandian and Danish species of Amischa

The female of *A. andreasi* n.sp. is unknown.

1. Tergite 7 feebly caved (Fig. 8). Spermatheca with elongated head (Fig. 16) ..... *A. decipiens* (Sharp)
– Tergite 7 with a median notch (Figs 9–11) 2
2. Tergite 7 with a weak notch (Fig. 10). Head of spermatheca elongated, apical opening directed to the right (Fig. 12) ..... *A. analis* (Gravenhorst)
– Tergite 7 with a deep notch (Figs 9, 11). Head of spermatheca rounded 3
3. Apical opening of spermatheca directed to the left (Fig. 13) ..... *A. bifoveolata* (Mannerheim)
– Apical opening of spermatheca directed upwards (Figs 14, 15) ..... *A. nigrofusca* (Stephens)

Amischa decipiens (Sharp)

Homalota decipiens Sharp, 1869:179.
Figs 1, 16, 18.



Figs 1–6. *Amischa*, male sternum 8. – 1. *A. decipiens* (Sharp). – 2. *A. andreasi* n.sp. – 3–4. *A. nigrofusca* (Stephens). – 3. S. Finland. – 4. S. France. – 5. *A. analis* (Gravenhorst). – 6. *A. bifoveolata* (Mannerheim). Scale 0.1 mm.

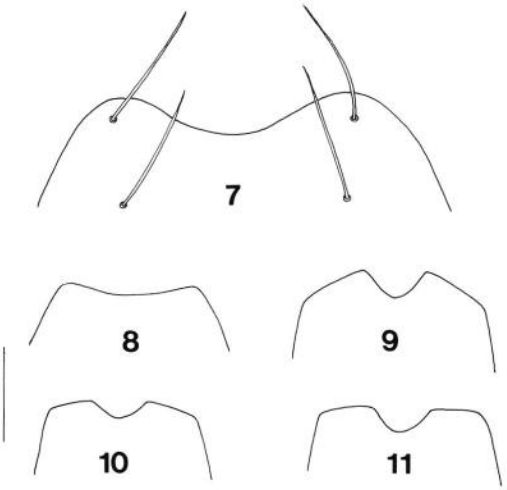
Type material: I have seen the lectotype and the paralectotypes (BMNH) selected by Williams (1969).

Diagnosis. This is a characteristic species. The abdomen is densely and evenly punctate, tergite 7 does not have a median notch, and the genitalia are distinctive (Figs 16, 18).

Notes. The first one to describe the male correctly was Benick (1967). The males are easily overlooked as the head is scarcely flattened and the sexual setae on the sternum 8 are difficult to notice. Males are regarded very rare, but they are common in at least one Finnish population and they are known from Norway as well (V. Mahler in. litt.)

Material studied: 43♂ 220♀.

Distribution: Finland A, V, U, EH, EK; Sweden, Norway, Denmark; also seen from Austria, Belgium, France, FRG, GDR, Great Britain and USSR.



Figs 7–11. *Amischa*, tergite 7. – 7–8. Male. – 7. *A. bifoveolata* (Mannerheim). – 8. *A. andreasi* n.sp., holotype. – 9–11. Female. – 9. *A. nigrofusca* (Stephens). – 10. *A. analis* (Gravenhorst). – 11. *A. bifoveolata* (Mannerheim). Scale 0.1 mm (8–11).

Amischa andreasi n.sp.

Figs 2, 8, 17.

Type locality: NE Finland, Kuusamo at the Arctic Circle.
Type material: Holotype ♂, Finland, Ks: Kuusamo, 736:61, 12.8.1983, J. Muona leg. (deposited in ZMH). The unique specimen was caught with a car net in the Oulanka national park in climax state coniferous forest with spruce as the dominant tree.
Etymology: Named in honour of the late Dr Andreas Strand (Norway), in recognition of his extensive knowledge of the Fennoscandian Aleocharinae.

Diagnosis. The primary and secondary sexual characters separate *A. andreasi* from all the other Palearctic *Amischa* species with densely and evenly punctate abdomen, i.e. *A. decipiens* (Sharp), *A. forcipata* (Mulsant & Rey) and *A. filum* (Mulsant & Rey). *A. forcipata* and *A. filum* are readily identified by the characters given in Benick & Lohse (1974).

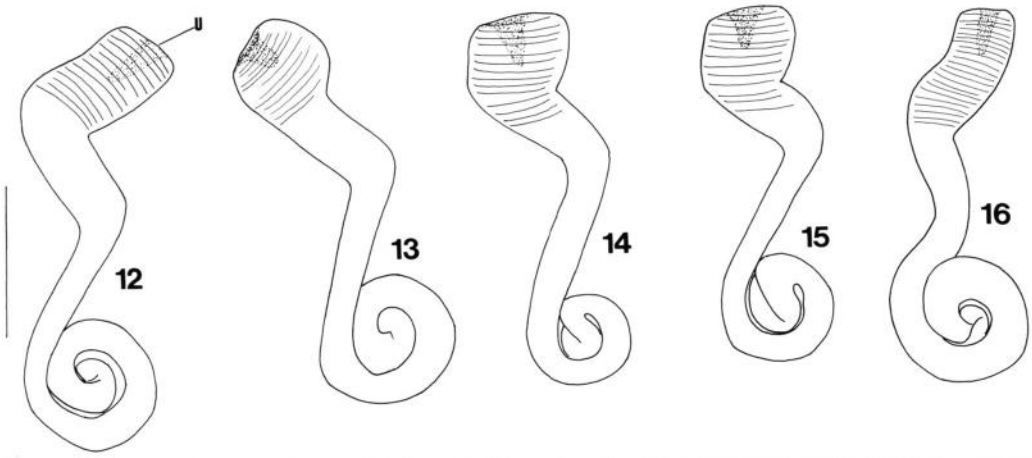
Description of male

Length 2.0 mm.
Colour of body uniformly pale brown, legs and antennae pale yellowish. Head wide, medially feebly flattened with strong microsculpture and very fine punctation. Temples evenly rounded, form of head less trapezoidal than in most *A. decipiens*. Antennae with segment 4 as long as wide, segments 5–10 gradually more transverse, segment 10 about 1.4 times as wide as long.
Ligula broad, undivided, with two setae.
Pronotum wide, convex, with median impression basally, very finely and sparsely punctate, microsculpture distinct. Pronotal vestiture as in *A. decipiens*.
Elytra slightly wider and longer than pronotum, punctation fine, much stronger than that on head and pronotum, but clearly finer than that in *A. decipiens*.
Abdominal punctation equal in strength to that on elytra, dense on all tergites, these without anterior row of setae.
Hind margin of tergite 7 caved (as in Fig. 8). Hind margin of sternum 8 nearly straight with six long black setae and fairly long fringe hairs (Fig. 2).
Median lobe characteristic, with wide space between base of apex and median crest (Fig. 17).

Amischa nigrofusca (Stephens)

Aleochara nigrofusca Stephens, 1832:129.
Aleochara apicalis Stephens, 1832:130. NEW SYNONYMY.
Homalota soror Kraatz, 1858:257. NEW SYNONYMY.
Homalota arata Mulsant & Rey, 1873:177–178. NEW SYNONYMY.
Homalota simillima Sharp, 1869:177. NEW SYNONYMY.
Homalota sarsi Munster, 1927:277. NEW SYNONYMY.
Figs 3, 4, 9, 14, 15, 19, 20.

Type material: *Aleochara nigrofusca* Stephens. Lectotype designated here. It is a female glued on a card (BMNH). The following labels are attached to the same pin: 1) "syntype", 29 "6", 3) "q. nigrofusca", 4) "63/56", "KIRBY", 7) a piece of celluloid acetate with last abdominal segments and the spermatheca in "Euparal", 8) Syntype Aleochara nigro-fusca Stephens S.L. Shute 1985 specimen from Kirby coll., 9) my lectotype label. Type area: Great Britain.
Aleochara apicalis Stephens. Lectotype designated here. It is a female glued on a card (BMNH). The following labels are attached to the same pin: 1) "syntype", 2) 83., 3) 2801., 4) a piece of cellu-



Figs 12–16. *Amischa*, spermatheca. – 12. *A. analis* (Gravenhorst). – 13. *A. bifoveolata* (Mannerheim). – 14–15. *A. nigrofusca* (Stephens). – 14. S. Finland. – 15. BRD. – 16. *A. decipiens* (Sharp). U = umbilicus. Scale 0.1 mm.

loid acetate with apical segments and spermatheca in "Euparal", 5) Syntype Aleochara apicalis Stephens S. L. Shute 1985, 7) my lectotype label. Type area: Great Britain.
Homalota soror Kraatz. I have seen a female syntype. It lacks head and thorax, but the genitalia leave no doubt as to its identity (MNB). Type area: Germany.
Homalota arata Mulsant & Rey. Lectotype designated here. It is a female glued on a card (MGL). Two other labels are attached to the same pin: 1) "o" and the original card glued on a new card, 2) my lectotype label. Type area: France.
Homalota simillima Sharp. I have studied the lectotype and the paralectotypes (BMNH) designated by Williams (1969). Type area: Scotland.
Amischa sarsi Munster. I have seen several syntypes (SC). Type area: Southern Norway.

Diagnosis. *Male:* Head moderately to strongly impressed. Hind margin of sternum 8 mostly slightly angled in middle, usually with 4 stout black setae (Figs 3, 4). Tergite 7 with deep median notch (as in Fig. 7). Apex of median lobe stouter than that of *A. analis* and *A. bifoveolata*, without apical cell in lateral view, base of apex with many pseudopores (Figs 19, 20). *Female*. Tergite 7 with deep median notch (Fig. 9), spermatheca with characteristic rounded head, umbilicus directed "upwards" (Figs 14, 15).

Notes. This species is highly variable. Most Scottish, Norwegian, Swedish and Finnish specimens are very dark in colour, nearly black, with relatively stout antennae (*simillima–soror* type). Specimens from Central Europe, Denmark and southern parts of British Isles tend to be large and have slender antennae (*nigrofusca–soror* type). Intermediate forms are common in Finland and Scandinavia, but I have seen them from FRG and France as well.

In the British Isles the distribution of the two forms do not overlap and they give the impression of being separate species. The form of the apex and the median crest of the median lobe varies considerably (Figs 19, 20). This variation is, however, continuous and none of the aedeagal characters is restricted to either of the externally different types. The number and length of the fringe hairs as well as the location of the sexual setae on the sternum 8 vary considerably, especially in the females. This variation is independent of antennal length and body colour. The shape of the spermatheca is constant.

In my opinion we are here dealing with one species that shows clinal variation in antennal structure, body colour and size. For historical reasons both extreme ends of the cline occur in the British Isles. The northern type has either survived as a relict in Scotland or invaded the area from the North, whereas the southern type has invaded

the country from France. Detailed genetic studies would be needed before this question can be settled.

Material studied: 53♂, 140♀.

Distribution: Finland: A, V, U, EH, EK; Denmark, Norway, Sweden; also seen from Austria, British Isles, France, FRG, Greece and USSR.

Amischa analis (Gravenhorst)

Aleochara analis Gravenhorst, 1802:76.
Bolitochara evanescens Mannerheim, 1830:81. NEW SYNONYMY.
Aleochara foveolata Stephens, 1832:128. NEW SYNONYMY.
Aleochara livipes Stephens, 1832:131. NEW SYNONYMY.
Aleochara littoralis Stephens, 1832:139. NEW SYNONYMY.
Homalota contemta Heer, 1841:593–594. NEW SYNONYMY.
Homalota tantilla Wollaston, 1854:553.
Figs 5, 10, 12, 21, 23.

Type material: *Aleochara analis* Gravenhorst. Not seen, types probably lost.
Bolitochara evanescens Mannerheim. Lectotype designated here. It is a female remounted on a card (ZMH). The head and the prothorax are missing. Two labels are attached to the same pin: 1) my lectotype label, 2) "Mus. Zool. Helsinki" Loan no. 85 c 665. Type area: Finland.
Aleochara foveolata Stephens, *Aleochara livipes* Stephens, *Aleochara littoralis* Stephens. I have studied the syntypes (BMNH). Type area for all three species: Great Britain.
Homalota analis var. *contemta* Heer. I have studied 4 syntypes from coll. Heer (MG). They all belong to *A. analis*. Type area: Switzerland.
Homalota tantilla Wollaston. I have seen syntypes (BMNH). They belong to *A. analis* as stated by Benick (1967). Type area: Canary Islands.

Diagnosis. *Male*. Head deeply impressed. Sternum 8 narrower than in *A. bifoveolata*, with a group of 7–9 stout black setae at hind margin, fringe hairs often short and few in number (Fig. 5). Tergite 7 with moderate notch, this often narrower than in *A. bifoveolata*. Median lobe not safely separable from that of *A. bifoveolata*, apex more elongated than in *A. nigrofusca*, with an apical cell in lateral view (Fig. 21).

Female. Sternum 8 with quite shallow median notch (Fig. 10). Spermatheca with slender head, umbilicus mostly directed to the right (Fig. 12).

Notes. This variable species is very closely related with *A. bifoveolata* and all specimens can not with certainty be safely kept apart. I have decided to regard the two forms as distinct species for two reasons: (1) the great majority of the females can be easily identified by the shape of tergite 7 and the spermatheca; (2) the distributions of the forms are slightly different, *A. bifoveolata* being the predominantly northern species.

During this study I came across an aberrant male specimen (coll. Rutanen). It had a small, characteristic median lobe (Fig. 23). I regard it to be an abnormal specimen of *A. analis*, as the internal sack is defective and very small with deformed and asymmetrical ductus lamells and basal hooks. It is of course possible that this specimen is the only true *A. analis* male ever reported and all the other males seen are *A. bifoveolata*. This I find, however, very unlikely. I have studied three fairly large samples from localities where no true *A. bifoveolata* females were taken: Sweden, Skåne 1♂, 14♀, T. Palm coll.; Finland, U: Pyhtää 1♂, 38♀, J. Muona coll.; Finland, KP: Oulu, 2♂, 40♀, J. Muona coll. All the females were typical *A. analis* and it appears reasonable to regard the males as conspecific.

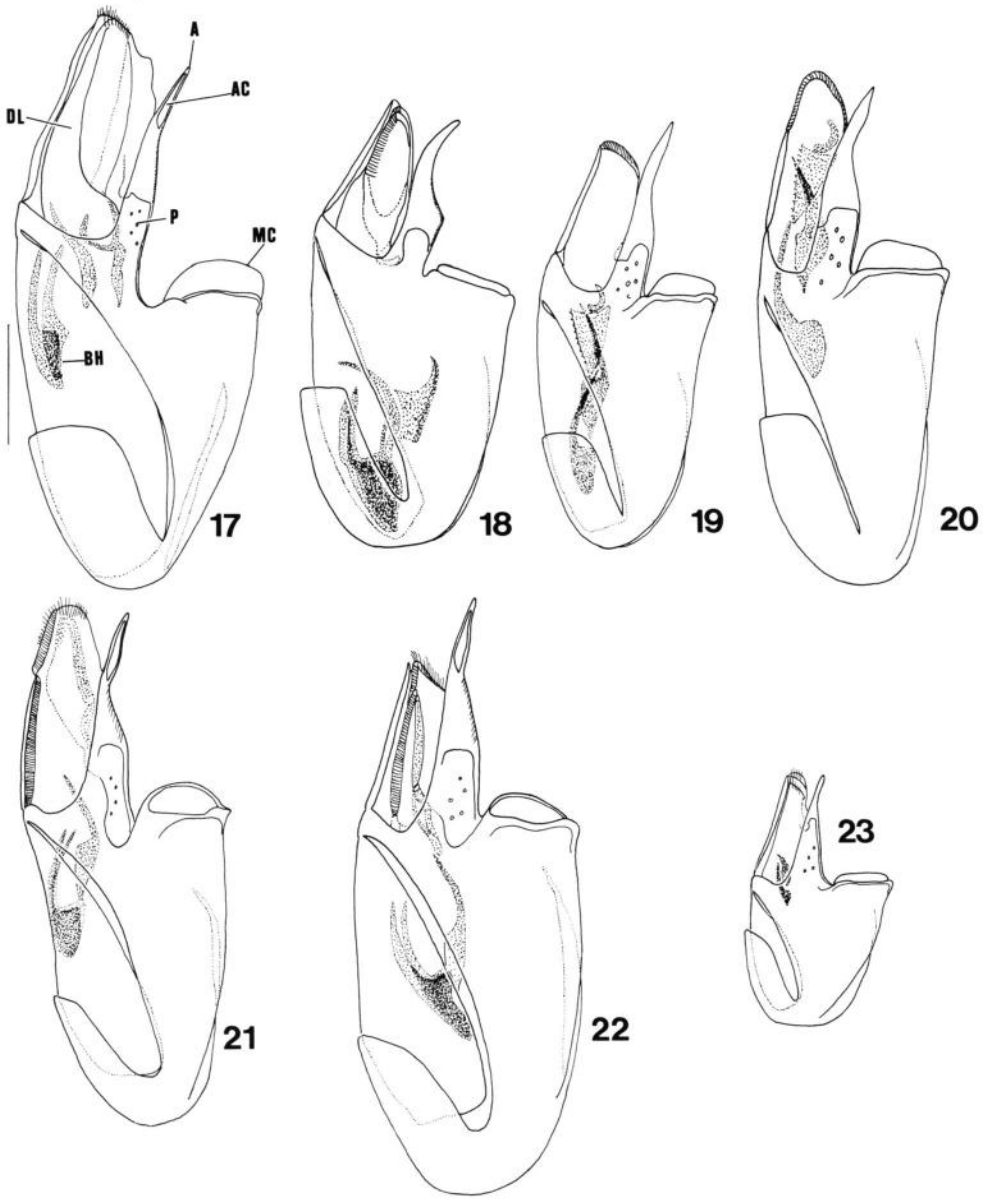
Material studied: 22♂, 1121♀.

Distribution: Finland: A, V, U, EK, EH, St, ES, PK, KP, PP, Ks; Denmark, Norway, Sweden; also seen from Australia (Melbourne), Austria, France, FRG, Greece, Italy, Jugoslavia, Romania, USA (Muona 1984) and USSR.

Amischa bifoveolata (Mannerheim)

Aleochara bifoveolata Mannerheim, 1830:79.
Homalota cavifrons Sharp, 1869:177. NEW SYNONYMY.
Figs 6, 7, 11, 13, 22.

Type material: *Aleochara bifoveolata* Mannerheim. Lectotype designated here. It is a female remounted on a card (ZMH). Three labels are attached to the same pin: 1) red triangle, 2) my lectotype label, 3) "Mus. Zool. Helsinki Loan no, 85 c 667". Type area: Finland.
Homalota cavifrons Sharp. I have seen the lecto-



Figs 17–23. *Amischa*, median lobe of aedeagus. – 17. *A. andreasi* n.sp., holotype. – 18. *A. decipiens* (Sharp). – 19–20. *A. nigrofusca* (Stephens). – 19. S. Finland. – 20. S. France. – 21. *A. analis* (Gravenhorst). – 22. *A. bifoveolata* (Mannerheim). – 23. *A. analis* (Gravenhorst), aberrant, S. Finland. A = apex, AC = apical cell, BH = basal hooks, DL = ductus lamells, MC = median crest, P = pseudopores. Scale 0.1 mm.

type and the paralectotypes (BMNH). Type area: Great Britain.

Diagnosis. *Male*. Head deeply impressed. Sternum 8 wider than that of *A. analis*, with a group of 6–11 (usually 8) stout black setae at hind margin, fringe hairs often fairly long (Fig. 6). Tergite 7 with fairly deep median notch (Fig. 7). Apex of median lobe as in *A. analis* (Fig. 22).
Female. Tergite 7 with wide and deep median

notch (Fig. 11). Spermatheca with wide head, suddenly constricted basally, umbilicus usually directed to the left (Fig. 13).

Notes. The difference in spermatheca between *A. analis* and *A. bifoveolata* is best seen in slide preparations. Very rarely the spermatheca of *A. bifoveolata* is twisted along its length axis and greatly resembles that of *A. analis* but even in these cases the head of the organ is stout. The depth of the notch of the tergite 7 in females seems to be constantly different. Some males can not be placed safely.

A. bifoveolata is frequently darker in colour than *A. analis*, but this character is unreliable. *A. bifoveolata* is dimorphic, some specimens having very short, others long elytra. The Scottish population appears to have mostly short elytra, but this form is rare in Fennoscandia and Continental Europe. The form with long elytra is often confused with *A. analis* in Central Europe.

Material studied: 180♂, 805♀.

Distribution: Finland: A, V, U, EK, St, EH, ES, PH, KP, PP, Ks, KeL (W), KeL (E), Li; Denmark (Jylland, J. Muona coll.), Norway, Sweden; also seen from British Isles, France (Savoy), FRG, GDR.

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Sammanfattning

Kortvingesläktet *Amischa* är i Norden representerat av fem arter: *A. decipiens* (Sharp), *A. andreasi* Muona, *A. nigrofusca* (Stephens), *A. analis* (Gravenhorst) och *A. bifoveolata* (Mannerheim). Bestämningstabeller ges separat för hanar resp honor. Många nya synonymer ges och *A. andreasi* beskrivs som en ny art från Kuusamo i Finland.