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New synonymies in the European Fanniidae (Diptera)

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Abstract: Four new synonyms are proposed, based mainly on the study of type material: *Fannia berolinensis* Hennig, 1955 = *F. limbata* (Tiensuu, 1938); *F. coracula* Collin, 1958 = *F. fuscitibia* Stein, 1920; *F. hylemyiaeformis* Ringdahl, 1952 = *F. brinae* Albuquerque, 1951; and *F. spinosa* Karl, 1923 = *F. sociella* (Zetterstedt, 1845). *F. fuscitibia* Stein is now shown to have a Holarctic distribution, and the known distribution of *F. limbata* (Tiensuu) is extended as far south as southern Moravia. Lectotypes are designated for *F. hylemyiaeformis* Ringdahl and *F. spinosa* Karl.

INTRODUCTION

Hennig's (1955–1964) monograph on the Palaearctic Fanniidae (as the subfamily Fanniinae of the family Muscidae) is still of fundamental importance for any more extensive study of the European species, including their identification. Valuable taxonomic and distributional notes, including descriptions of some new species, were subsequently added by Collin (1958), Fonseca (1958, 1966, 1967), Ackland (1963), Pont (1965a, 1965b, 1967, 1969, 1970, 1983a, 1983b, 1984a, 1984b, 1986b), Pont & Michelsen (1982), and Rognes (1982, 1983). Although the keys to the identification of males and females by Fonseca (1968) include British species only, they are of value for other parts of Europe, not least because a number of females are distinguished for the first time. Several species with a Holarctic distribution can be identified successfully using the monograph of the Nearctic Fanniidae by Chillcott (1961). Earlier data on the larvae of Fanniidae were evaluated critically by Lyneborg (1970), who examined and described the larvae of 18 *Fannia* species.

The present fauna of the European Fanniidae includes 83 species (Pont, 1986a). The family has been particularly well studied in the British Isles (Pont, 1975, 1983b – 60 species), Norway (Rognes, 1985 – 42 spp.), Sweden (Ringdahl, 1952a; Rognes, 1982 – 50 spp.), Finland (Hackman, 1980 – 39 spp.), Poland (Draber-Mońko, 1991 – 46 spp.), the former Czechoslovakia (Gregor, 1986, 1987; Rozkošný & Gregor, 1988 – 57 spp.), and Hungary (Mihályi, 1975 – 43 spp.).

Our extensive study of Czech and Slovak Fanniidae in the recent years has led to the discovery of a number of interesting and rare species, some of which had not been recorded from central Europe (Gregor, 1981, 1984; Gregor & Barták, 1985; Gregor & Rozkošný, 1986; Rozkošný, 1985; Rozkošný & Gregor, 1988). The discovery of the Nearctic *F. fuscitibia* Stein in continental Europe for the first time (Gregor, 1982) suggested that some other little known or problematic European taxa should be re-investigated. Our studies of type specimens have resulted in the four new synonyms and species redescriptions presented here.

Fannia brinae Albuquerque, 1951

Fannia hylemyiaeformis Ringdahl, 1952, syn. n.

Male: Body length 6.2–6.6 mm. Frontal vitta dull black, orbits and parafacials silvery-white. Face and genae black, with dense grey pollinosity. Eyes bare. Orbits separated by relatively broad frontal vitta, although boundaries between it and the orbits are indistinct. Distance between eye margins on frons about twice as broad as width of 3rd antennal segment. Long and short setae alternating between 10 pairs of frontals, especially in lower part of frons, one pair of strong fronto-orbitals present. 3rd antennal segment about twice as long as 2nd, arista thickened in basal third, very finely pubescent. Gena somewhat broader than 3rd antennal segment. Theca of proboscis rather short, pollinose, palpi slender and long.

Thorax black in ground-colour, mesonotum with grey pollinosity and 3 narrow brown longitudinal stripes along dorsocentrals and in middle. Presutural acrostichals in 3 rows, postsutural ones in 4 rows. Two prealar setae present, anterior one usually stronger, posterior occasionally absent. Wings slightly brownish infuscated, veins yellow. Squamae well-developed, lower squama distinctly projecting, halteres yellow.

Legs black, knees broadly yellow, coxae without any spines. Fore femur with complete rows of posteroventrals and posterodorsals, double row of weaker posterals also developed. Mid-femur with simple row of anteroventrals and double row of posteroventrals, posterior setae distinct only in apical third. Mid-tibia with short, dense and brush-like hairs along inner side, with 1 antero- and 1 posterodorsal seta. Mid-basitarsus without any crest. Hind coxa with several setae on posterior inner margin. Hind femur with rows of anteroventrals and posteroventrals, hairs on ventral and posteroventral sides elongate, several strong anterodorsals in apical half regularly present. Hind tibia with 2–3 anteroventrals, 1 anterodorsal and 2 dorsals; upper dorsal and anterodorsal seta inserted almost at the same level above apical third, both conspicuously long.

Abdomen greyish dusted, with a relatively broad dark median stripe consisting of matt trapezoid spots on abdominal terga. Male genitalia similar to other species of *canicularis*-group (Figs 3–4), with a small heart-shaped cercal plate and pointed surstyli bearing a slender and apically pubescent basal lobe.

Female: unknown.

MATERIAL EXAMINED: France, La Grave, 9.vii.1951 3♂♂, O. Ringdahl lgt. (syntypes of *F. hylemyiaeformis* Ringdahl, one hereby designated as lectotype here; preserved in the Museum of Zoology and Entomology, Lund).

DISTRIBUTION: This species is known only from the French Alps (Moutière and La Grave).

DISCUSSION: The male holotype of *F. brinae* Albuquerque (France, Alpes Maritimes, Moutière, 1925 ♂, R. Benoist lgt.) deposited in the Muséum National d'Histoire Naturelle, Paris, was examined by Hennig (1964: 1069). His redescription agrees with the 3 examined males of *F. hylemyiaeformis* Ringdahl in virtually all details, particularly in the broad frons, the presence of fronto-orbitals and in the number and position of the setae on tibiae. It should be noted that there is one difference, concerning the bristles on the posterior inner margin of the hind coxae. All the syntypes of *F. hylemyiaeformis* have distinct setae, as do all the other members of the *canicularis*-group. Nevertheless, Hennig (l.c.) states that the hind coxae are bare in the holotype of *F. brinae*. In our opinion this character is not subject to variation, and these setae may be broken and/or probably overlooked

by Hennig. Ringdahl described *F. hylemyiaeformis* from two males, and, since there are three males from the type locality deposited in the Museum of Lund, one of these is designated as lectotype.

Fannia fuscitibia Stein, 1920

Fannia coracula Collin, 1958, syn. n.

Male: Body length 4.7–5.2 mm. Orbits and parafacials bright silvery-white, ocellar triangle black, with grey pollinosity. Antennae black, 2nd segment sometimes yellowish apically. Face and genae black, very densely pale grey pollinose. Eyes with very sparse and short hairs. Narrow orbits contiguous in a relatively long line, distance between eye margins barely twice as wide as anterior ocellus. Usually 8 pairs of well-developed, almost equal frontals, distance between the last frontal and anterior ocellus longer than ocellar triangle. Parafacials narrow, at base of antenna as wide as 3rd antennal segment but tapering towards lower eye margin. 3rd antennal segment about 1.5 times as long as 2nd. Arista only indistinctly pubescent. Gena very narrow in lateral view, always narrower than 3rd antennal segment. Postocular ciliation uniserial. Theca of proboscis short and dark, distinctly dusted, palpi only slightly longer than theca.

Thorax black and slightly lustrous, non-vittate, sparsely pollinose. Presutural acrostichals mainly biserial, postsutural acrostichals mostly triserial, 2+3 dorsocentrals, single prealar about 3/4 as long as posterior notopleural, inserted close to suture. Wing membrane brownish infumated, veins brown but more yellow basally. Both squamae contrasting white, with whitish marginal fringe, halteres pale yellow.

Legs blackish-brown, knees of fore and middle legs distinctly yellow as well as basal fifth of fore tibia. Mid-femur with a row of anteroventrals and a row of posteroventrals, and about 3-4 preapical posterals. Mid-tibia somewhat swollen in apical half and with dense inner pubescence on this part; longest hairs always shorter than tibial width at the same level; 2 antero- and 2 posterodorsals well developed. Mid-basitarsus without any crest at base. Hind coxa bare on posterior inner margin. Hind femur with 4–6 long anteroventrals and same number of anterodorsals, posteroventrals quite absent. Hind tibia with 2 anteroventrals (the upper distinctly weaker), 2–3 anterodorsals and 2 dorsals.

Abdomen black and slightly lustrous in ground colour, with grey pollinosity and black median stripe on terga 2–4, posterior half of tergum 4 and tergum 5 shining black. Male genitalia (Figs 1–2) markedly specific, cercal plate with a pair of median hooks, surstyli with double-arch in posterior view.

Female: Body length 4.9–5.5 mm. Orbits broad and shining black, frontal stripe much narrower than one orbit, in middle only 1/3–1/2 as wide as on orbit. Orbits covered with sparse setulae in addition to about 5 pairs of inclinate frontals and 2 normal fronto-orbitals. Face and genae densely greyish dusted but less pale than in male. Ventral setae on femora reduced, virtually indistinct on mid-femur and with only 3 strong preapical anteroventrals developed on hind femur. Mid-tibia with 2 anteroventrals in addition to 2 anterodorsals and 2 posterodorsals (all upper setae conspicuously shorter). Usually, setae on hind tibia as in male. Generally, wings paler than in male, mostly more yellow, all veins pale yellow. Abdomen shining black, without median stripe, slight pollinosity visible only in extreme posterior view.

MATERIAL EXAMINED: USA, Idaho, Moscow, 11.vii.1908 ♀, J.M. Aldrich lgt. (holotype of *F. fuscitibia* Stein, 1920; preserved in the Museum für Naturkunde, Berlin); Indiana, La Fayette, 14.vi.1916 ♂, J.M. Aldrich lgt.; Canada, Quebec, Harrington, Gatineau, 31.v.1954 ♂, E.E. Sterns lgt.; 8.vi.1954 ♀, J. Huckel lgt.; Ontario, Orillia, 12.vi.1927 ♂, C.H. Curran lgt. (the last four specimens deposited in the Biological Resources Division, CLBRR, Agriculture Canada, Ottawa). Great Britain, Norfolk, Horning, 9.vii.1954 ♂, J.E. Collin lgt. (holotype of *F. coracula* Collin, 1958; male genitalia mounted in dry medium on celluloid; in the University of Oxford, Hope Entomological Collections). Czech Republic, Moravia, Lednice, light trap, 5.v.1972 ♂, J. Vaňhara lgt. (in the F. Gregor Collection, Brno).

DISTRIBUTION: Canada and USA (from Alaska and Quebec to California and New Mexico), England (Norfolk, Worcestershire, Westmorland, Gloucestershire, Glamorganshire), Czech Republic (southern Moravia), Japan.

DISCUSSION: The description of *F. fuscitibia* was based on a female holotype originating from Idaho in the USA. Although it appears not to have been re-examined by Chillcott (1961), he interpreted the species correctly. In comparison with other material examined, the female holotype has conspicuously paler legs, with the femora and coxae almost completely yellow. However this state may be the result of the non-definite colouring of the specimen because no known *Fannia* species has this type of bicoloured legs. All the other

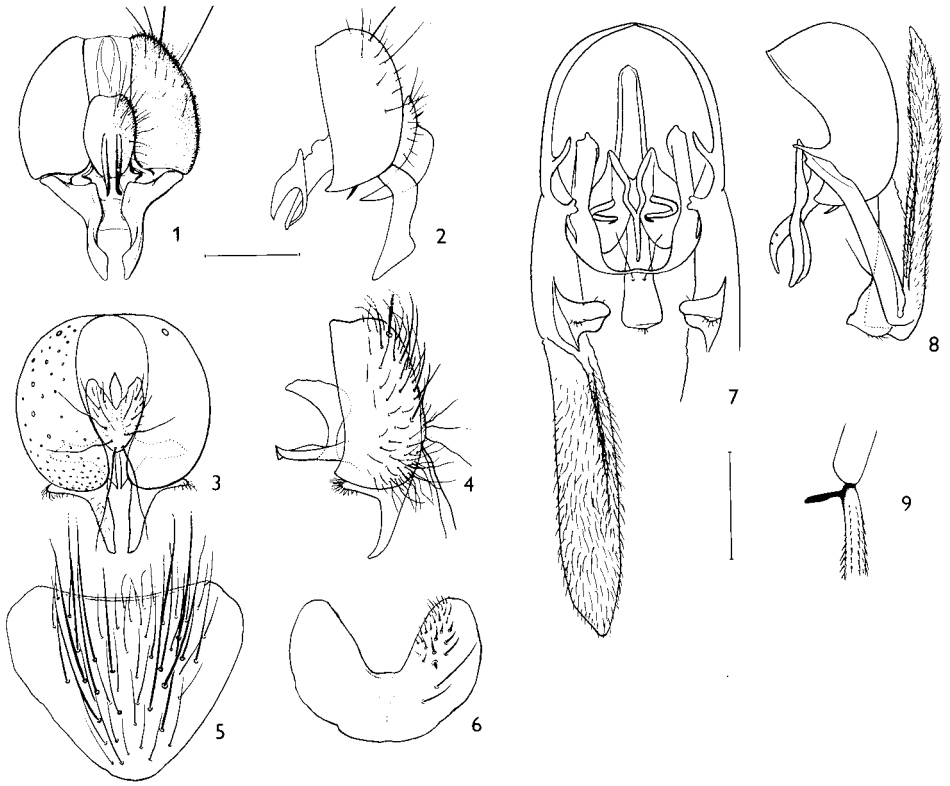

Fig. 1–2. Male genitalia of *Fannia fuscitibia* Stein (Czech Republic) in caudal and lateral views. Fig. 3–4. The same of *F. brinae* Albuquerque (France). Fig. 5–6. Male sternum 5 of *F. brinae* Albuquerque (France) and *F. fuscitibia* (Czech Republic). Fig. 7–9. *Fannia limbata* (Tiensuu), male genitalia with exposed (7) and folded surstyli (8) (Finland), and crest on mid-basitarsus (9) (Czech Republic). Scales = 0.5 mm.

diagnostic characters, including the chaetotaxy, correspond well with the recent concept of the species. Chillcott (1961), discussing the relationship of this species, stated that *F. fuscitibia* "is very close to *F. coracula* Collin but differs in the structure of the cercal plate" (l.c., p. 132). However, this statement was based only on the illustration published by Collin (1958). Gregor (1982), who was the first to record this species from the former Czechoslovakia, compared his single male with the descriptions given by Collin (1958) and Chillcott (1961) and pointed out that there were no differences in the shape of the hypopygium between the Central European male and *F. fuscitibia* as illustrated by Chillcott but that there were some discrepancies with the illustration of *F. coracula* by Collin. Now that we have sufficient comparative material at our disposal, including the holotypes of both species under discussion, we can state that both species are identical and that the only alleged difference between them was deduced from Collin's imprecise figure and not from a study of the original holotype. Consequently, *F. coracula* Collin is only a synonym of *F. fuscitibia* Stein and the distribution of this species is actually of the Holarctic type, including the USA, Canada, Japan and Europe (Great Britain and Czech Republic).

Fannia limbata (Tiensuu, 1938)

Fannia berolinensis Hennig, 1955, syn. n.

Male: Body length 4.5–5.5 mm. Orbits, face and genae sparsely greyish pollinose. Eyes bare. Orbits contiguous, with 13–15 frontals of different lengths on each side, almost extending to the ocellar triangle. Upper postocular ciliae in several rows. Parafacials tapered ventrally, in the middle about half as wide as 3rd antennal segment. 3rd antennal segment barely 1.5 times as long as wide, arista relatively short, somewhat thickened in basal half, only indistinctly pubescent. Gena comparatively broad, usually more than twice as wide as 3rd antennal segment.

Thorax black, only weakly dusted, fine acrostichals in two irregular rows, one strong prealar seta inserted close to suture. Wings brownish infuscate, both squamae yellowish brown, halteres yellow with blackish knob.

Legs completely black. Mid-femur conspicuously emarginate before apex ventrally. Mid-tibia slender and only short haired in basal part, but swollen and with upright long pubescence in apical half; with 2–4 anterodorsals and 1–2 posterodorsals. Basal crest on mid-basitarsus well-developed, almost rod-like (Fig. 9). Posterior inner margin of hind coxae bare. Hind femur with 4–5 preapical anteroventrals and without posteroventrals. Hind tibia with 1 anteroventral, 1 short anterodorsal and 2 dorsals.

Abdomen elongate oval, brownish-grey pollinose, with conspicuous black triangular spots arranged in median row. Cercal plate long, gradually dilated towards apex. Surstyli unusually long, strip-like and pubescent, folded back towards epandrium (Fig. 8).

Female: unknown.

MATERIAL EXAMINED: Finland, Ivalo, 19.vi.1928 ♂, E. Kanervo lgt. (holotype of *Ivalomyia limbata* Tiensuu, 1938; spec. typ. No 8161; male genitalia in dry medium on celluloid; deposited in the Zoological Museum, Helsinki); Vehkalahti, 10.v.1975 ♂, L. Tiensuu lgt. (in the same museum). Germany, Berlin-Finkenkrug, 30.vii.1911 ♂, L. Oldenberg lgt. (holotype of *F. berolinensis* Hennig, 1955; male hypopygium and 5th sternum mounted in two separate slides; Deutsches Entomologisches Institut, Eberswalde-Finow). Czech Republic, Bohemia, Kostelní Lhota near Sadská, pine forest, 190 m, 19.iv.1988 ♂, Barták lgt. (in the F. Gregor Collection, Brno).

DISTRIBUTION: Europe (Norway, Sweden, Finland, Germany, Czech Republic).

DISCUSSION: The male genitalia of *F. limbata* are so peculiar that Tiensuu (1938) described this species within a separate genus *Ivalomyia* which, however, has not been accepted by subsequent authors. The long and strip-like surstyli are normally folded up along the posterior wall of the epandrium (Fig. 8) but when the male hypopygium is treated in a hot solution of potassium hydroxide, they may become unfolded and exposed almost in one plane (Fig. 7). With this in mind, it becomes clear that Hennig's description of *F. berolinensis* was based only on a small male of *F. limbata* and that his figures (Hennig, 1955, Figs 32 and 94) are drawn from a macerated hypopygium with the surstyli flattened out. This may also be confirmed by comparison Hennig's figures of the male genitalia for *F. berolinensis* and *F. limbata* (cf. Hennig, l.c., Figs 34 and 87). As far as the external morphological characters are concerned, we can confirm that both holotypes are fully identical. Thus there can be no doubt that *F. berolinensis* Hennig is a synonym of *F. limbata* (Tiensuu). *F. limbata* has been considered to be a European species with a boreal distribution. It is now clear that the species was collected in the vicinity of Berlin as early as 1911 and has recently been captured in Bohemia as well.

Fannia sociella (Zetterstedt, 1845)

Fannia spinosa Karl, 1928, syn. n.

F. sociella (Zetterstedt) (body length 4.2–5.5 mm) is a well-defined and widely distributed element of the Holarctic fauna. A detailed description including illustrations of the male genitalia may be found e.g. in Hennig (1955) or Chillcott (1961). As a member of the *serena*-group, *F. sociella* possesses a reduced lower squama; and from related species it may be distinguished by the characteristic group of 3–4 strong anteroventral setae at the middle of mid-femora as well as by the specific shape of the male genitalia, which bear unciform and strongly sclerotized bacilliform processes. The females differ by having 2 anterodorsals on the hind tibia and by an anteriorly-elongate ocellar triangle.

MATERIAL EXAMINED: Poland, Stolp (=Słupsk), 8.viii.1927 ♂, O. Karl lgt. (lectotype of *Fannia spinosa* Karl, 1928, here designated; deposited in the Zoological Institute, Polish Academy of Sciences, Warsaw); the same locality but dated 14.viii.1927 ♂, O. Karl lgt. (paralectotype; also deposited in Warsaw); several dozens of both sexes of *F. sociella* (Zetterstedt) from central Europe (Czech Republic, Slovak Republic, Austria, Germany, Poland).

DISTRIBUTION: Canada and USA (from Alaska and N.W.T. to New Mexico and Colorado), Europe (from Great Britain and Scandinavia to Spain and the former Yugoslavia), China, Japan.

Discussion: *Fannia spinosa* Karl was described from 4 males captured at Stolp (=Słupsk, Poland) in the first half of August. According to the original description, *F. spinosa* is closely related to *F. sociella* but differs by the presence of the preapical dorsal bristle on the hind tibia (i.e. two dorsal bristles are present). Also, it is said to be larger, the longitudinal stripes on the mesonotum are more distinct, the spine-like bristles on the basal half of the mid-femur are weaker, and the dense hairs on the apical half of the mid-tibia are conspicuously long. Hennig (1955), who examined a male originating from Berlin and identified by Karl as *F. spinosa*, confirmed the presence of 2 dorsal bristles on the hind tibia but doubted the validity of this species, especially as the 2nd dorsal was present exceptionally in some males of *F. sociella*.

We examined 2 males from Stolp, identified as *F. spinosa* by Karl and collected by him on the 8th and 14th August 1927. Apparently both these males belong to the original type series, and the first of them is here designated as lectotype. After a detailed comparison of

the examined males with extensive material of *F. sociella* from central Europe, we concluded that *F. spinosa* Karl is conspecific with *F. sociella* (Zetterstedt), for the following reasons: (1) the male genitalia of *F. spinosa* and *F. sociella* are totally identical; (2) all the other differences mentioned by Karl (1928) are within the range of specific variability; (3) in the normal population of *F. sociella* the males possess only one dorsal and the females two dorsal bristles on the hind tibia, but 2 bristles occasionally occur in some males (cf. Hennig, 1955, p. 86, 88, and the males described by Karl as *F. spinosa*); (4) we found a male of *F. sociella* in Slovakia (Bohúňovo, 18.v.1980, R. Rozkošný lgt.) in which 2 distinct dorsals are present on the left hind tibia and only one dorsal seta on the right hind tibia.

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