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A generic revision of the genus Syrphus and allied genera (Diptera, Syrphidae) in the Palearctic region, with descriptions of the male genitalia

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INTRODUCTION

The aim of the present work has been to revise the genus *Syrphus* and allied genera of the Palaearctic region rearranging them into natural and if possible monophyletic units, to revise the generic nomenclature and to figure the male genitalia of the Palaearctic species.

The genus *Syrphus* was founded by FABRICIUS (1775) for 49 species which he divided into two groups under the headings »Antennis seta plumata» and »Antennis seta nuda». Afterwards, he (FABRICIUS 1805) restricted the name *Syrphus* to his first group, which had previously been named *Volucella* by GEOFFROY (1764), and gave the name *Scaeva* to part of his second group. MEIGEN (1803), however, had already limited the name *Syrphus* to the second group of FABRICIUS (1775) and this has been accepted by most subsequent authors up till now. The name *Scaeva* was accepted by FALLEN (1817), CURTIS (1834) and ZETTERSTEDT (1838, 1843), among others. CURTIS (1834) even designated *Musca pyrastri* as its type-species, a fact that has generally been overlooked by later authors (GOFFE 1933).

Between the middle of the 19th century and the beginning of the 20th, several new genera were proposed, most of which were separated from *Syrphus*: RONDANI (1845) created the genus *Lasiopthicus (Musca pyrastri)*, WALKER (1852) the genus *Epistrophe (Epistrophe conjungens)*, SCHINER (1860) the genus *Leucozona (Musca lucorum)*, OSTEN-SACKEN (1877) the genus *Catabomba (Musca pyrastri)*, BIGOT (1882) the genus *Ischyrosyrphus (Musca glaucia)*, MIK (1897) the genus *Lagenosyrphus (Syrphus leiophthalmus)*, VERRALL (1901) the genus *Melangyna (Melanostoma quadrimaculatum)*, and BRUNETTI (1908) the genus *Dideoides (Dideoides ovata)*.

The genus *Lasiopthicus* was accepted by most later authors (e.g. BECKER & BEZZI & KERTESZ & STEIN 1907, SHIRAKI 1930, SACK 1932). SCHINER (1868) sank it as a synonym of *Syrphus*. The genus *Catabomba* was accepted by VERRALL (1901), among others. The genus *Epistrophe* was not considered at all by SCHINER (1862) and OSTEN-SACKEN (1875) and was sunk as a synonym of *Syrphus* by many later authors (VERRALL 1901, BECKER & BEZZI & KERTESZ & STEIN 1907, LUND-

BECK 1916, SHIRAKI 1930). SACK (1932) included in *Epistrophe* all those species of *Syrphus* that are without a marginated abdomen, and since then the generic name *Epistrophe* has been generally used, but for varying groups of species (FLUKE 1935, SZILADY 1940, GOFFE 1944a, FREY 1945, FLUKE 1950, etc.). The genus *Dideoides* was accepted by SHIRAKI (1930). Since VERRALL's time *Lagenosyrphus* has been considered a synonym of *Ischyrosyrphus*. The genera *Leucozona*, *Ischyrosyrphus* and *Melangyna* have been generally accepted.

LUNDBECK (1916) was the first to discuss the natural subgrouping within the genus *Syrphus* s. l. The grouping was based mainly on the hairiness of the eyes and the form and colour pattern of the abdomen. He also mentioned similarities between the larvae within some of his groups.

MATSUMURA (MATSUMURA & ADACHI 1916, 1917a, 1917b and MATSUMURA 1918) proposed the following new genera: *Stenosyrphus (Syrphus lasiophthalmus)*, *Episyrphus (Syrphus balteatus)*, *Mesosyrphus (Mesosyrphus constrictus)*, *Eusyrphus (Eusyrphus cingulatus)*, *Dideodes (Syrphus latus)*, *Betasyrphus (Syrphus serarius)*, *Metasyrphus (Syrphus corollae)*, *Karasyrphus (Chaemosyrphus miyakei)*, *Conosyrphus (Conosyrphus okunii)* and *Eristalosyrphus (Eristalosyrphus griseofasciatus)*. *Macrosyrphus (Syrphus okinawae)* and *Parasyrphus (Syrphus aeneostoma)* were erected as subgenera of *Syrphus*. These names have been largely ignored, especially by European authors (SACK 1932, ENDERLEIN 1937, SZILADY 1940, FREY 1945), perhaps owing to the difficulty of obtaining the papers in question. SHIRAKI (1930) sank most of MATSUMURA's names as synonyms of older ones. However, CURRAN (1924) accepted the genus *Stenosyrphus*, GOFFE (1944a) the genera *Stenosyrphus*, *Mesosyrphus* and *Episyrphus*, and FLUKE (1950) the genus *Metasyrphus* in addition to those already mentioned. For lack of a type-species, *Eusyrphus*, *Macrosyrphus* and *Eristalosyrphus* are not considered in the present paper.

In the paper of ENDERLEIN (1937) three new genera were founded: *Phalacrodira (Scaeva tarsata)*, *Dasysyrphus (Dasysyrphus albostriatus)* and *Posthosyrphus (Posthosyrphus americanus)*. *Dasysyrphus* was accepted by GOFFE (1946) and FLUKE (1950), and the latter also used *Posthosyrphus* as a subgenus of *Metasyrphus*.

SZILADY (1940) proposed three new subgenera in the genus *Epistrophe: Heterepistrophe (Musca balteata)*, *Euryepistrophe (Syrphus grossulariae)* and *Dasyepistrophe (Scaeva macularis)*. All SZILADY's names were proved by GOFFE (1944a) to be synonyms of older ones.

GOFFE (1933, 1943, 1944a, 1944b, 1946) dealt especially with the nomenclatural problems of the genus *Syrphus* and allied genera and criticized the above-mentioned papers of MATSUMURA (1916—1918), ENDERLEIN (1937) and SZILADY (1940). He (GOFFE 1933) proposed a new generic name *Syrphidis* for *Musca ribesii* but this name is generally considered a synonym of *Syrphus* (FLUKE 1950, COLLIN 1952, etc.). GOFFE (1944a) also created the genus *Syrphella (Scaeva tricincta)* but

it proved to be a synonym of *Dasysyrphus* (GOFFE 1946). He also (1944a) made a new generic division within the genus *Epistrophe*, as delimited by SACK (1932), and allied genera, and accepted the following genera: *Melangyna*, *Stenosyrphus*, *Mesosyrphus*, *Episyrphus*, *Ischyrosyrphus* and *Epistrophe*.

FREY (1945) published a key to the Syrphinae genera of the world and also founded two new subgenera in the genus *Epistrophe: Meliscaeva (Scaeva cinctella)* and *Meligramma (Scaeva guttata)*. FLUKE (1950) used *Meligramma* as a subgenus of *Stenosyrphus*.

HULL (1949) mainly summarized the earlier works.

The generic taxonomy of the genus *Syrphus* with allied genera has largely been based on colour patterns, hairiness of eyes, form of abdomen and other characters, with unsatisfactory results. COLLIN (1952) introduced, in addition, the hairiness of the mesopleura and the dark chitinized stripes on the actual hind-margin of the wing as group characters.

Although the group studied is difficult at species level, very few students have studied the male genitalia or published drawings of them. However, figures are given in the works of COLLIN (1931), FLUKE (1950, 1954), GAUNITZ (1954, 1963), GLUMAC (1958) and DUSEK & LASKA (1964). The only students who have used the axial system of the penis in Syrphid taxonomy are COLLIN (1931) and GAUNITZ (1954, 1963).

The first dipterologist to base a system on the structure of the male genitalia was MUELLER (1926), dealing with the German *Tachinidae*. In the case of the *Syrphidae*, KANERVO (1938) proposed a phylogenetic system of European species of the genus *Eristalis* which was based on the structure of the male genitalia. BEAN (1949) has similarly studied North American species of the genus *Tubifera*.

FLUKE (1950) published profiles of male genitalia of no less than 136 species of *Syrphus*, *Epistrophe* and allied genera. The species are mainly American but many Palaeartic species were also figured. In that work the following genera were recognized on the basis of the structure of the male genitalia: the genus *Syrphus* with subgenera *Syrphus* s. str. and *Epistrophe*, the genus *Stenosyrphus* with subgenera *Stenosyrphus* s. str., *Episyrphus*, *Meligramma*, a new subgenus *Metepistrophe (Epistrophe remigis)*, *Ischyrosyrphus* and a new subgenus *Mercurymyia (Epistrophe caldus)*, the genus *Claraplumula*, the genus *Fazia*, the genus *Allograpta*, the genus *Metasyrphus* with subgenera *Metasyrphus* s. str. and *Posthosyrphus* and the genus *Dasysyrphus*. The non-Palaeartic genera *Claraplumula*, *Fazia* and *Allograpta* and the subgenera *Mercurymyia* and *Metepistrophe* are not considered in the present paper.

In several papers GLUMAC (1958, 1960a 1960b) has studied the taxonomic value of the male genitalia, mainly at subfamily level.

In the present work, the male genitalia are used to revise the generic taxonomy of the genus *Syrphus* with allied genera in the Palaearctic region.

MATERIAL AND METHODS

The material used in this study consists of dry pinned specimens. Most are from my own collection but I have received additional material from the following museums: the Zoological Museum of the University of Helsinki, the Zoological Museum of the University of Turku, the Zoological Institute of the Academy of Sciences of USSR, Leningrad, and the Zoological Museum of the University of Copenhagen.

After the specimen had been relaxed, the genitalia were dissected out with a fine needle and cleared by boiling in 15—20 % KOH solution. Boiling for one or two minutes was usually sufficient because it was only necessary to remove the soft parts. In some cases, however, when the genitalia were very dark, it was found best to soak the dissected parts in 10% KOH solution for about 12 hours before boiling. However, the last-mentioned method often softened the chitin too much and the genitalia were liable to be damaged during manipulation.

When cleared, the genitalia were washed in water and placed in 70 % alcohol in a spot dish with some cotton wool on the bottom for microscopic study and for drawing a picture.

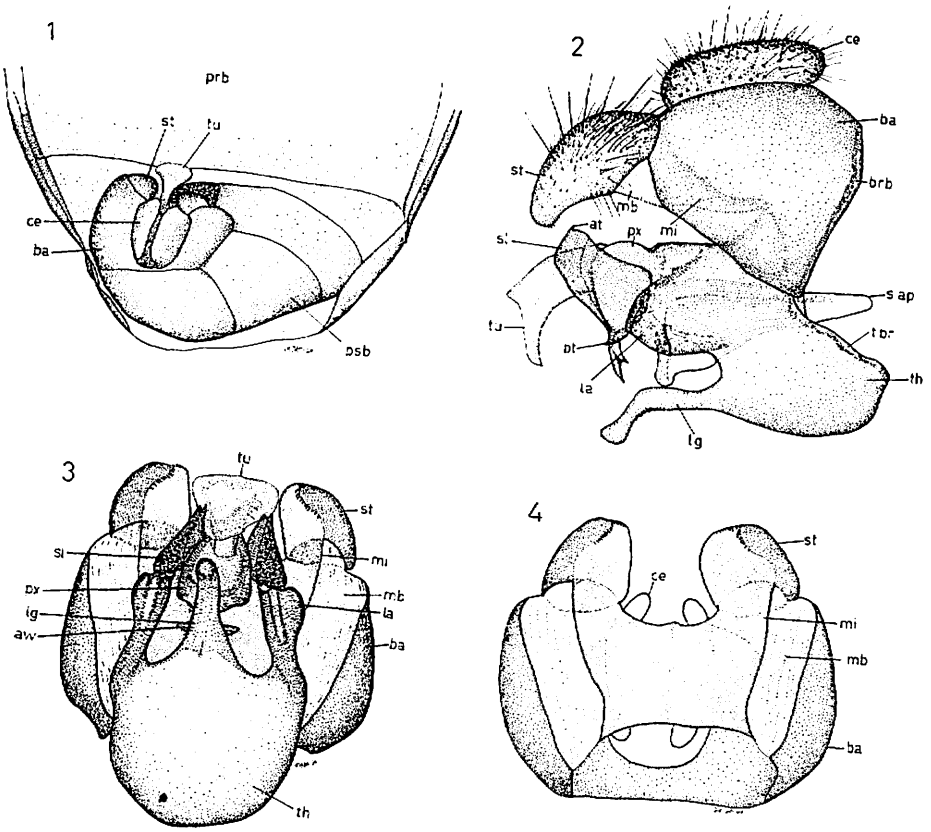
All the drawings in this paper have been made on tracing paper with the aid of a Wild M5 Zeichentubus attached to a Wild M5 stereomicroscope. From the image magnified with an optic pantograph a detailed drawing with shading has been made. For drawing a total view of the genitalia, the hypandrium and epandrium are spread out so that all the necessary parts can be seen. In many cases it has been impossible to place the epandrium and hypandrium so that both can be seen in absolute profile. All the hairs of the cerci and styli have been drawn in Fig. 2 and only the black bristle-like hairs of the styli have been drawn in all figures. After the total view has been drawn, the axial system of the penis is manipulated free from the theca and superior lobes, and a drawing is made. The small apicoventral spinules of the tubus can not be seen well with a stereomicroscope and they have been added after study with a Wild M20 microscope. The figures of the genitalia of different species have not been drawn to the same scale.

To avoid confusion concerning the specific identity of the species dealt with in this paper, a short description of every specimen studied is given with two figures: one depicting the profile of the head and the other the abdominal pattern. The parts mentioned have been drawn as they appeared under the microscope, without any improvements. The figures of the head and of the abdomen, respectively, have been drawn to the same scale. In the descriptions of the species of different genera and species groups somewhat different characters are mentioned and attention has mainly been paid to distinguishing characters, some of which have not formerly been used. In the descriptions of the male genitalia of different species, usually only the points in which they differ from nearly allied species are mentioned. For the most part, the descriptions of the genera in the present paper are based only on the material examined and will probably be much changed after species from other regions have been studied.

Excluding some Japanese species, the material of the group studied covers about 85 % of the species known in the Palaearctic region.

STRUCTURE OF THE MALE GENITALIA AND NOMENCLATURE USED

In the following description of the genitalia I mainly follow the nomenclature of METCALF (1921) and GAUNITZ (1960). The abdomen is composed of two parts:



Figs. 1—4: Male genitalia of *Syrphus torvus* O. S. — *1.* tip of abdomen in ventral view, — *2.* dextrolateral view of male genitalia, — *3.* ventral view of male genitalia, — *4.* ventral view of epandrium. Abbreviations for *Figs. 1—7:* at = apical tooth; aw = posterolateral wings of the sustentacular apodeme; ba = basale; brb = basal rim of basale; bt = basal tooth; ce = cercus; dc = dorsolateral corner of basal rim of theca; la = lateral arm; lg = lingula; lw = lateral wing of tubus; mb = membrane; mi = minis; prb = preabdomen; psb = postabdomen; px = pyxis; s.ap = sustentacular apodeme; sl = superior lobe; st = stylus; tbr = basal rim of theca; th = theca; tu = tubus.

the symmetrical preabdomen (Fig. 1: prb), containing normal segments, and the postabdomen (Fig. 1: psb), with strongly modified segments. The segments incorporated in the preabdomen are from the first to the fifth and those in the postbadomen beyond the fifth. This numbering of segments does not correspond to the case described as primitive by METCALF (op. cit.). In the Syrphini the fifth tergite is fairly normal but the fifth sternite is strongly modified and asymmetrical (see Fig. 1). The postabdomen is highly asymmetrical, due to rotation through 180 degrees clockwise round its long axis, so that what is morphologically the ventral

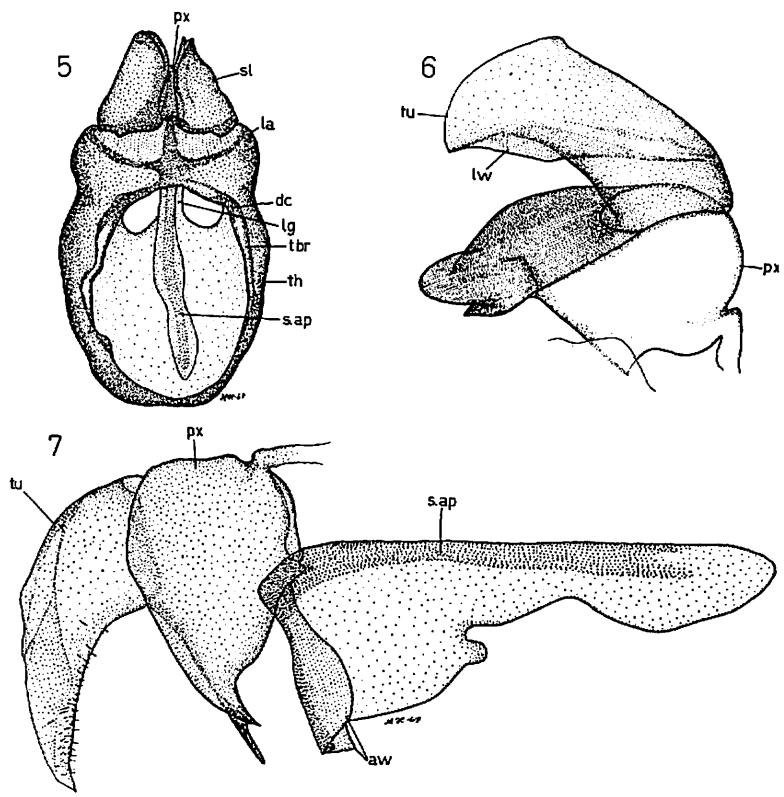
face of the tip of the postabdomen or hypopygium actually forms the dorsal surface. At the same time the postabdomen has also twisted through 180 degrees clockwise so that the posterior face of the hypopygium is directed anteriourly. For further discussion, see CRAMPTON (1942), VAN EMDEN (1953) and VAN EMDEN & HENNIG (1956). When at rest, the postabdomen is coiled in a depression under the tip of the preabdomen, called by METCALF the genital pouch.

The genitalia proper are composed of dorsal epandrium and ventral hypandrium, which are articulated with one another. The largest part of the epandrium is the strongly convex ninth tergite called by GAUNITZ (op. cit.) basale (Figs. 1,2,3,4: ba). The basal margin of the basale is somewhat thickened and is called the basal rim (Fig. 2: brb) (METCALF op. cit.). On the posterolateral margin of the basale are articulated paired appendages, the styli (Figs. 1,2,3,4: st). The outer faces of the styli are more or less densely clothed with hairs or bristles of varying length. On the inner faces of the tips of the styli there are usually numerous short spinules. Within the basale there is a chitinized plate, called the tenth sternite by METCALF and the minis (Figs. 3, 4: mi) by GAUNITZ. The minis is articulated with the basal margin of the inner sides of the styli and is connected by a membrane (Figs. 2, 3, 4: mb) to the lateroventral margins of the basale. The membrane is also partly attached to the basolateral margins of the styli. The anterolateral corners of the minis are articulated with the dorsolateral corners of the theca (Fig. 5: dc). Thus when the epandrium and hypandrium are opened, the basal rim of the theca pushes the minis backwards, which in turn makes the styli lever and open. On the dorsal side of the basale there is a large emargination called by METCALF the cercal emargination. In this emargination are situated the semioval and compressed cerci (Figs. 1, 2, 4: ce), which are attached to the basale by a membrane. The cerci are clothed with minute hairs and also with longer ones arising from distinct basal rings (Fig. 2).

The most conspicuous part of the hypandrium is the theca (Figs. 2, 3, 5: th), called by METCALF the penis sheath. The theca is a somewhat cylindrical structure with a heavy basal rim (Figs. 2, 5: tbr) (METCALF op. cit.) by which it is articulated with the anteroventral corners of the basale and with the minis. Midventrally the posterior end of the theca often bears an unpaired appendage called by METCALF the lingula (Figs. 2, 3, 5: lg), which is developed in varying degree in the different groups of Syrphini. Posterolaterally on the theca there are the lateral arms (Figs. 2, 3, 5: la), also developed to varying degree in different species. On the lateral arms are articulated paired lobes of varying shape and size (Figs. 2, 3, 5: sl), called lobi superiores by METCALF or Schlosslobe by GAUNITZ. In the profile picture of a superior lobe it is usually possible to see one or two apical teeth (Fig. 2: at) and one or two basal teeth at the posterior corner (Fig. 2: bt). The superior lobes are also articulated with the chitinous box of the axial system of

the penis. The theca and superior lobes form the structure called the peripheral system of the penis (METCALF op. cit.).

Partly lying within the theca is the structure called the axial system of the penis (METCALF op. cit.), which is composed of three major parts. The ejaculatory hood (METCALF op. cit.) or tubus (GAUNITZ op. cit.) (Figs. 1, 2, 3, 7: tu) is a more or less weakly chitinized tube. The tubus usually bears small spinules apicoventrally and sometimes lateral wing-like projections (Fig. 6: lw). It is articulated with the next part, the chitinous box (METCALF op. cit.) or pyxis (GAUNITZ op. cit.) (Figs. 2, 3, 5, 6, 7: px). The pyxis is a tubular or somewhat box-like structure and usually bears paired lateroventral appendages or is like the structure in Figs. 6 and 7, or may be quite simple. The anterior face of the pyxis is attached middorsally to the theca and laterodorsally articulated with the superior lobes, and it is also articulated with the third part of the axial system called the sustentacular apodeme (METCALF op. cit.) (Figs. 2, 5, 7: s.ap). The latter is a largely membran-



Figs. 5—7: Male genitalia of *Syrphus torvus O.S.* — *5.* dorsal view of hypandrium, — *6.* posterolateral view of pyxis with tubus, — *7.* axial system of penis in dextrolateral view.

eous structure which is more or less thickened proximally and dorsally. The posterior end of the sustentacular apodeme bears lateral membraneous wing-like appendages (Figs. 3, 7: aw). The sustentacular apodeme serves for attachment of muscles.

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A GENERIC REVISION OF THE GENUS *SYRPHUS* AND ALLIED GENERA

Genus *Melangyna* VERRALL

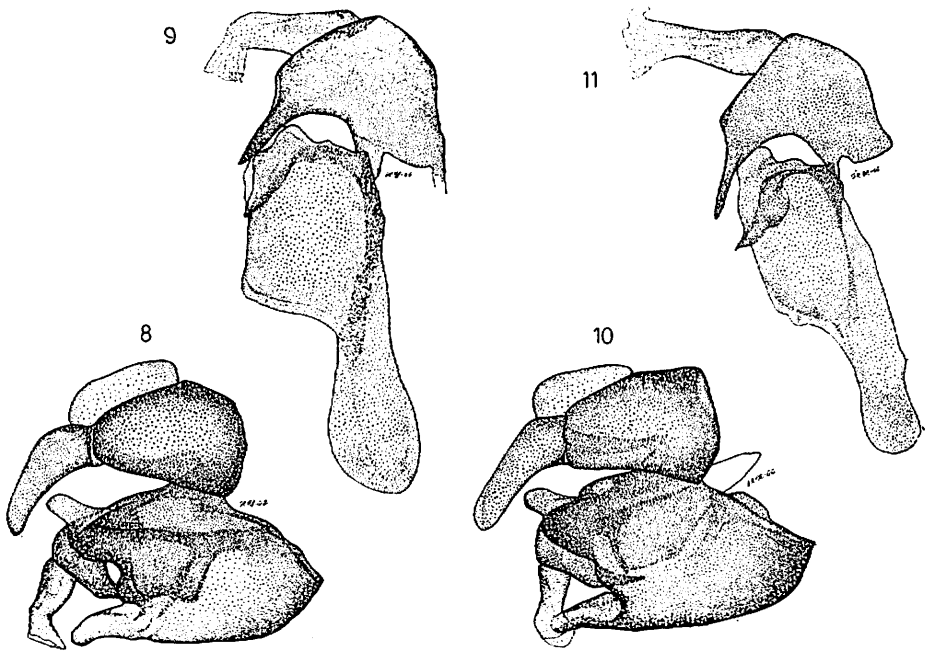
Melangyna VERRALL 1901, British flies 8, p. 313. Type-species *Melanostoma quadrimaculatum* VERRALL 1873, by monotypy.

Stenosyrphus MATSUMURA 1917, Ent. Mag., Kyoto 3:1, p. 14. Type-species *Scaeva lasiophthalma* ZETTERSTEDT 1843, by original designation.

Extensively dark species. Face considerably darkened with a broad median stripe and broadly black mouth-edge or even totally black. If the face is pale, then heavily dusted. Eyes bare or hairy in varying degree. Mesonotum dull or faintly shining. Mesopleura just behind the prothoracic stigma without any long hairs. Metasternum bare. Abdomen narrow, its sides almost parallel and without margination. Abdominal pattern composed of three pairs of more or less quadrangular spots, which on the second tergite are often rudimentary or absent.

Styli usually somewhat long and narrow. The genus is well characterized by its gross dimensions and the characteristic shape of the theca. Lingula short, extending about as far posteriorly as the lateral arms. Lateral arms distinct, short and broad. Superior lobes of typical shape and in typical position, without any apical teeth, but usually with one or two basal teeth. Pyxis not strongly compressed laterally and with one pair of lateroventral appendages, the structure of which can be seen in Fig. 18. Tubus relatively short, usually well chitinized and with small apicoventral spinules. Lateral wings at posterior end of sustentacular apodeme unusually well chitinized.

Remarks: Since VERRALL (1901) erected *Melangyna* for his species *Melanostoma quadrimaculatum*, this genus has been considered monotypic up to the present day. LUNDBECK (1916) and SACK (1932) refered to its close similarity to *Syrphus barbifrons* (FALLEN), the only clear distinction being the hairy eyes and the entirely black abdomen of the female. VIOLOVITSH (1956, 1960), dealing with his new species *Syrphus pavlovskyi*, made no reference to *M. quadrimaculata*, although these species are extremely similar. In the catalogue of STONE, CURTIS, SABROSKY, et al. (1965), the genus *Melangyna* was no longer monotypic.



Figs. 8—9: Male genitalia of *Melangyna umbellatarum* (FABR.) in dextrolateral view. — *8.* general, — *9.* axial system of penis. — Orig.
Figs. 10—11: Male genitalia of *Melangyna compositarum* (VERR.) in dextrolateral view. — *10.* general, — *11.* axial system of penis. — Orig.

Melangyna umbellatarum (FABRICIUS)

Syrphus umbellatarum FABRICIUS 1794, Ent. Syst. 4, p. 307.

Specimen studied (Finland, Kustö): Frons black, pale-dusted, black-haired. Lunula yellowish. Face yellow, heavily white-dusted, pale-haired. Mouth-edge broadly brown. Median stripe brown, extending near bases of antennae. Antennae unicolorous dark brown. Eyes with inconspicuous hairs. For profile of head, see Fig. 27. Thorax greyish green, somewhat dull. Postalar calli partly brownish. Scutellum yellow, laterally and along front margin, however, mixed with yellow hairs. Wings faintly brown; stigma pale brown. Legs mainly dark brown: Tips of all femora, basal third of anterior and middle tibiae, extreme base of hind tibiae and tips of all tibiae pale. For abdominal pattern, see Fig. 36. Spots on fourth tergite extending narrowly over side-margins. Second, third and fourth sternites pale. Wing length 8.6 mm.

Genitalia (Figs. 8—9): Differs from the other species in shape of styli, course of posterior margin of theca, shape of lateral arms, and shape of pyxis and its appendages.

Melangyna compositarum (VERRALL)

Syrphus compositarum VERRALL 1873, Ent. Mon. Mag. 9, p. 254.

Specimen studied (Finland, Somero 16. VII. 1964): Differs from the specimen of *M. umbellatarum* examined in the following respects: Frons slightly grey-dusted. Face dirty yellow,

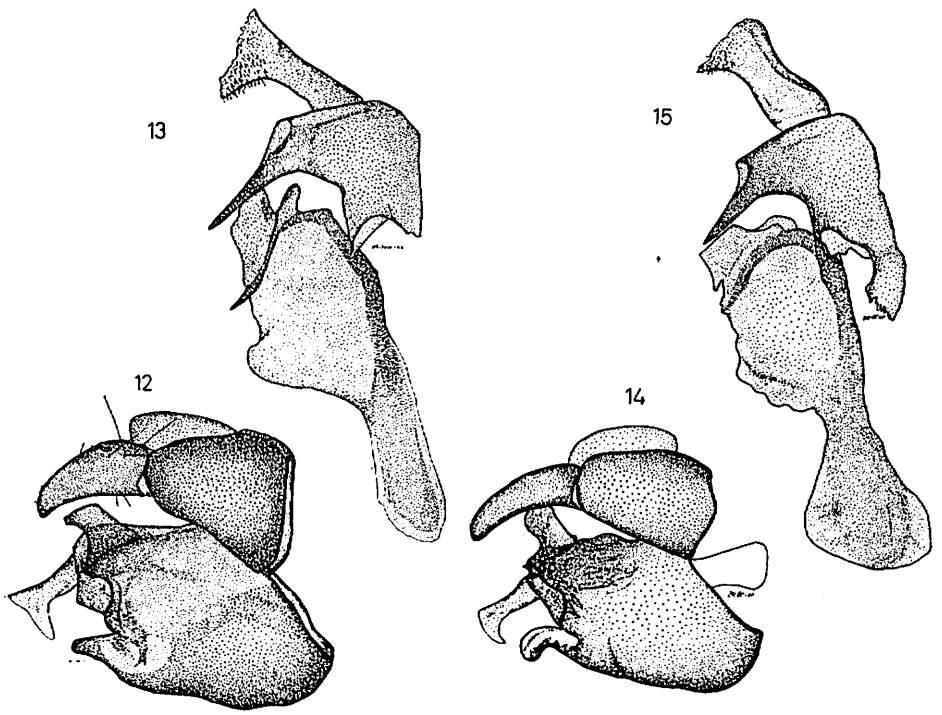
not so heavily dusted. Mouth-edge more broadly black. Median stripe broad and black, narrowing evenly towards base of antennae. For profile of head, see Fig. 28. Wings clear. Apical fifth of anterior femora, basal two-thirds of anterior and middle tibiae yellow. For abdominal pattern, see fig. 37. Yellow spots on fourth tergite not extending over side-margins. Wing length 8.0 mm.

Genitalia (Figs. 10—11): Distinguished from the foregoing species by different shape of pyxis and course of posterior margin of theca.

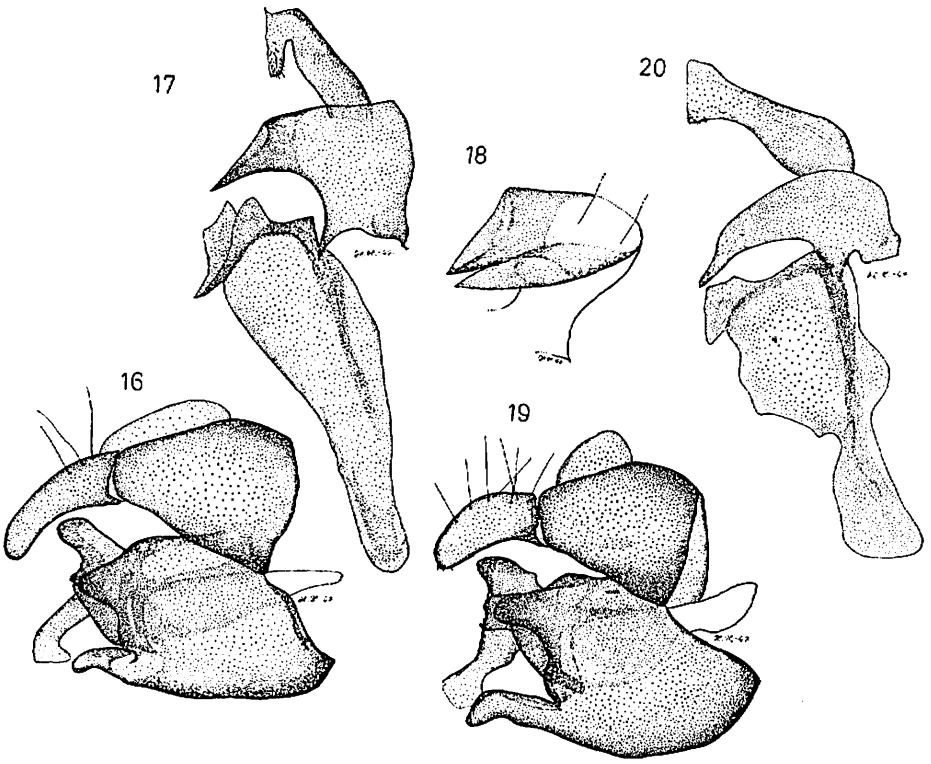
Melangyna lasiophthalma (ZETTERSTEDT), n. comb.

Scaeva lasiophthalma ZETTERSTEDT 1843, Dipt. Scand. 2, p. 735.

Specimen studied (Finland, Somero 3. V. 1964): Differs from *M. umbellatarum* in the following respects: Frons only slightly dusted. Face dirty yellow, not so heavily dusted, black-haired. Mouth-edge broadly black. Median stripe black, broad, extending to base of antennae. Eyes distinctly short-haired. For profile of head, see Fig. 29. Mesonotum bronze-coloured, laterally shining, dullish in the middle. Scutellum brownish, laterally and along front- and hind-margin black. Wings clear; stigma brown. Only the bases of all tibiae pale. For abdominal pattern,



Figs. 12—13: Male genitalia of *Melangyna lasiophthalma* (ZETT.) in dextrolateral view. — *12.* general, — *13.* axial system of penis. — Orig.
Figs. 14—15: Male genitalia of *Melangyna labiatarum* (VERR.) in dextrolateral view. — *14.* general, — *15.* axial system of penis. — Orig.



Figs. 16—18: Male genitalia of *Melangyna olsufjevi* (VIOL.). — *16.* general, — *17.* axial system of penis in dextrolateral view, — *18.* posterolateral view of pyxis. — Orig.
Figs. 19—20: Male genitalia of *Melangyna arctica* (ZETT.) in dextrolateral view. — *19.* general, — *20.* axial system of penis. — Orig.

see fig. 38. Spots on the fourth tergite not extending over side-margin. Second, third and fourth sternites dark with two large pale spots near front-margin; hind-margin also pale. Wing length 7.8 mm.

Genitalia (Figs. 12—13): Differs from other species in shape of styli, basale, and superior lobes, course of hind-margin of theca with lateral arms, and shape of pyxis and its appendages.

Melangyna labiatarum (VERRALL), n. comb.

Syrphus labiatarum VERRALL 1901, British Flies 8, p. 415.

Specimen studied (England, The park, Cirencester 9. VII. 1924): Differs from *M. lasiophthalma* in the following respects: Frons heavily brown-dusted. Face paler, heavily grey-dusted except for central prominence. Median stripe dark brown and extending just over central prominence. For profile of head, see Fig. 30. Mesonotum greyish brown, dull in the middle, laterally shining. Scutellum yellow, with only lateral corners black. Wings distinctly brownish. Tips of anterior and middle femora, both ends of anterior and middle tibiae and base

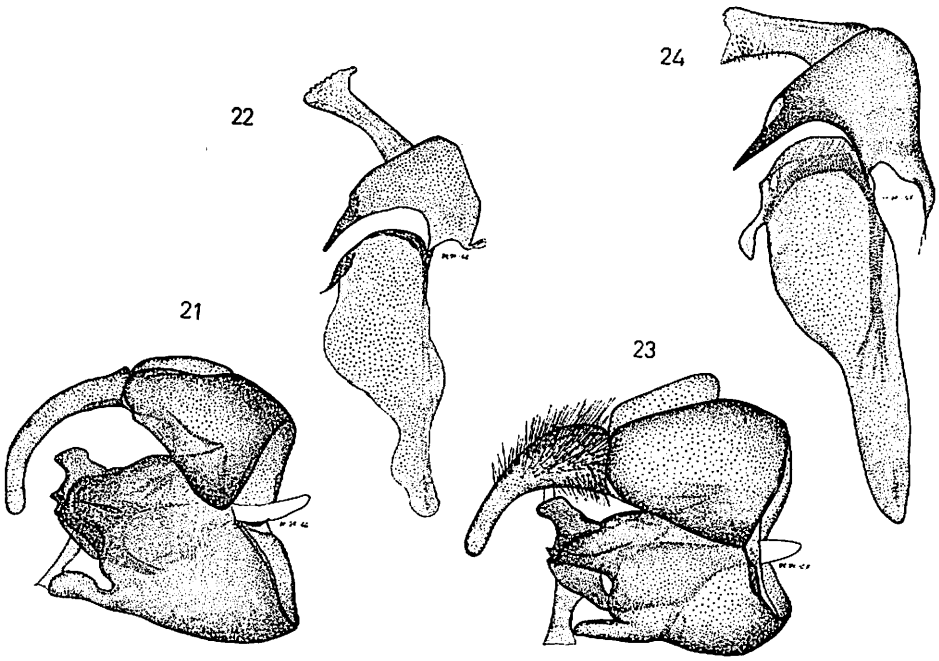
of hind tibiae pale. For abdominal pattern, see Fig. 39. Second sternite pale, third and fourth dark. Wing length 7.0 mm.

Genitalia (Figs. 14—15): Distinguished by shape of superior lobes, lingula and pyxis with its appendages.

Melangyna olsufjevi (VIOLOVITSH), n. comb.

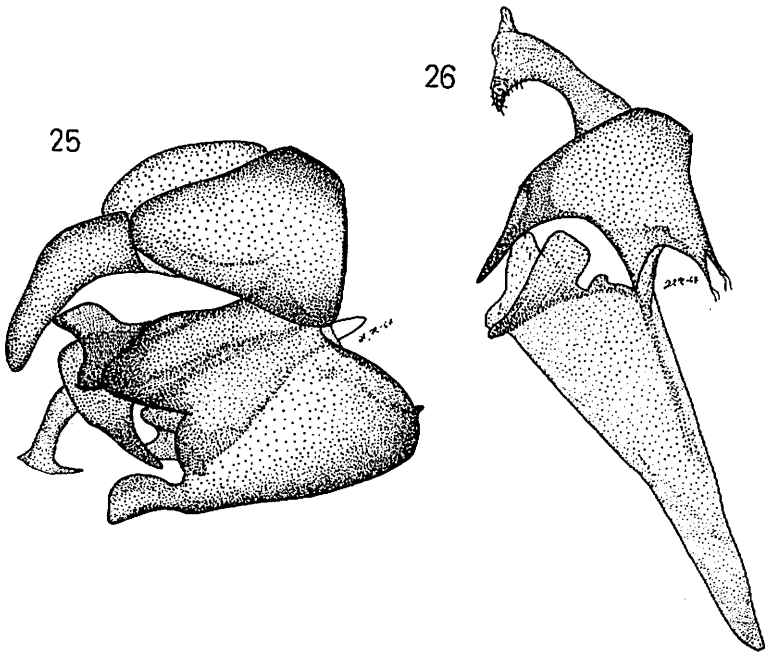
Syrphus olsufjevi VIOLOVITSH 1956, Zool. Zhurn. 35:5, p. 742.

Specimen studied (USSR, Sakhalin): Frons black, pale-dusted, black-haired. Lunula brown. Face yellow with a black median stripe extending about half-way between central prominence and bases of antennae. Face black-haired, pale-dusted. Mouth-edge broadly black. Antennae blackish brown. Eyes densely pale-haired. For profile of head, see Fig. 31. Mesonotum in the middle blackish brown and dull, in front and laterally green, somewhat shining. Postalar calli partly brownish. Scutellum yellowish brown, laterally broadly black, yellow-haired, posteriorly with some black hairs. Wings clear; stigma brown. Legs mainly yellow: about half of anterior and middle femora and three-fifths of hind femora basally dark. Extreme base of hind femora also pale. All tibiae with a submedian annulation. All tarsi distinctly darkened. For abdominal pattern, see Fig. 40. Sternites dark; second and third with two large pale spots at front-margin; the posterior margins also somewhat broadly pale. Wing length 10.0 mm.



Figs. 21—22: Male genitalia of *Melangyna barbifrons* (FALL.) in dextrolateral view. — *21.* general, — *22.* axial system of penis. — Orig.

Figs. 23—24: Male genitalia of *Melangyna quadrimaculata* (VERR.) in dextrolateral view. — *23.* general, — *24.* axial system of penis. — Orig.



Figs. 25—26: Male genitalia of *Melangyna pavlovskyi* (VIOL.) in dextrolateral view. — *25.* general, — *26.* axial system of penis. — Orig.

Genitalia (Figs. 16—18): Distinguished by shape of basale, shape and size of superior lobes and shape of pyxis with relatively short appendages.

Melangyna arctica (ZETTERSTEDT)

Scaeva arctica ZETTERSTEDT 1838, Ins. Lapp., p. 604.

Specimen studied (USSR, Pechenga): Frons and face black, black-haired. Antennae black. Eyes bare. For profile of head, see Fig. 32. Mesonotum somewhat black, slightly shining. Scutellum laterally and along front- and hind-margins broadly black, black-haired. Wings brownish; stigma brown. Halteres darkened. Legs black; only tips of femora and bases of tibiae paler. For abdominal pattern, see Fig. 41. Sternites dark; posterior margin of the second and front-margin of the third pale. Wing length 7.0 mm.

Genitalia (Figs. 19—20): The species is well characterized by the relatively short and broad styli, the unusual length of the lingula, the shape of the superior lobes and the pyxis with its appendages.

Melangyna barbifrons (FALLEN), n. comb.

Scaeva barbifrons FALLEN 1817, Dipt. Suec. Syrph., p. 45.

Specimen studied (Finland, Somero 17. V. 1964): Differs from the foregoing species in the following respects: Middle part of face brownish. For profile of head, see Fig. 33. Mesonotum

brownish black, hardly shining. Wings almost clear; stigma dark brown. Halteres pale. Basal two-fifths of tibiae somewhat pale. For abdominal pattern, see Fig. 42. Abdominal spots black-haired. Sternites dark, the third with two pale spots near front-margin; hind-margin also pale. Wing length 6.5 mm.

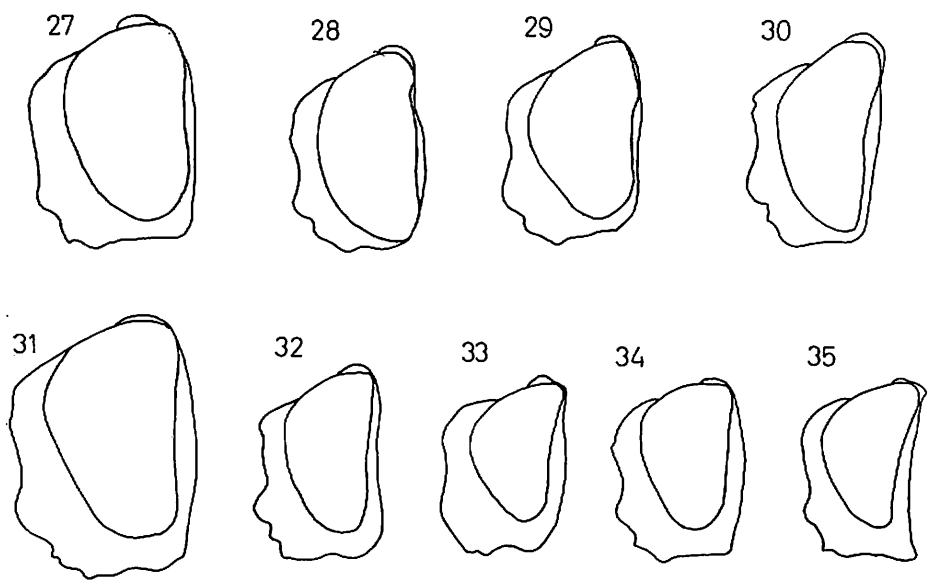
Genitalia (Figs. 21—22): Easily distinguished from the other species studied by the long, narrow, curved styli, and the shape of lingula, superior lobes and pyxis.

Melangyna quadrimaculata (VERRALL)

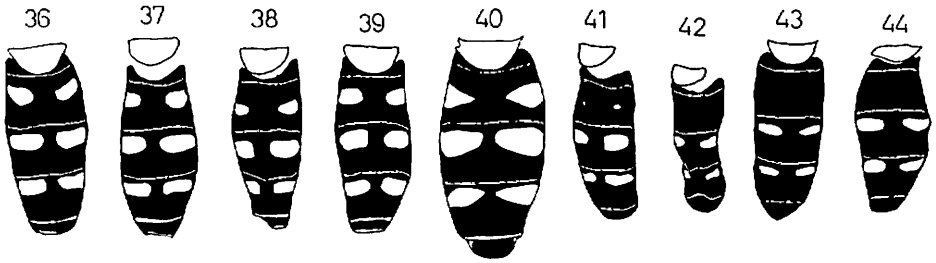
Melanostoma quadrimaculatum VERRALL 1873, Ent. Mon. Mag. 9, p. 281.

Specimen studied (Denmark, Geel Skov 22. IV. 1917): Frons and face blackish brown; bases of antennae paler, black-haired. Antennae blackish brown. Eyes densely short grey-haired. For profile of head, see Fig. 34. Mesonotum blackish brown, dullish, in the middle pale-haired, laterally black-haired as are also the pleurae. Postalar calli partly brownish. Scutellum yellowish in the middle, broadly blackish brown along margins, clothed in the middle and along front-margin with yellow hairs mixed with some black ones, laterally and along hind-margin black-haired. Wings very faintly brownish; stigma dark brown. Legs dark blackish brown, knees somewhat paler. For abdominal pattern, see Fig. 43. Second abdominal segment laterally black-haired. Second, third and fourth sternites dark with pale hind-margins. Wing length 7.3 mm.

Genitalia (Figs. 23—24): Characterized by shape and numerous black bristles of styli, shape of lingula, superior lobes, lateral arms and pyxis with its appendages.



Figs. 27—35: Heads of the *Melangyna* species studied, in profile. — *27. M. umbellatarum* (FABR.), — *28. M. compositarum* (VERR.), — *29. M. lasiophthalma* (ZETT.), — *30. M. labiatarum* (VERR.), — *31. M. olsufjevi* (VIOL.), — *32. M. arctica* (ZETT.), — *33. M. barbifrons* (FALL.), — *34. M quadrimaculata* (VERR.), — *35. M. pavlovskyi* (VIOL.). — Orig.



Figs. 36—44: Abdominal patterns of the *Melangyna* species studied. — *36. M. umbellatarum* (FABR.) — *37. M. compositarum* (VERR.), — *38. M. lasiophthalma* (ZETT.), — *39. M. labiatarum* (VERR.), — *40. M. olsufjevi* (VIOL.), — *41. M. arctica* (ZETT.), — *42. M. barbifrons* (FALL.), — *43. M. quadrimaculata* (VERR.), — *44. M. pavlovskyi* (VIOL.). — Orig.

Melangyna pavlovskyi (VIOLOVITSH), n. comb.

Syrphus pavlovskyi VIOLOVITSH 1956, Zool. Zhurn. 35:5, p. 741.

Specimen studied (USSR, South Sakhalin 18. V. 1953): Differs from the specimen of *M. quadrimaculata* examined in the following respects: Frons and face black, black-haired, grey-dusted. Antennae black. Eyes somewhat long-haired. For profile of head, see Fig. 35. Mesonotum more extensively pale-haired; pleurae mainly pale-haired. Postalar calli black. Scutellum shining bluish, with dark margination less broad, laterally mainly pale-haired. Wings faintly greyish; stigma brown. For abdominal pattern, see Fig. 44. Abdominal spots bluish. Second abdominal segment laterally pale-haired. Wing length 7.0 mm.

Genitalia (Figs. 25—26): Distinguished by shape of pyxis and superior lobes, course of posterior margin of theca and lateral arms. Lingula very similar to that of *M. barbifrons*.

The following Nearctic species can be included in the genus *Melangyna* VERRALL on the basis of the figures published by FLUKE (1950):

Syrphus mentalis WILLISTON 1886 = *Melangyna mentalis* (WILLISTON).
Syrphus pullulus SNOW 1895 = *M. pullulus* (SNOW).
Syrphus fisheri WALTON 1911 = *M. fisheri* (WALTON).
Melanostoma cherokeenensis JONES 1917 = *M. cherokeenensis* (JONES).
Stenosyrphus vittifacies CURRAN 1923 = *M. vittifacies* (CURRAN).
Stenosyrphus albipunctatus CURRAN 1924 = *M. albipunctata* (CURRAN).
Stenosyrphus columbiae CURRAN 1924 = *M. columbiae* (CURRAN).
Stenosyrphus diversipunctatus CURRAN 1924 = *M. diversipunctata* (CURRAN).
Stenosyrphus garretti CURRAN 1924 = *M. garretti* (CURRAN).

Genus *Epistrophe* WALKER

Epistrophe WALKER 1852, Ins. Saund. Dipt., p. 242. Type-species *Epistrophe conjungens* WALKER 1852 (= *Syrphus grossulariae* MEIGEN 1822), by monotypy.

Euryepistrophe SZILADY 1940, Ann. Mus. Nat. Hung. (Zool.) 33, p. 59 (as a subgenus of *Epistrophe* WALKER 1852). Type-species *Syrphus grossulariae* MEIGEN 1822, by designation of GOFFE 1944.

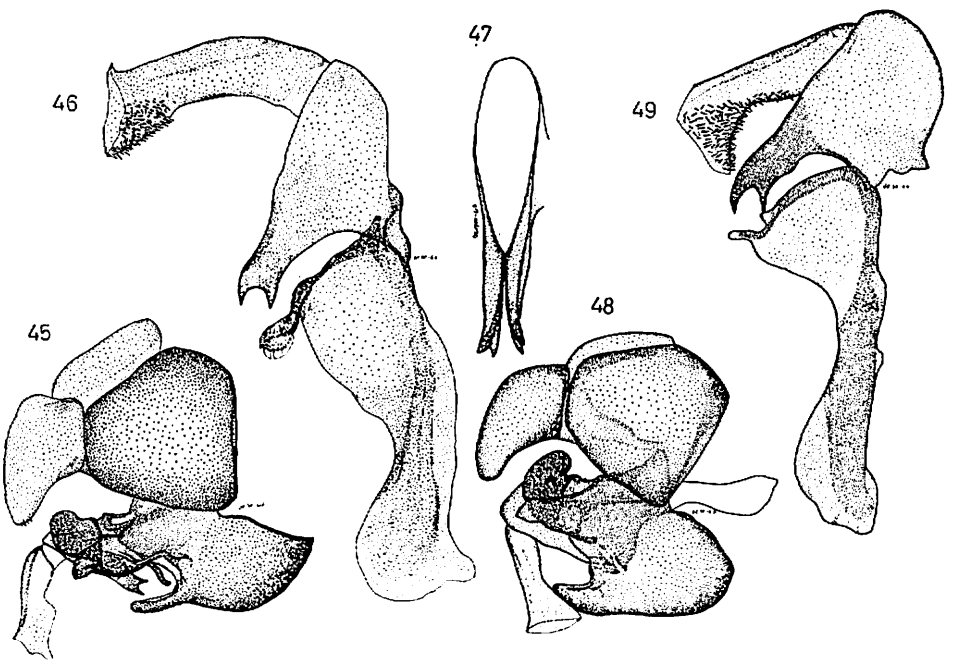
Face yellow, usually without a dark median stripe. Eyes bare or more or less distinctly hairy. Mesonotum shining or dull. Mesopleura just behind the prothoracic stigma, without any long hairs. Metasternum bare or hairy. Abdomen oval, seldom with parallel sides, without margination. Abdominal pattern on the second tergite composed of somewhat triangular spots, which extend at almost their maximal breadth over the lateral margin. In *E. angustifasciata* the spots on the second tergite are narrow and do not extend over the side-margin. The third and fourth tergites have entire bands extending over the side-margins, usually in full breadth, or the fourth may be totally dark.

Styli rather short and broad. Theca often with transverse corrugations ventrally, especially at the base of the lingula. Lingula short and grooved, not extending as far posteriorly as the lateral arms. Lateral arms distinct, long and narrow. Superior lobes usually relatively small, the apex rounded and without any teeth, basally with one more or less distinct tooth. Pyxis strongly compressed laterally, very high relative to its length. Lateroventrally, the pyxis bears two long and broad projections divided apically into two teeth. For structure of pyxis, see Fig. 47. Tubus rather long and weakly chitinized, apicoventrally with rather long, thick spinules.

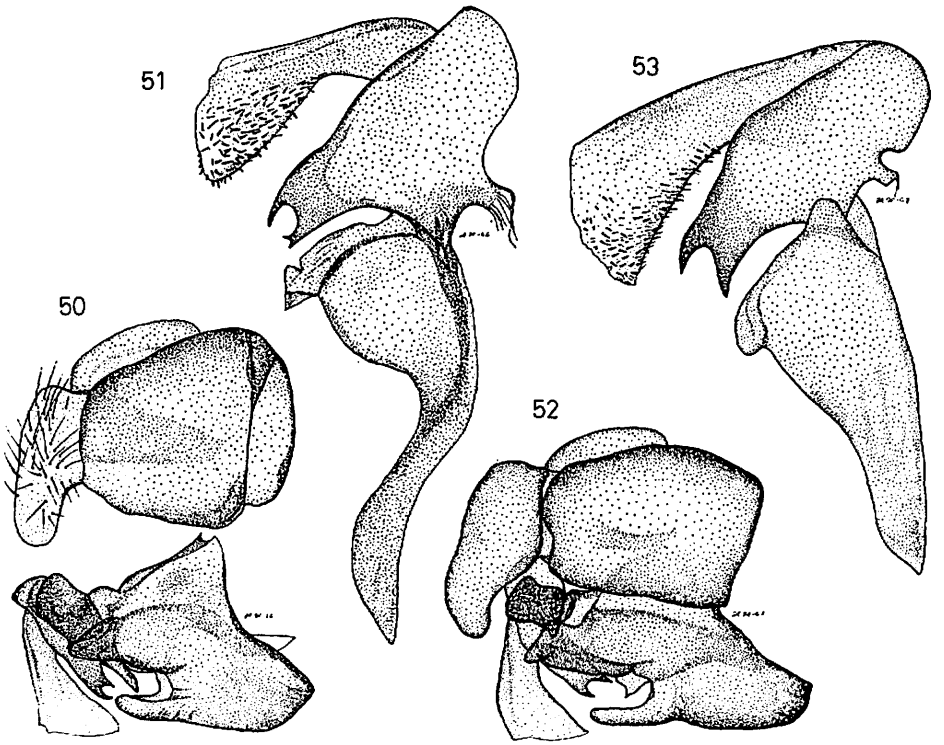
Epistrophe grossulariae (MEIGEN)

Syrphus grossulariae MEIGEN 1822, Syst Beschr. 3, p. 306.

Specimen studied (Finland, Suomussalmi): Frons brown, behind lunula heavily pale-dusted,



Figs. 45—47: Male genitalia of *Epistrophe grossulariae* (MEIG.). — *45.* general and — *46.* axial system of penis in dextrolateral view, — *47.* pyxis in posterolateral view. — Orig.
Figs. 48—49: Male genitalia of *Epistrophe annulitarsis* (STACK.) in dextrolateral view. — *48.* general, — *49.* axial system of penis. — Orig.



Figs. 50—51: Male genitalia of *Epistrophe ochrostoma* (ZETT.) in dextrolateral view. — *50.* general, — *51.* axial system of penis. — Orig.
Figs. 52—53: Male genitalia of *Epistorophe angustifasciatus* (VIOL.) in dextrolateral view. — *52.* general, — *53.* axial system of penis. — Orig.

along eye-margins yellow-haired, othervise black-haired. Lunula brown. Face yellow, pale-dusted except for central prominence, yellow-haired. Antennae unicolorous black. Eyes very inconspicuously short-haired. For profile of head, see Fig. 68. Mesonotum gold-green, dullish, laterally with metallic lustre. In front laterally of the transverse suture heavily pale-dusted. Scutellum yellow, yellow-haired, but apically black-haired. Wings brownish; stigma pale brown. Legs mainly yellow; basal fifth of anterior femora and basal fourth of middle and hind femora darkened. Three last segments of anterior and middle tarsi faintly darkened. Hind tarsi totally darkened. Anterior face of hind tibiae a little darkened in the middle. For abdominal pattern, see Fig. 79. Second sternite pale with a narrow brown median stripe; the third and fourth dark with paler anterior and posterior margins. Wing length 10.0 mm.

Genitalia (Figs. 45—47): Distinguished by shape of pyxis and lateral arms.

Epistrophe annulitarsis (STACKELBERG)

Syrphus annulitarsis STACKELBERG 1918, Bull. Akad. Sci. Russie, p. 2155.

Specimen studied (USSR, Yashchera, Leningrad region 31. VII. 1957): Differs from the specimen of *E. grossulariae* examined in the following respects: Only hind part of frons dark.

Frons totally black-haired. Lunula pale with a dark median stripe. Antennae unicolorous orange. For profile of head, see Fig. 69. Mesonotum shining gold-green. Scutellum with mixed black and yellow hairs, laterally entirely yellow-haired. Legs totally yellow, hind tarsi with black dorsal spots on both ends of first segment and on apical ends of second, third and fourth segments. For abdominal pattern, see Fig. 80. Sternites pale; second and third with posterolateral stripe-like dark spors. Wing length 9.0 mm.

Genitalia (Figs. 48—49): Distinguished by shape of pyxis, lateral arms, and superior lobes.

Epistrophe ochrostoma (ZETTERSTEDT)

Scaeva ochrostoma ZETTERSTEDT 1849, Dipt. Scand. 8, p. 3133.

Specimen studied (Finland, Somero 6. VI. 1965): Hind part of frons dark, grey-dusted; front part yellow. Frons black-haired. Lunula yellow. Face totally yellow, laterally pale-dusted, yellow-haired. Antennae totally orange. Eyes bare. Eye suture shorter than vertical triangle. For profile of head, see Fig. 70. Mesonotum greyish green, moderately shining. Scutellum yellow, with yellow hairs, mixed with some black ones in the middle. Wings clear; stigma pale brown. Legs mainly yellow; basal fifth of anterior and middle femora darkened; third and fourth segments of anterior tarsi and whole of hind tarsi slightly darkened. For abdominal pattern, see Fig. 81. Sternites pale. Wing length 9.5 mm.

Genitalia (Figs. 50—51): Easily distinguished by shape of pyxis and lateral arms. Anterior teeth of lateroventral projections of pyxis divided in two.

Epistrophe angustifasciata (VIOLOVITSH), n. comb.

Syrphus angustifasciatus VIOLOVITSH 1956, Zool. Zhurn. 35:5, p. 744.

Specimen studied (USSR, Sachalin 22. VII. 1957): Frons dark, heavily pale-dusted, black-haired. Lunula black. Face yellow, heavily pale-dusted except for central prominence, yellow-haired; dorsolaterally, however, dark-haired. Upper mouth-edge darkened. Median stripe brown, extending near bases of antennae. Antennae unicolourous blackish brown. Eyes distinctly short-haired. For profile of head, see Fig. 71. Mesonotum in the middle greyish brown and dull, laterally shining green. Postalar calli brownish. Scutellum yellow, black-haired. Wings clear; stigma black. Legs mainly yellow; three-fifths of anterior and middle femora and two-thirds of hind femora basally dark. Apical half of hind tibiae dark. Four last segments of anterior and middle tarsi dorsally and hind tarsi totally darkened. For abdominal pattern, see Fig. 82. Yellow bands on third and fourth tergites do not run over side-margins. Second, third and fourth sternites dark with a pale band at front-margin occupying about a quarter of length of sternite; hind-margin also narrowly pale. Wing length 10.8 mm.

Genitalia (Figs. 52—53): Distinguished by relatively low and long basale, shape of pyxis, lateral arms and superior lobes.

Epistrophe melanostomoides (STROBL), n. comb.

Syrphus melanostomoides STROBL 1880, Progr. Ober-Gymn. Seitenstetten 14, p. 60.

Specimen studied (Finland, Somero 9. VI. 1964): Frons black, coarsely punctate, black-haired. Lunula black, in the middle brown. Face orange-brown, laterally somewhat dusted, yellow-haired. Upper mouth-edge narrowly, behind anteroventral corners broadly black. Antennae pale brown; third segment apicodorsally darkened. Eyes with very inconspicuous short scattered hairs. For profile of head, see Fig. 72. Mesonotum brownish green, slightly grey-

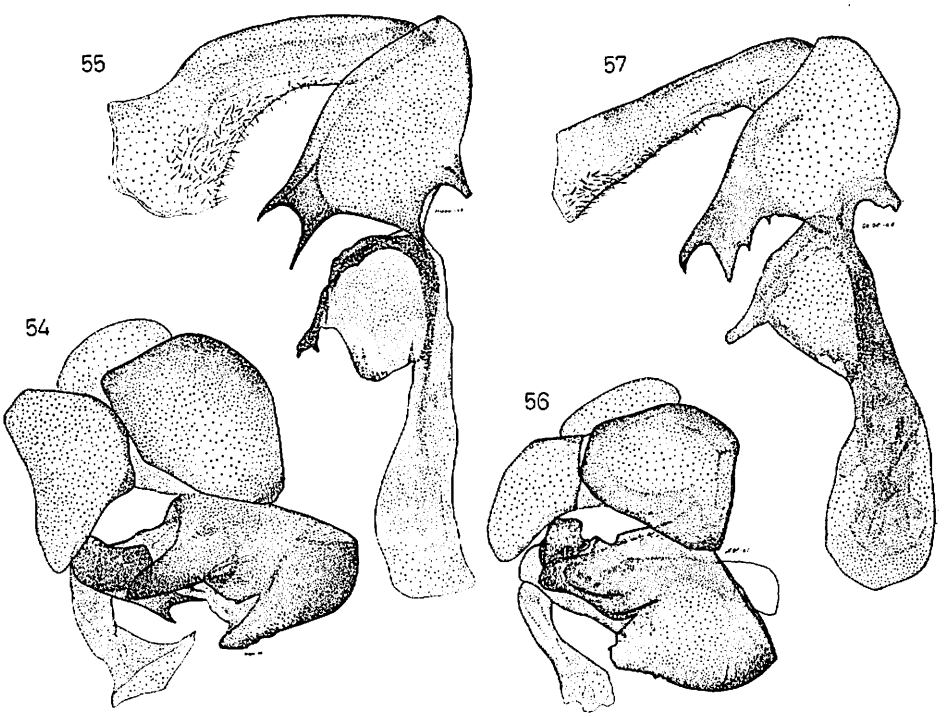
dusted behind transverse suture and postalar calli translucent brown. Scutellum yellowish, yellow-haired. Wings brownish, especially along front-margin; stigma brown. Legs mainly yellow; basal half of anterior and middle femora and basal two-thirds of hind femora black. Hind tibiae with a broad dark submedian annulation. Three middle segments of all tarsi darkened. For abdominal pattern, see Fig. 83. Second, third and fourth sternites yellow. Wing length 10.0 mm.

Genitalia (Figs. 54—55): Easily distinguished from other species studied by shape of pyxis; lateroventral projections relatively very short. Styli large and broad, with lateral arms typically shaped and superior lobes rather long.

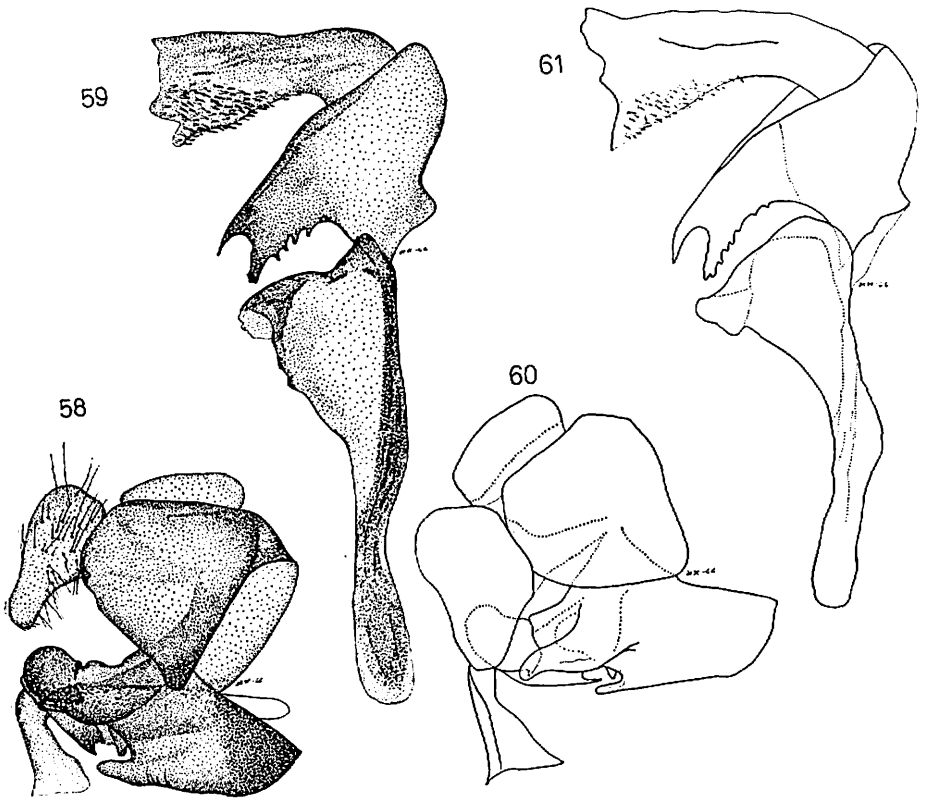
Epistrophe diaphana (ZETTERSTEDT)

Scaeva diaphana ZETTERSTEDT 1843, Dipt. Scand. 2, p. 711.

Specimen studied (Sweden, Bohuslän): Frons yellow, yellow-haired, pale-dusted, whitish yellow-haired. Antennae dark brown; first and third segments reddish at base. Eyes with very inconspicuous short scattered hairs. For profile of head, see Fig. 73. Mesonotum brownish green, somewhat shining, laterally heavily pale-dusted. Postalar calli yellowish brown. Scutellum yellow, whitish yellow-haired. Wings faintly yellowish; stigma yellow. Legs yellow;



Figs. 54—55: Male genitalia of *Epistrophe melanostomoides* (STROBL) in dextrolateral view. — *54.* general, — *55.* axial system of penis. — Orig.
Figs. 56—57: Male genitalia *Epistrophe diaphana* (ZETT.) in dextrolateral view. — *56.* general, — *57.* axial system of penis. — Orig.



Figs. 58—61: Male genitalia of *Epistrophe nitidicollis* (MEIG.) in dextrolateral view. — *58.* and *60.* general, — *59.* and *61.* axial system of penis. — Orig.

only hind tarsi darkened. For abdominal pattern, see Fig. 84. Sternites pale, the second and third with large triangular brown spots laterally on apical half. Wing length 8.8 mm.

Genitalia (Figs. 56—57): Distinguished by shape of lateral arms, superior lobes, pyxis and tubus. (Lingula destroyed). Lateroventral projections of pyxis with big teeth on anterior surface.

Epistrophe nitidicollis (MEIGEN)

Syrphus nitidicollis MEIGEN 1822, Syst. Beschr. 3, p. 308.

Specimens studied: 1. (Finland, Somero 1. VI. 1965): Hind part of frons black, grey-dusted; front part yellowish, black-haired. Lunula orange. Face brownish yellow, laterally somewhat pale-dusted, yellow-haired. Upper mouth-edge narrowly but behind the antero-lateral corners rather broadly black. Antennae orange. Eyes bare. Vertical triangle about twice as long as broad. For profile of head, see Fig. 74. Mesonotum glittering bluish green, laterally narrowly brownish. Postalar calli brownish. Scutellum yellow, yellow-haired along margins, in the middle with mixed yellow and black hairs. Wings clear; stigma brown. Legs mainly yellow; anterior and middle femora ventrally darkened at base, hind femora just after

the base. For abdominal pattern, see Fig. 85. Fourth segment slightly marginated. Sternites pale. Wing length 9.0 mm. For genitalia, see Figs. 58—59.

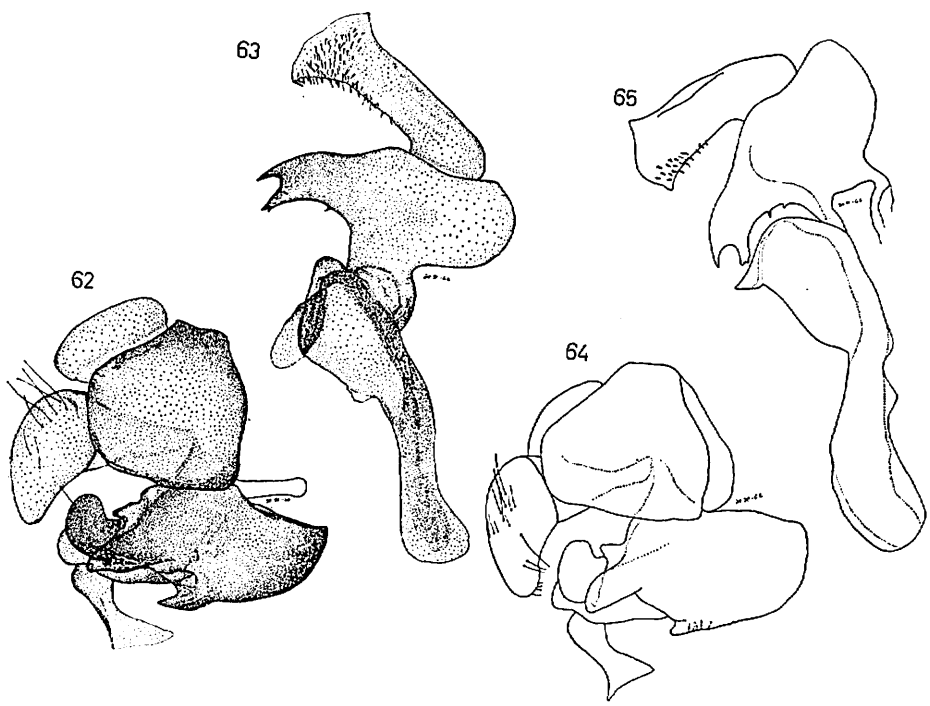
2. (Finland, Turku 23. V. 1964): Differs from the foregoing specimen in the following respects: Mouth-edge behind anteroventral corners only slightly brownish. For profile of head, see Fig. 75. Mesonotum glittering greenish black. Scutellum in the middle entirely black-haired. Hind femora totally yellow. For abdominal pattern, see Fig. 86. Wing length 9.0 mm. For genitalia, see Figs. 60—61.

Genitalia (Figs. 58—61): Distinguished by shape of lateral arms and pyxis. Anterior surface of lateroventral projections of pyxis with many big teeth.

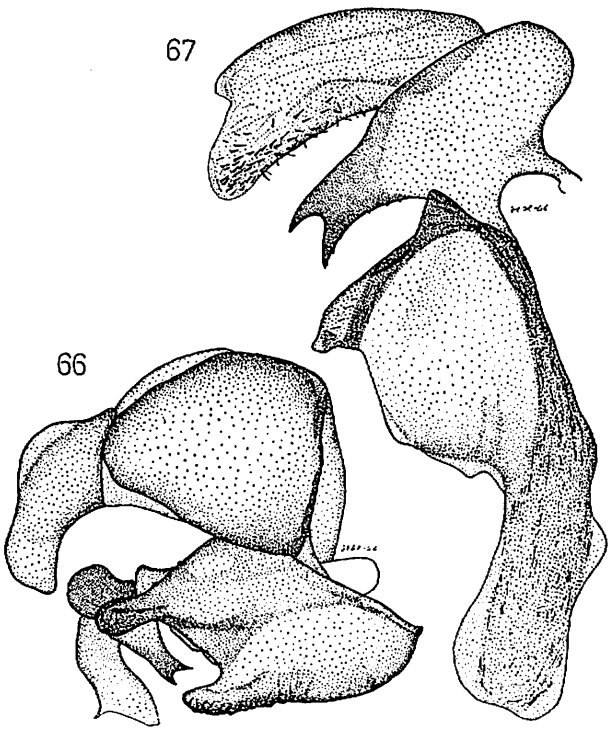
Epistrophe melanostoma (ZETTERSTEDT)

Scaeva melanostoma ZETTERSTEDT 1843, Dipt. Scand. 2, p. 711.

Specimens studied: 1. (Finland, Somero 30. V. 1965): Differs from the first-described specimen of *E. nitidicollis* in the following respects: Frons totally black. Face dorsolaterally black-haired and also with some black hairs in the middle. Mouth-edge broadly black. Third antennal segment dorsally darkened. Vertical triangle only a little longer than broad. For profile of head, see Fig. 76. Mesonotum glittering green. Scutellum totally yellow-haired. Third of anterior and fourth of middle femora basally black. Hind femora with a long brown anteroventral spot before the middle. Last three segments of anterior and middle tarsi faintly



Figs. 62—65: Male genitalia of *Epistrophe melanostoma* (ZETT.) in dextrolataral view. — *62.* and *64.* general, — *63.* and *65.* axial system of penis. — Orig.



Figs. 66—67: Male genitalia of *Epistrophe bifasciata* (FABR.) in dextrolateral view. — *66.* general, — *67.* axial system of penis. — Orig.

darkened. Last four segments of hind tarsi dark. For abdominal pattern, see Fig. 87. Fourth abdominal segment without margination. Wing length 8.1 mm. For genitalia, see Figs. 62—63.

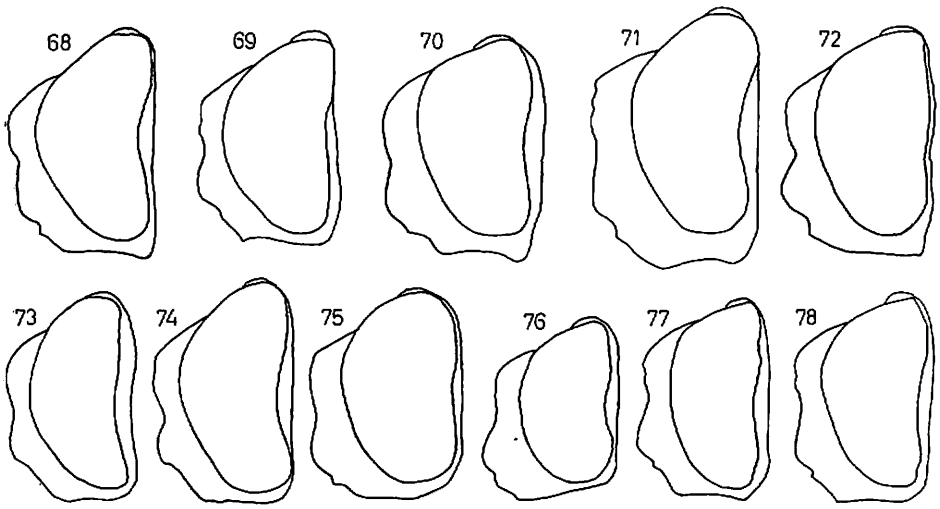
2. (Finland, Somero 6. VI. 1965): Differs from the foregoing specimen in the following respects: Face laterally with mixed black and yellow hairs. For profile of head, see Fig. 77. Scutellum with some black hairs on apical part. Hind femora with a more extensive dark area. For abdominal pattern, see Fig. 88. Second and third sternites with dark band on posterior half. Wing length 8.6 mm. For genitalia, see Figs. 64—65.

Genitalia (Figs. 62—65): Distinguished from *E. nitidicollis* by different shape of lateral arms and pyxis; posterior surface of pyxis more undulating and anterior surface of the lateroventral projections with few and smaller teeth.

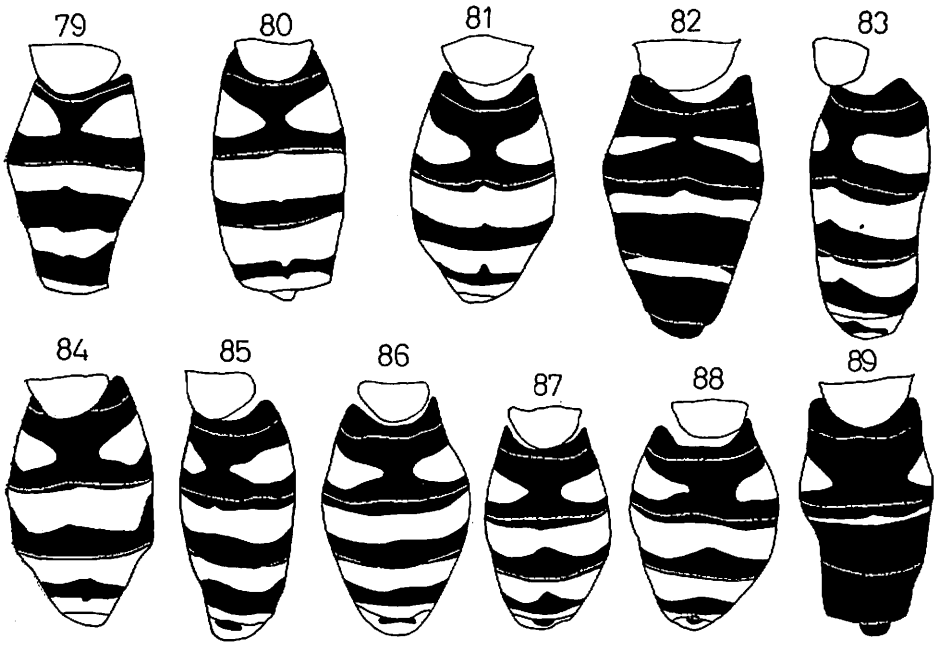
Epistrophe bifasciata (FABRICIUS)

Syrphus bifasciatus FABRICIUS 1794, Ent. Syst. 4, p. 305.

Specimen studied (Germany): Frons medially and above lunula black, otherwise yellowish, dark-haired. Lunula dark. Face yellow, slightly dusted, yellow-haired. Mouth-edge narrowly brown with a brown band from behind the anteroventral corners to the eye-margin. Antennae pale; first segment apicodorsally, second basally and third dorsally dark. Eyes with obvious, short, scattered hairs. For profile of head, see Fig. 78. Mesonotum shining me-



Figs. 68—78: Heads of the *Epistrophe* species studied, in profile. — *68. E. grossulariae* (MEIG.), — *69. E. annulitarsis* (STACK.), — *70. E. ochrostoma* (ZETT.), — *71. E. angustifasciatus* (VIOL.), — *72. E. melanostomoides* (STROBL), — *73. E. diaphana* (ZETT.), — *74.* and *75. E. nitidicollis* (MEIG.), — *76.* and *77. E. melanostoma* (ZETT.), — *78. E. bifasciata* (FABR.). — Orig.



Figs. 79—89: Abdominal patterns of the *Epistrophe* species studied. — *79. E. grossulariae* (MEIG.), — *80. E. annulitarsis* (STACK.), — *81. E. ochrostoma* (ZETT.), — *82. E. angustifasciata* (VIOL.), — *83. E. melanostomoides* (STROBL), — *84. E. diaphana* (ZETT.), — *85.* and *86. E. nitidicollis* (MEIG.), — *87.* and *88. E. melanostoma* (ZETT.), — *89. E. bifasciata* (FABR.). — Orig.

tallic greenish black. Postalar calli brown. Scutellum yellowish brown, laterally a little darkened, clothed with yellow hairs. Wings yellowish at base; stigma pale brown. Legs mainly yellow; all femora darkened at base; three basal segments of hind tarsi dark, the last two slightly darkened. For abdominal pattern, see Fig. 89. Second sternite brown, third brown with a pale band on basal half and the fourth, except for hind margin, dark. Wing length 9.4 mm.

Genitalia (Figs. 66—67): Distinguished by shape of styli, lateral arms and pyxis. Anterior surface of lateroventral projections with small inconspicuous teeth.

The following American species can be included in the genus *Epistrophe* on the basis of the figures published by FLUKE (1950):

Scaeva emarginata SAY 1823 = *Epistrophe emarginata* (SAY)
Xanthogramma felix OSTEN SACKEN 1875 = *E. felix* (OSTEN SACKEN)
Syrphus divisa WILLISTON 1882 = *E. divisa* (WILLISTON)
Syrphus xanthostomus WILLISTON 1886 = *E. xanthostoma* (WILLISTON)
Syrphus invigorus CURRAN 1921 = *E. invigora* (CURRAN)
Stenosyrphus hunteri CURRAN 1924 = E. *hunteri* (CURRAN).
Syrphus weborgi FLUKE 1931 = *E. weborgi* (FLUKE).
Metasyrphus metcalfi FLUKE. = *E. metcalfi* (FLUKE)

Genus *Leucozona* SCHINER

Leucozona SCHINER 1860, Wien. Ent. Monatschr. 4, p. 214. Type-species *Musca lucorum* LINNAEUS 1758, by monotypy.

Ischyrosyrphus BIGOT 1882, Ann. Soc. Ent. Fr. 6:2, p. LXVIII. Type-species *Musca glaucia* LINNAEUS 1758, by designation of VERRALL 1901. N. syn.

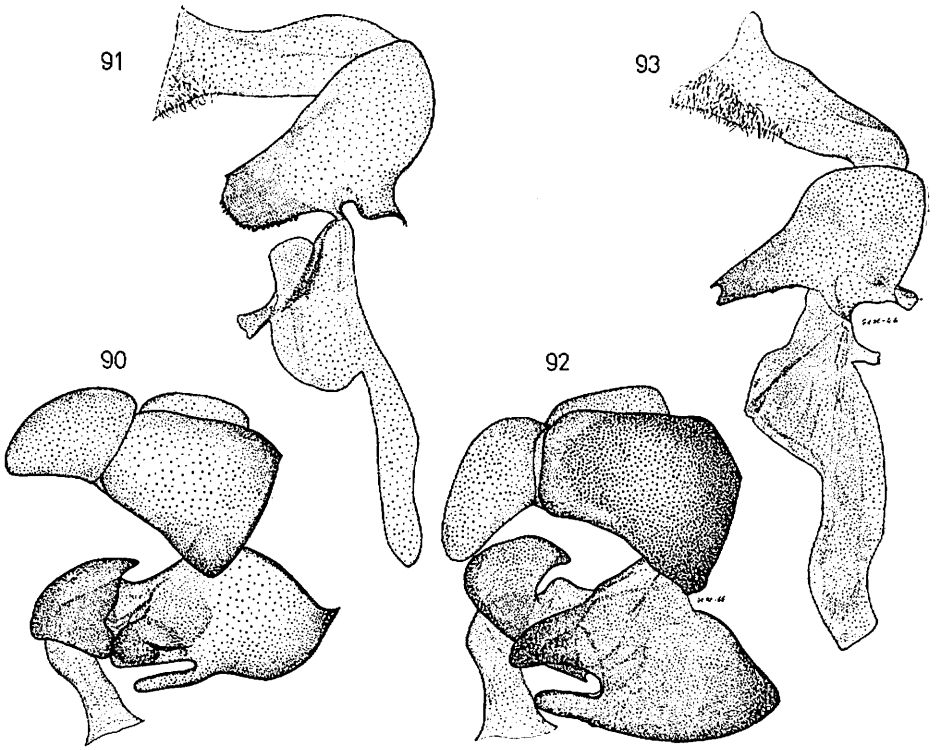
Lagenosyrphus MIK 1897, Wien. Ent. Zeit. 16, p. 64. Type-species *Syrphus leiophthalmus* SCHINER & EGGER 1853, by designation of VERRALL 1901. N. syn.

Karasyrphus MATSUMURA 1918, J. Coll. Agric. Sapporo 8:1, p. 9. Type-species *Chaemosyrphus miyakei* MATSUMURA 1911 (= *Musca glaucia* LINNAEUS 1758), by original designation. N. syn.

Face yellow, with or without a dark median stripe. Eyes hairy or bare. Mesonotum dull. Mesopleura just behind the prothoracic stigma without any long hairs. Metasternum bare. Abdomen narrow with almost parallel sides or oval, with or without margination. Abdominal pattern composed of large quadrangular spots on the second tergite, which may cover the whole tergite, extending or not over the side-margin. Third and fourth tergites with stripe-like spots not extending over side-margins, or without pale markings. Pale abdominal markings whitish or bluish.

General structure of male genitalia very similar to the genus *Epistrophe;* basale, however, relatively lower and longer and superior lobes large and of characteristic shape. Lateroventral projections of pyxis divided into two teeth (as seen in profile) the anterior of which is rounded and smoothly serrate or not divided into two teeth and then anteroventrally serrate.

Remarks: I have not studied *Syrphus leiophthalmus* but it certainly belongs to the genus *Leucozona,* the only remarkable difference being the bare eyes. Probably the genus *Eriozona* SCHIN. is nearly allied to *Leucozona* s. str.



Figs. 90—91: Male genitalia of *Leucozona lucorum* (L.) in dextrolateral view. — *90.* general, — *91.* axial system of penis. — Orig.
Figs. 92—93: Male genitalia of *Leucozona glaucia* (L.) in dextrolateral view. — *92.* general, — *93.* axial system of penis. — Orig.

Subgenus *Leucozona* SCHINER s. str.

Face with a dark median stripe. Eyes hairy. Wings clouded. Abdomen oval and marginated, third and fourth segments usually without pale markings.

Lateroventral projections of pyxis relatively short and broad, not apically divided into two teeth (as seen in profile), anteroventrally somewhat roughly serrate.

Leucozona lucorum (LINNAEUS)

Musca lucorum LINNAEUS 1758, Syst. Nat. ed. X, p. 592.

Specimen studied (Finland, Suomussalmi): Frons black, slightly pale-dusted, black-haired. Lunula black. Face considerably darkened, pale-dusted except for the median stripe and a broad band from lower mouth-edge to eye-margin. Median stripe broad and black, extending to bases of antennae. Eyes densely brown-haired. Antennae unicolorous black. For profile of head, see Fig. 96. Mesonotum dull, greenish grey. Postalar calli dark brown. Scutellum yellow; lateral corners dark, yellow-haired. Wings with a blackish brown cloud extending from stigma to middle of wing. Legs mainly dark brown; apex of all femora and basal half of anterior and

middle tibiae and basal third of hind tibiae paler. For abdominal pattern, see Fig. 99. Second sternite and anterior third of third sternite yellowish white. Hind part of third and fourth sternites totally dark brown. Wing length 9.8 mm.

Genitalia (Figs. 90—91): For discussion, see under *Leucozona* s. str.

Subgenus *Ischyrosyrphus* BIGOT

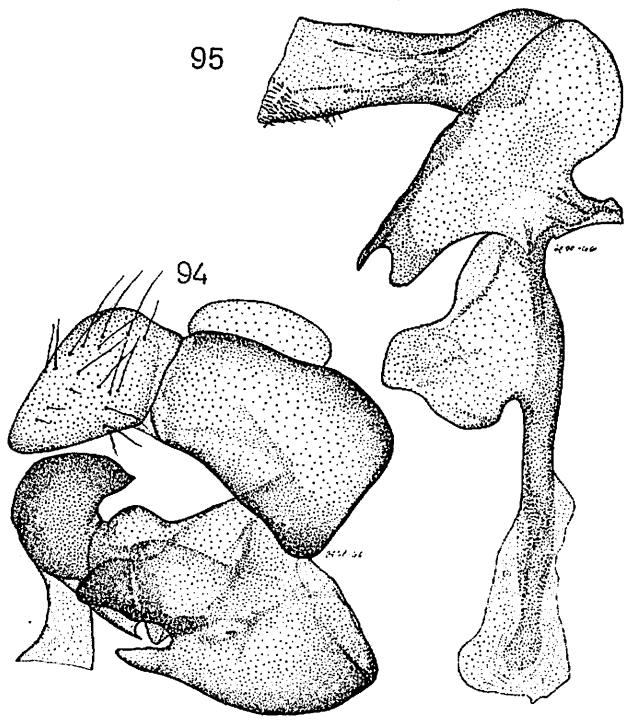
Face with or without the dark median stripe. Eyes hairy or bare. Wings not clouded. Abdomen narrow, with almost parallel sides and unmarginated, usually with pale markings on third and fourth tergites.

Lateroventral projections of pyxis relatively long, apically divided into two teeth (as seen in profile), the anterior one rounded and smoothly serrate.

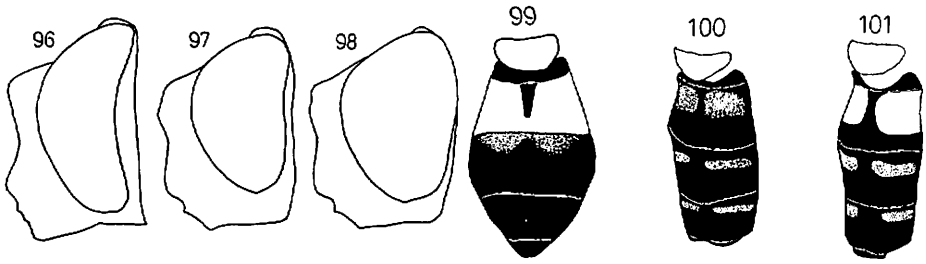
Leucozona glaucia (LINNAEUS), n. comb.

Musca glaucia LINNAEUS 1758, Syst. Nat. ed. X, p. 593.

Specimen studied (Finland, Somero 6. VII. 1964): Frons black medially and above lunula, otherwise yellow, black-haired. Lunula black. Face yellow, laterally slightly dusted, yellow-haired. Upper mouth-edge and anteroventral corners somewhat darkened. Antennae unicolorous black. Eyes densely yellowish-haired. For profile of head, see Fig. 97. Mesonotum



Figs. 94—95: Male genitalia of *Leucozona laternaria* (O. F. MÜLL.) in dextrolateral view. — *94.* general, — *95.* axial system of penis. — Orig.



Figs. 96—98: Heads of the *Leucozona* species studied, in profile. — *96. L. lucorum* (L.), — *97. L. glaucia* (L.), — *98. L. laternaria* (O. F. MÜLL.). — Orig.

Figs. 99—101: Abdominal patterns of the *Leucozona* species studied. — *99. L. lucorum* (L.), — *100. L. glaucia* (L.), — *101. L. laternaria* (O. F. MÜLL.). — Orig.

dull, greyish green and with two distinct dark longitudinal stripes. Scutellum yellow, yellow-haired. Wings clear; stigma black. Legs mainly yellow: three-fifths of anterior and middle femora and four-fifths of hind femora basally black. Hind tibiae with a broad submedian annulation occupying about one-third of length of tibiae. Basal half of hind metatarsus dorsally darkened. For abdominal pattern, see Fig. 100. All pale abdominal markings bluish grey. Sternites dark with pale bands at front margins. Wing length 9.4 mm.

Genitalia (Fig. 92—93): Easily distinguished from *L. laternaria* by shape of pyxis. Latero-ventral projections of pyxis with small dots on anterior surface.

Leucozona laternaria (O. F. MÜLLER), n. comb.

Musca laternaria O. F. MÜLLER 1776, Zool. Dan. Prodr., p. 2040.

Specimen studied (Finland, Somero 25. VI. 1964): Frons dark, heavily pale-dusted except just in front, black-haired. Lunula dark. Face yellowish, laterally black-haired, otherwise yellow-haired, pale-dusted except for the central prominence. Mouth-edge and ventral surface of head dark. Face with a dark median stripe extending half-way between central prominence and bases of antennae. Antennae unicolorous black. Eyes densely brown haired. For profile of head, see Fig. 98. Mesonotum dull, blackish, with two grey-dusted longitudinal stripes on anterior half. Postalar calli faintly brownish. Scutellum dark, in the middle and along hind- margin pale, pale-haired. Wings clear, stigma black. Legs mainly dark: one-quarter of anterior and middle femora and one-fifth of hind femora apically pale, half of anterior and middle tibiae and one-third of hind tibiae basally paler; also tips of anterior and middle tibiae somewhat pale. For abdominal pattern, see Fig. 101. Pale markings on second and third tergites yellowish white, on the fourth greyish brown. Second sternite pale, third and fourth dark with large, pale, lateral spots touching front-margin; hind-margin pale. Wing length 8.8 mm.

Genitalia (Figs. 94—95) Easily distinguished from *L. glaucia* by shape of pyxis.

Genus *Scaeva* FABRICIUS

Scaeva FABRICIUS 1805, Syst. Antl., p. 248. Type-species *Musca pyrastri* LINNAEUS 1758, by designation of CURTIS 1843.

Lasiopthicus RONDANI 1845, Nuo. Ann. Sc. Nat. Bol. 2:2, p. 459. Type-species *Musca pyrastri* Linnaeus 1758, by monotypy.

Catabomba OSTEN-SACKEN 1877, Bull. U. S. Geol. Surv. 3, p. 326. Type-species *Musca pyrastri* LINNAEUS 1758, by monotypy.

Face yellow, with or without a dark median stripe. Eyes hairy or bare. Mesonotum shining. Mesopleura just behind the prothoracic stigma without any long hairs. Metasternum bare. Wings with the vein R4 + 5 smoothly but distinctly bent in the middle. Abdomen ovate and marginated. Abdominal pattern composed of three pairs of more or less lunulate spots usually not extending over the side-margins, or entire undulating bands may extend over the third and fourth tergites.

Styli rather short and broad. Dorsal surface of theca as seen in profile roughly undulating. Lingula small and grooved, usually not reaching as far posteriously as the lateral arms. Lateral arms distinct. Superior lobes almost in upright position and with one more or less distinct basal tooth. Pyxis not strongly laterally compressed, with two short lateroventral projections apically divided into two teeth somewhat as in the genus *Epistrophe*. For structure of pyxis, see Figs. 104 and 111. Tubus not especially strongly chitinized, armed with spinules apicoventrally.

Subgenus *Scaeva* FABRICIUS s. str.

Frons considerably inflattened. Angle of frons at approximation of eyes more than 135 degrees. Eyes densely hairy and with a distinct area of larger facets in males.

Posterodorsal surface of basale in profile rather long and concave as in *Posthosyrphus*. Lateral arms of theca short. Superior lobes about as long as broad. Pyxis not strongly laterally compressed. For structure of pyxis, see Fig. 104. Tubus rather thick, somewhat recalling that of the genus *Posthosyrphus* in shape, and spiconventrally with thin spinules.

Scaeva pyrastri (LINNAEUS)

Musca pyrastri LINNAEUS 1758, Syst. Nat. ed. X, p. 594.

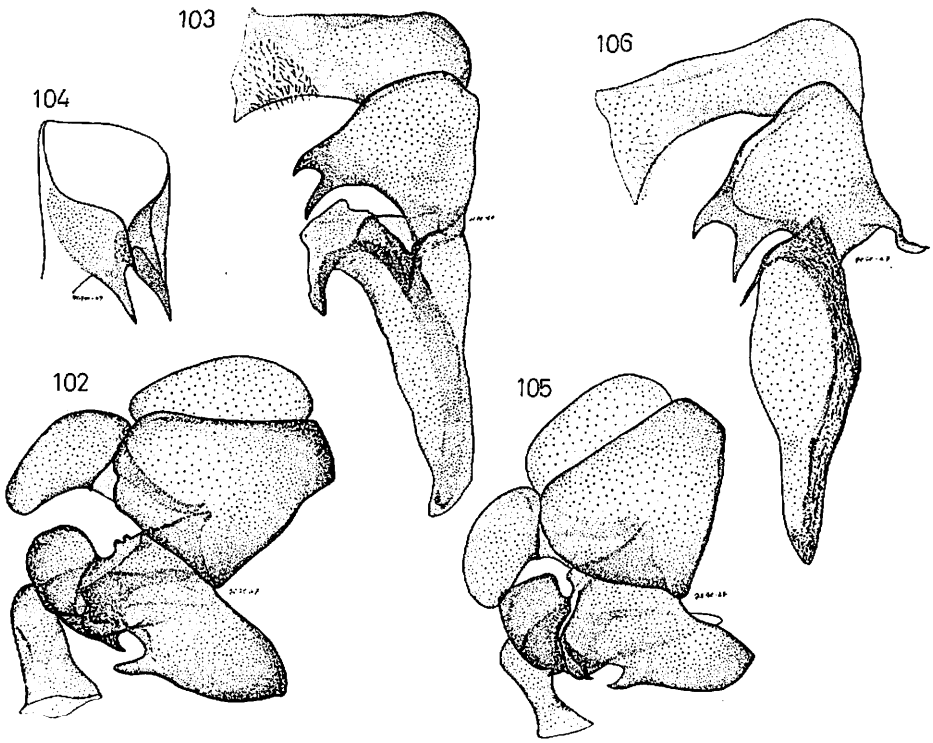
Specimen studied (Finland, Somero 21. VIII. 1964): Frons yellow, black-haired. Face yellow, yellow-haired, laterally along eye-margins black-haired. Upper mouth-edge darkened; median stripe narrow, brown and hardly extending beyond central prominence. Antennae blackish brown, the first and second segments ventrally and the third ventrally at base pale brown. Eyes densely brown-haired. For profile of head, see Fig. 112. Mesonotum bluish green, laterally orange-brown; postalar calli brown. Scutellum brown, shining bluish, laterally black; hairs black in the middle, yellow laterally and along front-margin. Wings clear; stigma pale brown. Legs mainly yellow: two-fifths of anterior and middle femora and five-sixths of hind femora basally black. Posterior faces of anterior and middle tibiae with a median dark spot; hind tibiae with an indistinct dark supramedian annulation. All tarsi darkened. For abdominal pattern, see Fig. 116. The second, third and fourth sternites with band-like black spots occupying about half the length of the sternite. Wing length 11.0 mm.

Genitalia (Figs. 102—104): Distinguished by shape of pyxis, styli and superior lobes.

Scaeva albomaculata (MACQUART)

Syrphus albomaculatus MACQUART 1842, D. Exot. 2:2, p. 86.

Specimen studied (USSR, Krasnovodsk): Differs from *S. pyrastri* in the following respects: Face whitish yellow. Median stripe extends well beyond central prominence. Eyes with pale greyish brown hairs. For profile of head, see Fig. 113. Mesonotum laterally yellow. Scutellum



Figs. 102—104: Male genitalia of *Scaeva pyrastri* (L.). — *102.* general — *103.* axial system of penis in dextrolateral view, — *104.* pyxis in posteroventral view. — Orig.
Figs. 105—106: Male genitalia of *Scaeva albomaculata* (MACQ.) in dextrolateral view. — *105.* general, — *106.* axial system of penis. — Orig.

mainly yellow-haired, black-haired in the middle and in middle of hind-margin. Anterior and middle tibiae without black spots. Only the three middle segments of anterior and middle tarsi darkened. For abdominal pattern, see Fig. 117. Wing length 10.0 mm.

Genitalia (Figs. 105—106): Distinguished by shape of pyxis, styli and superior lobes. Basale especially high. Apicoposterior cornes of superior lobes serrate.

Scaeva selenitica (MEIGEN)

Syrphus seleniticus MEIGEN 1822, Syst. Beschr. 3, p. 304.

Specimen studied (Finland, Somero 5. IX. 1964): Differs fron *S. pyrastri* in the following respects: Face not laterally black-haired but central prominence with black hairs. Antennae unicolorous blackish brown. Eyes grey-haired. For profile of head, see Fig. 114. About basal half of middle femora black and only tips of hind femora yellow. Anterior and middle tibiae without dark spots; hind tibiae with a dark submedian annulation occupying about one-third of length of tibia. For abdominal pattern, see Fig. 118. Second and third sternites with large dark spots in the middle, the fourth with a dark median band. Wing length 12.0 mm.

Genitalia (Figs. 107—108): Distinguished by shape of pyxis, styli and superior lobes.

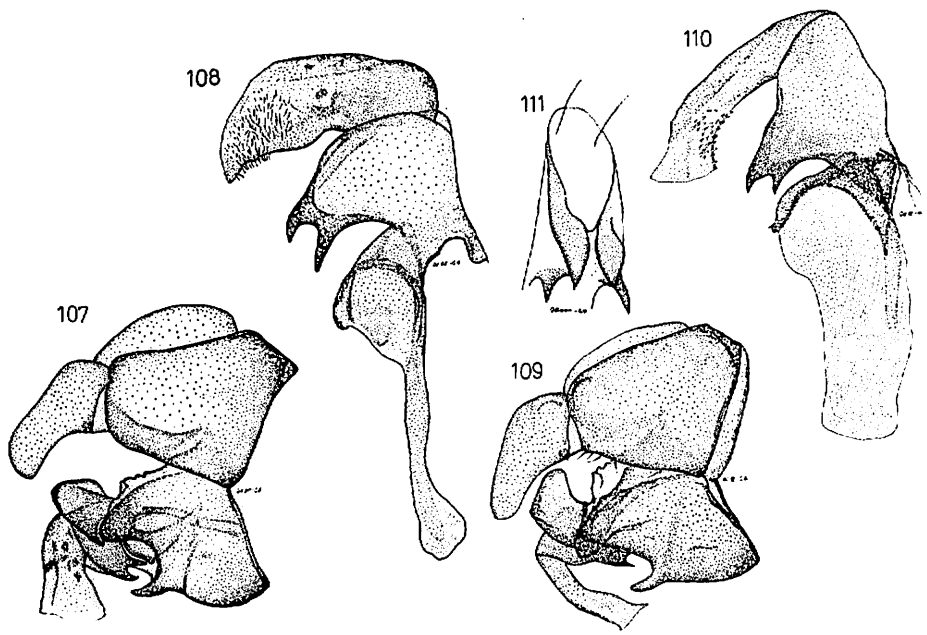
Subgenus *Beszella* n. subg.

Frons not inflattened. Angle of frons at approximation of eyes about 90 degrees. Eyes bare; area of larger facets in males not very distinct.

Posterodorsal surface of basale in profile not especially long or concave. Lateral arms longer than in *Scaeva* s. str., somewhat recalling those of the genus *Epistrophe*. Superior lobes longer than broad. Pyxis somewhat strongly compressed laterally. For structure of pyxis, see Fig. 111. Tubus rather long and thin, with thick spinules apicoventrally.

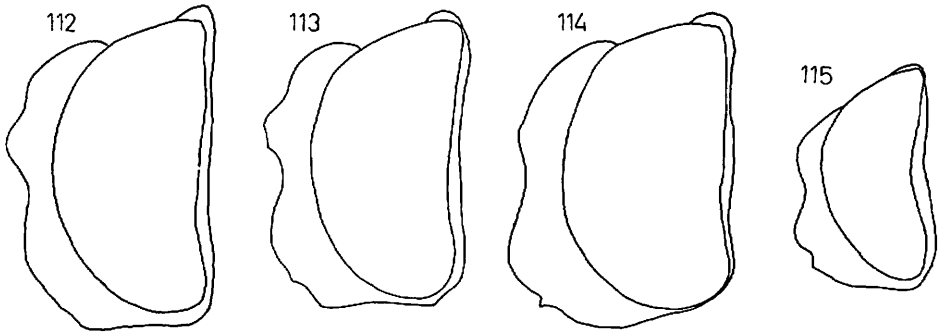
Type-species *Scaeva lapponica* ZETTERSTEDT 1838.

In the subgenus *Beszella* the shape of the tubus is very similar to that of *Epistrophe*. The structure of the pyxis seems to be between that of *Scaeva* s. str. and *Epistrophe*. The structure of the theca is like that of *Scaeva* s. str. but both indicate a distinct relationship with *Epistrophe*.

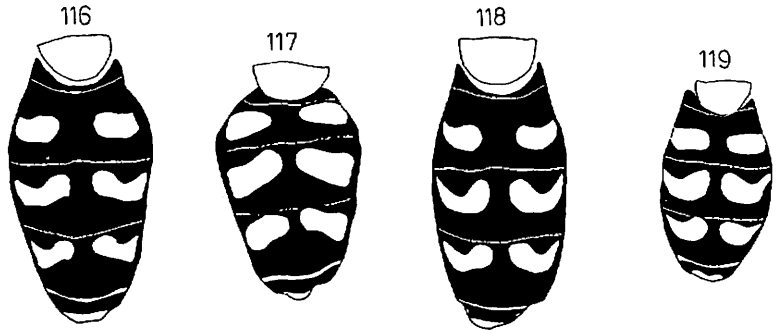


Figs. 107—108: Male genitalia of *Scaeva selenitica* (MEIG.) in dextrolateral view. — 107. general, — *108.* axial system of penis. — Orig.

Figs. 109—111: Male genitalia of *Scaeva lapponica* (ZETT.), — *109.* general and — *110.* axial system of penis in dextrolateral view, — *111.* posteroventral view of pyxis. — Orig.



Figs. 112—115: Heads of the *Scaeva* species studied, in profile. — *112. S. pyrastri* (L.), — *113. S. albomaculata* (MACQ.), — *114. S. selenitica* (MEIG.), — *115. S. lapponica* ZETT. — Orig.



Figs. 116—119: Abdominal patterns of the *Scaeva* species studied. — *116. S. pyrastri* (L.), — *117. S. albomaculata* (MACQ.), — *118. S. selenitica* (MEIG.), — *119. S. lapponica* ZETT. — Orig.

Scaeva lapponica ZETTERSTEDT

Scaeva lapponica ZETTERSTEDT 1838, Ins. Lapp., p. 598.

Specimen studied (Finland, Suomussalmi): Frons pale, pale-dusted, above the lunula narrowly black, brown-haired. Face yellowish, whitish-haired. Mouth-edge broadly black; median stripe brown, extending half way between central prominence and bases of antennae. Antennae brown; second segment dorsally and third apically faintly darkened. For profile of head, see Fig. 115. Mesonotum shining greenish black, whitish-haired. Postalar calli brown. Scutellum yellow, in the middle black-haired, laterally broadly yellow-haired. Wings clear; stigma pale brown. Legs mainly yellow; two-fifths of anterior, half of middle and four-fifths of hind femora basally dark. Hind tibiae with a broad brown submedian annulation. Three middle segments of all tarsi darkened. For abdominal pattern, see Fig. 119. Lunulae on third tergite extending narrowly over side-margin. Sternites pale, the second, third and fourth with large, band-like, glittering black spots. Wing length 9.1 mm.

Genitalia (Figs. 109—111): For explanation, see under subgenus *Beszella*.

The following American species can be included in the subgenus *Beszella* on the basis of the figure given by FLUKE (1950):

Syrphus aberrantis CURRAN 1924 = *Scaeva (Beszella) aberrantis* (CURRAN), n. comb.

This species usually has entire undulating bands on the third and fourth tergites instead of lunulate spots.

Genus *Posthosyrphus* ENDERLEIN

Posthosyrphus ENDERLEIN 1937, Sitz. Ber. Naturf. Ges. Berlin 4—7, p. 204. Type-species *Posthosyrphus americanus* (WIEDEMANN) 1830 *(= Syrphus wiedemanni* JOHNSON 1919*)*, by original designation.

Face entirely yellow or with a more or less distinct dark median stripe. Eyes bare or very slightly hairy. Mesonotum shining. Mesopleura just behind the prothoracic stigma without any long hairs. Metasternum hairy. Abdomen oval and marginated. Abdominal pattern composed of a pair of oval spots on the second tergite. The spots may be connected anterolaterally to the side-margin. Third and fourth tergites with lunulate spots or undulating bands which usually do not extend over the side-margin.

Styli rather long and basally broad. Posterodorsal surface of basale in profile unusually long, straight and sometimes even slightly concave. Theca with rough corrugations on surface. Lingula absent; lateral arms indistinct. Superior lobes of characteristic shape, in upright position, and with one basal tooth. Pyxis rather strongly compressed laterally, with two pairs of ventral teeth, the posterior pair being much shorter than the anterior pair. For structure of pyxis, see Fig. 138. Tubus of moderate length, well chitinized, laterally compressed at base (and seen in profile somewhat swollen). Apiconventral teeth of tubus distinct and rather thick.

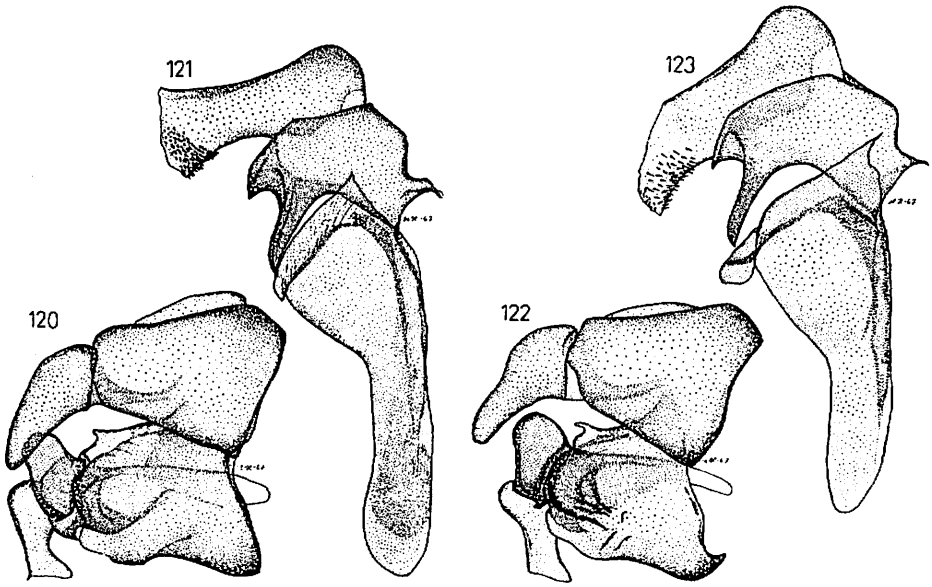
Remarks: I have not studied the type-species of the genus *Posthosyrphus* but the figure given by FLUKE (1950) clearly indicates that *Syrphus wiedemanni* is congeneric with the species placed in this genus in the present work. In North America, the species of *Posthosyrphus* have for a long time been included in the genus *Metasyrphus* MATSUMURA (type-species *Syrphus corollae* FABRICIUS). Unfortunately, *S. corollae*, although very similar in general appearance, is set apart from the other species by the quite different structure of the male genitalia and must be regarded as the only representative of the genus *Metasyrphus* in the present material.

Posthosyrphus braueri (EGGER), n. comb.

Syrphus Braueri EGGER 1858, Verh. des Zool. Bot. Vereins. 8, p. 714.

Specimen studied (USSR, Aschabad 5. III. 1907): Frons totally yellow, black-haired. Face yellowish white, dorsolaterally black-haired, otherwise yellowish-haired. Upper mouth-edge faintly brownish. Antennae brownish, third segment basally and ventrally orange. Eyes bare. Eye suture a little shorter than vertical triangle. For profile of head, see Fig. 145. Mesonotum glittering greenish black, laterally narrowly pale-dusted. Postalar calli yellowish. Scutellum yellow, with yellow hairs, in the middle, however, mixed with some black ones. Wings very faintly yellowish; veins yellowish brown; stigma pale brown. Legs yellow; three middle segments of anterior and middle tarsi dorsally faintly darkened. For abdominal pattern, see Fig. 157. Sternites pale; third and fourth with a large roundish dark spot in middle. Wing length 8.1 mm.

Genitalia (Figs. 120—121): Somewhat resembles *P. latilunulatus;* easily distinguished, however, by the relatively lower and differentially shaped pyxis and the corrugations of the theca.



Figs. 120—121: Male genitalia of *Posthosyrphus braueri* (Egg.) in dextrolateral view. — *120.* general, — *121.* axial system of penis. — Orig.
Figs. 122—123: Male genitalia of *Posthosyrphus latilunulatus* (Coll.) in dextrolateral view. — *122.* general, — *123.* axial system of penis. — Orig.

Posthosyrphus latilunulatus (Collin), n. comb.

Syrphus latilunulatus Collin 1931, Ent. Mon. Mag. 67, p. 179.

Specimen studied (Canary Islands, Fuerteventura 10—14. V. 1951): Frons and face totally yellow; frons dark-haired, face yellow-haired. Antennae orange; third segment dorsally darker. Eyes bare. Eye suture about as long as vertical triangle. For profile of head, see Fig. 146. Mesonotum shining blackish green, pale-dusted laterally on both sides of the transverse suture. Postalar calli yellowish brown. Scutellum yellow, yellow-haired. Wings clear; veins yellowish brown; stigma pale brown. Legs yellow; three middle segments of anterior tarsi only faintly darkened. For abdominal pattern, see Fig. 158. Sternites pale, the second and third with dark spots in the middle. Wing length 7.0 mm. The specimen differs considerably from the original description (Collin 1933) in having almost entirely yellow legs.

Genitalia (Figs. 122—123): Posterolateral faces of theca not prolonged posteriorly as in *P. nitens* and *P. latifasciatus*. Pyxis relatively high compared with its length and of characteristic shape. The figure given by Collin (1931) appears somewhat different, but I think this is only due to the different drawing technique.

Posthosyrphus nitens (Zetterstedt)

Scaeva nitens Zetterstedt 1843, Dipt. Scand. 2, p. 712.

Specimens studied: 1. (Finland, Somero 24. VII. 1964): Frons yellow, black-haired. Lunula yellow with two large dark spots laterodorsally. Face yellow; mouth-edge and central promi-

nence black. Antennae yellowish brown; third segment apicodorsally a little darkened. Eyes with short scattered hairs. Eye suture about as long as vertical triangle. For profile of head, see Fig. 147. Mesonotum glittering greenish black; postalar calli brownish. Scutellum brownish, laterally black, in the middle black-haired, laterally yellow-haired. Wings brownish; stigma brown. Legs mainly yellow; one-third of anterior and middle femora and three-fifths of hind femora basally black. Three middle segments of all tarsi darkened. For abdominal pattern, see Fig. 159. Yellow bands on second, third and fourth tergites not extending over side-margins of segments. Second, third and fourth sternites pale, with glittering black bands occupying about half length of segment. Wing lentgh 8.0 mm. For genitalia, see Figs. 124—125.

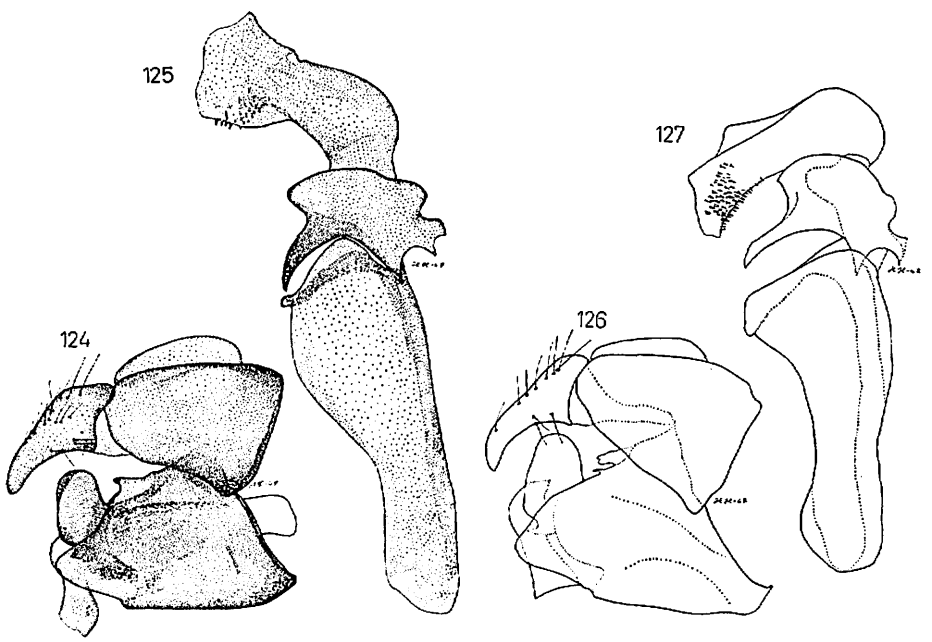
2. (Finland, Somero 15. VII. 1964): Differs from the foregoing specimen in having the first antennal segment dorsally dark brown. For profile of head, see Fig. 148. For abdominal pattern, see Fig. 160. Wing length 8.0 mm. For genitalia, see Figs. 126-127.

Genitalia (Figs. 124—127): The posterolateral faces of the theca extend as far as or a little further posteriorly than the superior lobes. In the shape of the pyxis there is a remarkable difference between Fig. 125 and Fig. 127 but this is due to the somewhat different angle of view.

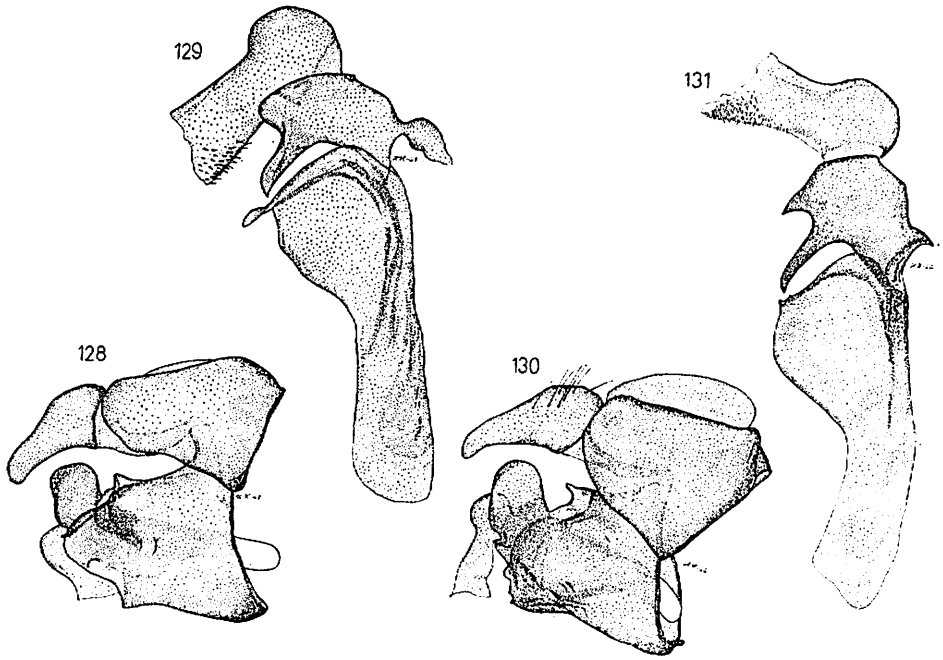
Posthosyrphus latifasciatus (MACQUART)

Syrphus latifasciatus MACQUART 1827, Lille Mém. Soc. Sc., p. 242.

Specimen studied (Finland, Suomussalmi): Frons yellow, black-haired. Lunula yellow. Face yellow; mouth-edge and lower part of central prominence brown, dorsolaterally black-



Figs. 124—127: Male genitalia of *Posthosyrphus nitens* (ZETT.) in dextrolateral view. — *124.* and *126.* general, — *125.* and *127.* axial system of penis. — Orig.



Figs. 128—129: Male genitalia of *Posthosyrphus latifasciatus* (MACQ.) in dextrolateral view. — *128.* general, — *129.* axial system of penis. — Orig.
Figs. 130—131: Male genitalia of *Posthosyrphus lundbecki* (SOOT-RYEN) in dextrolateral view. — *130.* general, — *131.* axial system of penis. — Orig.

haired, elsewhere yellow-haired. Antennae yellowish brown; third segment dorsally darker. Eyes bare. Eye suture about half as long as vertical triangle. For profile of head, see Fig. 149. Mesonotum shining greenish brown. Postalar calli brown. Scutellum yellow, laterally somewhat darkened, yellow-haired. Wings yellowish, stigma pale brown. Legs mainly yellow: two-fifths of anterior and middle femora and three-fifths of hind femora basally dark. Four basal segments of anterior and three middle segments of middle tarsi slightly darkened. Hind tarsi totally dark. For abdominal pattern, see Fig. 161. Sternites dark. Wing length 6.5 mm.

Genitalia (Figs. 128—129): Posterolateral faces of theca reaching about as far posteriourly as superior lobes, as in *P. nitens*; shape, however, different. Pyxis of characteristic shape; posterior pair of teeth rounded, anterior pair rather stout.

Posthosyrphus lundbecki (SOOT-RYEN)

Syrphus lundbecki SOOT-RYEN 1946, Entomol. Tidskr. 67, p. 196.

Specimen studied (Finland, Somero 29. VII. 1966): Frons yellow; lunula laterally faintly darkened, black-haired. Angle of frons at approximation of eyes about 135 degrees. Face yellow, dorsolaterally black-haired, otherwise yellow-haired. Upper mouth-edge to anterolateral corners darkened. Madian stripe brown, extending just over central prominence. Antennae dark brown, ventrally paler. Eyes with inconspicuous, short, scattered hairs. For profile of head,

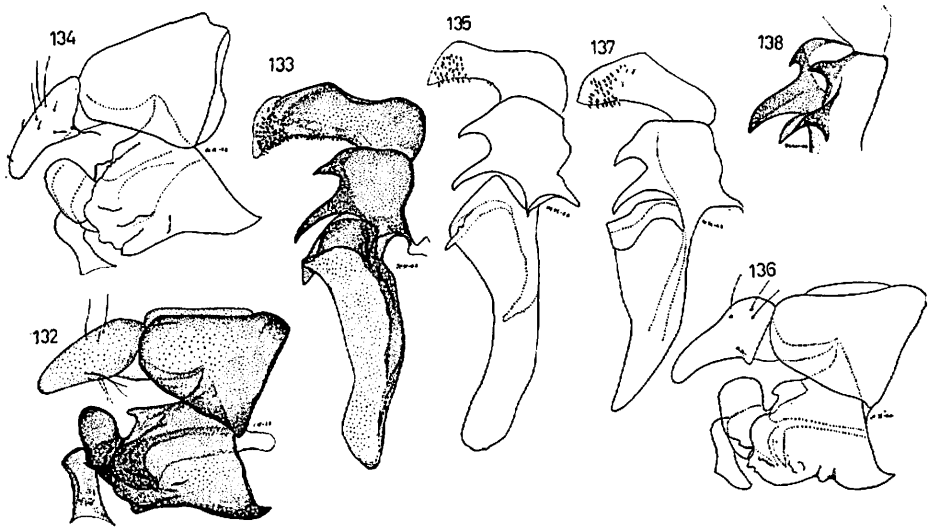
see Fig. 150. Mesonotum shining bluish green, laterally behind transverse suture distinctly brown. Postalar calli brown. Scutellum brownish, laterally dark, in the middle black-haired, laterally and along hind-margin yellow-haired. Wings clear, R4+5 smoothly but distinctly bent; stigma brown. Legs mainly yellow; two-fifths of anterior and middle femora and three-fifths of hind femora basally black. Posterior faces of anterior and middle tibiae and anterior faces of hind tibiae with a submedian dark spot. First four segments of anterior tarsi, and last four segments of hind and middle tarsi totally darkened. For abdominal pattern, see Fig. 162. Sternites pale, the second, third and fourth with band-like black spots occupying about half the length of the segment. Wing length 9.6 mm.

Genitalia (Figs. 130—131): Easily distinguished from *P. luniger* and *P. punctifer* by shape of pyxis. Shape and corrugations of theca also characteristic.

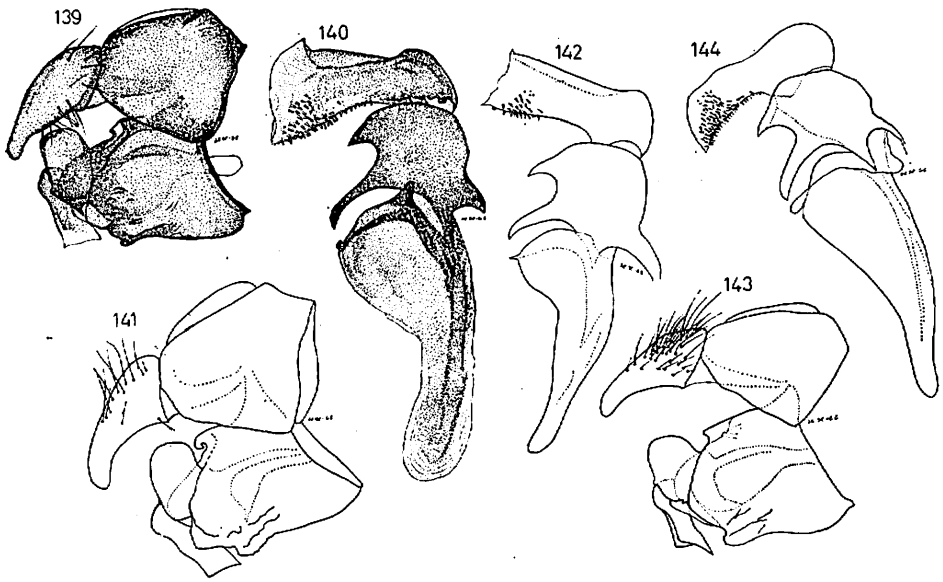
Posthosyrphus luniger (MEIGEN)

Syrphus luniger MEIGEN 1822, Syst. Beschr. 3, p. 300.

Specimens studied: 1. (Finland, Somero 14. VI. 1965): Frons yellow, black-haired; lunula laterally faintly darkened. Face yellow, laterally black-haired, in the middle yellow-haired. Upper mouth-edge and central prominence darkened. Antennae dark brown, ventrally orange. Eyes with obvious scattered hairs. Angle of frons at approximation of eyes less than 90 degrees. For profile of head, see Fig. 151. Mesonotum glittering green, laterally behind transverse suture distinclty brownish; postalar calli brown. Scutellum yellow, laterally black, in the middle black-haired. Wings clear; stigma pale brown. Legs mainly yellow; one-third of anterior and middle femora and three-fifths of hind femora basally black. First four segments of anterior tarsi, and three middle segments of middle and hind tarsi totally darkened. For abdominal pattern, see



Figs. 132—138: Male genitalia of *Posthosyrphus luniger* (MEIG.). — *132., 134.* and *136.* general, — *133., 135.* and *137.* axial system of penis in dextrolateral view. — *138.* pyxis in lateroventral view. — Orig.



Figs. 139—144: Male genitalia of *Posthosyrphus punctifer* (FREY in KANERVO) in dextrolateral view. — *139., 141.* and *143.* general, — *140., 142.* and *144.* axial system of penis. — Orig.

Fig. 163. Second, third and fourth sternites mainly pale: the second with a roundish, the third with a band-like dark spot on posterior half, the fourth only a little darkened in the middle. Wing length 9.6 mm. For male genitalia, see Figs. 132—133 and 138.

2. (Finland, Askainen 5. VI. 1966): Differs from the foregoing specimen in the following respects: Face black-haired only dorsolaterally. Face with a dark median stripe extending just over central prominence. For profile of head, see Fig. 152. Postalar calli partly yellow. Dark colour on posterior side of anterior femora extending near the middle. Two-fifths of middle femora black. Only last four segments of hind tarsi darkened. For abdominal pattern, see Fig. 164. Second, third and fourth sternites with dark spots in the middle. Wing length 8.7 mm. For genitalia, see Figs. 134—135.

3. (USSR, Vyborg): Differs from the specimen first described in the following respects: Face dark-haired only dorsolaterally. For profile of head, see Fig. 153. One-fourth on middle femora and two-fifths of hind femora basally black. Only last three segments of hind tarsi darkened. For abdominal pattern, see Fig. 165. Second, third and fourth sternites with dark bands occupying about half length of sternite. Wing length 8.8 mm. For genitalia, see Figs. 136—137.

Genitalia (Figs. 132—138): Easily distinguished from the following species by shape of basale and pyxis. Posterior margin of theca also somewhat different.

Posthosyrphus punctifer (FREY in KANERVO), n. comb.

Syrphus punctifer FREY in KANERVO 1934, Ann. Soc. Zool.-Bot. Fenn. Vanamo 14:5, p. 125.

Specimens studied: 1. (Finland, Somero 10. VI. 1965): Differs from the first specimen of *P. luniger* in the following respects: Frons yellowish with two large dark lateral spots above lunula. Lunula brownish, laterally darkened. Angle of frons at approximation of eyes more than 100 degrees. Face clothed with black hairs mixed with some yellow ones. Face somewhat

bluish shining. Mouth-edge very broadly black. Median stripe extending about half-way between central prominence and bases of antennae. For profile of head, see Fig. 154. Postalar calli only slightly brownish. Scutellum more extensively yellow-haired. Two-fifths of middle femora basally black. Posterior face of anterior and middle tibiae with a submedian dark spot. Hind tibiae with an indistinct submedian annulation. Only three middle segments of anterior tarsi darkened. For abdominal pattern, see Fig. 166. Second, third and fourth sternites with glittering black bands occupying about half length of sternite. Wing length 8.5 mm. For genitalia, see Figs. 139—140.

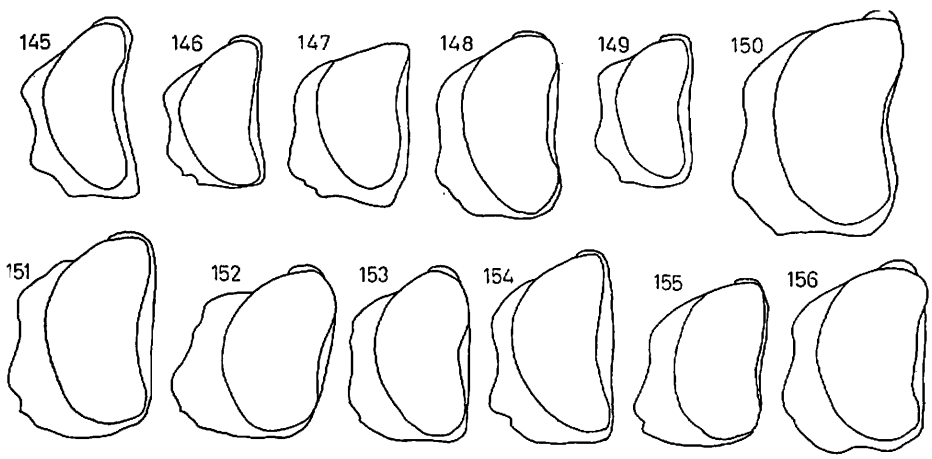
2. (Finland, Somero 30. V. 1965): Differs from the foregoing specimen in having all tibiae without dark markings and in the dark bands on the abdominal sternites being brown. For profile of head, see Fig. 152. For abdominal pattern, see Fig. 167. Wing length 7.5 mm. For genitalia, see Figs. 141—142.

3. (Finland, Karjalohja): Differs from the first-described specimen in the following respects: Face in the middle mainly yellow-haired. Antennae orange; third segment dorsally only a little darkened. For profile of head, see Fig. 156. Only basal fourth of anterior and basal third of middle femora dark. Four last segments of anterior tarsi darkened. For abdominal pattern, see Fig. 168. Sternites dark; only the second with front margin pale. Wing length 8.5 mm. For genitalia, see Figs. 143—144.

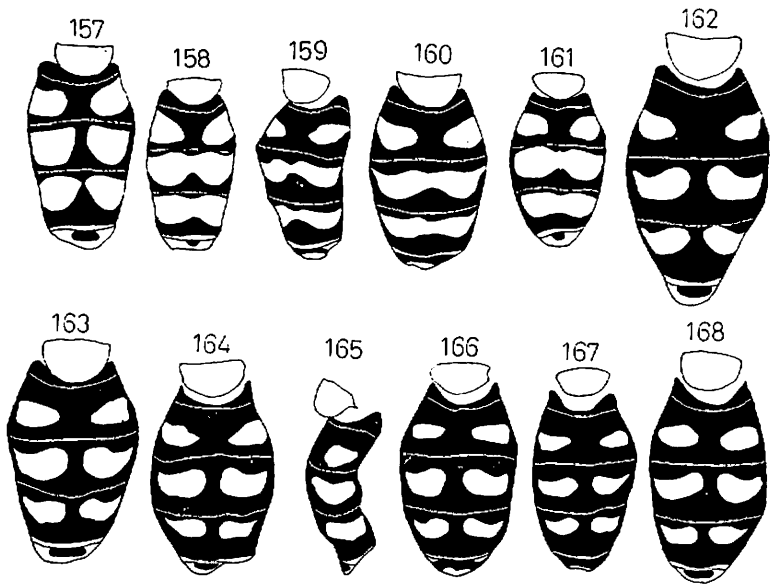
Genitalia (Figs. 139—144): Differs from other species of the genus studied in having a relatively short and high basale. Also readily distinguished by shape of pyxis and course of posterior margin of theca.

The following American species can be included in the genus *Posthosyrphus* on the basis of the figures published by FLUKE (1950):

Syrphus fumipennis THOMPSON 1868 = *Posthosyrphus fumipennis* (THOMPSON).
Syrphus montivagus SNOW 1895 = *P. montivagus* (SNOW).



Figs. 145—156: Heads of the *Posthosyrphus* species studied, in profile. — *145. P. braueri* (EGG.), — *146. P. latilunulatus* (COLL.), — *147.* and *148. P. nitens* (ZETT.), — *149. P. latifasciatus* (MACQ.), — *150. P. lundbecki* (SOOT-RYEN), — *151., 152.* and *153. P. luniger* (MEIG.), — *154., 155.* and *156. P. punctifer* (FREY in KANERVO). — Orig.



Figs. 157—168: Abdominal patterns of the *Posthosyrphus* species studied. — *157. P. braueri* (Egg.), — *158. P. latilunulatus* (Coll.), — *159.* and *160. P. nitens* (Zett.), — *161. P. latifasciatus* (Macq.), — *162. P. lundbecki* (Soot-Ryen), — *163., 164.* and *165. P. luniger* (Meig.), — *166., 167.* and *168. P. punctifer* (Frey in Kanervo). — Orig.

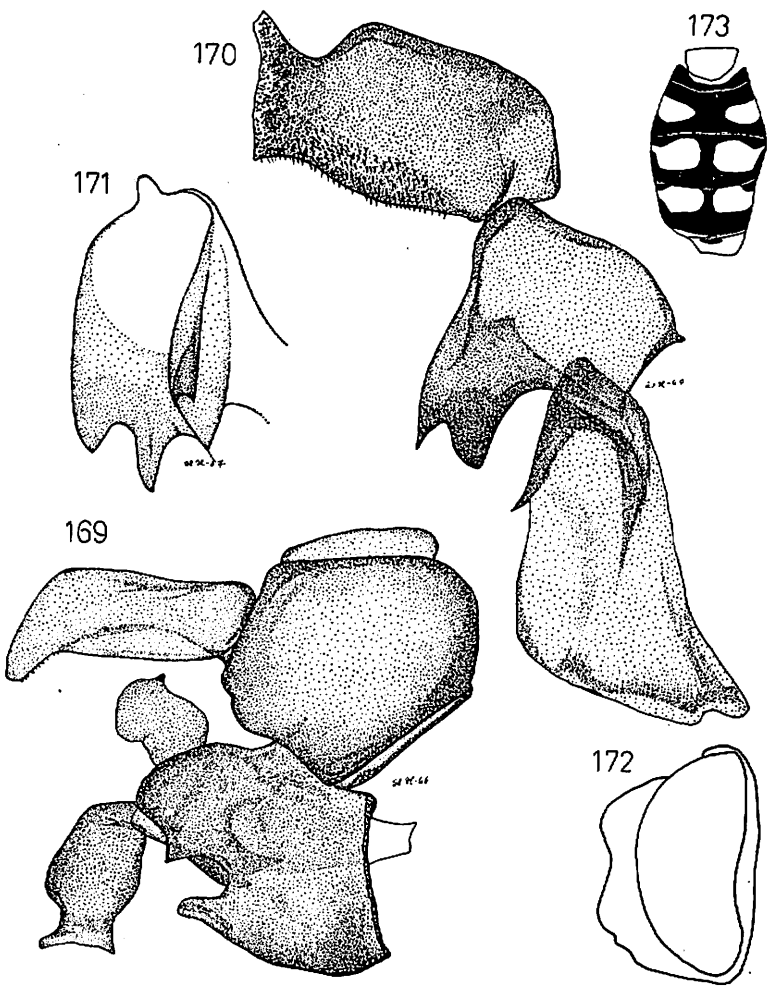
Scaeva perplexus Osburn 1910 = *P. perplexus* (Osburn).
Syrphus flukei Curran 1917 = *P. flukei* (Curran).
Syrphus marginatus Jones 1917 = *P. marginatus* (Jones).
Syrphus wiedemanni Johnson 1919 = *P. wiedemanni* (Johnson).
Syrphus vinelandi Curran 1921 = *P. vinelandi* (Curran).
Syrphus snowi Wehr 1922 = *P. snowi* (Wehr).
Syrphus montanus Curran 1924 = *P. montanus* (Curran).
Syrphus neoperplexus Curran 1924 = *P. neoperplexus* (Curran).
Syrphus canadensis Curran 1926 = *P. canadensis* (Curran).
Syrphus venablesi Curran 1929 = *P. venablesi* (Curran).
Syrphus lebanoensis Fluke 1930 = *P. lebanoensis* (Fluke).
Syrphus pigreensis Fluke 1930 = *P. pigreensis* (Fluke).
Metasyrphus depressus Fluke 1933 = *P. depressus* (Fluke).
Metasyrphus talus Fluke 1933 = *P. talus* (Fluke).

Genus *Metasyrphus* Matsumura

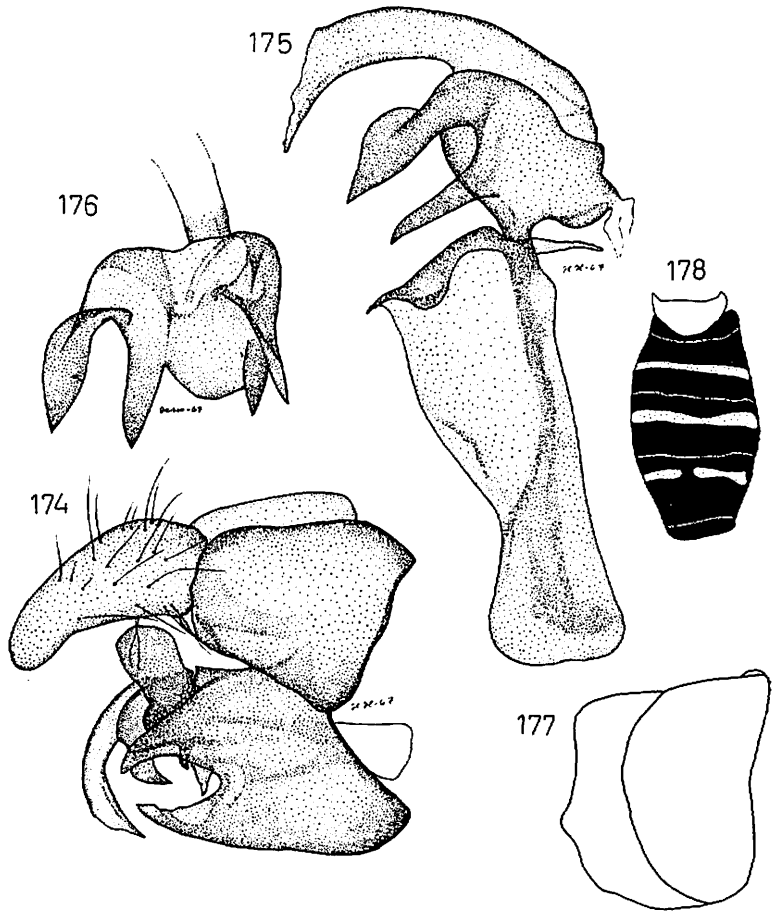
Metasyrphus Matsumura 1917, Ent. Mag., Kyoto 2:4, p. 147. Type-species *Syrphus corollae* Fabricius 1794, by original designation.

I cannot find any distinct differences between the genera *Posthosyrphus* and *Metasyrphus* except in the male genitalia; these are quite different in structure. However, the mesonotum is dull and the abdominal spots somewhat quadrangular and they extend over the lateral margins.

Styli long and straight. Basale short and high; dorsal surface strongly convex in profile. Lingula short, broad and grooved. Lateral arms of theca very broad, reaching much further posteriourly than lingula. Superior lobes exceptional in shape and position. Pyxis not strongly laterally compressed, with two broad lateroventral projections apically divided into two teeth. For structure of pyxis, see Fig. 171. Tubus large, somewhat bulbous in shape, strongly chitinized and armed apically and ventrally with numerous short spinules.



Figs. 169—173: Metasyrphus corollae (FABR.).— *169.* total view of male genitalia, — *170.* axial system of penis in dextrolateral view, — *171.* posterolateral view of pyxis, — *172.* head in profile, — *173.* abdominal pattern. — Orig.



Figs. 174—178: Betasyrphus serarius (WIED.). — *174.* total view of male genitalia, — *175.* axial system of penis in dextrolateral view, — 176. posteroventral view of pyxis, — *177.* head in profile, — *178.* abdominal pattern. — Orig.

Metasyrphus corollae (FABRICIUS)

Syrphus corollae FABRICIUS 1794, Ent. syst. 4, p. 306.

Specimen studied (Finland, Somero 27. VIII. 1964): Frons totally yellow, black-haired. Face yellow, yellow-haired. Upper mouth-edge and central prominence brownish. Antennae dark brown; first segment ventrally and third segment ventrally at base paler. For profile of head, see Fig. 172. Mesonotum greenish, laterally glittering, in the middle dull. Postalar calli brownish. Scutellum yellow, laterally somewhat darkened, yellow-haired. Wings clear; stigma brown. Legs mainly yellow; half of anterior and middle femora and four-fifths of hind femora basally black. Three middle segments of anterior and middle and last four segments of hind tarsi darkened. For abdominal pattern, see Fig. 173. Sternites pale, the second and third with large shining black spots in the middle. Wing length 7.5 mm.

Genitalia (Figs. 169—171): For explanation, see under genus *Metasyrphus*.

Genus *Betasyrphus* MATSUMURA

Betasyrphus MATSUMURA 1917, Ent. Mag., Kyoto 2:4, p. 143. Type-species *Syrphus serarius* WIEDEMANN 1830, by original designation.

Face yellow, with a broad dark median stripe. Third antennal segment unusually broad, about as long as first and second segements together. Vertical triangle unusually long and narrow. Eyes hairy. Mesonotum dull. Mesopleura just behind the prothoracic stigma without any long hairs. Metasternum bare. Abdomen oval, without margination. Abdominal pattern composed of entire narrow bands extending in full breadth over lateral margin; bands yellowish, with a blue sheen.

Styli relatively long and broad. Lingula grooved, of moderate size and reaching about as far posteriorly as lateral arms. Lateral arms long, pointed and reaching much further posteriorly than superior lobes. Superior lobes in upright position, rather long and without any apical or basal teeth. Pyxis broad, with two pairs of long lateroventral tooth-like appendages. For structure of pyxis, see Fig. 176. Tubus rather long, well chitinized and without apicoventral spinules.

Betasyrphus serarius (WIEDEMANN)

Syrphus serarius WIEDEMANN 1830, Auss. Zweifl. 2, p. 128.

Specimen studied (Japan, Kamikochi 6. IX. 1935): Frons black, hind-part brown-dusted, black-haired. Lunula black in the middle and laterally brown. Face yellowish, grey-dusted. Central prominence shining dark brown. Mouth-edge broadly black. Antennae blackish brown; third segment a little paler ventrally at base. Eyes densely brown-haired. For profile of head, see Fig. 177. Mesonotum dull greenish grey with three indistinct dark longitudinal stripes. Postalar calli dark brown. Scutellum yellowish brown, laterally narrowly black, black-haired. Wings faintly brownish; stigma brown. Legs mainly brown: basal third of all femora and all tarsi dorsally darkened. Third and fourth abdominal segments with slight margination. For abdominal pattern, see Fig. 178. Sternites black with pale front and hind margins. Wing length 9.6 mm.

Genitalia (Figs. 174—176): For explanation, see under genus *Betasyrphus*.

Genus *Syrphus* FABRICIUS

Syrphus FABRICIUS 1775, Syst. Ent., p. 762. For designation of type-species, see under "Remarks".

Parasyrphus MATSUMURA 1917, Ent. Mag., Kyoto 3:1, p. 39 (as a subgenus of *Syrphus* FABRICIUS). Type-species *Syrphus aeneostoma* MATSUMURA 1917 (= *Syrphus vitripennis* MEIGEN 1822), by designation of HULL 1949.

Syrphidis GOFFE 1933, Trans. Ent. Soc. S. Engl. 8:2, p. 78. Type-species *Musca ribesii* LINNAEUS 1758, by original designation.

Face yellow, without a dark median stripe. Eyes almost bare or hairy. Mesonotum dull. Mesopleura just behind prothoracic stigma without any long hairs. Metasternum bare. Lower lobe of squama with long hairs on disc, unlike the other genera studied. Abdomen oval and marginated. Abdominal pattern composed of a pair of spots on the second tergite much cut away behind towards the sides and reaching forward to or near to the base of the segment, while extending over the side-margin. Third and fourth tergites with entire bands or quadrate spots running narrowly over the lateral margin or not.

Styli relatively short and broad. Lingula long, almost cylindrical and extending more posteriorly than lateral arms. Lateral arms distinct, short. Superior lobes large, long and almost upright position, with one small apical and one basal tooth. Pyxis not strongly laterally compressed. Posteroventral face of pyxis flat, with elevated sides. As seen in profile, the pyxis seems to bear two ventral teeth. The anterior tooth may be formed by the elevated side or be free from it. Tubus thick, weakly chitinized and with distinct apicoventral spinules.

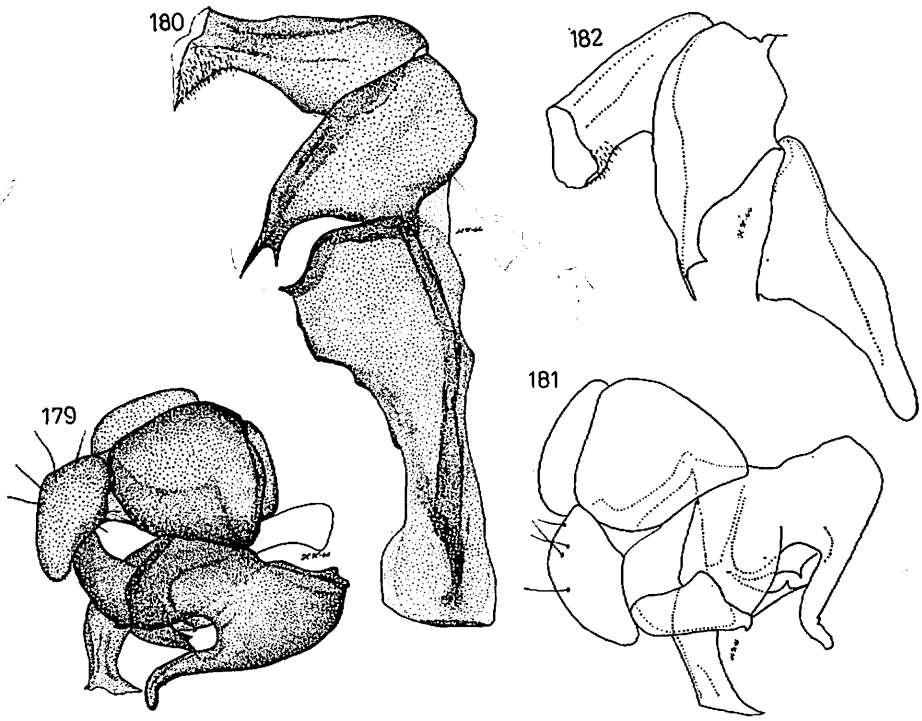
Remarks: Since MEIGEN's days, *Syrphus* has been used as the generic name for a group of species with *S. ribesii*, the central species of MEIGEN (1803), as type-species by designation of RONDANI (1844). However, the type-species of *Syrphus* was first designated by CURTIS (1839) who selected *Musca lucorum* L. as the type, a fact pointed out by GOFFE (1933). The revival of *M. lucorum* as the type-species of *Syrphus* has led to many difficulties, because it is not congeneric with the *ribesii* group and is the type-species of *Leucozona* SCHINER. To avoid, as he put it, any drastic alternations in the name of the whole family and the *ribesii* group, GOFFE (1933) proposed the name *Syrphidis*, designating *Musca ribesii* as the type-species. However, as was suspected by HINCKS (1934), MATSUMURA & ADACHI (1917 a) had already proposed a name which would replace GOFFE's (1933) *Syrphidis*. In the above-mentioned Japanese paper the name *Parasyrphus* is proposed for a subgenus of *Syrphus* containing two species, *S. aeneostoma* MATS. and *S. nigrogena*, both new and neither designated as the type. *S. aeneostoma* was sunk as a synonym of *S. vitripennis* MEIG. by SHIRAKI (1930). GOFFE (1943) was well aware of the annoying situation in dealing with MATSUMURA's subgenus *Parasyrphus* but he did not make any type designation. The designation of *S. aeneostoma* as the type of *Parasyrphus* was made by HULL (1949) and as *S. aeneostoma* is a synonym of *S. vitripennis*, which in turn is clearly congeneric with *S. ribesii*, the name *Parasyrphus* MATS. will replace *Syrphidis* GOFFE. COLLIN (1952) retains the generic name *Syrphus* for *Musca ribesii* on the basis of the worldwide use of that combination. I think it would be best, as recommended by the International Commission, to establish *Musca ribesii* as the type of *Syrphus* and *Musca lucorum* as the type of *Leucozona*.

Syrphus ribesii (LINNAEUS)

Musca ribesii LINNAEUS 1758, Syst. Nat. ed. X, p. 593.

Specimens studied: 1. (Finland, Somero 3. VII. 1965): Frons yellow, medially and above the lunula black, the hind part heavily yellow-dusted, dark-haired. Lunula yellow with dark spots above each antenna. Face yellow, yellow-haired, the upper mouth-edge faintly darkened. Antennae dorsally dark brown, ventrally orange. Eyes with obvious short scattered hairs. Eye-suture about as long as vertical triangle. For profile of head, see Fig. 195. Mesonotum greyish green. Scutellum yellow, black-haired, laterally and along front-margin narrowly yellow-haired. Wings clear; stigma pale brown. Legs mainly yellow; one-fourth of anterior and middle femora and three-fifths of hind femora basally black. Hind tibiae with a dark submedian annulation. Three middle segments and apex of first segment of anterior, middle and hind tarsi totally darkened. Short hairs on yellow parts of anterior and middle femora yellow, on hind femora mainly black on anterior side, on posterior side yellow. For abdominal pattern, see Fig. 203. Sternites pale; the second with a large, dark, somewhat quadrangular spot in the middle, the third with a broad dark band on posterior half extending laterally and medially near front-margin of sternite, the fourth with dark lateral stripes and a small spot medially at front-margin. Wing length 10.2 mm. For male genitalia, see Figs. 179—180.

2. (Finland, Somero 30. VI. 1966): Differs from the foregoing specimen in the following respects: For profile of head, see Fig. 196. Yellow apical part of hind femora with mixed black



Figs. 179—182: Male genitalia of *Syrphus ribesii* (L.) in dextrolateral view. — *179.* and *181.* general, — *180.* and *182.* axial system of penis. — Orig.

and yellow hairs. Hind tibiae without annulation. For abdominal pattern, see Fig. 204. Second and third sternites with a median dark spot on anterior half, fourth totally pale. Wing length 10.2 mm. For genitalia, see Figs. 181—182.

Genitalia (Figs. 179—182): Anteroventral teeth of pyxis free from elevated sides of flat posterior face, rather short and broad. Shape of pyxis characteristic.

Syrphus pilisquamus Ringdahl

Syrphus pilisquamus Ringdahl 1928, Entomol. Tidskr. 49, p. 18.

Specimen studied (Finland, Sotkamo): Hind part of frons black, front part yellow, heavily pale-dusted and black-haired. Face yellow, yellow-haired. Upper mouth-edge narrowly brown. Antennae totally orange. Eyes with indistinct, short, scattered hairs. Eye suture much shorter than vertical triangle. For profile of head, see Fig. 197. Mesonotum greyish green, laterally behind transverse suture brownish. Postalar calli yellowish brown. Scutellum yellow, yellow-haired, mixed with some black hairs in the middle. Wings distinctly yellowish; veins pale brown; stigma yellow. Legs mainly yellow; basal fourth of anterior, basal fifth of middle and the extreme base of hind femora darkened. Hairs on legs yellow; anterior side of hind tarsi, tibiae and apex of femora with mixed black hairs. For abdominal pattern, see Fig. 205. Sternites

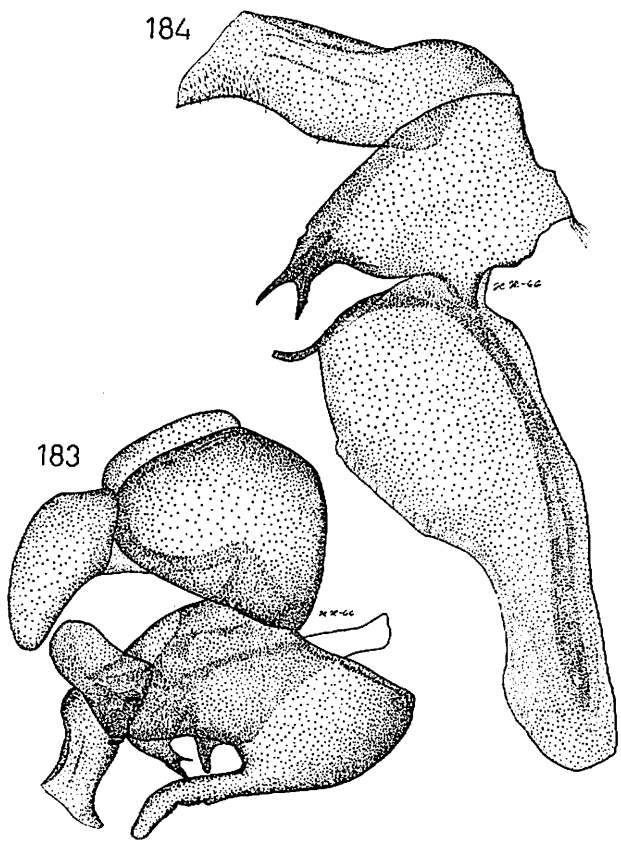
yellow; the second with a big dark median spot, the third with a narrow median stripe. Wing length 9.4 mm.

Genitalia (Figs. 183—184): Distinguished from *S. ribesii* by the different shape of the pyxis and the relatively longer and narrower anteroventral teeth.

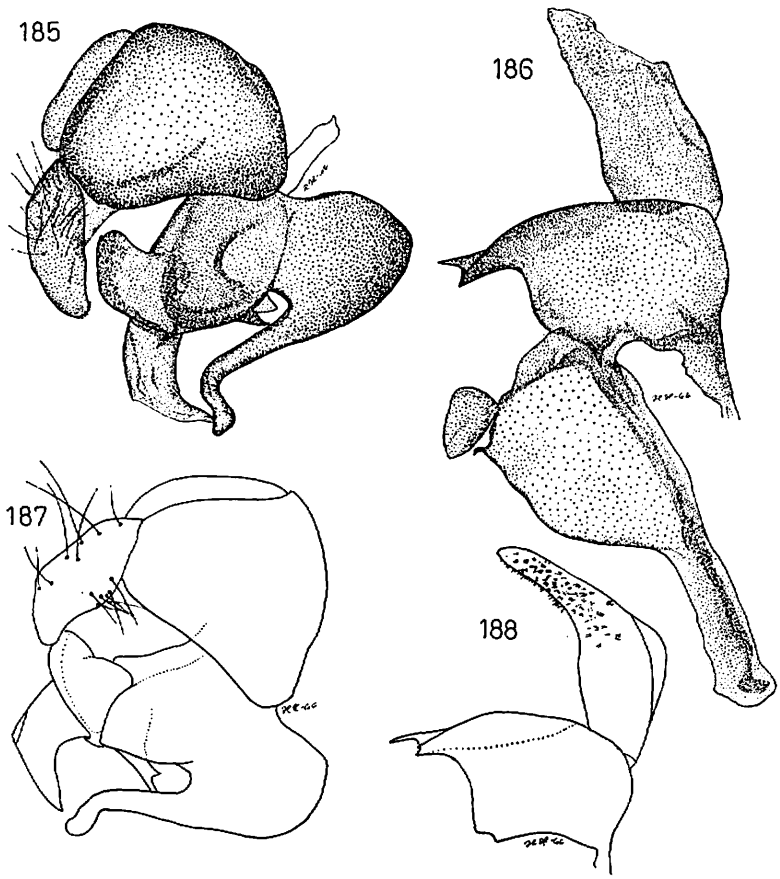
Syrphus torvus Osten Sacken

Syrphus torvus Osten Sacken 1875, Proc. Bost. Soc. 18, p. 139.

Specimens studied (Finland, Somero 1. VII. 1965): Differs from the first-described specimen of *S. ribesii* in the following respects: Frons almost totally dark. Face clothed with black hairs, mixed with some yellow ones. Antennae blackish brown; third segment reddish beneath. Eyes densely pale-haired. For profile of head, see Fig. 198. Mesonotum greyish brown. Stigma brown. Two-fifths of anterior and middle femora and three-quarters of hind femora basally black.



Figs. 183—184: Male genitalia of *Syrphus pilisquamus* Ringd. in dextrolateral view. — *183.* general, — *184.* axial system of penis. — Orig.



Figs. 185—188: Male genitalia of *Syrphus torvus* O. S. in dextrolateral view. — *185.* and *187.* general, — *186.* and *188.* axial system of penis. In *Fig. 188.* the sustentacular apodeme has been destroyed. — Orig.

Anterior tarsi totally and last three segments of middle tarsi dark. For abdominal pattern, see Fig. 206. Second, third and fourth sternites with big triangular median spots. Wing length 10.8 mm. For genitalia, see Figs. 185—186.

2. (Finland, Somero 30. VI. 1966): Differs from the foregoing specimen in the following respects: Face ventrally and laterally mainly yellow-haired. Third antennal segment yellowish brown, dorsally somewhat darkened. For profile of head, see Fig. 199. Mesonotum greyish green. Stigma dark brown. Apical half of hind tibiae darkened. Anterior face of hind tibiae with a row of long black bristles. For abdominal pattern, see Fig. 207. Second, third and fourth sternites with a broad dark median stripe. For genitalia, see Figs. 187—188.

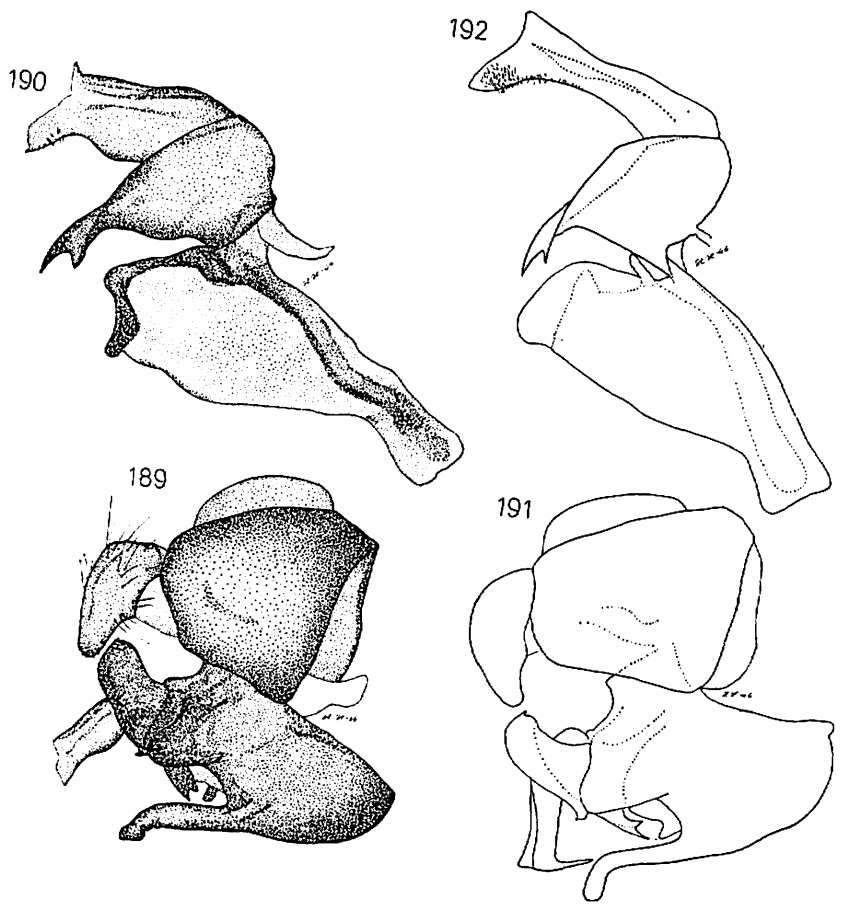
Genitalia (Figs. 185—188): Anteroventral teeth of pyxis (as seen in profile) formed by elevated sides of flat posteroventral face (Fig. 7). Pyxis of characteristic shape. Tip of lingula more angularly bent than in other species.

Syrphus vitripennis MEIGEN

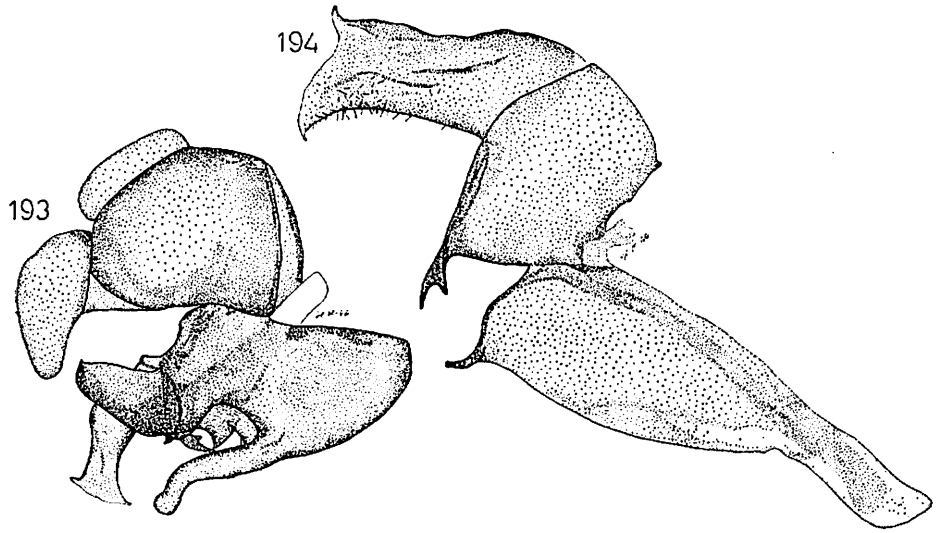
Syrphus vitripennis MEIGEN 1822, Syst. Beschr. 3, p. 308.

Specimen studied: 1. (Finland, Somero 4. VII. 1965): Differs from first-described specimen of *S. ribesii* in the following respects: Frons almost totally dark. Antennae orange, dorsally a little darker. For profile of head, see Fig. 260. One-third of anterior and four-fifths of hind femora basally black. Hind tibiae with very indistinct annulation. Anterior and middle tarsi quite yellow. Short hairs on yellow tips of hind femora totally yellow. For abdominal pattern, see Fig. 208. Sternites pale, the second with a small dark spot in the middle. Wing length 8.7 mm. For genitalia, see Figs. 289—290.

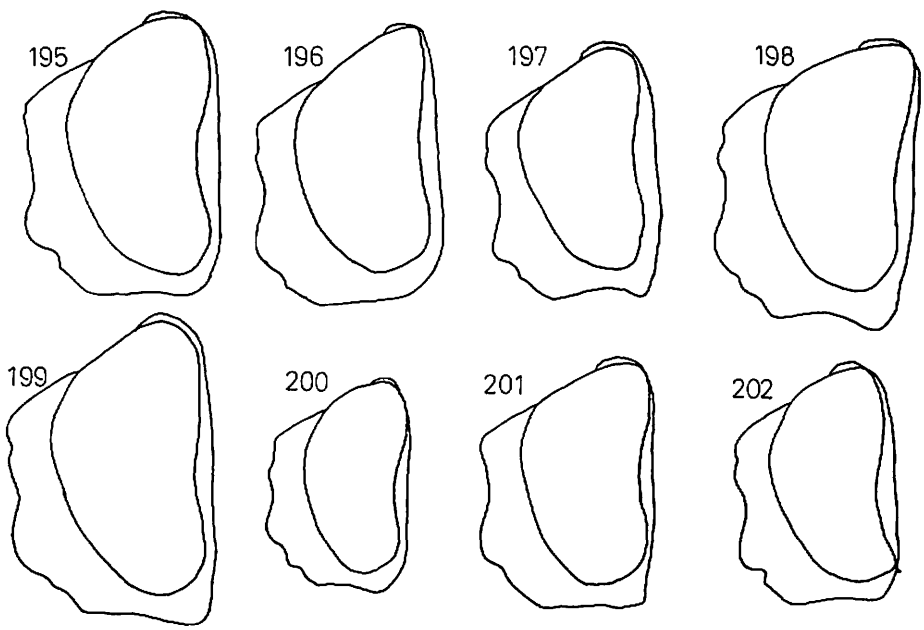
2. (Finland, Somero 30. VI. 1966): Differs from the foregoing specimen in the following respects: For profile of head, see Fig. 201. Scutellum anterolaterally with a large area of yellow



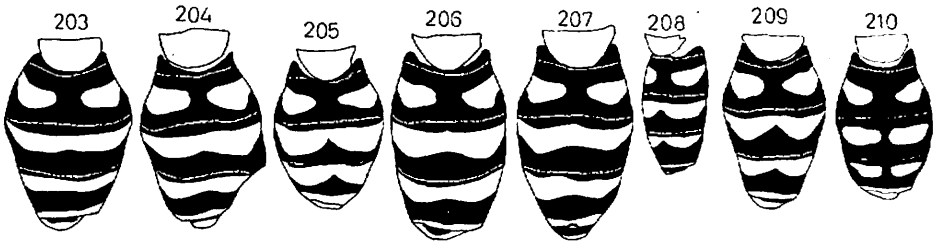
Figs. 189—192: Male genitalia of *Syrphus vitripennis* MEIG. in dextrolateral view. — *189.* and *191.* general, — *190.* and *192.* axial system of penis. — Orig.



Figs. 193—194: Male genitalia of *Syrphus sexmaculatus* (ZETT.) in dextrolateral view. — *193.* general, — *194.* axial system of penis. — Orig.



Figs. 195—202: Heads of the *Syrphus* species studied, in profile. — *195.* and *196. S. ribesii* (L.), — *197. S. pilisquamus* RINGD., — *198.* and *199. S. torvus* O. S., — *200.* and *201. S. vitripennis* MEIG., — *202. S. sexmaculatus* (ZETT.). — Orig.



Figs. 203—210: Abdominal patterns of the *Syrphus* species studied. — *203.* and *204. S. ribesii* (L.), — *205. S. pilisquamus* RINGD., — *206.* and *207. S. torvus* O. S., — *208.* and *209. S. vitripennis* MEIG., — *210. S. sexmaculatus* (ZETT.). — Orig.

hairs. For abdominal pattern, see Fig. 209. Third sternite also with a dark middle spot. Anterior side of hind tibiae mainly with black hairs. Wing length 8.8 mm. For genitalia, see Figs. 291—292.

Genitalia (Figs. 189—192): Distinguished from *S. torvus* by shape of pyxis and lingula.

Syrphus sexmaculatus (ZETTERSTEDT)

Scaeva sexmaculata ZETTERSTEDT 1838, Ins. Lapp., p. 603.

Specimen studied (Finland, Piippola 6. VII. 1966): Hind part of frons black, front part yellow, black-haired. Lunula yellow. Face yellow with mixed black and yellow hairs, dorsolaterally totally black-haired. Antennae orange; third segment mid-dorsally with a triangular dark spot. Eye-suture a little shorter than vertical triangle. Eyes with distinct short scattered hairs. For profile of head, see Fig. 202. Mesonotum greyish green. Scutellum yellow, yellow-haired; posteriorly, however, broadly black-haired. Wings faintly brownish; stigma brown. Legs mainly yellow: basal third of anterior and middle femora and hind tarsi totally dark. Anterior face of hind tibiae mainly black-haired; anterior face of hind femora yellow-haired with some scattered black hairs. For abdominal pattern, see Fig. 210. Sternites yellow, the second with a very indistinct dark spot. Wing length 8.2 mm.

Genitalia (Figs. 193—194): Differs from *S. torvus* in the shape of pyxis and lingula.

The following American species can be included in the genus *Syrphus*, according to the figures of FLUKE (1950):

Syrphus phaeostigma WIEDEMANN 1830.
S. rectus OSTEN SACKEN 1875.
S. opinator OSTEN SACKEN 1877.
S. knabi SHANNON 1916.
S. transversalis CURRAN 1921.
S. attenuatus HINE 1922.
S. bigelowi CURRAN 1924.
S. currani FLUKE 1924.
S. willistoni FLUKE 1942.

Genus *Mesosyrphus* MATSUMURA

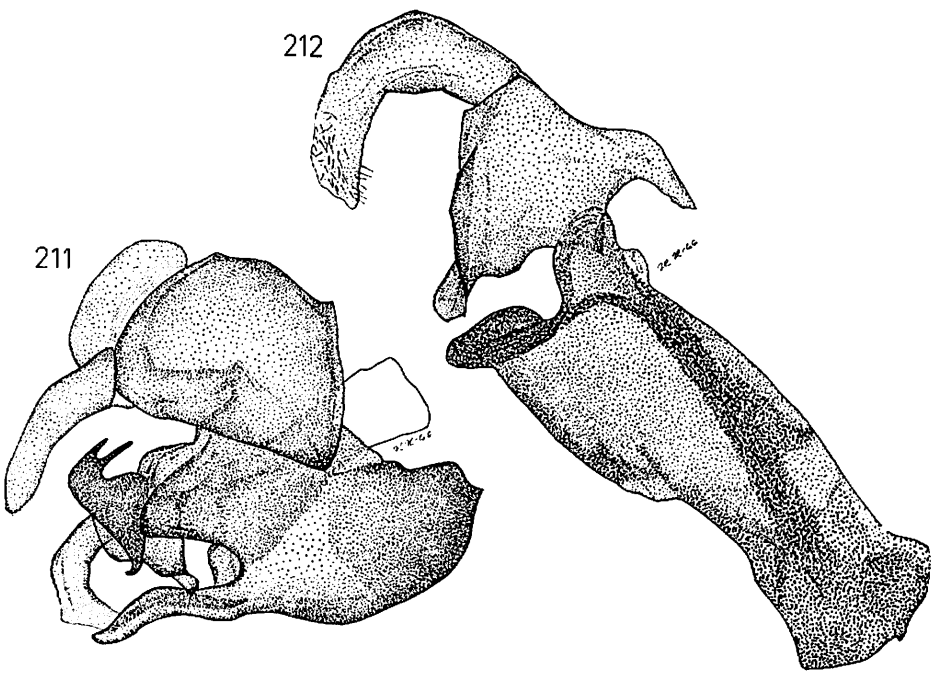
Mesosyrphus MATSUMURA 1917, Ent. Mag., Kyoto 3:1, p. 19. Type-species *Mesosyrphus constrictus* MATSUMURA 1917, by original designation.

Phalacrodira ENDERLEIN 1937, Sitz. Ber. Naturf. Ges. Berlin 4—7, p. 205. Type-species *Scaeva tarsata* ZETTERSTEDT 1843, by original designation.

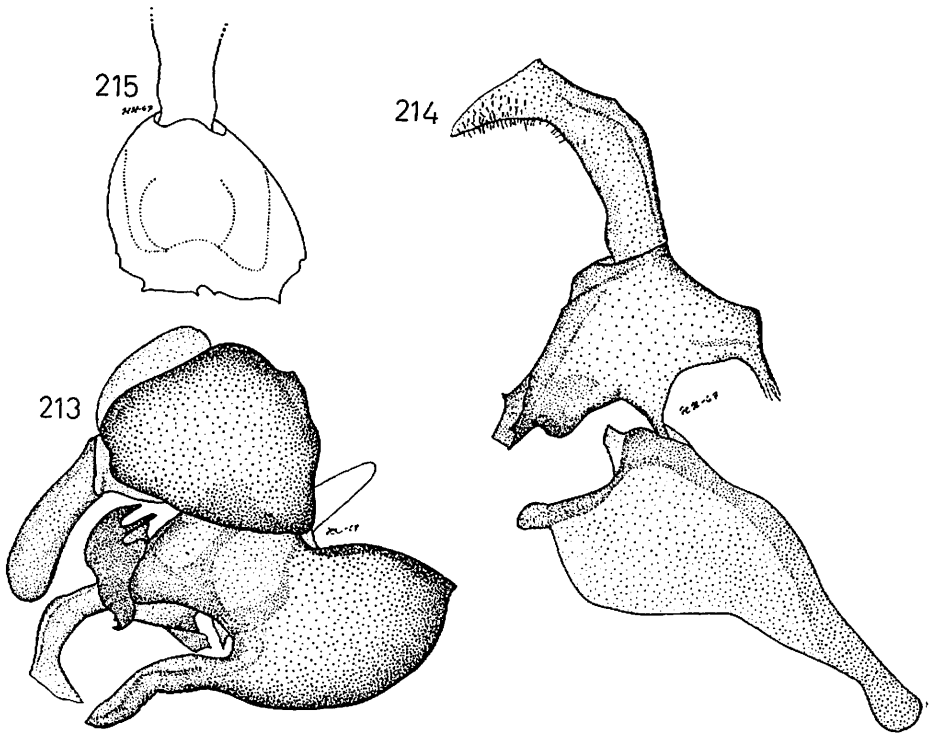
Dasyepistrophe SZILADY 1940, Ann. Mus. Nat. Hung. (Zool.) 33, p. 59 (as a subgenus of *Epistrophe* WALKER 1852). Type-species *Scaeva macularis* ZETTERSTEDT 1843, by designation of GOFFE 1944.

Face yellow, with or without a dark median stripe. Eyes hairy or bare. Mesonotum dull or shining. Mesopleura with obvious long hairs just behind the prothoracic stigma. Metasternum bare. Abdomen linear or oval in varying degree and without margination. Abdominal pattern composed of a pair of spots on the second tergite much cut away behind towards sides and reaching forward near the base of the segment when extending over the side-margin. Third and fourth tergites with entire bands or a pair of spots which usually extend narrowly over the side-margins.

Styli usually rather long and narrow. Lingula long, broad and grooved, reaching much further posteriourly than lateral arms. Size of lateral arms varying. Superior lobes in upright position with one or two anteriorly directed apical teeth of varying size and one or two basal teeth. Pyxis not strongly compressed laterally. Posteroventral face of pyxis broad and flat (see Figs. 215 and 220) with more or less elevated sides. Anterolaterally, the pyxis usually bears a pair of teeth of varying size. Tubus rather long and well chitinized, with large lateral wings, so that when seen from above it is somewhat oval, or without such wings. Spinules at apex of tubus usually inconspicuous.



Figs. 211—212: Male genitalia of *Mesosyrphus tarsatus* (ZETT.) in dextrolateral view. — *211.* general, — *212.* axial system of penis. — Orig.



Figs. 213—215: Male genitalia of *Mesosyrphus dryadis* (HOLMGR.). — *213.* general, — *214.* axial system of penis in dextrolateral view, — *215.* posteroventral view of pyxis. — Orig.

Remarks: I have not studied the type-species of *Mesosyrphus* MATSUMURA, but MATSUMURA's (1917) description and figure indicate its close relationship to *Scaeva macularis* ZETTERSTEDT, as was also mentioned by GOFFE (1944 a).

Mesosyrphus tarsatus (ZETTERSTEDT), n. comb.

Scaeva tarsata ZETTERSTEDT 1838, Ins. Lapp., p. 601.

Specimen studied (USSR, Pechenga): Frons black, black-haired; lunula yellow. Angle of frons at approximation of eyes about 90 degrees. Face totally yellow, in the middle short yellow-haired, laterally long black-haired. Mouth-edge black. Antennae black; base of third segment, however, reddish. Eyes pale-haired. Eye-suture shorter than vertical triangle. For profile of head, see Fig. 237. Mesonotum greenish, somewhat dull. Scutellum yellow, laterally black, black-haired in the middle, laterally and along front-margin yellow-haired. Wings faintly brownish; stigma pale brown. Legs mainly yellow; basal half of anterior and middle femora and basal two-thirds of hind femora black. All tarsi dark brown. For abdominal pattern, see Fig. 249. Sternites pale, the second with a dark spot in the middle extending to the front-margin of the segment. Wing length 8.0 mm.

Genitalia (Figs. 211—212): Basale rather long. Superior lobes with two long apical teeth and one basal tooth. Pyxis rather long; posteroventral face flat with angular elevated sides. Anteroventral lateral teeth truncate. Tubus somewhat angularly bent, without lateral wings.

Mesosyrphus dryadis (HOLMGREN), n. comb.

Scaeva dryadis HOLMGREN 1869, Sv. Vet. Akad. Handl. 8, p. 26.

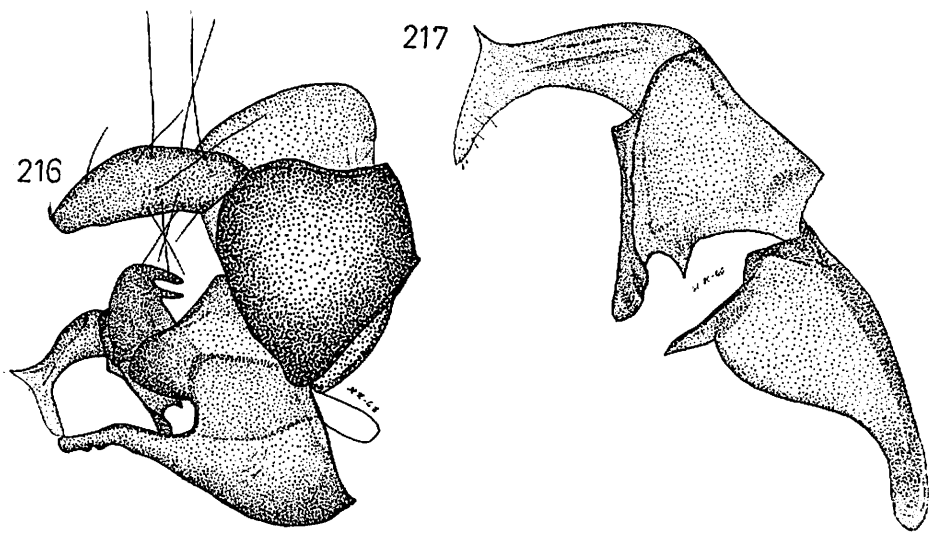
Specimen studied (USSR, Usty-Tsylyma, on the river Pechora 18. VI. 1908): Differs from the specimen of *M. tarsatus* studied in the following respects: Relatively broader species. Angle of frons at approximation of eyes about 135 degrees. Frons with a distinct metallic green sheen with denser and longer dark hairs. Antennae unicolorous blackish brown. For profile of head, see Fig. 238. Scutellum totally dark-haired. Basal two-thirds of anterior and middle femora and basal four-fifths of hind femora dark. Middle and hind tibiae with a very indistinct dark median annulation. For abdominal pattern, see Fig. 250. Second, third and fourth sternites dark with large pale lateral spots at front-margin; hind-margin rather broadly pale. Wing length 8.1 mm.

Genitalia (Figs. 213—215): Differs from *M. tarsatus* in the following respects: Styli relatively shorter and differently shaped. Basale considerably shorter. Superior lobes somewhat different in shape. Pyxis relatively much shorter and higher.

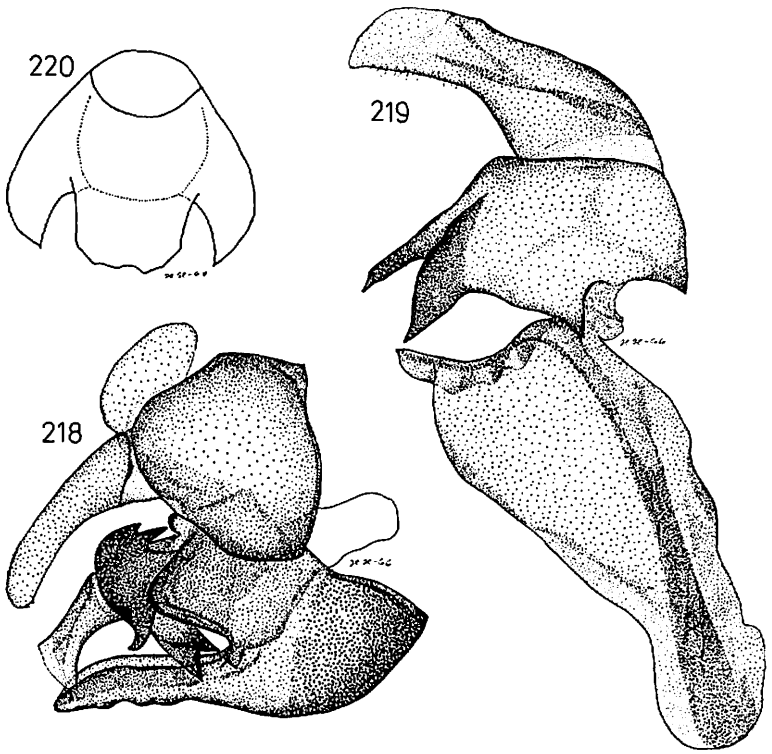
Mesosyrphus macularis (ZETTERSTEDT)

Scaeva macularis ZETTERSTEDT 1843, Dipt. Scand. 2, p. 730.

Specimen studied (Finland, Somero 30. V. 1965): Frons black, grey-dusted, black-haired. Lunula black. Face blackish yellow, heavily dusted, black-haired. Mouth-edge very broadly black. Median stripe indistinctly boardered, medially undusted, black and extending to bases



Figs. 216—217: Male genitalia of *Mesosyrphus macularis* (ZETT.) in dextrolateral view. — *216.* general, — *217.* axial system of penis. — Orig.



Figs. 218—220: Male genitalia of *Mesosyrphus nigritarsis* (ZETT.). — *218.* general and — *219.* axial system of penis in dextrolateral view, — *220.* posteroventral view of pyxis. — Orig.

of antennae. Antennae unicolorous black. Eyes brown-haired. Eye-suture longer than vertical triangle. For profile of head, see Fig. 239. Mesonotum greenish, rather shining. Scutellum yellow; lateral corners black, black-haired. Wings slightly darkened; stigma blackish. Legs mainly black; tips of all femora yellow. Anterior and middle tibiae yellowish with a broad, indistinct, dark, submedian annulation. For abdominal pattern, see Fig. 251. Second sternite with a large triangular spot extending to front-margin of segment, third and fourth sternites with dark bands near hind-margin with a narrow process to the front-margin. Wing length 8.1 mm.

Genitalia (Figs. 216—217): Differs from *M. tarsatus* in the following respects: Styli relatively broader. Basale short and high. Theca considerably smaller and different in shape. Superior lobes different in shape. Flat posteroventral face of pyxis without distinct elevated sides. Pyxis anteroventrally with a pair of pointed teeth. Tubus not angularly bent.

Mesosyrphus nigritarsis (ZETTERSTEDT), n. comb.

Scaeva nigritarsis ZETTERSTEDT 1843, Dipt. Scand. 2, p. 710.

Specimen studied (Finland, Sodankylä): Frons black, grey-dusted, dark-haired. Lunula yellow. Face yellow, yellow-haired, pale-dusted except for central prominence. Mouth-edge broadly black. Antennae orange; third segment dorsally a little darkened. Eyes bare. For pro-

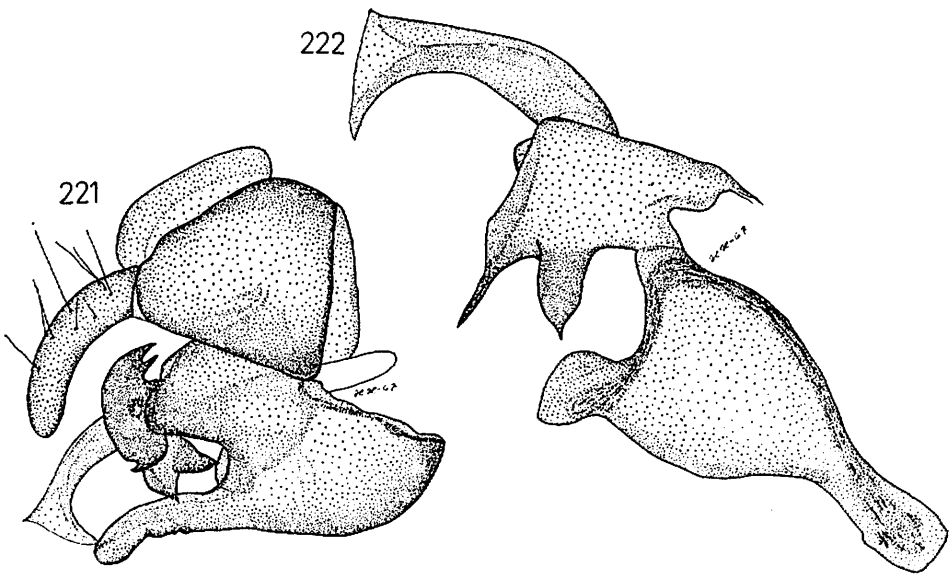
file of head, see Fig. 240. Mesonotum greyish green, moderately shining. Postalar calli brownish. Scutellum yellow, yellow-haired, posteriorly mixed with some black hairs. Wings somewhat yellowish; stigma yellowish brown. Legs maily yellow; basal third of anterior and middle femora and basal three-fifths of hind femora black. All tarsi blackish brown. For abdominal pattern, see Fig. 252. Sternites pale, the second with a large roundish dark median spot. Wing length 8.8 mm.

Genitalia (Figs. 218—220): Styli rather long. Basale high, higher than long. Theca large and of typical shape. Superior lobes with two apical teeth, the lower longer than the upper one, and with one basal tooth. Flat posteroventral face of pyxis without elevated sides. Pyxis posteroventrally with a pair of huge teeth. Tubus with lateral wings of moderate size.

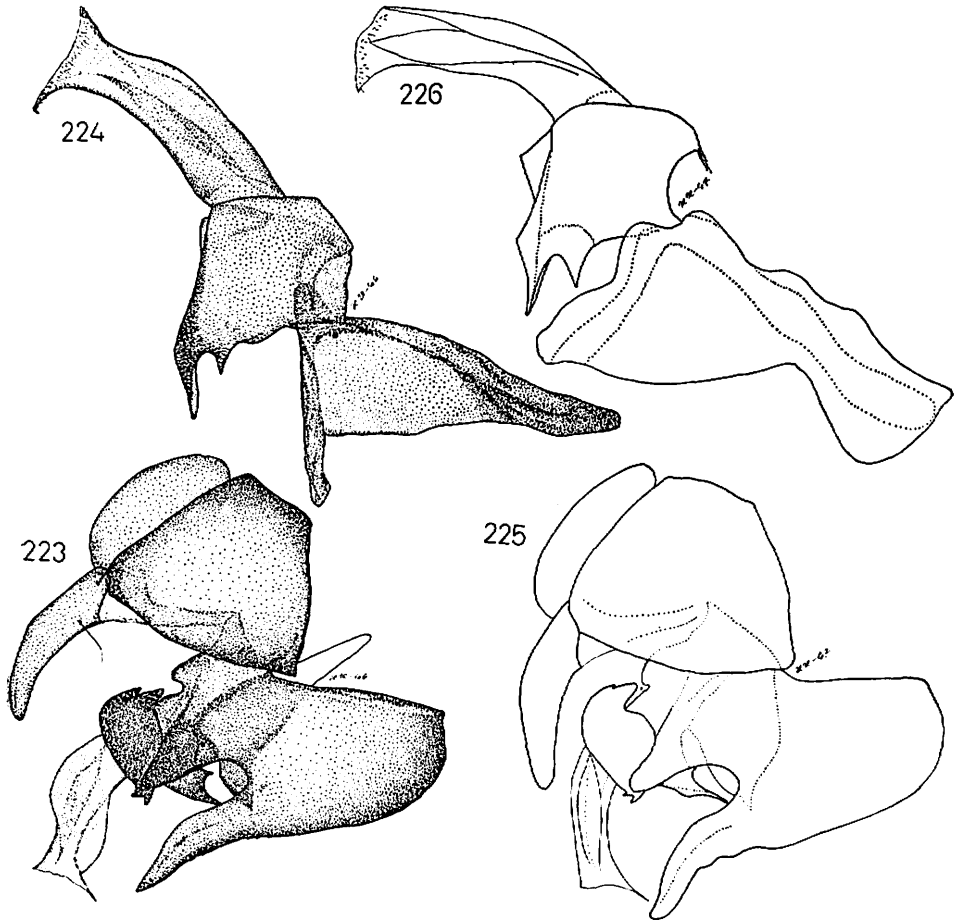
Mesosyrphus malinellus (COLLIN), n. comb.

Syrphus malinellus COLLIN 1952, Proc. R. Ent. Soc. Lond. (B) 21, p. 35.

Specimen studied (USSR, Yashchira, Leningrad region 19. V. 1963): Frons black, dark-haired, pale-dusted. Lunula yellow. Face yellowish, somewhat pale-dusted except for central prominence. Mouth-edge broadly black. Facial median stripe broad, brown, extending near bases of antennae. Antennae pale brown; third segment faintly darkened dorsally. Eyes with obvious short scattered hairs. For profile of head, see Fig. 241. Mesonotum greenish black, in the middle somewhat dull, laterally glittering. Scutellum yellowish, laterally dark, clothed with mixed black and yellow hairs in the middle, laterally totally yellow-haired. Wings clear; stigma brown. Legs mainly yellow; basal half of anterior and middle femora and basal five-sixths of hind femora black. Anterior and middle tibiae with a very indistinct dark submedian annulation. Last three segments of anterior tarsi and whole of middle tarsi somewhat darkened.



Figs. 221—222: Male genitalia of *Mesosyrphus malinellus* (COLL.) in dextrolateral view. — *221.* general, — *222.* axial system of penis. — Orig.



Figs. 223—226: Male genitalia of *Mesosyrphus vittiger* (ZETT.) in dextrolateral view. — *223.* and *225.* general, — *224.* and *226.* axial system of penis. — Orig.

Apical three-fifths of hind tibiae and whole of hind tarsi dark. For abdominal pattern, see Fig. 253. Second and third sternites with anterior half pale and posterior half dark, the fourth totally dark. Wing length 7.4 mm.

Genitalia (Figs. 221—222): Styli rather long and narrow. Lateral arms short and rounded. Superior lobes in similar position to the four foregoing species, with two apical teeth of about equal size and one basal tooth. Flat posteroventral face of pyxis with elevated angular sides. Anteroventrally, the pyxis bears a pair of large lateral teeth. Tubus with large lateral wings.

Mesosyrphus vittiger (ZETTERSTEDT)

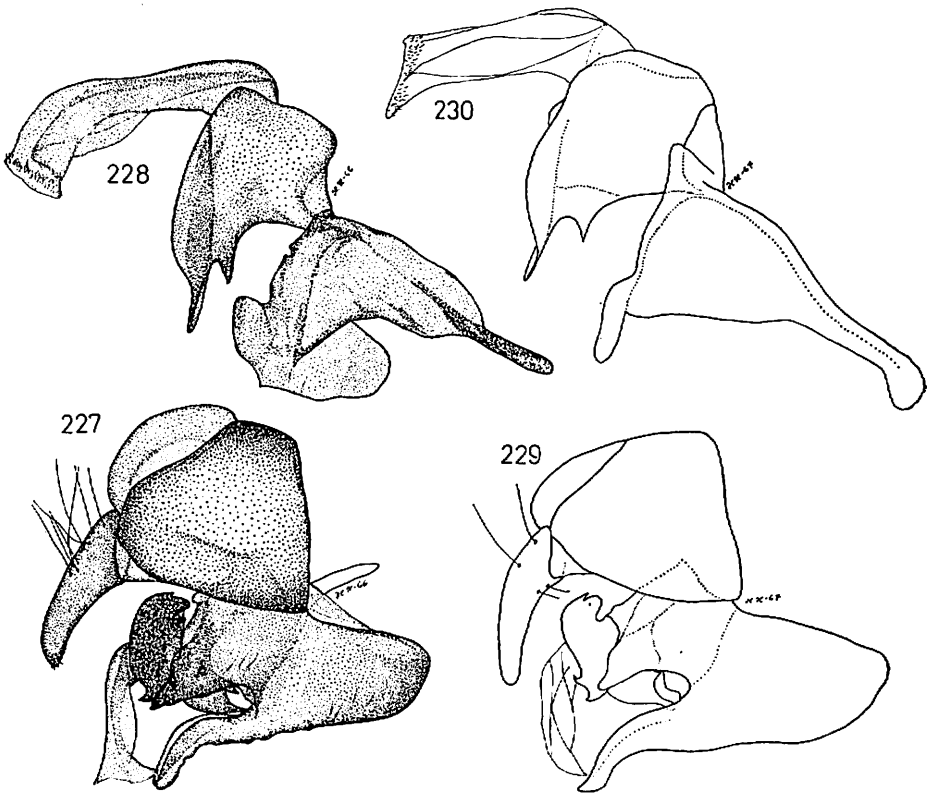
Scaeva vittigera ZETTERSTEDT 1843, Dipt. Scand. 2, p. 715.

Specimens studied. 1. (Finland, Somero 7. V. 1965): Frons black, grey-dusted, black-haired. Lunula yellow. Face yellowish, laterally pale-dusted, with mixed dark and pale hairs.

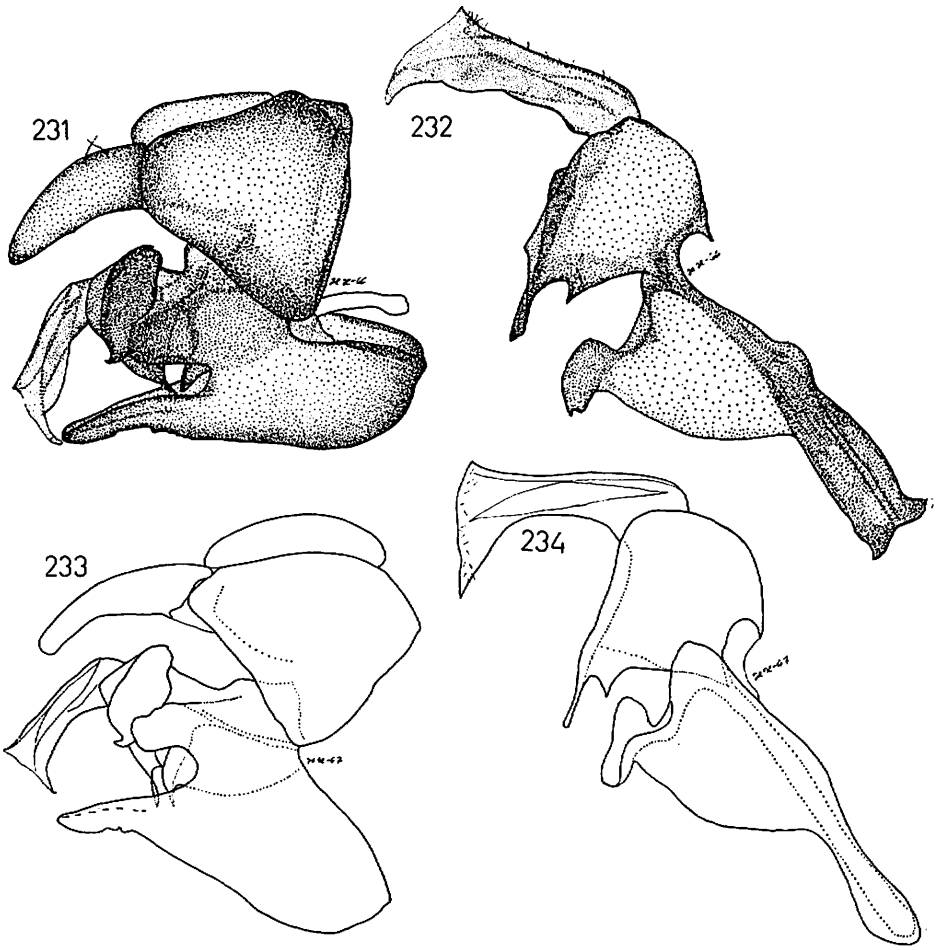
Upper mouth-edge and central prominence darkened. Antennae unicolorous blackish brown. Eye suture about as long as vertical triangle. Eyes with indistinct short scattered hairs. For profile of head, see Fig. 242. Mesonotum greyish green, dull. Scutellum yellow, black-haired. Wings clear; stigma pale brown. Legs mainly yellow: basal third of anterior and middle femora and basal four-fifths of hind femora dark. Hind tibiae with a broad dark median annulation. Last three segments of anterior and middle tarsi and whole of hind tarsi darkened. Anterior sides of anterior and middle tibiae mainly yellow-haired. For abdominal pattern, see Fig. 254. Yellow bands on third and fourth tergites extend only narrowly over side-margin of segments. Second, third and fourth sternites pale, the second with a small dark spot at front-margin. Wing length 7.5 mm. For genitalia, see Figs. 223—224.

2. (Finland, Karjalohja): Differs from the foregoing specimen in the following respects: Face entirely yellow-haired. Median stripe brown, extending half-way between central prominence and bases of antennae. For profile of head, see Fig. 243. For abdominal pattern, see Fig. 255. Second abdominal sternite with a dark median stripe. Wing length 8.0 mm. For genitalia, see Figs. 225—226.

Genitalia (Figs. 223—226): Lateral arms of theca rather long. Superior lobes with two



Figs. 227—230: Male genitalia of *Mesosyrphus lineola* (ZETT.) in dextrolateral view. — *227.* and *229.* general, — *228.* and *230.* axial system of penis. — Orig.



Figs. 231—234: Male genitalia of *Mesosyrphus annulatus* (ZETT.) in dextrolateral view. — *231.* and *233.* general, — *232.* and *234.* axial system of penis. — Orig.

apical teeth, the lower one much bigger than the upper, and two basal teeth. Flat posteroventral face of pyxis with elevated angular sides. Anteroventrally, the pyxis bears a pair of teeth of moderate size. Tubus with large lateral wing-folds.

Mesosyrphus lineola (ZETTERSTEDT)

Scaeva lineola ZETTERSTEDT 1843, Dipt. Scand. 2, p. 714.

Specimens studied: 1. (Finland, Jokioinen 4. VI. 1965): Frons black, hind part brown-dusted, black-haired. Face yellowish, heavily pale-dusted, black-haired. Mouth-edge darkened. Median stripe black, extending near base of antennae, although difficult to see owing to heavy dusting. Antennae unicolorous black. Eyes with distinct short scattered hairs. Eye suture longer than vertical triangle. For profile of head, see Fig. 244. Mesonotum greenish, dull. Wings-

somewhat clear; stigma blackish. Scutellum yellow, black-haired. Legs mainly dark; apical fourth of anterior and middle femora and tips of hind femora yellow. Anterior and middle tibiae yellow with a dark submedian annulation; bases of hind tibiae pale. Anterior sides of anterior and middle tibiae black-haired. For abdominal pattern, see Fig. 257. Yellow bands on third and fourth tergites extend broadly over side-margin of segments. Second, third and fourth sternites pale with large triangular spots, the apices of which extend to the front-margin of segments while the bases are well removed from the hind-margins. Wing length 8.1 mm. For genitalia, see Figs. 227—228.

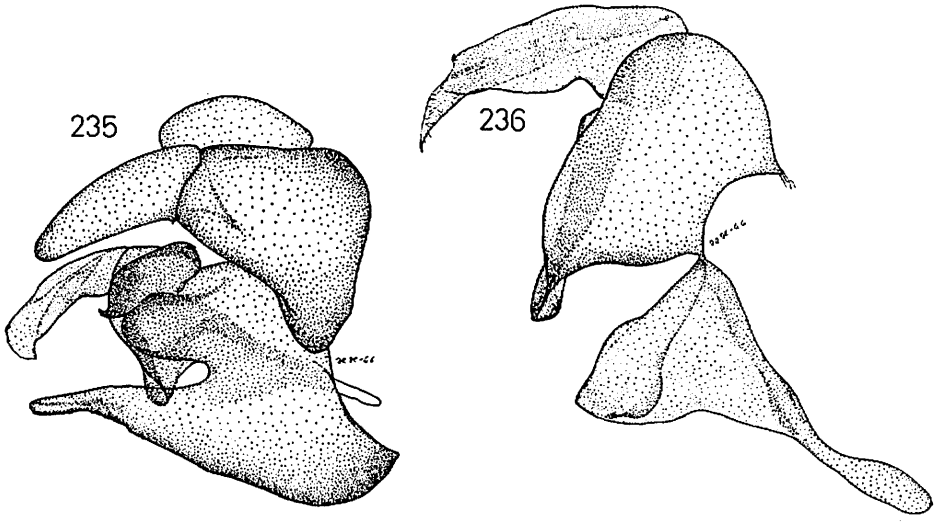
2. (Finland, Jokioinen 4. VI. 1965): Differs from the foregoing specimen in the following respects: Face with mixed pale and dark hairs. For profile of head, see Fig. 245. Mesonotum bluish green. Basal third of hind tibiae pale. For abdominal pattern, see Fig. 257. Third and fourth sternites without distinct dark spots. Wing length 7.8 mm. For genitalia, see Figs. 229—230.

Genitalia (Figs. 227—230): Differs from *M. vittiger* in the different shape of the lateral arms, in the lower apical tooth of the superior lobes being relatively shorter, in the different shape of the pyxis and in the elevated sides of the flat posteroventral surface being higher and rounded.

Mesosyrphus annulatus (ZETTERSTEDT)

Scaeva annulata ZETTERSTEDT 1838, Ins. Lapp., p. 604.

Specimens studied: 1. (USSR, Petchenga): Frons black, broadly grey-dusted along eye-margins, black-haired. Lunula dark brown. Face yellow, rather heavily dusted except for central prominence and upper mouth-edge. Mouth-edge broadly darkened. Median stripe broad and brown, extending near base of antennae. Eyes with obvious scattered short hairs. Eye suture as long as vertical triangle. Antennae pale brown; third segment about as long as deep. For profile of head, see Fig. 246. Mesonotum greenish, moderately shining. Scutellum



Figs. 235—236: Male genitalia of *Mesosyrphus relictus* (ZETT.) in dextrolateral view. — *235.* general, — *236.* axial system of penis. — Orig.

yellow, black-haired. Wings faintly yellowish; stigma pale brown. Legs mainly yellow; one-third of anterior, two-fifths of middle and four-fifths of hind femora basally dark. Hind tibiae with an indistinct broad dark submedian annulation. Hairs of anterior and middle tibiae mainly yellow. Last three segments of hind tarsi darkened. For abdominal pattern, see Fig. 258. Yellow bands on third and fourth tergites extending broadly over the side-margin of the segments. Sternites pale, the second with a dark band on the posterior half occupying about half the segment and with a narrow process to the front-margin. Wing length 6.4 mm. For genitalia, see Figs. 231—232.

2. (Finland, Lapinjärvi 6. VI. 1966): Differs from the foregoing specimen in the following respects: Third antennal segment distinctly longer than deep. Eye suture somewhat longer than vertical triangle. For profile of head, see Fig. 247. Wings clear. Only one-third of middle femora basally dark. For abdominal pattern, see Fig. 259. Wing length 7.0 mm. For genitalia, see Figs. 233—234.

Genitalia (Figs. 231—234): Lateral arms rather short. Superior lobes with only one apical tooth, the lower one being very short, rounded and indistinct and with one basal tooth. Pyxis very similar to *M. vittiger*, but somewhat different in shape. Tubus with large wing folds.

Mesosyrphus relictus (ZETTERSTEDT), n. comb.

Scaeva relicta ZETTERSTEDT 1838, Ins. Lapp., p. 603.

Specimen studied (Finland, Turku): Frons dark, heavily grey-dusted except for central prominence, pale-haired. Mouth-edge very broadly brown. Median stripe broad and brown, extending to base of antennae. Antennae pale brown; third segment dorsally faintly darker. Eye suture about as long as vertical triangle. For profile of head, see Fig. 248. Mesonotum greenish brown, dull in the middle, moderately shining laterally. Postalar calli brown. Scutellum yellow, black-haired, with a few yellow hairs laterally. Wings faintly yellowish, stigma pale brown, indistinct. Legs mainly yellow; one-third of anterior femora, two-fifths of middle femora and four-fifths of hind femora basally dark (the colour of the legs is very difficult to see because of the age of the specimen). Apical half of hind tibiae and hind tarsi totally darkened. For abdominal pattern, see Fig. 260. Second, third and fourth sternites dark with a pair of pale lateral spots. Wing length 6.0 mm.

Genitalia (Figs. 235—236): Shape of theca and superior lobes much resembling *M. annulatus*. Elevated sides of flat posteroventral face of pyxis high and rounded, as in *M. lineola*. Anteroventrally, the pyxis bears no lateral tooth. General shape of pyxis characteristic. Tubus with lateral wing folds.

The following Palaearctic species, which I have not studied but of which a figure is given by FLUKE (1950), can be placed in the genus *Mesosyrphus:*

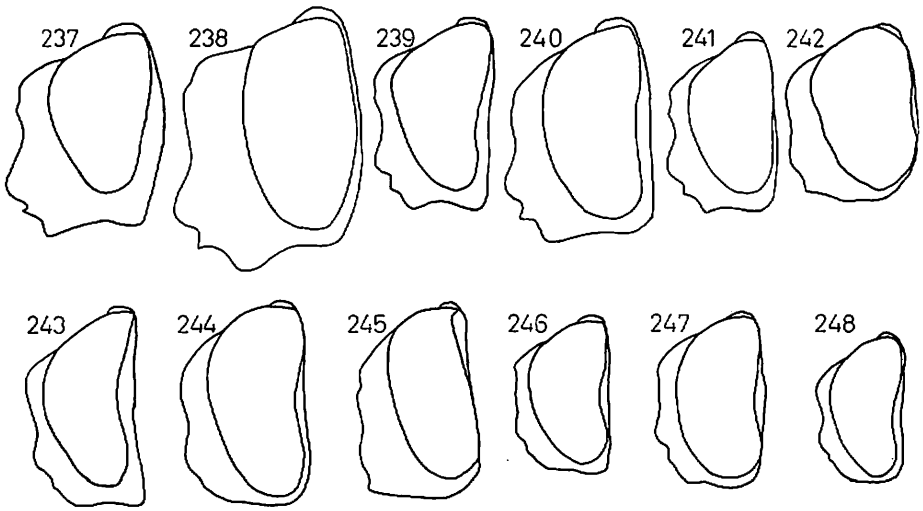
Syrphus punctulatus VERRALL 1873 = *Mesosyrphus punctulatus* (VERRALL).

The following North American species can be placed in the genus *Mesosyrphus*, according to the figures of FLUKE (1950):

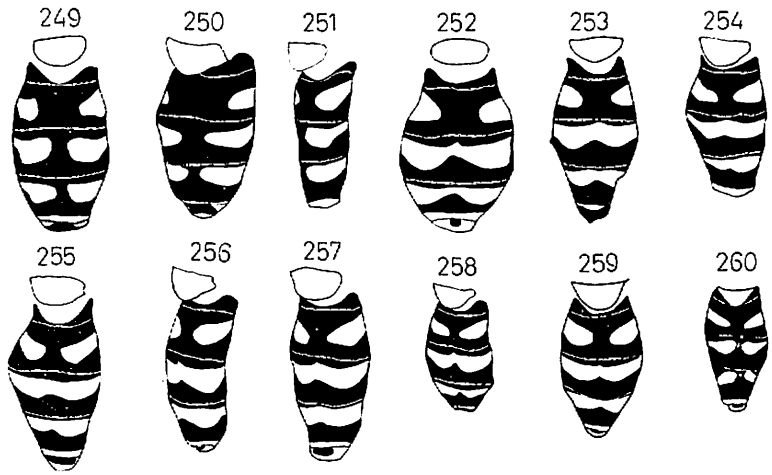
Syrphus sodalis WILLISTON 1886 = *Mesosyrphus sodalis* (WILLISTON), n. comb.

Further, the following North American species probably belong to the genus *Mesosyrphus* but the figures given by FLUKE (1950) are somewhat inadequate for confident placing:

Syrphus quinquelimbatus BIGOT 1884, *Syrphus genualis* WILLISTON 1886, *Syrphus insolitus* OSBURN 1908, *Syrphus rectoides* CURRAN 1921, *Epistrophe semiinterrupta* FLUKE 1935.



Figs. 237—248: Heads of the *Mesosyrphus* species studied, in profile. — *237. M. tarsatus* (ZETT.), — *238. M. dryadis* (HOLMGR.), — *239. M. macularis* (ZETT.), — *240. M. nigritarsis* (ZETT.), — *241. M. malinellus* (COLL.), — *242.* and *243. M. vittiger* (ZETT.), — *244.* and *245. M. lineola* (ZETT.), — *246.* and *247. M. annulatus* (ZETT.), — *248. M. relictus* (ZETT.). — Orig.



Figs. 249—260: Abdominal patterns of the *Mesosyrphus* species studied. — *249. M. tarsatus* (ZETT.) — *250. M. dryadis* (HOLMGR.), — *251. M. macularis* (ZETT.), — *252. M. nigritarsis* (ZETT.), — *253. M. malinellus* (COLL.), — *254.* and *255. M. vittiger* (ZETT.), — *256.* and *257. M. lineola* (ZETT.), — *258.* and *259. M. annulatus* (ZETT.), — *260. M. relictus* (ZETT.). — Orig.

Genus *Meligramma* FREY

Meligramma FREY 1945, Not. Ent. 25, p. 165 (as a subgenus of *Epistrophe* WALKER 1852) Type-species *Scaeva guttata* FALLEN 1817, by original designation.

In general appearance much resembling the genus *Melangyna*. Face yellow or considerably darkened, without a dark median stripe. Eyes bare. Mesonotum moderately shining. Mesopleura just behind the prothoracic stigma without any long hairs. Metasternum bare. Abdomen narrow; its sides almost parallel and without margination. Abdominal pattern composed of somewhat triangular spots on second tergite extending or not over side-margin and triangular or quadrangular spots on third and fourth tergites not extending over side-margin.

Styli relatively short and broad. Basale unusually high compared with theca. Lingula straight cylindrical. Lateral arms distinct. Superior lobes in typical position, somewhat quadrangular, about as high as broad. For further discussion, see under subgenera.

Subgenus *Meligramma* FREY, s. str.

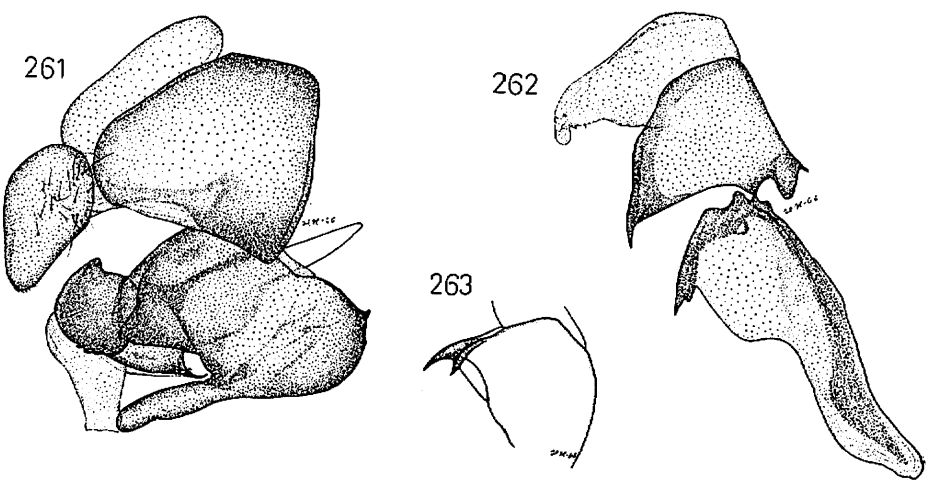
Face narrow, much narrower than eye as seen from in front.

Lingula long, extending as far posteriourly as lateral arms. Superior lobes ventrally serrate. Pyxis somewhat simple with one pair of small posteroventral appendages. For structure of pyxis, see Fig. 263. Tubus short, in typical position, tapering towards apex and with a few thick apicoventral spinules.

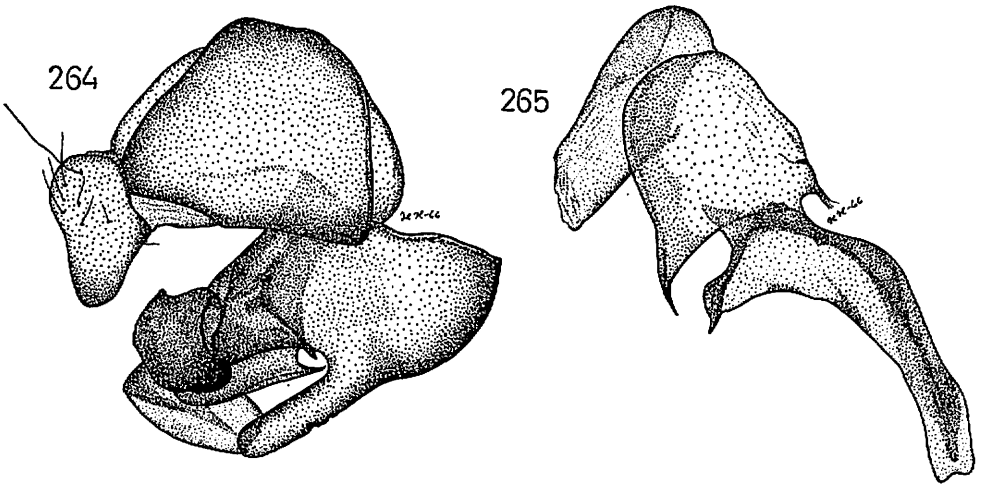
Meligramma guttata (FALLEN)

Scaeva guttata FALLEN 1817, Dipt. Suec. Syrph., p. 44.

Specimen studied (Finland, Somero 24. VI. 1965): Frons yellow, hind part yellow, front part black-haired. Face totally yellow, yellow-haired. Antennae totally dark brown. For profile of head, see Fig. 269. Mesonotum glittering greyish green with three indistinct dusted stripes,



Figs. 261—263: Male genitalia of *Meligramma guttata* (FALL.). — *261.* general, — *262.* axial system of penis in dextrolateral view, — *263.* lateroventral view of pyxis. — Orig.



Figs. 264—265: Male genitalia of *Meligramma triangulifera* (ZETT.) in dextrolateral view. — *264.* general, — *265.* axial system of penis. — Orig.

laterally broadly yellow and with a big yellow spot near posterior margin. Pleurae also partly yellow. Scutellum yellow, laterally narrowly black, yellow-haired. Wings clear; stigma pale, indistinct. Legs mainly dark brown; bases of all femora and apical half of anterior, apical three-fifths of middle and apex of hind femora pale. Anterior tibiae yellow; middle tibiae yellow with a broad indistinct submedian annulation; basal three-fifths of hind tibiae pale. Anterior tarsi totally and two basal segments of middle tarsi yellow. For abdominal pattern, see Fig. 272. Anterior half of second and third and front-margin of fourth sternites pale; otherwise dark. Wing length 6.5 mm.

Genitalia (Figs. 261—263): Distinguished from *M. triangulifera* by thinner lingula and pyxis being higher than long.

Meligramma triangulifera (ZETTERSTEDT)

Scaeva triangulifera ZETTERSTEDT 1843, Dipt. Scand. 2, p. 737.

Specimen studied (Finland, Somero 7. VI. 1965): Frons black, grey-dusted, black-haired. Lower part of face up to central prominence dark, upper part dirty orange, black-haired. Antennae blackish brown; third segment paler at base. Eyes with inconspicuous short scattered hairs. For profile of head, see Fig. 270. Mesonotum shining greenish black with yellowish spots laterally just behind transverse suture. Scutellum brown, laterally broadly black, yellow-haired. Wings clear; stigma dark brown. Legs mainly black; apical third of anterior and middle femora and apex of hind femora yellow. Anterior tibiae and tarsi yellow; middle tibiae and tarsi slightly darkened. Basal fourth and apex of hind tibiae pale. For abdominal pattern, see Fig. 272. Second, third and fourth sternites greyish with indistinct dark bands on posterior half. Wing length 7.5 mm.

Genitalia (Figs. 264—265): Distinguished from *M. guttata* by thicker lingula and by pyxis being about as high as long.

The following Nearctic species can be included in *Meligramma* s. str., judging by the figure given by FLUKE (1950):

Xanthogramma tenuis OSBURN 1908 = *Meligramma tenuis* (OSBURN).

Subgenus *Zimaera*, n. subg.

Face seen from in front broader than eye. Lingula short, not extending as far posteriorly as lateral arms. Superior lobes not ventrally serrated. For structure of pyxis, see Fig. 268. Tubus somewhat long, in cross-section angular and with numerous long apicoventral spinules.

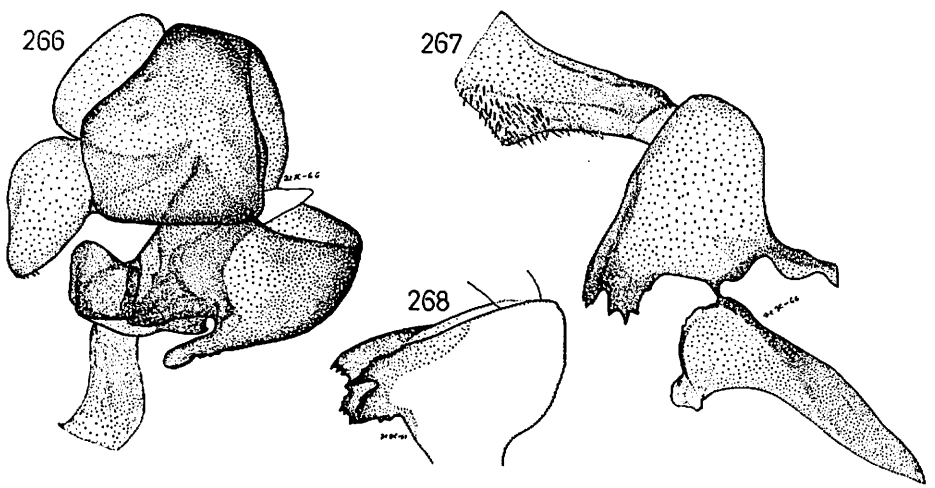
Type-species *Syrphus euchromus* KOWARTZ 1885.

Meligramma euchroma (KOWARZ)

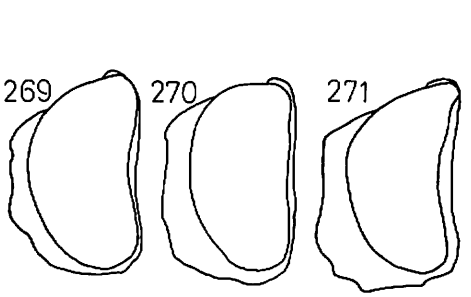
Syrphus euchromus KOWARZ 1885, Wien. Ent. Zeit. 4, p. 167.

Specimen studied (Finland, Somero 4. VI. 1965): Frons black, grey-dusted, black-haired. Lunula brown. Face yellow; mouth-edge black, yellow-haired, laterally somewhat dusted. Antennae orange; apical half of third segment a little darker. For profile of head, see Fig. 271. Mesonotum shining bluish green, laterally behind transverse suture yellowish. Postalar calli partly yellowish. Scutellum yellow, laterally black, yellow-haired. Wings clear; stigma pale brown. Legs mainly yellow; all femora basally with a dark annulation occupying about one-fifth on anterior, one-fourth on middle and one-third on hind femora; extreme base, however, yellow and black annulation on hind femora dorsally open. For abdominal pattern, see Fig. 274. Sternites pale. Wing length 7.2 mm.

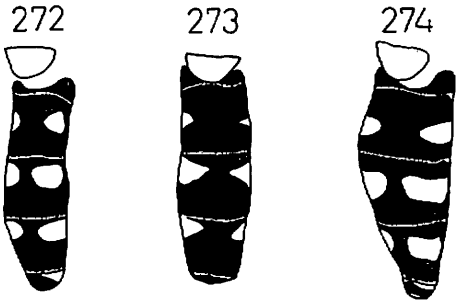
Genitalia (Figs. 266—268): For explanation, see under description of subgenus *Zimaera*.



Figs. 266—268: Male genitalia of *Meligramma euchroma* (Kow.). — *266.* general, — *267.* axial system of penis in dextrolateral view, — *268.* lateroventral view of pyxis. — Orig.



Figs. 269—271: Heads of the *Meligramma* species studied, in profile. — *269. M. guttata* (FALL.), — *270. M. triangulifera* (ZETT.), — *271. M. euchroma* (KOW.). — Orig.



Figs. 272—274: Abdominal patterns of the *Meligramma* species studied. — *272. M. guttata* (FALL.), — *273. M. triangulifera* (ZETT.), — *274. M. euchroma.* — Orig.

Genus *Dasysyrphus* ENDERLEIN

Conosyrphus MATSUMURA 1918, J. Coll. Agric. Sapporo 3:1, p. 11. Type-species *Conosyrphus okunii* MATSUMURA 1918 (= *Scaeva tricincta* FALLEN 1817), by original designation. Junior homonym of *Conosyrphus* FREY 1915.

Dasysyrphus ENDERLEIN 1937, Sitz. Ber. Naturf. Ges. Berlin 4—7, p. 208 (as a subgenus of *Syrphus* FABRICIUS 1775). Type-species *Scaeva albo-striata* FALLEN 1817, by original designation.

Syrphella GOFFE 1944, Ent. Monthly Mag. 80, p. 129. Type-species *Scaeva tricincta* FALLEN 1817, by original designation.

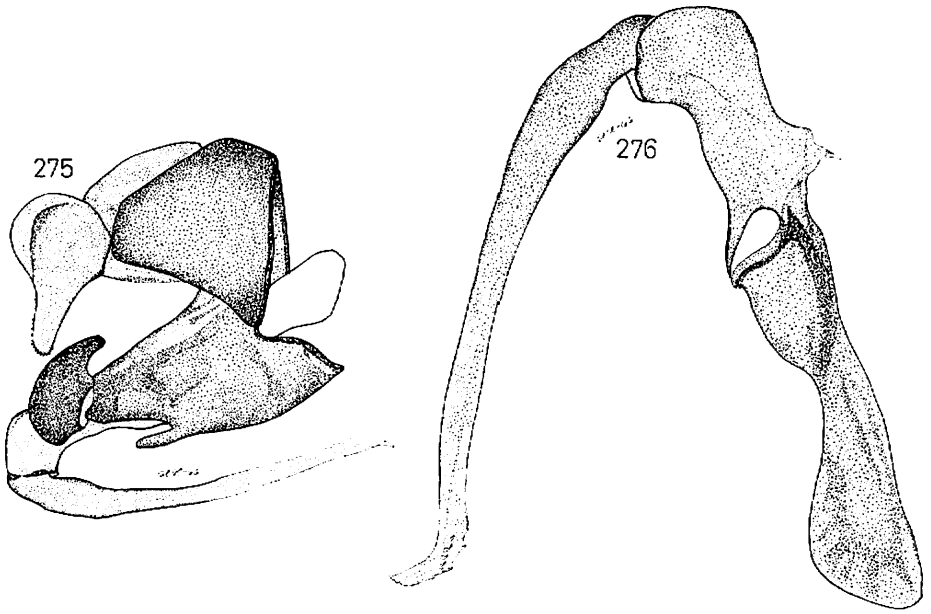
Face yellow, with a dark median stripe. Eyes hairy. Mesonotum shining or dull. Mesopleura just behind prothoracic stigma without any long hairs. Metasternum bare. Abdomen oval and marginated. Abdominal pattern composed of three pairs of bandlike spots of varying shape and size, which may extend over lateral margins or not.

Styli somewhat short and broad. Outside of styli simple or with a more or less distinct crest. Theca somewhat short and high, with a relatively large grooved lingula and rounded lateral arms, which reach about equally far posteriorly, or somewhat elongate and conical with a small lingula and more pointed lateral arms which reach much further posteriorly than lingula. Superior lobes in almost upright position or directed more or less posteriorly. Pyxis simple, usually elongate, strongly laterally compressed, anteroventrally with one pair of lateral appendages developed in varying degree or almost absent. Posterior end of pyxis bent more or less downwards. Tubus remarkably long (except D. *tricinctus*) and strongly chitinized. Apicoventral spinules of tubus thick.

Dasysyrphus albostriatus (FALLEN)

Scaeva albo-striata FALLEN 1817, Dipt. Suec. Syrph., p. 42.

Specimen studied (Finland, Somero 15. VII. 1964): Frons yellow, dark-haired. Face yellow with a black median stripe extending near base of antennae. Facial hairs yellow. Antennae dark brown; first and second segments paler beneath, third pale beneath at base. Eyes densely grey-haired. For profile of head, see Fig. 239. Mesonotum glittering greenish black, with two distinct longitudinal grey stripes extending posteriorly to middle of mesonotum. Presutural depression of



Figs. 275—276: Male genitalia of *Dasysyrphus albostriatus* (FALL.) in dextrolateral view. — *275.* general, — *276.* axial system of penis. — Orig.

mesonotum yellow-dusted. Postalar calli yellow. Scutellum yellow, indistinctly darkened in the middle and clothed with dark hairs; front-margin, however, yellow-haired. Wings clear; stigma blackish. Anterior and middle legs totally yellow. Hind legs yellow; femora with a submedian dark annulation and hind tarsi with three last segments darkened. For abdominal pattern, see Fig. 302. The yellow markings do not reach the side-margins. The second abdominal sternite with a narrow band and the third and fourth with broad dark bands on posterior half. Wing length 7.8 mm.

Genitalia (Figs. 275—276): Easily distinguished from the other species studied by the very long tubus, the shape of the styli and the elongate conical theca. Lingula relatively small. Superior lobes large and upright. Anteroventral lateral appendages of pyxis better developed than in the other species.

Dasysyrphus arcuatus (FALLEN), n. comb.

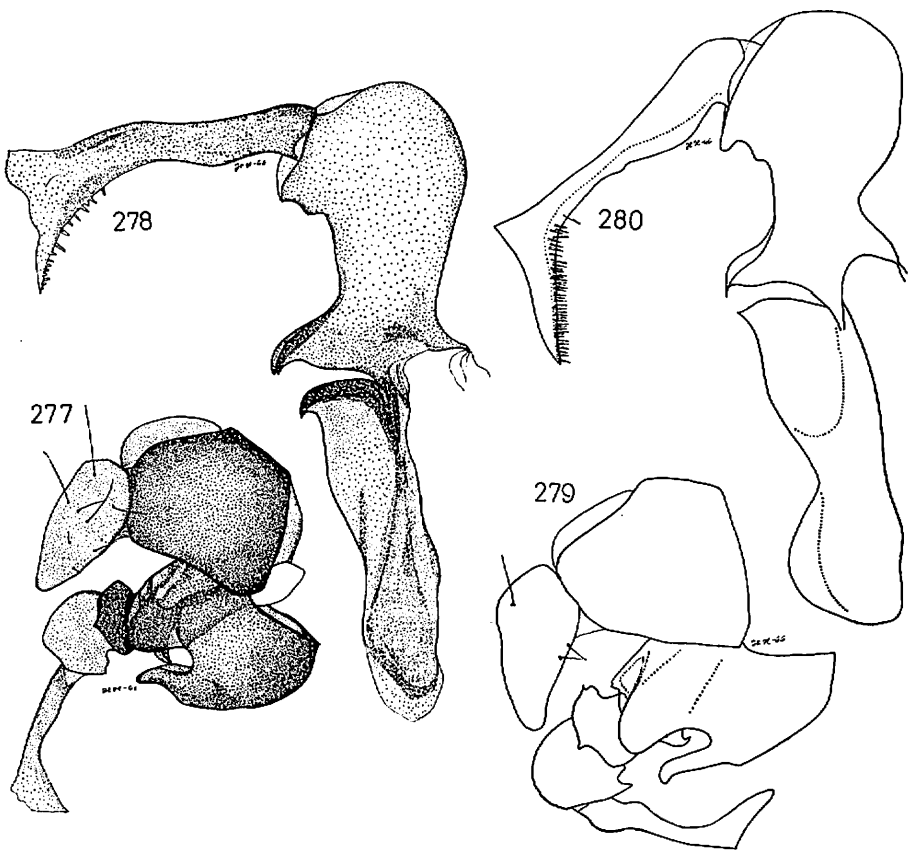
Scaeva arcuata FALLEN 1817, Dipt. Suec. Syrph., p. 42.

Specimens studied: 1. (Finland, Somero 30. V. 1965): Frons and face yellow-haired; laterally, however, dark-haired. Frons black; face yellow with a broad black median stripe reaching bases of antennae. Mouth-edge broadly black. Antennae orange; third segment dorsally dark. Eyes densely brown-haired. For profile of head, see Fig. 294. Mesonotum shining, blackish. Scutellum brown, laterally and along hind-margin black, totally yellow-haired. Wings brownish; stigma brown. Legs mainly yellow; basal quarter of anterior femora, basal third of middle and basal

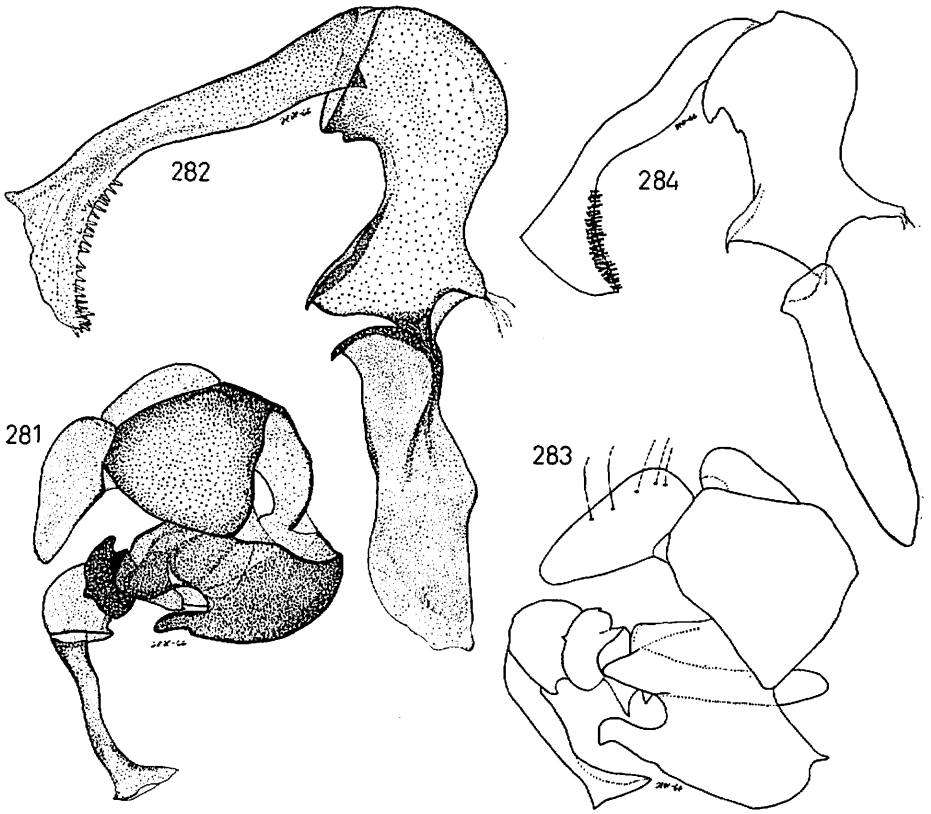
three-fifths of hind femora black. Hind tibiae with an indistinct submedian annulation and last three segments of hind tarsi distinctly darkened. For abdominal pattern, see Fig. 303. Yellow markings extend over side-margins. Second and third abdominal sternites with glittering black bands occupying about a third of length of segment. The band on the fourth sternite occupies about half its length. Wing length 7.8 mm. For genitalia, see Figs. 277—278.

2. (Finland, Somero 1. VI. 1965): Differs from the foregoing specimen in the following respects: For profile of head, see Fig. 295. One-third of anterior femora black. Hind tibiae without annulation. Scutellum with black hairs on hind-margin. For abdominal pattern, see Fig. 304. Wing length 7.7 mm. For genitalia, see Figs. 279—280.

Genitalia (Figs. 277—280): Styli without a crest. Theca short, not much conical. Lateral arms rounded. Lingula relatively large. Superior lobes upright and in profile with a tooth on posterior margin. Pyxis of characteristic shape with small apicoventral appendages. I cannot see any constant difference between the genitalia of *D. arcuatus* and the next species, *D. postclaviger*, in the profile figures (Figs. 277—280 and 281—284).



Figs. 277—280: Male genitalia of *Dasysyrphus arcuatus* (FALL.) in dextrolateral view. — *277.* and *279.* general, — *278.* and *280.* axial system of penis. — Orig.



Figs. 281—284: Male genitalia of *Dasysyrphus postclaviger* STYS & MOUCHA in dextrolateral view. — *281.* and *283.* general, — *282.* and *284.* axial system of penis. — Orig.

Dasysyrphus postclaviger (STYS & MOUCHA)

Syrphus postclaviger STYS & MOUCHA 1962, Acta Univ. Carol. (Biol.), Suppl. 1962, p. 60.

Specimens studied: 1. (USSR, Pechenga): Differs from the first-described specimen of *D. arcuatus* in the following respects: For profile of head, see Fig. 296. Basal half of anterior femora, three-fifths of middle femora and four-fifths of hind femora black. Apical half of hind tibiae darkened; only the actual tip yellow. Stigma pale brown. For abdominal pattern, see Fig. 305. Wing length 7.0 mm. For genitalia, see Figs. 281—282.

2. (USSR, Pechenga): Differs from the foregoing specimen in the following respects: Face totally dark-haired. Antennae dark brown, paler beneath at base of third segment. For profile of head, see Fig. 297. Scutellum dark-haired, only the hind-margin with some yellow hairs. Stigma dark brown. Two-fifths of anterior and middle femora black. Third and fourth abdominal sternites with black bands occupying about two-thirds length of segment. For abdominal pattern, see Fig. 306. Wing length 9.5 mm. For genitalia, see Figs. 283—284.

Genitalia (Figs. 281—284): For explanation, see under *D. arcuatus.*

Dasysyrphus lunulatus (MEIGEN), n. comb.

Syrphus lunulatus MEIGEN 1822, Syst. Beschr. 3, p. 299.

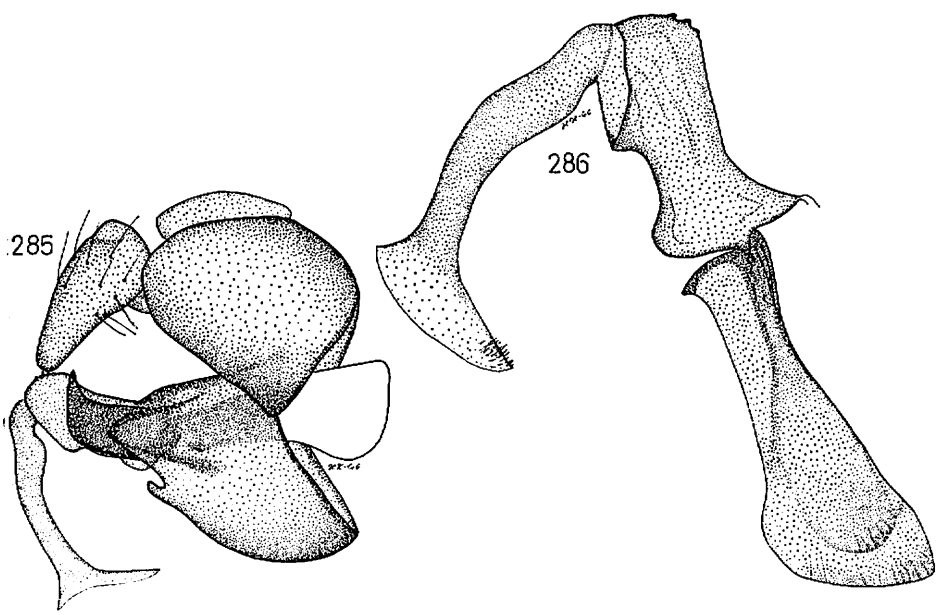
Specimen studied (Finland, Somero 3. VII. 1965): Frons black, black-haired. Face yellow, yellow-haired, laterally mixed with some black hairs. The black median stripe ends well before the base of the antennae. Mouth-edge black. First antennal segment blackish, the others unicolorous dark brown. For profile of head, see Fig. 298 Mesonotum laterally shining, in the middle dullish. Scutellum yellowish brown, laterally black, clothed with long black hairs; on the front margin there are shorter yellow hairs. Stigma pale brown; wings brownish. Legs mainly yellow; basal two-fifths of anterior and middle femora and basal four-fifths of hind femora dark. Hind tibiae with a broad indistinct dark annulation. Four basal segments of hind tarsi darkened. Dorsal sides of tarsi without dark hairs. For abdominal pattern, see Fig. 307. Sternites pale, the second with a large dark spot, the third and fourth with dark bands occupying half length of segment. Wing length 7.4 mm.

Genitalia (Figs. 285—286): Styli crested. Theca somewhat conical. Lingula small. Lateral arms pointed. Theca with transverse corrugations ventrally. Superior lobes not upright but pointing more or less posteriorly. Pyxis with some knots posterodorsally and without any anteroventral appendages.

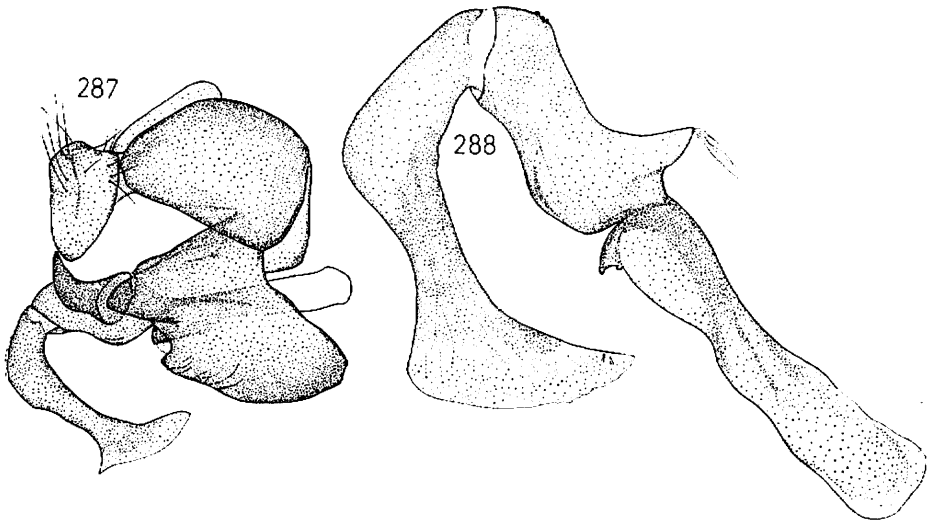
Dasysyrphus nigricornis (VERRALL), n. comb.

Syrphus nigricornis VERRAL 1898, Ent. Monthly Mag. 9, p. 251.

Specimen studied (Finland, Sodankylä): Frons and face black-haired. Frons black; face



Figs. 285—286: Male genitalia of *Dasysyrphus lunulatus* (MEIG.) in dextrolateral view. — *285.* general, — *286.* axial system of penis. — Orig.



Figs. 287—288: Male genitalia of *Dasysyrphus nigricornis* (VERR.) in dextrolateral view, — *287.* general, — *288.* axial system of penis. — Orig.

yellow with broadly black mouth-edge and broad median stripe extending to base of antennae. Antennae orange; third segment darker above. Third segment deeper than long. Eyes pale-haired. For profile of head, see Fig. 299. Mesonotum in the middle dullish, laterally shining, black. Scutellum brown, laterally black, clothed with dark hairs. Wings brownish; stigma brown. Legs as in *D. lunulatus*, except hind tarsi totally yellow. Dorsal sides of tarsi with numerous black hairs. For abdominal pattern, see Fig. 308. Second and fourth abdominal sternites pale with black bands occupying half length of segment; in the third segment the band occupies about one-third length of segment. Wing length 5.8 mm.

Genitalia (Figs. 287—288): Very similar to *D. lunulatus*, but is distinguished by almost complete absence of lingula, evenly tapering superior lobes and peculiar shape of tubus.

Dasysyrphus bilineatus (MATSUMURA), n. comb.

Syrphus bilineatus MATSUMURA 1917, Ent. Mag. Kyoto 3:1, p. 38.

Specimen studied (USSR, South Primorje, Tigrovoi 26. VII. 1962): Frons black, hind part heavily grey-dusted, black-haired. Face yellow, yellow-haired. Mouth-edge narrowly black with a black band from anteroventral corners to eye-margin. Median stripe brown, dividing in two below central prominence and gradually fading. Antennae black; third segment narrowly pale beneath at base. Eyes grey-haired. For profile of head, see Fig. 300. Mesonotum moderately shining, greyish green, with three dull brownish longitudinal stripes. Presutural areas grey-dusted. Postalar calli brown, grey-dusted. Scutellum yellow, black-haired, along front-margin yellow-haired. Wings slightly brownish; stigma blackish brown. Legs mainly yellow; one-fourth of anterior femora, two-fifths of middle and three-fourths of hind femora basally black. Hind tibiae faintly, but broadly, darkened apically. Anterior tarsi, three middle segments of middle tarsi and four last segments of hind tarsi faintly darkened. For abdominal pattern, see Fig. 309.

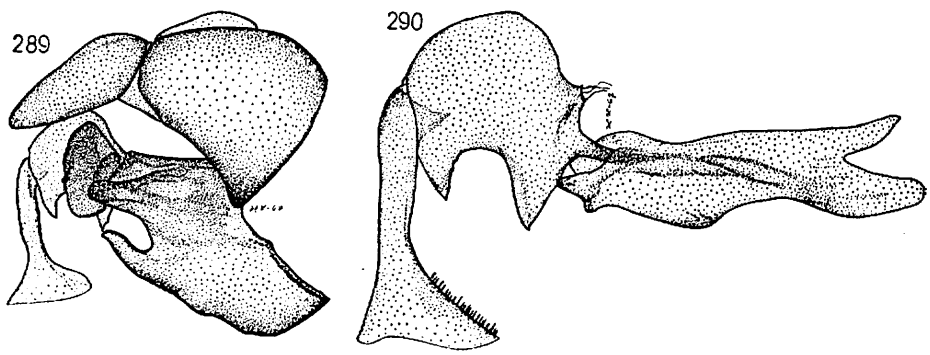
Second abdominal sternite with a small spot in middle of front-margin, otherwise pale. Wing length 12.7 mm.

Genitalia (Figs. 289—290): Styli without a crest. Theca somewhat conical. Superior lobes upright. Pyxis characteristically shaped, somewhat resembling that of *D. tricinctus*.

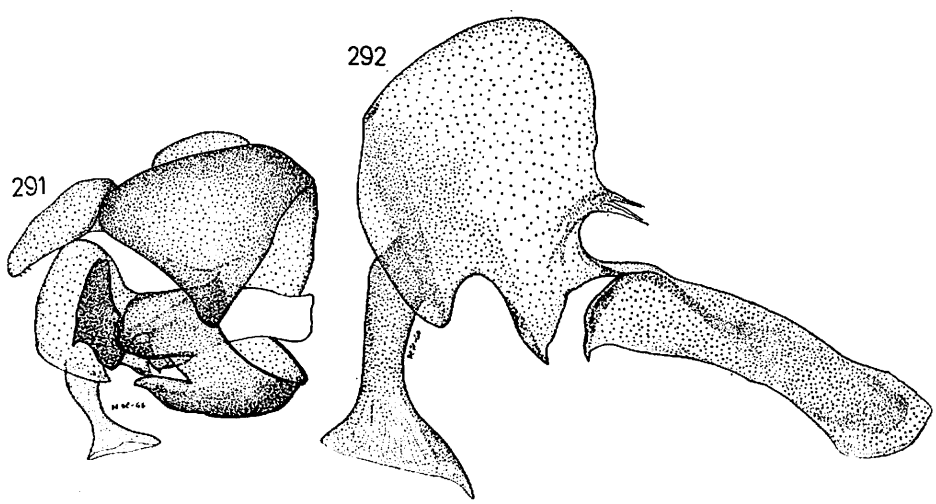
Dasysyrphus tricinctus (FALLEN), n. comb.

Scaeva tricincta FALLEN 1817, Dipt. Suec. Syrph., p. 41.

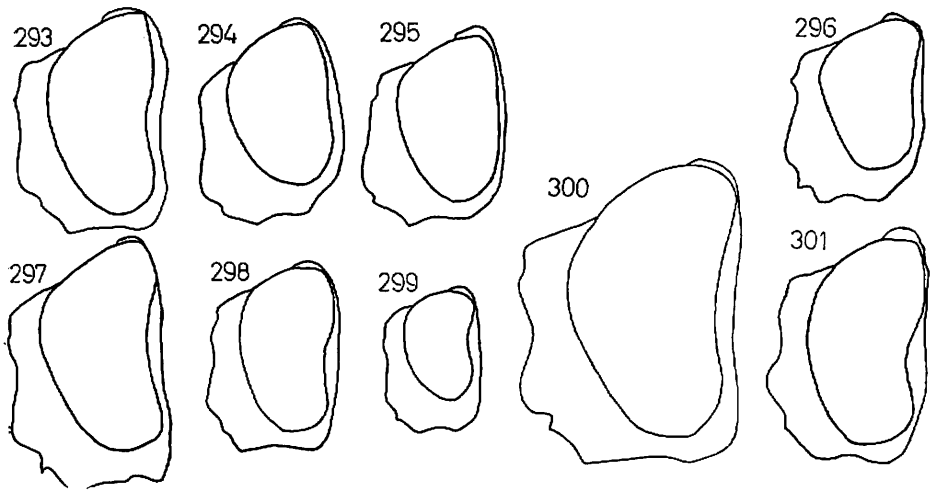
Specimen studied (Finland, Forssa 26. VI. 1964): Frons black, black-haired. Face yellow, yellow-haired. Mouth-edge broadly black. Median stripe broad, extending near base of an-



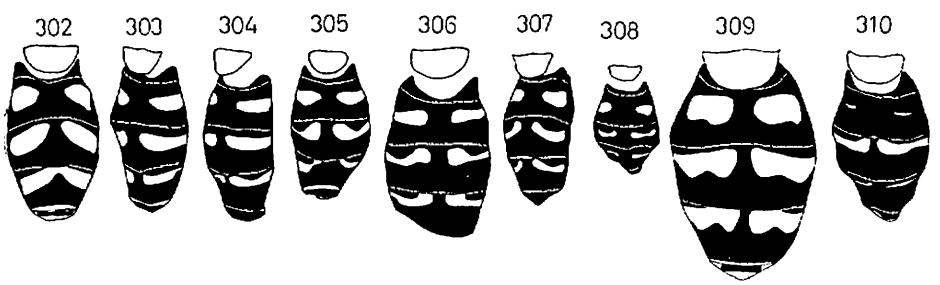
Figs. 289—290: Male genitalia of *Dasysyrphus bilineatus* (MATS.) in dextrolateral view. — *289.* general, — *290.* axial system of penis. — Orig.



Figs. 291—292: Male genitalia of *Dasysyrphus tricinctus* (FALL.) in dextrolateral view. — *291.* general, — *292.* axial system of penis. — Orig.



Figs. 293—301: Heads of the *Dasysyrphus* species studied, in profile. — *293. D. albostriatus* (FALL.), — *294.* and *295. D. arcuatus* (FALL.), — *296.* and *297. D. postclaviger* STYS & MOUCHA, — *298. D. lunulatus* (MEIG.), — *299. D. nigricornis* (VERR.), — *300. D. bilineatus* (MATS.), — *301. D. tricinctus* (FALL.). — Orig.



Figs. 302—310: Abdominal patterns of the *Dasysyrphus* species studied. — *302. D. albostriatus* (FALL.), — *303.* and *304. D. arcuatus* (FALL.) — *305.* and *306. D. postclaviger* STYS & MOUCHA, — *307. D. lunulatus* (MEIG.). — *308. D. nigricornis* (VERR.). *309. D. bilineatus* (MATS.). *310. D. tricinctus* (FALL.). — Orig.

tennae and bearing some black hairs. Antennae black; third segment narrowly pale at base. Eyes grey-haired. For profile of head, see Fig. 301. Mesonotum shining bluish black. Postalar calli partly brown. Scutellum yellowish brown, laterally darker, black-haired except laterally and along front-margin yellow-haired. Legs mainly yellow; two-fifths of anterior femora, one-half of middle and four-fifths of hind femora basally black. Three middle segments of anterior and three last segments of hind tarsi darkened. For abdominal pattern, see Fig. 310. Anterior corners of fifth tergite yellow, which cannot be seen from the figure. Second, third and fourth abdominal sternites pale with dark bands occupying about one-third of segment length. On second sternite band extends medially to front-margin. Wing length 8.6 mm.

Genitalia (Figs. 291—292): In general structure near *D. arcuatus* and *D. postclaviger* but is easily distinguished by high superior lobes and peculiar shape and gross dimensions of pyxis. Tubus relatively short.

The following North American species can be included in the genus *Dasysyrphus* on the basis of the figures given by FLUKE (1950):

Syrphus amalopsis OSTEN SACKEN 1875 = *Dasysyrphus amalopsis* (OSTEN SACKEN).
Syrphus creper SNOW 1895 = *D. creper* (SNOW).
Syrphus pauxillus WILLISTON 1886 = *D. pauxillus* (WILLISTON).
Syrphus disgregus SNOW 1895 = *D. disgregus* (SNOW).
Syrphus pacificus LOWETT 1919 = *D. pacificus* (LOWETT).
Syrphus limatus HINE 1922 = *D. limatus* (HINE).
Syrphus laticaudus CURRAN 1924 = *D. laticaudus* (CURRAN).

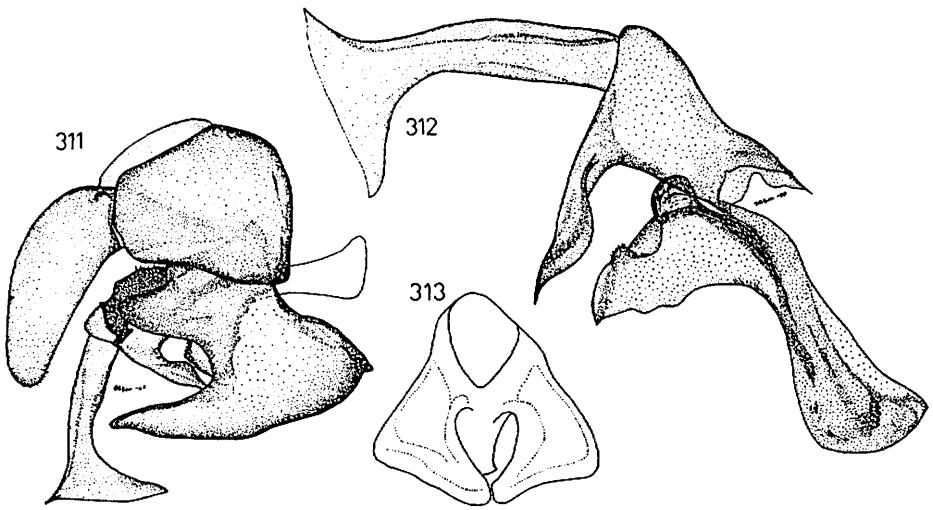
Genus *Dideoides* BRUNETTI

Dideoides BRUNETTI 1908, Rec. Ind. Mus. 2, p. 54. Type-species *Dideoides ovata* BRUNETTI 1908, by monotypy.

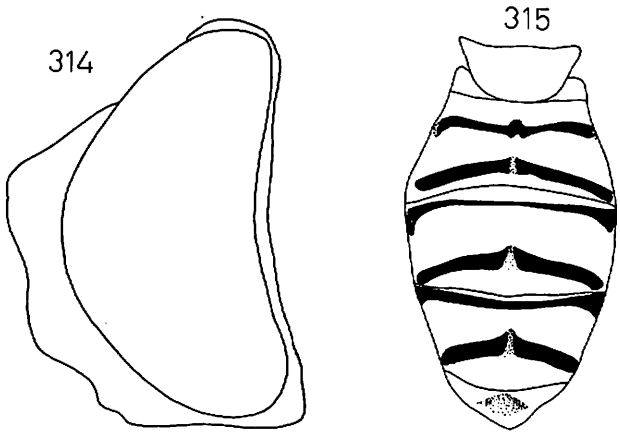
Dideodes MATSUMURA 1917, Ent. Mag., Kyoto 2:4, p. 140. Type-species *Syrphus latus* COQUILLETT 1898, by original designation.

Face yellow, without a dark median stripe. Frons very long, protruding. Vertical triangle unusually long and narrow. Eyes densely hairy. Mesonotum dull. Mesopleura just behind the prothoracic stigma without any long hairs. Metasternum hairy. For abdominal pattern, see Fig. 315.

Styli large and long. Theca short with a large, broad and grooved lingula which reaches further posteriorly than lateral arms. Lateral arms distict, short. For shape and position of



Figs. 311—313: Male genitalia of *Dideoides latus* (COQ.) — *311.* general and — *312.* axial system of penis in dextrolateral view, — *313.* posteroventral view of pyxis. — Orig.



Figs. 314—315: Dideoides latus (Coq.). — *314.* head in profile, — *315.* abdominal pattern. — Orig.

superior lobes, see Fig. 311. Pyxis not strongly laterally compressed, and bearing one pair of huge posteroventral appendages. For structure of pyxis, see Fig. 313. Tubus very long and heavily chitinized, without any apicoventral spinules.

Remarks: I have not studied the type-species of the genus *Dideoides* but Brunetti's (1908) description and figures of *D. ovata* clearly indicate its congenerity with *Syrphus latus*. *D. ovata* was described from Sikkim.

Dideoides latus (Coquillett)

Syrphus latus Coquillett 1898, Proc. U. S. Nat. Mus. 21, p. 322.

Specimen studied (China, Yen-Ping-Fu, Fukien Prov. 17. V. 1935): Frons yellowish, hind-part heavily pale-dusted, brown-haired. Lunula yellow. Face totally yellow, yellow-haired and heavily pale-dusted except for central prominence. Antennae orange; third segment apicodorsally slightly darkened. Eyes densely haired, dorsally with brown, ventrally with grey hairs. For profile of head, see Fig. 314. Mesonotum greenish grey, dull, with three dark longitudinal stripes extending near hind-margin. Postalar calli yellow. Scutellum yellow, black-haired; laterally, however, broadly yellow-haired. Wings clearly brownish; stigma brown. Legs yellow; third and fourth segments of anterior and middle tarsi and three middle segments of hind tarsi dorsally darkened. For abdominal pattern, see Fig. 315. Sternites pale, the second with a triangular spot on posterior half, the third and fourth laterally and along posterior margin narrowly dark; the actual posterior margin, however, yellow. Wing length 12.3 mm.

Genitalia (Figs. 311—313): For explanation, see under genus *Dideoides*.

Matsumura (1917) also included the species *Syrphus lautus* Coquillett 1898 and *Syrphus formosanus* Matsumura 1910 in his genus *Dideodes*.

Genus *Episyrphus* Matsumura

Episyrphus Matsumura 1917, Ent. Mag., Kyoto 3:1, p. 16. Type-species *Musca balteata* De Geer 1776, by original designation.

Heterepistrophe SZILADY 1940, Ann. Mus. Nat. Hung. (Zool.) 33, p. 59 (as subgenus of *Epistrophe* WALKER 1852). Type-species *Musca balteata* DE GEER 1776, by designation of GOFFE 1944.

Meliscaeva FREY 1945, Not. Ent. 25, p. 164. Type-species *Scaeva cinctella* ZETTERSTEDT 1843, by original designation.

Face yellow, with or without dark median stripe. Eyes bare. Mesonotum shining or more or less dull. Mesopleura just behind prothoracic stigma with obvious long hairs. Metasternum bare or hairy (hairy in *E. balteata*). Actual hind-margin of wings with minute dark chitinized stripes placed alternately on upper and lower surface of wing. These stripes occur only in this genus. Abdomen narrow; its sides almost parallel and without margination. Abdominal pattern variable.

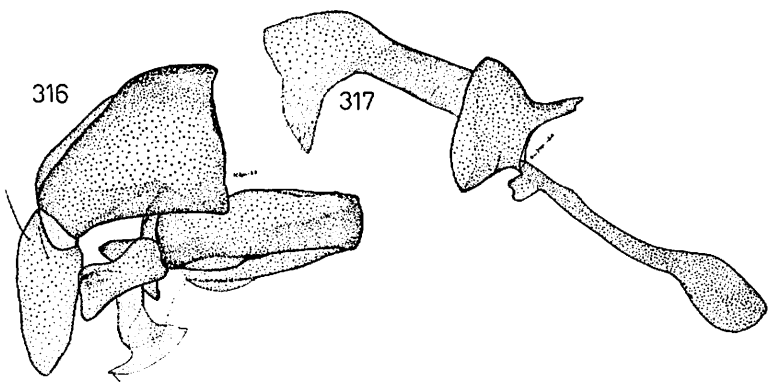
Shape of styli variable. Theca low, ventrally open and without lingula and distinct lateral arms. Superior lobes pointing posterolaterally. Pyxis simple, short, collar-like, weakly chitinized and without any ventral appendages. Tubus weakly chitinized (except *E. cinctellus*) and with very inconspicuous spinules apicoventrally.

Remarks: The genus *Episyrphus* resembles the American genus *Allograpta* OSTEN SACKEN by the absence of a lingula and the simple structure of the pyxis, as can be seen from the figures given by FLUKE (1950). The general structure of the male genitalia also much resembles that of the following genus *Syrphoides*.

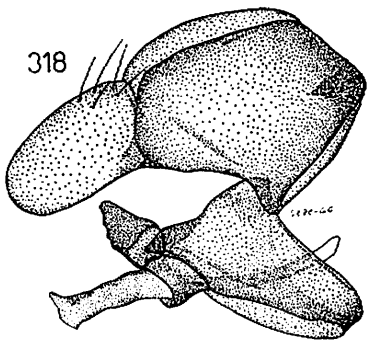
Episyrphus auricollis (MEIGEN)

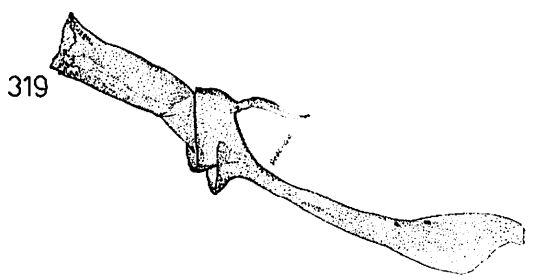
Syrphus auricollis MEIGEN 1822, Syst. Beschr. 3, p. 318.

Specimen studied (Austria, Mallnitz): Frons dark, pale-dusted, dark-haired. Lunula yellow. Face yellow, pale-dusted except for central prominence and with a dark median stripe extending half-way between central prominence and base of antennae. Antennae orange; third segment dorsally and apically darkened. For profile of head, see Fig. 322. Mesonotum shining gold-green, in front of transverse suture dusted. Postalar calli brownish. Scutellum yellow, black-haired; laterally and along anterior margin, however, yellow-haired. Wings slightly yellowish; stigma pale brown. Legs mainly yellow; anterior and middle femora with very indistinct dark markings on dorsal and posterior faces near base. Hind femora broadly darkened in the middle.



Figs. 316—317: Male genitalia of *Episyrphus auricollis* (MEIG.) in dextrolateral view. — *316.* general, — *317.* axial system of penis. — Orig.





Figs. 318—319: Male genitalia of *Episyrphus balteatus* (De Geer) in dextrolateral view. — *318* general, — *319*. axial system of penis. — Orig.

Four last segments of hind tarsi darkened. For abdominal pattern, see Fig. 325. Abdominal spots laterally metallic shining and reaching side-margin of segments. Second and fourth sternites pale, third sternite dark with pale hind-margin. Wing length 9.0 mm.

Genitalia (Figs. 316—317): In most respects similar to *E. cinctellus*. Basale, however, shaped quite otherwise. Theca in profile relatively lower. Shape of pyxis somewhat different with a characteristic tubus.

Episyrphus balteatus (De Geer)

Musca balteata De Geer 1776, Mem. Ins. 6, p. 116.

Specimen studied (Finland, Somero 26. VIII. 1964): Hind part of frons black, front part yellow, black-haired. Lunula yellow with small dark lateral spots. Face yellow, pale-dusted except for central prominence, yellow-haired. There is a dark band from anteroventral corners of mouth-edge to eye-margin. Antennae orange; second and third segments dorsally darkened. For profile of head, see Fig. 323. Mesonotum greyish green, dusted, with four shining green longitudinal stripes, the lateral ones broad and extending to posterior margin of mesonotum, the middle ones narrower and not reaching hind-margin of mesonotum. Postalar calli yellowish brown. Scutellum yellow, black-haired; along front-margin and laterally, however, yellow-haired. Wings clear; stigma pale brown. Legs yellow; only last four segments of hind tarsi dark. For abdominal pattern, see Fig. 326. Abdominal sternites pale; second with a dark spot near hind-margin, third and fourth with very indistinct triangular spots on posterior half. Wing length 9.5 mm.

Genitalia (Figs. 318—319): Styli shorter and broader than in other species. Theca in profile posterodorsally broadening more than in other species and with distinct pointed lateral arms. Superior lobes conical, smoothly serrate ventrally. Pyxis short, not much constricted towards base.

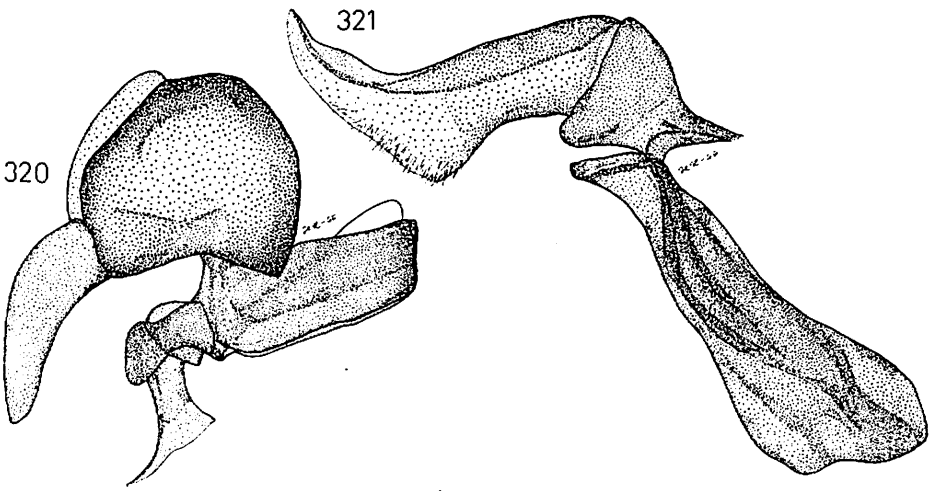
Episyrphus cinctellus (Zetterstedt)

Scaeva cinctella Zetterstedt 1843, Dipt. Scand. 2, p. 742.

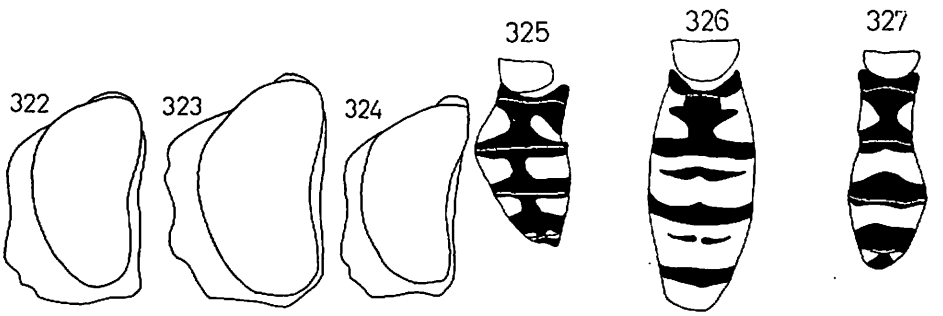
Specimen studied (Finland, Somero 9. VII. 1964): Frons black, along eye-margin broadly brown-dusted, black-haired. Lunula black. Face brownish, laterally and dorsally dusted, yellow-haired. Upper mouth-edge narrowly darkened. Antennae pale brown; second segment

dorsally and third apicodorsally dark. For profile of head, see Fig. 324. Mesonotum shining gold-green, heavily dusted in front of transverse suture. Scutellum yellow, laterally slightly darkened, black-haired. Wings brownish; stigma brown. Anterior and middle legs mainly yellow; bases of anterior and middle femora darkened posterodorsally about one-third, anteroventrally only very narrowly; extreme bases also pale. Third and fourth segments of anterior and middle tarsi slightly darkened. Hind legs black; only tips and extreme bases of femora yellow. For abdominal pattern, see Fig. 327. Sternites pale. Wing length 8.6 mm.

Genitalia (Figs. 320—321): Styli relatively longer and narrower than in the foregoing species. Basale in profile high and convex. Theca in profile not much broadening posterodorsally, with truncate indistinct lateral arms. Superior lobes truncate, constricted in the middle. Pyxis constricted towards base. Tubus of characteristic shape.



Figs. 320—321: Male genitalia of *Episyrphus cinctellus* (ZETT.) in dextrolateral view. — *320.* general, — *321.* axial system of penis. — Orig.



Figs. 322—324: Heads of the *Episyrphus* species studied, in profile. — *322. E. auricollis* (MEIG.), — *323. E. balteatus* (DE GEER), — *324. E. cinctellus* (ZETT.). — Orig.

Figs. 325—327: Abdominal patterns of the *Episyrphus* species studied. — *325. E. auricollis* (MEIG.), — *326. E. balteatus* (DE GEER), — *327. E. cinctellus* (ZETT.). — Orig.

Genus *Syrphoides* n. gen.

Face yellow with a dark median stripe. Eyes hairy. Mesonotum semi-shining. Mesopleura just behind the prothoracic stigma without any long hairs. Metasternum hairy. Scutellum without a fringe of hairs below its hind-margin, unlike all other genera in this paper. Wings with the vein R4+5 strongly dipped in the middle. Abdomen oval and marginated. Abdominal pattern composed of moderately large curved spots on the second tergite and entire bands on the third and fourth tergites, which extend in full breadth over the side-margins.

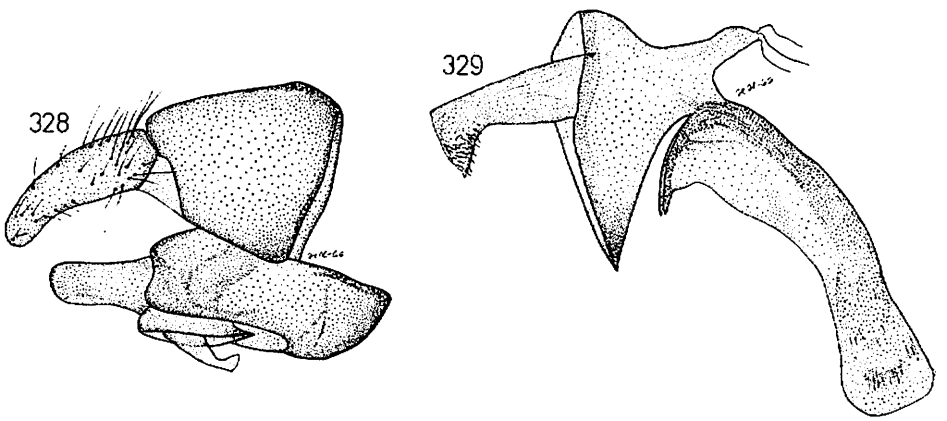
Styli rather long and narrow. Theca low, ventrally open and without lingula or distinct lateral arms. Superior lobes parallel, pointing posteriorly and with a claw on the outer side. Pyxis simple, collar-like, somewhat prolonged ventrally and without any appendages. Tubus relatively short and weakly chitinized, with thin spinules apicoventrally.

Type-species *Scaeva annulipes* ZETTERSTEDT 1838.

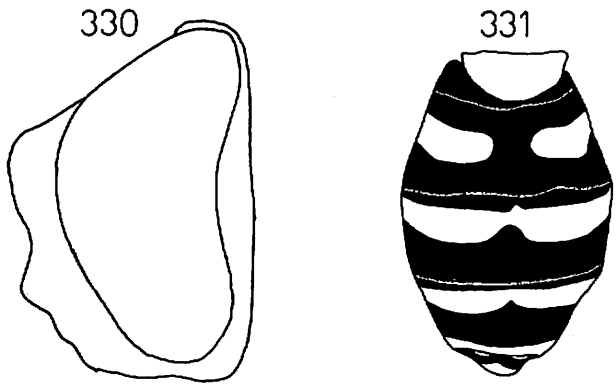
Syrphoides annulipes (ZETTERSTEDT), n. comb.

Scaeva annulipes ZETTERSTEDT 1838, Ins. Lapp., p. 599.

Specimen studied (Finland, Somero 14. VII. 1965): Frons black, along eye-margins broadly pale-dusted, black-haired. Lunula black, a little paler in the middle. Face yellow, yellow-haired with a black median stripe extending near bases of antennae. Face, except for median stripe, pale-dusted. Antennae blackish brown; third segment basally indistinctly reddish. Eyes densely pale-haired. For profile of head, see Fig. 330. Thorax bronzy black. Postalar calli brownish. Scutellum yellow, laterally black, clothed mainly with black hairs, laterally and along front-margin yellow-haired. Wings brownish, brown along front-margin; stigma blackish. Legs mainly yellow; basal half of anterior and middle femora and basal three-quarters.



Figs. 328—329: Male genitalia of *Syrphoides annulipes* (ZETT.) in dextrolateral view. — *328.* general, — *329.* axial system of penis. — Orig.



Figs. 330—331: Syrphoides annulipes (ZETT.). — *330.* head in profile, — *331.* abdominal pattern. — Orig.

of hind femora black. Hind tibiae with a black submedian annulation occupying about one-fifth of length of tibia. Three middle segments and apical part of first segment of all tarsi dark. For abdominal pattern, see Fig. 331. Second, third and fourth sternites pale with black bands on posterior half occupying about two-fifths of length of sternite. Wing length 10.3 mm.

Genitalia (Figs. 328—329): For explanation, see under the genus *Syrphoides.*

The following American species can be included in the genus *Syrphoides* on the basis of the figures published by FLUKE (1950):

Didea laxa OSTEN SACKEN 1875 = *Syrphoides laxus* (OSTEN SACKEN), n. comb.

VALUE OF DIFFERENT CHARACTERS IN THE GENERIC TAXONOMY OF THE GENUS *SYRPHUS* AND ALLIED GENERA, WITH SUGGESTIONS FOR SOME POSSIBLE SUPRAGENERIC GROUPS

Up to the present day, the taxonomy of the genus *Syrphus* and closely allied genera has been largely based on colour patterns, form of abdomen, hairiness of eyes and some other characters which, for delimitation of supraspecific taxa, are of doubtful value within this group.

The structure of the abdomen, whether marginated or not, is uniform within each genus in this paper, with the exception of the genus *Leucozona,* in which the subgenus *Leucozona* s. str. has a marginated and the subgenus *Ischyrosyrphus* an

unmarginated abdomen. Unmarginated and marginated abdomens also occur in some groups which, from the structure of the male genitalia, seem to be closely allied. For example, in the genus *Mesosyrphus* the abdomen is unmarginated but in the genus *Syrphus* marginated, and it is marginated in the genus *Scaeva* but without margination in the genus *Epistrophe*. In the genera with abdominal margination the form of the abdomen is oval and in the genera without that margination the abdomen is usually narrow with almost parallel sides. Some species with an oval abdomen occur in three of the six genera without abdominal margination.

The abdominal pattern, whether composed of bands or spots, cannot be used as a key character for the subdivision of *Syrphus* s. l. The form of the bands, whether straight or undulating, and the spots, whether lunulate, quadrangular or stripe-like and so on, are better indicators. Within many genera the abdominal pattern is very uniform provided one takes into account that the bands may be interrupted to form spots and vice versa. Somewhat similar patterns occur in some genera, for example in *Syrphus*, *Mesosyrphus* and *Syrphoides*. *Syrphus* and *Mesosyrphus* are closely allied but *Syrphoides* is well separated from the other two genera by many other characters and the similar patterns have probably developed independently.

The hairiness of the eyes has hardly any value in supraspecific taxonomy. The eyes are at least slightly hairy in almost all species in this paper, although in many cases this character is visible only at high magnification. Species with seemingly bare eyes and those with distinctly hairy eyes occur in six genera in this paper.

The long hairs on the mesopleura just behind the prothoracic spiracle mentioned by COLLIN (1952) are good and constant characters in both *Episyrphus* and *Mesosyrphus*, but they can hardly be supposed to indicate a close relationship between these genera.

The dark chitinous stripes at the actual hind-margin of the wings (COLLIN 1952) in *Episyrphus* may prove a valuable group character when material from other regions is studied in this respect.

The long hairs on the disc of the lower lobe of the squama seem to be a good indicator of the genus *Syrphus* as delimited in the present paper.

The hairiness of the metasternum seems to be constant within each genus, with the exception of *Epistrophe* and *Episyrphus*.

In the male genitalia there are good generic characters in the theca, especially in the structure of the lingula, the form and position of the superior lobes and the structure of the pyxis. In many cases the form of the basale, styli and tubus are also characteristic within each genus. The best specific differences are usually found in the form and structure of the pyxis and the shape of the theca and

superior lobes. The sustentacular apodeme is highly variable within each species (compare Figs. 59,61; 63,65; 133,135,137; 140,142,144; 180,182; 190,192; 224,226; 228,230; 232,234; 277,279; 282,284) and it possesses neither specific nor group characters. In the genus *Melangyna*, however, the lateral wings at the posterior end of the sustentacular apodeme are characteristic in being unusually strongly chitinized.

In the structure of the female genitalia some good generic characters may be found but they are beyond the scope of this paper. ETCHEVERRY & SHENEFELT (1960) have already described the difference between *Syrphus* and *Scaeva* in the structure of the female genitalia. It may be mentioned in this connection that those species of which only the female sex is known can in most cases easily be placed in the correct genera by the characters mentioned in the generic descriptions.

The structure of the male genitalia provides clues to some possible suprageneric groups. One such group is clearly formed by *Episyrphus* and *Syrphoides*. In these genera the genitalia are very distinctive: the pyxis is simple and collar-like, the theca is ventrally open and without a lingula and the superior lobes point posteriorly or postero-laterally. According to the figures of FLUKE (1950) the American genus *Allograpta* also belongs to this group. *Syrphus* and *Mesosyrphus* form a group in which the pyxis is somewhat box-like; its posteroventral face is flat with elevated sides, and anterolaterally there is usually a pair of tooth-like appendages. The structure of the superior lobes is also very similar. The genera *Dideoides* and *Dasysyrphus* possess some distinct similarities in the theca, especially in the structure of the lingula, and the tubus is extraordinarily long and strongly chitinized in both genera. In *Epistrophe*, *Leucozona* and *Scaeva* the structure of the pyxis especially is very similar in having two broad lateroventral projections apically divided into two teeth.

The interrelationships of the genera dealt with in the present paper will be further discussed in my later papers concerning the female genitalia and other groups of *Syrphinae*. Comparison of the larvae will also give valuable information regarding the phylogenetic taxonomy of the group.

CHECK-LIST OF SPECIES STUDIED

In the following check-list are also included those North American species which, on the basis of the figures published by FLUKE (1950), can be placed in the genera in the present paper. The following abbreviations are used: P. = Palaearctic, H. = Holarctic and N. = Nearctic.

Genus *Melangyna* VERRALL

albipunctata (CURRAN), N.
arctica (ZETTERSTEDT), H.
barbifrons (FALLEN), P.
cherokeenensis (JONES), N.
columbiae (CURRAN), N.
compositarum (VERRALL), H.
diversipunctata (CURRAN), N.
fisheri (WALTON), N.
garretti (CURRAN), N.
labiatarum (VERRALL), P.
lasiophthalma (ZETTERSTEDT), P.
mentalis (WILLISTON), N.
olsufjevi (VIOLOVITSH), N.
pavlovskyi (VIOLOVITSH), P.
pullula (SNOW), N.
quadrimaculata (VERRALL), P.
umbellatarum (FABRICIUS), H.
vittifacies (CURRAN), N.

Genus *Epistrophe* WALKER

angustifasciata (VIOLOVITSH), P.
annulitarsis (STACKELBERG), P.
bifasciata (FABRICIUS), P.
diaphana (ZETTERSTEDT), P.
divisa (WILLISTON), N.
emarginata (SAY), N.
felix (OSTEN SACKEN), N.
grossulariae (MEIGEN), H.
hunteri (CURRAN), N.
invigora (CURRAN), N.
melanostoma (ZETTERSTEDT), P.
melanostomoides (STROBL), P.
metcalfi (FLUKE), N.
nitidicollis (MEIGEN), H.
ochrostoma (ZETTERSTEDT), P.
weborgi (FLUKE), N.
xanthostoma (WILLISTON), N.

Genus *Leucozona* SCHINER

Subgenus *Leucozona* s. str.

lucorum (LINNAEUS), H.

Subgenus *Ischyrosyrphus* BIGOT

glaucia (LINNAEUS), P.
laternaria (O. F. MÜLLER), P.

Genus *Scaeva* FABRICIUS

Subgenus *Scaeva* s. str.

albomaculata (MACQUART), P.
pyrastri (LINNAEUS), H.
selenitica (MEIGEN), P.

Subgenus *Beszella* n. subg.

aberrantis (CURRAN), N.
lapponica (ZETTERSTEDT), H.

Genus *Posthosyrphus* ENDERLEIN

braueri (EGGER), P.
canadensis (CURRAN), N.
depressus (FLUKE), N.
flukei (CURRAN), N.
fumipennis (THOMPSON), N.
latifasciatus (MACQUART), H.
latilunulatus (COLLIN), P.
lebanoensis (FLUKE), N.
lundbecki (SOOT-RYEN), P.
luniger (MEIGEN), H.
marginatus (JONES), N.
meadii (JONES), N.
montanus (CURRAN), N.
montivagus (SNOW), N.
neoperplexus (CURRAN, N.
nitens (ZETTERSTEDT), P.
perplexus (OSBURN), N.
pigreensis (FLUKE), N.
punctifer (KANERVO in FREY), P.
snowi (WEHR), N.
talus (FLUKE), N.
venablesi (CURRAN), N.
vinelandi (CURRAN), N.
wiedemanni (JOHNSON), N.

Genus *Metasyrphus* MATSUMURA

corollae (FABRICIUS), P.

Genus *Betasyrphus* MATSUMURA

serarius (WIEDEMANN), P.

Genus *Syrphus* FABRICIUS

attenuatus HINE, N.
bigelowi CURRAN, N.
currani FLUKE, N.
knabi SHANON, N.
opinator OSTEN SACKEN, N.
phaeostigma WIEDEMANN, N.
pilisquamus RINGDAHL, P.
rectus OSTEN SACKEN, N.
ribesii LINNAEUS, H.
sexmaculatus ZETTERSTEDT, P.
torvus OSTEN SACKEN, H.
transversalis CURRAN, N.
vitripennis MEIGEN, H.
willistoni FLUKE, N.

Genus *Mesosyrphus* MATSUMURA

annulatus (ZETTERSTEDT), P.
constrictus MATSUMURA, P.
dryadis (HOLMGREN), P.
lineola (ZETTERSTEDT), H.
macularis (ZETTERSTEDT), H.
malinellus (COLLIN), P.
mallochi (CURRAN), N.
nigritarsis (ZETTERSTEDT), P.
punctulatus (VERRALL), P.
relictus (ZETTERSTEDT), P.
sodalis (WILLISTON), N.
tarsatus (ZETTERSTEDT), H.
vittiger (ZETTERSTEDT), P.

Most probably also the following Nearctic species:

Syrphus genualis WILLISTON
Syrphus insolitus OSBURN
Syrphus quinquelimbatus BIGOT
Syrphus rectoides CURRAN
Epistrophe semiinterrupta FLUKE

Genus *Meligramma* FREY
Subgenus *Meligramma* s. str.

guttata (FALLEN), H.
tenuis (OSBURN), N.
triangulifera (ZETTERSTEDT), H.

Subgenus *Zimaera* n. subg.

euchroma (KOWARZ), P.

Genus *Dasysyrphus* ENDERLEIN

albostriatus (FALLEN), P.
amalopsis (OSTEN SACKEN), N.
arcuatus (FALLEN), H.
bilineatus (MATSUMURA), P.
creper (SNOW), N.
disgregus (SNOW), N.
laticaudus (CURRAN), N.
limatus (HINE), N.
lunulatus (MEIGEN), H.
nigricornis (VERRALL), P.
pacificus (LOVETT), N.
pauxillus (WILLISTON), N.
postclaviger (STYS & MOUCHA), P.
tricinctus (FALLEN), P.

Genus *Dideoides* BRUNETTI

latus (COQUILLETT), P.

Genus *Episyrphus* MATSUMURA

auricollis (MEIGEN), P.
balteatus (DE GEER), P.
cinctellus (ZETTERSTEDT), H.

Genus *Syrphoides* n. gen.

annulipes (ZETTERSTEDT), P.
laxus (OSTEN SACKEN), N.

SUMMARY

In the present work a generic revision of the genus *Syrphus* and allied genera in the Palaearctic region is presented. The following 14 genera, based mainly on the structure of the male genitalia, are accepted: *Melangyna*, *Epistrophe*, *Leucozona* with subgenera *Leucozona* s. str. and *Ischyrosyrphus*, *Scaeva* with subgenera *Scaeva* s. str. and *Beszella*, *Posthosyrphus*, *Metasyrphus*, *Betasyrphus*, *Syrphus*, *Mesosyrphus*, *Meligramma* with subgenera *Meligramma* s. str. and *Zimaera*, *Dasysyrphus*, *Dideoides*, *Episyrphus* and *Syrphoides*.

Of every specimen studied two or three figures of the male genitalia are given, one of the head in profile and one illustrating the abdominal pattern.

Among the genera accepted in this paper are also included those North American species which can be correctly placed on the basis of figures of the male genitalia given by FLUKE (1950).

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