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Classification of the palearctic species of the genera Xylota Meigen and Xylotomima Shannon (Dipt., Syrphidae)

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Abstract

In the present work the grounds for separating the genera *Xylota* MEIGEN and *Xylotomima* SHANNON are reconsidered.

The interrelationships of the Palearctic species in the genera mentioned are discussed and the genus *Xylota* is divided into three groups.

In the genus *Xylota* the following Palearctic species are included: *X. florum* (F.), *X. meigeniana* (STACK.), comb. n., *X. coquilletti* H.-B., *X. sylvarum* (L.), *X. xanthocnema* COLLIN, *X. abiens* MEIG., *X. segnis* (L.), *X. ignava* (PANZ.), *X. tarda* MEIG., *X. coeruleiventris* ZETT., *X. triangularis* ZETT. and *X. suecica* (RINGD.), comb. n.

In the genus *Xylotomima* the following Palearctic species are included: *X. femorata* (L.), *X. curvipes* (LOEW), *X. sapporensis* (SHIR.), comb. n., *X. longa* (COQ.), comb. n., *X. pigra* (F.), *X. fulviventris* (BIG.), comb. n., *X. lenta* (MEIG.), comb. n., *X. eumera* (LOEW), comb. n., *X. nemorum* (F.) and *X. nigripes* (ZETT.), comb. n.

The following Nearctic species, misplaced by SHANNON (1926), is a member of the genus *Xylotomima: X. bicolor* (LOEW), comb. n.

Xylotomima fulviventris is found to be conspecific with *X. pigra*. *X. fulviventris* may also be a Corsican subspecies of the later.

Zelima jacobsoni STACK. is a member of neither *Xylota* (*Zelima*) nor *Xylotomima*, but belongs to the genus *Myiolepta: Myiolepta jacobsoni* (STACK.), comb. n.

The male genitalia of 21 Palearctic species of *Xylota* and *Xylotomima* are figured.

A comparison table of *X. florum*, *X. meigeniana*, *X. abiens* and *X. coeruleiventris* is presented, and notes concerning the identification of some other species are also included.

Speculations are made on some possible phylogenetic relationships between *Xylota* and *Xylotomima*.

Introduction

The genus *Xylota* MEIGEN 1822 (*Zelima* MEIGEN 1800, of many authors) in the broad sense is a well defined group which has been rather well delimited since MEIGEN's day (MEIGEN 1822). However, the interrelationships of the differ-

ent species and species groups have been poorly and unreliably known up to present day, mainly owing to the use of the abdominal pattern as an indication of affinity (VERRALL 1901, LUNDBECK 1916, SACK 1932, SHIRAKI 1930), for this character is of only very slight value, as will be seen later.

The first real attempt to arrange the species of the genus *Xylota* into subgroups was made by SAINT-FARGEAU and SERVILLE (1825). This grouping was based on the spurs on the male hind trochanters and is in many respects similar to that presented in the present paper.

STACKELBERG (1925) divided all the known Palearctic species of the genus *Zelima* (*Xylota*) into six groups, but the only natural one is his first group, including the species with largely reddish legs and dark abdomen, and representing part of the genus *Xylotomima* in the present work.

Some good group characters were introduced by SHANNON (1926) when he separated the genus *Xylotomima* from *Xylota*. This separation was based primarily on the pilosity of the metasternum and on several other characters, some of which have proved highly valuable during the present studies.

The characters of the male genitalia, which form the basis of the present work, have not formerly been used in the supraspecific taxonomy of this group, and knowledge of their structure has been very incomplete. Some figures, however, can be found in the works of METCALF (1921), COLLIN (1939), STACKELBERG (1952) and GLUMAC (1958, 1960 a). To show the affinities of the different species and to serve as an aid to their identification, the male genitalia of every species studied of which a male was available is figured in the present paper.

In some groups the identification of species has frequently proved very puzzling. Valuable contributions to the present knowledge and understanding of many Palearctic species have been made by COLLIN (1939), COE (1939, 1953), RINGDAHL (1943), GAUNITZ (1947) and finally a good summary was given by STACKELBERG (1952), with much additional information. The present paper also includes clues to the recognition of some species in the most difficult groups.

Material, methods and nomenclature of the male genitalia used

The material described in this paper is composed of dry specimens from the following collections, in addition to that belonging to the author: the Zoological Museum of the University of Turku, the Zoological Museum of the University of Helsinki, the Museum National d'Histoire Naturelle in Paris, the Zoological Museum of the University of Lund, and Dr. V. S. VAN DER GOOT in Amsterdam.

For details of the preparation and drawing techniques, as well as the nomenclature used in describing the male genitalia, see HIPPA (1968).

Altogether 24 of the 30 known Palearctic species of *Xylota* s. l. are considered and the male genitalia of 21 of these are figured in this paper. The male genitalia of the different species have not been drawn on the same scale.

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The concept of Xylota Meigen and Xylotomima Shannon

The genus *Xylota* s.l. forms a well defined group of species in the subfamily *Milesinae*. The group as a whole has been well diagnosed, for example by VERRALL (1901), LUNDBECK (1916), SACK (1932), HULL (1949) and STACKELBERG (1952), and no further comment is required here. In North America, SHANNON (1926) split the classical genus *Xylota* into two separate genera: *Xylota* and *Xylotomima*. The genus *Xylotomima* has later been accepted by KLOET & HINKS (1945), GLUMAC (1960 a, and b) and STONE et al. (1965) in the composition of SHANNON (l.c.). HULL (1949) recognized *Xylotomima* as a subgenus of *Xylota*.

The characters on which the separation of the above-mentioned two genera were originally based are summarized and reconsidered below in the light of the present studies.

1. Metasternum with pile about the length of the pile on the hind coxae in *Xylotomima* but in *Xylota* much shorter than that on the hind coxae. As an exception in *Xylotomima* was mentioned *X. pigra*, with short hairs on the metasternum. — The length of the pile on the metasternum has proved to be of only slight diagnostic value by itself. In addition to *X. pigra*, *X. fulviventris* and *X. lenta* have also proved to be exceptions in the genus *Xylotomima* as delimited in the present paper. All species placed in the genus *Xylota* have short hairs on the metasternum.

2. Metathoracic spiracle approximately the size of the second antennal joint in *Xylotomima* but about the size of the third antennal joint in *Xylota*. — This is in general true. This character does not depend solely on the size of the spiracle but also on the fact that the antennae are generally larger in *Xylotomima* than in *Xylota*.

3. Arista usually shorter than the width of the face in *Xylotomima* but longer than the width of the face in *Xylota*. — In the present material this character has also proved to have some value: in *Xylotomima* the arista is always proportionately shorter than in *Xylota* but not necessarily shorter than the width of the face.

4. Hind femora greatly enlarged in *Xylotomima* but fairly slender in *Xylota*. — This property of the hind femora has proved highly valuable. The only exception is *Xylota abiens*, with its considerably thickened hind femora.

5. Male with frontal triangle almost entirely shining in *Xylotomima* but covered with silvery pollinosity in *Xylota*. — In the present material this character has proved to have no diagnostic value.

6. Hind trochanters of the male without a spur in *Xylotomima* but spurred in

Xylota (exc. *X. bicolor*). — This character has proved to be absolute for separating the two genera. *X. bicolor*, which was mentioned as an exception, has been found during this work to be in fact a member of *Xylotomima*.

7. Metatarsi of first and second legs with a long light-coloured hair at the inner apical angle in *Xylota* but without such a hair in *Xylotomima*. — In the present material this kind of hair likewise occurs only in the genus *Xylota* but only in *X. segnis*, *X. tarda*, *X. ignava*, and *X. abiens* and in all cases only in the male and only on the metatarsi of the first legs. Occasionally there may also be more than one such hair in the species mentioned.

8. Frons of female rather broad in *Xylotomima* but rather narrow in *Xylota*. — In the present material the frons of the female is likewise always relatively broader in *Xylotomima* than in *Xylota*.

In addition to these characters used by SHANNON (l.c.), very profound differences can be found in the structure of the male genitalia. The epandrium is structurally rather simple and constant in the species of *Xylota* but more complex and variable in *Xylotomima*. The styli, especially, are very uniform in *Xylota*, while in *Xylotomima* both the dorsal and ventral lobes are specialized in many ways (compare Figs. 2 – 7, 9 – 14 and 15 – 23). The cerci also show a clear tendency to specialize in *Xylotomima*, while they are always simple in *Xylota*.

In the hypandrium the lateral arms of the theca are rather simple apically, dorsally and on the outer surface in *Xylotomima* but highly specialized in one or

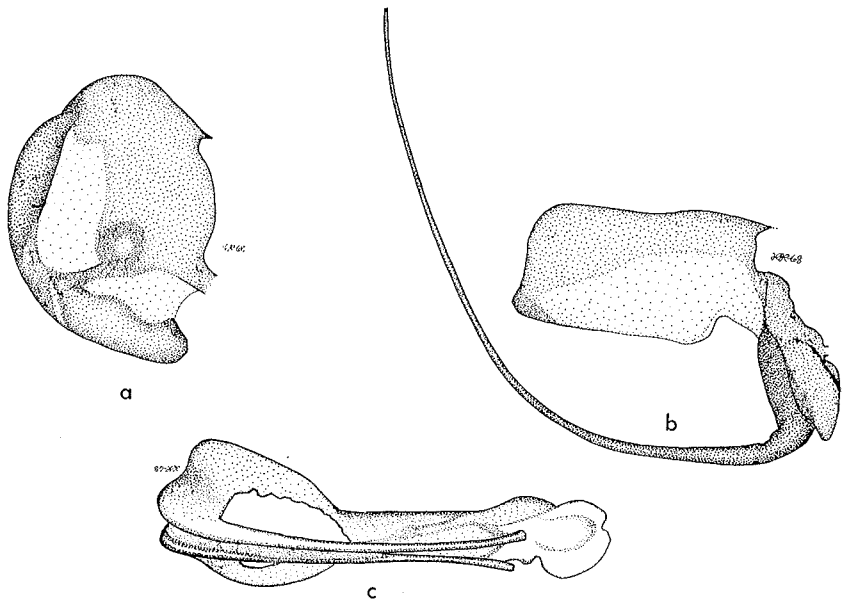


Fig. 1. Pyxis of the axial system of the penis with associated structures. — a *Xylota triangularis* ZETT. and b *Xylotomima lenta* (MEIG.) in dextrolateral view, c *Xylotomima femorata* (L.) in ventrolateral view. — Orig.

more of those parts in *Xylota*. In *Xylotomima* on the inner sides of the lateral arms a lamella runs from the apex towards the base and ends with one or many-pointed tooth or a serrate edge which projects antero-ventrally. In *Xylota* the inner sides of the lateral arms are simple. The lingula may or may not be present in both genera.

The structure of the axial system of the penis in both genera is also radically different (see Fig. 1). In *Xylotomima* two ± long tubes (ejaculatory processes of METCALF 1921) arise from the base of the pyxis. The genus *Xylota* lacks such structures but has small incurved spurs on the wall of the pyxis (appearing as a dark ring in Fig. 1 a).

Good differences may also be found in the structure of the larvae. LUNDBECK (1916) has already referred to the closer similarity of the larvae of *Xylota nemorum* and *X. pigra*, both of which are members of the genus *Xylotomima*, with each other than with *X. segnis*, a member of the genus *Xylota* s. str.

The principal characters separating the genera *Xylota* and *Xylotomima* according to the present studies are tabulated below:

Xylota	*Xylotomima*
Hind trochanters of male spurred	Hind trochanters of male unspurred
Hind femora slender (fairly enlarged in *X. abiens*)	Hind femora enlarged
Pile on metasternum always much shorter than that on hind coxae	Pile on metasternum as long as that on hind coxae (short in *X. pigra*, *X. lenta* and *X. fulviventris*)
Arista much longer than width of face	Arista shorter or only a little longer than width of face
Lateral arms of theca with dorsal, apical or lateral specializations	Lateral arms of theca without dorsal, apical or lateral specializations
Inner sides of the lateral arms simple	Inner sides of lateral arms with a longitudinal lamella ending with a strongly chitinized ventrally pointing tooth or a serrate edge; the tooth wanting in *X. lenta*
Pyxis of axial system of penis without a pair of prominent tubes	Pyxis of axial system of penis with a pair of ± long tubes

The grouping within the genera Xylota and Xylotomima, with a contribution for the identification of some species

In this chapter the interrelationships of the species in the material studied are discussed. The greatest use for recognition of natural groups has been the struc-

ture of the male genitalia, especially of the styli and the lateral arms of the theca. As a help to identification, the male genitalia of the species studied are also figured. In some cases of closely similar species, the identification of which is known to be difficult, a number of important recognition characters, several of which are new, will be discussed or tabulated.

Genus Xylota Meigen

Zelima MEIGEN 1800, Nouvelle classification des mouches à deux ailes, etc., p. 34. Type-pecies *Musca segnis* LINNAEUS 1758, by designation COQUILLETT 1910. Suppressed by I.C.Z.N. 1963.

Eumeros MEIGEN 1803, Illiger's Mag. 3, p. 273. Type-species *Musca segnis* LINNAEUS 1758, by subsequent monotypy.

Heliophilus MEIGEN 1803, Illiger's Mag. 3, p. 273. Type-species *Musca sylvarum* LINNAEUS 1758, by monotypy.

Xylota MEIGEN 1822, Syst. Beschr. 3, p. 211. Type-species *Musca segnis* LINNAEUS 1758, by designation of CURTIS 1832 (COQUILLETT 1910).

Micraptoma WESTWOOD 1840, Intr. synopsis 2, p. 136. Type-species *Musca segnis* LINNAEUS 1758, by monotypy (COQUILLETT 1910).

For the same reasons as in the catalogue of STONE, SABROSKY et al. (1965), the name *Xylota* MEIGEN is used here. It has enjoyed long and almost universal usage.

The genus as a whole has already been characterized above and is not further commented on here. According to the present material, three distinct groups can be found within this genus.

Group *florum*

Regarding the structure of the male genitalia, this group is characterized by rather long and posteriorly projecting ventral lobes of styli with a ± distinct angular projection at an anterior ventral angle, highly modified lateral arms of theca and weak development of lingula. *X. xanthocnema* is an exception in having no angular projection on the ventral lobes of the styli.

The basic abdominal pattern in the *florum* group is formed by roughly quadrangular yellowish spots in the second and third tergites. The spots are frequently obscured or even totally lacking (*X. coquilletti* and *X. florum*).

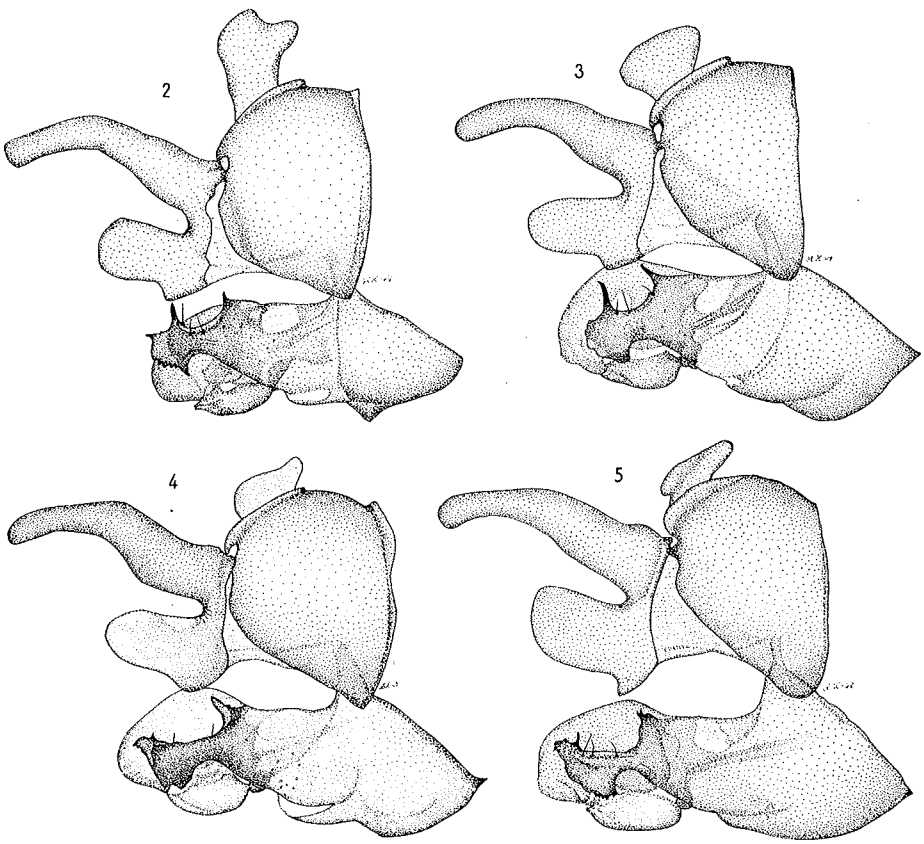
The following Palearctic species are here included in this group:

Xylota meigeniana (STACKELBERG) 1964, comb. n.
X. florum (FABRICIUS) 1805
X. coquilletti HERVE-BASIN 1914
X. sylvarum (LINNAEUS) 1758
X. xanthocnema COLLIN 1939
X. abiens MEIGEN 1822

Within this group *X. florum* and *X. meigeniana* appear to be very near relatives, differing only in some quite minor external and genital characters. *X. coquilletti*

and *X. sylvarum* also show clear affinity to the above-mentioned species in the structure of the male genitalia. All six species are characterized by two distinct dorsal projections on the lateral arms and the presence of three prominent hairs in a depression between them (see Figs. 2 – 5).

Although *X. sylvarum* and *X. xanthocnema* are very similar to each other and similarly aberrant from the other species of *Xylota* in the coloration of the abdomen, they are sharply dissimilar in the structure of the genitalia (see Figs. 5 – 6). In *X. sylvarum* the styli are of the form usual in the *florum* group but in *X. xanthocnema* the ventral lobes are without an angular projection. Although the lateral arms of the theca are structurally more complex in *X. xanthocnema* than in any of the other species studied, the basic structure of the *florum* group is nevertheless evident. Only the region of the anterior projections of the lateral arms is very highly developed and directed posteriorly, and forms a roof-like structure over the other



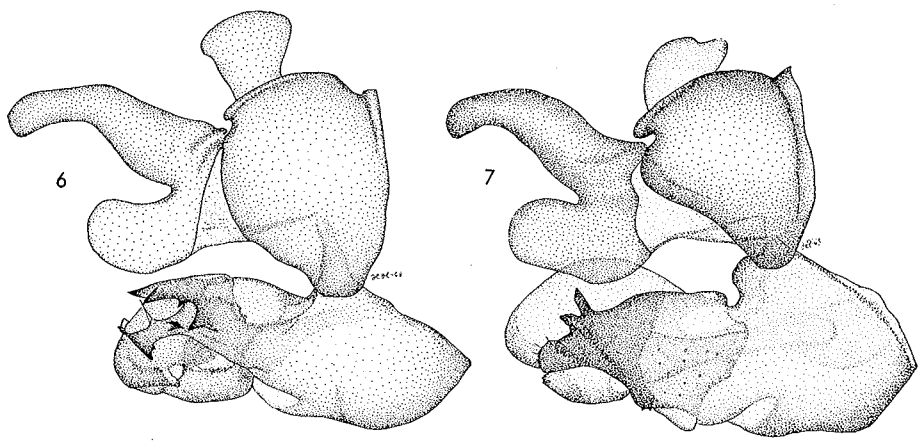
Figs. 2 – 5. — Male genitalia in dextrolateral view. — 2: *Xylota florum* (F.) (Finland), — 3: *X. meigeniana* (STACK.) (Finland), — 4: *X. coquilletti* H.-B. (Japan), — 5: *X. sylvarum* (L.) (USSR, South Karelia). — Orig.

= hisamatsui Shiraki (Hippa 1979)

parts. The abdominal pattern of both species is composed of highly reduced pale spots lying in the middle of as metallic shining areas which is covered with golden hairs, as is also the fourth tergite. Because of this character and the fact that *X. sylvarum* has two spurs on the hind trochanters, and there is also a clear indication of the rudiment of this second spur in *X. xanthocnema*, not found in other species, I suppose these species to be rather near relatives, in spite of the somewhat marked differences in the male genitalia.

X. abiens shows all the features characterizing the *florum* group but the structure of the lateral arms is very different from the other species and does not indicate a close relationship to any other species of the group (see Fig. 7).

X. abiens is also peculiar in having a long light hair at the apex of the male front metatarsus characteristic of the *segnis* group. This and the fact that in *X. tarda* in the *segnis* group the lateral arms are rather complex, being strongly chitinized and bearing numerous short dorsal spinules, may indicate that there is no clearcut difference between these groups or that *X. abiens* and *X. tarda* should be placed in a separate group.



Figs. 6 – 7. — Male genitalia in dextrolateral view. — 6: *Xylota xanthocnema* COLLIN (USSR South Karelia), — 7: *X. abiens* MEIG. (France). — Orig.

Identification of species in the *florum* group

Most of the species in this group are very easily confused. The separation of *X. xanthocnema* and *X. sylvarum* is fully discussed by COE (1939) and COLLIN (1939). The rest of the species, including *X. coeruleiventris* of the *triangularis* group, are identifiable according to STACKELBERG (1952) (in this key ♂. *subabiens* STACKELBERG 1952 = ♂. *abiens* (MEIGEN 1822) and ♂. *abiens* (MEIGEN) 1822 = ♂. *meigeniana* STACKELBERG 1964, see STACKELBERG 1964). Some good contributions have

Table 1. Comparison of *Xylota florum*, *X. meigeniana*, *X. abiens* and *X. coeruleiventris*.

♂♀	*florum*	*meigeniana*	*abiens*	*coeruleiventris*
General appearance	large and robust	medium-sized and slender	small and short	medium-sized and rather broad
Mesopleura behind prothoracic stigma	dull	brightly shining	dull	dull
Mesonotum	not especially shining, covered with bluish or purplish bloom	shining	shining	shining
Hind femora	anterodorsally richly haired, some of the hairs longer than the femur is thick; not enlarged	anterodorsally relatively sparsely haired, no hairs longer than the femur is thick; not enlarged	anterodorsally relatively sparsely haired, no hairs longer than the femur is thick; considerably enlarged	anterodorsally relatively sparsely haired, no hairs longer than the femur is thick; not enlarged
Hind tibiae	basal third pale	basal third pale	only very obscurely pale at base	basal third pale
Tarsi of the first and second legs	three basal segments yellow	three basal segments yellow	two or three basal segments yellow	two basal segments yellow
Wings	± unicolorous	± distinct clouding below stigma	± unicolorous	± unicolorous
Microtrichiation of wings	Fig. 8 b	largely similar to that in Fig. 8 b	like that in Fig. 8 a but the bare area of the second basal cell also extends some distance along the vein Cu	Fig. 8 a
Arista	apical part usually pale	totally dark	apical part obscurely pale	totally dark or faintly pale at actual tip
♂: Hairs of the pregenital segment	dark	pale	pale	dark
Genitalia	Fig. 2	Fig. 3	Fig. 7	Fig. 12
A long light hair at the tip of front basitarsus	no	no	yes	no
♀: Frontal dust spots	well separated from each other and not continuous to dusting of face along eye margins	well separated from each other and not usually connected to dusting of face along eye margins	usually touching at midline of frons and connected to dusting of face along eye margins	usually touching at midline of frons and connected to dusting of face along eye margins

also been made by RINGDAHL (1943) and GAUNITZ (1947). The main recognition characters concerning the species with yellow spotted abdomens in *Xylota* are also given in Table 1. It has not usually been recognized that in *X. tarda* in the *segnis* group there also occurs a form with a four-spotted abdomen. *X. tarda*, however, is always distinguished by the fact that most parts of the pleurae are brightly shining. In addition, all the species mentioned are readily distinguished by the structure of the male genitalia.

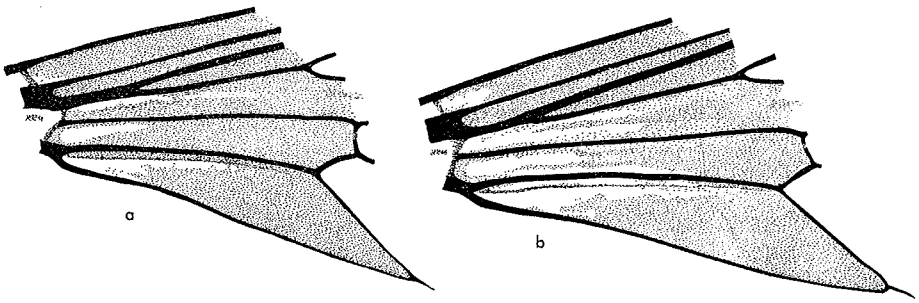


Fig. 8. Part of the wing base to show the unmicrotrichiated areas. — a *Xylota coeruleiventris* ZETT., b *X. florum* (F.). — Orig.

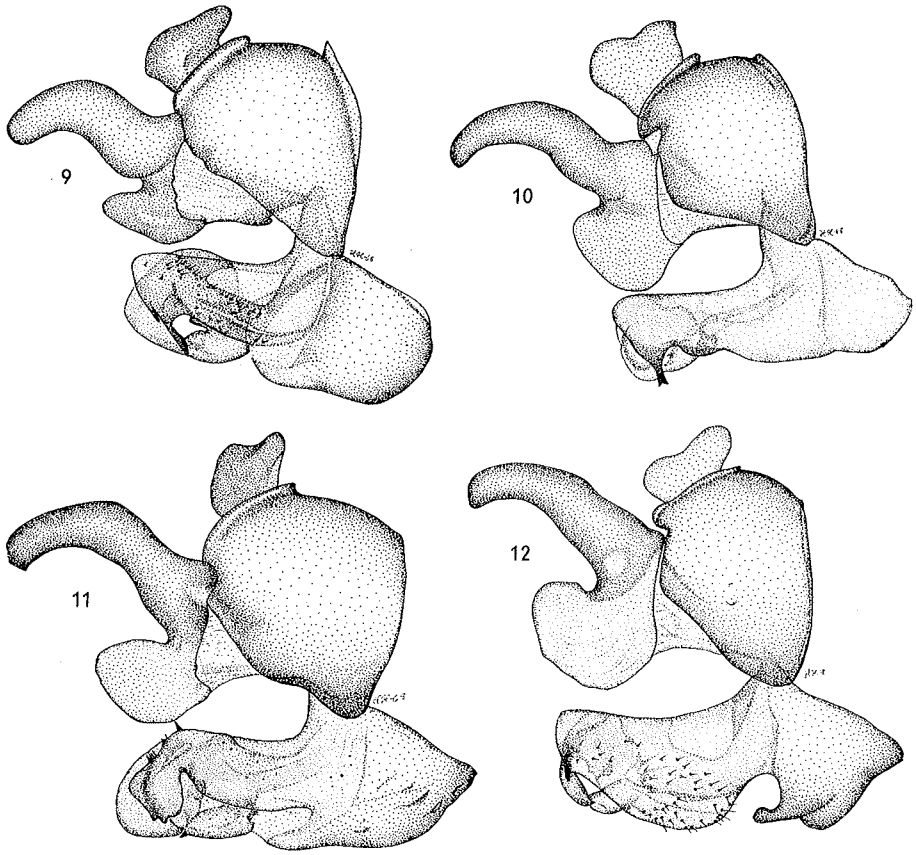
Group *segnis*

In the structure of the male genitalia this group is characterized by the rather small size of the ventral lobes of styli and the absence of the angular projection at the antero-ventral angles of the latter. The lateral arms of the theca are less modified than in the foregoing group and without conspicuous dorsal projections. A lingula is similarly absent, as in the foregoing group. In the abdomen the second and third tergites are almost totally reddish, forming a clear band which is sometimes highly reduced in *X. tarda*. This group is also characterized by the presence of a long light-coloured hair at the apex of the inner sides of the front metatarsi in the males.

The following Palearctic species are here included in the *segnis* group:

Xylota segnis (LINNAEUS) 1758
X. ignava (PANZER) 1798
X. tarda MEIGEN 1822

X. segnis and *X. ignava* seem to be very close relatives. In the ventral apical part of the lateral arms of the theca there are two separate, ventrally directed, strongly chitinized projections of unequal length in *X. segnis*, but in *X. ignava* they are about equal in length and have fused to form a single two-headed projection (see Figs. 9 – 10). Both species also possess an unusually long spur on the hind trochanters.



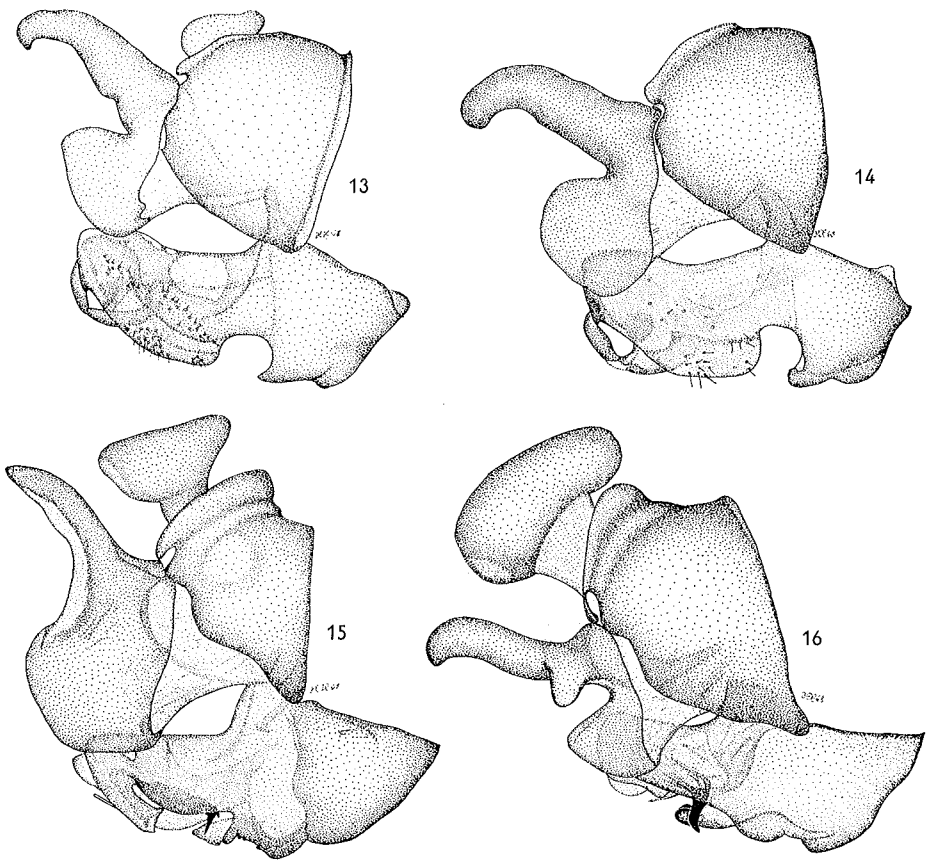
Figs. 9 – 12. — Male genitalia in dextrolateral view. — 9: *Xylota segnis* (L.) (Finland), — 10: *X. ignava* (Panz.) (Finland), — 11: *X. tarda* Meig. (Finland), — 12: *X. coeruleiventris* Zett. (Finland). — Orig.

The position of *X. tarda* in this group is somewhat questionable. The lateral arms of the theca are rather specialized, relatively strongly chitinized and with numerous short dorsal spines and in this respect indicate a relationship with the *florum* group (see Fig. 11). I have also found numerous forms of *X. tarda* in which the pale band on the abdomen is reduced to a spotted condition, recalling that in the *florum* group. A possible affinity, especially to *X. abiens*, is discussed under the foregoing group.

Group *triangularis*

In this group the ventral lobes of the styli are large, rounded and deep. The lateral arms of the theca are rather simple and in basic structure very similar to *X. segnis* and *X. ignava*. Apico-ventrally in the lateral arms there is one strongly

chitinized ventrally directed claw-like structure which is probably homologous with the apicoventral projections of *X. segnis* and *X. ignava*. The lateral arms also bear conspicuous long bristle-like hairs which can also be found in *X. segnis*. A distinct lingula is present, in contrast to the foregoing groups. The basic abdominal pattern in all probability consisted of spots, as seen in the *florum* group, and still persisting in *X. coeruleiventris*. In the other species of the group the pale spots have become totally reduced and instead there are shining metallic triangular lateral spots on the corresponding tergites. In the female of *X. coeruleiventris* a clear transition series can be seen between these two types. There are specimens with clear pale spots as in the male, specimens in which reduced pale spots exist in the middle of triangular greyish-haired lateral spots with a metallic sheen and finally specimens without any pale markings.



Figs. 13 – 16. — Male genitalia in dextrolateral view. — 13: *Xylota triangularis* ZETT. (Finland), 14: *X. suecica* (RINGD.) (Sweden), — 15: *Xylotomima femorata* (L.) (Finland), — 16: *X. curvipes* (LOEW) (France). — Orig.

The following Palearctic species are here included in the *triangularis* group:

Xylota coeruleiventris ZETTERSTEDT 1838
X. triangularis ZETTERSTEDT 1838
X. suecica (RINGDAHL) 1943, comb. n.

Judging from the structure of the male genitalia (see Figs. 12 – 14), these three species form a group of very nearly allied species with only minor differences. *X. triangularis* and *X. suecica* are very similar in most other characters as well, while *X. coeruleiventris* is in many ways similar to the species of the *florum* group in external characters.

Identification of species in the *triangularis* group

X. triangularis and *X. suecica* are separable, according to RINGDAHL (1943, ♂) and STACKELBERG (1952, ♂♀). In addition to the criteria suggested by both for distinguishing these species, it can be mentioned that there is a dark-haired band on the mesonotum just beyond the middle in *X. triangularis* which can readily be seen with the naked eye. This band is also present in *X. suecica*, but the dark-haired area extends along the mid-line of the mesonotum nearly to its front edge. This pattern is not conspicuous and is not seen with the naked eye. The identification of *X. coeruleiventris* has already been discussed in connection with the *florum* group.

Genus Xylotomima Shannon

Xylotomima SHANNON 1926, Proc. U. S. Nat. Mus. 69, p. 15. Type-species *Xylota vecors* OSTEN-SACKEN 1856, by original designation.

The genus as a whole has already been characterized above. The type-species, *X. vecors*, which is a Nearctic species, has not been studied by me. However, the male genitalia of this species are figured by METCALF (1921) and the species is clearly congeneric with the species considered here under the genus *Xylotomima*.

In the genus *Xylotomima* the material studied has appeared more heterogeneous than in the genus *Xylota*. Because of this and the fact that some Palearctic species probably belonging to *Xylotomima* have not been studied and that, especially in the Oriental region, there occur large groups of species possibly also belonging to this genus, no named groups of species have been made. Instead, the affinity of the species studied is discussed.

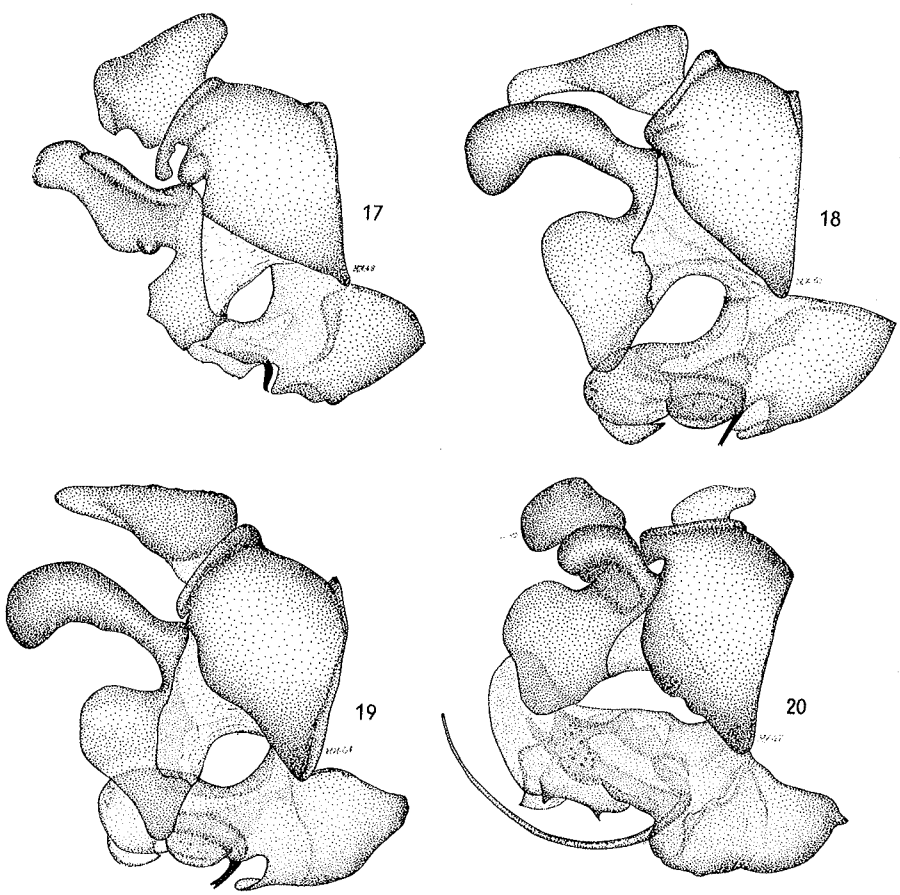
The following Palearctic species are here included in the genus *Xylotomima:*

Xylotomima femorata (LINNAEUS) 1758
X. curvipes (LOEW) 1854
X. sapporensis (SHIRAKI) 1930, comb. n.
X. longa (COQUILLETT) 1898, comb. n.
X. pigra (FABRICIUS) 1794
X. fulviventris (BIGOT) 1861, comb. n.
X. lenta (MEIGEN) 1822, comb. n.
X. eumera (LOEW) 1896, comb. n.
X. nemorum (FABRICIUS) 1805
X. nigripes (ZETTERSTEDT) 1838, comb. n.

In all probability the following Palearctic species, which have not been studied here, also belong to the genus *Xylotomima:*

Xylota rufipes LOEW 1873
X. amurensis (STACKELBERG) 1925
X. pannonica (OLDENBERG) 1916

In the material studied, *X. femorata* and *X. curvipes* clearly form a quite nearly allied pair of species. Both are characterized by great enlargement of cerci and a distinct crest surrounding the cercal emargination. The structure of the whole hypandrium is also strikingly similar (see Figs. 15 – 16). The greatest difference between these species is in the form of the styli. Species probably nearly allied



Figs. 17 – 20. — Male genitalia in dextrolateral view. — 17: *Xylotomima longa* (COQ.) (Japan), — 18: *X. pigra* (F.) (Finland), — 19: *X. fulviventris* (BIG.) (Corsica), — 20: *X. lenta* (MEIG.) (Holland). — Orig.

to both the above-mentioned are *Xylota amurensis*, *X. pannonica* and *X. rufipes* and also *Xylotomima sapporensis*, of which one female was studied. All the above-mentioned species are characterized by mostly reddish legs and a relatively long, dark, blackish-violet abdomen.

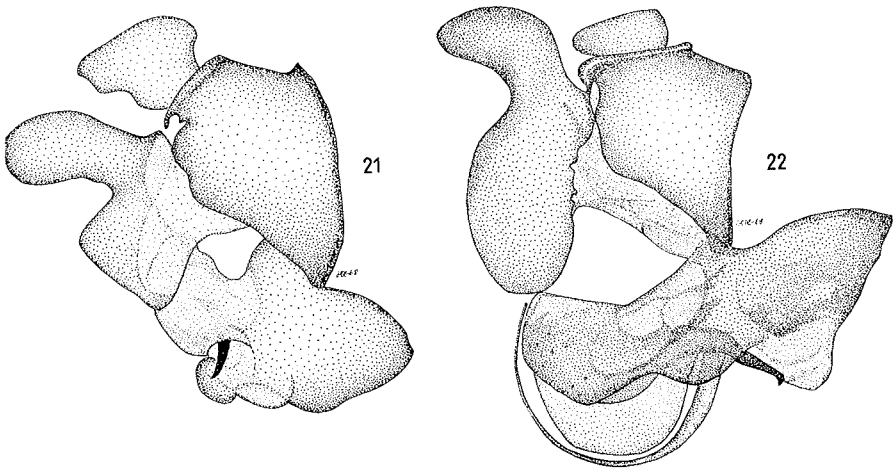
According to the structure of the male genitalia (see Fig. 18), *X. pigra* is in many ways also similar to *X. femorata* and *X. curvipes*. In this species the cerci are also enlarged and greatly modified. The lamella on the inner surface of the lateral arms of the theca is very similar and the tubes of the pyxis are relatively short in all these species.

In external characters *X. pigra* is very similar to *X. lenta*. In both species the abdomen is largely reddish, almost totally so in *X. pigra* and the second and third tergites in *X. lenta*. Both species have totally black legs and are exceptional in the genus in having a very short-haired metasternum. In the structure of the genitalia, however, there are very profound differences. In *X. lenta* (see Fig. 20) the cerci are not enlarged, the lingula is absent and the pyxis-part of the axial system of the penis bears extremely long tubes. The lamella on the inner side of the lateral arms of the theca is also exceptional in having no conspicuous, ventrally directed process. Only in the general shape of the styli are there any similarities between *X. pigra* and *X. lenta*, the dorsal lobes being, however, highly specialized in the later.

The status of *X. fulviventris* is discussed separately below.

SHANNON (1926) mentioned that *Xylota bicolor* LOEW formed an exception in his genus *Xylota* in having unspurred hind trochanters. The male genitalia of this species are figured by METCALF (1921) and it can be seen that the species is in fact a member of the genus *Xylotomima*. According to the figure mentioned by METCALF (op. c.), *Xylotomima bicolor*, comb. n., is so similar to *X. lenta* that I strongly suspect these species to be conspecific. In external characters, also, these species seem to be very similar.

X. longa is an interesting species in being somewhat intermediate between *X. femorata*, *X. curvipes* and their possible allies, on the one hand, and *X. pigra* and *X. lenta*, on the other. The general body form in this species is similar to that of the first-mentioned species and the metasternun is also long-haired. The legs, however, are unicolorous black, as in *X. pigra* and *X. lenta*. At the inner apical end of the hind tibiae there is a long beak-like outgrowth in *X. longa* and this structure is also found in *X. pigra*, although it is less conspicuous, but not in other species. In the male genitalia (see Fig. 17) the hypandrium in basic structure recalls that of the above-mentioned species except *X. lenta*. There is one striking similarity, however, between *X. longa* and *X. lenta* in the ventral margin of the lateral arms: In *X. lenta* there are two conspicuous teeth in this margin which can also be seen in *X. longa*, although they are much smaller. On the dorsal lobes of the styli in *X. longa* there is a long dorsolateral crest and a smaller ventrolateral outgrowth. The former character can also be seen in *X. lenta*, although in much more modified condition, the latter in *X. curvipes*. The possible significance



Figs. 21 – 22. — Male genitalia in dextrolateral view. — 21: *Xylotomima eumera* (LOEW) (USSR, Siberia), — 22: *X. nemorum* (F.) (Finland). — Orig.

of the abovementioned characters is, however, neither possible nor reasonable to decide on the basis of the present material.

X. eumera differs from the other species of the genus studied in the well known sexual dimorphism in the coloration of the legs, the extensive metallic abdominal markings and the considerably curved vein R2 + 3. In the structure of the male genitalia this species shows some similarities to *X. pigra*, *X. femorata* and *X. curvipes* (see Fig. 21).

X. nemorum (see Fig. 22), like *X. lenta*, possesses very long tubes on the pyxis, which itself is very large. The cerci are relatively unmodified. The styli are large and somewhat reminiscent of those of *X. femorata*. The lateral arms of the theca and their lamellae are very similar to those of *X. pigra*. *X. nemorum* is well separated from the species already considered in having an unusually short abdomen with strikingly similar yellowish spots on the second and third tergites, like the species in the *Xylota florum* group.

According to the structure of the male genitalia (see Fig. 23), the most deviating species of the genus *Xylotomima* is *X. nigripes*. In this species the dorsal lobes of the styli are extremely long and the ventral lobes very inconspicuous. The whole hypandrium is very exceptional in form and the lamella of the lateral arms ends in a broad serrate edge. In genital morphology, this species does not appear to be a close relative of any of the foregoing species. Externally, it somewhat resembles *X. nemorum* and is sometimes suspected to be a dark variety of the latter (STACKELBERG 1925, LUNDBECK 1916). The abdomen is as short as in *X. nemorum*, but without any pale markings. Instead there are shining metallic lateral spots, as in the *Xylota triangularis* group.

The species *Zelima jacobsoni* STACKELBERG 1921, also described as *Myiolepta*

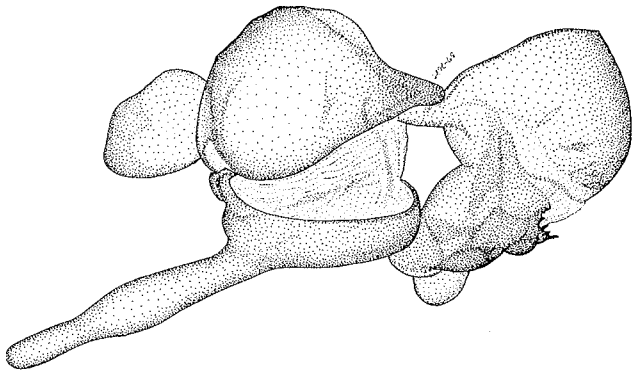


Fig. 23. Male genitalia of *Xylotomima nigripes* (ZETT.) in dextrolateral view (Finland). — Orig.

helophiloides by KANERVO (1938) (see STACKELBERG 1964), is considered to be nearly allied to *X. nemorum* by STACKELBERG (1925, 1952). I have studied this species also and according to the structure of the head and male genitalia it is clearly a member of the genus *Myiolepta*, as supposed by KANERVO (l.c.): *Zelima jacobsoni* STACKELBERG 1921 = *Myiolepta jacobsoni* (Stackelberg), comb. n.

The status of *Xylotomima fulviventris* (Bigot).

X. fulviventris has been described from the island of Corsica, the only place where it has ever been met with. The species has been well characterized, for example by BIGOT (1861), STACKELBERG (1925, 1952) and SACK (1930), but its affinity to other species was only commented on by STACKELBERG (1925), when he placed *X. pigra* and *X. fulviventris* alone in one of his groups. However, all the characters of *X. fulviventris*, except the colour of the abdomen, according to descriptions and compared specimens, are found in *X. pigra* as well. The genitalia of the two species are also quite identical (see Figs. 18 – 19) and the only feature separating these two forms is the totally black colour of the abdominal tergites in *X. fulviventris*, while the tergites from the second backwards are red in *X. pigra*. *X. pigra* and *X. fulviventris* are undoubtedly conspecific, *X. fulviventris* being only a dark form of the former: *X. fulviventris* (BIGOT) 1861 = *X. pigra* (FABRICIUS) 1794, syn. n. *X. fulviventris* may also have subspecific status, but the present author is not sufficiently aware of the distribution of *X. pigra* in Corsica.

On some possible phylogenetic relationships of Xylota and Xylotomima

The genera *Xylota* and *Xylotomima* are both undoubtedly monophyletic units with their own very distinctive characters, already discussed above. Possibly these groups are also nearly allied to each other and have diverged from common ancesters.

In the structure of the male genitalia these two groups have diverged in different directions in many respects. In the genus *Xylota* the lateral arms of the theca have tended to specialize, while the styli are left rather unmodified. In *Xylotomima*, on the contrary, the lateral arms are rather simple but the styli are modified in many ways. It seem very probable that the function played especially by the dorsal and apical armature of the lateral arms in *Xylota* is performed by the styli in *Xylotomima*.

The possible origin and evolution of the longitudinal lamella on the inner side of the lateral arms of the theca in *Xylotomima* is seen by comparison with certain apical structures in the lateral arms of *Xylota*. Especially the apicoventral projections possessed by *X. segnis* and *X. ignava* (see Figs. 9 – 10) could easily be converted to the lamella of *Xylotomima*. The same structure is also well seen in the *Xylota triangularis* group.

The presence of spurs on the male trochanters in *Xylota* and the fact that in the trochanters of some species of *Xylotomima* there are clear indications of a reduced spur, appearing as small inconspicuous knots and disturbances of punctation, may indicate that in the ancestral forms trochanters were spurred and later became simplified in the line leading to *Xylotomima*.

An interesting parallellism can also be seen in the abdominal pattern, which has led to erroneous groupings and even misidentifications. In both genera there occur forms with almost totally reddish second and third tergites (*Xylota segnis* group, *Xylotomima lenta*, *X. pigra*), forms which possess quadrangular pale spots on the tergites mentioned (*Xylota florum* group, *X. coeruleiventris*, *Xylotomima nemorum*), forms with triangular metallic lateral spots (*Xylota triangularis* group, *Xylotomima nigripes*) and finally forms with a completely dark abdomen without any conspicuous markings (some species in the *Xylota florum* group, *Xylotomima femorata*, *X. curvipes*, *X. longa*). Probably the ancestral forms of both were of either the first- or second-mentioned type, both of which might easily be thought to have given rise to the whole series (see *Xylota florum* and *triangularis* groups).

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