The Megalodontesidae of Europe (Hymenoptera, Symphyta)

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Abstract: A key to the European species of Megalodontesidae is presented. The characters used for identification are briefly discussed. The following synonymies are established: *Tarpa loewii* STEIN, 1876 syn. nov. of *Megalodontes eversmanni* (FREYMUTH, 1870), *Tarpa flabellata* EVERSMANN, 1847 and *Megalodontes xanthocerus* GUSSAKOVSKIJ, 1935 syn. nov. of *Megalodontes plagiocephalus* (FABRICIUS, 1804). *Megalodontes mocsaryi* (ANDRÉ, 1881) is considered to be a valid species, and no longer a form of *Megalodontes flabellicornis* (GERMAR, 1825). *Megalodontes turcicus* (MOCSÁRY, 1881) is recorded from Europe for the first time. *Megalodontes thor* sp. nov. is described. This widely distributed species has been mistaken for *Megalodontes cephalotes* (FABRICIUS, 1781) and *Megalodontes plagiocephalus* (FABRICIUS, 1804).

Introduction

The Megalodontesidae (= Megalodontidae; Opinion 1829, 1996) is exclusively Palaearctic. Most species occur in the Mediterranean, three are known from Siberia, and five from Central Asia. Some species from Turkey, the Middle East, the Transcaucasus, and Northern Africa will be described by SPRINGATE, TAEGER & BURCKHARDT (submitted) and in an additional paper of the present author (TAEGER in prep.). In these papers information on the types (including the selection of lectotypes), as well as redescriptions and detailed information on the distribution of all species will be,given, too. The aim of the present paper is to enable the user of the key to identify all European species. TAEGER (1998) stated that most European species seem to be known and gave a key to the European taxa. Since that time many more specimens have been examined. This required the revision of several opinions published by TAEGER (1998).

The characters given in the key are sometimes fairly weak, but they seem to be useful for practical reasons. There is no problem in uniting forms which are dealt with as species in the key if they are found to be conspecific. On the other hand, it is impossible to separate the data of erroneously united taxa without checking the material again. Though in some species (e.g. *cephalotes*) the forms show a more or less distinct geographical restriction, their treatment as subspecies seems to be unreasonable, according to our present knowledge. For these forms I prefer to use epithets without nomenclatorial relevance.

As far as known, the larvae feed on Apiaceae (=Umbelliferae), Rutaceae, and Lamiaceae. Most species occur in steppes and even in semi-deserts. In the temperate zone they prefer warm habitats.

Taxonomy

The Pamphilioidea (Megalodontesidae + Pamphiliidae) form a well founded monophylum (based on the structure of the head capsule and the ovipositor; VILHELMSEN 1996, 1997, 2001).

The monophyly of the Megalodontesidae is well supported by the following characters. The first five seem to be unique within the Symphyta.

1. Clypeus covered by the mandibles (in other Symphyta the clypeus more or less covers the mandibles).
2. Labrum membranous.
3. Tergum 1 deeply emarginated in the middle, but undivided, lateral parts separated by a deep furrow.
4. Vein 2A&3A in fore wing straight (area aspera within the anal cell).
5. Flagellomeres (flagellar segments of the antenna) with more or less elongated, flattened projections (flabelli; sometimes very short), only some apical flagellomeres may be simple.
6. Larvae on Umbelliferae, Rutaceae, and Lamiaceae. Abdominal segments of the larvae with six dorsal annulets.

Additionally SPRINGATE (1994) pointed out an unique shape of digitus and cuspis in the male genitalia.

Character assessment

A short assessment of the characters applied for the separation of the taxa in the key is to be given, to enable the user of the key to decide which couplet best fits a specimen.

Generally, all characters are to be considered as an entirety, because the variability within the species sometimes results in single specimens that do not fit in all respects with the "usual set" of characters of the species. For example, *M. skorniakowii* from Central Asia varies in size between 8 and 14 mm and the sculpture and colouration are highly variable. In European species such a strong variability is not to be found. Only in *M. phaenicius* the variability of colour and sculpture seems to be unusually great, but in this case it is not certain, if the specimens united under this name really belong to the same species.

Obviously some species have local forms. Looking at the distinguishing characters in the whole range of the species, the characterization of these taxa may become difficult. Because often 2–3 well separated forms can be found sympatrically, it is very likely that they are not conspecific. On the other hand, it is sometimes not quite clear, if the different forms from different places (which are treated here as belonging to the same species) are really conspecific.

Colour. The colour can often be used for the separation of the species. Because of the variability mainly the pattern und tendencies of the colour must be considered. Sometimes the colour alone allows the identification of the species (e.g. *M. fabricii*). Distinguishing groups with the help of the number of yellow spots on the mesonotum as done by GUSSAKOVSKIJ (1935) is very uncertain. The differentiation of species based on the intensity of the yellow colour (whitish yellow or yellow) cannot be applied in European species. Specimens are to be found with differing intensities of yellow, but these differences seem not to be of specific value. In the non-European *M. judaicus* and *M. parvus* the pale colour seems to be always whitish.

Antennae. The length of the flabelli (projections of the flagellomeres) was a main reason for describing the genera *Tristactus*, *Melanopus* and *Tristactoides* and the subgenus *Rhipidioceros*. The differences in the length are graduated, and therefore not sufficient for the separation of genera. On the other hand, the relative length of the flabelli, compared with the length of other flabelli or the length of the following antennomeres is a valuable character for species identification. Nevertheless there is a certain variability, as in other characters, too. Measuring the relative length of the flabelli is often difficult, because the antennae are often distorted. In these cases the data are to be interpolated. Usually the length of flabelli is similar in both sexes, only in *M. spiraeae* and *M. interruptus* were slightly longer flabelli found in the males. Sometimes the relative length of the antennomeres or the number of antennomeres show specific differences. The length of the antennomeres is measured on the upper side without flabellum (fig. 1). The number of antennomeres varies more in species with a greater average number of antennomeres.

Mouthparts. There are often distinct differences in the shape of the mouthparts. Glossa, paraglossa and prementum are usually more or less elongated. In *M. merceti* und the Central Asian *M. kuznetzovi* the galea is strongly enlarged. The shape of the mouthparts is difficult to use for species identification because of the distortion caused by drying.

Genitalia. SPRINGATE (1994) analysed the structures of the male genitalia. He discovered partly good distinguishing characters for the species. Usually the greatest differences are to be found in species which show greater differences in their external morphology, too. Otherwise, in groups with few external differences between the taxa, the genitalia are usually also similar. An exception is *M. phaenicius* and *M. olivieri*: the females can be separated only with some doubt, whereas the males are well separated by the different shape of the gonostyli. As

the latter species does not occur in Europe, is it not necessary to deal with the genitalia in the key given below.

Other characters. There are clear sculptural differences between the species, but the variability seems to be no less than in other characters. Tergum 8 in males shows different forms, which can be used for the separation of species groups. The postgenal carina is reduced in several (not closely related) taxa. The claws are usually cleft, only in *M. kuznetzovi* from Central Asia is the inner tooth small.

Key to the European species of Megalodontesidae

The division of the group into various (sub-)genera as used in the past is not supported by phylogenetic analysis. As only about 40 Megalodontesidae species are known, there is no need to divide *Megalodontes* into different genera. The names used in the key are based on the examination of the types in connection with the revision of the group (SPRINGATE, TAEGER & BURCKHARDT, submitted). The males of *M. dusmeti, flavicornis, krausi* and *scythicus* are unknown. Characters, which are given as supplementary information without counterpart are in small print.

1 Females 2
— Males 29

2(1) Flabellum of the 3rd antennomere well developed (usually longer than the following 3 antennomeres together), at least 0.75 times as long as the flabellum of the 4th antennomere (fig. 5) 3
— Flabellum of the 3rd antennomere about half long as the flabellum of the 4th antennomere or shorter, sometimes extremely short, usually shorter than the following 3 antennomeres together (fig. 1–4) 12

3(2) Gena not carinate (fig. 6) or carina obsolete; vertex nearly always yellow posteriorly and without lateral stripes (if rarely lateral stripes present, hind margin broad yellow). Mesonotum with 0-2 (rarely 4) yellow spots; flabellum of the 3rd antennomere as long as the following 4–5 antennomeres together. Larva on *Sphallerocarpus gracilis*. Eastern Europe (Russia: Bashkiria) to Eastern Siberia. ***Megalodontes spiraeae*** **(KLUG, 1824)** ♀
— Gena carinate (fig. 7); vertex nearly always with distinct lateral yellow stripes, hind margin usually at least partly black 4

4(3) Flabellum of the 3rd antennomere as long as the following 10-12 antennomeres together 5
— Flabellum of the 3rd antennomere as long as the following 3–8 antennomeres together 6

5(4) 3rd antennomere broader than long, about as long as the pedicel; sterna more or less yellow; eastern mediterranean species. Highly variable, perhaps more than one species included. Larva on *Haplophyllum thesioides*. SE Europe (Bulgaria, Greece, Moldavia, Ukraine, Yugoslavia); Azerbaijan, Egypt, Iran and Turkey.
Megalodontes phaenicius **(LEPELETIER, 1823)** ♀

— 3rd antennomere clearly longer than broad and longer than the pedicel; sterna black or with very narrow yellow hind margins; western mediterranean species. Hitherto only two ♀♀ known. The few differences given in the key leave some doubt about the validity of the species. On the other hand, these differences are more distinct than the differences between the females *M. olivieri* (BRULLÉ, 1846) and *M. phaenicius*, which are different species without doubt because of the completely different male genitalia. Perhaps the unknown ♂ can answer the question in future. Spain. ***Megalodontes dusmeti* ENSLIN, 1914 ♀**

6(4) Malar space clearly broader than the half diameter of the anterior ocellus; lower face largely yellow; larger species, usually about 12-13 mm; galea enlarged; glossae short. Central Spain. ***Megalodontes merceti* KONOW, 1904 ♀**

— Malar space narrower than the half diameter of the anterior ocellus; lower face largely black; often smaller than 12 mm; galea not enlarged; glossae elongated 7

7(6) Head between the eyes above the antennal sockets rugose or with deep, dense punctures; species from the Iberian Peninsula 8

— Head between the eyes above the antennal sockets punctate or punctulate, more or less rugose shining between the punctures; eastern mediterranean species 9

8(7, 15) Flabellum of the 3rd antennomere about as long as the following 4.5 antennomeres together; head between the eyes above the antennal sockets rugose; tergum 3 with broad yellow hind margin; last abdominal segment mainly black. Portugal, Spain. ***Megalodontes krausi* TAEGER, 1998 ♀**

— Flabellum of the 3rd antennomere about as long as the following 2.5–3 antennomeres together; head between the eyes above the antennal sockets with deep, dense punctures; tergum 3 only laterally yellow; last abdominal segment mainly yellow. Spain. ***Megalodontes gratiosus* (MOCSÁRY, 1881) ♀**

9(7) Scape about as long as the basal 6 flagellomeres together; 3rd antennomere about as long as the pedicel; larger species, up to 15 mm. SE Europe (Bulgaria, Greece), Caucasus region (Armenia, Azerbaijan, Georgia, Iran, Russia), Turkey. Cf. p. 475. ***Megalodontes eversmanni* (FREYMUTH, 1870) ♀**

— Scape about as long as the basal 4–5 flagellomeres together; 3rd antennomere about 1.5–2 times as long as the pedicel; smaller species, usually not larger then 12 mm. There are several similar species or forms from Turkey, the Middle East, and the Caucasus, which seem to have a local distribution. Not all of these forms are included in the key 10

10(9) Tergum 3 with a complete yellow hind margin, which is enlarged laterally; rather large species, usually 11–12 mm; yellow hind margins of terga 4–7 comparatively narrow and not enlarged laterally, each occupying about one third of the visible part of the terga; yellow spot in the middle of the face usually does not include the whole clypeus (at least area above the mandible bases remains black); scape and tegula (mainly) yellow. Tergum 1 often yellow; tergum 8 with yellow hind margin; sterna 5+6 distinctly marked with yellow; area behind cenchri black. In the typical form (eastern coast of Adriatic Sea, W Greece) the mesonotum is more or less densely punctured, without large smooth areas; 3rd antennomere about 2 times as long as broad. There are single specimens from other places (Moldavia, NW and NE Turkey) which are similar to the typical specimens, but slightly differ in reduced sculpture of the

mesonotum and/or by a slightly shorter 3rd antennomere. Eastern coast of Adriatic Sea (Bosnia and Herzegovina, Croatia, Italy, Slovenia, Yugoslavia), Greece, Moldavia, Turkey.

***Megalodontes flabellicornis* (GERMAR, 1825) ♀**

— Characters not in this combination: usually yellow hind margin of tergum 3 interrupted in the middle or only yellow laterally; if tergum 3 with continuous yellow hind margin, the yellow spot in the middle of the face includes the clypeus; usually not larger than 10mm; yellow hind margins of terga 4–7 often broader than one third of the visible part of the terga and sometimes distinctly enlarged laterally; scape usually dorsally black and tegula black or yellow spotted on outer margin. Mesonotum often with large smooth areas; terga 1+8 usually black; area behind cenchri sometimes yellow; scutellum sometimes with a yellow spot 11

11(10) Yellow hind margin of tergum 3 (often also that of tergum 4) interrupted in the middle or only yellow spotted laterally; yellow margins of terga 4–7 somewhat broader laterally than in the middle; tegulae and terga 1+8 black; sterna usually ± marked with yellow, but sometimes nearly completely black; mesonotum with large smooth areas; 7.5–10mm.
(= *M. flabellicornis* forma **c** sensu TAEGER, 1998). Bulgaria, Greece, Romania, Yugoslavia,Turkey.
Cf. p. 475.
***Megalodontes mocsaryi* (ED. ANDRÉ, 1881) ♀**

— Characters not in this combination. The following forms are only known from few specimens. More material is required to find a reasonable taxonomic placement.

A Yellow hind margin of tergum 3 not interrupted in the middle; area behind cenchri yellow; scutellum black; tegulae yellow; tergum 8 black or yellow laterally; sculpture similar to *M. mocsaryi*, perhaps a pale form of this species; 9–10mm. (Greece: Peloponnes, Ionanina) (= *M. flabellicornis* forma a sensu TAEGER, 1998). ***Megalodontes mocsaryi* forma a**

— Yellow hind margin on tergum 3 interrupted in the middle; area behind cenchri black; scutellum with yellow spot; tegulae black; tergum 8 black; sculpture as in typical *M. flabellicornis* and perhaps a form of this species; 11 mm. If considered to be a valid species, the name *Megalodontes exornatus* (ZADDACH, 1863) is to be used (loc. typ. unknown, ? SE Europe). (= *M. flabellicornis* forma b, TAEGER, 1998).

***Megalodontes flabellicornis* forma b**

12 (2) Hind coxa black with lateral yellow stripe; lower face yellow or with few black markings; mesonotum with 4 yellow spots; mesepisternum with a large yellow spot; species from the Iberian Peninsula 13

— Hind coxa black or pale marked apically and/or ventrally; lower face marked with black; mesonotum with 0-4 yellow spots; yellow spot on mesepisternum usually small 14

13(12) Gena without distinct carina (cf. fig. 6); longest flabelli about as long as the following 1.5 antennomeres together; sterna apically broad yellow; 3rd antennomere mainly black. Portugal, Spain ***Megalodontes bucephalus* (KLUG, 1824) ♀**

— Gena with distinct carina (fig. 7); longest flabelli about as long as the following 2.5 antennomeres together; sterna marked with yellow only laterally; 3rd antennomere yellow. SW France, Portugal, Spain. ***Megalodontes capitalatus* KONOW, 1904 ♀**

14(12) Flabellum of the 3rd antennomere about as long as the following 2 antennomeres together

or somewhat longer; longest flabelli about as long as the following 3-4 antennomeres together 15

— Flabellum of the 3rd antennomere about as long as the following 1.5 antennomeres together or shorter (cf. fig. 4); longest flabelli about as long as the following 1.5-3 antennomeres together 17

15(14) Clypeus yellow; vertex with pale lateral stripes; mesonotum with 4 yellow spots; species from Spain; (cf. *gratiosus*) 8

— Clypeus partly or completely black; vertex without pale lateral stripes; mesonotum with 2-4 yellow spots; Eastern Mediterranean species 16

16(15,24) Tegula, scape and usually terga 1-2(-3) black, terga 1-3 sometimes with yellow spots; face between ocelli and eyes more or less rugulose punctate; mesonotum with 2 yellow spots; femur of front leg with more than basal third black. Bulgaria (Melnik), Syria, Turkey. ***Megalodontes turcicus* (MOCSÁRY, 1881) ♀**

— Tegula yellow; scape yellow or black on outer side; terga 1-3 with large yellow spots; face punctate, not rugulose; mesonotum with 2-4 yellow spots; anterior femora usually black only in the basal quarter. E Europe (Ukraine: Saporishshja, Kerch; Russia: Novorossiisk, Gelendshik) Azerbaijan, Turkey. Also 1 ♀ from "Griechenland" (coll. Hiendlmayr, Zoologische Staatssammlung, München; labels unreliable). ***Megalodontes medius* KONOW, 1897 ♀**

17(14) Face only with lateral yellow spots; apical 7-9 antennomeres without distinct flabelli; other flabelli not longer than the following antennomere (fig. 2). Terga 1-3 and usually 7 black, terga 4-5 and 8 with yellow margin; tergum 6 laterally yellow, tergum 7 sometimes with narrow yellow margin. Larva according to MÓCZÁR & ZOMBORI (1973) on *Salvia sylvestris*. C and SE Europe (Austria, Bulgaria, Croatia, Czech Republic, Germany, Hungary, Macedonia, Moldavia, Romania, Russia, Slovakia, Slovenia, Ukraine, Yugoslavia), Turkey.
***Megalodontes fabricii* (LEACH, 1817) ♀**

— Face with at least 3 yellow spots (one in the middle of the face); apical 3-5 antennomeres without distinct flabelli, other antennomeres at least partly with longer flabelli (fig. 3–4) 18

18(17) Very dark: yellow hind margins on terga 5-6 laterally broad, but interrupted in the middle; tegulae black or yellow marked on outer side. Longest flabelli somewhat longer than the following 1.5 antennomeres together; sculpture as in *plagiocephalus*, perhaps an unusual coloured form of this species. E Europe (Russia: Orenburg, Krasninsk; Ukraine: Sevastopol), Kazakhstan (Uralsk). ***Megalodontes scythicus* ZHELOCHOVTSEV, 1988 ♀**

— Yellow hind margins on terga 5-6 not interrupted; tegulae often mainly yellow or yellow marked on inner side 19

19(18) Yellow hind margins of terga 5-8 about of the same width (cf. fig. 8); tegula more or less yellow; if terga very broadly yellow, then tegula yellow 20

— Yellow hind margins of terga 5-6 clearly narrower than on tergum 7(-8) (cf. fig. 9); if terga very broadly yellow, tegula black or with yellow only on inner side 26

20(19,26) Tergum 1 black or with small lateral yellow spots which are clearly smaller than the spots on tergum 2; mandibles mainly yellow; outer orbits yellow towards the base of

the mandibles; mesonotum with 2 yellow spots. Antenna and tegula yellow; sculpture between eyes and ocelli partly rugulose; mesonotum with smooth areas. ♂ unknown, most likely a parthenogenetic species (specimens claimed to be the ♂ of *M. flavicornis* belong to a hitherto undescribed species). C, E and SE Europe (Austria, Bulgaria, Czech Republic, Germany, Hungary, Italy, Russia, Slovakia, Ukraine), Caucasus region (Armenia, Azerbaijan, Georgia, N Iran), Turkey, Turkmenistan. ***Megalodontes flavicornis* (KLUG, 1834) ♀**

— Characters not in this combination: tergum 1 with yellow spots, which are usually clearly larger than the spots on tergum 2 (tergum 2 sometimes, rarely both tergum 1 and tergum 2 black; exceptionally tergum 1 black and tergum 2 broad yellow, but then mesonotum with 4 yellow spots and outer orbits not yellow towards the mandibles); mandibles often mainly black; outer orbits usually less yellow; mesonotum frequently with 4 yellow spots; (flagellum sometimes darkened; sculpture often different) 21

21(20) Flagellum yellow or reddish, mesonotum with 4 (rarely 2) yellow spots 22

— Flagellum more or less darkened, mesonotum with 0-2 (very rarely 4) yellow spots. Area between ocelli and eyes rugose, mesonotum rugose; mandibles often reddish brown 27

22(21) Area between eyes and ocelli, and mesonotum rugose; about 12mm. Vertex with lateral yellow stripes, which are connected on hind margin of vertex 23

— Area between eyes and ocelli punctate with shiny interspaces; mesonotum often with small smooth areas; usually smaller, about 10-12mm. 24

23(22) Yellow hind margins of terga very broad (fig. 10); mandibles largely yellow. Yellow spots behind the cenchri present; perhaps only a large pale form of *cephalotes*. Central Spain. ***Megalodontes mundus* KONOW, 1904 ♀**

— Yellow hind margins of terga not broader than the half of the length of the terga; mandibles mainly black. Sterna 5+6 largely yellow apically, the yellow color often slightly interrupted in the middle; terga 1–3 largely yellow spotted laterally, black in the middle. Perhaps only a large form of *M. panzeri*. SE Europe (Bosnia and Herzegovina, Bulgaria, Croatia, Romania). ***Megalodontes laticeps* KONOW, 1897 ♀**

24(22) Longest flabelli about as long as the following 3 antennomeres together (cf. *medius* and *turcicus*) 16

— Longest flabelli about as long as the following 1.5–2 antennomeres together 25

25(24) Mesonotum usually with 4 yellow spots; scape and tegulae yellow. In SE European specimens sometimes tergum 1 black and tergum 2 more or less yellow; longest flabelli about as long as the following 1.5 antennomeres together; yellow hind margins of sterna 5–6 usually continuous; mandibles usually mainly black. Large forms with much more dense sculpturing cf. *M. laticeps*. Larva on *Peucedanum cervaria*. C and SE Europe (Albania, Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, E France, S Germany, Greece, Hungary, N Italy, Macedonia, Slovakia, Slovenia, Switzerland, Yugoslavia). (= *M. cephalotes* auct.). ***Megalodontes panzeri* (LEACH, 1817) ♀**

— Mesonotum with 2 yellow spots; scape and tegulae usually more or less black 26

26 (19,25) Tergum 1 black or with small lateral yellow spots which are clearly smaller than the spots on tergum 2; antenna yellow; mandibles mainly yellow; outer orbits yellow

towards the base of the mandibles; mesonotum with 2 yellow spots (cf. *flavicornis*). 20

— Colouration different 27

27 (21,26) Head between eyes and ocelli rugose; mesonotum closely punctate, without distinct smooth areas; longest flabelli usually about as long as the following 2.5 following antennomeres together; flagellum darkened towards the apex, never completely yellow (fig. 4); hind margins of terga 5–7 about of the same width (fig. 8) or tergum 7 with somewhat broader margin; hind margin of tergum 8 usually clearly narrower than that of tergum 7; hind margin of sterna 3–4 usually yellow in the middle (sometimes with additional lateral spots), sterna 5–6 usually with yellow hind margin which is not interrupted in the middle; mesonotum with 0–2 (exceptionally 4) yellow spots; tergum 1 marked with yellow and tegulae mainly yellow, exceptionally black. Species with more or less distinct local forms, but intermediates occur (?? subspecies). Most records from mountainous and alpine places (up to 2 400 m), but also in the lowlands. Larva on *Laserpitium latifolium, L. siler, Peucedanum cervaria, P. alsaticum* and *Seseli libanotis*. Europe except N and NW (Andorra, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Europe, France, Germany, Italy, Macedonia, Poland, Romania, Russia, Slovakia, Slovenia, Spain, Switzerland, Yugoslavia), ? NW Turkey. (= *M. spissicornis, M. klugii,* nec *M. cephalotes* auct.).

***Megalodontes cephalotes* (FABRICIUS, 1781) ♀**

A Scape reddish brown or mainly yellow, tegulae mainly yellow. ..... B

— Scape mainly black, tegulae sometimes black (forms named according to TAEGER, 1998). C

B Yellow hind margins of terga narrow, terga 2-3 often black; scape usually reddish brown, f lagellum distinctly darkened towards the apex; mesonotum with 0–2 yellow spots; (= *M. cephalotes* forma a sensu TAEGER, 1998). C Europe, France. ***M. cephalotes* s. str.**

— Terga 1–3 with yellow spots and other tergites with broad yellow hind margins; scape yellow and flagellum only slightly darkened; mesonotum sometimes with 4 yellow spots, sometimes also scutellum with yellow spot; sculpture not as strong as in Central European specimen. NE Spain. (= *M. cephalotes* forma f sensu TAEGER, 1998, part.). **forma f**

C Tergum 1 and tegulae black. NE Europe. **forma c**

— Tergum 1 and tegulae more or less yellow. ..... D

D Sculpture as dense as in Central European specimen. SE- and E Europe. **forma d**

— Sculpture not as dense as in Central European specimen. Perhaps not conspecific with *cephalotes*. NW Turkey. **forma e**

— Characters not in this combination: head between eyes and ocelli not rugose, but often closely punctate; mesonotum often with distinct smooth areas; longest flabelli usually clearly shorter than the following 2.5 following antennomeres together (fig. 3); flagellum sometimes yellow; yellow hind margins of terga 5–6 usually clearly narrower than that of tergum 7 (fig. 9); hind margin of sterna 3–4 usually black or yellow spotted only laterally; sterna 5–6 with yellow hind margin interrupted or not; mesonotum often with 4 yellow spots; tergum 1 and tegulae often black. Mostly found in the lowlands, but records from mountainous places (usually not higher than 1 000 m) are known 28

28(27) Mesonotum with distinct smooth areas; scape usually mainly black or yellow with two dark stripes, exceptionally reddish brown; yellow hind margins of sterna 5–6 usually continuous, rarely interrupted on sternum 5 or 5–6; yellow margin of the pronotum in dorsal view distinctly broadened in outer direction, nearly triangular. Larva on *Peucedanum alsaticum* and *Seseli libanotis* (?). C, W, E and SE Europe (Andorra, Austria, Bulgaria, Czech Republic, France, SW Germany, Hungary, N Italy, Romania, Russia, Slovakia, NE Spain, Ukraine, Yugoslavia); Caucasus (Armenia, Georgia), NW Kazakhstan. Cf. p. 475.

***Megalodontes plagiocephalus* (FABRICIUS, 1804) ♀**

There are more or less distinct forms, which have a more or less distinct restricted distribution. Therefore these forms might be considered to be subspecies. Intermediates between the forms occur.

A Femora of front and middle legs reddish yellow, at most slightly darkened basally. (Tegula black, rarely yellow on inner margin; terga 1 and 3 sometimes yellow spotted, tergum 2 nearly always black; scape and pedicel black, exceptionally reddish brown; mesonotum with 0-2 yellow spots; longest flabelli about as long as the following 2 antennomeres together.) [= *M. flabellatus* (EVERSMANN, 1847)]. E Europe, Caucasus, Southern Russia, Ukraine, Romania. **forma a**

— Femora of front and middle legs largely darkened basally.....B

B Scape mainly black, more or less yellow dorsally; mesonotum with 2 (rarely 4) yellow spots; longest flabelli usually about as long as the following 1.5 antennomeres together. C Europe. ***M. plagiocephalus* s. str.**

— Scape yellow with 1–2 black stripes; mesonotum with 4 (rarely 2) yellow spots; longest flabelli usually about as long as the following 2 antennomeres together (= *M. cephalotes* forma f sensu TAEGER, 1998, part.). C

C Tegulae black or yellow on inner side. France. (= *M. xanthocerus* GUSSAKOVSKIJ, 1935). **forma b**

— Tegulae mainly yellow. Spain. **forma c**

— Mesonotum without larger smooth areas; scape usually reddish brown; yellow hind-margins of sterna 5–6 usually interrupted; yellow margin of the pronotum usually rather narrow, not distinctly broadened in outer direction, nearly parallel sided. Femora of front and middle legs darkened basally; longest flabelli usually about as long as the following 2 antennomeres together; tegulae usually more or less yellow on outer side, rarely yellow or black. (= *M. cephalotes* forma b sensu TAEGER, 1998 part., = *M. plagiocephalus* sensu TAEGER, 1998 part.). Larva on *Peucedanum oreoselinum*. C, SE and E Europe (Austria, Bulgaria, Croatia, Czech Republic, SE France, S Germany, Hungary, N Italy, Poland, Romania, Russia, Slovakia, Slovenia, Switzerland, Ukraine), NW Kazakhstan (Janvarcevo, Uralsk). Cf. p. 476.

***Megalodontes thor* sp. n. ♀**

29(1) Flabellum of the 3rd antennomere well developed, at least 0.75 times as long as the flabellum of the 4th antennomere, usually longer than the following 3 antennomeres together 30

— Flabellum of the 3rd antennomere about 0.5 times as long as the flabellum of the 4th antennomere or shorter, sometimes extremely short, usually shorter than the following 3 antennomeres together 37

30(29) Gena not carinate or carina obsolete; vertex nearly always yellow behind and without lateral stripes (if rarely lateral stripes present, hind margin broadly yellow); Mesonotum with 0-2 (rarely 4) yellow spots; tergum 8 simple, without distinct impression, at most impression faintly indicated; flabellum of the 3rd antennomere as long as the following 5–7 antennomeres together. Eastern Europe (Bashkiria) to Eastern Siberia. ♀ cf. couplet 3. ***Megalodontes spiraeae*** **(KLUG, 1824)** ♂

— Gena carinate; vertex nearly always with distinct lateral yellow stripes, hind margin usually at least partly black (if lateral stripes reduced, hind margin black); sometimes thorax ventrally completely yellow, mesonotum usually with 4 yellow spots; tergum 8 often with distinct impression or divided in the middle; flabellum of the 3rd antennomere as long as the following 3–12 antennomeres together. Western Palaearctic 31

31(30) Tergum 8 simple; flabellum of the 3rd antennomere as long as the following 10-12 antennomeres together. The hitherto unknown male of *M. dusmeti* from Spain is most likely similar to this species. ♀ cf. couplet 4. ***Megalodontes phaenicius*** **(LEPELETIER, 1823)** ♂

— Tergum 8 divided in the middle by a furrow or a distinct impression; flabellum of the 3rd antennomere as long as the following 3-8 antennomeres together 32

32(31) Propleura at least mainly yellow, abdomen below nearly completely yellow; scape usually yellow, rarely black dorsally; pronotum mainly yellow with few black markings. Femora often completely yellow 33

— Propleura black, rarely with few yellow markings; abdomen below usually distinctly marked with black; scape more or less black dorsally, rarely yellow; if lower corners of pronotum marked with yellow, the yellow colour is not connected with the yellow colour of the upper corners 34

33(32) Body completely yellow below; impression on tergum 8 V-shaped; flabellum of the 3rd antennomere about as long as the following 3 antennomeres together; 3rd antennomere about 1.5-2 times as long as the pedicel; galea enlarged, short. ♀ cf. couplet 6. ***Megalodontes merceti*** **KONOW, 1904** ♂

— Body below with distinct black markings; impression on tergum 8 usually furrow-shaped; flabellum of the 3rd antennomere about as long as the following 5–6 antennomeres together; 3rd antennomere about as long as the pedicel; galea not enlarged 35

34(32) 3rd antennomere about twice as long as the pedicel; flabellum of the 3rd antennomere about as long as the following 2 antennomeres together. Spain. ♀ cf. couplet 8. ***Megalodontes gratiosus*** **(MOCSÁRY, 1881)** ♂

— 3rd antennomere about 1–1.5 times as long as the pedicel; flabellum of the 3rd antennomere as long as the following 4–6 antennomeres together; Eastern Mediterranean species 35

35(33,34) Scape about as long as the first 6 flagellomeres together; flabellum of the 3rd antennomere about as long as the following 6 antennomeres together; tergum 1 partly yellow. ♀ cf. couplet 9. ***Megalodontes eversmanni*** **(FREYMUTH, 1870)** ♂

There are more or less distinct forms:

A Face with 3 (often large) yellow spots; femora of front and middle legs more or less black basally; mesepisternum usually with small yellow spot. ..... B

— Face yellow, only somewhat darkened near the base of antenna; femora of front and middle legs usually completely yellow; mesepisternum largely yellow. Mainly found in southern Transcaucasia.(= *M. loewii* sensu KONOW). **forma a**

B Propleura with yellow markings; abdomen below nearly completely yellow. (Greece, Bulgaria, W Turkey).(= *M. loewii* (STEIN, 1876)). **forma b**

— Propleura black; abdomen below distinctly marked with black. (NE Turkey, Transcaucasia, Caucasus). ***M. eversmanni* s. str.**

— Scape about as long as the first 4-5 flagellomeres together; flabellum of the 3rd antennomere about as long as the following 4-5 antennomeres together; tergum 1 black or with two yellow spots on each side (a small one dorsally and a larger one ventrally) 36

36(35) Tergum 3 with yellow hind margin; tegulae mainly yellow; mesonotum more or less densely punctured, without large smooth areas; rather large species, usually 11–12 mm. ♀ cf. couplet 10. ***Megalodontes flabellicornis* (GERMAR, 1825) ♂**

— Tergum 3 yellow only laterally; tegulae black (*mocsaryi* s. str.) or more or less yellow; mesonotum with large smooth areas; smaller species, 7.5–10 mm. ♀ cf. couplet 11. ***Megalodontes mocsaryi* (ED. ANDRÉ, 1881) ♂**

37(29) Clypeus yellow, often lower face completely yellow; yellow spot on mesepisternum usually large; antenna with about 15 antennomeres; species from the Iberian Peninsula..38

— Clypeus mainly or completely black, face with 2-3 yellow spots (the spot in the middle sometimes divided into several smaller spots); yellow spot on mesepisternum small (except in *mundus* from Spain); antenna usually with more than 15 antennomeres. ..40

38(37) Hind coxa nearly completely black; face with 3 yellow spots; 3rd antennomere yellow or infuscated basally. Longest flabelli about as long as the following 2-3 antennomeres together; genal carina distinct. ♀ cf. couplet 8. ***Megalodontes gratiosus* (MOCSÁRY, 1881) ♂**

— Hind coxa nearly completely yellow or at least with lateral yellow stripes and ventrally yellow spots; face completely yellow; 3rd antennomere usually mainly or completely black 39

39(38). Propleura, mesepisternum and hind coxa nearly completely yellow, sometimes also mesosternum yellow; longest flabelli usually about as long as the following 1.5 antennomeres together; gena without distinct carina. ♀ cf. couplet 13. ***Megalodontes bucephalus* (KLUG, 1825) ♂**

— Propleura black, mesepisternum and hind coxa partly black; longest flabelli about as long as the following 2.5 antennomeres together; gena with distinct carina. ♀ cf. couplet 13. ***Megalodontes capitalatus* KONOW, 1904 ♂**

40(37) Face only with lateral yellow spots; apical 7-9 antennomeres without distinct flabelli; other flabelli usually not longer than the following 1.5 antennomeres together. Terga

1-3 and 7 black, 4 and 8 with yellow margin; 5-6 laterally yellow. ♀ cf. couplet 17.

***Megalodontes fabricii* (LEACH, 1817) ♂**

— Face with at least 3 yellow spots; apical 3(-5) antennomeres without distinct flabelli, other antennomeres at least partly with longer flabelli 41

41(40) Flabellum of the 3rd antennomere about as long as the following 2 antennomeres together or somewhat longer; longest flabelli about as long as the following 3-4 antennomeres together 42

— Flabellum of the 3rd antennomere about as long as the following 1.5 antennomeres together or shorter; longest flabelli about as long as the following 1.5-3 antennomeres together. The male specimens of the following species, all belonging to the *cephalotes* complex, sometimes are not separated for sure. The characters (colour, sculpture) seem to be somewhat less stable than in the females 43

42(41,50) Tegula and scape yellow; terga 1-3 with large yellow spots; face punctate, not rugulose; mesonotum with 2-4 yellow spots; anterior femora black only in the basal quarter; sterna mainly yellow. ♀ cf. couplet 16.

***Megalodontes medius* KONOW, 1897 ♂**

— Tegula, scape and often terga 1-2(-3) black; face between ocelli and eyes more or less rugulose punctate; mesonotum with 2 yellow spots; femora of front legs with more than basal half black; sterna mainly black. ♀ cf. couplet 16.

***Megalodontes turcicus* (MOCSÁRY, 1881) ♂**

43(41) Femora of front and middle legs reddish yellow, at most slightly darkened basally; tegula black, rarely yellow on inner margin; terga 1 and 3 sometimes yellow spotted, tergum 2 nearly always black; scape and pedicel black, exceptionally reddish brown; mesonotum with 0-2 yellow spots; head and mesonotum punctate, with smooth interspaces 46

— Front and middle femora black basally or mainly black; tegula, scape and terga 1-3 often with distinct yellow markings; mesonotum with 0-4 yellow spots; sculpture often rugose 44

44(43,47) Mesonotum closely punctate, without distinct smooth areas; head between eyes and ocelli rugose; flagellum darkened towards the apex, never completely yellow; tergum 1 and tegulae marked with yellow, exceptionally black; longest flabelli about as long as the following 2.5 following antennomeres together. Most records from mountainous and alpine places (up to 2 400 m), but also in the lowlands. Yellow hind margins of terga variable: interrupted on terga 5–7, or margin about of the same width on terga 5–7, or yellow hind margin of tergum 7 somewhat broader than on terga 5–6; yellow hind margin of tergum 8 usually clearly broader than that of tergum 7; mesonotum with 0–2 (exceptionally 4) yellow spots. The species occurs as local forms, which are more distinct in females. On the Iberian Peninsula very light forms are to be found with scape yellow and flagellum only slightly darkened, terga 1–3 with yellow spots and other terga with broad yellow hind margins, mesonotum sometimes with 4 yellow spots, rarely also scutellum with yellow spot (cf. *mundus*). ♀ cf. couplet 27.

***Megalodontes cephalotes* (FABRICIUS, 1781) ♂**

— Characters not in this combination: mesonotum often with smooth areas; head between eyes and ocelli often not rugose; tergum 1 frequently black; flagellum often

completely yellow; longest flabelli sometimes distinctly shorter than the following 2 antennomeres together 45

45(44) Yellow hind margins on terga 5-6 interrupted in the middle or clearly narrower than on tergum 7 (margin on tergum 7 usually yellow at least in the middle); scape often marked with black; tegula often black 46

— Yellow hind margins on terga 5-7 about of the same width, exceptionally interrupted on terga 5–7; scape often yellow; tegula mainly yellow 47

46(43,45,51) Mesonotum with distinct smooth areas; yellow margin of the pronotum in dorsal view distinctly broadened in outer direction, nearly triangular; tegula usually yellow on inner margin, sometimes mainly yellow or black. ♀ cf. couplet 28.

***Megalodontes plagiocephalus* (FABRICIUS, 1804) ♂**

— Mesonotum without larger smooth areas; yellow margin of the pronotum usually rather narrow, not distinctly broadened in outer direction, nearly parallel sided; tegula usually yellow on outer margin, sometimes mainly yellow or black. ♀ cf. couplet 28.

***Megalodontes thor* sp. n. ♂**

47(45) Flagellum more or less darkened, mesonotum with 0-2 (very rarely 4) yellow spots; area between ocelli and eyes rugose, mesonotum rugose (cf. *cephalotes*) 44

— Either flagellum (whole antenna) yellow, or sculpture not so strong; mesonotum with 4 (rarely 2) yellow spots 48

48(47) Area between eyes and ocelli rugose; mesonotum closely punctate, usually without distinct smooth areas; about 12 mm 49

— Area between eyes and ocelli punctate with shiny interspaces; mesonotum often with small smooth areas; usually somewhat smaller, about 10-12 mm 50

49(48) Yellow spot on mesepisternum enlarged downwards; propleura and hind coxae with yellow spots. Perhaps only a pale local form of *cephalotes* from Spain. ♀ cf. couplet 23.

***Megalodontes mundus* KONOW, 1904 ♂**

— Yellow spot on mesepisternum small, not enlarged downwards; propleura and hind coxae black. Perhaps only a larger local form of *panzeri* from SE Europe. ♀ cf. couplet 23.

***Megalodontes laticeps* KONOW, 1897 ♂**

50(48) Femora of front and middle legs mainly yellow, at most the basal quarter black; longest flabelli about as long as the following 3 antennomeres together (cf. *medius*) 42

— Femora of front and middle legs behind at least black in the basal half; longest flabelli about as long as the following 1.5-2 antennomeres together 51

51(50) Scape at least partly black, tegula usually black or with yellow margin on inner or outer side (cf. *plagiocephalus* and *thor*) 46

— Antenna and tegula yellow. ♀ cf. couplet 25. ***Megalodontes panzeri* (LEACH, 1817) ♂**

Remarks on some species

***Megalodontes eversmanni* (FREYMUTH, 1870)**

= *Tarpa loewii* STEIN, 1876, **syn. nov.**

TAEGER (1998) treated *Megalodontes loewii* (STEIN, 1876) with some doubt as valid species. The material examined (87 specimens) makes it likely that the characters given by TAEGER fall into the range of *M. eversmanni* (FREYMUTH, 1870). The European specimens, especially the males, are usually paler (*"loewii"*) than the typical specimens of *eversmanni* from the Caucasus region.

***Megalodontes mocsaryi* (ED. ANDRÉ, 1881), sp. rev.**

M. mocsaryi (ED. ANDRÉ, 1881) is considered to be a valid species, and no longer as a form of *M. flabellicornis* (GERMAR, 1825). About 50 specimens of *mocsaryi* and 100 specimens of *flabellicornis* were examined. Though there is an overlapping variability of the characters given in the key, the different distribution is an additional indication for the validity of both taxa. In Greece (Pelopónnisos: Zachlorou) the species were sympatric. Apart from the characters given in the key, the longest flabelli of *M. flabellicornis* are usually longer than the following 4 antennomeres (up to 5 antennomeres), whereas the longest flabelli in *M. mocsaryi* are usually somewhat shorter than the following 4 antennomeres.

***Megalodontes plagiocephalus* (FABRICIUS, 1804)**

= *Tarpa flabellata* EVERSMANN, 1847, **syn. nov.**

= *Megalodontes xanthocerus* GUSSAKOVSKIJ, 1935, **syn. nov.**

As pointed out in the key above, *flabellata* and *xanthocerus* belong most likely to *plagiocephalus* and represent more or less regional forms of this species. This conclusion is based on the examination of about 900 specimens of *plagiocephalus* (as defined here in the key). The species is distinguished from *M. cephalotes* and *M. thor* by the complex of characters given in the key. *M. plagiocephalus* has been confused in the past mainly with *M. thor* (compare below). It should be noted that the average length of the flabelli seem to be slightly different in the various forms. The more or less vicarious distribution of the forms and the overlapping variability of the characters make it likely that the forms belong to the same species, at most forming subspecies. The host plants are to be confirmed, as the data may be confused with *M. thor*.

Megalodontes thor **sp. n.**

Description: ♀. 9–12 mm; antenna with 15–17 antennomeres; flabellum of 3rd antennomere about as long as antennomere 4, longest flabelli about as long as the following 1.5 antennomeres, sometimes somewhat longer; apical 2–3 antennomeres without distinct flabelli; face densely punctate; upper head less densely punctate, with some smooth areas; mesonotum densely punctate, areas between punctures usually not larger than the diameter of the punctures.

Black with yellow pattern. Antenna usually reddish, with darkened flabelli; mandibles black, apically brown; face in the middle with yellow spot, inner orbits yellow in the middle; upper head with yellow stripes reaching from the middle of outer orbits to the hind corners of vertex; vertex black or with more or less yellow marked hind margin; pronotum with yellow upper margin, which is usually only slightly broader than the diameter of the ocelli; tegulae black or with yellow outer margin, exceptionally mainly yellow; mesonotum black or with 2 yellow spots on hind lateral lobes, rarely praescutum with yellow markings; upper corner of mesepisternum yellow spotted; coxae and trochanters black; femora of front legs mainly black, apically yellow and/or reddish; femora of middle legs similar, but somewhat less black; hind femora reddish, at most slightly darkened basally; tibiae yellow, more or less reddish towards the apex, tarsi reddish; usually terga 1–2 black and tergum 3 yellow spotted laterally, terga 4–9 yellow apically, the yellow colour usually slightly broader laterally; yellow hind margin of tergum 4 rather broad, covering about the half tergum, margins of terga 5–7 clearly narrower than on tergum 4, and margin of tergum 7 somewhat narrower than margins on tergum 5–6 (cf. fig. 9); tergum 8 mainly yellow, tergum 9 with narrow yellow hind margin; hind margins of sterna 5–6 usually spotted yellow laterally, exceptionally with continuous yellow hind margin. ♂ similar to ♀; scape and pedicel mainly black; mandibles often more or less yellow on outer side; terga 4 and 8 largely yellow; terga 2 and 3 usually spotted laterally, terga 5–7 with more or less dissolved yellow hind margin, tergum 7 usually yellow laterally and in the middle, terga 5–6 often yellow only laterally; subgenital plate more or less yellow apically; wings yellowish, fore wing anteriorly darkened, veins more or less brown, pterostigma darkened in the middle.

Material examined: 210 ♂♂, 313 ♀♀. Holotype, ♀: Germany, Bavaria: "TK 7341 Dingolfing Ost. rechts 4542640 hoch 5391690. 14.6.2001 leg. A. Liston. NSG Rosenau. Lkr. Dingolfing, Niederbayern, BRD" in coll. Deutsches Entomologisches Institut, Eberswalde, Germany. Paratypes from several places (C, SE and E Europe: Austria, Bulgaria, Croatia, Czech Republic, SE France, S Germany, Hungary, N Italy, Poland, Romania, W Russia, Slovakia, Slovenia, Switzerland, Ukraine; NW Kazakhstan: Janvarcevo, Uralsk) from the following collections: Museum für Naturkunde der Humboldt-Universität, Berlin, Germany (Frank Koch); Stephan M. Blank Collection, Eberswalde, Germany; Hungarian Natural History Museum, Budapest, Hungary (Lajos Zombori); Zoological Museum, University of Copenhagen, Copenhagen, Denmark (Roy Danielsson); Deutsches Entomologisches Institut, Eberswalde, Germany; Museo Civico di Storia Naturale, Ferrara, Italy (Fausto Pesarini); Zoologie Generale et Appliquée, Gembloux, Belgium (Raymond Wahis); Museo Civico di Storia Naturale "Giacomo Doria", Genova, Italy (Valter Raineri); Martin Hauser Collection, Urbana/Ill., USA; University of Helsinki, Zoological Museum, Helsinki, Finland (Matti Viitasaari); Ewald Jansen Collection, Leipzig, Germany; Staatliches Museum für Naturkunde Karlsruhe, Karlsruhe, Germany (Paul Westrich); Manfred Kraus Collection, Nürnberg, Germany; Nationaal Natuurhistorisch Museum, Leiden,

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Etymology: The specific name is a noun, derived from the name of the Germanic deity Thor.

Biology: A. D. LISTON and J. SPÄTH observed at the type locality the oviposition on *Peucedanum oreoselinum*. It is likely that some host plant records of *M. plagiocephalus* (and *M. cephalotes* ?) really refer to *M. thor*. A detailed description of the biology of the new species will be given elsewhere.

Discussion: This species has been mixed in the past mainly with *M. plagiocephalus* (about 900 specimens examined) and *M. cephalotes* (about 1300 specimens examined). It caused most likely most of the confusion of Central European species of the *cephalotes* complex. Morphologically, *M. panzeri* (about 350 specimens examined) is similar to *M. thor*, too. The distinctly different colour pattern will avoid a confusion of these two species.

According to the labels, the species can be found at the same places, in some cases two of the mentioned species were collected on the same day. The question, if the species occur exactly on the same sites has to be left open. Rather long mixed series of *M. thor* and *M. plagiocephalus* from Stúrovo and Vienna (Bisamberg) make this very likely. As pointed out in the key, *M. cephalotes* usually is to be found at higher altitudes than *plagiocephalus* and *thor*.

List of the European Megalodontesidae

***Megalodontes* Latreille, 1803**
Tarpa Fabricius, 1804
Tristactus Konow, 1897
Melanopus Konow, 1897
Megalodontes (*Rhipidioceros*) Konow, 1897
Megalodontes (*Forficulotarpa*) Pic, 1918
Tristactoides Chevin, 1985

***Megalodontes bucephalus* (Klug, 1824)**
Tarpa bucephala Klug, 1824
Tarpa hispanica Spinola, 1843

***Megalodontes capitalatus* Konow, 1904**

***Megalodontes cephalotes* (Fabricius, 1781)**
Tenthredo cephalotes Fabricius, 1781
Tarpa klugii Leach, 1817
Tarpa spissicornis Klug, 1824

***Megalodontes dusmeti* Enslin, 1914**

~~***Megalodontes escalerai* Konow, 1899***~~

***Megalodontes eversmanni* (Freymuth, 1870)**
Tarpa eversmanni Freymuth, 1870
Tarpa loewii Stein, 1876
Tarpa (*Megalodontes*) *multicincta* Mocsáry, 1891

***Megalodontes fabricii* (Leach, 1817)**
Tarpa fabricii Leach, 1817
Tarpa megacephala Klug, 1824

***Megalodontes flabellicornis* (Germar, 1825)**
Tarpa flabellicornis Germar, 1825
Tarpa coronata Zaddach, 1866
Tarpa exornata Zaddach, 1866
Tarpa albicincta Stein, 1876
Tarpa speciosa Mocsáry, 1877

***Megalodontes flavicornis* (Klug, 1824)**
Tarpa flavicornis Klug, 1824

***Megalodontes gratiosus* (Mocsáry, 1881)**
Tarpa gratiosa Mocsáry, 1881
Megalodontes castiliensis Enslin, 1914

***Megalodontes krausi* Taeger, 1998**

***Megalodontes laticeps* Konow, 1897**

***Megalodontes medius* Konow, 1897**

***Megalodontes merceti* Konow, 1904**

***Megalodontes mocsaryi* (Ed. André, 1881)**
Tarpa mocsaryi André, 1881
Megalodontes (*Tarpa*) *anatolicus* Mocsáry, 1883

***Megalodontes mundus* Konow, 1904**

***Megalodontes panzeri* (Leach, 1817)**
Tarpa panzeri Leach, 1817
Megalodontes cephalotes auct.

***Megalodontes phaenicius* (Lepeletier, 1823)**
Tarpa phaenicia Lepeletier, 1823
Tarpa caucasica Ed. André, 1882
Megalodontes imperialis Konow, 1897
Megalodontes kohli Konow, 1897
Megalodontes phoenicius err.

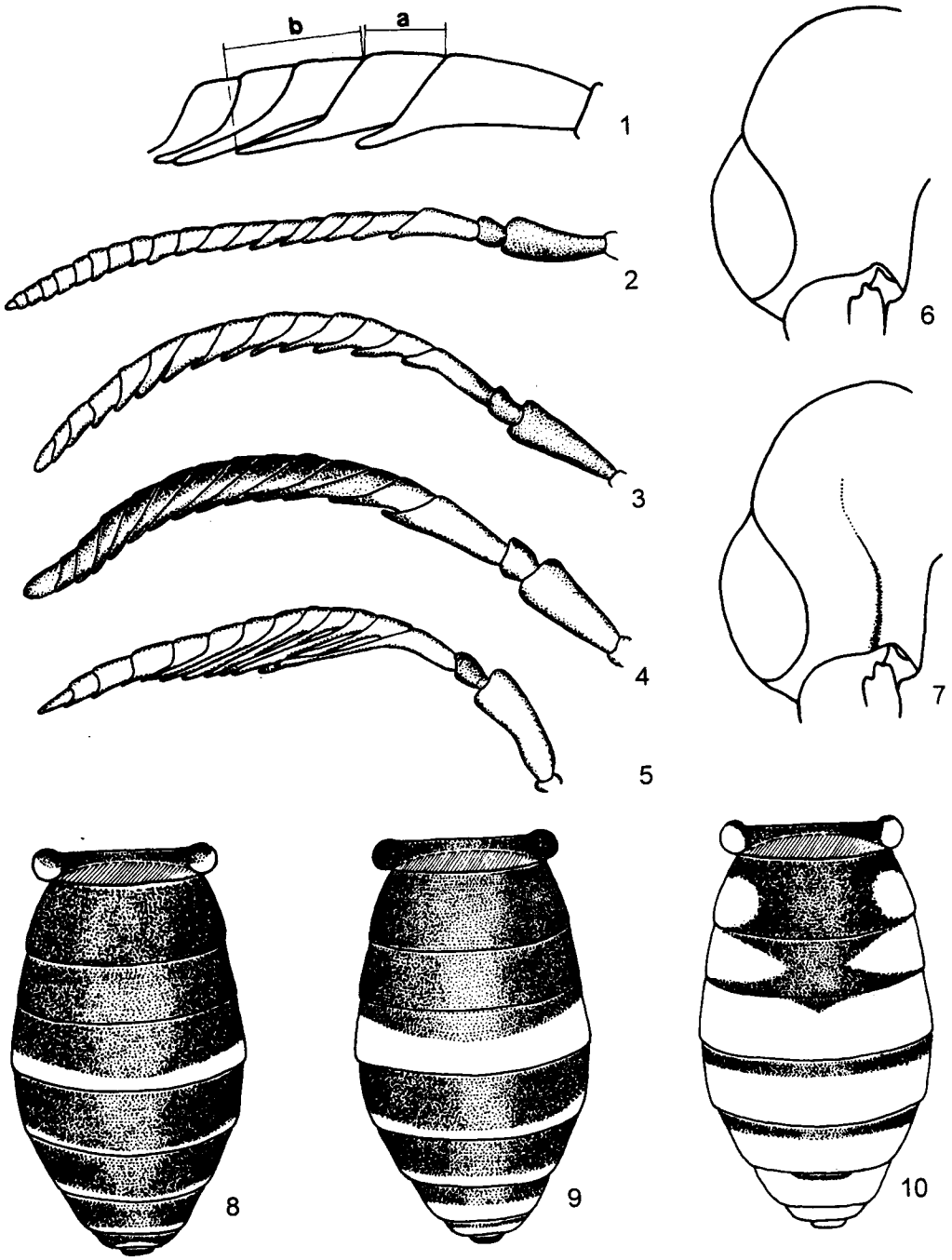
***Megalodontes plagiocephalus* (Fabricius, 1804)**
Tarpa plagiocephala Fabricius, 1804
Tarpa flabellata Eversmann, 1847
Megalodontes aquilus Konow, 1902
Megalodontes nigritegulis Konow, 1904
Megalodontes xanthocerus Gussakovskij, 1935

***Megalodontes scythicus* Zhelochovtsev, 1988**
Megalodontes eversmanni Gussakovskij, 1935

***Megalodontes spiraeae* (Klug, 1824)**
Tarpa spiraeae Klug, 1824
Tarpa pectinicornis Klug, 1824
Tarpa ruthena Jakovlev, 1888
Tarpa borealis Jakovlev, 1891
Megalodontes (*Rhipidioceros*) *siberiensis* Rohwer, 1925
Megalodontes coreensis Takeuchi, 1927

***Megalodontes thor* sp. n.**

***Megalodontes turcicus* (Mocsáry, 1881)**
Tarpa turcica Mocsáry, 1881
Tarpa orientalis Mocsáry, 1881
Megalodontes pectinicornis auct.



Figs. 1–10. *Megalodontes*. **Fig. 1.** Basal part of antennal flagellum. a. Measuring the length of flagellomere. b. Measuring the relative length of flabelli in relation to the number of flagellomeres. **Figs. 2–5.** Antennae. 2. M. fabricii. 3. *M. plagiocephalus*. 4. *M. cephalotes*. 5. *M. krausi*. **Figs. 6–7** Left gena. 6. Gena carinate. 7. Gena not carinate. **Figs. 8–10.** Schematic colour pattern of female abdomen. 8. *M. cephalotes*. 9. *M. plagiocephalus*. 10. *M. mundus*.

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