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Revision of the *Rhamphomyia* (*Megacyttarus*) *poissoni*-group (Diptera, Empididae), including the description of two new species

[Revision der *Rhamphomyia* (*Megacyttarus*) *poissoni*-Gruppe (Diptera, Empididae) nebst der Beschreibung von zwei neuen Arten]

by
Miroslav BARTÁK

Prague (Czech Republic)

With compliments and great thanks to Andrey from Miroslav

Abstract A revison of the Palaearctic *Rhamphomyia* (*Megacyttarus*) *poissoni*-group is given. ***Rhamphomyia* (*Megacyttarus*) *kovalevi* spec. nov.** and ***Rhamphomyia* (*Megacyttarus*) *tuberifemur* spec. nov.** are described. All three species of this group are keyed and illustrated. A key to world groups of the subgenus is provided.

Key words Diptera, Empididae, *Rhamphomyia*, *Megacyttarus poissoni*-group, Palaearctic region, new species, descriptions, redescription, key, distribution.

Zusammenfassung Die Arten der paläarktischen *Rhamphomyia* (*Megacyttarus*) *poissoni*-Gruppe werden einer Revision unterzogen. Es erfolgt die Beschreibung von ***Rhamphomyia* (*Megacyttarus*) *kovalevi* spec. nov.** und ***Rhamphomyia* (*Megacyttarus*) *tuberifemur* spec. nov.** Alle drei Arten der Gruppe werden in einem Bestimmungsschlüssel charakterisiert und abgebildet. Ein Schlüssel zu den Gruppen der Untergattung *Megacyttarus* der Weltfauna ergänzt die Arbeit.

Stichwörter Diptera, Empididae, *Rhamphomyia*, *Megacyttarus poissoni*-Gruppe, paläarktische Region, neue Arten, Beschreibungen, Nachbeschreibung, Bestimmungsschlüssel, Verbreitung

Introduction

Megacyttarus is a large subgenus of *Rhamphomyia* with Holarctic distribution. The subgenus may be separated from all other known species of the *Rhamphomyia* s. l. by absence of (at least ventral part) of vertical plate of ejaculatory apodeme (Fig. 4c–f) and trilobate dorsal genital lamella (Figs. 1c, 2a, 3c). Moreover, vein R1 is swollen in apical part (Fig. 4b). BARTÁK (2001) recognised altogether 92 world species, out of them 66 Nearctic [all described or redesribed by BARTÁK (2002)], 24 Palaearctic (20 of them described, two additional described herewith) and 2 Holarctic (both described). The present paper represents continuation of the revision of Nearctic *Rhamphomyia* (*Megacyttarus*) (BARTÁK 2002), covering fauna of the *Rhamphomyia* (*Megacyttarus*) *poissoni*-group. The complete knowledge on biology and morphology of the subgenus was gathered by BARTÁK (2002). In the paper he recognised altogether 5 groups of species (*R. scaurissima*-group, *R. crassirostris*-group, *R. poissoni*-group, *R. praecipua*-group, and *R. argentea*-group) based on characters of male terminalia and arrangement of dorsocentral bristles. *R. poissoni*-group is allied to *R. crassirostris*-group, both having multiserial dorsocentral bristles, male pregenital segments unmodified, cranial process of dorsal genital lamella present, basal swelling of phallus absent, hypopygium "opened", and "hood" of dorsal genital lamella absent. However, they markedly differ in the shape of phallus which has two outgoing loops in species of *R. crassirostris*-group, which are absent in species of *R. poissoni*-group (Figs 1d, 2d, 3a), in the presence of dorsal pat of vertical plate of ejaculatory apodeme in *R. poissoni*-group (Fig. 4d) which is totally absent in all other *Megacytta-*

Systematic treatment

Rhamphomyia (*Megacyttarus*) *poissoni*-group

Diagnosis (A = apomorphic feature, P = plesiomorphic, inside *Megacyttarus*)

1. Dorsocentral bristles multiserial (P)
2. Male pregenital segments unmodified (P)
3. Cranial process of dorsal genital lamella present (A)
4. Basal swelling of phallus absent (A)
5. Hypopygium "opened" (P)
6. "Hood" of dorsal genital lamella absent (A)
7. Phallus without outgoing loops in apical part (P)
8. Hind margin of the 8th sternite straight (P)
9. The tip of hypandrium membranose and depigmented (A)
10. Middle lobe of dorsal genital lamella with concave upper margin
11. Vertical plate of ejaculatory apodeme present in the form of short dorsal outgrowth of horizontal plate
12. West palaearctic distribution

Anagenetic trends in characters 10–12 are unclear. Character of vertical plate of ejaculatory apodeme seems to be different from other groups of main *Rhamphomyia* tree and, thus derived. However, it may represent remnants of original lamella and further studies are necessary to elucidate the problem. Characters 1–6 are common with species of the most allied *R. crassirostris*-group.

Rhamphomyia (*Megacyttarus*) *kovalevi* spec. nov.

(Fig. 1a–d)

Male. Head: Eyes dichoptic, facets in the upper part of eye much smaller than lower ones. Frons velvety brownish black, 0.06 mm broad above and 0.08 mm below, being 3.6 times as long as broad, bearing 4–5 black hairs on each side which are much longer than frons is broad. Ocellar bristes slightly longer than frons, black, and ocellar triangle with 2 additional hairs. Face brownish black, dark grey pruinose, 0.04 mm broad at midlength, being almost parallel sided and about 8 times as long as broad, bare. Occiput brownish black, dark grey pruinose, sparsely black bristled (bristles arranged almost in two rows), postocular row complete. Antennae black, both basal segments brown, ratio of antennal segments = 13: 10: 24: 4. Labrum brown, polished, shorter than head is high. Palpi brown, short, covered with a few rather long hairs.

Thorax dark brownish black, grey pruinose, mesonotum almost velvety brownish black, without any stripes. All bristles and hairs are black. Chaetotaxy: 3 hairs on proepisternum, propleura and prosternum bare, 18 biserial, medium thick ac are almost twice as long as the distance between rows of ac and dc, 13–14 dc are irregularly biserial and of the same character and length as ac, ending in 2 prescutellars, 1 long and strong h (and 5–6 much shorter hairs), 1 ih, 1 ph (1–4 hairs around ph), 3–4 n (3–5 hairs in front part of notopleura), 2–3 sa (2–3 pra hairs), 1 pa, 4 sc, mtpl dark. **Legs** including coxae brown, pruinose, dark haired and bristled. A very short and fine bristle present in "comb" at tip of hind tibia. Front femur with sparse av and pv ciliation half as long as vertical diameter of femur, dorsal ciliation rather dense and equally short. Front tibia with almost homogeneous pd ciliation as long as diameter of tibia, ventral hairs short. Middle femur with complete rows of about 10 av and 15 pv bristles which are slightly longer than vertical diameter of femur (the longest are av in apical third of femur). Middle tibia with a single subbasal pv, other cilation short and fine (up to as long as diameter of tibia), without bristles. Hind femur (Fig. 1a) with a complete row of av bristles which are slightly longer than vertical diameter of femur and with only slightly shorter ad and d bristles, pv much shorter. Hind tibia (Fig. 1a) with a single row of dorsal subequally spread bristles, 7–9 of them are nearly twice a long as diameter

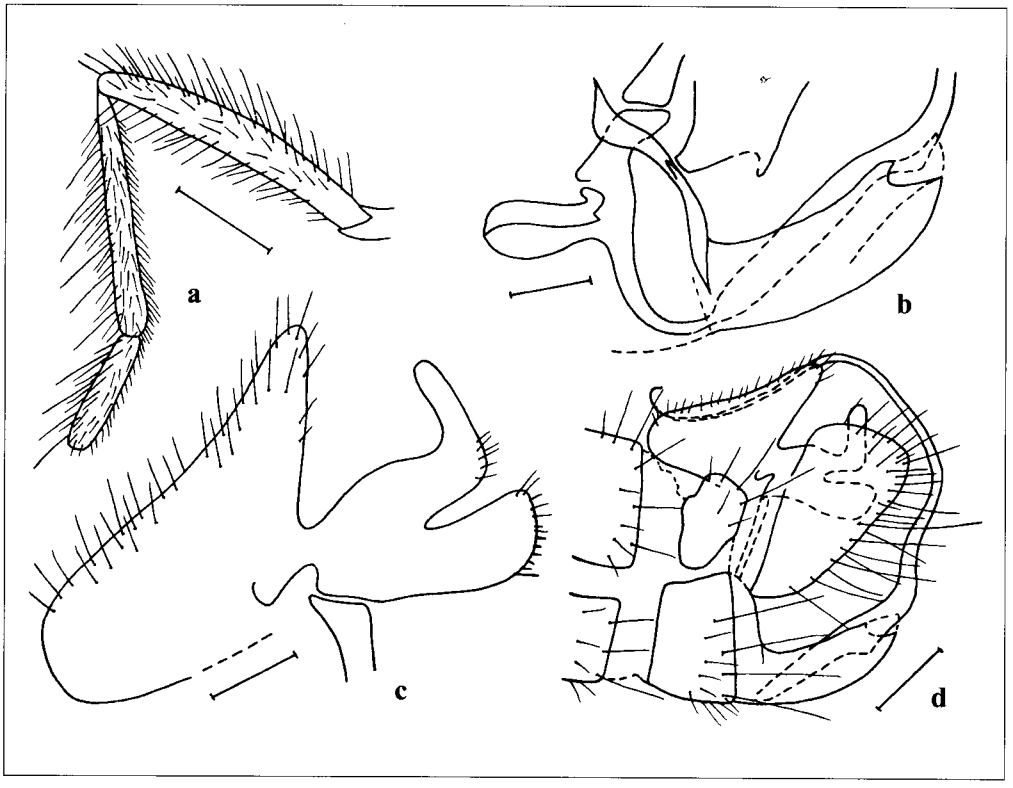

Fig. 1a–d: *Rhamphomyia* (*Megacyttarus*) *kovalevi* spec. nov. (Holotype). – **a**: Hind leg (femur, tibia and basitarsus), anterior view. – **b**: Hypandrium and phallobase. – **c**: Dorsal genital lamella. – **d**: Hypopygium, macerated, lateral view. Scale bars: a = 0.5 mm; b, c = 0.1 mm; d = 0.2 mm.

of tibia, ventral ciliation subequally long as diameter of tibia. Basitarsus of front leg thin and short haired, T1: Mt1 = 2.0, Mt1: Mt1 = 9.0. Basitarsus of middle leg thin and short haired, T2: Mt2 = 2.3, Mt2: Mt2 = 8.0. Basitarsus of hind leg (Fig. 1a) thin, with a few dorsal hairs which are twice as long as diameter of basitarsus, T3: Mt3 = 2.0, Mt3: Mt3 = 7.5. **Wings** clear, stigma hyaline, veins pale brown, vein A absent in apical part. Costal bristle long, ax angle 90°. M2/D = 1.4, M3/Db = 3.4. Halter brown, squama brown with dark fringes.

Abdomen brown, pruinose, tergites 3–6 conspicuously light, being almost silvery (but sparsely) pruinose. Bristles and hairs exclusively dark. Hind marginal bristles on sides of tergites are 2/3 as long as segments, dorsum of tergites short haired (hind marginals about 1/3 as long as segments). Discal hairs shorter than marginals. Terminalia as in Fig. 1b–d.

Length of body 3.7 mm, wing 3.5 mm.

Female. Unknown.

Differential diagnosis: *Rhamphomyia* (*Megacyttarus*) *kovalevi* spec. nov. differs from both remaining species of this group by a number of characters. Beside those given in the key: hind tibia is straight, halter brown, hind femur has no protuberance posteriorly, mesonotum dark, almost velvety brownish black, hind femur with both dorsal and ventral bristles which are at least as long as vertical diameter of femur and midle femur without long pv. There are slight differences in the shape of male genitalia between the above described species and both other species of this group: phallus has no fold preapically, it is only upcurved at extreme tip and cranial process of dorsal genital lamella has short and broad hind margin and straight lower margin (whereas both other species have narrow hind margin and lower

margin distinctly convex) – see Figs 1c, 2a, 3c. Moreover, wholly black haired body it is a rare exception among Palaearctic *Megacyttarus*. This character occurs only in Japanese *R. brevicellula* SAIGUSA. The species described above seems to be the most primitive member of *R. poissoni*-group according to plesiomorphic character of leg chaetotaxy and absence of protuberance on hind femur.

Material. Holotype male: RUSSIA, Krasnodarskij kraj, okr. (= district) Severskoj, Ubinskaja, 12.v.1970, leg. V. KOVALEV, deposited in ZMUM. – No further specimens avaiable.

Distribution: Russia, West Caucasus.

Dates of occurence: May.

Derivatio nominis: The species is dedicated to the collector of the Holotype, the late famous Russian dipterist, Valeri G. KOVALEV.

Rhamphomyia (*Megacyttarus*) *poissoni* (TREHEN, 1966)

(Fig. 2a–e)

Rhamphomyia tephraea auct., not MEIGEN, 1822.
Megacyttarus poissoni (TREHEN, 1966): Annls. Soc. ent. Fr. (N.S.), **2**(3): 627 (*Megacyttarus*)

Male. Head: Eyes dichoptic, facets in the upper part of eye smaller than lower ones. Frons black to brownish black, very light grey pruinose, 0.10–0.14 mm broad above and 0.10–0.12 mm below, being 1.8–2.5 times as long as broad, bearing 3–8 black hairs on each side which are longer than frons is broad. Ocellar bristes slightly longer than frons, black, and ocellar triangle with 2–6 additional hairs. Face black to brownish black, very light grey pruinose, 0.13–0.14 mm broad at midlength, broadening below, being 1.8–2.5 times as long as broad, bare. Occiput black, light grey pruinose, sparsely black bristled, in lowermost part with a few pale hairs, postocular row nearly complete. Antennae black, both basal segments brown, ratio of antennal segments = 15–19: 9–10: 28–34: 8. Labrum brown, polished, as long as or shorter than head is high. Palpi brown, short, covered with a few dark hairs, preapical bristle sometimes prominent.

Thorax black, light grey pruinose, mesonotum with two brown stripes between ac and dc bristles and two brown stripes to spots outside of dc. Large bristles and hairs are black, small hairs incl. mtpl pale. Chaetotaxy: 1–9 pale hairs on proepisternum, propleura and prosternum bare, 13–26 biserial, fine ac are slightly shorter than the distance between rows of ac and dc, 14–24 dc are irregularly biserial, medium thick and as long as or slightly longer than the distance between rows of ac and dc, ending in 2 prescutellars, 1 long black h (and several much shorter pale hairs), 1 ih, 1 ph (1–4 hairs between ih and ph), 2 n (a few pale hairs in front part of notopleura), 2–3 sa (1–3 pra hairs), 1 pa, 2 sc (usually with 2–4 additional short hairs), mtpl pale. **Legs**: Coxae brownish black, light grey pruinose, mostly pale haired, larger hairs may be dark. Legs brown, pruinose, middle femur and sometimes hind femur anteriorly, hind tarsus on both sides and hind femur posteriorly partly subpolished. Legs both dark and pale haired and bristled, proximal parts of legs mostly dark haired. A very short bristle present in "comb" at tip of hind tibia. Front femur with sparse av and pv ciliation 1/3 as long as vertical diameter of femur, dorsal ciliation more dense and equally short. Front tibia with heterogeneous pd ciliation, the longest bristles are slightly longer than diameter of tibia, and with several ventral (or pv) bristles as long as vertical diameter of tibia. Middle femur with short and irregularly arranged av hairs half as long as vertical diameter of femur, 2–3 long pv are more twhan twice as long as vertical diameter of femur (intermixed with short hairs between them), dorsal ciliation very short. Middle tibia with a single long subbasal pv, other cilation short and fine (up to as long as diameter of tibia), rarely with several bristles (subbasal pd etc.) shorter than diameter of tibia. Hind femur (Fig. 2b) with short and fine av and pv hairs which are slightly shorter than vertical diameter of femur. Hind tibia (Fig. 2b) slightly curved, bearing a single long subbasal pv (twice as long as diameter of tibia), with a row of av bristles in apical third which are as long as diameter of tibia, and with 0–2 ad and 2–4 pd bristles which are at most 1.5 times as long as diameter of tibia, longer ad and pd situated mostly in apical part of tibia. Basitarsus of front leg slightly swollen and short haired, T1: Mt1 = 1.7–2.0, Mt1: Mt1 = 3.6–4.3. Basitarsus of middle leg thin, bearing 2–4 pd bristles which are 2–3 times as long as diameter of basitarsus, T2: Mt2 = 2.1–2.5, Mt2: Mt2 = 4.5–5.2. Basitarsus of hind leg (Fig. 2b) thin, with an irregular row of av bristles which are about three

as in male. Legs brown, pruinose, mostly dark haired and bristled, proximal parts with some pale hairs intermixed. Both front and middle femora short haired. Front tibia with several pd and pv and a subbasal v bristle(s) which are up to as long as diameter of tibia. Middle tibia with 0–3 ad, av, pd and pv bristles which are up to as long as diameter of tibia. Hind femur somewhat arched dorsally, short haired. Hind tibia short haired, without any bristles, or with several badly detectable short pd. Basitarsi of all legs thin and short haired, front and midle ones with distinct relativelly long ventral spines. T1: Mt1 = 2.0–2.3, Mt1: Mt1 = 4.2–5.0, T2: Mt2 = 1.9–2.0, Mt2: Mt2 = 5.6–5.8, T3: Mt3 = 1.5–1.7, Mt3: Mt3 = 7.8–9.2. **Wing** (Fig. 2e) similar to male, M2/D = 1.1–1.3, M3/Db = 1.3–2.0.
Abdomen brown, tergites 2–5 silvery, corresponding sternites light grey pruinose, the rest of abdomen grey pruinose. Discal hairs on sides of tergites 4–5 sparse and short (about 0.06 mm).
Length of body 4.5–6.5 mm, wing 4.4–5.5 mm.

Discussion: The species was briefly redescribed (as *tephraea*) by FREY (1954–56: 510, however, with a mistake "Vordermetatarsus ... oben mit 3–4 starken und sehr langen Borsten" – FREY described in fact basitarsus of midle leg) and BARTÁK (1982: 437). Illustration of male terminalia provided BARTÁK (1982, Fig. 13d) and TREHEN (1966). COLLIN (1961: 411) stated that the type of *R. tephraea* MEIGEN represents in fact probably *R. laevipes* (FALLÉN, 1816). The same synonymy was confirmed by BARTÁK (1989). The same author (BARTÁK 1982: 437) synonymised „*R. tephraea*: auct." with *R. poissoni* TREHEN. Because no younger name exists (all authors treated the species described above as *R. tephraea*), it should be named *R. poissoni* in spite of the fact that the species was described rather by mistake (TREHEN considered *R. tephraea* to be a separate species of *Megacyttarus* and fixed differences between both "species" on the base of rather inadequate illustration by FREY (l.c.) – Fig. 393, where for example hypandrium is hairy and one hair is present even on base of phallus!). *R. poissoni* may be differentiated from both other species of the group according to the key. Beside characters given in the key, middle lobe of dorsal genital lamella is only moderately bent and very narrow, whereas almost right angled bent and distinctly broader in both remaining species of this group (compare Fig. 2a). The female differs from al other Palaearctic *Rhamphomyia* by the following combination of characters: ac bristles biserial, legs brown (not yellow), anal vein incomplete, dc bristles multiserial, ax angle never sharply acute, prosternum bare, body partly pale haired, mesonotum with dark stripes between rows of bristles, cell D short, wing clear without dark spots (contrary to *R. maculipennis* ZETTERSTEDT, 1842), hind femur short haired ventrally (contrary to *R. fulvolanata* FREY, 1922), face bare (contrary to *R. brevicellula* SAIGUSA, 1964). However, females of both other species of this group remain unknown.

Material examined (beside records published by BARTÁK (1982, 1998) and BARTÁK et al. (1997), from Germany, Italy, Switzerland, Czech and Slovak Republics): CZECH REPUBLIC (Sepekov, Jistebnice, Vráž nr. Písek, Dobříš, Horní Lomná, Sázava, Mukařov, Jistebnice), SLOVAK REPUBLIC (Nová Sedlica, Stakín, Volárenský potok), FRANCE (Montagne d. Lure, Sr. Front), HUNGARY (Misina – Mecsek), AUSTRIA (Styria – Hengstpass, Oberlaussa, Unterlaussa), 125 ex (PCMB, CUP) on dates ranging from 15.v. (SWITZERLAND: Delémont) – 15.vii. (CZECH REPUBLIC, Bohemia mer., Sepekov nr. Smutná river), CEIANU (1992) recorded even 20.vii.

Distribution: Temperate Europe ranging in West-East direction from France to Romania (CEIANU 1992) and from northernmost record in south Finland to North Italy and southern France. The species seems to be common along brooks flowing through forests or meadows with well developed tree vegetation corridor.

Dates of occurrence: May–June.

Rhamphomyia (*Megacyttarus*) *tuberifemur* spec. nov.

(Fig. 3a–d)

Male. Head: Eyes dichoptic, facets in the upper part of eye smaller than lower ones. Frons brownish black, light grey pruinose, 0.14 mm broad above and 0.13 mm below, being 1.5 times as long as broad, bearing 4 black hairs on each side which are longer than frons is broad. Ocellar bristes much longer than frons, black, and ocellar triangle with 2–4 additional hairs. Face brownish black, light grey pruinose, 0.15 (? slightly collapsed) mm broad at midlength, broadening below, being almost twice as long as broad, bare. Occiput black, light grey pruinose, sparsely black bristled in upper part (bristles arranged almost in two rows), in lower third with pale hairs, postocular row nearly complete. Antennae black, both basal segments brown, ratio of antennal segments = 16: 8: 37: 6. Labrum brown, polished, as long as head is high. Palpi brown, short, covered with a few hairs, preapical bristle slightly prominent.

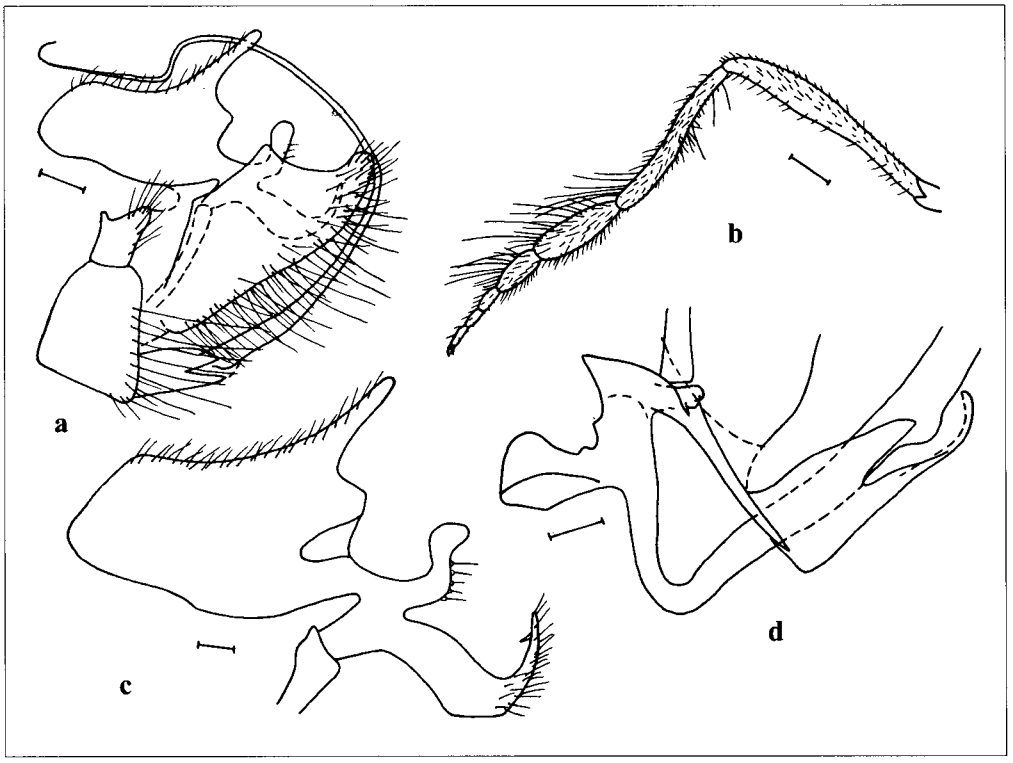

Fig. 3a–d: *Rhamphomyia* (*Megacyttarus*) *tuberifemur* spec. nov. (Holotype). – **a**: Hypopygium, macerated, lateral view. – **b**: Hind leg, anterior view. – **c**: Dorsal genital lamella. – **d**: Hypandrium and phallobase. Scale bars: a = 0.2 mm; b = 0.5 mm; c, d = 0.1 mm.

Thorax brownish black, light grey pruinose, mesonotum with two brown stripes between ac and dc bristles and two brown stripes outside of dc, these brown markings are not very distinct. Large bristles and hairs are black, small hairs incl. mtpl pale. Chaetotaxy: 1–2 pale hairs on proepisternum, propleura and prosternum bare, 16 closely biserial (almost uniserial), fine ac are about as long as the distance between rows of ac and dc, 16–21 dc are irregularly biserial, medium thick and slightly longer than the distance between rows of ac and dc, ending in 2–3 prescutellars, 1 long black h (and several much shorter pale hairs), 1 ih, 1 ph (1–2 hairs between ih and ph), 1 strong and 2 smaller n (a few pale hairs in front part of notopleura), 2–3 sa (3 pra hairs), 1 pa, 2 long and 2 short sc, mtpl pale. **Legs**: Coxae brownish black, light grey pruinose, pale haired. Legs brown, pruinose, basal part of middle femur subpolished anteriorly. Legs pale haired mostly on femora and dark haired on proximal parts. Rather long but fine bristle present in "comb" at tip of hind tibia. Front femur with av ciliation up to 2/3 as long as vertical diameter of femur, pv slightly shorter. Front tibia with pd ciliation shorter than diameter of tibia (except preapical bristles). Middle femur with short and irregularly arranged av hairs half as long as vertical diameter of femur, with a single long subbasal pv and additional 1–2 pv in apical half of femur which are 1–2 times as long as vertical diameter of femur, dorsal ciliation very short. Middle tibia with a single long subbasal pv, other cilation except preapical bristles short and fine (shorter than diameter of tibia). Hind femur (Fig. 3b) conspicuously narrowed in basal part, bearing prominent posterior tubercule slightly beyond middle, fine and sparse av hairs are at most as long as vertical diameter of its narrowed basal portion, dorsal and pv ciliation shorter. Hind tibia (Fig. 3b) distinctly curved, bearing a row of 3–4 pv in basal half of tibia which are up to 1.5 times as long as diameter of tibia, av are rather dense and slightly longer than diameter of tibia at about middle, an irregular row of dorsal bristles in apical 1/4 of tibia consists of about 15 bristles which are about 5 times as long as diameter of tibia.

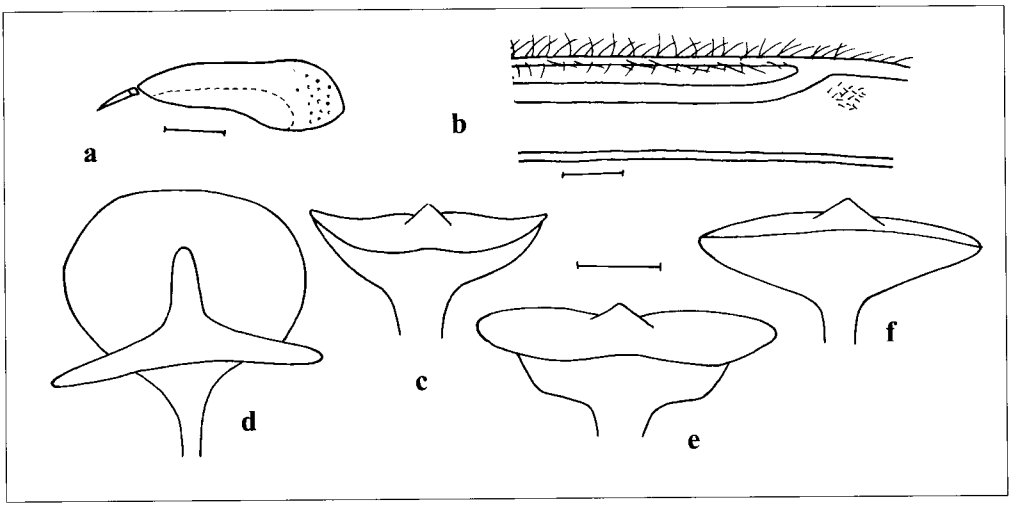

Fig. 4a–f: Differential characters of *Rhamphomyia* (*Megacyttarus*) spp. – **a, b**: *Rhamphomyia* (*Megacyttarus*) *poissoni* TREHEN. – **a**: Antennal flagellum, – **b**: Tip of vein R1 and part of vein R2+3, wing membrane microchaetae illustrated only partly. – **c–f**: Ejaculatory apodeme, cranial view. – **c**: *Rhamphomyia* (*Megacyttarus*) *paradoxa* WAHLBERG, 1844, – **d**: *Rhamphomyia* (*Megacyttarus*) *poissoni* TREHEN; – **e**: *Rhamphomyia* (*Megacyttarus*) *kamtschatica* FREY, 1922; – **f**: *Rhamphomyia* (*Megacyttarus*) *crassirostris* FALLÉN. Scale bars: a–f = 0.1 mm.

Basitarsus of front leg slightly swollen and short haired, T1: Mt1 = 1.8 (?), Mt1: Mt1 = 3.5 (? basitarsi are collapsed on both sides). Basitarsus of middle leg thin and short haired, T2: Mt2 = 2.3, Mt2: Mt2 = 5.8. Basitarsus of hind leg (Fig. 3b) swollen as well as the second joint of hind tarsi, both are covered with long dorsal bristles (which are more than twice as long as their greatest diameter), ventral hairs short, T3: Mt3 = 1.8, Mt3: Mt3 = 3.9. Wings clear, stigma light brown, veins yellowish brown, vein A absent in apical part. Costal bristle present, ax angle 75°. M2/D = 1.5, M3/Db = 1.9. Halter yellow, squama brownish yellow with pale fringes. Abdomen brown, light grey pruinose. Bristles and hairs mostly pale, large hind marginals on dorsum of hind tergites dark. Hind marginal bristles on sides of tergites 2–4 are 2/3 as long as segments, those on the following tergites half as long as segment, dorsum of tergite 2 with short hind marginals, hind marginals on dorsum of tergites 3–5 subequal to those on sides and on tergites 6–7 longer than those on sides. Discal hairs shorter than marginals especially on tergites 4–7. Terminalia as in Fig 3a, c, d. Length of body 4.5 mm, wing 6.5 mm.

Female: Unknown.

Differential diagnosis: *Rhamphomyia* (*Megacyttarus*) *tuberifemur* spec. nov. is closely related to *R. poissoni*. Both species differ most easily in hind leg chaetotaxy as described in the key and illustrated on Figs 2b and 3b. Moreover, brown stripes on mesonotum are much less prominent in *R. tuberifemur* than in *R. poissoni*. Male genitalia differs from both other species of this group by very long and narow tip of ventral lobe of dorsal genital lamella (Fig. 3c).

Material. Holotype male: GEORGIA, Andzharia, okr. (= district) Kobuleti, Kintrishskij zapov., 10.v.1971, leg. V. KOVALEV, deposited in ZMUM. – No further specimens available.

Distribution: Georgia.

Dates of occurence: May.

Derivatio nominis: The name of the species is derived from the prominent posterior tubercule on hind femora.

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