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Palaearctic species of the *Rhaphium caliginosum* group (Diptera, Dolichopodidae)

Палеарктические виды группы *Rhaphium caliginosum* (Diptera, Dolichopodidae)

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Ключевые слова: Rhaphiinae, *Rhaphium*, Палеарктика, новый вид, определитель.

Abstract. A review of 14 species of the *Rhaphium caliginosum* species group in the Palaearctic Region is presented, including *R. makarkini* Grichanov, **sp.n.** from Primorye. Species of the group differs from the other groups in the following combination of characters: hind coxa with a strong black lateral seta; mid coxa usually with black apical setae, often forming spine; femora and tibiae mainly yellow; frons shining blue, without pruinosity; face silvery-white or grey; antenna with band-like postpedicel and rather short arista-like stylus; thoracic notopleuron usually without black spot; cercus simple, non-lobate. A key to species of the group is provided; new records for previously known species are given from Kazakhstan, Russia and Sweden. *R. appendiculatum* Zetterstedt, 1849 is found in Kazakhstan for the first time, as is *R. caliginosum* Meigen, 1824 from Belgorod and Perm oblasts of Russia, and *R. monotrichum* Loew, 1850 from Buryatia and Yamalia.

Резюме. Дан обзор палеарктических видов группы *Rhaphium caliginosum*, которая содержит 14 видов, включая новый для науки *Rhaphium makarkini* Grichanov, **sp.n.** из Приморья. Виды группы отличаются от других групп видов рода следующими признаками: задний тазик с крепкой чёрной щетинкой; средний тазик обычно с чёрными апикальными щетинками и шипом; бёдра и голени в большей части жёлтые; лоб блестящий синий, без опыления; лицо серебристо-белое или серое; усик с лентовидным 3-м члеником и очень короткой аристой; нотоплевры груди обычно без чёрного пятна; церка простая, без лопасти. Приведены определитель и новые указания для известных видов группы из Казахстана, России и Швеции. *Rhaphium appendiculatum* Zetterstedt, 1849 впервые обнаружен в Казахстане. *Rhaphium caliginosum* Meigen, 1824 впервые указан из Белгородской и Пермской областей России, а *Rhaphium monotrichum* Loew, 1850 — из Бурятии и Ямало-Ненецкого автономного округа.

Introduction

The genus *Rhaphium* Meigen, 1803 with about 210 species is known from all zoogeographical regions except Australasia, but being the most numerous in the Palaearctic, numbering there more than 100 species [Grichanov, 2024]. Negrobov [1979] combined the former genera *Porphyrops* Meigen, 1824 and *Xiphandrium* Loew, 1857 with *Rhaphium*, published descriptions and line drawings for the majority of Palaearctic species and compiled an identification key. Since then many new species of this genus were described mainly from eastern part of the Palaearctic Region. Some regional keys were published, including newly described species [Grichanov, 2006, 2007; Negrobov et al., 2012, 2020; Qilemoge et al., 2020]. Unfortunately, the intrageneric composition of *Rhaphium* is yet poorly studied. Negrobov, Grichanov [2010] defined the limits of the *R. crassipes* species group (within former *Porphyrops*), Negrobov et al. [2013] reviewed the *R. albifrons* species group and separated it from the *R. ensicorne* species group (*R. ensicorne* Meigen, 1824 is the type species of the former genus *Xiphandrium*). Here I describe one new species from Primorye found in the collection of Federal Scientific Center of the East Asia Terrestrial Biodiversity, Vladivostok, Russia (FSC Biodiversity) and define the limits of the *R. caliginosum* species group, which comprises 14 Palaearctic species. New records for known species are given and identification key to species of the group is compiled.

Material and methods

The material examined is mounted on pins and will be housed at the Zoological Institute of the Russian Academy of Sciences (ZIN), Saint Petersburg, Russia, and Zoological Museum of Moscow State University, Russia (ZMMU). The holotype has been studied and photographed with a ZEISS Discovery V-12 stereo microscope and an AxioCam MRc5 camera. Genitalia preparation has been photographed with a ZEISS Axiostar stereo microscope and an AxioCam ICc3 camera. Morphological terminology and abbreviations follow Cumming, Wood [2017] and Grichanov, Brooks [2017]. The relative lengths of the antennomeres and podomeres should be regarded as representative ratios and not measurements. Body length is measured from the base of the antenna to the tip of abdominal segment 6. Wing length is measured from the base to the wing apex. The figures showing the hypopygium and its appendages in lateral view are oriented as they appear in the intact specimen, with the morphologically ventral surface of the genitalia

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facing upwards, dorsal surface downwards. The words «Region» (Oblast) and «Territory» (Krai) are omitted from the list of Russian regions.

Nomenclatural acts introduced in the present work are registered in ZooBank (www.zoobank.org) under urn:lsid:zoobank.org:pub:DB07E37B-498A-4425-B5E6-A442A2F3DAA5

Results

Rhaphiinae Bigot, 1852
Rhaphium Meigen, 1803

Type species: *Rhaphium macrocerum* Zetterstedt, 1843, designation by Curtis, 1835 (as *Rhaphium macrocerum* Meigen, 1824, unrecognized) = *Rhaphium monotrichum* Loew, 1850.

RHAPHIUM CALIGINOSUM SPECIES GROUP

Diagnosis. Size 2–3 mm. The *Rhaphium caliginosum* species group is a part of the former genus (or subgenus) *Xiphandrium* Loew, 1857, which includes also the Palaearctic *Rhaphium albifrons* species group and *Rhaphium ensicorne* species group [Negrobov et al., 2013]. It differs from the latter two groups in the following combination of characters: hind coxa with a strong black lateral seta; mid coxa with black apical setae, often forming spine; femora and tibiae mainly yellow; frons shining blue, without pruinosity; face silvery-white or grey; antenna with band-like postpedicel and rather short arista-like stylus; thoracic notopleuron usually without black spot; cercus simple, non-lobate. It is worth noting that *R. beringiense* Negrobov et Vockeroth, 1979 and *R. borisovi* Negrobov, Barkalov et Selivanova, 2012 match characters of *Rhaphium albifrons* species group, but have not been associated with the latter by Negrobov et al. [2013]. The following 14 species are included in the *Rhaphium caliginosum* group.

Rhaphium appendiculatum Zetterstedt, 1849

Rhaphium appendiculatum Zetterstedt, 1849: 3058. Type locality: Sweden: «Scania ad Esperod».

= *Xiphandrium anale* Becker, 1918: Negrobov, 1979: 510. Type locality: «Vallambrosa; von Vemet, Ostpyreneen» (Italy; France).

= *Xiphandrium macrocerum* Parent, 1925: 42 (nec Meigen, 1824, nec Zetterstedt, 1843 (misidentification)): Collin, 1940: 266.

Material. **Kazakhstan,** ***Almaty:*** 1♂ — Malaya Almatinka River, 43.17°N, 77.04°W, h~1450 m a.s.l., 15–21.V.2016, N. Vikhrev leg.; **Russia,** ***Moskovskaya Oblast:*** 1♂ — Podolsk, rail station Vesennyaya, forest edge, 55.393°N, 37.511°W, 17.VI.2020, K. Tomkovich leg.

Distribution. Abkhazia, Afghanistan, Algeria, Austria, Bulgaria, Czech, Denmark, Finland, France, Georgia, Germany, Greece, Hungary, Iran, Ireland, Italy, Morocco, Netherlands, Poland, Romania, Russia (Adygea, Alania, Altai Terr., Crimea, Krasnodar, Krasnoyarsk, Leningrad, Moscow, Pskov, «Ural»), Serbia, Slovakia, Spain, Sweden, Turkey, UK, «Middle Asia»; Afrotropical: St. Helena (?introduced). First record from Kazakhstan.

Rhaphium auctum Loew, 1857

Rhaphium auctum Loew, 1857: 32. Type locality: Poland: Harz, Meseritz.

= *Xiphandrium spinicoxa* Becker, 1910: Becker, 1918: 240, 253. Type locality: France: Bastia, Corsica.

Distribution. Austria, Belgium, Bulgaria, Czech, Denmark, Finland, France, Hungary, Iran, Ireland, Italy, Netherlands, Poland, Romania, Russia (Karelia), Slovakia, Sweden, Switzerland, UK, Ukraine (Ivano-Frankovsk).

Rhaphium caliginosum Meigen, 1824

Rhaphium caliginosum Meigen, 1824: 29. Type locality: not given.

= *Xiphandrium zetterstedti* Parent, 1925: 42 (unnecessary new name for *Rhaphium caliginosum* Zetterstedt, 1843, nec Meigen, 1824 (misidentification)).

Material. **Russia,** ***Voronezhskaya Oblast:*** 1♂ — Liski distr., 15.VII.1994, V. Zlobin leg.; ***Permskaya Oblast:*** 1♂ — Kishert', Sylva River, swampy shore, 27.VII.1997, K. Gorodkov leg.; ***Belgorodskaya Oblast:*** 2♂♂, 1♀ — Borisovka vil., 15–18,VI.2001, D. Kostrov leg.; ***Kurskskaya Oblast:*** 1♂ — Streletskaya Step Nat. Res., 20.VII.2007, N. Vikhrev leg.; ***Krasnodarskii Krai:*** 1♂ — Varenikovskaya env., 45.083° N, 37.586° W, 27.IV.2014, N. Vikhrev leg.; ***Moskovskaya Oblast:*** 1♂ — S Moscow, Shcherbinka, garden, 9–15.VII.2019, K. Tomkovich leg.

Distribution. Algeria, Armenia, Austria, Azerbaijan, Bosnia and Herzegovina, Bulgaria, Denmark, Estonia, Finland, France, Germany, Greece, Israel, Golan Heights, Italy, Kazakhstan, Latvia, Morocco, Netherlands, Norway, Romania, Russia (Adygea, Alania, Kabardino-Balkaria, Kaliningrad, Karachai-Cherkessia, Kherson, Krasnodar, Krasnoyarsk, Kursk, Leningrad, Moscow, Murmansk, Pskov, Rostov, Stavropol, Tatarstan, Voronezh), Serbia, Sweden, Switzerland, Syria, Turkey, UK, Ukraine (Odessa). First records from Belgorod and Perm oblasts.

Remarks. Negrobov et al. [2012] named in error the surstylus as cercus in their key to species of *Rhaphium* (§33). See correct paragraph in the key below (§6).

Rhaphium fasciatum Meigen, 1824

Rhaphium fasciatum Meigen, 1824: 31. Type locality: not given.

Distribution. Austria, Belgium, Czech, Denmark, Estonia, Finland, France, Germany, Ireland, Latvia, Netherlands, Norway, Poland, Romania, Russia (Kabardino-Balkaria, Karachai-Cherkessia, Leningrad, Pskov, «Siberia»), Slovakia, Sweden, Switzerland, UK.

Rhaphium flavilabre Negrobov, 1979

Rhaphium flavilabre Negrobov, 1979: 501. Type locality: Russia: Primorye, Komarovo-Zapovednoe.

Material. **Russia,** ***Primorye:*** 1♂ — Khasan distr., Troitsa Bay, 28.VIII.1984, V. Zlobin leg.; 1♂, 2♀♀ — Ussuri distr., Gornotayozhnoe, 5.IX.1980, V. Zlobin leg.; 1♂ — Khabarovsk, 11.VIII.1991, I. Grichanov leg.

Distribution. Russia (Khabarovsk, Primorye, Sakhalin).

Rhaphium intermedium (Becker, 1918)

Xiphandrium intermedium Becker, 1918: 248. Type locality: Poland: «Rothkirch, Umgebung von Liegnitz, Schlesien».

Distribution. Belgium, Poland, Czech, Russia (Leningrad).

Rhaphium lanceolatum Loew, 1850

Rhaphium lanceolatum Loew, 1850: 131. Type locality: Germany.

= *Rhaphium caliginosum* Parent, 1925: 42 (nec Meigen, 1824 (misidentification)): Collin, 1940: 266.

Distribution. Algeria, Austria, Belgium, Czech, Estonia, Denmark, Finland, Germany, Ireland, Morocco, Norway, Romania, Slovakia, Sweden, Syria, Russia (Arkhangelsk, Baikal, Karachai-Cherkessia, Karelia, Krasnodar, Leningrad, Murmansk, Primorye), UK.

Remarks. Parent [1925] placed *R. lanceolatum* in synonymy to misidentified *R. caliginosum*; the synonymy was refuted by Collin [1940]. Negrobov et al. [2012: Figs 7I-J] figured genitalia of *R. lanceolatum* under the name *R. caliginosum*.

Rhaphium monotrichum Loew, 1850

Rhaphium monotrichum Loew, 1850: 132 (nom. nov. for *Rhaphium macrocerum* Zetterstedt, 1843, nec Meigen, 1824). Type locality:

Sweden: «Sueciam meridionalem et medium; in Scania ad Esperod, Ostrogothia ad Sudercopiam, ad Gusum, ad Walstena, ipsc. Etiam, Gottlandia, ad Holmiam» (automatic).

= *Hydrochus laticornis* Fallén, 1823: 7 (var. b): Negrobov, 1979: 513. Type locality not given.

= *Rhaphium macrocerum* Zetterstedt, 1843: 460 (nec Meigen, 1824 (misidentification)): Negrobov, 1979: 513.

Material. **Russia,** ***Yamalo-Nenetskii Okrug:*** 2♂♂ — Salekhard, 66.66° N, 66.8° W, 16–19.VII.2019, N. Vikhrev leg.; ***Pskovskaya Oblast:*** 2♀♀ — Plyussky distr., Zaplyussye, 58.429° N, 29.739° W, 15.VI.2020, I. Grichanov leg.; ***Buryatia:*** 1♂ —Tunka env., 51.7° N, 102.6° W, 750 m, 7–11.VI.2021, N. Vikhrev leg.; **Sweden,** ***Gårdeby:*** 3♂♂, 1♀ — 24 km S Norrköping, 14.VI.1999, I. Grichanov leg.; 11♂♂, 17♀♀ — 7 km S Uppsala, 16.VI.1999, I. Grichanov leg.; 2♀♀ — Lake Mälaren, 15 km S Enköping, 16.VI.1999, I. Grichanov leg.

Distribution. Austria, Belarus, Belgium, Czech, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Netherlands, Norway, Poland, Romania, Russia («Igarka», Irkutsk, Kabardino-Balkaria, Krasnoyarsk, Leningrad, Mordovia, Moscow, Murmansk, Novgorod, Pskov, Voronezh), Slovakia, Sweden, Switzerland, UK. First records from Buryatia and Yamalia.

Rhaphium neimengense Tang, Wang, Yang, 2016

Rhaphium neimengense Tang, Wang, Yang, 2016: 591. Type locality: China: Inner Mongolia, Daqinggou, Primeval forest.

Distribution. China (Inner Mongolia).

Remarks. The species was separated from *R. flavilabre* Negrobov by two variable characters: the length / width ratio of the postpedicel and the number of the acrostichal setae [Tang et al., 2016]. The antenna of *R. neimengense* on line drawing (Fig. 18) of the authors differs from its antenna on photo (Fig. 6); the latter is identical with the antenna of *R. flavilabre*. Tang et al. [2016: Fig. 19] named the cercus as surstylus and vice versa. The two species names may be synonyms.

Rhaphium quadrispinosum (Strobl, 1898)

Xiphandrium quadrispinosum Strobl, 1898: 218. Type locality: Austria: «Admont».

Distribution. Austria, Belgium, France, Germany, Hungary, Poland, Romania, Switzerland.

Rhaphium qinghaiense Yang, 1998

Rhaphium qinghaiense Yang, 1998a: 182. Type locality: China: Qinghai, Menyuan.

Distribution. China (Qinghai).

Remarks. The species was incorrectly compared with *R. albifrons* Zetterstedt, 1843 [Yang, 1998], being very similar with *R. auctum* as described and figured by Negrobov [1979]. The latter is mainly European species, but once reported from Iran.

Rhaphium umbripenne (Frey, 1915)

Xiphandrium umbripenne Frey, 1915: 44. Type locality: Finland: Tavastehus, Kuopio, Tuovilanlahti, Ilomantsi, Jacobstad, Saraisniemi, Kuusamo, Muonio, Enontekis, Kantalaks, Ponoj, Fl. Voronje; Russia: Kola Peninsula.

Material. **Russia,** ***Khantia-Mansia:*** 1♂ — Cis-Polar Ural, Neroika Mt., swamp, 600 m, VI.1993, A. Malozemov leg.

Distribution. Finland, Norway, Russia (Kamchatka, Karelia, Khantia-Mansia, Komi, Leningrad, Murmansk, Yakutia), Sweden. Nearctic: «North America».

Rhaphium xinjiangense Yang, 1998

Rhaphium xinjiangense Yang, 1998b: 161. Type locality: China: Xinjiang, Jichang and Chaosu.

Distribution. China (Xinjiang).

Remarks. The species was originally compared with rather schematic line drawings of *R. macrocerum* sensu Parent, 1925 (now *R. appendiculatum*) in Negrobov [1979], and was separated by two variable characters: «obliquely acute apically postpedicel and male surstylus with concave apical margin» [Yang, 1998b]. *Rhaphium appendiculatum* is a common western Palaearctic species reaching Russian Altai and south-eastern Kazakhstan (near Chaosu County of Xinjiang Province of China). The two names may be synonyms.

Rhaphium makarkini Grichanov, **sp.n.**

Figs 1–6.

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Material. **Russia:** ***Primorskii Krai*****:** Holotype, ♂, Arsenyev [town], 10.VI.1990, Makarkin leg. (ZIN). The holotype has its male terminalia dissected and stored in glycerin in a microvial pinned with the source specimen.

Description. *Male* (Fig. 1). Head. Face silvery-white, under antennae as wide as height of postpedicel, 2 times wider than clypeus; proboscis dark-brown; palpi dark, with black setae and white hairs; frons shining blue; antenna (Fig. 2) black; postpedicel band-like, 5.5 times longer than its width at base; arista-like stylus simple, apical, covered with short hairs, 2 times longer than width of postpedicel at base; length (mm) of scape, pedicel, postpedicel, arista-like stylus: 0.09/0.06/0.71/0.26; lower postocular setae white.

Thorax metallic greenish black; mesonotum shining; thoracic pleura whitish pollinose; propleura with group of long white hairs; mesonotum anteriorly with additional hairs; 6 pairs of strong dorsocentrals, with anterior pair short and posterior pair long; 2 rows of 8–10 long acrostichals, posterior setae longer than distance between acrostichal rows; scutellum with 2 strong black marginal bristles and 2 small black lateral setae.

Legs mostly yellow; mid coxa with brown spot in basal half, segment 5 of fore tarsus brownish; mid tarsus with segments 2–4 brownish and segment 5 light yellow with white setulae; hind tarsus brown from tip of basitarsus, with segment 5 light yellow with white setulae (Fig. 3); pulvilli white; coxae with white hairs and black setae; fore coxa with 3 setae at apex; mid coxa with 2 setae and white apical spine; hind coxa with strong seta and thin hairs; fore femur without long setae and hairs; fore tibia with 1 short anterodorsal, 2 short posterodorsals and 1 dorsal at apex; fore basitarsus simple, without remarkable setation; mid femur without long hairs, with preapical seta anteriorly and preapical seta posteriorly; mid tibia with 2 anterodorsal, 2 posterodorsal, 1 short ventral and 4 apical setae; mid tarsus simple; hind femur without distinct setae; hind tibia simple, with 2 anterodorsal and 2 posterodorsal setae; hind basitarsus simple, without strong setae; femur, tibia and tarsomere (from first to fifth) length (mm): fore leg: 0.74/0.73/0.39/0.12/0.09/0.07/0.08, mid leg: 1.02/1.01/0.49/0.22/0.99/0.13/0.12, hind leg: 1.29/1.45/0.37 /0.48/0.37/0.26/0.14.

Wing (Fig. 4) hardly darkened; lengths of costa between R_{2+3} and R_{4+5} and between R_{4+5} and M_1 (in mm), 0.35/0.21; R_{4+5} and M_{1+2} veins subparallel; M_{1+2} almost straight in distal part; distal part of M_4 longer than crossvein dm-m — 0.55/0.21; halter yellow; lower calypter yellow with white cilia.

Abdomen greenish black, white pollinose laterally, with black setae, with white hairs at base and ventrally; epandrium, surstylus and cercus blackish brown (Fig. 5); epandrium about as long as wide, with rounded distoventral lobes; hypandrium fused with epandrium, with short lateral arms; phallus hooked, thick, strongly sclerotized; surstylus (Fig. 6) short, with wide

basal half and triangular distal half, with thin inner process at middle, as long as distal half, with white, slightly curved setae; distal half of surstylus with 7 long thick setae at base, with about 10 elongate setae on inner surface, with pair of short thickened setae on apex; cercus (Fig. 7) black, longer than surstylus, elongate-ovate with acute apex, simple, covered with short and long black setae.

Measurements (mm). Body length 2.9, wing 2.7/0.9, antenna length 1.1.

Female unknown.

Differential diagnosis. *R. makarkini* sp.n. may be distinguished from all other species of the *R. caliginosum*-group by the segment 5 of mid and hind tarsi light yellow, covered with white setulae. It is close to *R. intermedium* (Becker), differing in morphology of cercus and surstylus of hypopygium (see key below). The use of Chinese key [Qilemoge et al., 2020] leads *R. makarkini* sp.n. to Oriental *R. palliaristatum* Yang et Saigusa, 2001 from Guizhou Province, which differs in entirely dark brown hind tibia and tarsus, mainly pale arista-like stylus, cercus not longer than surstylus, surstylus with very small inner process.

Distribution. The new species is only known from the type locality in the Russian Far East (Primorskii Krai).

Etymology. The specific epithet is dedicated to the holotype collector, the Russian entomologist Dr. Vladimir Nikolaevich Makarkin (FSC Biodiversity).

Key to Palaearctic species groups of the former *Xiphandrium* and males of *Rhaphium caliginosum* species group

1. Frons densely white or grey pollinose; male cercus bilobed 2

Figs 1–7. Details of *Rhaphium makarkini* Grichanov, sp.n. morphology, holotype, male. 1 — habitus, lateral view; 2 — antenna; 3 — hind tarsus, lateral view; 4 — wing; 5 — dry hypopygium, right lateral view; 6 — hypopygium after maceration, ventral-lateral view; 7 — hypopygium, ventral view. Scale bars: 1 — 1 mm; 2 — 0.3 mm; 3, 4 — 0.5 mm; 5 — 0.2 mm; 6, 7 — 0.1 mm.

Рис. 1–7. Детали строения голотипа, самца *Rhaphium makarkini* Grichanov, sp.n. 1 — внешний вид, сбоку; 2 — усик; 3 — задняя лапка, вид сбоку; 4 — крыло; 5 — гипопигий, вид справа сбоку; 6 — гипопигий после размачивания, вид снизу сбоку; 7 — гипопигий, вид снизу. Масштаб: 1 — 1 мм; 2 — 0,3 мм; 3, 4 — 0,5 мм; 5 — 0,2 мм; 6, 7 — 0,1 мм.

— Frons metallic, without pollen; male cercus simple (*R. caliginosum* group) 3

2. Hind coxa with black seta ..... *R. ensicorne* group

— Hind coxa with light seta ..... *R. albifrons* group

3. Abdomen yellow laterally at base 4

— Abdomen entirely dark, usually metallic green 5

4. Mesonotum with two dark lateral spots; fore tibia with 3–4 strong dorsal setae; cercus long [Negrobov, 1979: Fig. 1872]; body 2.2–2.4 mm ..... *R. quadrispinosum*

— Mesonotum without dark lateral spots; fore tibia with 1 strong dorsal seta; cercus short, triangular [Negrobov, 1979: Fig. 1744]; body 2.0–2.5 mm .....*R. fasciatum*

5. Cercus elongate-triangular, with 1 long seta at apex [Negrobov et al., 2012: Fig. 7H]; body 2.5–3.3 mm..... *R. monotrichum*

— Cercus without long seta at apex 4

6. Surstylus with dense bunch of long setae at apex 7

— Surstylus without bunch of long setae at apex 9

7. Cercus long, bandlike [Negrobov, 1979: Fig. 1813 as in *R. macrocerum*; Yang, 1998b: Fig. 41] ....*R. appendiculatum* (body 2.4–3.1 mm) and *R. xinjiangense* (body 3.2–4.4 mm)

— Cercus short, irregularly triangular, widened at middle ...8

8. Coxae yellow, but mid coxa dark at base; surstylus with thin bundle of setae [Parent, 1938: Fig. 650 as in *Xiphandrium zetterstedti*]; body 2.8–3.3 mm .....*R. caliginosum*

— Coxae mostly yellow, but mid and hind coxae dark in basal half; surstylus with thick bundle of setae [Negrobov, 1979: fig. 1758; Tang et al., 2016: fig. 19]... *R. flavilabre* (body 2.2–2.6 mm) and *R. neimengense* (body 2.5–2.9 mm)

9. Postpedicel about 4 times longer than high 10

— Postpedicel about 5 times longer than high 11

10. Arista-like stylus 1/3 length of postpedicel; cercus elongate-triangular, longer than surstylus, with long sparse hairs [Negrobov, 1979: Fig. 1674; Yang, 1998a: Fig. 18]..... *R. auctum* (body 3.3–3.5 mm) and *R. qinghaiense* (body 3.0–3.1 mm)

— Arista-like stylus 2/3 length of postpedicel; cercus short, nearly equal in length to surstylus, with short dense hairs [Negrobov et al., 2012: Fig. 7K]; body 2.8–3.3 mm .... *R. lanceolatum*

11. Cercus band-like, with long basoventral spine [Negrobov et al., 2012: Fig. 7N]; fore and mid femora darkened; body 2.6 mm ..... *R. umbripenne*

— Cercus various, without long basoventral spine; femora yellow, at most hind femur dark at apex 10

12. Cercus broad, shorter than surstylus; surstylus broad, with distal comb of setae and basoventral pedunculate seta [Negrobov, 1979: Fig. 1791]; last segments of mid tarsus dark; hind tarsus entirely dark; body 2.6–3.3 mm ..... *R. intermedium*

— Cercus elongate-ovate, longer than surstylus (Fig. 5); mid tarsus brownish, with segment 5 light yellow; hind tarsus brown from tip of basitarsus, with segment 5 light yellow; body 2.9 mm .....*R. makarkini* Grichanov, sp.n.

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