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First reliable record of the genus *Micromorphus* Mik, 1878 (Diptera: Dolichopodidae) from the Oriental Region, with the description of a new species from India

Первая достоверная находка рода *Micromorphus* Mik, 1878 (Diptera: Dolichopodidae) в Ориентальной области и описание нового вида из Индии

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KEY WORDS: Diptera, Dolichopodidae, Peloropeodinae, *Micromorphus,* taxonomy, new species, India.

КЛЮЧЕВЫЕ СЛОВА: Diptera, Dolichopodidae, Peloropeodinae, *Micromorphus,* таксономия, новый вид, Индия.

ABSTRACT: The genus *Micromorphus* Mik, 1878 is known in the Oriental Region by doubtful records of two Palaearctic species from Nepal and Sichuan province of China and two species with uncertain position from Guizhou province of China. A new species of *Micromorphus* from India is described and illustrated: *Micromorphus rishikeshensis* **sp.n.** Male of the new species differs reliably from other congeneric species in the black thorax, black coxae and blackish femora, simple legs, five strong dorsocentral bristles, but mainly in the shape and setation of hypopygial cercus, surstylus, postgonite and epandrial lobes.

РЕЗЮМЕ: Род *Micromorphus* Mik, 1878 известен в ориентальной области по сомнительным находкам двух палеарктических видов из Непала и китайской провинции Сычуань и двух видов с неопределенным статусом из китайской провинции Гуйчжоу. В статье дано описание и иллюстрации нового вида *Micromorphus rishikeshensis* **sp.n.** из Индии. Самец нового вида достоверно отличается от других родственных видов черной грудью, черными тазиками и черноватыми бедрами, простыми ногами, пятью крепкими дорсоцентральными щетинками, но преимущественно формой и хетотаксией придатков гипопигия: церок, сурстилей, постгонита и лопастей эпандрия.

Introduction

Recently Bickel [2022] has discussed the genus *Micromorphus* Mik, 1878 as a whole and records of its type species, *Micromorphus albipes* (Zetterstedt, 1843). It is a genus with about 30 small-sized species with body length about 1.5 mm, reported from all zoogeographical regions. Bickel [2022] excluded *M. albipes* from the fauna of New World and Australasia and supposed that the record of this species from Nepal [Hollis, 1964] was unsubstantiated, belonging probably to an undescribed species. Grichanov [2020] transferred *Nepalomyia jinshanensis* Wang, Yang et Grootaert, 2009 to the *Micromorphus.* The species was described [Wang et al., 2009] from environs of Beijing (holotype) and from the Oriental Sichuan province of China (paratype). Grichanov [2020] supposed that the description of *N. jinshanensis* (with acrostichal setae on mesonotum and basal spur on male hind basitarsus) belonged to the paratype representing a different species of mainly Oriental *Nepalomyia*, while the figures belonged to the holotype representing a Palaearctic species of *Micromorphus*. In contrast with *Micromorphus* generic concept, *M. ellampus* Wei, 2006 and *M. heterophalla* Wei et Yang, 2007, both described from the Oriental Guizhou province of China, bear acrostichals on the mesonotum [Wei, 2006; Wei, Yang, 2007] and belong probably to another genus. So, at present, there are no reliable records of the genus from the Oriental Region. A record of *M. albipes* from Nepal [Hollis, 1964] may belong to a new species described below from the northern part of India.

Material and methods

The material cited in this work is housed at the Zoological Museum of Moscow State University, Moscow, Russia (ZMUM) and Lund University Zoological Collections,

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Lund, Sweden (MZLU). Specimens have been studied and photographed with a ZEISS Discovery V–12 stereo microscope and an AxioCam MRc5 camera. The measurement accuracy of this microscope is 0.01 mm. Morphological terminology and abbreviations follow Cumming, Wood [2017] and Grichanov, Brooks [2017]. The lengths of the podomeres are given in millimeters. 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 in lateral view is oriented as it appears on the intact specimen, with the morphologically ventral surface of the genitalia facing upwards, dorsal surface downwards, anterior end facing right and posterior end facing left.

Taxonomy

Genus *Micromorphus* Mik

Micromorphus Mik, 1878: 6. Type species: *Hydrophorus albipes* Zetterstedt, 1845 (original designation).

DIAGNOSIS AND REMARKS. See Bickel [2022] and Grichanov, Brooks [2017] for diagnosis of the genus. Species of *Micromorphus* differ from those in closest *Nepalomyia* in arista-like stylus usually dorsal; acrostichal setae absent; male hind leg with tarsomere 1 lacking upcurved basal spur; and setal and cercal characters of hypopygium (e.g., pedunculate setae along ventral margin of epandrium). Species of *Nepalomyia* have antennal arista-like stylus apical (often arising in an apical excavation of the postpedicel), or subapical; acrostichal setae present; male hind leg with tarsomere 1 with upcurved basal spur. Identification keys were provided to Palaearctic [Negrobov, 2000] and Afrotropical species [Grichanov, 2013].

The type species collected from Sweden, *M. albipes*, is known from a female holotype lacking diagnostic characters (examined; MZLU: https://www.flickr.com/photos/tags/mzlutype05935). Males of the two Swedish *Micromorphus* species with similar habitus were found in the MZLU collection [Grichanov, Viklund, 2007: figs. 1, 2]. One of them is somewhat closer in hypopygium morphology to *M. albipes* figured schematically by Parent [1938: fig. 906]. The second species is identical to description and figure of hypopygium of *M. mesasiaticus* Negrobov, 2000 [Negrobov, 2000: fig. 8]. No other pictures for Swedish *M. albipes* are known; so, I consider the Fig. 1 [Grichanov, Viklund, 2007] as belonging to the typical *M. albipes*.

Micromorphus rishikeshensis Grichanov **sp.n.**
Figs 1–7.

MATERIAL. Holotype ♂, India, Northwest Reg., Uttarakhand, Rishikesh at: 30.1093°N, 78.309°E, Ganga River, 12–13.IV.2012, K.Tomkovich leg. (ZMUM). Holotype in good condition; male terminalia dissected and stored in glycerin in microvial pinned with the specimen.

DESCRIPTION. **Male** (Fig. 1). Head (Fig. 2). Frons black, grey pollinose; vertical seta black, long, as long as ocellar seta; 1 short blackish postvertical seta positioned far from postocular setal row; postocular setae entirely white; 1 upper seta longer than others; eyes distinctly separated anteriorly; face (somewhat shrunken) black, grey pollinose, under antennae at least 2 times wider than at clypeus; palpus and proboscis black; palpus irregularly rounded, with strong black seta and dark hairs; antenna black; scape small, vase-like; pedicel larger, globular, with ring of short setulae; postpedicel subtriangular, as long as high, long haired; arista-like stylus mid-dorsal, 3 times as long as main segments of antenna combined, microscopically pubescent, with thick 1st and filiform 2nd segment of arista; length (mm) of scape, pedicel, postpedicel, stylus: 0.05/0.05/0.08/0.44.

Thorax. Mesonotum and scutellum black, weakly pollinose, with black bristles; pleura covered with white pruinosity; 1 postalar, 2 postsutural supra-alar, 1 sutural, 1 presutural, 1 humeral, 1 posthumeral, 2 notopleural bristles; no acrostichals; 5 strong dorsocentral bristles decreasing in size anteriorly; 5th bristle slightly shifted towards lateral margin; proepisternum with 1 strong black bristle and 1 short hair-like seta above fore coxa; 1 pair of scutellar bristles, without lateral hairs.

Legs. Coxae black; femora blackish brown; tibiae and basitarsi brownish yellow; 3 apical segments of tarsi brown-black; fore and mid coxae with long dark setae in distal half; hind coxa with 1 long dark outer setae at middle; mid and hind trochanters having 1 fine dorsal seta; fore femur with 2–3 very short brown ventral setae at base (Fig. 4); fore tibia and tarsus simple, without strong bristles; mid femur simple, bearing 1 strong anterior subapical bristle; mid tibia simple, with 1 strong anterodorsal bristle and 1 posterodorsal seta, with 3 apical setae; no ventral setae; tarsus simple; hind femur with 1 strong anterior subapical seta and somewhat elongate dorsal setulae at base; hind tibia simple, with 1 strong anterior bristle at basal third, 2 short posterodorsal, few very short ventral, 3–4 simple short apical setae; hind basitarsus with short basoventral seta; femur, tibia and tarsomere (from first to fifth) length ratio (mm): fore leg: 0.52/0.51/0.28/0.15/0.11/0.07/0.07; mid leg: 0.58/0.64/0.39/0.2/0.14/0.08/0.07; hind leg: 0.58/0.73/0.23/0.23/0.11/0.08/0.07.

Wing (Fig. 3). Greyish, veins brown; costal setulae and hairs at base slightly longer than those at wing apex; costal setulae reaching R_{2+3}; costa simple; ratio of part of costa between R_{2+3} and R_{4+5} to that between R_{4+5} and M_{1+2}, 0.24/0.21; R_{2+3}, R_{4+5} and M_{1+2} almost straight; R_{2+3} and R_{4+5} slightly diverging towards wing apex; R_{4+5} and M_{1+2} slightly diverging in distal half; ratio of dm–m to apical part of M_4, 0.12/0.38; crossvein dm–cu somewhat weaker than adjacent longitudinal veins, slightly convex, forming right angles with M_{1+2} and M_4; posterior wing margin convex right before M_4; lower calypter yellow-brown, with dark cilia; halter yellow-brown.

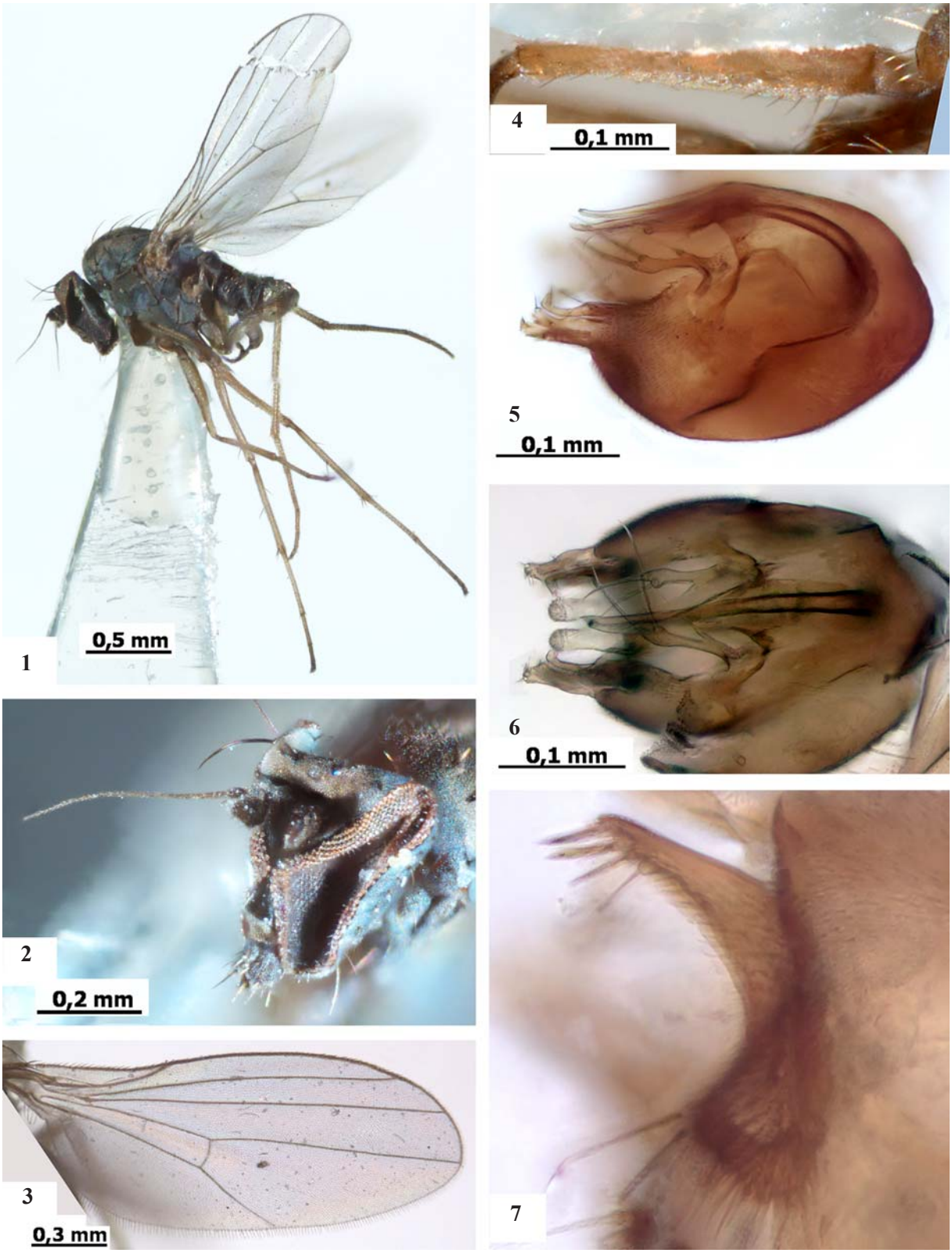
Abdomen. black, with black hairs and marginal setae, cylindrical (somewhat shrunken); 5–6th sterna small; 6th tergum well developed, bare; 7th segment concealed in dry specimen; 8th segment brown-black, large, covering about half of left lateral surface of epandrium, covered with short setae; epandrium (Fig. 5) black, globular, slightly longer than high; hypandrium basoventral, narrow, straight at apex; phallus simple and narrow; appendages brown, symmetric; midventral epandrial lobe digitiform, narrow, with 2 very long pedunculate setae at apex and thin process basally bearing long seta; distoventral epandrial lobe thin, almost reaching apex of surstylus, right-angularly curved at apex, with short preapical spine and long pedunculate seta at base; surstylus projected, with thin straight lobes bearing few short setae; dorsal lobe of surstylus with 1 thick apical seta; postgonite projected between surstyli, with narrowly divided lobes (ventral aspect: Fig. 6) covered with spicules distally; cercus (Fig. 7) with long narrow ventral plate bearing 2 thick apical and 2 simple preapical setae in one row; basodorsal cercal plate small, subtriangular, bearing strong pedunculate bristles dorsally.

Measurements (mm). Body length 1.5; antenna length 0.6; wing length 1.9; wing width 0.7.

Female. Unknown.

ETYMOLOGY: Toponimic, referring to the Rishikesh city in the Indian state Uttarakhand.

DIAGNOSIS. *Micromorphus rishikeshensis* **sp.n.** male keys to Afrotropical *M. ugandensis* Grichanov, 2013, differing



Figs 1–7. *Micromorphus rishikeshensis*, **sp.n.**, male holotype: 1 — habitus; 2 — head; 3 — wing; 4 — fore femur; 5— hypopygium, lateral view; 6 — hypopygium, ventral view; 7 — cercus.

Рис. 1–7. *Micromorphus rishikeshensis*, **sp.n.**, голотип, самец: 1 — внешний вид; 2 — голова; 3 — крыло; 4 — переднее бедро; 5 — гипопигий, сбоку; 6 —гипопигий, снизу; 7 — церка.

from the latter in black coxae and blackish femora, slightly shorter legs (e.g., hind tarsus as long as hind tibia), distal part of M4 and dm-m length ratio (3.2/1) and hypopygium morphology. *Micromorphus ugandensis* male has yellow coxae and femora, slightly longer legs (hind tarsus 1.2 times as long as hind tibia), distal part of M4 and dm-m length ratio (3.7/1) [Grichanov, 2013]. In the key to Palaearctic species of the genus [Negrobov, 2000], *M. rishikeshensis* **sp.n.** goes to doubtful *M. paludosus* (Karl, 1921) described from environs of Słupsk in northern Poland. It was described in the former genus *Oligochaetus* Mik, 1878 (now *Medetera* Fischer von Waldheim, 1819) with such unusual characters as deep black face and white-grey dusted clypeus, hind tibia with full ventral row of short setae of equal length, hypopygium big, elongate-rounded, with band-like cercus and yellow, long and filiform surstylus [Karl, 1921]. The species was placed in synonymy to *M. albipes* [see Stackelberg, 1962] or *M. claripennis* (Strobl, 1899) [Negrobov, 1991] or was considered a true *Micromorphus* species [Negrobov, 2000], but was never collected again, never studied and illustrated. *Oligochaetus paludosus* has most probably nothing to do with the genus *Micromorphus* and must be considered *incertae sedis*.

Hypopygium of *M. rishikeshensis* **sp.n.** is very different from that in *M. albipes* [Grichanov, Viklund, 2007: fig. 1], being closest to the hypopygium of *M. jinshanensis* [Wang et al., 2009: fig. 13] known from environs of Beijing (China) and Khanka Lake shore (Russian Primorye). Nevertheless, *M. jinshanensis* hypopygium was figured with short ventral plate of cercus bearing row of 7 dorsal setae; basodorsal cercal plate relatively large, rounded. *Micromorphus rishikeshensis* **sp.n.** male has cercus with long narrow ventral plate bearing 2 thick apical and 2 simple preapical setae in one row; basodorsal cercal plate small, subtriangular. The shape and setation of distoventral epandrial lobe and surstylus are also different in the two species.

Conclusion

Species of the genus *Micromorphus* are similar in habitus and generally lack diagnostic male secondary sexual characters, although Afrotropical *M. spatulipes* Parent, 1937 and *M. ethiopiensis* Grichanov, 2013 have flattened tarsomeres on male fore and mid legs [Grichanov, 2013], and fore femur of *M. alutaceus* Negrobov, 2000 was described with ventral row of five long white hairs in basal half [Negrobov, 2000]. The southern African *M. aristalis* (Curran, 1926) and *M. maraisi* Grichanov, 2000, and Palaearctic *M. aereus* (Vaillant, 1953) differ from other species in mostly orange-yellow or pale brown thorax in contrast to black-brown abdomen. The colour characters of legs used by Negrobov [2000] in his key are most probably individually variable. Wing shape and venation may sometimes serve as diagnostic features. The male hypopygium provides such diagnostic characters that enable accurate species identification, as shape and setation of cercus, surstylus, postgonite and epandrial lobes.

Specimens of *Micromorphus* are rarely collected and quite uncommon in most collections because of their small size. The large Malaise trap and yellow pan trap samples contain sometimes significant number of specimens of this genus [Bickel, 2022]. Little is known on ecology of species. My experience shows that the imagoes of Palaearctic *Micromorphus* are met on wet mud and sand near freshwater lakes and rivers. According to labels under the published material, species can inhabit the mountainous areas up to 2200–3000 m above sea level. Nepalese "*Micromorphus albipes*" male was collected from dead leaves lying in sun on sandy river shore in Arun Valley [Hollis, 1964]; this record may belong to *M. rishikeshensis* **sp.n.** that has similar habitus with that of Swedish *M. albipes.*

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