

First record of an extant species of the genus *Schistostoma* Becker
(Diptera: Dolichopodidae: Microphorinae)
from the Oriental Region

Первая находка современного вида рода *Schistostoma* Becker
(Diptera: Dolichopodidae: Microphorinae)
из Ориентальной области

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КЛЮЧЕВЫЕ СЛОВА. Empidoidea, Dolichopodidae, Microphorinae, *Schistostoma*, Индия, новый вид.

ABSTRACT. A new species of the genus *Schistostoma* Becker, 1902 (Dolichopodidae: Microphorinae) is described from the foothills of the Himalayas (India, Uttarakhand) — *S. indicum* sp.n. It is the first extant species of the genus recorded from the Oriental Region, in addition to two species described from Burmese amber. The new species belongs to the *S. albopilosum* species group which also includes one species from the Mediterranean and three species from South Africa.

РЕЗЮМЕ. Новый вид рода *Schistostoma* Becker, 1902 (Dolichopodidae: Microphorinae) описан из предгорий Гималаев (Индия, Уттаракханд) — *S. indicum* sp.n. Это первый современный вид рода, найденный в Ориентальной области, в дополнение к двум видам, описанным из Бирманского янтаря. Новый вид относится к группе видов *S. albopilosum*, включающей один вид из Средиземноморья и три вида из Южной Африки.

Introduction

The genus *Schistostoma* Becker, 1902 (with *S. eremita* Becker as type species) currently includes 24 species most of which are distributed in the Northern Hemisphere [Shamshev, Sinclair, 2006; Brooks et al., 2019]; however, three species are known from South Africa [Chvála, 1991; Shamshev, Sinclair 2006]. In addition, two species were described very recently from Burmese amber [Brooks et al., 2019]. This paper in-

cludes the description of a new species of *Schistostoma* collected from northern India (Uttarakhand), which is the first formal record of an extant species of the genus from the Oriental Region. The new species is a member of the *S. albopilosum* species group [Shamshev, Sinclair, 2006], but has the male mid tibia simple rather than modified like the other included species in the group.

Material and methods

This study is based on Diptera material housed in the Zoological Museum of Moscow State University, Moscow, Russia (ZMMU). Terms used for adult structures and descriptive format follow those of Shamshev and Sinclair [2006] and Brooks et al. [2019]. Photographs were taken with a Canon EOS 11 40D camera supplied by a Canon MP-E 65 mm objective and were combined using the Helicon Focus 5.3.14 software. To facilitate observations, the terminalia were macerated in cold 10% KOH, then put for a short period in 85% lactic acid and immersed in glycerine. In describing the hypopygium, “dorsal” and “ventral” refer to the position prior to genital rotation and flexion. Figures showing the male genitalia in lateral view are oriented as they appear on the intact specimen (rotated and lateroflexed to the right). Holotype label data is cited verbatim, with data from each label placed in quotation marks and separated from data on other labels by a semicolon. Lines on labels are delimited by a slash (/).

Taxonomic account

Class Insecta Linnaeus, 1758

Order Diptera Linnaeus, 1758

Suborder Brachycera Macquart, 1834

Superfamily Empidoidea Latreille, 1804

Family Dolichopodidae Latreille, 1809

Subfamily Microphorinae Collin, 1960

Genus *Schistostoma* Becker, 1902

Schistostoma indicum Shamshev, **sp.n.**

Figs 1–4.

TYPE MATERIAL. Holotype, ♂, “INDIA, Uttarakhand, Rishikesh/ 30.1333°N 78.317°E, forest stream/ K. Tomkovich 15, 17.iv.2012”; “*Schistostoma indicum*/ Shamshev, sp. nov.” (ZMMU; terminalia dissected, in microvial pinned with specimen).

DIAGNOSIS. Very small greyish flies (body about 1.5 mm); eyes with ommatrichia present, postpedicel onion-shaped; thorax with black setation, acrostichals biserial, dorsocentrals uniserial; mid tibia simple; abdominal sternites 3–5 bearing pair of long, stout blunt-tipped setae mounted on small tubercles.

DESCRIPTION. **Male** (Fig. 1). Body 1.6 mm, wing 1.7 mm. Head black. Eyes holoptic; upper ommatidia considerably enlarged, with rather scattered ommatrichia. Frons represented by very small, subtriangular, greyish space just above antennae. Face broad, greyish pruinose. Ocellar triangle with 2 pairs of fine setae (partly missing). Occiput brownish grey pruinose (in some views with some dark bluish tinge), with black setae; postoculars minute, almost bare on upper part, some short setae laterally and around mouth-opening. Antenna black; scape short, postpedicel with circle of subapical setulae including 1 longer seta dorsally; postpedicel onion-shaped, slightly broader than high, pubescent with microtrichia; stylus long, 3.3X longer than postpedicel width. Proboscis short, directed forward. Palpus black, obscured by mouth-cavity, with black setae.

Thorax black, densely brownish grey pruinose, black setose; mesoscutum strongly arched, more distinctly brownish pruinose (especially posteriorly) than mesopleuron, in anterodorsal view with two narrow weakly visible darker vittae between rows of acrostichals and dorsocentrals; prescutellar depression present. Prosternum separated. Proepisternum with 1 moderately long seta on upper part opposite anterior spiracle. Anteprototum with 1 setula on each side. Postpronotal lobe with 1 long seta. Mesonotum with 1 moderately long presutural intra-alar; 1 longer presutural supra-alar, 3 short postsutural supra-alars (close to suture, arranged in regular row), 3 notopleurals (situated before suture; 2 lateral setae longer and stronger), 1 postalar, 4 almost equally long scutellars (inner pair slightly longer, cruciate); acrostichals arranged in 2 regular rows, very short, lacking on prescutellar depression; dorsocentrals uniserial, mostly subequal in length to acrostichals, two posterior pairs considerably longer (prescutellar pair longest). Spiracles brown. Mesopleuron bare.

Legs slender, almost uniformly brownish, coxae somewhat darker, “knees” paler; greyish pruinose; with simple structure and vestiture, only hind tibia slightly evenly thickened toward apex and somewhat sinuate (posterior view). Podomeres with very inconspicuous black setation, mostly covered with rather sparse setulae; in addition, fore femur with some longer setae dorsally and near apex

posteriorly, mid femur with similar setation but dorsal setae less distinct, hind femur with almost complete row of short setae dorsally (nearly half as long as femur width) and complete row of mostly short anteroventral setae (3–4 subapical setae longer).

Wing membrane uniformly faintly infuscate, with brownish normally sclerotised veins, covered with uniform microtrichia. Pterostigma absent. Longitudinal veins complete (except CuA+CuP evanescent). Costa circumambient; extreme anterior base with 2 strong setae; short setulae along anterior margin, distinct throughout, upper surface with distinct dorsal spinules. Sc distinct apically, reaching costa near middle of wing (or nearly opposite base of M_2). R_1 weakly sinuous, reaching costa far beyond middle of wing. Base of Rs originating opposite humeral crossvein. R_{2+3} diverging from R_{4+5} apically. R_{4+5} weakly sinuous. R_{4+5} and M_1 , M_1 and M_2 , M_2 and M_4 diverging beyond cell dm. Short r-m crossvein present in basal portion of wing, distal to base of R_{4+5} . Crossvein bm-m complete. Cell dm present, emitting three veins, closed by base of M_2 and crossvein dm-m, cell extended to middle of wing. Cells br, bm and cua in basal fourth of wing. Cells bm and cua broader than br. Cell cua closed, rounded apically with CuA curved. Anal lobe well-developed and right-angled, alula absent. Calypter brownish yellow, pale fringed. Halter with yellowish knob and brown stem.

Abdomen black, densely brownish grey pruinose (in some view tergites darker); tergites with rather sparse intermixed pale and black longer laterally (black setae more numerous distally); sternites with scattered short, fine, pale and dark setae (except noted), sternites 3–5 bearing pair of long, stout, blunt-tipped setae mounted on small tubercles, sternite 8 with several long posteromarginal setae.

Hypopygium (Figs 2–4) lateroflexed to right, inverted with posterior end directed anteriorly, small, asymmetrical. Cercus yellowish, short, bilobed, with several long setae apically. Epandrium with pair of symmetrical, slender, finger-like dorsal lobes (part of surstylus), bearing one short spine-like seta near mid-length and one short spine-like blunt-tipped subapical seta, mostly straight; right epandrial lamella oblong, left epandrial lamella subrectangular. Right ventral surstylus broadly expanded, subtriangular apically; left ventral surstylus with digitiform extension. Phallus sickle-shaped with somewhat hooked tip. Postgonites rounded apically. Hypandrium fused basally to each epandrial lamella; prolonged and distinctly tapered apically, bearing pair of long setae closer to base and pair of apical setae, less than one-third length of hypandrium.

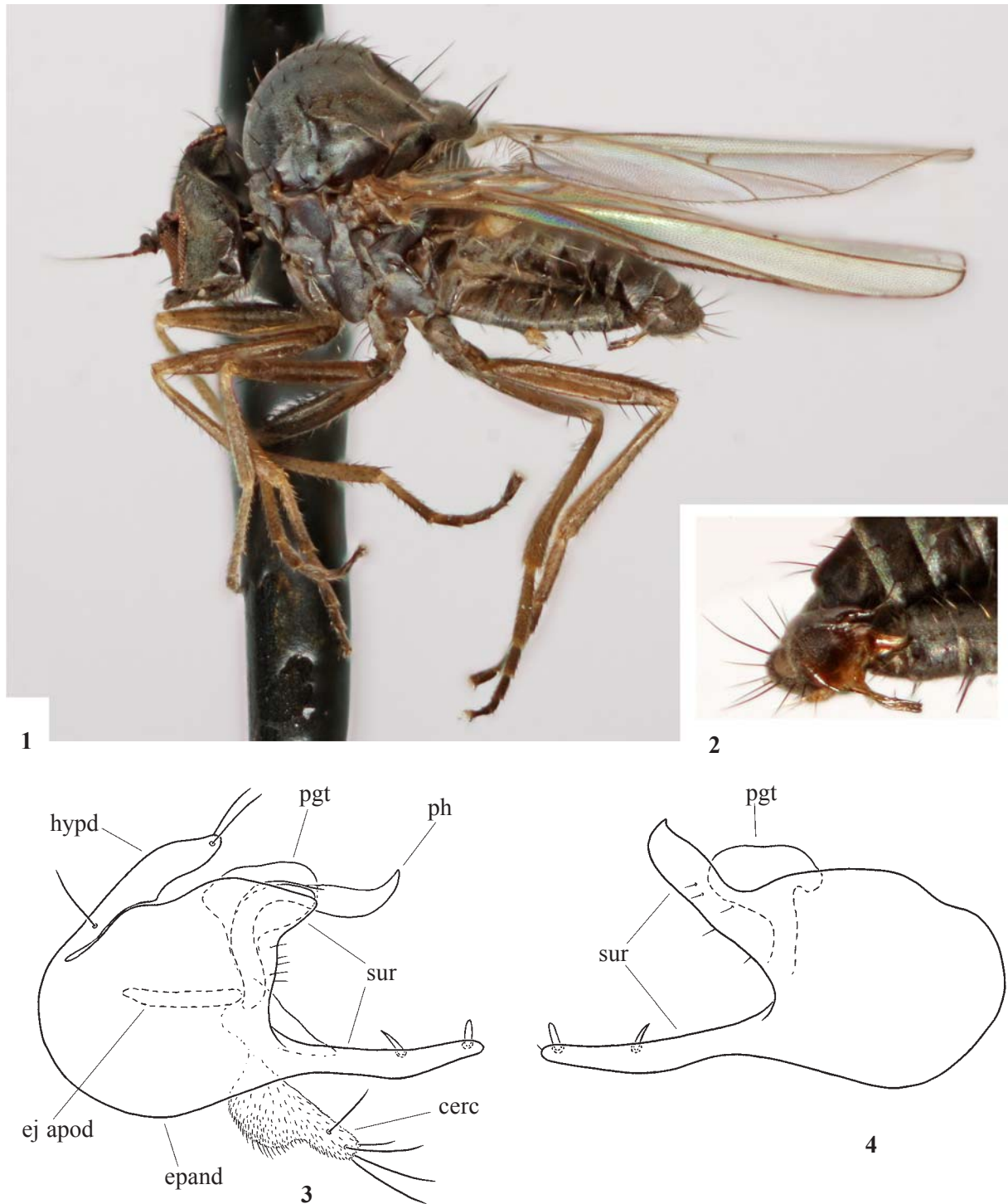
Female. Unknown.

DIFFERENTIAL DIAGNOSIS. In having ommatrichia (pubescence eyes) and a shortened hypandrial lobe fused to the epandrium basally the new species should be compared with species of the *Schistostoma albopilosum* group [Shamshev, Sinclair, 2006]. This group includes one species distributed broadly in the Mediterranean, i.e. *S. albopilosum* (Becker, 1910), and three species known only from South Africa, i.e. *S. brandbergensis* Shamshev et Sinclair, 2006; *S. kalgat* Shamshev et Sinclair, 2006 and *S. stuckenbergi* Chvála, 1991. *Schistostoma indicum* **sp.n.** differs from all these species primarily by unmodified mid tibiae and spine-like setae on abdominal sternites of the male. The female of the new species is unknown, however, once discovered it may likely differ from the females of the species of the *S. albopilosum* group by the onion-shaped

postpedicel.

ETYMOLOGY. The specific epithet refers to the country of the origin of the new species.

DISTRIBUTION. Orient: India (Uttarakhand). According to the label data, the holotype was collected in the foothills of the Himalayas near a "forest stream".



Figs 1–4. *Schistostoma indicum* sp.n., ♂ holotype: 1—habitus, left lateral view; 2—postabdomen, right lateral view; 3—terminalia, right lateral view; 4—terminalia, hypandrium and cercus removed, left lateral view. Abbreviations: cerc—cercus; eband—epandrium; ej apod—ejaculatory apodeme; hypd—hypandrium; pgt—postgonite; ph—phallus; sur—surstylus.

Рис. 1–4. *Schistostoma indicum* sp.n., ♂ голотип: 1—габитус, сбоку слева; 2—постабдомен, сбоку справа; 3—терминалии, сбоку справа; 4—терминалии, гипандрий и церк удалены, сбоку слева. Сокращения: cerc—церк; eband—эпандрий; ej apod—эякуляторная аподема; hypd—гипандрий; pgt—постгонит; ph—фаллус; sur—сурстиль.

Discussion

The new species possesses an interesting combination of characters, some of which are unique or rare in *Schistostoma*. *Schistostoma indicum* **sp.n.** has distinct ommatrichia (pubescence eyes) and a shortened hypandrial lobe fused to the epandrium basally that place it in the *S. albopilosum* group [Shamshev, Sinclair, 2006]. Although the phylogenetic relationships of *Schistostoma* remain unresolved, this group appears to be distinct and may represent the sister group to all remaining *Schistostoma*. The male terminalia of the new species are strikingly similar to the male terminalia of the South African species of the *S. albopilosum* group. However, *S. indicum* **sp.n.** differs from all species of the *S. albopilosum* group by simple male mid leg, onion-shaped postpedicel, the absence of the pterostigma, spine-like setae on abdominal sternites and the presence of a pair of setae near the base of the hypandrium.

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