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*Baetis khakassikus* n. sp., a new species of the subgenus *Rhodobaetis* JACOB, 2003 from Middle Siberia, Russian Federation  
(Ephemeroptera: Baetidae)

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ABSTRACT. A new species *Baetis khakassikus* n. sp. belonging to the subgenus *Rhodobaetis* JACOB, 2003 is described and illustrated at larval stage from material collected in West Sayan Mountains (1332 m a.s.l.), Republic of Khakassia, Middle Siberia, Russian Federation. Critical characters distinguishing it from other representatives of *Rhodobaetis* are presented.

Key words: entomology, taxonomy, Ephemeroptera, Baetidae, *Baetis*, *Rhodobaetis*, new species, larva, Republic of Khakassia, Siberia, Russian Federation.

#### INTRODUCTION

The first mayfly collecting in the Republic of Khakassia, Middle Siberia, Russian Federation was done by entomological expeditions carried out by the Institute of Animal Systematics and Ecology, the Siberian Division of the Russian Academy of Science in late July and August 2002 (BEKETOV & PETROZHITSKAYA, in review). Among 27 mayfly species found one species belonging to the subgenus *Rhodobaetis* JACOB, 2003 was previously unknown.

The subgenus *Rhodobaetis* was established by JACOB (2003) on the diagnostic basis of the characters of both larvae and imagines. The distinguishing character of *Rhodobaetis* larvae according to the author is the availability of movable

spatulas on terga surface. Although the name *Rhodobaetis* was suggested for the first time by KAZLAUSKAS (1972) for species united by MÜLLER-LIEBENAU (1969) in *Baetis rhodani* species-group it was invalid as type species were not determined (HUBBARD 1979). JACOB (2003) made use of the old name given by KAZLAUSKAS (1972) designating the type species of the subgenus *Rhodobaetis* viz. *B. rhodani rhodani* PICTET, 1843. Finally, GODUNKO et al. (2004) have summarized data on taxonomy and distribution of West Palaearctic species of the subgenus *Rhodobaetis*.

Although only one mature larva of the new species was found we decided to describe it as it has a whole series of pronounced distinctive morphological characters that allow distinguishing it from all other known species of *Rhodobaetis* definitely. Besides, collecting additional material in the near future is questionable, as it requires a special expedition.

### ***Baetis khakassikus* n. sp.**

#### ETYMOLOGY

The species name *khakassikus* is derived from the name of the region where the species was found – Republic of Khakassia.

#### MATURE LARVA

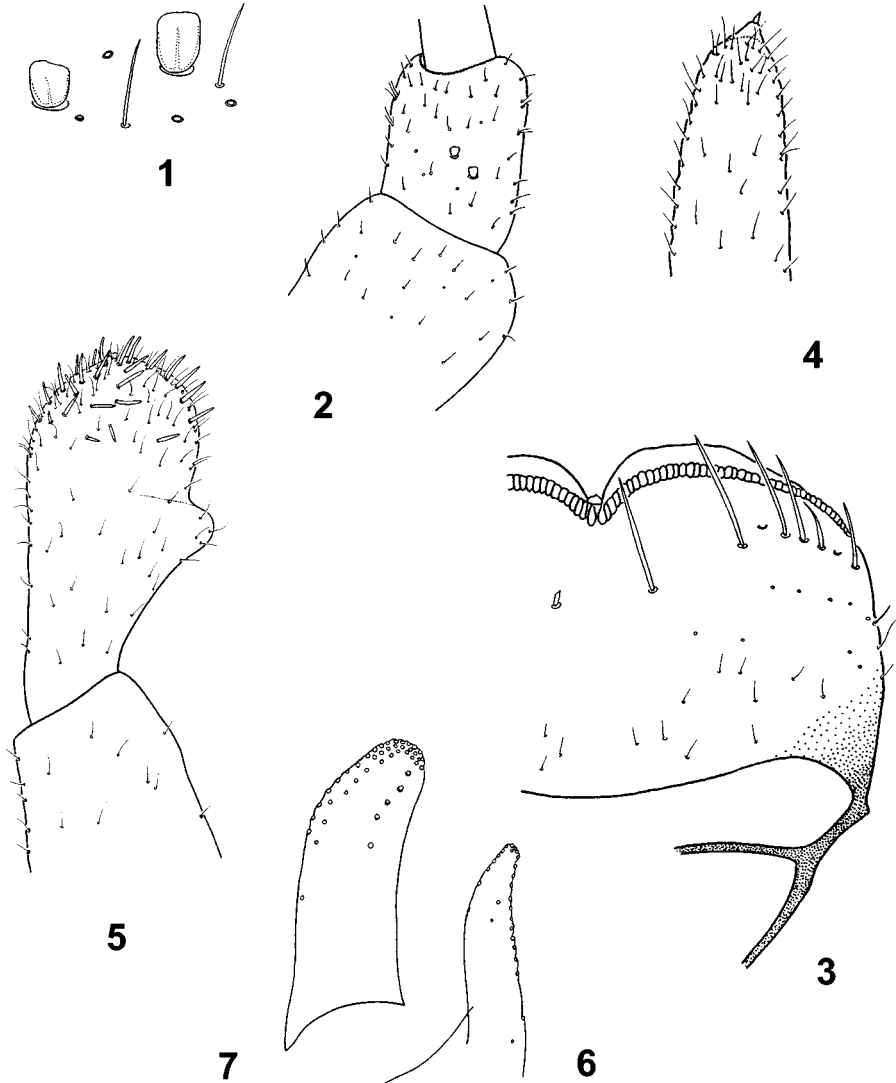
Length of body: 8.1 mm; length of cerci: 6.0 mm; terminal filament damaged.

Light brown. Antennae yellowish-brown. Frons surface with small spatulas and fine hairs (Fig. 1). Pedicel with 2-3 small spatulas and numerous fine hairs. Scape without spatulas (Fig. 2). Labrum distinctly wide (the width/length ratio = 1.47), with 1 + 6-7 long submarginal bristles arranged in one regular row (Fig. 3). Labrum with few fine bristles laterally. Apical part of segment 2 of maxillary palps with distinct scales on rounded projection and fine hairs (Fig. 4). Teeth of mandibular incisors not preserved. Segment 3 of labial palps rounded and relatively symmetrical (Fig. 5). The length/width ratio of segments 2+3 of labial palps = 2.0. Glossae and paraglossae relatively narrow (Figs 6, 7). Paraglossae with three regular rows of bristles at the apex.

Thorax yellowish-brown to brown. Legs yellowish-brown to brown, with slightly darker proximal part. Femora with central diffuse brownish spot. External margin of femora with dense row of long slender setae, bluntly pointed at the apex. Its setae arranged in 2-3 rows in proximal part of femora, and 1-2 rows in central and distal parts (Fig. 8). Inner margin of femora with small spines. Surface of femora with elongate spatulas, spatulas bases, translucent triangular scales and fine hairs. Tibiae the same color as femora. Inner margin of tibiae with row of small spines and fine hairs. External margin of tibiae with row of numerous small spines and fine hairs alternating with a few long fine spines (Fig. 9). Tarsi brown. Tarsal claw brown, with 10 teeth and without hairs at the tip (Fig. 10).

Abdominal terga yellowish-brown to light brown: tergum I uniformly light brown; tergum II light brown, with two brownish central spots; terga III and VII

uniformly brown, with two elongated spots near anterior part of segment and two yellowish spots laterally; tergum VIII uniformly brown, terga IX-X uniformly light brown. Sterna lighter than terga, yellow. Posterior margin of abdominal terga of different structure: posterior margin of tergum I generally with irregular row of sparse widened apically spatulas alternating with fine hairs; terga II-X with regular row of broad triangular spines alternating with sparse hairs (Figs 11, 12). Surface of terga with widened spatulas, numerous broad translucent triangular



1-7. *Baetis khakassikus* n. sp., holotype, mature female larva: 1 - surface of frons; 2 - base of antenna; 3 - labrum; 4 - apex of maxillary palp; 5 - labial palp; 6 - glossa; 7 - paraglossa

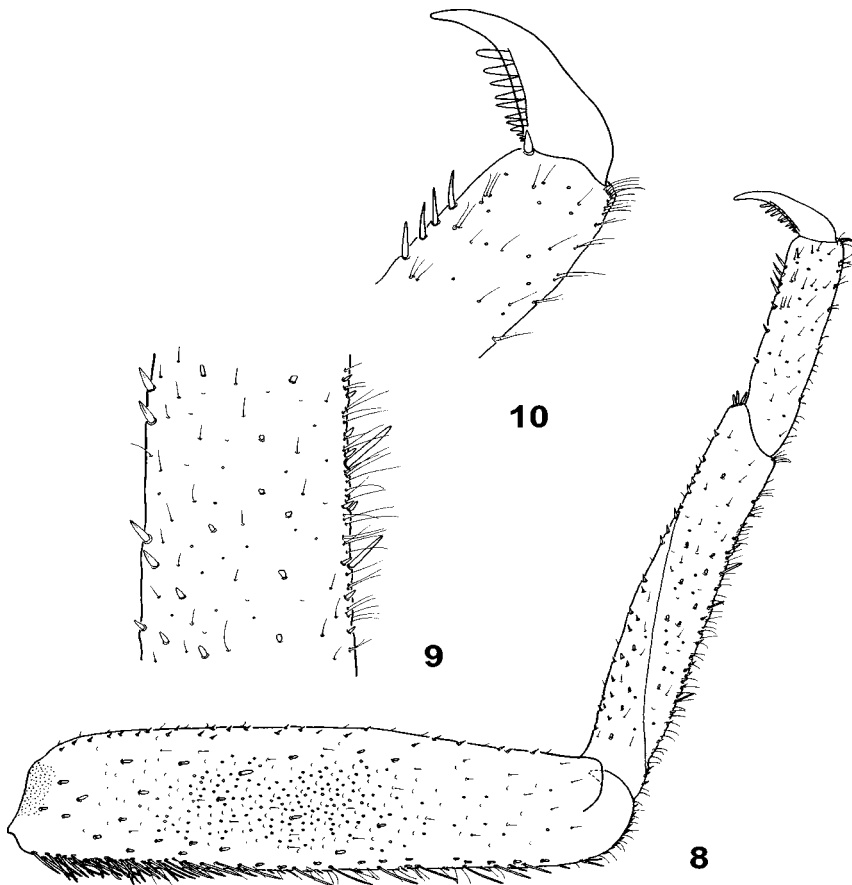
scales and fine hairs. First pair of gills not preserved. Gills 2-7 slightly asymmetric with hardly visible tracheization (Figs 13, 14). External margin of all gills fine-serrate, with fine hair only, without strong spines. Paraproct plates with 28-30 teeth on the margin; surface of paraproct plates with a few bluntly pointed scales, bases of scales and fine hairs. Cerci yellowish-brown.

ADULTS

Unknown.

MATERIAL EXAMINED

Holotype: mature female larva on microscopic glycerol-based slide, Russian Federation, Republic of Khakassia, 120 km from Ak-Dovurag village, 51°55' N

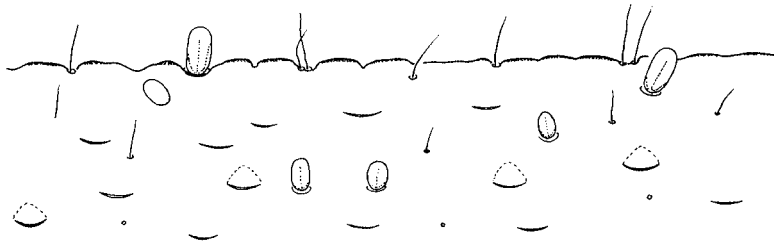


8-10. *Baetis khakassikus* n. sp., holotype, mature female larva: 8 - hind leg; 9 - tibia fragment; 10 - tarsal claw

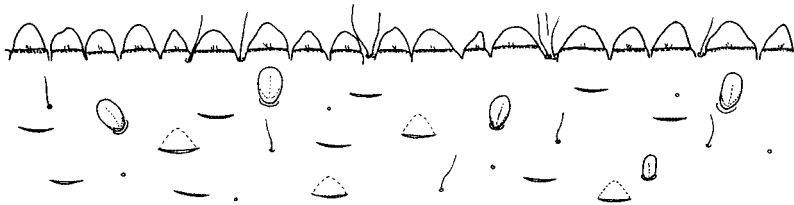
lat. and 89°45' E long., 1332 m a.s.l., Stoktysh Rivulet (left tributary of Bolshoi On River, substrate – boulders and pebble stones,  $t - 6.3-7^{\circ}\text{C}$ , current velocity – 0.8-3.5 m/sec, width – 10 m, depth – 0.8-1 m), 31.VII.2002, leg. L.V. Petrozhitskaya. The holotype is deposited in Siberian Zoological Museum, Institute of Systematics and Ecology of Animals, Russian Academy of Science (Novosibirsk, Russia).

#### DIAGNOSIS

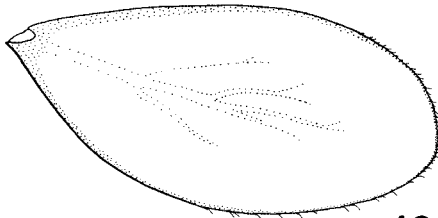
The availability of spatulas on the surface of terga, pedicels and paraproct plates indicates that *Baetis khakassikus* n. sp. belongs to the subgenus *Rhodobaetis*. The described larva evidently belongs to a new species and can be easily differed



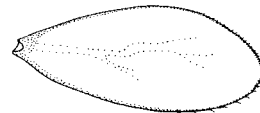
**11**



**12**



**13**



**14**

11-14. *Baetis khakassikus* n. sp., holotype, mature female larva: 11 - posterior margin of abdominal tergum I; 12 - posterior margin of abdominal tergum IV; 13 - gill 3; 14 - gill 7

from all other known species of *Rhodobaetis* by the following characters: (1) pedicel with 2-3 small spatulas; (2) scape without spatulas; (3) external margin of femora with dense row of long slender setae, bluntly pointed at the apex; (4) external margin of tibiae with row of numerous small spines and fine hairs alternating with a few long fine spines; (5) tarsal claw without hairs at the tip; (6) posterior margin of abdominal terga II-X with regular row of broad triangular spines alternating with sparse hairs; (7) external margin of all gills without strong spines; (8) paraproct plates with 28-30 teeth on the margin.

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