

**Description of *Rhithrogena austriaca* sp. n. and a
complementary description of *R. vaillantii*
SOWA & DEGRANGE, 1987 from Austria**
(Ephemeroptera, Heptageniidae)

by

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***Rhithrogena austriaca* n. sp. und ergänzende Beschreibung von *R. vaillantii*
SOWA & Degrange, 1987, aus Österreich**
(Ephemeroptera, Heptageniidae)

Synopsis: *Rhithrogena austriaca* sp. n., eine neue Art der *hybrida*-Gruppe aus Österreich, wird anhand von Merkmalen der Männchen, Nymphen und Eier, von *R. vaillantii* SOWA & DEGRANGE, 1987, werden erstmals Männchen, Weibchen und Subimagines anhand von Material aus den Tiroler Alpen beschrieben.

Abstract: *R. austriaca*, a new species of the *hybrida*-group from Austria is described and illustrated by characteristics of male imago, nymph and eggs. For *R. vaillantii* SOWA & DEGRANGE, 1987 a complementary description and illustration of males and females in adult and subimago stage is given from material of the Austrian Alps in Tyrol.

Key words: Taxonomy, Ephemeroptera, Heptageniidae, *Rhithrogena*, *hybrida*-group, *alpestris*-group.

Introduction:

The intention of this article is to describe a new species, namely *Rhithrogena austriaca* sp. n. belonging to the *hybrida*-group in which it is characteristic of its relatively small dimensions. We will also give a description of the adult stages of *R. vaillantii* SOWA & DEGRANGE, of the *alpestris*-group, which was recently described in its larval and egg stages (SOWA & DEGRANGE, 1987; GAINO et al., in press). The identification of these two stages as that of *R. vaillantii* has been partly done by rearing the nymphs to subimagines and imagines. Part of the material belongs to the collection of Dr. Volker PUTHZ (Schlitz, BRD). We want to express our thanks to our German colleague for his donation.

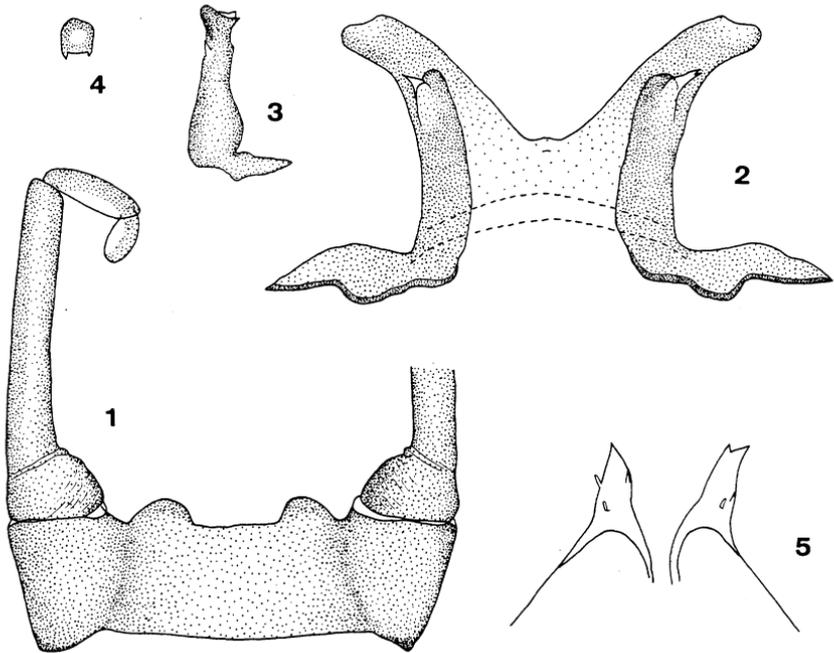
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Mag. Dr. P. Weichselbaumer, University of Innsbruck, Institute of Zoology, Department of Limnology, Technikerstraße 25, A-6020 Innsbruck, Austria.

Imago, male

Body length 7.5 mm, length of fore wings 8.0 mm, cerci 13 mm. Compound eyes as seen in profile are comparable with the eyes of *R. alpestris* ETN. concerning their dimensions (SOWA & SOLDAN, 1984, fig. 2). Head light brown with a violet strip between the basis of the antennae and the compound eyes. Thorax brown, mesosternum and metanotum dark brown. Lateral parts of thorax without particular markings. Both pairs of wings transparent and incolorous. Longitudinal veins of fore wings light brown, cross veins still somewhat lighter and hardly visible. Pterostigma whitish, humeral vein dark. Cross veins in the proximal half of costal area invisible and within the pterostigma hardly distinguishable and simple. Fore legs light brown. On femur a large and diffuse agglomeration of violet-shaded pigment, sometimes hardly visible. Middle and hind legs pale yellow, femora without traces of pigment. First articulation of tarsi slightly separated from tibia. Abdominal terga of rusty violet color; on the lateral parts of the abdomen this coloration intensifies and forms quadrangular markings. Sternites light, without particular markings. Nerve ganglia incolorous. Cerci brown, light grey against the end, articulations dark near the base.

Genitalia: Posterior margin of styliger with large, trapezeshaped incision; the two expansions thus formed are interiorly directed. First segments of styli relatively big, the others rather short (fig. 1). Penis lobes long and thin, clearly bent externally. In ventral view the apical margin of lobes slightly sinuate (fig. 2). In lateral view the apico-ventral part of lobes slightly bent, basal part extended, and the two subapical teeth are visible superposed (fig. 3). In caudal view the apical contour of lobes almost square and the outer tooth hardly longer than the inner tooth (fig. 4). Titillators small, pointed or with two teeth on apex (fig. 5).



Figs. 1 - 5: *Rhithrogena vaillanti* SOWA & DEGRANGE, male imago. 1: forceps base and part of forceps, ventral view; 2: penis from ventral view; 3: penis from lateral view; 4: apical part of left penial lobe from caudal view; 5: titillators.

Imago, female

Body length 7.0 mm, length of fore wings 9.0 mm, cerci 10 mm. Head and legs with the same coloration as in male imago. Also like in male imago, the first joint of middle and hind legs is slightly separated from tibia. Thorax light brown, anterior base of fore wings with traces of violet-shaded pigments. Wings see in male imago. Fore wings with first longitudinal veins brown, the next becoming gradually lighter, and they are whitish in the anal zone. Crossveins clear, hardly visible. Humeral vein dark. Venation of hind wings clear, whitish. Abdominal terga brown with a rusty violet tint, sterna light. Nerve ganglia and cerci see male imago. Subgenital plate short and large, posterior margin rounded and in the middle part concave.

Subimagines

Body length: male 7.0 - 8.0 mm, female 6.0 - 7.5 mm. Length of fore wings: male 8.0 mm, female 8.0 - 9.5 mm. Cerci: female 6.5 - 7.0 mm. Body generally pale, grey yellowish, with the disposition of dark spots on head, thorax, anterior femora and abdomen as in adults. Wings unicolorous, grey, rather dark, venation relatively well apparent. Penis of male similar to imago one, but shorter and larger.

Material

Austria: 2 im. ♂♂, 3 subim. ♂♂, 1 im. ♀, 2 subim. ♀♀, 1 nymph in last stage, Tyrol, Brandenberger Ache at Kaiserhaus, 700 m, 15.08.1985 leg. P. WEICHSELBAUMER.

Affinities

In the stage of male imago *R. vaillanti* is closely related to *R. alpestris* ETN., especially in the general shape of the penis. Nevertheless, differences in details are visible: in *R. vaillanti*, the lobes begin to diverge well below the basis of titillators, and in ventral view they are uniformly sclerified in their apical half (fig. 2). From this view the apical margin of the lobe is less concave and the inner subapical tooth is invisible. By the same characteristics our species differs from *R. landai* SOWA & SOLDAN and from *R. neretvana* TANASIJEVIĆ.

Rhithrogena austriaca sp. n.

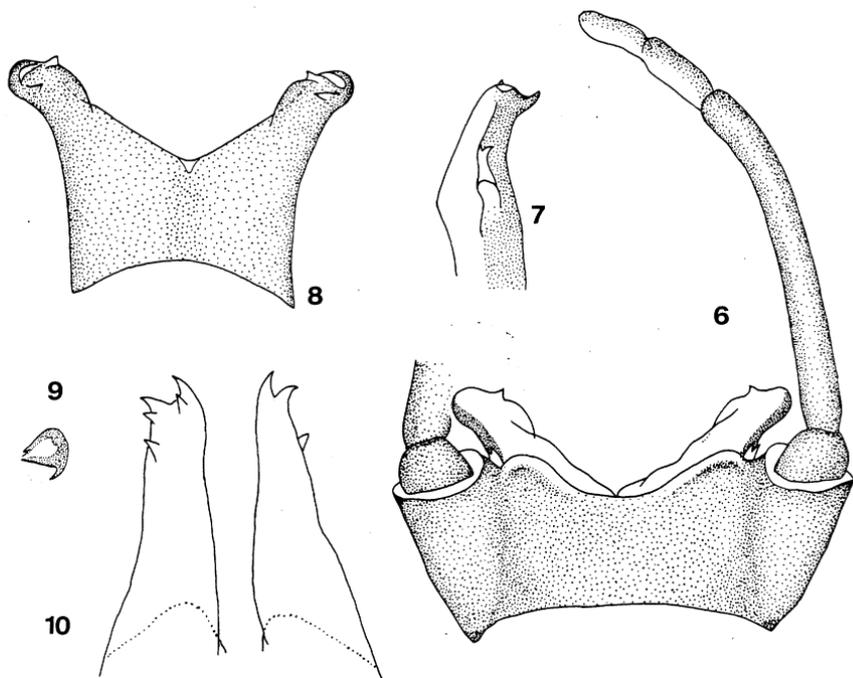
Imago, male

Body length and length of fore wings 8.5 mm, cerci damaged. Thorax dark brown, without conspicuous markings. Fore legs brown, middle and hind legs yellowish. All femora without a dark spot on the dorsal surface. Fore wings relatively large, slightly brown colored on the basal half. Longitudinal and cross veins dark brown and unicolorous. In costal area transversal veins well apparent, also in part near the base. Humeral vein clear. Pterostigma whitish, transversal veins simple. Abdomen brown, without particular markings, nerve ganglia clear and hardly visible. Cerci uniformly brown.

Genitalia:

Posterior margin of styliger largely concave, the two extensions rather broad and clearly externally directed (fig. 6). Penis rather short, the lobes visibly directed to the exterior. In ventral view the inner subapical margin of penis lobes evidently convex (figs. 6 and 8). In lateral view the apical margin of the lobe forms together with the outer tooth a rounded concavity (fig. 7). Apical contour of the lobe in caudal view similar to that of *R. hybrida* ETN. (SOWA et al. 1985), but less flattened dorsoventrally (fig. 9). Titillators rather slender and toothed on apex (fig. 10).

Female imago and subimagines unknown.



Figs. 6 - 10: *Rhithrogena austriaca* sp. n., male imago. 6: genitalia from ventral view; 7: fragment of penis from lateral view; 8: penis from dorsal view; 9: apical part of right penial lobe from caudal view; 10: titillators.

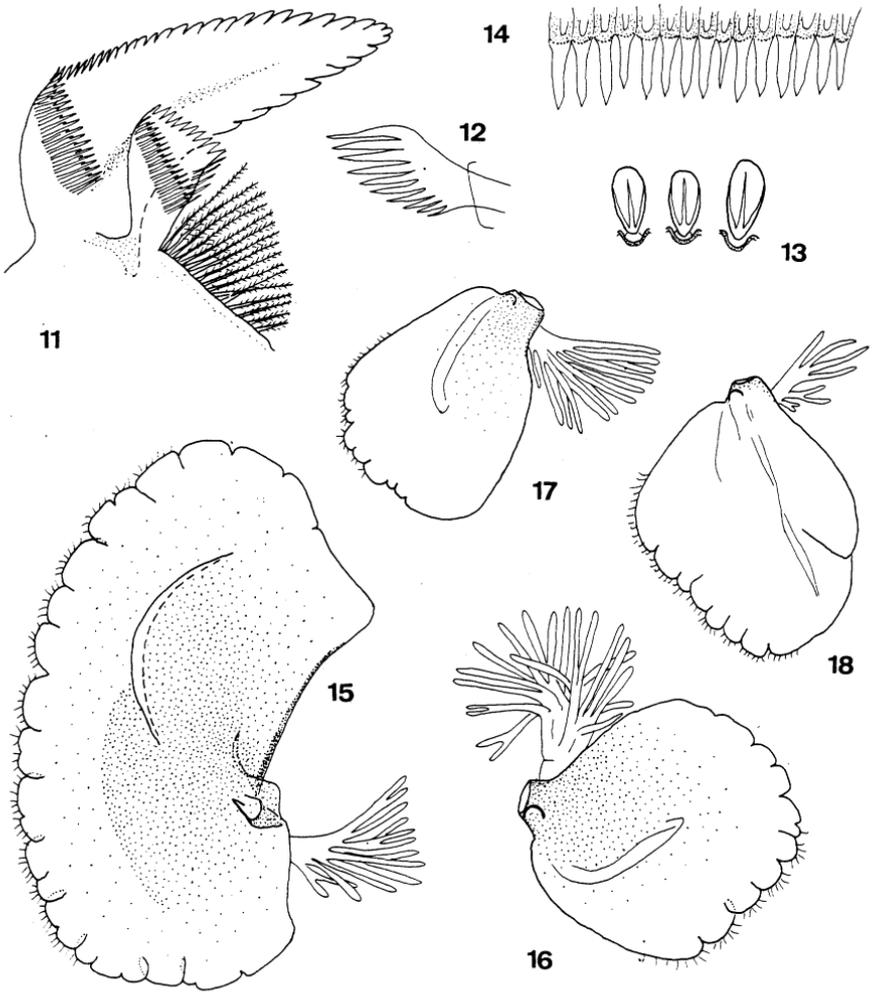
Egg (of nymph in last stage)

Length 200 μm , diameter 130 μm approximately. Egg surface covered with numerous adhesive elements. On central egg surface these adhesive elements are small and rather sparse. On the two egg poles they are bigger and accumulate, thus forming a dense and rather extended concentration. Egg surface completely granulated mainly by rounded "macrogranules" as seen from above, bigger and more densely grouped on the two poles. On the rest of the chorion they are scattered or more or less grouped around the adhesive elements (which develop directly from the chorion). Better developed eggs show numerous microgranules on their surface. External margin of micropylar plate without a visible granulation.

Nymph (last stage)

Body length: 7.0 - 7.5 mm, cerci 6.5 mm. General coloration of body pale, grey yellowish. The examined material is strongly depigmented, therefore details of coloration are not visible. Labrum rounded on the sides. Prosteca of right mandible as in fig. 11. Apex of lacinia with 8 - 9 combs. Each of the external combe consisting of 9 - 10 teeth (fig. 12). Femora without dark spots on dorsal surface. Spines on the dorsal surface of femora moderately numerous, those of the center of hind femora rather long and thin, slightly extended apically (fig. 13). Claws with two rather big teeth. Anterior margin of the lateral sclerite of the first abdominal sternum very slightly directed anteriorly. Middle

of posterior margin of fifth tergum as in fig. 14. Lamellae of all gills moderately crenated (figs. 15 - 18). Lamella of the first gill with a long flat semi-lunar fold. Nerve ganglia pale and hardly visible.



Figs. 11 - 18: *Rhithrogena austriaca* sp. n., nymph. 11: fragment of right mandible; 12: pectinate spine from the terminal part of maxilla; 13: spines from central part of dorsal surface of hind femur; 14: central portion of the posterior margin of the fifth abdominal tergum; 15: first gill; 16: second gill; 17: sixth gill; 18: seventh gill.

Material

Austria: Holotype male imago, Gosslinger Moor, 70 km SE of Linz, 350 m, 30.8.1975, leg. A. FISCHER. Paratypes: male nymph in last stage. Upper Austria, Steyr river near Klaus, 450 m, 08.1969, leg. V. PUTHZ; female nymph in last stage, Tyrol, Brandenberger Ache at Kaiserhaus, 700 m, 15.08.1985, leg. P. WEICHSELBAUMER.

Affinities

As imago male this new species seems to be closely related to *R. hybrida* ETN. from which it differs mainly by the shape of penis in ventral view, the internal margin of penis lobe being evidently arched. In egg stage *R. austriaca* sp. n. shows relations to *R. puthzi* SOWA as to the dispersion of adhesive elements and of granules. The granules, however, are more differentiated in size and bigger in *R. puthzi*. The nymphs relate closely to the nymphs of the nominal species of the group, especially as to their dimensions. They differ from *R. hybrida* in the greater number of teeth on the combs of the lacinia as well as in the shape of the gills.

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