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Rhyacophila extensa Martynov, 1928 from Nepal (Trichoptera: Rhyacophilidae)

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Abstract – Ottó Kiss 2012: *Rhyacophila extensa* Martynov, 1928 from Nepal (Trichoptera, Rhyacophilidae). –*e-Acta Naturalia Pannonica, 4: 01–08.* A paratype male imagine and allotype female imagine of the *Rhyacophila extensa* Martynov, 1928 (=syn. *Rhyacophila carletoni* Banks, 1931) are described from Nepal and illustrated with drawings of the genitalia and photos.

Key words – Trichoptera, *Rhyacophila*, *naviculata*-group, Ganesh Himal, Nepal

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Introduction

The number of Trichoptera species in 2009 was estimated to be about 13,574. Rhyacophilidae are represented by 753 species (6% of species) and are distributed in the East Palaearctic, West Palaearctic, Nearctic and the Oriental biogeographic regions (Morse 1997, 2011).

Márton Hreblay and his colleagues, including Lajos Németh, made several Lepidoptera collecting expeditions to the Nepalese region of the Himalayas in the 1990s where they also collected Trichoptera imagines and donated the Trichoptera material to the author. I have found two male specimens and one female specimen of *Rhyacophila extensa* Martynov, 1928 (=syn. *Rhyacophila carletoni* N Banks, 1931), in the *R. naviculata* group Ross, 1956 (Branch *R. naviculata* Schmid 1970). *Rhyacophila extensa* was described from Kirghizstan, near the lake Issyk Kul (Martynov 1927a,b). *Rhyacophila carletoni* N Banks, 1931 was reported from Kullu, Himachal Prades, north of Shimla, India (Ross 1956) and from Tien-Shan, Hindu-Kush and Pakistan (Schmid 1970). This is the first time the occurrence of this species has been reported from Nepal. This species resembles *Rhyacophila macrorrhiza* Sun & Yang 1995, collected in SW China, (Sichuan province, Song-pan county, Huang-long, Fu river) in 1990 at an elevation of 3150 m by Morse & Yang & Li & Chen (Figs 7–10). The female allotype of this species has not been described at all so far.

Material and methods

Nepal is a small, landlocked Himalayan country. The climate varies from cool summers and severe winters in north to subtropical summers and mild winters in south. Most of the rivers flow southward from the glaciers of Nepal to join the Ganges. From 3,000 to 4,000 m are the eastern and western Himalayan subalpine conifer forests, including *Picea spp*., *Abies spp*., *Tsuga spp*, and *Larix spp*.

The imagines of this species were caught by light trapping at an elevation of the 3000 m in the Ganesh Himal, Rasuwa District, and Central Nepal with the Trisuli River as one of its large rivers (Figs 18–21).

The specimens are stored in 75% ethanol. The posterior half of the abdomen of the paratype male and allotype female imagines were cleared in 10% lactid acid and the phallic apparatus of the male everted (Blahnik & Holzenthal 2004). Then they were placed in ethanol for examination under a stereomicroscope (Nikon, SMZ-10-2x) and sketched. For the identification of species I overviewed the works by (Kimmins 1952, 1964, Kiss & Malicky 2003, Kiss, 2011a,b, Malicky 1997, 2004, 2006, 2010, Ross 1956, Schmid 1970, and Sun and Yang 1995) and also sent the drawing of the male genitalia to Professor Malicky, who identified it as *Rhyacophila extensa* Martynov, 1928. The imagines of *Rhyacophila extensa* Martynov, 1928 are kept in the collection of Ottó Kiss at Hort, Hungary. The

terminology for genitalia used in this paper follows that of Ross (1956), Malicky (2010), Oláh & Johanson (2008), Schmid (1970), and Sun and Yang (1995).

The following abbreviations are used: a = apodeme; a.b. = apical band; a.l.IX. = apicodorsal lobe of segment IX; a.s. = anal sclerite; c. = paired female cerci; C = caudal view; D = dorsal view; end. = endotheca; f.s. = first segment of paired inferior appendages; L = left lateral view; par. = paired parameres; ph. = phallicata (aed. = ''aedéage'' of Schmid 1970); phal. = phallotheca; s.j. = second joint of paired inferior appendages; t.b. = tergal band; ten. = paired tenons of the phallotheca; tend. = tendon of an inferior appendage, first segment; X = segment X.

Description of the species from Nepal

Rhyacophila extensa Martynov, 1928
(Figs 3–6, 11–17)

Male body length 10 mm, forewing length 15.5 mm, forewing width 4 mm, length of each antenna 10 mm. Body, antennae, palpi, legs and wings yellowish brown, abdomen brown, (Fig. 11).

Male genitalia (Figs 3–6, 11–13): Apicodorsal lobe of segment IX (Figs 3, 4) relatively long in lateral view with broad base and narrower rounded distal end, its two sides slightly curved in dorsal view. Segment X (Figs 3, 5) lobe-like, small and elongated in lateral view. Anal sclerites (Fig. 3, 5) paired, circular in lateral view and triangular in ventral view. Apical band (Fig. 3) ribbon-like in lateral view. Phallicata (Fig. 3) wave-like, slightly curved and tapering distally; paramere (Fig. 3) concave, shorter than phallicata, uniformly narrowing distally with tiny, upward curved apex in lateral view. First segment of inferior appendages (Fig. 3) long, second joint of inferior appendages (Figs 3, 6) with ventral end produced in a long process with three teeth dorsally, slightly dented and covered with thick rows of teeth on oblique side in lateral view.

Material – Paratype**:** 2 ♂♂, Ganesh Himal, 1 km SE of Somdang, 3000 m, 28°11′N, 85°12′E by light trapping 08.04.1995. leg. Márton Hreblay and Lajos Németh, (Figs 11–13, gen. prep. No. 119/A, coll. Ottó Kiss).

Diagnosis – This species is similar to *Rhyacophila macrorrhiza* Sun & Yang, 1995 (naviculata group, Figs 7–10), but differs from it in that:

1. segment X oblique, sub-trapezoid in left lateral view,
2. apical band triangular in lateral view,
3. paramere shorter than phallicata,

anal sclerites paired and footprint-shaped in caudal view.

Female body length 12 mm, forewing length 17 mm, forewing width 5.5 mm, length of each antenna 8.5 mm. Body, antennae, palpi and wings yellowish brown, the major longitudinal veins of wings (R3, R4, R5, M1, M2) blackish brown, abdomen brown, legs yellowish brown (Fig. 14).

Allotype: 1 ♀, Ganesh Himal, 1 km SE of Somdang, 3000 m, 28°11′N, 85°12′E by light trapping 08.04.1995. leg. Márton Hreblay and Lajos Németh, (Figs 15–17, gen. prep. No. 119/B, coll. Ottó Kiss).

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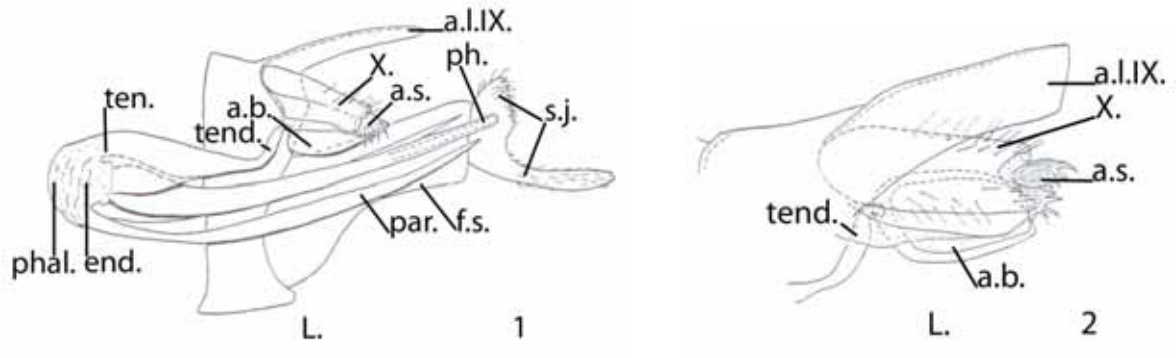


Figures 1–2. *Rhyacophila extensa* Martynov, 1928 (=syn. *Rhyacophila carletoni* N Banks, 1931) male genitalia, 1, left lateral view (L.); 2, apicodorsal lobe of segment IX, segment X, anal sclerite, apical band, tendon of an inferior appendage, first segment, left lateral view (L.) (from Ross, 1956)

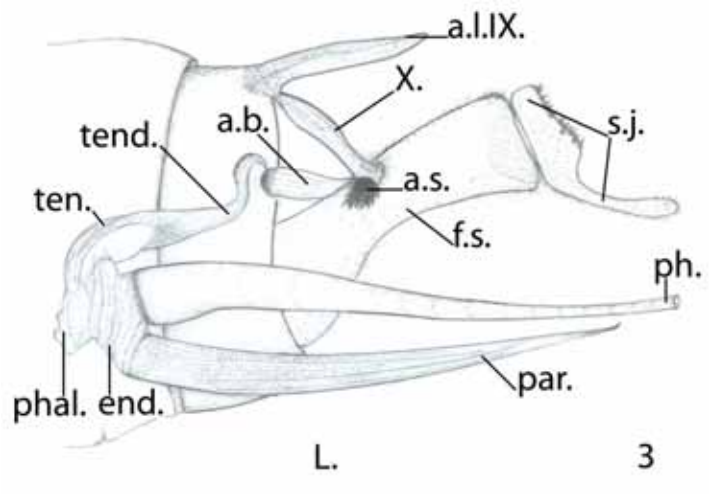
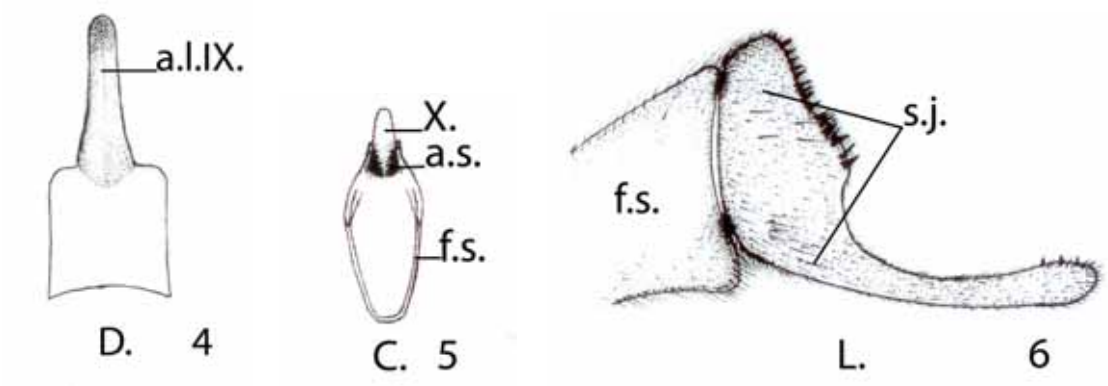


Figure 3. *Rhyacophila extensa* Martynov, 1928 (=syn. *Rhyacophila carletoni* N Banks, 1931) male genitalia, 1, left lateral view (L.)



Figures 4–6. *Rhyacophila extensa* Martynov, 1928 (=syn. *Rhyacophila carletoni* N Banks, 1931), male genitalia, apicodorsal lobe of segment IX, dorsal view (D); 5, segment X, anal sclerite, first segment of paired inferior appendages, caudal view (C); 6, first segment of paired inferior appendages and second joint of paired inferior appendages, left lateral view(L.)

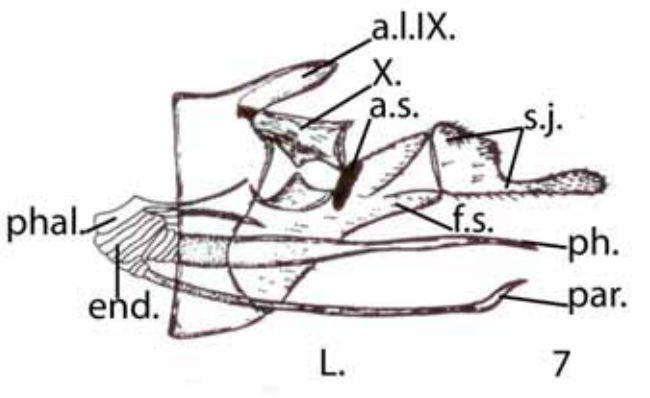
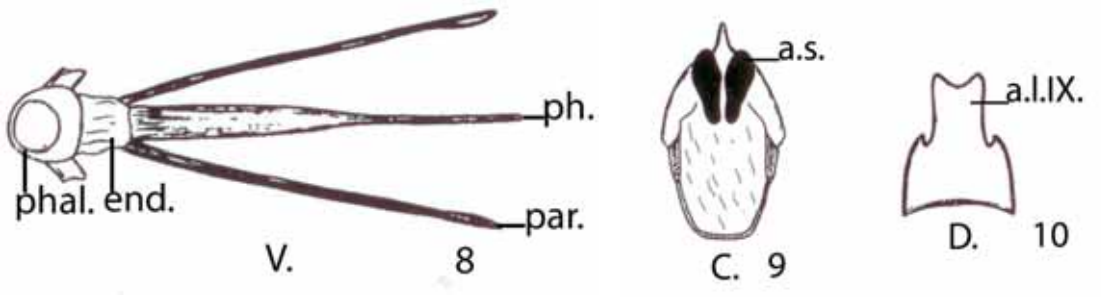


Figure 7. *Rhyacophila macrorrhiza* Sun and Yang, 1995: male genitalia, 7, left lateral view (L.) (from Sun and Yang, 1995)



Figures 8–10. *Rhyacophila macrorrhiza* Sun and Yang, 1995: male genitalia, phallic apparatus, ventral view (V.); 9, apical band, tergal strap, and anal sclerite, caudal view (C.); 10, apicodorsal lobe of segment IX, dorsal view (D.) (from Sun and Yang, 1995)

Figures 11–12. *Rhyacophila extensa* Martynov, 1928 (=syn. *Rhyacophila carletoni* N Banks, 1931), male, left lateral view: 11 = habitus, 12 = genitalia habitus

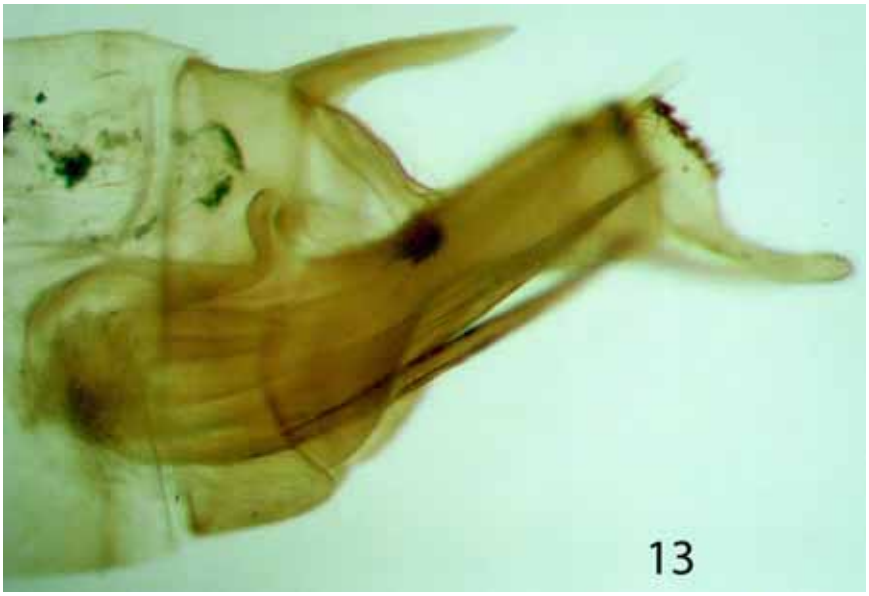
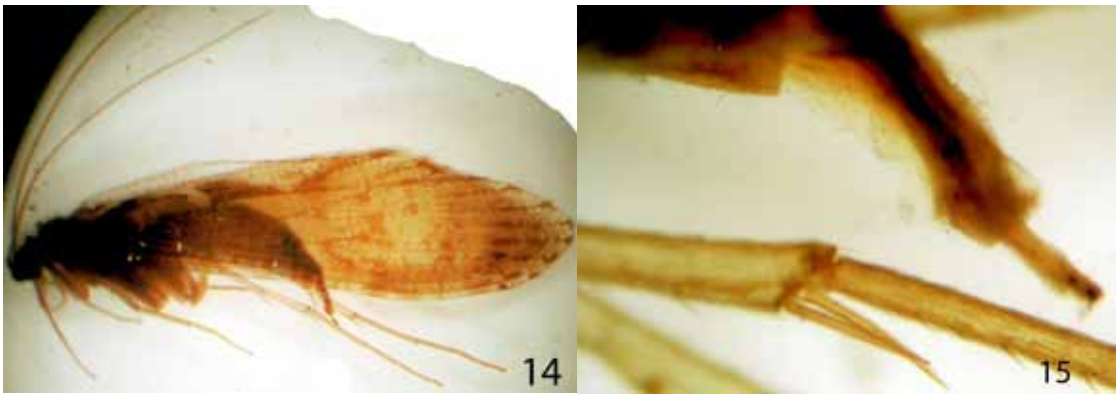


Figure 13. *Rhyacophila extensa* Martynov, 1928 (=syn. *Rhyacophila carletoni* N Banks, 1931), 13 = male genitalia prep. habitus, left lateral view



Figures 14–15. *Rhyacophila extensa* Martynov, 1928 (=syn. *Rhyacophila carletoni* N Banks, 1931), 14, allotype female habitus, left lateral view; 15, female genitalia habitus, left lateral view

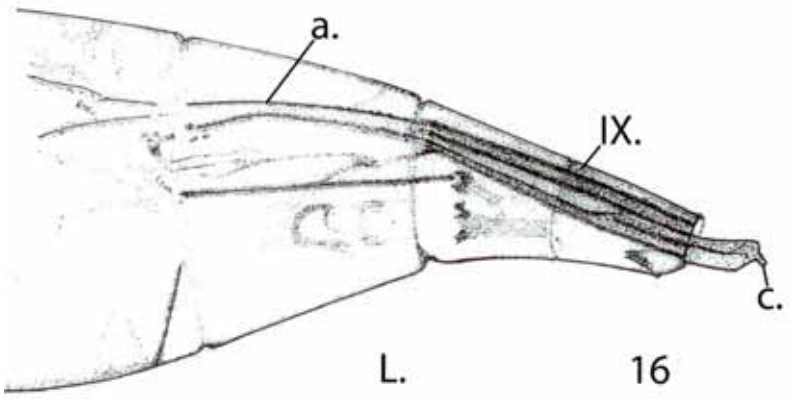


Figure 16. *Rhyacophila extensa* Martynov, 1928 (=syn. *Rhyacophila carletoni* N Banks, 1931), allotype female genitalia, left lateral view (L.). (Abbreviations: a. = apodeme; c. = paired female cerci; segment IX

Figure 17. *Rhyacophila extensa* Martynov, 1928 (=syn. *Rhyacophila carletoni* N Banks, 1931), female genitalia prep., left lateral view

Figure 18. Collecting sites at Somdang, Nepal (photo by Tibor Csővári)

Figure 19. Power plant and collecting sites at Somdang, Nepal (photo by Tibor Csővári

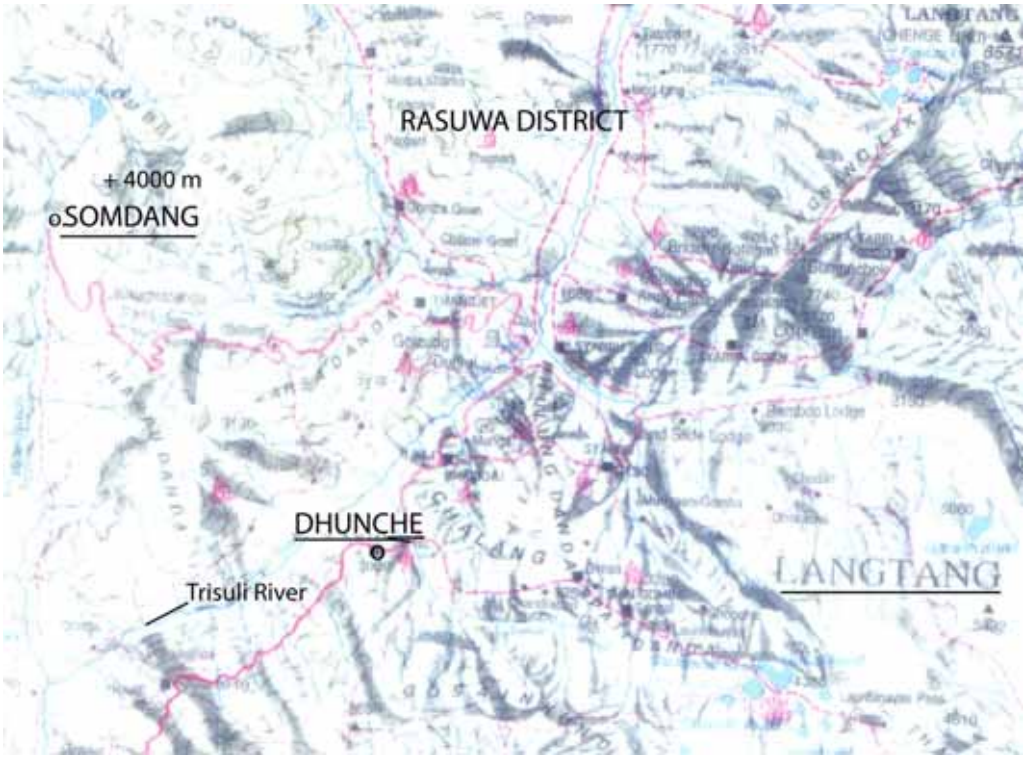


Figure 20. Collecting site of *Rhyacophila extensa* Martynov, 1928: Somdang, Nepal

Figure 21. Map of collecting site: Somdang, Nepal (R.= River, o = light trap, B•= Barabise, Rasuwa District, Δ = Mt. E. =Mt. Everest, S• = Somdang, K•= Katmandu, N.•D. = New Delhi)

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