

## Review of the genus *Pseudoneureclipsis* ULMER, 1913 (Trichoptera: Pseudoneureclipsidae) from India with description of *P. ramosa* from India.

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**Abstract:** The genus *Pseudoneureclipsis* ULMER, 1913 is reviewed from India where the genus is represented by 11 species. *Pseudoneureclipsis ramosa* is redescribed and illustrated based on a specimen collected from the Himachal Pradesh. In addition, a catalogue of the Indian species of *Pseudoneureclipsis* is provided.

**Keywords:** India, Himachal Pradesh, *Pseudoneureclipsis*, taxonomy, catalogue.

### Introduction

*Pseudoneureclipsis* was established by ULMER (1913) within the family Polycentropodidae. Based on his observations of wing venation, MARTYNOV (1914, 1934) advocated that the genus be placed in the Psychomyiidae under the subfamily Ecnominae. BANKS (1916) placed *Pseudoneureclipsis* in the family Hydropsychidae. Later in 1951, Ulmer erected the subfamily *Pseudoneureclipsinae* within the Polycentropodidae to include the Old World genus *Pseudoneureclipsis* (FISCHER 1972). But based on cladistic analysis, LI & al., (2001) transferred *Pseudoneureclipsis* to the Dipseudopsidae. The placement of *Pseudoneureclipsis* in the Dipseudopsidae has not been fully accepted (MALICKY 2001, 2007; MALICKY & PROMMI 2006; MEY 2006) and is not corroborated by higher-level phylogenetic studies (KJER et al. 2001, 2002; HOLZENTHAL & al. 2007). According to JOHANSON & ESPELAND (2010), it would better fit into the Ecnomidae.

This genus is represented by 118 species at world level and of this total, 99 (more than 2/3) species are present in the Oriental region alone (MORSE, 2017) showing its diversity and origin in Southeast Asia. Most of the contribution to the *Pseudoneureclipsis* was made by MALICKY (2001, 2008, 2009, 2014), MEY (2003), OLÁH & JOHANSON (2010). MALICKY (2009) described 8 new species in addition to reporting *Ps. ramosa* from India. At present, 11 species are on record from India: Uttarakhand (1 species by MALICKY, 2009), Meghalaya (3 species, by MALICKY, 2009), Manipur (2 species by MALICKY, 2009), Karnataka (1 species by OLÁH & JOHANSON, 2010) and Tamil Nadu (2 species by MALICKY, 2009).

### Materials and Methods

In this study, the specimens were collected by M.S. Pandher and S.H. Parey during the months of April – October using light traps with ultraviolet or mercury-vapour bulbs. Where electricity was not available, we used a 22-W Circline ultraviolet, fluorescent (BL.) tube (Bioquip Products, USA) powered by a 12-volt rechargeable battery. These lights were placed near the edge of high altitude streams in the Himalayan region of India for 1–4 hours beginning at dusk. The collected

specimens were preserved in 70% ethyl alcohol with a drop of glycerol and labeled with pertinent information such as collection date, locality, altitude, and name(s) of the collector(s).

Various morphological characters such as labial palps, antennae, setal warts, legs, wing maculation and venation, and genitalic structures were examined. For studying genitalic characters, the genitalia were dissected from the specimen and put in 10% KOH solution overnight. The genitalia were put in a solution of 80% ethyl alcohol with a drop of glycerol for observation. The illustrations were prepared with a radical zoom stereoscopic binocular microscope (maximum magnification of 160X) fitted with an ocular grid in one eyepiece. The inking of the final drawings was done with Rotring black ink. After illustration, the genitalia were transferred to a glass vial together with the rest of the specimen in 80% alcohol. Terminology for the genitalia follows that of HAMILTON (1986). The illustrations were scanned at 600 dpi greyscale, and mounted onto plates in Adobe® Photoshop® 7.0.

The voucher specimen has been deposited in the National Pusa Collection, Indian Agricultural Research Institute, New Delhi, India (NPC). Specimens in the Checklist are deposited in the following collections (arranged alphabetically by acronyms): Canadian National Collection, Ottawa, Ontario, Canada (CNC)

Hans Malicky Collection, Linz am See, Austria (HMC)  
National Pusa Collection, Indian Agricultural Research Institute, New Delhi, India (NPC)

National Zoological Collection, Zoological Survey of India, Kolkata, India (NZC)

Oláh Private Collection, under National Protection of the Hungarian Natural History Museum, Budapest, Hungary (OPC)

Zoological Museum, Hamburg, Germany (ZMH)

Zoological Museum Stockholm, Sweden (ZMS)

### *Pseudoneureclipsis ramosa* ULMER, 1913

**Description:** Adult male; color in alcohol, dark brown, antenna light brown, maxillary palp pale, wings hyaline, light brown, dorsum of head black brown. Length from tip of head to apex of folded forewing about 5mm long; maxillary palp 1.25mm long, segment II rounded, smaller than segment III, segment V long and flexible; labial palp 0.50mm long. Length of forewing about 4.25mm; venation typical for genus. Hind wing length about 3mm.

#### Male genitalia (Figs. 1- 5):

Sternum IX (s. IX) very short, with rounded excision on the posterior margin at middle, almost straight anterior margin. Tergum IX+X trilobed, with unpaired dorsomesal lobe (d.m.IX+X) directed caudad, slender, setose apically; paired dorsolateral lobes (d.l.IX+X) almost equal to the dorsomesal lobe, directed dorsocaudad, setose. Preanal appendages each quadrate in lateral view, with short ventral process bearing mesoventral row of bristles visible in dorsal view. Inferior appendages each with basodorsal process curved mesad and ventrad, acute at apex; main body of appendage longer and with an acute apex in lateral and ventral views; in ventral view, inferior appendages broad basally and tapering towards acute apex. Phallic apparatus with broad, long phallobase, continuing into straight, horizontal tube-like phallotheca.

posteroventrally acute spine present. Length of phallotheca and protruding endotheca discernable; strong, long, slender spine embedded together with sclerotized structure, possibly representing phallotremal sclerite.

**Material examined:** Male; India: Himachal Pradesh; Chopta, 1100m, 30-v-2008, Pandher & Parey (NPC).

**Diagnosis:** This species closely resembles in the shape of the male genitalia *Pseudoneureclipsis josia* MALICKY & CHANTARAMONGKOL, 1993 and *P. kainam* MALICKY & CHANTARAMONGKOL, 1993, both reported from Thailand. It is closer to *P. josia*. However, in *P. ramosa* ULMER, 1913, the dorsomesal lobe (d.m. IX+X) is almost equal to the dorsolateral lobes (d.l.IX+X) in lateral view; rounded apex of dorsomeasal lobe (d. m. IX+X) in dorsal view and Sternum IX (s. IX) is broad; whereas, in *P. josia* MALICKY & CHANTRAMONGKOL, 1993 the dorsomesal lobe (d.m. IX+X) is smaller than the dorsolateral lobes (d.l. IX+X) in lateral view; apex of the dorsomesal lobe (d.m.IX+X) is invaginated medially in dorsal view and the sternum IX (s.IX) is small.

**Distribution:** India: Himachal Pradesh, Afghanistan, Thailand, Nepal, Indonesia, Vietnam, Myanmar, Cambodia, Malaysia.

#### Catalogue of the known species of genus *Pseudoneureclipsis* from India.

1. *Pseudoneureclipsis bonaventura* MALICKY. India (Meghalaya)

*Pseudoneureclipsis bonaventura* MALICKY, 2009: 718

Type: Male; India: Meghalaya; Shillong, Myntang, 21-iv-1960, CNC.

2. *Pseudoneureclipsis diogenes* MALICKY. India (Assam, Manipur)

*Pseudoneureclipsis diogenes* MALICKY, 2009: 721

Type: Male; India: Assam; Sirtrang, 28-iv-1960, CNC. Paratypes: 7 males, collection data same as of holotype. Paratypes; 5 males, Manipur, Longbi Khulen, 30-vi-1960, CNC.

3. *Pseudoneureclipsis ezbon* MALICKY. India (Meghalaya)

*Pseudoneureclipsis ezbon* MALICKY, 2009: 716

Type: Male; India: Meghalaya; Shillong, Myntang, 21-iv-1960, CNC.

4. *Pseudoneureclipsis hieronymus* MALICKY. India (Manipur)

*Pseudoneureclipsis hieronymus* MALICKY, 2009: 719

Type: Male; India: Manipur; Vangai Chungpao, 21-v-1960, CNC.

5. *Pseudoneureclipsis higleri* MALICKY. India (Meghalaya)

*Pseudoneureclipsis higleri* MALICKY, 2009: 721

Type: Male; India: Meghalaya; Thangrain, 22.iv.1960. Paratypes: 1male, Meghalaya, Mawpran, 10-iv-1960. 1male, Meghalaya, Rumkheng, 26-iii-1960. 1male, Meghalaya; Nongrim, 27-iii-1960, CNC.

6. *Pseudoneureclipsis malaleel* MALICKY. Myanmar; India (Manipur)

*Pseudoneureclipsis malaleel* MALICKY 1993:1108

Type: Male, Myanmar, Mekane, 2.-8-11-1934, ZMS Zool.Mus.Stockholm

7. *Pseudoneureclipsis porphyrios* MALICKY. India (Uttarakhand)

*Pseudoneureclipsis porphyrios* MALICKY, 2009: 715

Type: Male; India: Uttarakhand: Pauri Garhwal, Duldhar, 2-vi-1958, CNC.

8. *Pseudoneureclipsis puyah* OLAH & JOHANSON. India (Karnataka)

*Pseudoneureclipsis puyah* OLAH & JOHANSON, 2010: 31

Type: Male; India: Karnataka, Tunga Rives at Shimoga, 18-iv-1992, (OPC). Paratypes: 5 males, collection data same as holotype.

9. *Pseudoneureclipsis ramosa* ULMER. Widespread from Afghanistan to Bali

*Pseudoneureclipsis ramosa* ULMER, 1913: 84

Type: Male; Indonesia: Semarang, Java, Oct. 1909, (ZMH). - Malicky 2009: 713; Morse 2017. - India: UDMNCH, Sirtang, 28.4.1960; C, Bandarkhal, 8.5.1960; UJKH, Therria, 2.4.1960; UJKH, Hat Nongshken, 4.4.1960; UP, Rishikesh, 25.-31.3.1958;

Kumaon, Bamrari, 24.9.1958 (all CNC).

10. *Pseudoneureclipsis sabta* MALICKY. India (Tamil Nadu)

*Pseudoneureclipsis sabta* MALICKY, 2009: 715

Type: Male; India: Tamil Nadu; Chennai, Kunjankhuzi, 2-i-1962, CNC.

11. *Pseudoneureclipsis ziphjon* MALICKY. India (Tamil Nadu)

*Pseudoneureclipsis ziphjon* MALICKY, 2009: 722

Type: Male; India: Tamil Nadu; Chennai, Ottakada, 5-i-1962, CNC. Paratypes: 4males, collection data same as of holotype.

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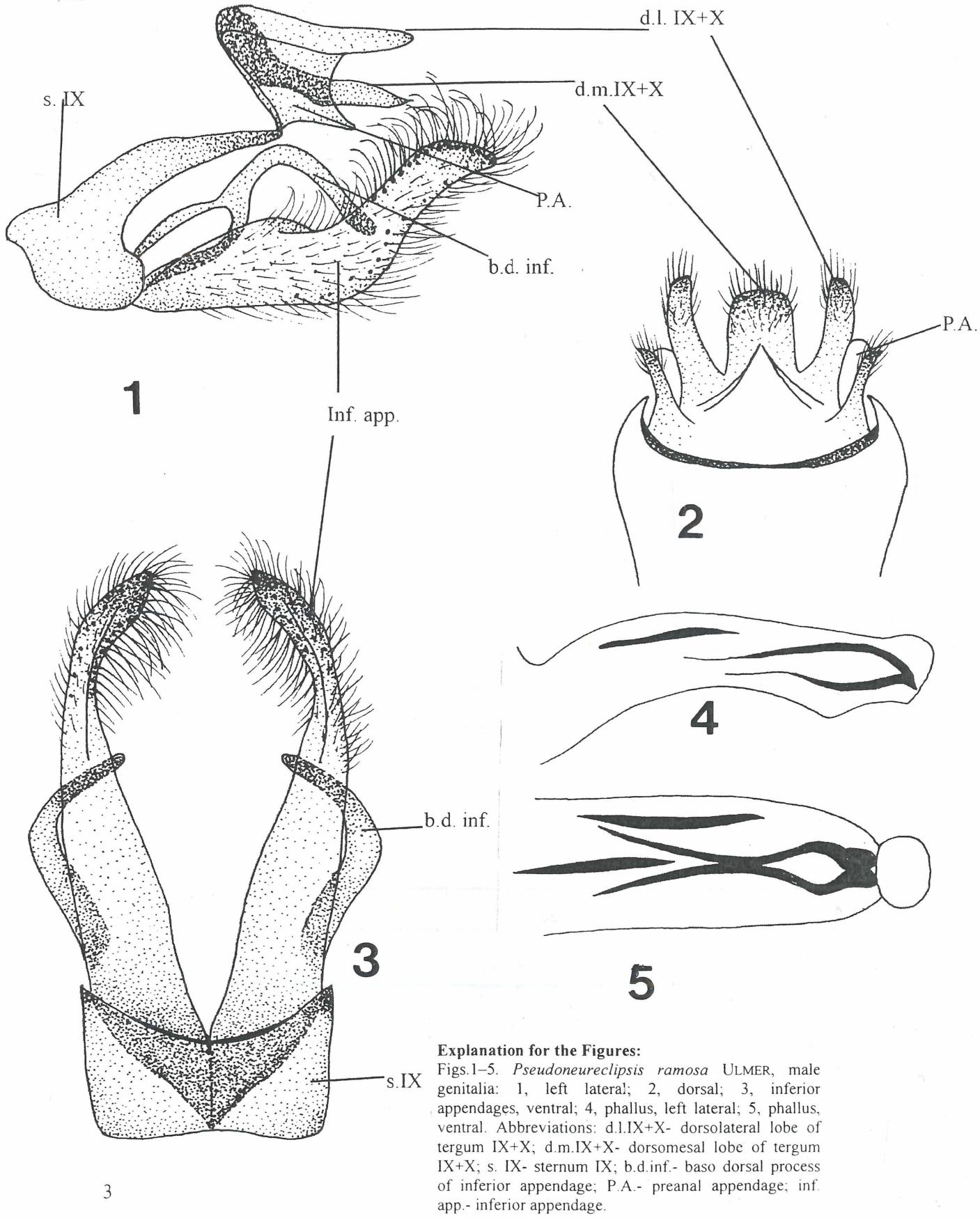
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**Explanation for the Figures:**

Figs. 1–5. *Pseudoneureclipsis ramosa* ULMER, male genitalia: 1, left lateral; 2, dorsal; 3, inferior appendages, ventral; 4, phallus, left lateral; 5, phallus, ventral. Abbreviations: d.l.IX+X- dorsolateral lobe of tergum IX+X; d.m.IX+X- dorsomesal lobe of tergum IX+X; s. IX- sternum IX; b.d.inf.- baso dorsal process of inferior appendage; P.A.- preanal appendage; inf. app.- inferior appendage.

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