

Research Article

GENITALIA ATTRIBUTES OF *TRISULOIDES CAERULEA* BUTLER AND FIRST RECORD FROM NORTH-EAST INDIA

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ABSTRACT

External male and female genitalia of *Trisuloides caerulea* Butler have been studied in detail for the first time to update the diagnosis of this species. This species has been recorded for the first time from North-east India.

Keywords: *Lepidoptera, Noctuidae, Trisuloides Caerulea, Male and Female Genitalia*

INTRODUCTION

Butler (1881) proposed the genus *Trisuloides* and designated *Trisuloides sericea* Butler as its type species. Moore (1883) included *catocalina* Moore it. Warren (1912), Droudt (1950), Sugi (1976), added more species under the present genus. Poole (1989) catalogued 20 species in the genus *Trisuloides* from the world. Sivasankarn *et al.*, (2012) listed five species of this genus in their checklist of Noctuidae of India.

In the present manuscript, male and female genitalic attributes of single species *Trisuloides caerulea* Butler have been studied, incorporated to its diagnosis and species recorded from North-East India for the first time.

MATERIALS AND METHODS

Intensive and extensive collection-cum-survey tours have been conducted in Northeast India between September, 2009 to May, 2012. The collection of adult Noctuid moths has been made with the help of light traps fitted at different places during night time. Both vertical sheet and portable light trap methods have been used for this purpose. Petromax lamp/ battery operated lamp was also used for collection purpose in some areas where electricity supply was not available. Collection was done in pre-monsoon and post-monsoon seasons.

Male and female representatives of *Trisuloides caerulea* Butler have been collected from Arunachal Pradesh. The identification of captured specimens was done with the help of relevant literature (Hampson, 1894). For study of genitalic attributes, the abdomen detached from the body of preserved moth with needle and forceps, as cutting of last few segments often damages the constituent parts of male and female genitalia (Robinson, 1976).

The detached abdomen dropped in test tube containing 10% KOH overnight to soften the chitin and for removal of muscles and other unwanted parts.

The potashed material washed in distilled water and residual traces of KOH removed later by dipping these structures in 1% glacial acetic acid. The abdomen dissected in 50% alcohol for taking out the male and female genitalic structures.

Aedeagus separated from the main genitalia by carefully keeping juxta and transtilla intact. Vesica everted carefully with help of fine forceps. After proper dehydration in different grades of alcohol, the genitalic structures were cleared in clove oil and then mounted in Canada balsam on cavity slides.

The terminology given by Klots (1970) has been followed in the present studies for naming different structures of genitalia.

Observations

Genus *Trisuloides* Butler

Butler, 1881. *Ann. Mag. Nat. Hist.* (5) 7: 36.

Type Species: *Trisuloides sericea* Butler.

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Diagnostic Characters: Palpi reaching vertex of head and clothed with hair; eyes hairy. Thorax hairy; Abdomen with dorsal tufts; tibiae moderately hairy. Fore wing with the apex somewhat rounded. Hind wing with vein M₂ from below centre of discocellulars

***Trisuloides caerulea* Butler**

Trisuloides caerulea Butler, 1889. *Ill. Het* 7: 35

Description: Head suffuse, with frons fuscous mixed with white; palpi porrect, fuscous, irrorated with white; antennae bipectinate upto middle; collar and thorax suffuse, later tinged with fuscous. Forewing fuscous mixed with brown; antemedial and medial lines wavy, black, defined by suffuse white; later indistinct below cell, merged in large fuscous blotch on inner margin; whitish patch with brown suffusion on disk extending to costa and outer angle with postmedial line, indistinct, brown wavy through it; three pale specks on costa below apex; submarginal area brown except tornus. Hindwing fuscous with blue tinge; cilia chequered with white; area above tornus with large white speck. Abdomen darker. Underside fuscous, irrorated with white. Forewing with medial oblique yellow band from costa to tornus; antemedial yellow spot below costa.

Male Genitalia: Uncus small, narrow at base, tip like hood of cobra; tegumen U-shaped, small; transtilla membranous; juxta heart shaped; vinculum V-shaped; saccus well developed; valve long, broader at base, costal margin concave at middle, saccular margin curved at middle; a saccular process long, curved, harpe long, broad; cucullus long, narrow, round, setosed; aedeagus long, narrow and curved towards base, two small robust spines at tip; vesica scobinated; ductus ejaculatorius enters into the aedeagus subapically.

Female Genitalia: Ovipositor lobes well developed strongly sclerotized, triangular, setosed; anterior and posterior apophysis almost of same length; osteum bursae sclerotized, with a robust, curved spine; ductus bursae small, strongly sclerotized; corpus bursae large, bulb-shaped, membranous; signum absent.

Material Examined

Arunachal Pradesh: Hunli 16.IX.2011- 1♂1♀.

Distribution: Arunachal Pradesh, N.W. Himalayas.

Abbreviations: AED: Aedeagus; PAP.A: Papilla analis; ANT.APO : Anterior apophysis; CRP.BU : Corpus bursae; DU.BU : Ductus bursae; PO.APO : Posterior apophyses; Cu1 : First cubital vein; Cu2 : Second cubital vein; 1A : First anal vein; 2A : Second anal vein; M1 : First medial vein; M2 : Second medial vein; M3 : Third medial vein; R₁ : First radial vein; R₂ : Second radial vein; R₃ : Third radial vein; R₄ : Fourth radial vein; R₅ : Fifth radial vein; Rs : Radial sector; Sc+R₁ : Stalk of Sc and R₁; JX : Juxta; TG : Tegumen; UN : Uncus; VES: Vesica; VN : Vinculum; VLV : Valva.

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REFERENCES

- Butler AG (1881).** Description of new genera and species of Heterocera from Japan. *Transactions of the Entomological Society of London* 1-23.
- Draudt M (1950).** Beitrage zur Kenntniss der Agrotiden-Fauna Chinas. Aus den Ausbeuten Dr. H. Hone's. *Mitteilungen der Münchner Entomologischen Gesellschaft* 49 1-174.
- Hampson GF (1894).** *The Fauna of British India, including Ceylon and Burma*, Moths 2 (Taylor and Francis Ltd.) London 1-609.
- Klots AB (1970).** *Lepidoptera, in Taxonomists Glossary of Genitalia in Insects*, 2nd edition, edited by Tuxen SD (Munksgaard, Copenhagen) 115-130.
- Moore F (1883).** Descriptions of new genera and species of Asiatic Lepidoptera Heterocera. *Proceedings of the Zoological Society of London* 1883 15-30.
- Poole RW (1989).** *Lepidopterorum Catalogus* (N. Ser.), Fasc. 118 Noctuidae (E. J. Brill, Leiden) 1-1314.

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Robinson GS (1976). The preparation of slides of Lepidoptera genitalia with special reference to Micro lepidoptera. *Entomology Gazzette* **27**(2) 127-132.

Sivasankaran K, Ignacimuthu S, Paulraj MG and Prabakaran S (2012). A checklist of Noctuidae (Insecta: Lepidoptera: Noctuoidea) of India. *Records of the Zoological Survey of India* **111**(3) 79-101.

Sugi S (1976). Descriptions of two new species of the genus *Trisuloides* Butler (Lepidoptera: Noctuidae: Pantheinae). *Tinea*, Tokyo **10** 57-62.

Warren W (1912). New Noctuidae in the Tring Museum, mainly from the Indo-Australian region. *Novitates Zoologicae* **19** 1-57.