



DYRZELA PLAGIATA WALKER REDISCOVERED AFTER >162 YEARS AS A NEW RECORD FROM WESTERN GHATS, INDIA WITH CHECKLIST OF DYRZELA (NOCTUIDAE: LEPIDOPTERA)

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ABSTRACT

***Dyrzela* Walker (1857) 1858, an Oriental noctuid genus comprises of eleven species. It is a rare noctuid from India, and the present study documents a new record of this almost after 162 years. Detailed redescription with illustrations of adults and male genitalia are provided. A checklist of known species of the genus *Dyrzela* is also provided.**

Key words: *Dyrzela*, Noctuidae, Western Ghats, chocolate-brown spotted noctuid, genitalia, redescription, illustration, new record, India, checklist

The noctuid moth, *Dyrzela plagiata* Walker (1857) 1858 is believed to be distributed widely in the Oriental region and so far, known from India to Sundaland, Sulawesi, Seram, New Guinea, Sri Lanka, Myanmar, Borneo (Holloway, 1989). Walker (1857) erected the genus *Dyrzela* with type species *D. plagiata* from North Hindustan. The placement of *D. plagiata* was uncertain, as it was placed under many genera by different workers: Hampson (1894) placed it under *Caradrina* Ochsenheimer, 1816; *Elydna* Walker, 1858 (Hampson, 1910); *Oglasa* Walker, 1859 and treated as species *costipannosa* by Swinhoe (1890). Zahiri et al., (2013) confirmed its generic assignment to *Dyrzela* Walker, 1858 based on molecular studies. There are total eleven extant species under the genus *Dyrzela* Walker, (1858) namely, *D. bosca* Swinhoe, 1890; *D. boscoides* Holloway, 1989; *D. castanea* Warren, 1913; *D. incrassata* Walker, 1858; *D. increnulata* Warren, 1913; *D. plagiata*; *D. roseata* Holloway, 1989; *D. squamata* Warren, 1913; *D. trichoptera* Robinson, 1975; *D. tumidimacula* Warren, 1913; *D. violacea* Holloway, 1989. Out of these known species, only one species namely, *D. plagiata* is reported from India. The literature published on moths including the checklist did not record or mentioned about this genus and species from India (Shubhalaxmi et al., 2011; Gurule and Nikam, 2013; Sondhi and Sondhi, 2016; Kalawate, 2018; Shubhalaxmi, 2018; Sondhi et al., 2018; Mitra et al., 2019; Singh, 2019).

Hampson (1894) reported the distribution of *D. plagiata* from Rangoon (=Myanmar), later he

reported it from India: PUNJAB (=Punjab province during British India; the present day Indian states of Punjab, Haryana, Chandigarh, Delhi and Himachal Pradesh and the Pakistani regions of the Punjab, Islamabad Capital Territory and Khyber Pakhtunkhwa); BOMBAY, Kanara, Karwar (Bombay presidency during British India; Canara (Kanara) was referred for West Coastal plains of present day Uttara Kanada (Karwar) and Dakshina Kanada (Mangalore) parts of Karnataka state); CEYLON, Kandy (=Sri Lanka); BURMA, Moulmein, Rangoon, Bhamo (=Myanmar) (Hampson 1910). Walker (1857) reported it from North Hindustan under *Dyrzela*. The voucher specimen of *D. plagiata* has not been recorded so far from its type locality (India) in the last 162 years. Hence, the present paper represents the rediscovery of *D. plagiata* after a long gap of more than one and a half century from its type locality and also reports its first record from Western Ghats, Maharashtra. *D. plagiata* is a monophagous species and the larval feeding is reported on *Grewia* and may be the reason of its rare appearance on the light trap. This report is particularly important as the monophagous species have threat to disappear or extinct if the habitat changes in their locality. During our studies, one specimen is reported from Pune, a highly urbanised and developed city, where lot of development activities are still under progress. These types of studies are important as it suggests the effect of development on the fauna of that particular city. On the contrary, other specimens were collected from the core area of Koyna Wildlife Sanctuary of northern Western Ghats, Maharashtra. The objective of this study

is to report a rare moth with its redescription, its first report from the Western Ghats along with checklist of the genus.

MATERIALS AND METHODS

The laboratory studies were carried out at the Entomology laboratory, Zoological Survey of India, Western Regional Centre, Pune. The specimens were collected using a light trap installed at different locations in the northern Western Ghats, Maharashtra, India. The collected specimens were euthanized with ethyl acetate vapours and were relaxed, pinned, and dry preserved in the laboratory. The identification was done as per Hampson (1894, 1910) and Holloway (1989). For redescrining the species, for the morphological and genitalia characters, the terminology used is as per Hampson (1894, 1910) and Holloway (1989) respectively. The records of distribution of the species have been verified from the literature (Walker, 1857; Swinhoe, 1890; Hampson, 1894, 1910; Holloway, 1989; Kononenko & Pinratana, 2013). All identified specimens were deposited in the National Zoological Collection, Zoological Survey of India, Western Regional Centre, Pune, Maharashtra, India (ZSI-WRC). The map of the collection locality was prepared using the open, free access QGIS software.

RESULTS AND DISCUSSION

A. Redescription

Genus *Dyrzela* Walker (1858); Superfamily Noctuoidea Latreille, 1809; Family Noctuidae Latreille, 1809; Subfamily Bagisarinae Crumb, 1956

Type species: *Dyrzela plagiata* Walker (1857) 1858

Dyrzela plagiata Walker (1857) 1858 (Figs. 1A-C)

Dyrzela plagiata Walker, (1857) 1858, List of the Specimens of lepidopterous Insects in the Collection of the British Museum, 15: 1758 (India, Hindustan, NHM (BMNH), London).

Oglasa costipannosa Swinhoe, 1890, Transactions of the Entomological Society of London, 1890: 266 (Myanmar, Rangoon, Moulmein, Bhamo, NHM (BMNH), London).

Oglasa costiplaga Swinhoe, 1891, Transactions of the Entomological Society of London, 1891: 153 (Myanmar, Rangoon, Moulmein, Bhamo, NHM (BMNH), London).

Dyrzela plagiata perampla Warren, 1913, in: Seitz A. (ed.): Die Gross-Schmetterlinge des Indo-Australischen Faunengebietes Gross-Schmett. Erde, II:

177 (British New Guinea, Oetakwa River, NHM (BMNH), London).

Elydna plagiata; Hampson, 1910, Cat. Lepid. Phalaenae Br. Mus. 9: 159.

Dyrzela plagiata: Holloway, 1976, Moths of Borneo with special reference to Mt. Kinabalu: 14.

Type locality: India [Hindustan].

Material examined: Male (ZSI-WRC, L-1902), India: Pune, Maharashtra (18.6482N; 73.7600E; altitude 580 m), 17.x.2018, coll. A.S. Kalawate; 02 Male (ZSI-WRC, L-1890), India: Ghatmatha, Satara, Maharashtra (17.3970N; 73.6787E; altitude 785 m), 20.vii.2018, coll. A.S. Kalawate and Party; Female (ZSI-WRC, L-1891), India: Navja, Satara, Maharashtra (17.4359N; 73.7189E; altitude 982 m), 16.x.2016, coll. P.S. Bhatnagar and Party.

Adult Male. Wing expanse: 28 mm. Head and thorax pale grey-brown. Vertex paler; antennae blackish, bipectinate and fasciculate till two-third portion; base of palpi in dorsal view whitish and rest greyish. Abdomen greyish brown dorsally, paler and glossy ventrally except at extremity. Forewings greyish-brown background, suffused with purple scales; roughly triangular subapical chocolate-brown patch arising from costa at middle to near apex and then extending till below radial vein, with paler edges; a subbasal black dot in cell; two oblique sinuous dark antemedial lines; postmedial line indistinct, dark, minutely waved; a series of black dots just before the outer margin. Underside greyish with inner margin paler and glossy; cilia golden-brown, glossy. Hindwings dark brown with a coppery-red gloss, darker towards the apical portion; cilia golden-brown, glossy; underside greyish-brown, a black discoidal lunule, indistinct curved postmedial line, and terminal series of black points (Fig. 1A). Male genitalia with uncus broad at base and narrow at tip, recurved, hooked, tip highly sclerotised, pointed. Tegumen almost inverted V-shaped. Valvae relatively membranous, flap like, divided in two folds, broad and large costal process and clavus, with a single medial sclerotised process and a basal digitiform process, both inner and outer lobes setosed. Vinculum V-shaped; saccus slender and long (Fig. 1B). Aedeagus tiny, bulbous, basal portion membranous, the apical portion sclerotised. Vesica with a single spine (Fig. 1C).

Distribution: India, Karnataka, Maharashtra (Pune, Satara: present study), Punjab. Thailand, Sri Lanka, Myanmar, Laos, Vietnam, Malaysia, Borneo, Indonesia, Philippines, China (Hampson 1910; Kononenko and Pinratana, 2013).



Fig. 1. *D. plagiata*: A, Adult; B, Male genitalia; C, Aedeagus. Scale bars: B–C, 0.5 mm.

Suggested common name: Chocolate-brown spotted noctuid moth.

Bionomics: *D. plagiata* was collected from the extremely contrasting ecosystem like core region of Forests of Koyna Wildlife Sanctuary (Ghatmatha and Navja) and urban location (Pune). Koyna Wildlife Sanctuary is a part of Sahyadri Tiger Reserve and is a habitat for many endemic species. On the other side, Pune is a highly developed, urban, recently declared to be developed as a smart city and due to the development process the habitat of many species might have been disturbed. The moths were collected from mid-July and mid-October at different altitudes ranging from 580 meters to 982 meters. As mentioned earlier, the moth completes many generations in a year. The Koyna Wildlife Sanctuary is dominated by Anjani (*Memecylon* sp.), jambul (*Syzygium cumini* (L.)), hirda (*Terminalia chebula* Retz.), awala (*Phyllanthus emblica* L.), umbar (*Ficus glomerata* Roxb.), bibba (*Semecarpus anacardium* Linn.f.), *Grewia* sp. etc. Pune (Pimpri Chinchwad Municipal Corporation) has three species of *Grewia* namely, *Grewia asiatica* L., *Grewia serrulate* DC. and *Grewia tiliiflora* Vahl. and other trees.

Recent publications on moth fauna from different regions of India have not recorded this species. In this study, the rediscovery of *D. plagiata* and its first report from Western Ghats of Maharashtra, India is reported. It is a poorly studied group of moths, whose taxonomy

received stable status after the molecular studied conducted by Zahiri et al. (2013). As stated earlier it is a monophagous pest and may be due to this it appears rare on the light trap. The host range, seasonal occurrence etc. can be studied further. The species completes many generations in a year Kononenko & Pinratana (2013), and is recorded in this study from 580 to 982 meters in the study. One specimen in the study is reported from a disturbed and highly urbanized region of Pune city. The other three specimens are recorded from the Koyna Wildlife Sanctuary, a part of Sahyadri Tiger reserve, Satara, Maharashtra, India. The species can be called as rare due to its less or no appearance in the light trap installed during the surveys.

Remarks: The larvae of this species feed on the large flowering plant genus *Grewia* of family Malvaceae (Zahiri et al. 2013). It completes several generations in a year (Kononenko & Pinratana 2013), pupates in loose silken cocoon in soil (Holloway, 1989). I believe the voucher specimen of *D. plagiata* has not been collected from any part of India since its original description.

B. Checklist of species of *Dyrzela*

1. *Dyrzela bosca* Swinhoe, 1890

Dyrzela bosca Swinhoe, 1890, Trans. ent. Soc. Lond. 1890(2): 266.

Type Locality: Myanmar.

Distribution: Borneo, Indonesia, Malay Peninsula, Malaysia, Myanmar, Philippines, Thailand (Kononenko and Pinratana, 2013).

2. *Dyrzela boscooides* Holloway, 1989

Dyrzela boscooides Holloway, 1989, Moths of Borneo, part 12: 184.

Type Locality: Malaysia.

Distribution: Malaysia, Thailand (Kononenko and Pinratana, 2013).

3. *Dyrzela castanea* Warren, 1913

Dyrzela castanea Warren, 1913, Gross-Schmett. Erde 11: 177.

Type Locality: Malaysia.

Distribution: Malaysia (Holloway, 1989).

4. *Dyrzela incrassata* Walker, 1858

Dyrzela incrassata Walker, 1858, List Spec. Lepid. Insects Colln Br. Mus. 15: 1759.

Type Locality: Malaysia.

Distribution: Indonesia, Malaysia, Thailand (Kononenko and Pinratana, 2013).

5. *Dyrzela increnulata* Warren, 1913

Dyrzela increnulata Warren, 1913, Gross-Schmett. Erde 11: 176.

Type Locality: Myanmar.

Distribution: Indonesia, Malay Peninsula, Laos, Malaysia, Myanmar, Thailand (Kononenko and Pinratana, 2013).

6. *Dyrzela plagiata* Walker, (1857) 1858

Dyrzela plagiata Walker, (1857) 1858, List Spec. Lepid. Insects Colln Br. Mus. 15: 1758.

Type Locality: India (Hindustan).

Distribution: China, India, Indonesia, Laos, Malaysia, Myanmar, Philippines, Sri Lanka, Thailand, Vietnam (Kononenko and Pinratana, 2013).

7. *Dyrzela roseata* Holloway, 1989

Dyrzela roseata Holloway, 1989, Moths of Borneo, part 12: 182.

Type Locality: Borneo, Kuching.

Distribution: Malaysia (Borneo) (Holloway, 1989).

8. *Dyrzela squamata* Warren, 1913

Dyrzela squamata Warren, 1913, Gross-Schmett. Erde 11: 177.

Type Locality: Myanmar.

Distribution: Malay Peninsula, Myanmar, South China, Thailand (Kononenko and Pinratana, 2013).

9. *Dyrzela trichoptera* Robinson, 1975

Dyrzela trichoptera Robinson, 1975, Durham E-Theses: 127.

Type Locality: Fiji,

Distribution: Fiji (Holloway, 1989).

10. *Dyrzela tumidimacula* Warren, 1913

Dyrzela tumidimacula Warren, 1913, Gross-Schmett. Erde 11: 176.

Type Locality: Malaya, Gunong Ljau.

Distribution: Peninsular Malaysia, Sumatra, Borneo (Holloway, 1989).

11. *Dyrzela violacea* Holloway, 1989

Dyrzela violacea Holloway, 1989, Moths of Borneo, part 12: 184.

Type Locality: Brunei, 1670m, Bukit Pagon

Distribution: Malaysia (Borneo) (Holloway, 1989).

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