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NOTE

**TAXONOMIC NOTE ABOUT WILLOW ERMINE MOTH
YPONOMEUTA RORRELLUS HÜBNER (LEPIDOPTERA:
YPONOMEUTIDAE) FROM LADAKH DIVISION OF
JAMMU & KASHMIR, INDIA**

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Govindasamy Mahendiran

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TAXONOMIC NOTE ABOUT WILLOW ERMINE MOTH *YPONOMEUTA RORRELLUS* HÜBNER (LEPIDOPTERA: YPONOMEUTIDAE) FROM LADAKH DIVISION OF JAMMU & KASHMIR, INDIA

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The superfamily Yponomeutoidea is widespread occurring in almost all continents with the moderate, tropical and subtropical climate (Gershenson 2003). These moths have been found associated with more than 23 plant families (Gershenson & Ulenberg 1998). *Yponomeuta* forms a small genus within the family Yponomeutidae and consists of about 103 known species (Moriuti 1977; Turner et al. 2010). The genus has a wide palearctic distribution and is found associated mostly with host plants belonging to plant families; Celastraceae, Rosaceae, Salicaceae and others (Herrebut et al. 1976). The majority of species are solitary, while some are gregarious building large, loose nests from silk produced in glands (Roessingh 1989). There are several distinct species as well as a number of morphologically similar taxa within the genus. Due to variation within characters and overlapping characters, species identification by means of morphology alone appears inconclusive and

unreliable (Friese 1960; Povel 1984). As such, it is always useful to supplement species description with information of associated host plants and details of genitalic structures. The genus is considered as model taxon for multidisciplinary investigations into the evolution of insect–plant associations (Menken & Roessingh 1998; Bakker et al. 2008).

The details of the most dominant ermine moth, *Y. rorrellus* from the Ladakh Division is provided in this paper. The species belongs to *Y. padellus*-complex consisting of five ill-described species or subspecies; *Y. cagnagellus* (Hübner, 1813); *Y. malinellus* (Zeller, 1838); *Y. padellus* (Linnaeus, 1758); *Y. mahalebella* Guenée, 1845, and *Y. rorrellus* (Hübner, 1796). Whether these five represent separate valid species or only one highly variable species is still to be settled (David & Povel 1983). The taxonomic studies of the species are carried with detailing of the female genitalic structures, biology and seasonality.

The adult moths were collected with the help of insect nets and light traps. Larvae along with their host plant parts, infesting leaves and buds were collected in different types of collection jars and reared at room temperatures (18–32 °C) in the laboratory. Microscopic examination was performed with the help of a binocular microscope fitted with an ocular grid. During field surveys, live photographs of caterpillars, pupae and adults along with their host plants were taken with a Canon Zoom Digital camera (14.0 MP, with 21X zoom). Distributional data including date of collection, number



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of specimens examined and localities with altitudes were recorded. Colour photographs are provided (Images 1–17). The collected materials have been deposited in Biosystematics Laboratory of Central Institute of Temperate Horticulture (CITH–Srinagar) and Skuast-K for future reference.

List of abbreviations used: ANT.APO - Anterior apophyses; CRP.BU - Corpus bursae; PAP.A - Papilla analis; PO.APO - Posterior apophyses; DU.BU - Ductus bursae; A₁ - First anal vein; Cu₁ - First anterior cubital vein; Cu₂ - Second anterior cubital vein; M₁ - First median vein; M₂ - Second median vein; M₃ - Third median vein; R₁ - First radial vein; R₂ - Second radial vein; R₃ - Third radial vein; R₄ - Fourth radial vein; R₅ - Fifth radial vein; Sc + R₁ - Stalk of subcostal and first radial vein.

***Yponomeuta rorrellus* (Hübner, 1796)**
(Images 1–17)

Material examined: SK-EL/LY/1-12, India: Jammu & Kashmir, Ladakh, Kargil, Drass, 34.2570 N & 75.4578 E, 3,350m, 12 females, 11.iv.2015, 21.vii.2012; CHT-EL/LY/1-9, Leh, Hunder, 34.1623 N & 74. 5364 E, 3,300m, 9 females, 14.iv.2015, 27.vii.2015; SK-EL/LY/1-13, Stakna, 34.0465 N & 77.3539 E, 3,385m, 13 females, 25.vii.2015 (coll. M.A. Dar and S.A. Akbar).

Distribution: Predominant European species also reported in few parts of Asia including; China, India and Pakistan.

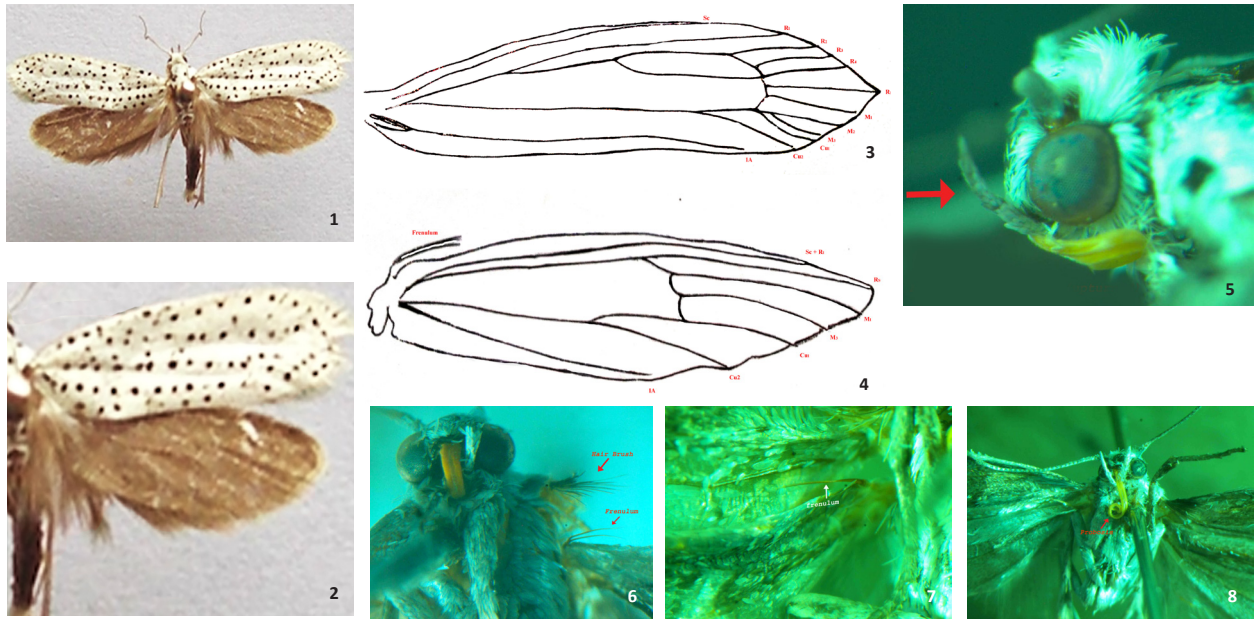
Description: Adults are small (1.21–1.33 cm in length); forewings are silvery with rows of small black spots, wingspan (2.31–2.53cm); hindwings fringed along trailing edges; head with smooth scales, haustellum naked; proboscis well developed; maxillary palps with two segments; labial palpi upturned, first segment small, second joint reaching up to frons; third segment pointed at extremity; frons smooth with tuft of hairs; tegulae with dorsal ridge; thorax heavily scaled, metathorax with depressed crest; abdomen with dorsal crest at base; tibial spurs formula (0-2-4) in fore-mid-hindlegs with epiphysis present in foreleg.

Female genitalia: Ovipositor lobes well developed, clothed with numerous setae, anterior apophysis short, rod like, posterior apophysis long highly sclerotized, forked towards anterior end, genital plate moderately sclerotized, ostium bursae membranous, ductus bursae is very short; entering corpus bursae beyond apical margin, corpus bursae pear shaped thick and broad anteriorly, thin/membranous and tapering towards apex; signum absent.

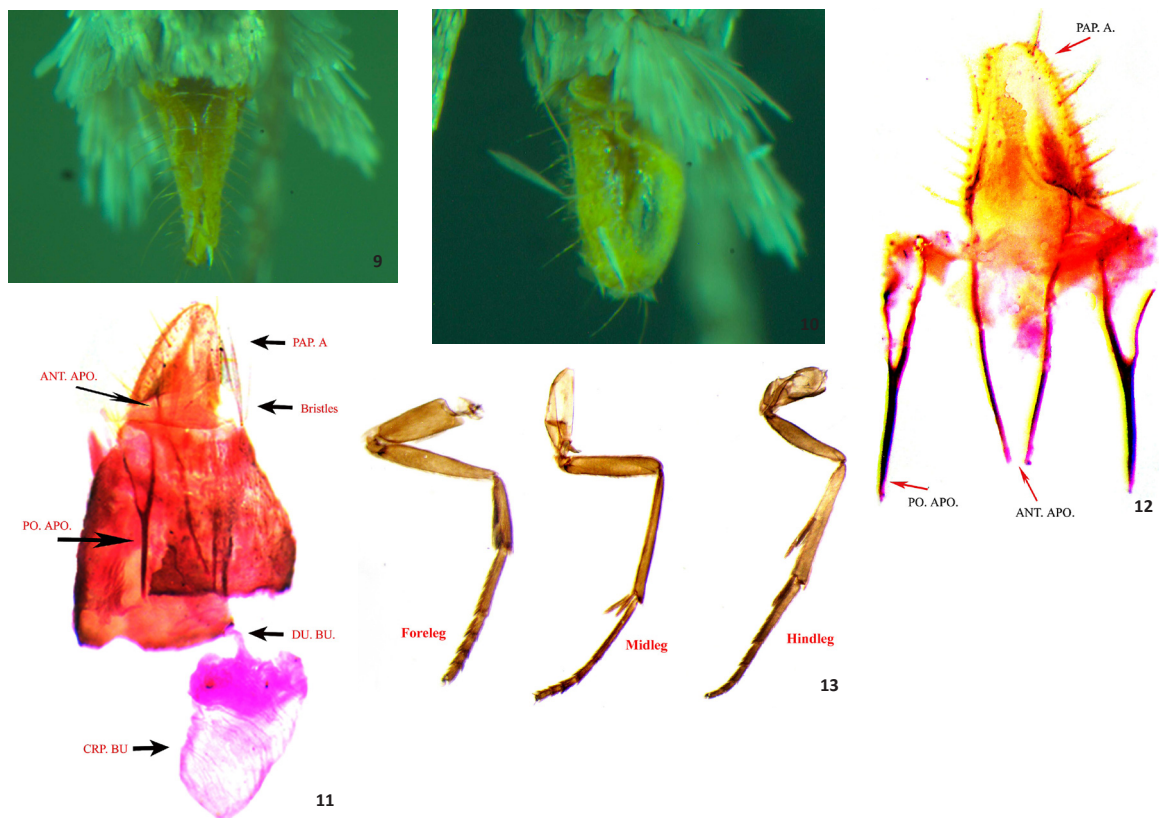
Male genitalia: Not studied.

Biology: Adult females lay clusters of eggs (70–90 eggs) on twigs and branches of host plants. Newly hatched larvae remain in close vicinity without migrating much; first-instar larvae bore into host plant twigs and overwinter under protective shields (communal hibernaculum webs) without feeding much. These larvae are grayish/creamy white in colour with dark black spots along sides; head black; prothoracic and anal plates blackish. These larvae form aggregations of communal webs with the help of drapes of silk produced by the larvae. Larvae along with their skin sheds are easily seen inside these silken webs. In the following spring the larvae resume feeding on newly developing foliage. Life cycle consists of five larval instars and once the first larval instar comes out of hibernation, the rest of the larval period takes 40–45 days to complete. These larvae grow up to the size of 3/4 inch in length before they pupate. The pupae are about 10mm long, white with light brown in colour; and suspend in clusters within the web. Pupation lasts for about 15–25 days after which adults emerge.

Seasonality and nature of damage: The pest overwinters as larvae (first instar) inside host twigs (from end of September to starting weeks of May). By the end of April almost all the overwintering larvae have come out of their hibernation. Towards the end of June and July all the larvae have matured, spin cocoons and undergone pupation. The second and third instar larvae are most frequently sighted during the latter half of June. As conditions become more favourable (whole of July) the larval densities as well as infestation rates become severe. These larvae attain third and fourth instar stages which cause considerable damage to the host plant. These cause complete defoliation and formation of communal silk webs; usually a single web consists of more than 25–30 larvae feeding on young foliage. The plants attain ghostly appearance with covering of large silk webs, suspended dust particles and numerous feeding larvae. The adults on emergence (July and August) mate and eggs are oviposited on the newly developing foliage. Maximum incidence was observed during the month of July and August, corresponding to mean values of (70%–47%) and (85%–56%) respectively. As the number of larvae increase and the availability of food decreases, the larvae were also observed to exhibit cannibalistic behaviour. The high densities during the month of July and August is attributed to increase in summer temperatures, however, no definite correlation was confirmed during the study. As the temperature falls rapidly, almost all the adult moths die by the end of September and beginning of October. Larvae



Images 1–8. *Yponomeuta rorrellus* (adult): 1 - body in dorsal view; 2 - fore and hind wings; 3 - forewing venation; 4 - hindwing venation; 5 - upturned labial palpi; 6 - hair brush and frenulum; 7 - frenulum; 8 - coiled proboscis. © Mudasir Ahmad Dar & Shahid Ali Akbar



Images 9–13. Female genitalia: 9 - ventral view; 10 - lateral view - 11 external genitalia with different parts demarked; 12 - anal palpi with anterior and posterior apophysis enlarged; 13 - legs. © Mudasir Ahmad Dar & Shahid Ali Akbar



continue feeding even during the month of September, within communal webs (hibernaculum) which shield them against cold temperatures. As the pest prepares to overwinter within these webs there is a decrease in mobility and feeding rates.

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