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Taxonomy and distribution of *Glenea beelsoni* Heller, 1926 (Coleoptera: Cerambycidae: Lamiinae: Saperdini) from Indian Himalayas

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ABSTRACT

The species *Glenea beelsoni* Heller, 1926 is redescribed with genitalia morphology and Walnut plant (*Juglans regia* Linnaeus of the family Juglandaceae) is confirmed to be the host plant of this species. Distribution map, habitus and genitalia pictures are provided.

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KEYWORDS

Host plant; genitalia; distribution; India; Kashmir region; Himalayas

Introduction

The species *Glenea beelsoni* Heller, 1926 was described based on one female specimen. It was only mentioned by one author (Breuning 1956a, 1956b, 1966) after the original description. The first author had examined some specimens from European museums, and recently the third author collected seven specimens from Walnut plant (*Juglans regia* Linnaeus of the family Juglandaceae) from Kashmir (Budgam), India. The additional material extends the localities of this species and represents a denser pubescent variety, and also confirms the host plant.

Materials and methods

Photographs were taken with several different camera systems. Habitus photographs were taken with a Sony T30, or Canon EOS 7D + Canon Macro 100 mm, and genitalia photographs were taken with Sony T30 + Leica S8AP0, or a large depth of field 3D Digital Microscope (Keyence VHX-1000C).

The male and female genitalia were prepared by soaking the whole beetle in water at room temperature for about 24 h, then removing the genitalia with forceps without removal of abdomen, and clearing them in 10% KOH at room temperature for 12–24 h. All genitalia materials were preserved in glass or polyethylene

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genitalia vials filled with glycerine after their examination. The genitalia terminology follows Lin et al. (2017).

Specimens studied are deposited in the following institutions, museums or private collections:

BMNH: The Natural History Museum, London, UK (NHML)

CCH: Collection of Carolus Holzschuh, Villach, Austria

CITHIC: Central Institute of Temperate Horticulture Insect Collection, Jammu and Kashmir, India

IZAS: Institute of Zoology, Chinese Academy of Sciences, Beijing, China

NHMB: Naturhistorisches Museum (Museum Frey, Tutzing), Basel, Switzerland

SMTD: Staatliches Museum für Tierkunde, Dresden, Germany

Taxonomy

Glenea beesoni Heller, 1926

Glenea (s. str.) *beesoni* Heller, 1926: 46, pl. 5, fig. 8. Type locality: India, Chakrata, Konain. Type depository: SMTD.

Glenea (*Glenea*) *beesoni*; Breuning, 1956a: 61; Breuning, 1956b: 695; Breuning, 1966: 686.

Type specimens examined. Holotype (Figures 1 and 2), female, India, Chakrata, Konain, 1924.VI.21, leg. C. F. C. Beeson (SMTD). It was collected from *Juglans regia* (Heller 1926).

Other specimens examined. 1 male, India, Chakrata, Konain, 1924.VI.21, leg. C. F. C. Beeson, ex *Juglans regia* (BMNH, dissected by M. Y. Lin on 2017.I.4). 2 males 1 female, Sikkim (NHMB, ex. Collection of Frey, one pair was dissected by M. Y. Lin in 2008.VI.26); 1 male 1 female, India (Jammu and Kashmir), Budgam, Yousmarg, 33.513°N 74.453°E, 2052 m. a.s.l., 2016.VI.8, leg. Shahid Ali Akbar from *Juglans regia* (IZAS, dissected by M. Y. Lin on 2016.XI.15); 2 males 3 females, same data but leg. Shahid Ali Akbar (CITHIC); 2 males 1 female, India, Jammu and Kashmir, District Kishtwar, Sonder, alt. 2000–2300 m, 1980.VII.9 & 10, leg. C. Holzschuh (CCH); 1 male, Pakistan, Shogran, alt. 2750–2900 m, 1979.V.26, leg. W. Wittmer (CCH).

Redescription: Male length: 10.0–13.6 mm; female length: 11.5–14.5 mm. Body black, densely clothed with yellow pubescence, with black maculae due to the lack of yellow pubescence; head covered by yellow pubescence including the occiput, sometimes the middle part of frons with a black line or black spot; antennae black. Prothorax covered with dense yellow pubescence except two longitudinal vittae on the disc and one lateral longitudinal vitta on each side, sometimes with a black line or spot in middle of disc. Scutellum densely clothed with yellowish pubescence. Elytra with one black stripe along lateral carina and five black markings on disc: the first one at the basal third, transverse; the second one from first one obliquely extending to middle, expanded apically; the third one more oblique than the second one, sometimes very small; the fourth with apex

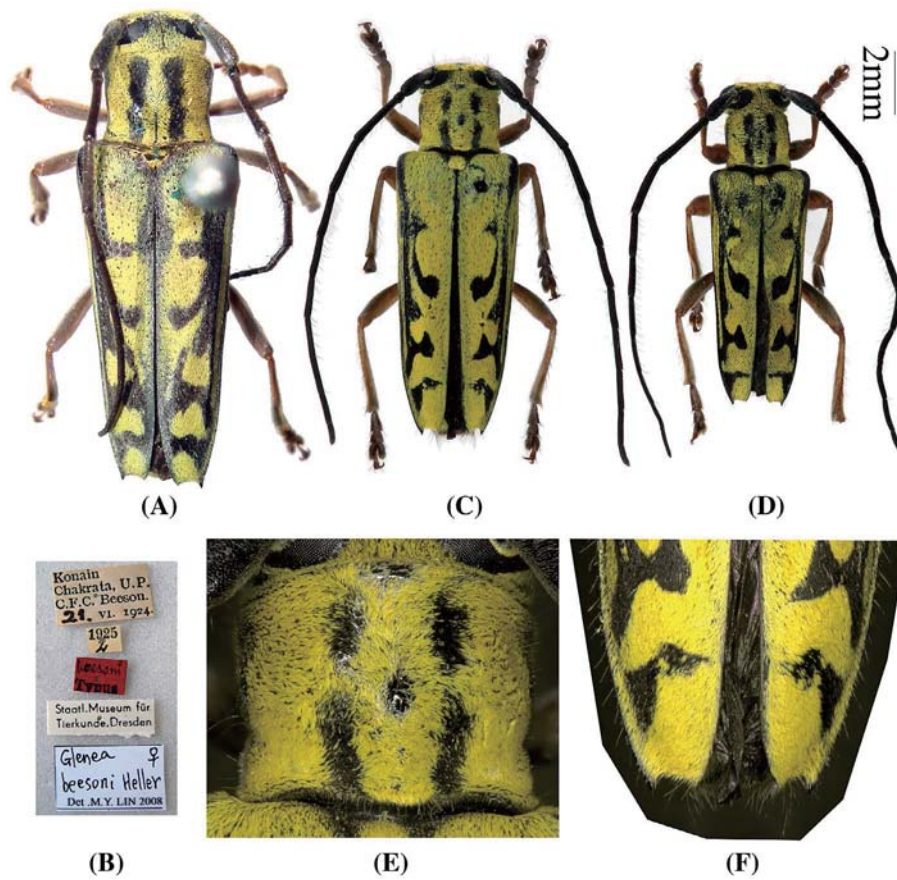


Figure 1A–F. *Glenea beelsoni* Heller, 1926. A, holotype, female, from India, Chakrata; B, labels of holotype; C, female, from Kashmir (Budgam); D, male, from Kashmir (Budgam); E, pronotum of female from Kashmir showing the incomplete black spots due to interference of yellow pubescence; F, elytral apex of female from Kashmir showing the black markings and the apical teeth. A, C–D: Scale bar – 2 mm; B, E–F: not to scale.

expanded as an oblique vitta; the fifth is a transverse line before elytral apex. The yellow pubescence and the black maculae are quite variable, such as: the black stripes on pronotum may be separated into four vittae (Figure 1E) or complete (Figure 1A); the suture with a black marking on basal half (Figure 1A, the Sikkim population the same) or without any black spots (Figures 1C–D, F and 3D); the five black transverse vittae on elytra from short and narrow to long and wide, especially the third one is very short in some (but not all) Kashmir specimens (Figures 1C–D and 3D) while as long as to divide one more yellow spot (Figure 1A). Ventral surfaces densely clothed with yellowish pubescence except the middle longitudinal area black due to sparser pubescence; legs yellowish brown with dorsal side of femora and tarsi black brown. Inferior eyelobes rounded-oblong, nearly three times as long as (male) or subequal to (female) gena below; antennae slightly longer than body, male slightly longer than female, with third antennomere the

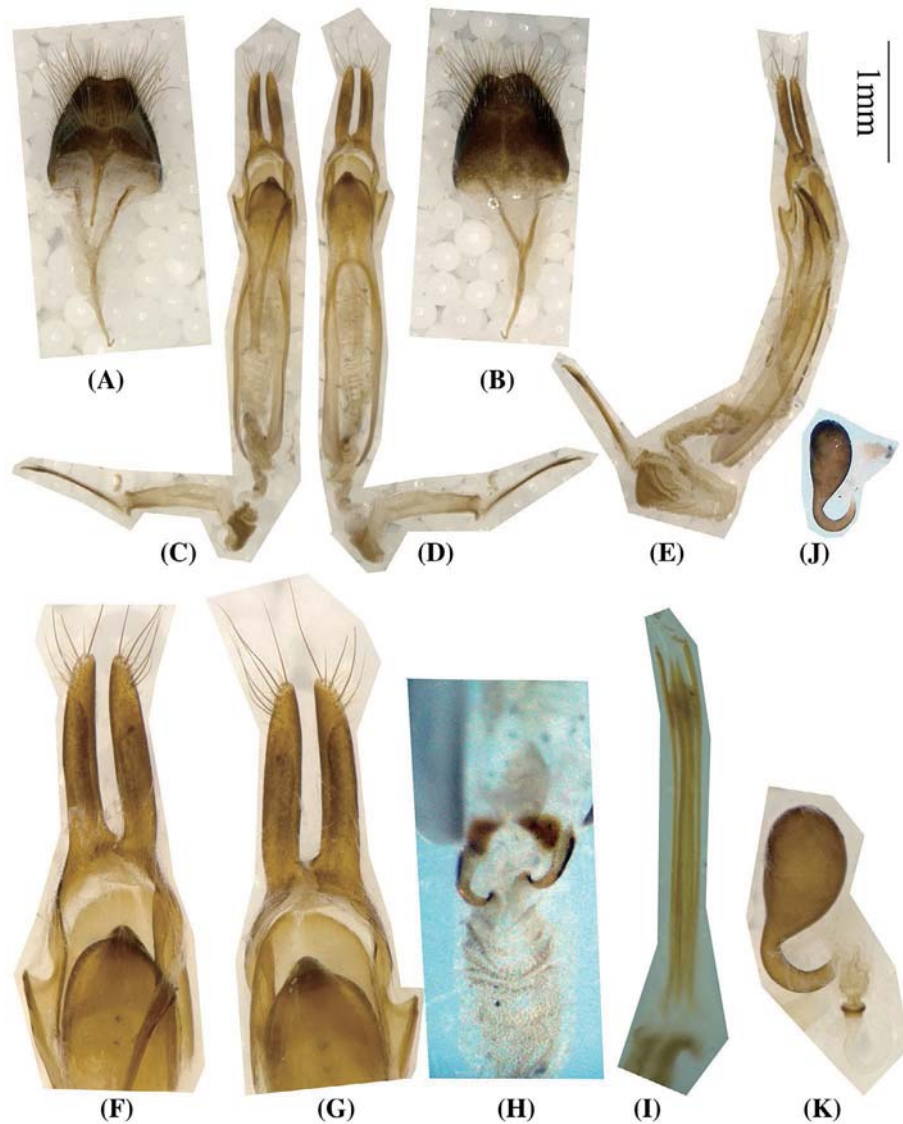


Figure 2A–K. Terminalia of *Glenea beesoni* Heller, 1926, from Kashmir (Budgam). A–B, tergite VIII and sternites VIII & IX; C–E, male genitalia; F–G, lateral lobes of tegmen and part of median lobe; A, C, ventral view; E, lateral view; B, D, dorsal view. H, middle part of internal sac, showing the four pieces of basal plate-like sclerites; I, rod-like sclerites; J–K, female genitalia, showing the spermathecal capsule. Scale bar – 1 mm, F–H & K: not to scale.

longest, fourth longer than scape. Pronotum as long as broad (male) or slightly broader than long (female). Elytra with one costa not reaching apex, truncated apically, with moderately long and sharp apical tooth at the outer angle (Figure 1F). Both male and female have simple claws. **Male terminalia** (Figure 2A–I): Tergite VIII (Figure 2A–B) trapeziform, apex emarginated, with moderately long setae. Spiculum gastrale subequal to ringed part of tegmen in length, spiculum



Figure 3A–E. *Glenea beelsoni* Heller, 1926, host plant, habitus and distribution map. A–C, host plant *Juglans regia*; A, walnut plant garden; B, walnut tree; C, nuts and leaves. D, ecological picture of an adult from Kashmir (Budgam); E, distribution map of *G. beelsoni*, red stars show the known localities in Indian Himalayas natural range of *J. regia* (green circles). Demarcation of country boundaries for biological references only.

relictum shorter than half of spiculum gastrale. Tegmen (Figure 2C–G) 2.3 mm in length; lateral lobes slender, about 0.6 mm long and 0.1 mm wide, finely setose basally (in ventral view, Figure 2F), apex rounded, with setae which are subequal

to half-length of lateral lobes; basal piece bifurcated distally; median lobe with median struts slightly curved and slightly longer than tegmen (26:23); median struts about 2/3 of the whole median lobe in length; apex of ventral plate widely rounded (Figure 2F), apex of dorsal plate more protruding and narrowly rounded (Figure 2G); median foramen narrowly elongated; endophallus more than twice length of median lobe, with four pieces of basal plate-like sclerites and two bands of creating armature, and four rod-like sclerites at end (Figure 2H), the two longer ones about 0.9 mm, shorter than half of tegmen. **Female genitalia:** spermathecal capsule (Figure 2J–K) composed of an apical orb and a curved stalk, strongly sclerotized part of stalk slightly shorter than apical orb. Spiculum ventrale longer than abdomen. In our observation, spiculum ventrale measured 6.6 and 8.6 mm for adults compared with abdomens which measured 5.0 and 5.8 mm respectively in ventral view.

Remarks. Two pictures of the specimen in BMNH are available from <https://apps2.cdfa.ca.gov/publicApps/plant/bycidDB/wdetails.asp?id=38145&w=o>. It is marked as cotype according to the ‘Co-type’ label. But it could not be a cotype for the following three reasons: (1) only female was mentioned in the original description; (2) the type should be 14.5 mm long (Heller 1926) while this male is 13.0 mm long; (3) the ‘Co-type’ label was added by museum curators, not by the taxon’s author. However, it is a perfect topotype specimen, which is also very helpful to identify this species.

The seven specimens from Kashmir (Budgam), India are different from the specimens from Chakrata and Sikkim in the following characters: (1) the yellow pubescence is much more developed, which make the black markings on pronotum and elytra smaller and the elytral suture lacking blacking maculae; (2) the size is smaller, only 10–11.5 mm in length, while those from Chakrata and Sikkim are 13.0–14.5 mm; (3) the lateral lobes of the tegmen in male genitalia is kind of more slender. However, we considered it as a northern variety instead of a subspecies for three reasons: (1) pubescence and size are variable within species, and the range is not too large; and the four specimens also from Kashmir in CCH are measured as 10.1–13.6 mm and the development of yellow pubescence are between Figure 1A and C, that is: the black stripes on pronotum are complete, the basal half part of elytra without black maculae on suture but the yellow marking just behind middle (behind the posterior femur) separated by a black line, which is the third black transverse vittae (Personal communication with C. Holzschuh, 2017.I.5); (2) though the lateral lobes are more slender compared with one male from Chakrata, the shapes are quite the same, and other characters of male genitalia are identical to each other; (3) all of them share same host plant, *Juglans regia* (Figure 3A–C).

Distribution (Figure 3E). A distribution map based on the examined data consist of five localities within Himalayas natural range of *J. regia* (Pollegioni et al. 2014; Google 2014).

Nature of damage. Larvae bore into a shoot, feed under the bark and make small oval holes. Frass comes out of these holes. The affected trees and branches

become fragile and often get broken by wind. The surface of infested branches gets perforated followed by yellowing and wilting of leaves. In combination with other pests (such as some Cerambycinae), a serious infestation may kill the whole tree. Pest remains active from May to August, causing new infestation.

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Disclosure statement

No potential conflict of interest is reported by the authors.

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