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Cover: Long-tailed Shrike *Lanius schach* resting on a dry branch after courtship. Digital illustration on Procreate. © Aakanksha Komanduri.



Eastern range extension of the band-winged grasshopper *Pusana rugulosa* (Uvarov, 1921) (Insecta: Orthoptera: Acrididae) in India

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The short-horned grasshopper belongs to the family Acrididae, which is the largest family under the superfamily Acridoidea (Insecta: Orthoptera) with about 6,891 species worldwide (Cigliano et al. 2025) and 361 species in India (Chand et al. 2024). The Indian Acrididae are catalogued under 15 subfamilies of which the members of the subfamily Oedipodinae are commonly called band-winged grasshoppers.

The genus *Pusana* was proposed by Uvarov (1940) as a nomen novum for the generic name *Pusa* Uvarov, 1921, under the subfamily Oedipodinae. This genus is distinguishable by its elongated head; very long and slender hind femur, and a feeble median carina of the pronotum, an indistinct lateral carina of pronotum, and a median carina of the pronotum crossed by three deep transverse sulci. Globally, this genus is represented by three species; of which two species, namely, *P. laevis* and *P. rugulosa*, are known to occur in India (Shishodia et al. 2010; Chand et al. 2024; Cigliano et al. 2025) and *Pusana chayuensis* (Yin, 1984) from China. Among the two species found in India, *P. rugulosa* has an apparent disjunct distribution in Bihar, Punjab, and Uttarakhand

(Sharma 2017). Whereas, *P. laevis* has been reported from Bihar, Himachal Pradesh, and Sikkim (Shishodia et al. 2010).

This study marks the first report of *P. rugulosa* from northeastern India as well as the first report of the genus *Pusana* from Assam. A detailed description of the male and female genitalia of the species is provided.

In 2024, two faunistic surveys were conducted in Dibru-Saikhowa Biosphere Reserve (Image 1) located in eastern Assam, where 13 specimens (5 males + 8 females) of *Pusana* were collected. The specimens were handpicked from sandy river bank, euthanised with ethyl acetate vapours and dry preserved. These were studied under stereo zoom microscope in the laboratory. The subfamily level identification is done based on the extant keys and descriptions (Kirby, 1914; Usmani, 2009; Usmani & Kumar, 2011) and the genus was determined based on Uvarov (1921) and Kumar & Usmani (2016). Identification to the species level is based on the morphological description by Uvarov (1921). The photographs of holotype catalogued in the orthopteraspeciesfile.org by Cigliano et al. (2025) were

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also compared which exhibits morphological similarity with our specimens. The specimens were processed for genitalic studies by the methods used by Usmani (2009) and Kumar et al. (2014). The terminology used for describing male and female genitalia follows Dirsh (1965) and Slifer (1939), respectively. The specimens are deposited in the national zoological collection of North Eastern Regional Centre, Zoological Survey of India, Shillong.

Pusana rugulosa (Image 2) is characterized by its notably elongated head, a typical feature of the genus, with frons less strongly reclined and a hexagonal fastigium that is slightly inclined and rounded where it meets the frontal ridge. The eyes are prominently bulging and nearly hemispherical, and the antennae are filiform, slightly thickened in the apical third. The species can be easily distinguished from its congener *P. laevis* as its habitus is more robust; face and body more densely covered with hairs, the face is rugulose with numerous, though not dense, impressed points.

Keys to the Indian species of *Pusana* Uvarov, 1940 (derived from Uvarov, 1921):

1. Face smooth, impunctate; pronotum only feebly constricted anteriorly; metazoan almost flat. Face and body covered with sparse hairs *P. laevis*, Uvarov, 1921.
2. Face rugulose, with numerous, though not dense, impressed points; pronotum more constricted anteriorly, with metazoan convex and distinctly raised above prozona. Face and body more densely hirsute *P. rugulosa*, Uvarov, 1921.

The *P. rugulosa* in Dibru-Saikhowa are adapted to sandy habitats as it provides natural camouflage.

The genus *Pusana* was proposed by Uvarov (1940) as a nomen novum for the generic name *Pusa* Uvarov, 1921, which was identified as a junior homonym of the mammalian genus *Pusa* Scopoli, 1771, used for earless seals. In his original description of *Pusa rugulosa*, Uvarov (1921) noted that the “typical male” was from an “unknown locality,” while the paratypic series was

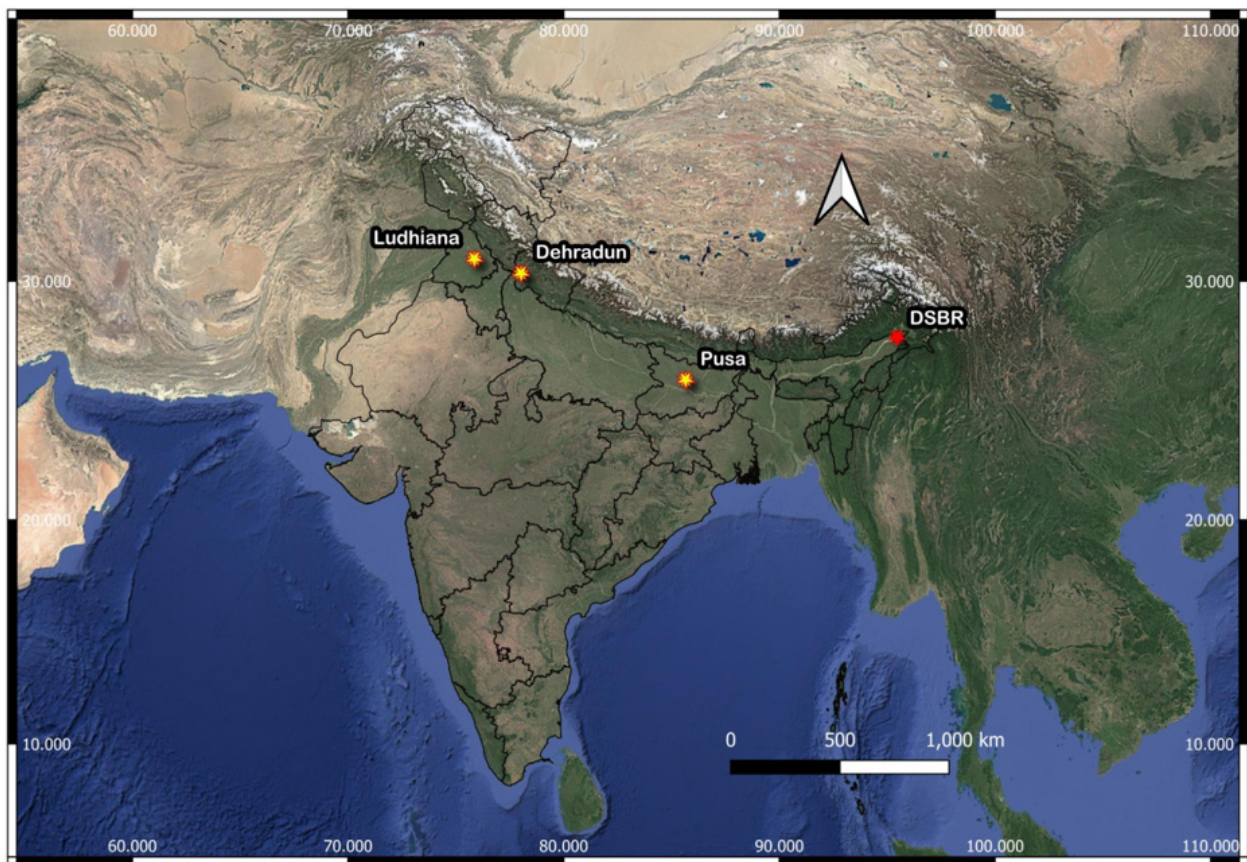


Image 1. Map showing locality records of *Pusana rugulosa* in India (yellow asterisk) with the new locality record in Assam (red asterisk, DSBR—Dibru Saikhowa Biosphere Reserve).

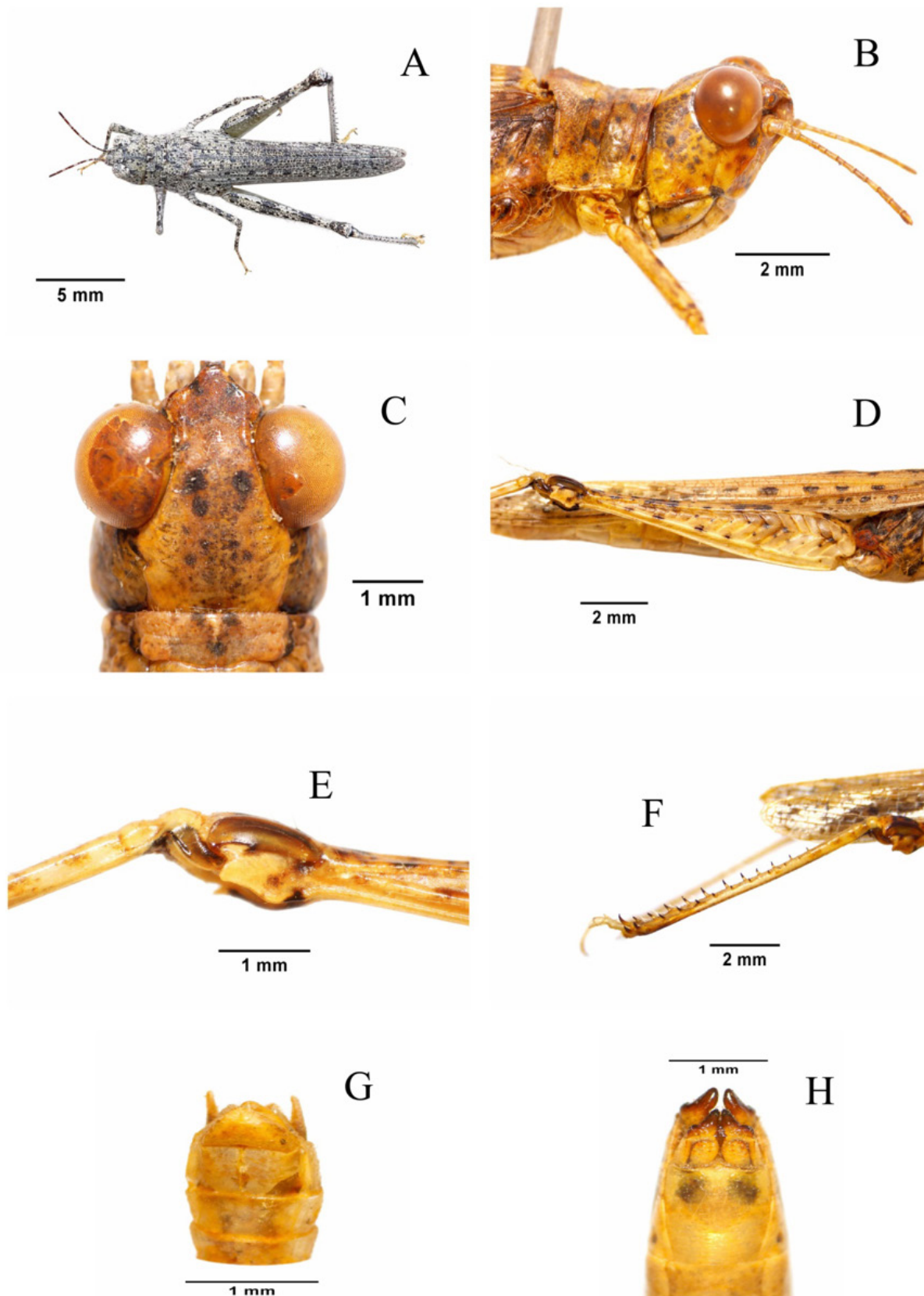


Image 2. *Pusana rugulosa* (male): A—Dorsal view | B—Lateral view of head and pronotum | C—Dorsal view of eye and fastigium of vertex | D—Hind femur | E—Knee lobe | F—Hind tibia | G—Ventral view of apex of abdomen | H—Ventral view of apex of abdomen (female). © Amlanjyoti Gautam.

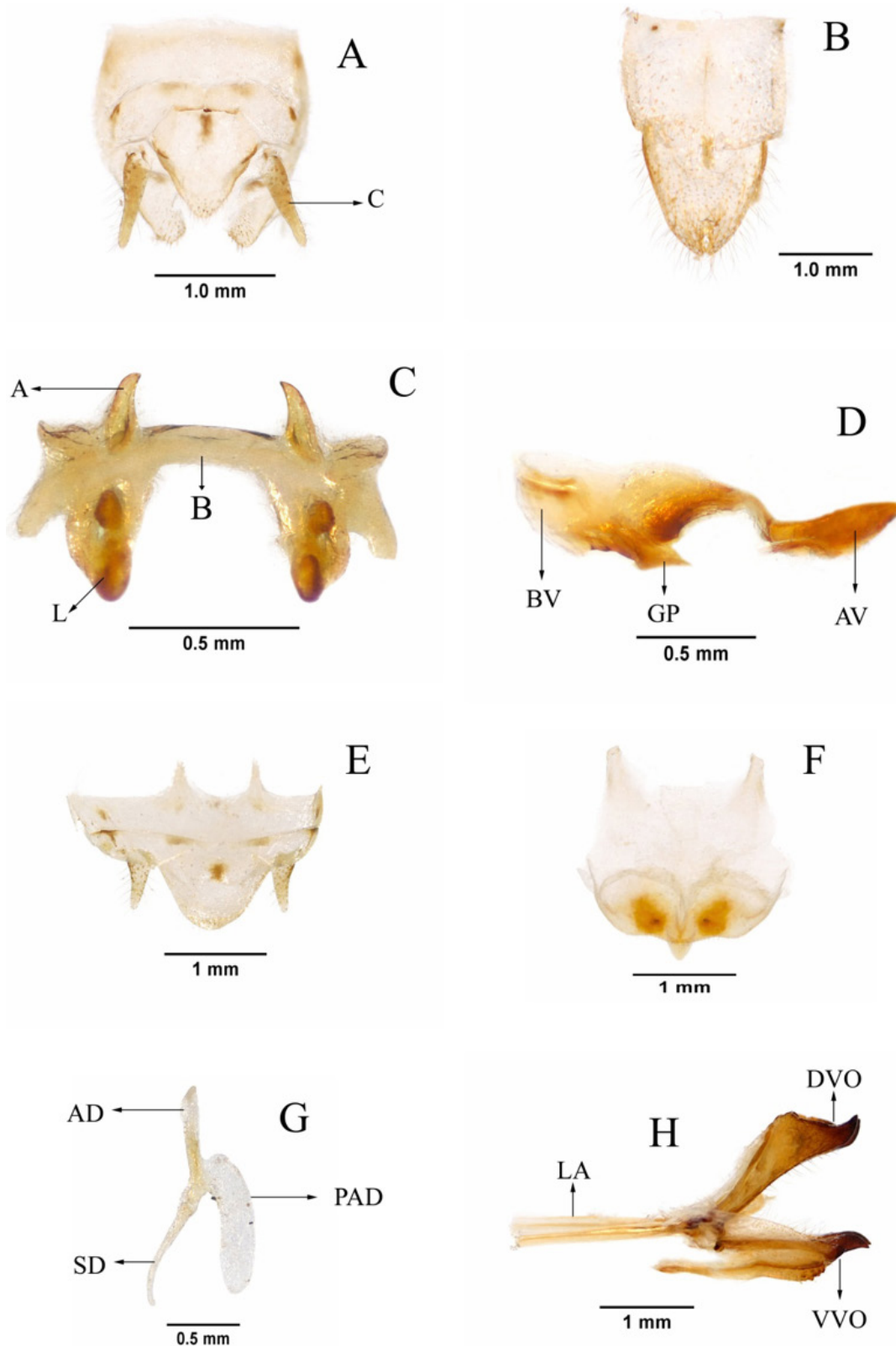


Image 3. Genitalia of *Pusana rugulosa* A–D (male); E–H (female): A—Supraanal plate | B—Subgenital plate | C—Epiphallus | D—Aedeagus | E—Supraanal plate | F—Subgenital plate | G—Spermatheca | H—Ovipositor.

Abbreviations: A—Ancorae | B—Bridge | C—Circus | L—Lophus | BV—Basal valve | AV—Apical valve | GP—Gonopore process | AD—Apical diverticulum | PAD—Preapical diverticulum | SD—Spermathecal duct | LA—Lateral apodeme | DVO—Dorsal valve of ovipositor | VVO—Ventral valve of ovipositor. © Amlanjyoti Gautam.

collected “partly from Pusa, Bihar and partly without precise data”. Assessment of the type material deposited at the Natural History Museum, London (NHMUK), as cataloged in the Orthoptera Species File (Cigliano et al. 2025), clarifies that the holotype male actually originated from Punjab, India. The previously reported range of *P. rugulosa* is apparently disjunctive, with established records from Bihar, Punjab, and Uttarakhand in India (Sharma 2017), and an extranational report from Afghanistan (Sharma 2017).

This study confirms the range extension of *P. rugulosa* to Assam, which now represents the easternmost known range for the species and the first record of the genus *Pusana* from the state of Assam. While photographic records (Ray 2020) on citizen science platforms such as iNaturalist have recently suggested the species’ presence in the westernmost part of Assam, the photographs alone are not sufficient to confirm the record as conspecific with *P. rugulosa*. This study provides the necessary taxonomic verification of the occurrence of this species in Assam through detailed morphological and genital examination of the collected specimens. Prior to this, the only species of the genus known from northeastern India was *Pusana laevis* (Uvarov, 1921), recorded from Sikkim by Shishodia et al. (2003).

This finding bridges a geographical gap in the species distribution suggesting that *P. rugulosa* may have a broader and more continuous range across northern and eastern India than previously thought. It highlights the potential for undiscovered populations in intervening regions, such as West Bengal or other parts of north-eastern India.

Description of genitalia

Male (Image 3A–D): Supraanal plate elongate angular, apex obtusely rounded, as long as wide; circus small, conical, longer than supra-anal plate; subgenital plate broad, longer than wide, apex obtusely conical, covered with setae. Epiphallus with narrow bridge and undivided medially; ancorae short with pointed apices, incurved; lophi bilobate and lobiform; Aedeagus flexure, apical valve short and broad, moderately curved, apex pointed, narrower and shorter than basal valve, connected with basal valve with flexure; basal valve broad, narrow towards the slightly acute apex, gonopore process short with acute apex.

Female (Image 3E–H): Supraanal plate broad with obtuse apex, circus short and conical, shorter than

supraanal plate; three times as long as wide with obtusely conical apex, subgenital plate with posterior margin semicircular, posterior marginal setae present; egg guide broad and conical, apex obtusely rounded; spermatheca with apical diverticulum shorter than the pre-apical diverticulum, tubular; pre-apical diverticulum long, broad, sac like; ovipositor valves short, robust and curved; dorsal valve broad, as long as the lateral apodeme, apical tip short and acute; ventral valve with apical tip short and acute, mesial valve dilated apically.

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