

Redescription of female *Sambus auberti* Théry, 1926 (Coleoptera: Buprestidae) and its first record from India, from an urban rooftop garden in Kolkata, West Bengal

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Taxonomy, range extension, distribution, new record, Coleoptera, Agrilinae, Agrilini, *Sambus*, India

Abstract. The Jewel beetle species *Sambus auberti* Théry, 1926 (Coleoptera: Buprestidae: Agrilinae: Agrilini) has been recorded for the first time from India. The specimen was collected from *Jasminum sambac* (Linnaeus, 1753) (Lamiales: Oleaceae) plant on the experimental rooftop garden of iForNature - Nature Club located at Kolkata, West Bengal, India. The female of the species has been redescribed.

সারাংশ

এই বৈজ্ঞানিক পত্রিকাটিতে স্যাম্বাস অউবার্টি নামক কাঁচপোকাকার (জুয়েল বিটেল) প্রজাতিটিকে প্রথমবার ভারতবর্ষ থেকে লিপিবদ্ধ করা হয়েছে। এই পোকাকারি বিউপ্রেস্টিডেই গোত্রের অন্তর্ভুক্ত অ্যাগ্রিলিনেইয়েছে। এই পোকাকারি বিউপ্রেস্টিডেই গোত্রের অন্তর্ভুক্ত অ্যাগ্রিলিনেই উপগোত্রের অ্যাগ্রিলিনি ট্রাইবের অন্তর্ভুক্ত। এই নমুনাটিকে কলকাতা তথা পশ্চিমবঙ্গের অন্তর্গত আই ফর্ নেচার পরিবেশবান্ধব ক্লাব এবং বৈজ্ঞানিক সংস্থার গবেষনামূলক ছাদবাগানে উপস্থিত বেল ফুল গাছ (জাসমিনাক স্যাম্বাক) থেকে সংগ্রহ করা হয়েছে। আনুসঙ্গিক ভাবে এই প্রজাতির স্ত্রী জননাস্ত্র এবং বাহ্যিক বৈশিষ্ট্যকে পুনরায় বর্ণনা করা হয়েছে।

INTRODUCTION

The family Buprestidae is represented by over 15.500 species worldwide. Buprestids are commonly known as jewel beetles owing to their vibrant metallic coloured exoskeleton. Another reason for their popularity amongst entomologists and ecologists around the globe is their bark and wood-boring nature that makes them a major pest threat for several plants

of economic importance (Evans et al., 2004). The anthropocentric introduction of exotic species around the world are known to have significant impact in the invaded territories, by causing environmental and economic damage (Ruzzier et al., 2023). Despite the fact that India is home to over 80 species of the Buprestidae family, the distribution and ecology of these species are not adequately documented in the currently available records and databases (Tara et al., 2023). The genus *Sambus* Deyrolle, 1864 recently contains 165 species distributed across Africa, parts of Asia, Oceania and Australia.

Prior to this study, only two species were known from India, *Sambus gardneri* Théry, 1928 and *S. gmelinae* Théry 1930 (Faisal et al., 2013). This paper discusses about the first record of the species, *Sambus auberti* Théry, 1926 from India, from an urban rooftop garden. The female of the species has been redescribed and key morphological features covering the mouth parts, genitalia and wing morphology has been provided.

MATERIAL AND METHODS

The species was recorded from iForNature - Nature Club experimental rooftop garden at Kolkata, West Bengal, India (22°38'34.2"N & 88°25'47.1"E). The specimen was collected by aspiration, after which it was dry mounted on a cardboard point and deposited to iForNature Nature Club Laboratory and educational collection, Kolkata, West Bengal, India. The specimen was examined using Radical Stereo Zoom Trinocular Microscope -RSM-9F (180x magnification) with circular LED illuminator (Radical Scientific Equipments Pvt. Ltd., Ambala Cantonment, Haryana, India). Pictures were taken with a SONY alpha-58 (SLT-A58) camera and a 41-megapixel HDMI microscope camera with a 0.5X trinocular adapter (Shenzhen Hayear Electronics Co. Ltd., China). The manufacturer's original software (HAYEAR USB microscope camera measure program, version x64) was used to analyse the images. Helicon Focus 8 software was used to stack images that were taken at various layers with the sharpest focus into a single image. The Erma Stage Micrometer (1mm -100 divisions) Model-Galaxy SMM101 (Erma Inc., Yushima, Bunkyo-Ku, Tokyo, Japan) was used to calibrate the measurements. Conventional morphometric methods and terminology have been applied.

The genitalia and mouthparts were dissected following Chakrovorty & Bhattacharjee (2025), Chakrovorty et al., 2025 and Háva et al. (2024). In brief, the specimen was hydrated, the abdomen was separated and placed in 10% KOH solution for 30 mins and placed in hot water bath. The abdomen was opened by separating the arthrodistal membrane of the lateral side and the genitalia was carefully dissected. The head capsule was separated from the body and the mouth parts were dissected. The genitalia and mouth parts were cleaned and permanent slides were prepared, followed by microscopic examination. Lawrence et al. (2021) was followed for terminologies associated with hindwing venation. Kubáň et al. (2000) was followed for terminologies associated with mouthparts and genitalia.

The following abbreviations were used for this study

- AA₃₊₄ = Anal Anterior, branches 3 and 4
- AA₄ = Anal Anterior, branch 4
- ade = Antero-apical dens

AL	= Length of antenna
AP ₃₊₄	= Anal Posterior, branches 3 and 4
bsg	= Basigalea
bst	= Basistipes
car	= Cardo
CAS	= Cubitoanal Strut (Cu + CuP + AA ₃)
cp	= Cardal process
Cu	= Cubitus or Cubital Vein
CuA ₂	= Cubitus Anterior, branch 2
CuA ₃₊₄	= Cubitus Anterior, branches 3 and 4
dpm	= Dorsal process of mental sclerite
dsg	= Distigalea
DVH	= Dorso-ventral height
dvs	= Dorsal valve setae in ovipositor
EL	= Elytral length from posterior margin of pronotum to tip of elytra
EW	= Maximum width of elytra
EYL	= Length of eye (dorso-ventral)
EYW	= Width of eye (antero-posterior)
FLL	= Length of foreleg (from the base of femur to the tip of tarsal claw)
fpp	= Female paraproct
ft9	= Female tergite 9 (epiproct)
HH	= Maximum dorso-ventral height of head from vertex to mandibles
HL	= Linear distance of head measured dorsally, from frons to anterior margin of pronotum
HLL	= Length of hindleg (from the base of femur to the tip of tarsal claw)
HW	= Maximum width of head in dorsal view
IAD	= Inter antennal distance (distance between inner margin of antennal base)
IOD	= Intraocular distance measured between inner ocular margin
lac	= Lacinia
lig	= Ligula
lp ₁₋₃	= Labial palpomeres 1-3
ltp	= Lateral tormal process
mco	= Mandibular condyle
mde	= Medial dens
mds	= Mediotipes
mep	= Medial tormal process
MLL	= Length of midleg (from the base of femur to the tip of tarsal claw)
mls	= Mental sclerites
MP ₁₊₂	= Media Posterior, branches 1 and 2
mp ₁₋₄	= Maxillary palpomeres 1-4
MP ₃₊₄	= Media Posterior, branches 3 and 4
MP ₄	= Media Posterior, branch 4
MSP	= medial spur (continuation of MP ₁₊₂)
PH	= Height of pronotum (dorso-ventral)
PL	= Length of the pronotum between anterior and posterior margins
plf	= Palpifer
pms	= Premental sclerites
PW	= Maximum width of pronotum
r3	= radial cross-vein 3

RA	= Radius Anterior
RA ₃₊₄	= Radius Anterior, branches 3 and 4
RP	= Radius Posterior
RP ₂	= Radius Posterior, branch 2
RP ₃₊₄	= Radius Posterior, branches 3 and 4
rrg	= Rectal ring
rsc	= Rectal sclerites
ScP	= Subcosta Posterior
sty	= Stylus
TL	= Total length of body
vpm	= Ventral process of mental sclerite
vvf	= Valvifer
WGL	= Wing length
WGW	= Wing width

TAXONOMY

Family Buprestidae Leach, 1815
Subfamily Agrilinae Laporte, 1835
Tribe Agrilini Laporte, 1835
Genus *Sambus* Deyrolle, 1864

***Sambus auberti* Théry, 1926**

(Fig. 1-7)

LSID:urn:lsid:zoobank.org:pub:B6EEF0C5-D1A5-4C73-8EE8-A0CF4E1EE69D

Type species: *Sambus lafertei* Deyrolle, 1864 (Tôyama 1986: 58)

Material examined: (1 ♀): glued on cardboard point with labels as follows “INDIA, West Bengal, Kolkata, iForNature - Nature Club experimental rooftop garden [22°38'34.2"N & 88°25'47.1"E]” “alt. 11 m, sample collection by aspirator, 19.May.2023, Arnob Chakrovorty” “Coleoptera, Buprestidae, Agrilinae, Agrilini” “*Sambus auberti* Théry, 1926 (♀)” (iForNature - Nature Club Entomology Collection).

Redescription. Measurements (mm): TL 5.282, DVH 1.638, HL 0.353, HH 1.394, HW 1.451, AL 0.995, IAD 0.251, EYL 0.849, EYW 0.494, IOD 1.012, PL 1.203, PW 1.817, PH 1.549, EL 3.776, EW 1.846, WGL 4.136, WGW 1.812, FLL 2.447, MLL 2.518, HLL 2.958.

Body entirely black in colour with metallic lustre; moderately setose with reticulate, rugate and rugo-reticulate markings throughout the body, including the legs. Additionally possess short, thick, white coloured pubescence on the dorsal and lateral surface of thorax and the dorsal surface of elytra, making a unique bilaterally symmetrical pattern. Black, coppery head, legs and edge of the pronotum tinged with copper colour; globular head, rounded forehead, shallow furrow, flattened eyes, widely notched epistome, not separated from the forehead by a keel, very narrow between the antennal cavities, strong and regular punctuations, white pubescence, longer and denser at the base of the forehead

Head (Figs. 1, 2, 4, 6): Length short, height and width subequal, appears circular in frontal view; reticulate markings present, a shallow furrow present on the vertex, visible



Fig. 1. *Sambus auberti* Théry, 1926 (♀): Image of a live specimen resting on *Jasminum sambac* (Linnaeus, 1753) at iForNature - Nature Club rooftop garden.

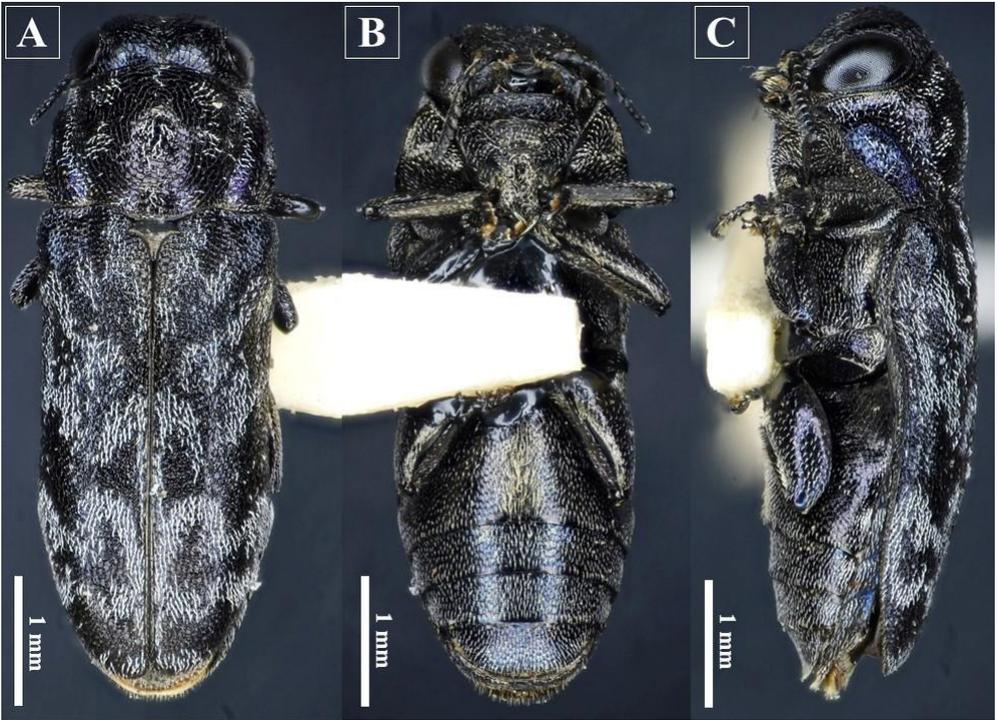


Fig. 2. *Sambus auberti* Théry, 1926 (♀): A- dorsal aspect; B- ventral aspect; C- lateral aspect.

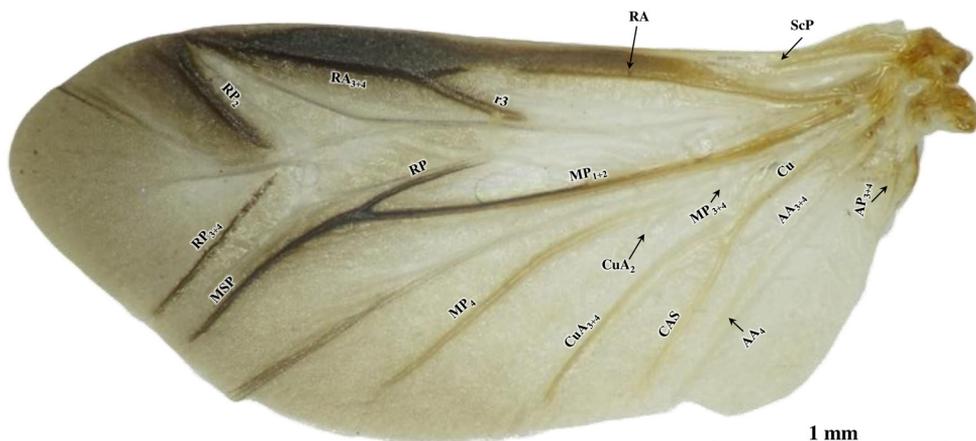


Fig. 3. *Sambus auberti* Théry, 1926 (♀): Left wing. Abbreviations: AA₃₊₄ - Anal Anterior, branches 3 and 4; AA₄ - Anal Anterior, branch 4; AP₃₊₄ - Anal Posterior, branches 3 and 4; CAS - Cubitoanal Strut (Cu + CuP + AA₃); Cu - Cubitus or Cubital Vein; CuA₂ - Cubitus Anterior, branch 2; CuA₃₊₄ - Cubitus Anterior, branches 3 and 4; MP₁₊₂ - Media Posterior, branches 1 and 2; MP₃₊₄ - Media Posterior, branches 3 and 4; MP₄ - Media Posterior, branch 4; MSP - medial spur (continuation of MP₁₊₂); r3 - radial cross-vein 3; RA - Radius Anterior; RA₃₊₄ - Radius Anterior, branches 3 and 4; RP - Radius Posterior; RP₂ - Radius Posterior, branch 2; RP₃₊₄ - Radius Posterior, branches 3 and 4; ScP - Subcosta Posterior.

when viewed dorsally (Figs. 1, 2A, 4B); eyes black, elliptical; post-occipital area very narrow, frontal pronotal margin extends over the post-occipital area and gena and partially covers it, inner eye margins not parallel, rather slightly convergent ventrally (Figs. 2C, 4A, 4C); Antennae 11-segmented, black coloured; base of antennae separated, frons with lateral depression in which the antennal socket is located, antennomeres 1-4 moniliform, slightly dilated; antennomeres 5-11 strongly serrated, 5, 8 and 9 subequal in width, around 0.160 mm, antennomere 6 is the widest, measuring 0.175 mm, antennomere 6 almost 1.3 times wider than antennomere 11, 7-11 gradually decreases in width (Figs. 2B, 4A, 4C, 4D). Maxillary palps 4-segmented; mp₁ L: 0.038 mm, W: 0.038 mm; mp₂ L: 0.061 mm, W: 0.055 mm; mp₃ L: 0.058 mm, W: 0.069 mm; mp₄ L: 0.130 mm, W: 0.122 mm; palpifer moderately sized, subequal to mp₂; mp₂ and mp₃ proximally narrower and distally wider; mp₄ subquadrate with two distally rounded angular projections, colouration proximally darker and distally lighter (Fig. 5A); galea subquadrate, heavily setose, setae measures 50-75 µm in length, separated from mediostipes; mediostipes not bipartite, outer side weakly angulate; lacinia entire, heavily setose distally, setae measures 45-80 µm in length, fused with mediostipes, angular in shape; basistipes elongate and subparallel with long seta on the lateral margin; cardo slender and elongated (0.228 mm) with prominent cardal process, width of cardo (measured dorsally) 0.053 mm. Labial palps 3-segmented; lp₁ L: 0.039 mm, W: 0.034, lp₂ L: 0.057 mm, W: 0.045 mm, lp₃ L: 0.056 mm, W: 0.037 mm; lp₂ significantly dilated and 1.22x wider than lp₃ (Fig. 6C); labium well formed, mental sclerites sinuate-conical, very slender, ventral process present, and dorsal processes present, more dilated (or wider) than the ventral processes (Fig. 6B); ligula triangular, heavily setose, length of seta almost equal to the length of lp₂; premental sclerites very slender, 0.148 mm in length,

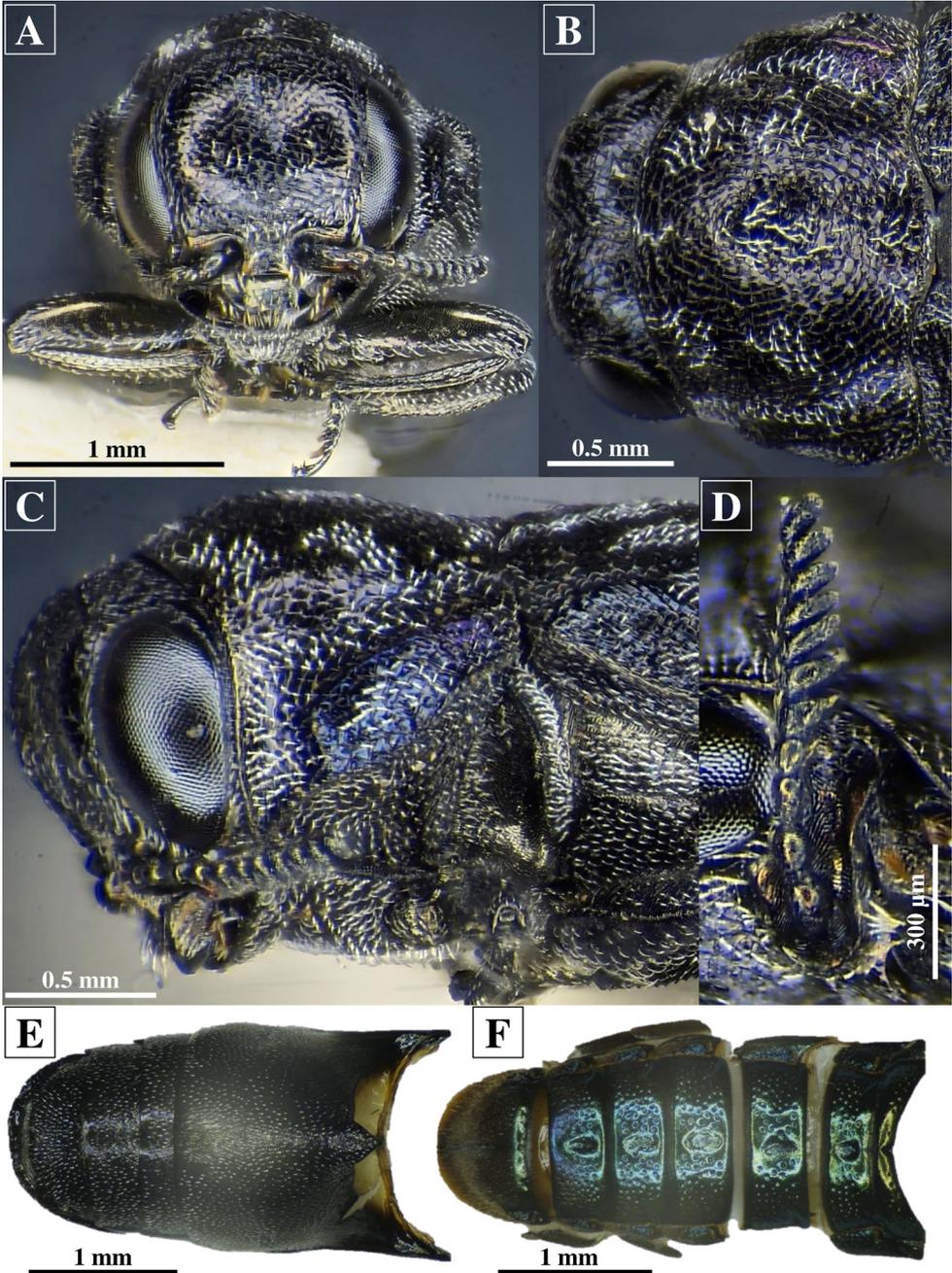


Fig. 4. *Sambus auberti* Théry, 1926 (♀): A- head in frontal view; B- dorsal view of head and pronotum; C- lateral view of head and pronotum; D- antenna; E- sternites 1-5; F- tergites 1-6.

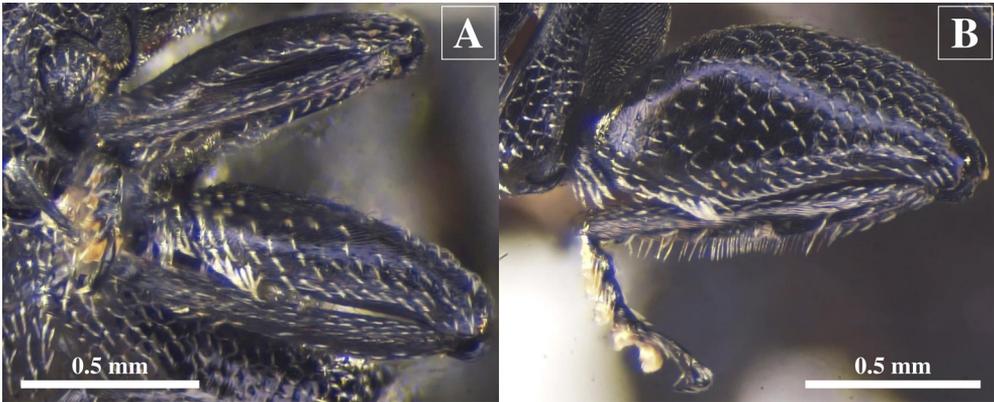


Fig. 5. *Sambus auberti* Théry, 1926 (♀): A- fore leg and middle leg; B- hindleg.

distally widened (Fig. 6C) (similar to that observed in *Coraebus* Laporte De Castelnau & Gory, 1836 and *Coraebosoma* Obenberger, 1923). Labrum rectangular with rounded corners, black coloured, distal margin almost flat with a slight inward curvature, setose, medial tormal process prominent, lateral tormal process prominent, not recurved, arched with a pointed tip (ogee arch) (Fig. 6D). Mentum triangular with rounded corners, proximal margin flat, black coloured (Fig. 6E). Mandible strongly built, triangular in gross morphology, black coloured, mandibular condyle prominent, antero-apical dens prominent, medial dens rounded, a denticle-like tooth present on the ventral surface, proximal to the antero-apical dens, dorso-lateral area above the mandibular condyle to the mid portion of the mandible setose (stiff bristle-like seta) (Fig. 6F).

Pronotum (Figs. 1, 2, 4): Black with shiny metallic iridescence, grossly trapezoidal, 1.5X wider than its length, moderately pubescent, with few white hairs dispersed on the dorsal, lateral and ventral surface; rugae like markings arranged in a centric fashion located on the dorsum (Figs. 1, 2A, 4B), anterior pronotal margin arched, posterior pronotal margin bisinuate, mentonniere present (a flap-like extension of the prosternal process, chin shield), pronotal (or prehumeral) carinae prominent, hypomeron prominent, hypomeral (or marginal) carinae and stenopleural suture prominent, prosternum triangular, prosternal process exceeds way beyond the procoxal cavity, subequal in width to the mid femur, slightly tapering towards the posterior, with two lateral denticular projections, procoxal cavity open.

Elytra (Figs. 1, 2, 4): Black with shiny metallic iridescence, length 2.05X the width, 3.14X the length of the pronotum, lateral margins sinuate, pubescent with few white hairs dispersed on the dorsal, lateral and ventral surface, weakly reticulate, the white pubescence makes a bilaterally symmetrical pattern, the anterior pattern looks like a X-mark, below it lies a mark, vaguely resembling “Batman logo”, and further below it lies a misshapen arrow mark on each elytra, pointing towards the medial elytral suture; scutellum grey in colour, has lateral striations, posterior margin in the shape of a “fountain pen nib”.

Wings (Fig. 3): Transparent, length 2.3x its width, distally darker in shade and the area above the RA_{3+4} is black in colour. ScP prominent, RA prominent and continues forward as RA_{3+4} , r3 prominent, RP_2 and RP_{3+4} not connected at the base, RP not connected at the

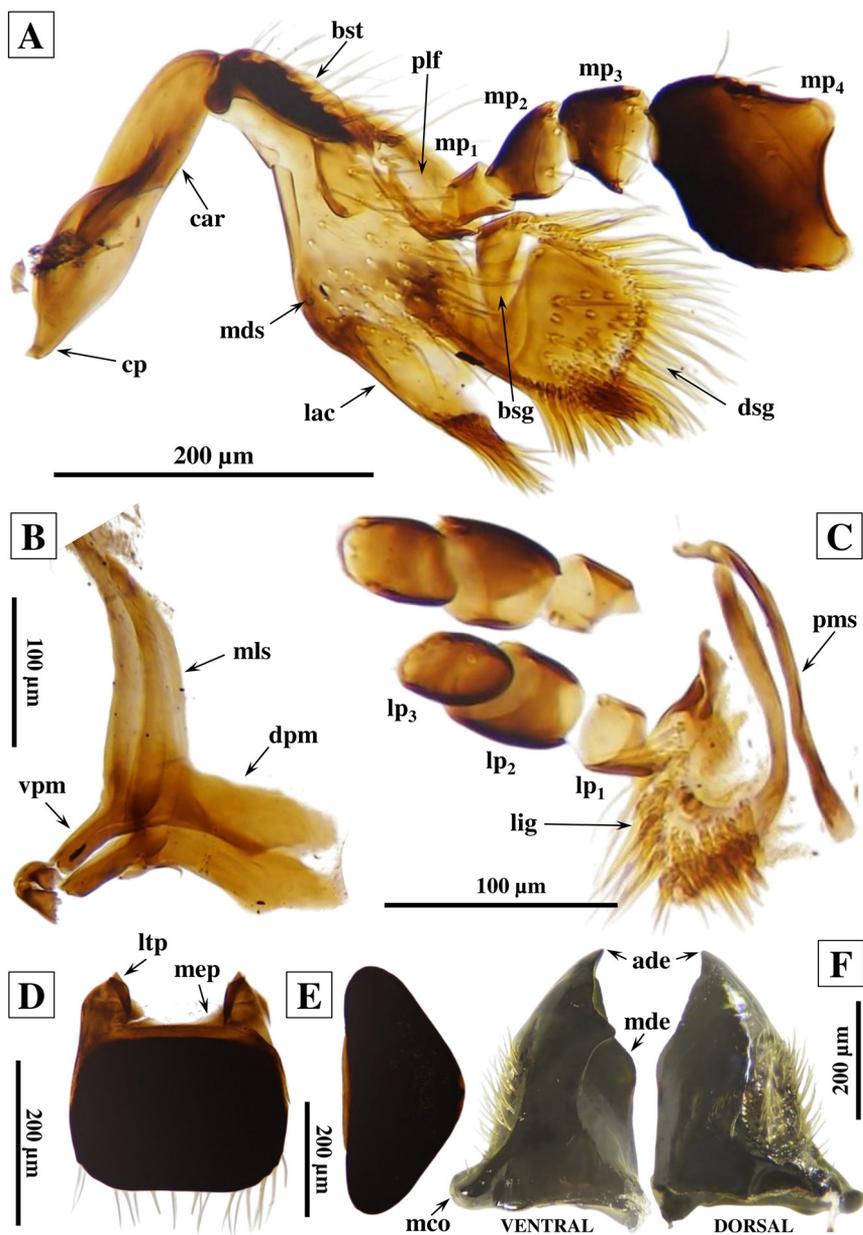


Fig. 6. *Sambus auberti* Théry, 1926 (♀): A- maxilla; B- mental sclerites of adult labium; C- labium; D- labrum; E- mentum; F- mandible, left- ventral aspect, right- dorsal aspect. Abbreviations: ade - antero-apical dens; bsg - basigalea; bst - basistipes; car - cardo; cp - cardal process; dpm - dorsal process of mental sclerite; dsq - distigalea; lp₁₋₃ - labial palpomeres 1-3; lac - lacinia; lig - ligula; ltp - lateral tormal process; mco - mandibular condyle; mde - medial dens; mds - mediostipes; mep - medial tormal process; mls - mental sclerites; mp₁₋₄ - maxillary palpomeres 1-4; plf - palpifer; pms - premental sclerites; vpm - ventral process of mental sclerite.

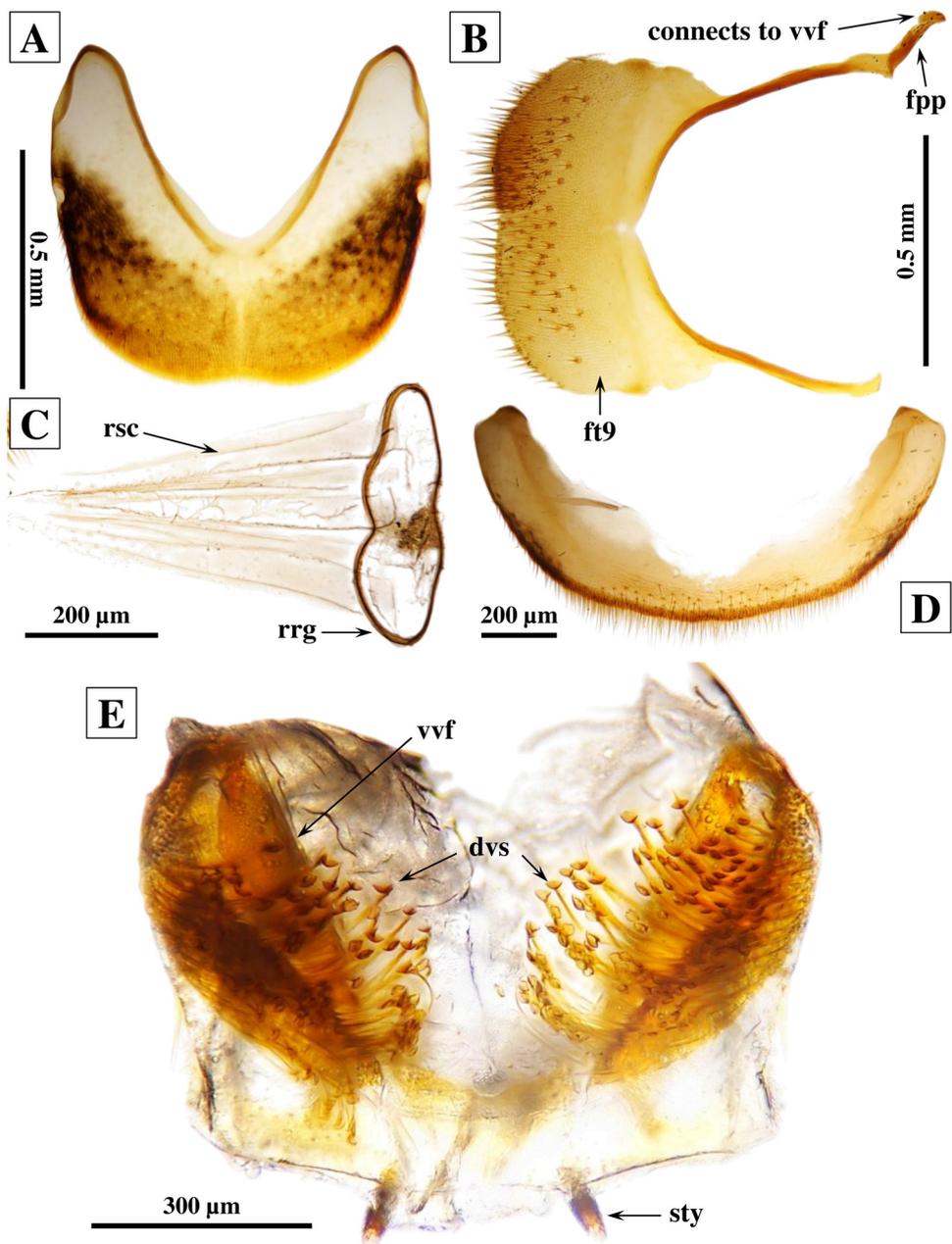


Fig. 7. *Sambus auberti* Théry, 1926 (♀): A- female tergite VIII; B- female tergite IX; C- female rectal sclerites and rectal ring; D- female sternite VIII; E- ovipositor (ventral aspect). Abbreviations: dvs - dorsal valve setae in ovipositor; fpp - female paraproct; ft9 - female tergite 9 (epiproct); rrg - rectal ring; rsc - rectal sclerites; sty - stylus; vvf - valvifer.

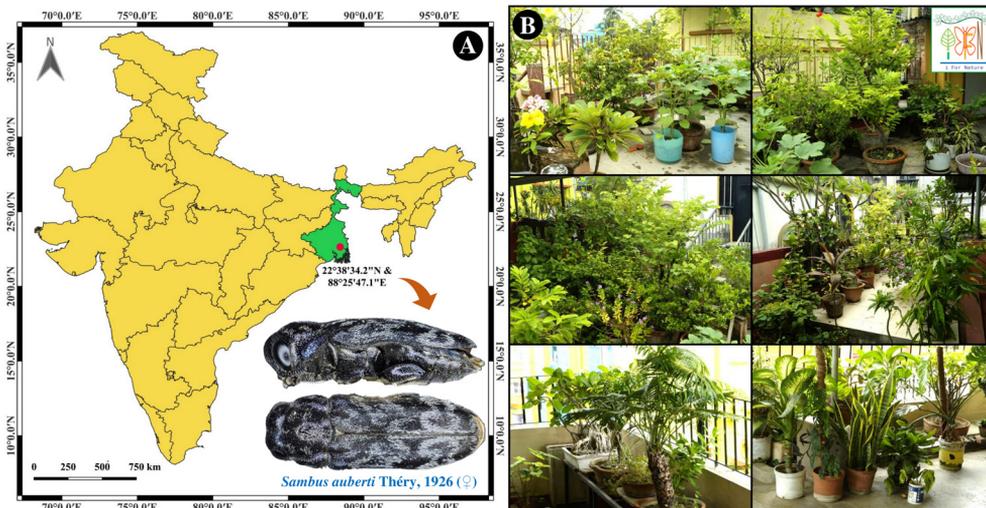


Fig. 8. *Sambus auberti* Théry, 1926 (♀): A- distributional map; B- images of the study site, iForNature - Nature Club rooftop garden (permitted to reuse the image from Háva et al. 2024).

base, RP and MP_{1+2} joins and projects forward as MSP , MP_{3+4} bifurcates into MP_4 and CuA_2 , CuA_2 is short and forms a small strut-like vein, Cu bifurcates into CuA_{3+4} and CAS , AA_{3+4} is straight and continues forward as AA_4 , AP_{3+4} occurs as a small strut-like vein near the jugal area.

Legs (Figs. 1, 2, 4, 5): Completely black in colour, rugose, setose, white seta present throughout the femur and tibia; tarsal claw formula 5-5-5, tarsal claw appendiculate; length of fore femur 4.5x its width, length of fore tibia 6.28X its width; length of mid femur 3.65x its width, length of mid tibia 8.74x its width; hind femur enormously dilated, 0.519 mm in width, length 2.3x its width, length of hind tibia 8.4x its width, a distinct notch present on the mid-length of the dorsal margin, hind tibia with a single row of erect setae running along the dorsal margin, setae becomes more densely packed below the notched area of the hind tibia.

Abdomen (Figs. 2, 4, 7): Completely black with metallic sheen, setose; tergites coarsely pitted; tergites 3-6 subequal in length, tergites 2-6 have a single deep concavity in the centre of each tergum; posterior margin of tergite 7 U-shaped (Fig. 4F); intercoxal process on abdominal sternite 3 triangular, the central area of sternite 3 and 4 have dense pubescence (Figs. 2B, 4E), sternite 9 (paraproct) arch-shaped, densely pubescent on the posterior margin (Fig. 7D); paratergites prominently formed; tergite 8 horseshoe-shaped, posterior margin slightly curved inwards, densely setose with fine small setae (Fig. 7A); tergite 9 (epiproct) shaped in the form of an “insect labrum” with a long process on each side, tip of the process attaches to the valvifer (Fig. 7B); Fig. 7C shows the structure of rectal sclerites and on the terminal is a sclerotised ring-like structure called the rectal ring.

Genitalia (Fig. 7): Valvifer moderate not filiform, dorsal valve setae in ovipositor not simple, rather, thickened to form abrupt clavate structures that are triangular in shape; two small stylus present, rest as in fig. 7D.

DISCUSSION

The discovery of *Sambus auberti* Théry, 1926 from an urban rooftop garden (Fig. 8) highlights the importance of these green spaces to harbour local insect fauna and contribute to the understanding of insect population in urban landscapes. Prior to this study, the iForNature - Nature Club rooftop garden has been instrumental for several scientific findings including the rediscovery of the sand wasp species, *Bembecinus proximus* (Handlirsch 1892) (Crabronidae: Bembicinae: Bembicini) (Chakrovorty et al., 2023b), discovery of a new species of myrmecophilous beetle *Thorictus bengalensis* Háva & Chakrovorty, 2024 (Coleoptera: Dermestidae: Thorictinae: Thorictini) (Háva et al., 2024), new species of hairy fungus species *Litargus arjanbasui* Háva & Chakrovorty in Chakrovorty et al., 2025 (Coleoptera: Mycetophagidae), new distribution record of *Itamus castaneus* Schmidt-Goebel, 1846 (Carabidae: Pausinae: Ozaenini) (Chakrovorty et al., 2024) and photo documentation of predation of *Vespa tropica* (Linn.) on *Polistes (Gyrostoma) olivaceus* (De Geer) (Chakrovorty et al., 2023a).

ACKNOWLEDGEMENTS. Arnob Chakrovorty and Banani Bhattacharjee would like to acknowledge iForNature - Nature Club for providing the necessary microscopy facilities. The authors are thankful to Vítězslav Kubáň (Czech Republic) for confirming the identification of the species. The authors are thankful to Eduard Jendek (Slovakia) for providing us with the manuscript of the original description.

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Received: 31.8.2025
Accepted: 10.10.2025
Printed: 31.3.2026

