

A new species of *Klabonosa* Bouček (Hymenoptera: Pteromalidae) reared from eggs of *Endochus* sp. (Hemiptera: Reduviidae) from India

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Abstract

The genus *Klabonosa* Bouček (Hymenoptera: Pteromalidae) is recorded for the first time from the Oriental region, with both sexes of *K. indica* Gupta, Sureshan & Yeshwanth **sp. n.** reared from eggs of the assassin bug *Endochus* sp. (Hemiptera: Reduviidae) on *Artocarpus heterophyllus* Lam. (Moraceae). The male is formally described and illustrated for the first time for the genus.

Key words: host record, Oriental region, key to species

Introduction

Klabonosa Bouček, 1976 (Hymenoptera: Pteromalidae: Pteromalinae) was described based on *K. ferox* Bouček, 1976 from Uganda (type species) and *K. watshami* Bouček, 1976 from Zimbabwe. Bouček (1988) subsequently described two more species *K. austini* and *K. cabra*, from Australia. The genus is distinctive in appearance, with an unusually large head with the antennae inserted at least at, if not above, the middle of the head and sometimes with conspicuous tentorial pits (Figs 2A, 5A; Bouček 1976, figs 28, 30, Bouček 1988, figs 754, 755). Until this study *Klabonosa* was known only from females, though a solitary male, suspected to be a third Australian species, was mentioned by Bouček (1988). The only other species with known biology, *K. austini*, was obtained from “? reduviid eggs” and “cecidomyiid galls”, with the latter record stated as being probably erroneous (Bouček, 1988: 427).

In the present study, the first species of *Klabonosa* is described and illustrated from the Oriental region based on both sexes along with the first confirmed host, *Endochus* Stål (Hemiptera: Reduviidae: Harpactorinae) on *Artocarpus heterophyllus* Lam. (Moraceae).

Material and methods

The specimens for the present study were reared from egg mass of *Endochus* sp. (Hemiptera: Reduviidae) on the host plant *Artocarpus heterophyllus* Lam. (Moraceae) collected from the campus of GKVK (Gandhi Krishi Vigyan Kendra), Bengaluru, Karnataka, India (12°58'N, 77°35'E, 937 m altitude). The specimens were preserved in 70% ethanol, card mounted, studied and photographed with a Leica M 205 A microscope. Pictures were taken with a stereozoom microscope with a Leica DC 420 camera using auto montage software (version 3.8). The images of the *Endochus* sp. eggs were captured using a Canon DSLR camera with macro-lens. The type specimens are housed in the University of Agricultural Sciences-Bengaluru (UAS-B), India; ICAR-National Bureau of Agricultural Insect Resources (NBAIR), Bengaluru, India, a Designated National Repository, and Zoological Survey of India, Western Ghat Regional Centre, Calicut (ZSIK), a Designated National Repository.

The following abbreviations are used in the text: F1–F6: funicular segments 1–6; MV: marginal vein; OD: diameter of median ocellus; OOL: ocular-ocellar line; PMV: postmarginal vein; POL: post-ocellar line; SMV: submarginal vein; STV: stigmal vein; CC: costal cell; T1: first gastral tergite. All measurements are taken in millimeters and for relative measurements mean and range in parenthesis of the types (female) specimens is taken.

Results

Klabonosa Bouček, 1976: 28–29.

Type species *Klabonosa ferox* Bouček, by original designation.

Description (modified from Bouček, 1976). Head with conspicuous tentorial pits; genae long and only little converging; lower face enlarged and swollen below at sides; occiput deeply excavated but not carinate; POL greater than OOL; antennae inserted at middle to distinctly above middle of face; clypeus not or only slightly striate, its lower margin bilobate; mouth broad with mandibles strong and usually large. Antennal formula 11263 in both female and male; male antenna slender with relatively short scape and long funicular segments, pedicel more globose and funicular segments more densely hairy than for female. Head and mesosoma finely to strongly reticulate. Pronotum dorsally not long, anteriorly carinate or subcarinate. Mesonotum with notauli incomplete, short; scutellar frenalum usually not separated, though sometimes distinct with strong reticulation. Propodeum short, without nucha; adpetiolar margin thin; without median carina; plicae indistinctly indicated by longitudinal swellings; spiracles small, near anterior margin. Legs normal; hind tibia with one spur. Fore wing with MV slender, longer or slightly shorter than PMV, stigma normal. Gaster sessile or petiolate, shorter than or as long as mesosoma, ovate-subacuminate, collapsing dorsally; hypopygium in female reaching beyond middle of gaster; ovipositor exerted; male with gaster shorter and more compressed than for female.

Key to females of *Klabonosa* Bouček

(based on descriptions and figures from Bouček 1976, 1988)

1. Tentorial pits in the form of simple pits; head in frontal view comparatively long and antennae inserted distinctly above middle of face (Figs 2A; Bouček 1976, fig. 28, Bouček 1988, fig. 754) 2
- Tentorial pits deep and distinct, sometimes united as short, divergent groove; head not as long as above and antennae sometimes inserted near middle of face (Bouček 1976, fig. 30, Bouček 1988, fig. 755) 3
2. Fore wing with broad speculum and MV longer than PMV (Bouček 1976, cf. fig. 31); STV $0.43\times$ MV; lateral ocellus less than half of its diameter from eye margin; mesosoma about twice as long as broad; body dark metallic green *K. ferox* Bouček
- Fore wing with speculum narrow and MV little shorter than PMV ($0.85\text{--}9.0\times$) (Fig. 2D); STV $0.54\text{--}0.6\times$ MV; lateral ocellus little more than its diameter from eye margin (Fig. 2B); mesosoma $1.34\text{--}1.54\times$ as long as broad (Fig. 2F); body dark metallic blue *K. indica* sp. n.
3. Tentorial pits united as transverse slot-like groove and much closer to ventral margin of head than to toruli such that clypeus strongly transverse (Bouček 1988, fig. 755); antennae inserted at middle of face (Bouček 1988, fig. 755) ... *K. cabra* Bouček
- Tentorial pits not completely united mesally and higher than above such that clypeus rectangular (Bouček 1976, fig. 30, Bouček 1988, fig. 754); antennae inserted slightly (Bouček 1976, fig. 30) to distinctly (Bouček 1988, fig. 754) above middle of face 4
4. Antennae inserted distinctly above middle of face (Bouček 1988, fig. 754); POL about $1.8\times$ OOL; pronotum carinate anteriorly; body mainly dark green; size 1.4–1.6mm *K. austini* Bouček
- Antennae inserted slightly above middle of face (Bouček 1976, fig. 30); POL fully twice as long as OOL; pronotum not carinate anteriorly; body mainly bluish green; size 1.7–1.9 mm *K. watshami* Bouček

Klabonosa indica Gupta, Sureshan & Yeshwanth sp. n.

(Figs 1–5)

Description. FEMALE (Fig. 1). [Measurements based on the holotype and paratypes.] Body length 1.58 mm (holotype) with average body length 1.6 mm (1.54–1.68) (see Table 1 for measurements).

TABLE 1. Comparative measurements of type material (females).

Body characters	Paratype1	Paratype2	Paratype3	Holotype	Mean
Body length	1.60	1.54	1.68	1.58	1.6
Head (frontal view): ratio of width/length	1.08	1.03	1.03	1.15	1.07
Head (dorsal view): ratio of width/length	1.47	1.53	1.49	1.53	1.51
Ratio of eye length/temple	3.07	3.18	3.01	2.97	3.06
Ratio of eye height/ malar space	2.58	3.22	2.5	2.65	2.74
Length: ratio of scape/eye height in lateral view	0.65	0.64	0.6	0.7	0.65
POL:OOL:OD	13.2:5.0: 5.0	11.5:6.0:5.1	10.9:5.8: 4.8	12.2:6.0:4.9	11.95:5.70:4.95
Ratio of POL/OOL	2.64	1.92	1.88	2.03	2.12
Forewing: ratio of MV/STV	1.6	1.7	1.6	1.7	1.65
Forewing: ratio of MV/PMV	0.89	0.83	0.82	0.86	0.85
Forewing: ratio of PMV/STV	1.88	2.03	1.94	1.98	1.96
Forewing: ratio of CC/MV	1.62	1.67	1.41	1.38	1.52
Ratio of clava length/ combined length of F5& F6	1.01	1.18	0.95	0.88	1.01

**FIGURE 1.** *Klabonosa indica*. Female, habitus in lateral view.

Colour. Head and mesosoma (Figs 2A–C, F) mostly with bluish metallic sheen except greenish on frons. Antenna with scape light yellow, pedicel and anelli yellowish-brown; flagellum and clava brown. Gaster (Fig. 2E) black with metallic green shine on T1; yellowish-brown coloration at base and on the lateral sides of entire gaster.

Legs with basal half of coxa concolourous with mesosoma, apical half yellow testaceous (Fig. 2E), remainder of legs yellowish with tips of tarsi brown. Tegula yellowish. Wings hyaline with veins and pilosity brown (Fig. 2D).

Head. Head distinctly reticulate (Figs 2A, B); ocellar triangle coarsely reticulate (Fig. 2B). Antenna inserted above middle of face (Fig. 2A); flagellum (Fig. 2C) with linear sensilla arranged in four irregular rows on F1, three irregular rows on remaining funicular segments; first anellus wider than second. Scrobal area reticulate. Clypeal area (Fig. 2A) finely reticulate, lower margin bilobed with a deep median incision. Left and right mandible similar with lower tooth long, second tooth short and truncate upper tooth (Fig. 3). Head in frontal view 1.07 (1.03–1.15)× wider than high, in dorsal view 1.51 (1.47–1.53)× wider than long; eye height 2.74× malar space; in lateral view malar space 0.36 (0.4–0.33)× eye height. Antenna with length of pedicel flagellum 1.92× head width in frontal view; scape reaching anterior ocellus, 0.65× eye height; pedicel 0.58 as long as F1; F1–F6 longer than wide (ratio of length : width of each segment = 13.7 : 10.9 : 10.6 : 11.3 : 10.0 : 9.8); clava length : width = 18 : 3, 1.01× as long as two preceding segments combined. POL: OOL: OD (11.95 : 5.70 : 4.95); POL 2.12' OOL.

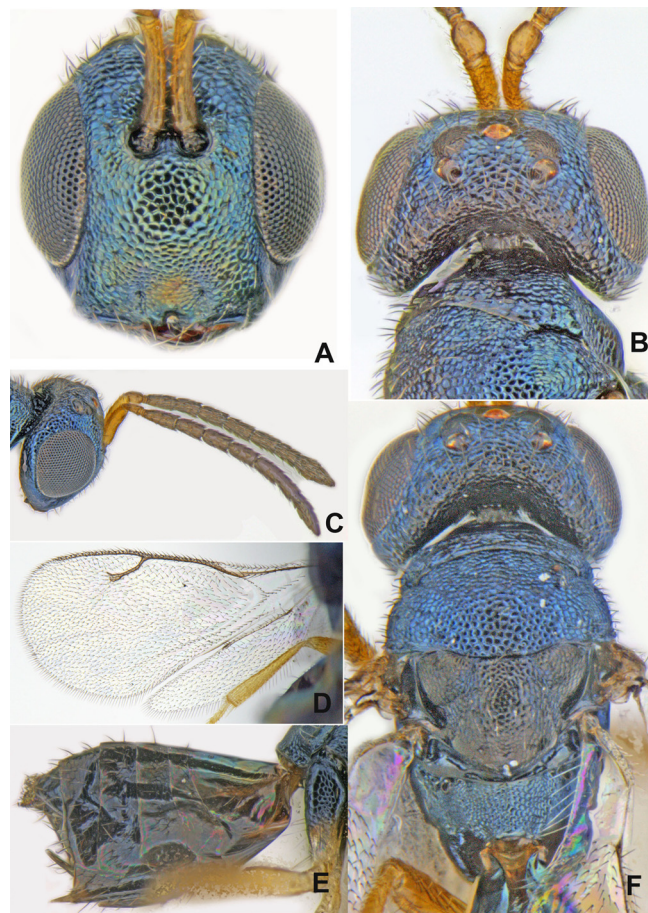


FIGURE 2. *Klabonosa indica*. Female: A, head in frontal view; B, head and pronotum in dorsal view; C, head in lateral view and antennae; D, wings; E, metasoma in lateral view; F, head and mesosoma in dorsal view.

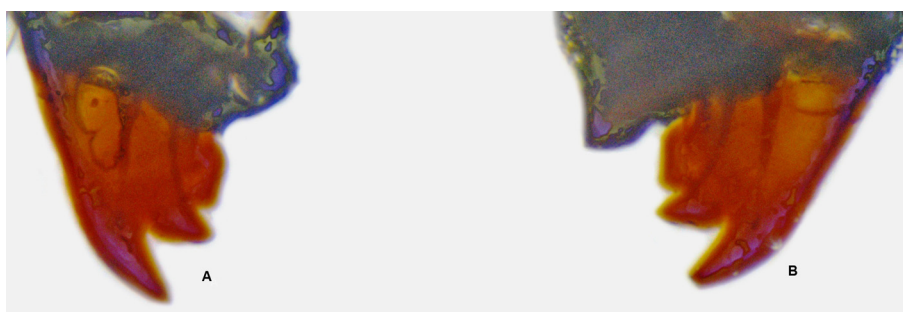


FIGURE 3. *Klabonosa indica*. Female: A, left mandible; B, right mandible.



FIGURE 4. *Klabonosa indica*. Male, habitus in lateral view.

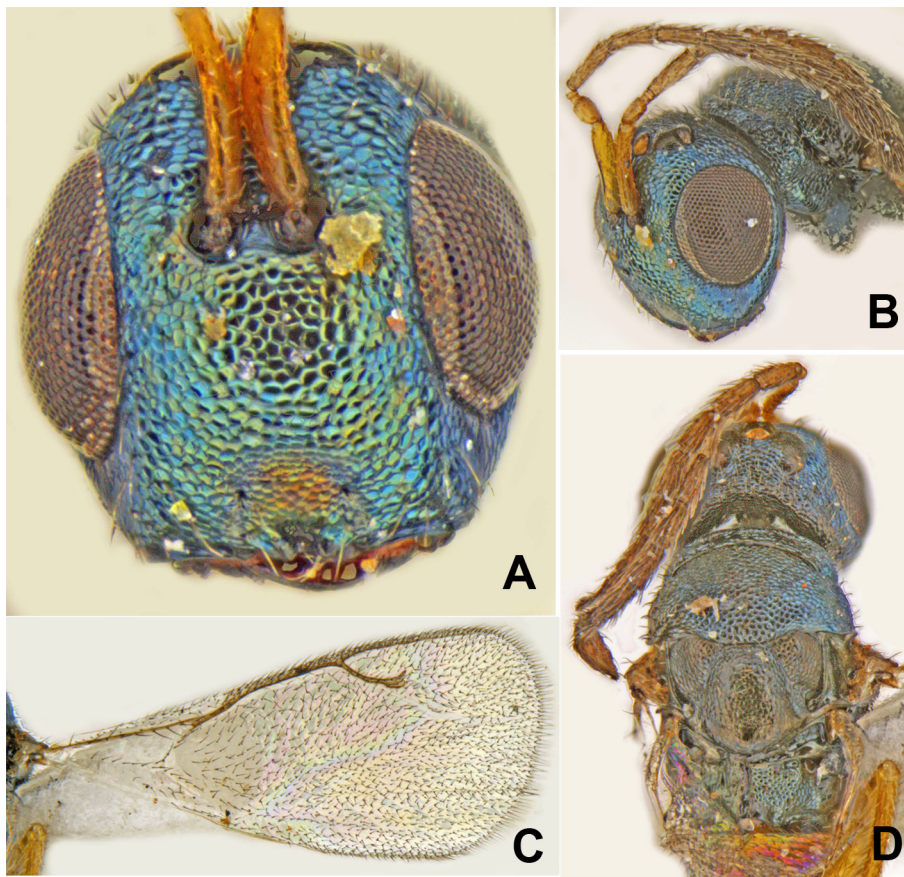


FIGURE 5. *Klabonosa indica*. Male: A, head in frontal view; B, antennae with body in part; C, fore wing; D, head and mesosoma in dorsal view.

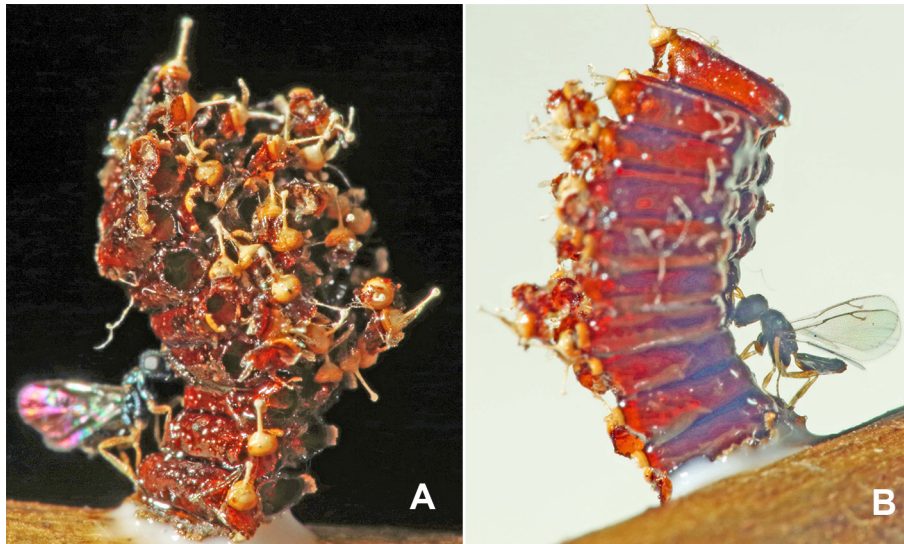


FIGURE 6. Parasitized host eggs of *Endochus* sp. A, egg case in dorsal view with wasp; B, egg case in lateral view with wasp.

Mesosoma. Mesosoma (Fig. 2F) $1.34\text{--}1.54\times$ as long as wide and $0.99\text{--}1.15\times$ as long as metasoma; slightly convex and reticulate except propodeum finely reticulate (Fig. 2F). Pronotal collar carinate anteriorly (Fig. 2B). Axilla reticulate; frenum faintly indicated by fine reticulation (Fig. 2F). Propodeum (Fig. 2F) width $3.31\text{--}3.65\times$ length; without median carina and with fine plicae, median area raised; spiracles oval with irregular margins, near the hind margin of metanotum. Mesoscutum width $2.04\times$ length; scutellum length subequal to width. Fore wing (Fig. 2D) length $2.25\times$ width, subhyaline; MV $0.85\times$ PMV, PMV $1.96\times$ STV, CC $1.52\times$ MV; costal cell dorsally and ventrally with setae; basal fold with line of 7–9 setae; speculum almost absent, narrow, closed below.

Metasoma (Fig. 2E). Gaster smooth and shiny, collapsing dorsally, $0.69\text{--}0.73\times$ as long as head and mesosoma combined, acute apically; petiole smooth, twice as wide as long; T1 largest, less than half length of gaster, hind margin slightly incised medially; hypopygium reaching $0.84\times$ length of gaster (without petiole). Ovipositor protruding slightly.

MALE. Body length 1.68 mm (Figs 4, 5A–D). Similar to female except for metasoma. Antenna (Figs 5B, D), densely hairy with linear sensilla arranged in multiple rows, and with globose pedicel. POL: OOL : OD = 13.2 : 5.0 : 5.0; POL $2.64\times$ OOL. Fore wing $2.21\times$ as long as wide; basal cell closed below and with 8 setae on basal fold (Fig. 5C); MV $0.89\times$ PMV, PMV $1.88\times$ STV, CC $1.48\times$ MV. Gaster more slender and compressed than for female; with side of first tergite and anterior part of second tergite yellowish-brown.

Type material. Holotype f# (UAS-B), INDIA, Karnataka, Bengaluru, UAS-B (GKVK campus), $12^{\circ}58'N$, $77^{\circ}35'E$, 937 m altitude, 08.x.2017, ex *Endochus* sp. (Hemiptera: Reduviidae) on the host plant *Artocarpus heterophyllus* Lam. (Moraceae), coll. H. M. Yeshwanth, registration number - UASB01827065. Paratypes: 3f#, 1m# (NBAIR) [same data as holotype], registration number - NBAIR/Ptero/Klab/81017B–E; 2f#, (UAS-B (GKVK campus)) [same data as holotype], codes- UASB01827066, UASB01827067; 2f#, (ZSI (Kozhikode)) [same data as holotype], registration number ZSI/WGRC/IR/INV/10346).

Etymology. The species name is derived from the country name from where it was collected.

Biology. Reared from eggs of an assassin bug *Endochus* sp. (Hemiptera: Reduviidae) (Fig. 6) on the host plant *Artocarpus heterophyllus* Lam. (Moraceae). The unparasitized eggs are also shown (Fig. 7). The host egg mass contained 30 eggs, from which 29 females and 1 male of *K. indica* emerged.

Remarks. The new species is most similar to *K. ferox* in general morphology especially in the shape of head with tentorial pits less distinct in the form of smaller pits (*cf.* Fig. 2A and Bouček 1976, fig. 28). They are also similar in having large ocelli, similar antennae which are situated high on the face, fore wing with basal cell closed below by cubital hairline, and similar body sculpture. However, *K. indica* differs from *K. ferox* in general colour of body which is more metallic blue rather dark green, POL $2.1\times$ diameter of lateral ocellus, which is little more than its own diameter from the eye margin, mesosoma $1.34\text{--}1.54\times$ as long as broad, fore wing with a very slender speculum (Fig. 2D), MV $0.85\times$ PMV, PMV $1.96\times$ STV and body length 1.6 mm (in *K. ferox* body dark green, POL nearly twice diameter of lateral ocellus, which is less than half its diameter from eye margin, mesosoma about

twice as long broad, fore wing with speculum broad and MV longer than PMV (Bouček 1976, *cf.* fig. 31), STV $0.42\times$ MV, and body length 2 mm).

Females of *K. austini*, *K. cabra* and *K. watshami* not only differ somewhat in head shape but also in having deep and distinct tentorial pits. In *K. cabra* these are united in a continuous groove quite close to the oral margin (Bouček 1988, fig. 755), whereas in *K. austini* (Bouček 1988, fig. 754) and in *K. watshami* (Bouček 1976, fig. 30) they are in the form of short, divergent grooves. The antennae are also inserted much closer to the middle of the head in these last two species than for *K. indica*.

Similarity in head shape between females (Fig. 2A) and males (Fig. 5A) of *K. indica* suggest that males of the other three species will be similar to conspecific females and thus also readily differentiated from *K. indica* males.

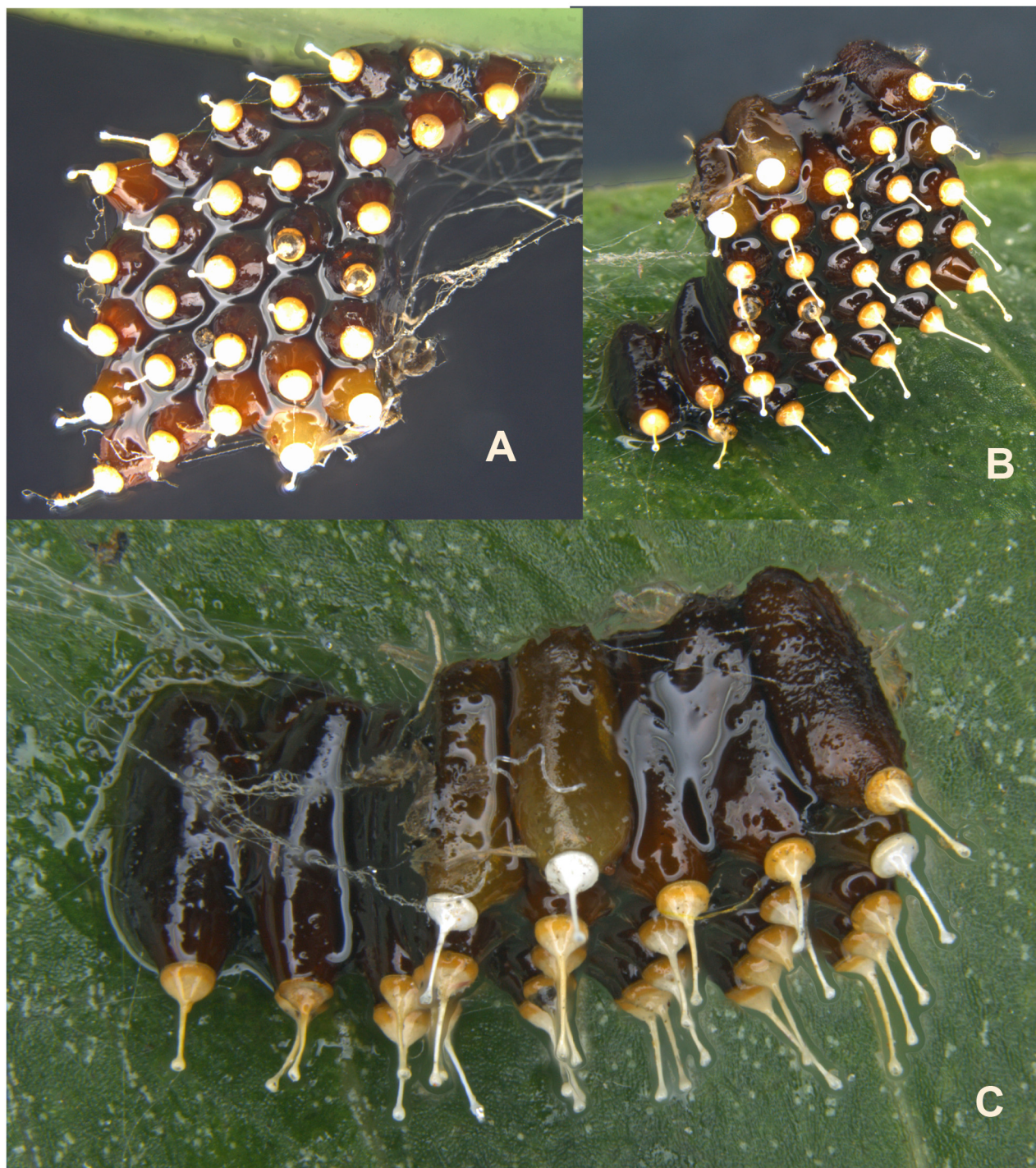


FIGURE 7. Unparasitized host eggs of *Endochus* sp. A, egg case in dorsal view; B, egg case at an angle, C, egg case in lateral view.

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