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The lanternflies from Andaman and Nicobar: one new *Pyrops* species, new records and illustrated key to the species (Hemiptera: Fulgoromorpha: Fulgoridae)

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Front cover: *P. azureus* (at rear) and *P. rogersi* (at front), Andaman Islands, Long Island, Lalaji Bay, 27 May 2014 (© A.V. Mohan).

The lanternflies from Andaman and Nicobar: one new *Pyrops* species, new records and illustrated key to the species (Hemiptera: Fulgoromorpha: Fulgoridae)

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Abstract

The species of *Pyrops* Spinola, 1839 recorded from the Andaman and Nicobar Islands are reviewed with a new species, *P. azureus* sp. nov. is described from North Andaman and recorded from South Andaman and Long Island based on photographs in nature. A distribution map of the species is given. The three *Pyrops* species currently known in the Archipelago, *P. andamanensis* (Distant, 1880), *P. rogersi* (Distant, 1906) and *P. azureus* sp. nov. are comprehensively illustrated, including the male genitalia. *Pyrops rogersi* is transferred from the *P. pyrorhynchus* group to the *P. candelaria* group. *Penthicodes* (*Ereosoma*) *atomaria* (Weber, 1801) is recorded from Andamans for the first time. New records based on photographs are given as well as an illustrated identification key to all Fulgoridae from the Andaman and Nicobar Archipelago. Together with *Penthicodes* (*Penthicodes*) *nicobarica* (Stål, 1869), *Penthicodes* (*Ereosoma*) *pulchella* (Guérin-Méneville, 1838) and *Polydictya negrito* Distant, 1906, seven species of Fulgoridae are currently recorded from the treated area.

Keywords: India, Malaysia, Lanternbug, Fulgoroidea, Planthopper.

Introduction

The Andaman and Nicobar Islands are an archipelago formed as an extension of the Arakan Yomas mountain range arising at Cape Negrais in Myanmar extending to the Achin head in Sumatra (DAS, 1999). It is the largest archipelago of the Bay of Bengal comprising about 325 islands. Most are part of the Andaman and Nicobar Islands Union Territory of India, while a small number in the north of the archipelago, including the Coco Islands, belong to Myanmar. The Andaman Islands show biogeographic affinities with the Indo-Burma region (DAS, 1999).

Five species of Fulgoridae are currently recorded from the archipelago, with four of them endemic: *Polydictya negrito* Distant, 1906, *Pyrops andamanensis* (Distant, 1880), *Pyrops rogersi* (Distant, 1906) and *Penthicodes* (*Penthicodes*) *nicobarica* (Stål, 1869), plus one (*Penthicodes* (*Ereosoma*) *pulchella* (Guérin-Méneville, 1838)) widespread in Southeast Asia and noted from Andamans (ATKINSON, 1885; BOURGOIN, 2017).

Considering that the descriptions and data about Andaman and Nicobar lanternfly species all date from more than one hundred years ago, it was surprising to find a new species of the conspicuous genus *Pyrops* from one of the most anthropized island of the archipelago, as well as to detect for the first time an additional species, *Penthicodes* (*Ereosoma*) *atomaria* (Weber, 1801).

Two species of *Pyrops* were hitherto known from the Andaman and Nicobar Islands.
(1) DISTANT (1880) described *P. andamanensis* from "Andaman Isles" in the genus *Fulgora* Linné, 1767. He stated that this species was closely related to *P. delessertii* (Guérin-Méneville, 1840) form southern India, considering the pattern of the tegmina; and to *P. maculatus* (Olivier, 1791) from Sri Lanka, considering the shape of the cephalic process. The species was recorded from 'Nicobar Island' by ATKINSON (1885) from a specimen in the Indian Museum (Kolkata), which he later illustrated (ATKINSON, 1889). The species was transferred to the genus *Laternaria* Linnaeus, 1764 by METCALF (1947), and later back to *Fulgora* by LALLEMAND (1963) who placed it in the *P. candelaria* group ("Premier groupe"). The latter view was followed by NAGAI & PORION (1996) who transferred the species to the genus *Pyrops* Spinola, 1839.
(2) In his Fauna of British India, DISTANT (1906) described *P. rogersi* based on a specimen from 'Nicobar Island'. The species was transferred to the genus *Laternaria* Linné, 1764 by METCALF (1947), and later back to *Fulgora* by LALLEMAND (1963) who placed it the *P. pyrorhynchus* group ("troisième groupe"). The latter view was followed by NAGAI & PORION (1996) who also transferred the species to the genus *Pyrops* Spinola, 1839.

The three other species of Fulgoridae recorded from Andaman and Nicobar are:
(1) *Penthicodes* (*Penthicodes*) *nicobarica* (Stål, 1869), described from the Nicobar Islands. The species is hitherto known from the type specimen only, from which all subsequent mentions were based (ATKINSON, 1885; DISTANT, 1906; METCALF, 1947; LALLEMAND, 1963; NAGAI & PORION, 1996; CONSTANT, 2010).
(2) *Penthicodes* (*Ereosoma*) *pulchella* Guérin-Méneville, 1838, described from Java and recorded from the Andaman Islands based on material in the collections of the Indian Museum (ATKINSON, 1885). Later mentions from the Andaman Islands were based on ATKINSON (1885) (viz. DISTANT, 1906; METCALF, 1947; NAGAI & PORION, 1996; CONSTANT, 2010).
(3) *Polydictya negrito* Distant, 1906, described from Andaman Islands based on two male specimens, from which later mentions were based (METCALF, 1947; NAGAI & PORION, 1996).

This study of recent material (10 specimens) and photographs (representing 6 records) of specimens of Fulgoridae from the Andaman and Nicobar Archipelago led to the discovery of a new species in the genus *Pyrops*, of a new species record species for the area and a reconsideration of some current issues concerning the species hitherto recorded from the archipelago.

The present paper aims to describe the new species of *Pyrops*, review the two other Andaman *Pyrops* species, add a new species record to the list of the Fulgoridae species of the Archipelago as well as provide an illustrated identification key to all recorded Fulgoridae from the Andaman and Nicobar Islands.

Material and methods

The type specimens of all endemic species were examined. The male genitalia of the *Pyrops* species were dissected as follows: the pygofer was cut from the abdomen of the softened specimen with a needle blade, and then boiled for about one hour in a 10% solution of potassium hydroxide (KOH) at about 100°C. The pieces were examined in ethanol, and then placed in glycerine with the pinned specimen for preservation. Observations were made using a Leica MZ8 stereo-microscope. Pictures were taken with a Canon EOS 700 D camera with Sigma DG Macro lens, stacked with CombineZ software and optimized with Adobe Photoshop CS3 software. The inflation of the phallus was not done due to the difficulty obtaining replicable results and because it is not required to separate the of *Pyrops*. Although post-genitalic, the anal tube is included with "genitalia" for descriptive purpose.
For the transcription of the labels of the types, the wording on each single label is delimited by square brackets.
The distribution map was produced with SimpleMappr (SHORTHOUSE, 2010).

Measurements were taken as in CONSTANT (2004) with the additions of CONSTANT (2015) for *Pyrops* and the following abbreviations are used:
BF = maximum breadth of the frons
BTg = maximum breadth of the tegmen
BPrH = breadth of the cephalic process at half length
LF = length of the frons in median line (excluding cephalic process)
LPr = length of the cephalic process
LTg = maximum length of the tegmen
TL = total length (apex of head to apex of tegmina)
(LF, LPr and TL measured to/from anteocular carina at the base of the cephalic process)

Acronyms used for the collections.
BMNH = Natural History Museum, London, United Kingdom.
IIS = Indian Institute of Sciences, Centre for Ecological Sciences, Bangalore, India.
NHRS = Naturhistoriska riksmuseet, Stockholm, Sweden.
RBINS = Royal Belgian Institute of Natural Sciences, Brussels, Belgium.
UASB = University of Agricultural Sciences, Bangalore, India.
ZMPA = Polish Academy of Sciences, Museum of the Institute of Zoology, Warsaw, Poland.

Taxonomy

Order **Hemiptera** Linnaeus, 1758
Suborder **Auchenorrhyncha** Duméril, 1806
Infra-order **Fulgoromorpha** Evans, 1946
Superfamily **Fulgoroidea** Latreille, 1807
Family **Fulgoridae** Latreille, 1807

Identification key to the Fulgoridae species of Andaman and Nicobar.

1. Head with long curved cephalic process directed anterodorsally (Fig. 1 E) ..... [genus *Pyrops*] **2**
- Head without cephalic process (Fig. 4 B) or with a very small process folded on vertex (Fig. 6 C) **4**

2. Head black with frons and ventral part of cephalic process yellow (Fig. 1 E, G); femora yellow-brown (Fig. 1 C); tegmina with yellowish white spots including a central yellow-orange spot (Fig. 1 A)..... ***Pyrops andamanensis*** (Distant, 1880)
- Head mostly bluish green (Fig. 2 C) or dark brown (Fig. 3); femora dark brown to black (Fig. 2 D); tegmina with spots unicolorous (Fig. 2 A) or including a central spot coloured as the rest of the tegmen (Fig. 3 A)..... **3**

3. Head mostly bluish green (Fig. 2 C); spots on tegmina uniformly bluish white (Fig. 2 A); tegmina with corium and membrane similarly coloured (Fig. 2 A) ..... ***Pyrops azureus*** sp. nov.
- Head dark brown (Fig. 3 D); spots on tegmina white with central spot coloured as tegmen (Fig. 3 A); tegmina with corium blackish green and membrane brown (Fig. 3 A)..... ***Pyrops rogersi*** (Distant, 1906)

4. Head without cephalic process (Fig. 4 B); frons smooth, without carinae (Fig. 4 D); tegmina with very dense reticulum of veins and cross-veinlets (Fig. 4 A) ..... ***Polydictya negrito*** Distant, 1906
- Head with small cephalic process folded on vertex (Fig. 6 C); frons with three longitudinal carinae (Fig. 6 D); tegmina without very dense reticulum of veins and cross-veinlets, cross-veinlets only on membrane (Fig. 6 A)..... [genus *Penthicodes*] **5**

5. Head with cephalic process distinct (Fig. 5 C); dorsum of abdomen brown (Fig. 5 A); tegmina with corium partly bluish green and membrane distinctly paler (Fig. 5 A); posterior wings brown with large blue marking (Fig. 5 A) ..... ***Penthicodes*** (***Penthicodes***) ***nicobarica*** (Stål, 1869)
- Head with cephalic process indistinct, strongly compressed on vertex (Fig. 6 C); dorsum of abdomen bright red (Fig. 6 A); tegmina brown with black markings (Fig. 6 A, 7 A); posterior wings largely bright red and/or orange (Fig. 6 A, 7 A)..... **6**

6. Head and pronotum pale yellow-brown, mesonotum black-brown (Fig. 6 C); tegmina with membrane unspotted and usually 2 large spots on costal cell (Fig. 6 A); legs uniformly dark brown to black (Fig. 6 B) ..... ***Penthicodes*** (***Ereosoma***) ***atomaria*** (Weber, 1801)
- Head and thorax uniformly coloured (Fig. 7 C); tegmina with small dark brown spots on membrane and costal cell without 2 large black spots, showing only small dark brown spots (Fig. 7 A); legs with pale rings (Fig. 7 B) ..... ***Penthicodes*** (***Ereosoma***) ***pulchella*** (Guérin-Méneville, 1838)

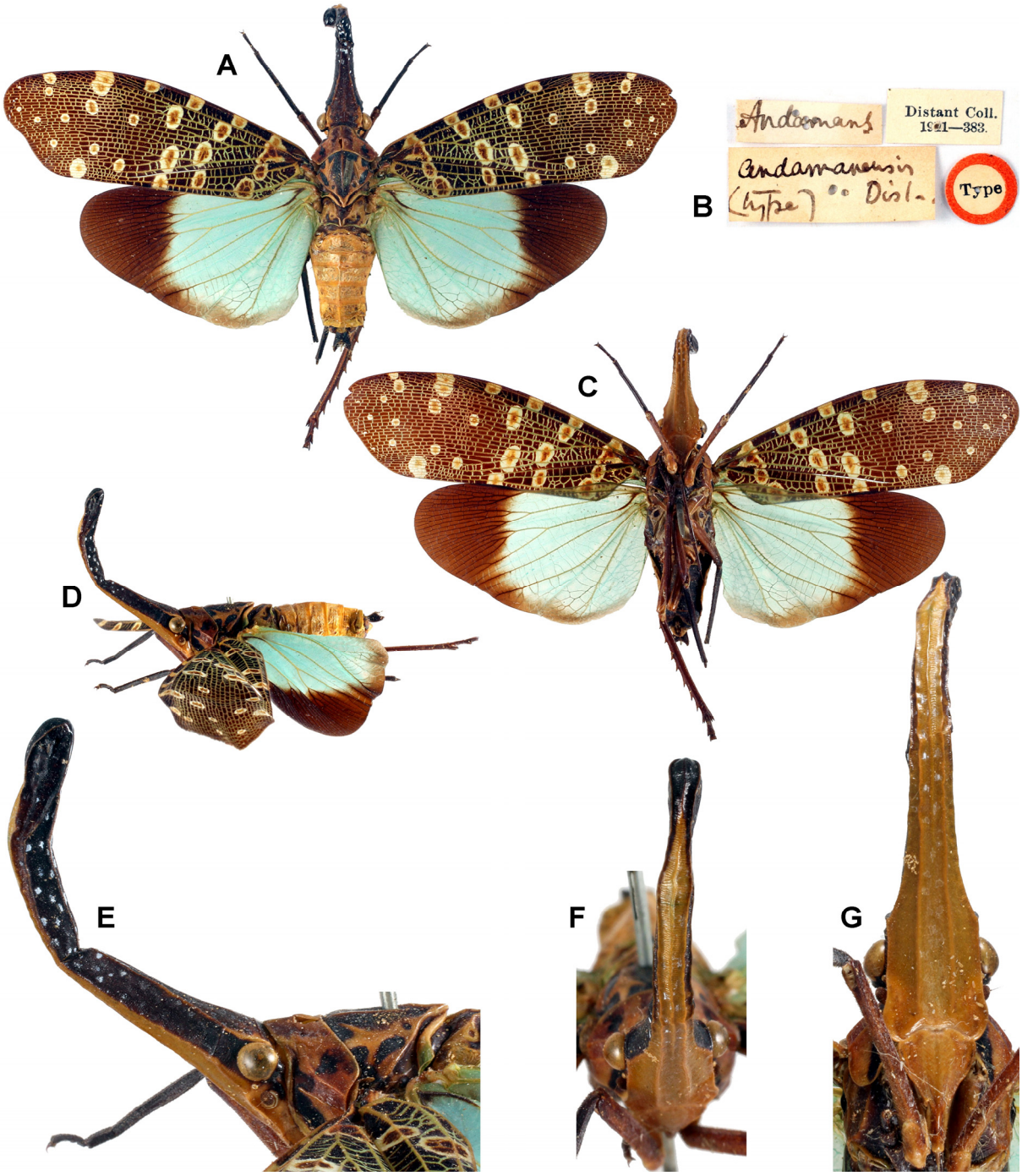

Fig. 1. *Pyrops andamanensis* (Distant, 1880), female holotype. A, habitus, dorsal view; B, labels. C, habitus, ventral view. D, habitus, lateral view. E, head and thorax, lateral view. F, apex of cephalic process, anterior view. G, frons, normal view.

Fig. 2. *Pyrops azureus* sp. nov., male holotype. A, habitus, dorsal view; B, vertex, pro and mesonotum, dorsal view. C, head and prothorax, lateral view. D, habitus, ventral view. E, habitus, lateral view. F, frons, normal view. G, apex of cephalic process, anterior view.

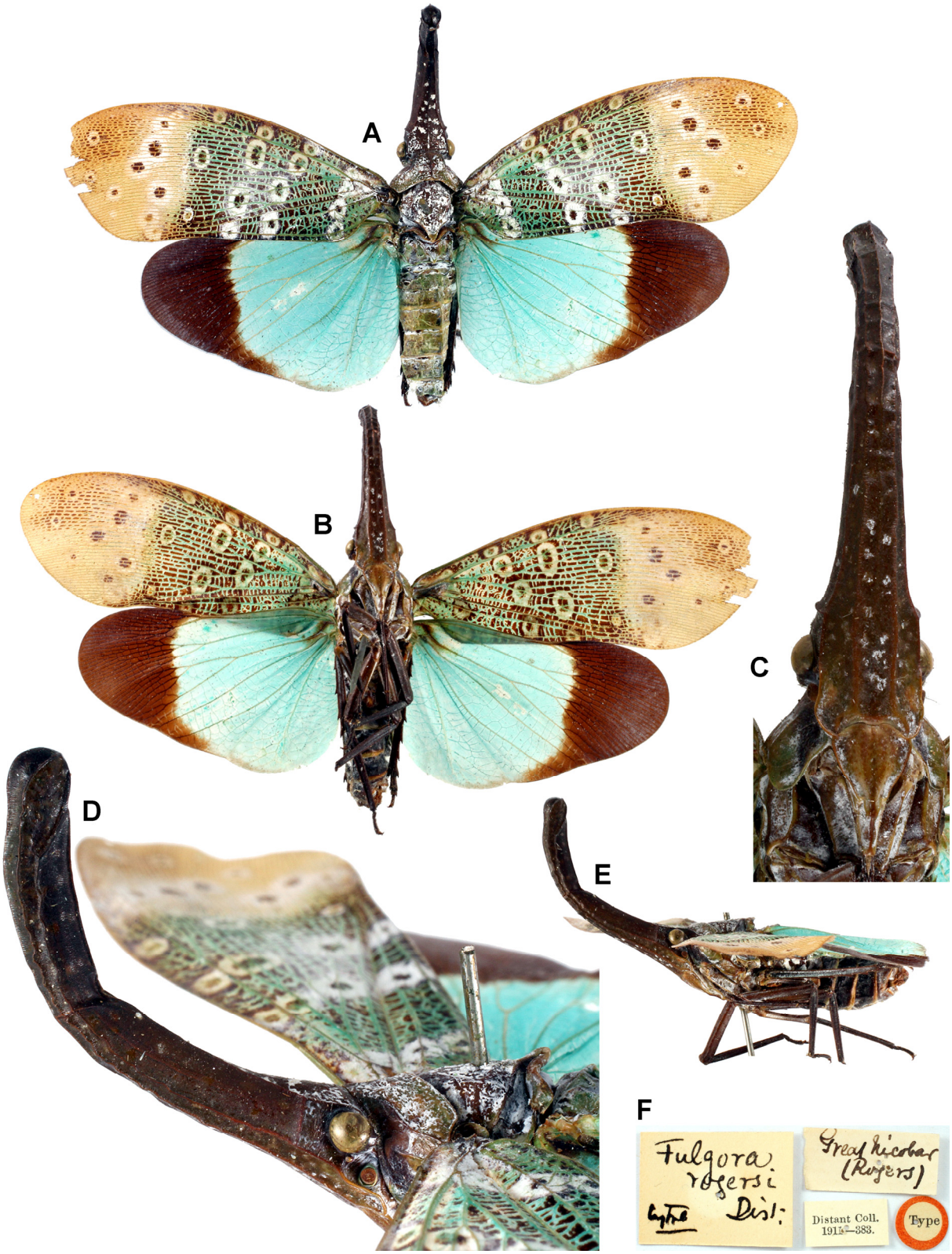

Fig. 3. *Pyrops rogersi* (Distant, 1906), female holotype. A, habitus, dorsal view; B, habitus, ventral view. C, frons, normal view. D, head and thorax, lateral view. E, habitus, lateral view. F, labels.

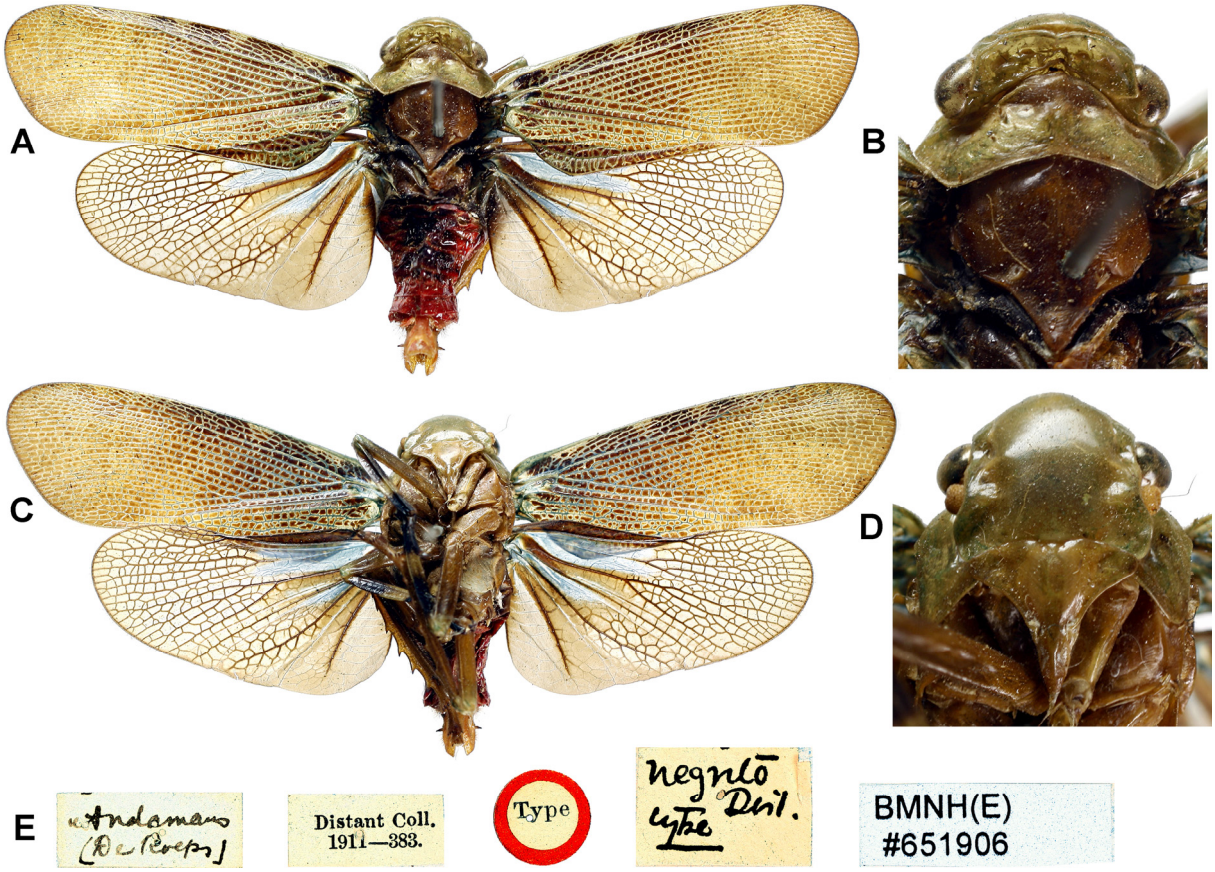

Fig. 4. *Polydictya negrito* (Distant, 1906), male syntype. A, habitus, dorsal view; B, head and thorax, dorsal view. C, habitus, ventral view. D, frons, normal view. E, labels.

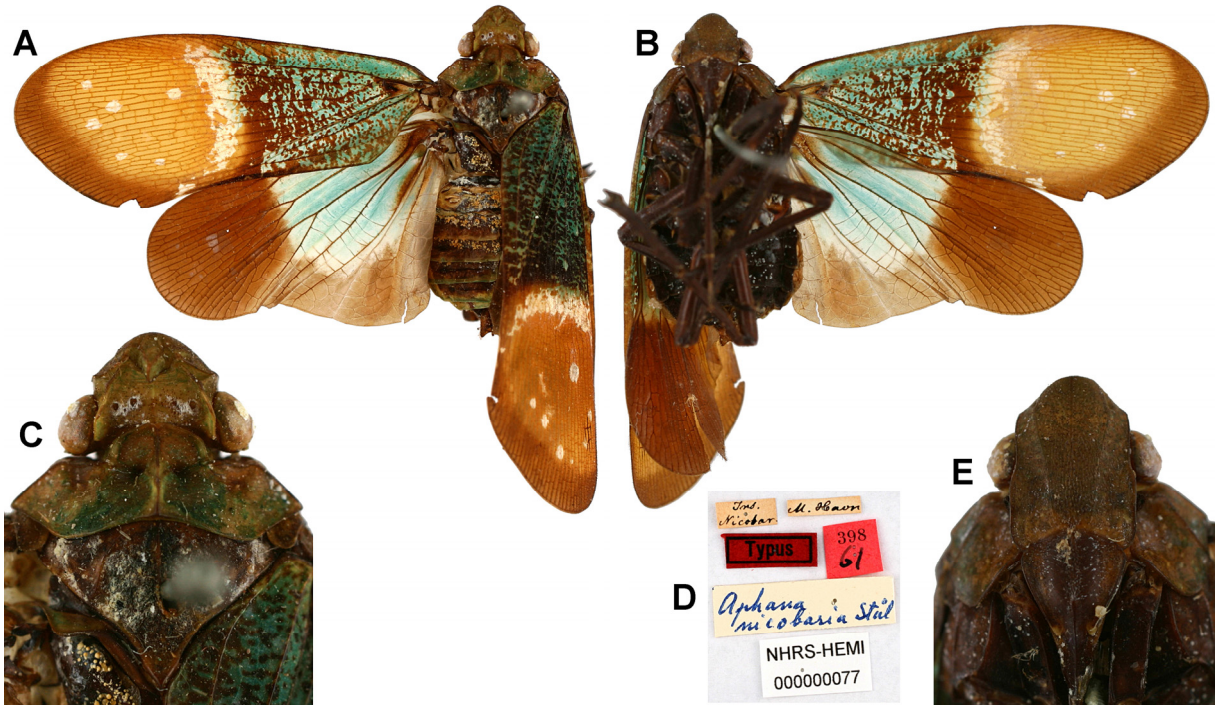

Fig. 5. *Penthicodes* (*Penthicodes*) *nicobarica* (Stål, 1869), female holotype. A, habitus, dorsal view; B, habitus, ventral view. C, head and thorax, dorsal view. D, labels. E, frons, normal view.

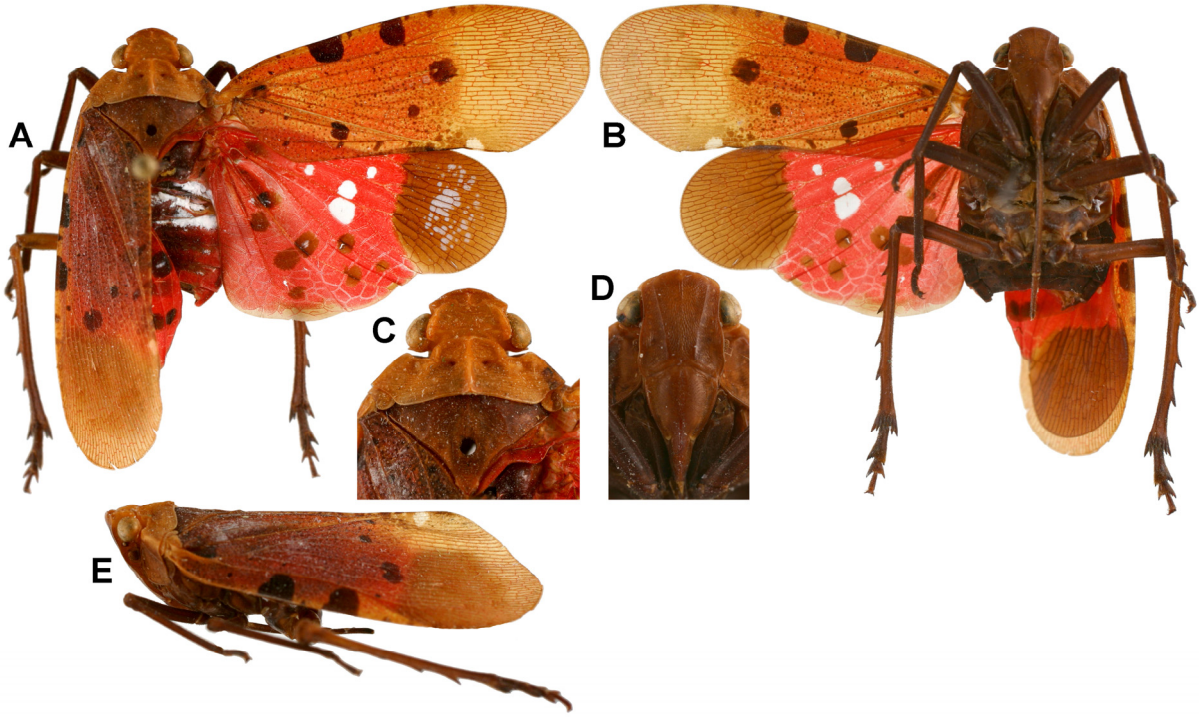

Fig. 6. *Penthicodes* (*Ereosoma*) *atomaria* (Weber, 1801), male. A, habitus, dorsal view; B, habitus, ventral view. C, head and thorax, dorsal view. D, frons, normal view. E, habitus, lateral view.

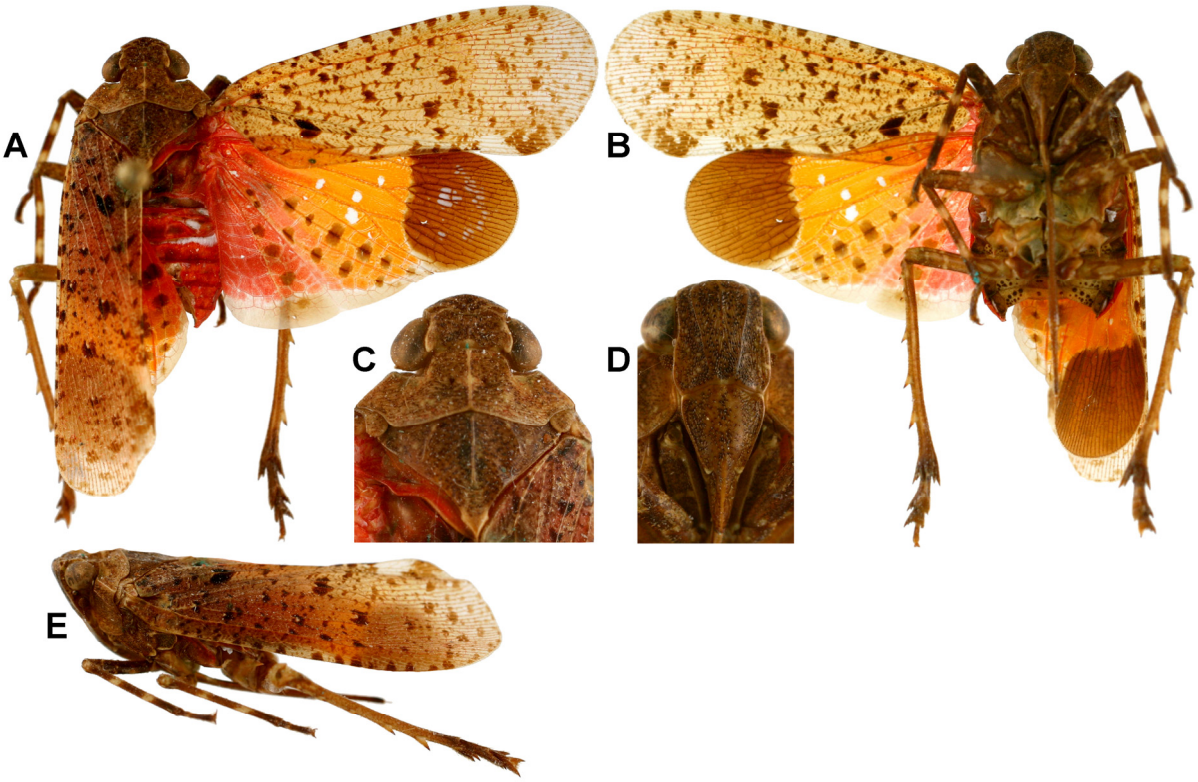

Fig. 7. *Penthicodes* (*Ereosoma*) *pulchella* (Guérin-Méneville, 1838), male. A, habitus, dorsal view; B, habitus, ventral view. C, head and thorax, dorsal view. D, frons, normal view. E, habitus, lateral view.

Genus ***Pyrops*** Spinola, 1839

Pyrops SPINOLA, 1839: 231.
Type species: *Pyrops candelaria* (Linnaeus, 1758) by subsequent designation by DUPONCHEL (1840: 200).
Hotinus AMYOT & SERVILLE, 1843: 490 [synonymized by BLANCHARD, 1845: 425].
Type species: *Pyrops candelaria* (Linnaeus, 1758) by original designation.

The definition of the genus given by CONSTANT (2015) is followed. See this work also for a historical review of the genus-level nomenclature of *Pyrops*.

Pyrops andamanensis (Distant, 1880)
Figs 1, 8, 9.

Fulgora andamanensis DISTANT, 1880: 152 [description], pl. 5, figs 7, 7a [dorsal and lateral aspects illustrated]. Type in BMNH.

Fulgora andamanensis – ATKINSON, 1885: 135 [description; compared with *P. delessertii* (Guérin-Méneville, 1840) and *P. maculatus* (Olivier, 1741)]. — ATKINSON, 1889: 338 [notes, mentioned from Nicobar island]; pl. 15 [dorsal aspect and lateral view of head of Nicobar specimen]. — DISTANT, 1906: 190 [described, keyed]. — LALLEMAND, 1963: 80 [keyed, described, placed in the *P. candelaria* group].
Laternaria andamanensis – METCALF, 1947 [transferred to *Laternaria*; catalogued].
Pyrops andamanensis – NAGAI & PORION, 1996: 24 [transferred to *Pyrops*; catalogued], pl. 11 fig. 153 [dorsal aspect]. — LIANG, 1998: 42 [catalogued].

DIAGNOSIS. The species can be separated from all other species of *Pyrops* by the following combination of characters:
(1) posterior wings pale blue with apex and area along sutural margin black brown, with brown area paler and narrower towards basosutural angle (Fig. 1 A);
(2) cephalic process elongate, curved and narrowing apically (Fig. 1 E–G);
(3) head black with frons yellow-brown (Fig. 1 E–G);
(4) tegmina uniformly with ground colour black and dense reticulum of green veins and veinlets, and with transverse rows of centrally orange white spots (Fig. 1 A).

MATERIAL EXAMINED.
TYPE MATERIAL. INDIA, Andaman and Nicobar Islands: holotype ♀ (Fig. 1): [Andamans] [andamanensis Dist. (Type)] [Distant Coll. 1911—383.] [Type]. (BMNH).

ADDITIONAL MATERIAL. INDIA, Andaman and Nicobar Islands: 1♂: Andaman, Distant Coll., 1911—383. (BMNH).

ADDITIONAL DATA. INDIA, Andaman and Nicobar Islands: 1 ex. (Fig. 8): Nicobar (ATKINSON, 1885, 1889).

SUPPLEMENTARY DESCRIPTION.
Male genitalia: brown-black with anal tube darker. Pygofer higher than long, with posterior margin broadly rounded with a ventral projection in lateral view (Fig. 9 A). Gonostyli (Fig. 11 A–B) elongate, 1.75 times longer than high in lateral view, with posterior margin broadly narrowly rounded and showing a slight lamina dorsolaterally; not surpassing apex of anal tube; lateral hooks of gonostyli strongly projecting laterally, and pointing ventrally at apex (Fig. 9 A–B). Anal tube elongate (Fig. 9 A, C), 1.15 times longer than broad in dorsal view, broader apically (Fig. 9 C); lateral margins slightly sinuate (Fig. 9 C) and apical margin strongly notched in dorsal view (Fig. 9 C).

Fig. 8. *Pyrops andamanensis* (Distant, 1880), specimen from Nicobar, illustration from ATKINSON (1889). A, habitus, dorsal view. B, head and thorax, lateral view.

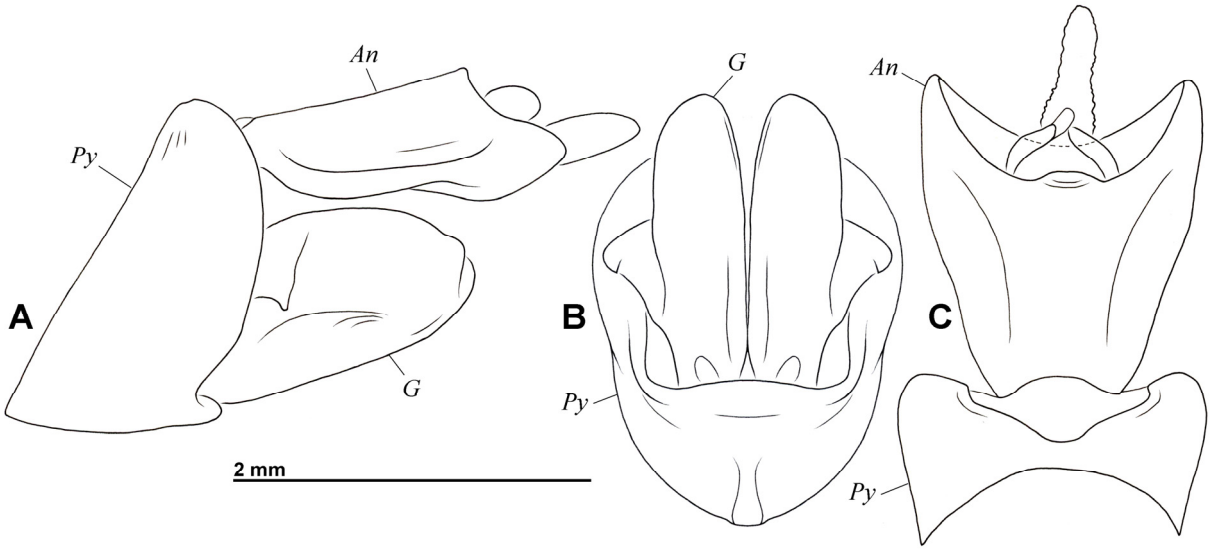

Fig. 9. *Pyrops andamanensis* (Distant, 1880), male genitalia. A, pygofer, anal tube and gonostylus, left lateral view. B, pygofer and gonostyli, posteroventral view. C, anal tube and pygofer, dorsal view. *An*: anal tube; *G*: gonostylus; *Py*: pygofer.

DISTRIBUTION. Andaman and Nicobar Islands, without more precision.

NOTE. The species has not been recorded for more than one century. The last record was given by ATKINSON (1885) from Nicobar.

Pyrops azureus sp. nov.

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Figs 2, 10–12.

ETYMOLOGY. The species epithet, *azureus* (adj., Latin) means "blue" and refers to the general colour of the species.

MATERIAL EXAMINED.

TYPE MATERIAL. INDIA, Andaman and Nicobar Islands: Holotype ♂ (Fig. 2): [Coll. I.R.Sc.N.B., India, Andaman Isls, North Andaman, near Saddle Peak, 25-27.xii.2006, 55m, 13.23877°N 93.03365°E, leg. G. Bretschneider, I.G.: 33.478] (RBINS).

MATERIAL EXAMINED FROM PHOTOGRAPHS IN NATURE. INDIA, Andaman and Nicobar Islands: 1 ex (Fig. 10 A): South Andaman Island, Mount Harriet NP, 7.III.2007, B.V. Sivaramakrishnan; 1 ex. (Fig. 10 B–D): Long Island, Lalaji Bay, 27.V.2014, Ashwini V. Mohan.

DIAGNOSIS. The species can be separated from all other species of *Pyrops* by the following combination of characters:
(1) posterior wings pale blue with apex and area along sutural margin black brown, with brown area paler and narrower towards basosutural angle (Fig. 2 A);
(2) cephalic process elongate, curved and narrowing apically (Fig. 2 B–C, F–G);
(3) head bluish green with black marking around eyes (Fig. 2 B–C, F–G);
(4) tegmina uniformly with ground colour black and dense reticulum of azure blue veins and veinlets, and with pale blue spots and markings (Fig. 2 A).

The most similar species are *P. andamanensis* (Distant, 1880), *P. maculatus* (Olivier, 1791) and *P. rogersi* (Distant, 1906) but *P. azureus* sp. nov. differs
— from *P. andamanensis* by its bluish green head (black with frons yellow-brown in *P. andamanensis*) and its blue spots on tegmina (spots orange in middle in *P. andamanensis*);
— from *P. maculatus* by its smaller blue spots on tegmina (larger, white spots in *P. maculatus*) and the brown area along sutural margin of hind wings getting very narrow on basal half of wing (brown area broad along all sutural margin in *P. maculatus*);
— from *P. rogersi* by its bluish green head (dark brown in *P. rogersi*) and by the uniform ground colour of tegmina (membrane brown, contrasting with the rest of tegmen, in *P. rogersi*).

DESCRIPTION.

Measurements and ratios

TL: ♂ (n = 1): 33.0 mm; TL+process: ♂ (n = 1): 42.0 mm; LTg/BTg = 2.68; BF/BPrH = 3.2; LPr/LF = 3.55; LPr/BPrH = 11.8.

Head: bluish green with brown-black marking over eyes extending from anteocular carina to posterior margin of head and including ocelli; apex of cephalic process slightly darker; clypeus brownish; antennae dark brown; ocelli orange (Fig. 2 B–C, F–G). Cephalic process more than 1.5 times as long as frons and clypeus combined in normal view of frons (Fig. 2 F), strongly curved anterodorsad and rather uniform in breadth in lateral view (Fig. 2 C); distinct broadening visible in anterior view at apical 2/3 of process (Fig. 2 G). Two longitudinal carinae on frons extending on sides of cephalic process up to apex (Fig. 2 F–G). Median, ventral carina on apical half of cephalic process (Fig. 2 G). Frons subquadrate (Fig. 2 F). Clypeus elongate with smooth median carina (Fig. 2 F). Labium brown-black, strongly surpassing posterior trochanter (Fig. 2 D).

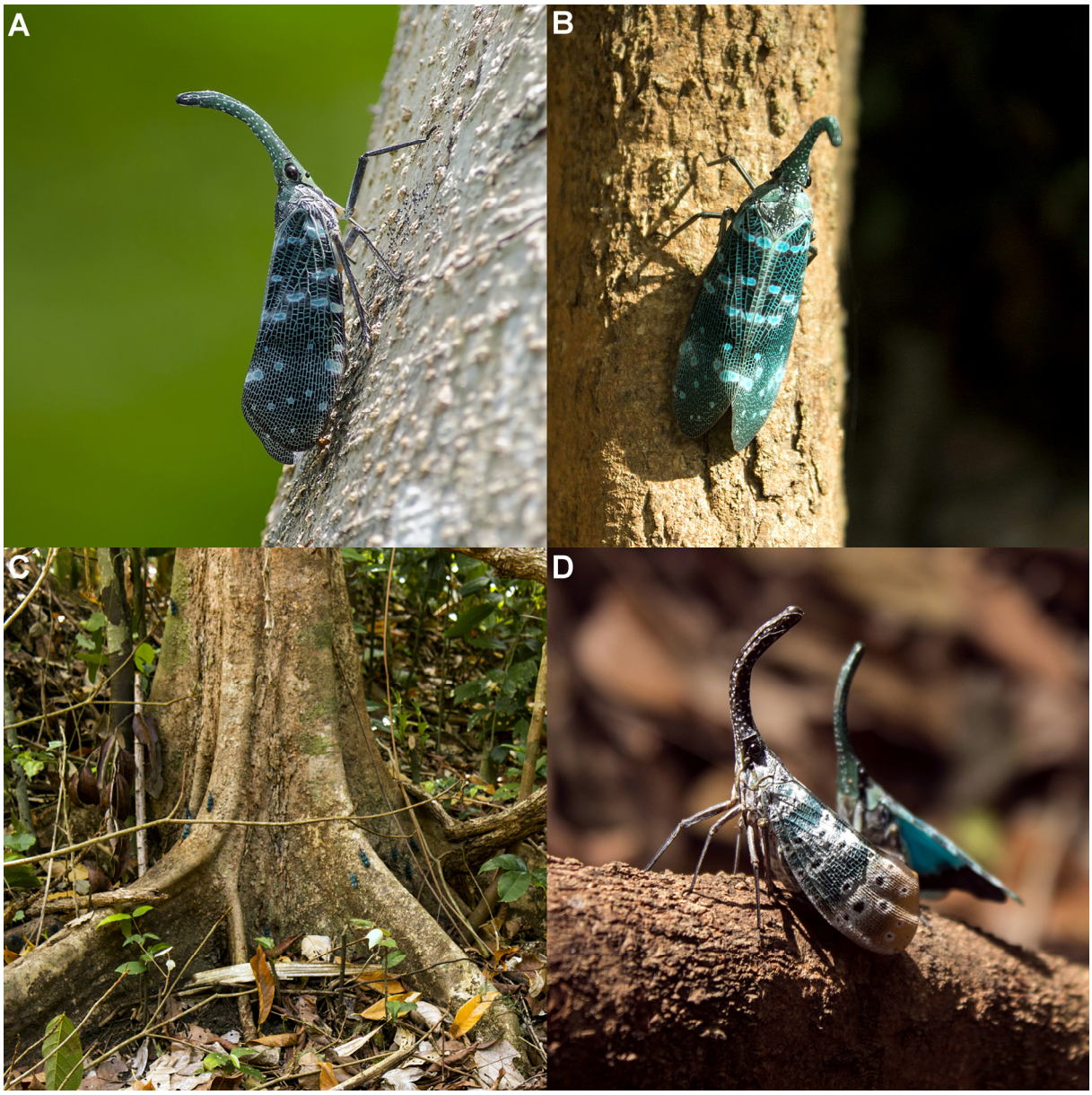

Fig. 10. *Pyrops azureus* sp. nov. and *P. rogersi* (Distant, 1906) in nature. A, *P. azureus*, South Andaman Island, Mount Harriet N.P., 7 Mar. 2007 (© B.V. Sivaramakrishnan). B–D, Andaman Islands, Long Island, Lalaji Bay, 27 May 2014 (© A.V. Mohan). B, *P. azureus*. C, *P. azureus* and *P. rogersi* on a big tree. D, *P. azureus* (at rear) and *P. rogersi* (at front).

Thorax: (Fig. 2 B–C) pronotum greenish brown with broad median brown band; four small black points, two included in brown band on each side of median carina, other two more laterally; short black line on side of prothorax behind eye, betweeen dorsolateral and lateral carinae; broad, complete, oblique black band directed posteroventrally on ventrolateral lobe, under lateral carina. Mesonotum broadly brown medially and with sides orangish brown with black markings; apex of scutellum paler; lateral and ventral tergites of mesothorax brown. Pro- and mesonotum slightly wrinkled; carinae of pronotum well marked; carinae of mesonotum weakly marked; scutellum slightly elevated apically. Tegulae greenish brown.

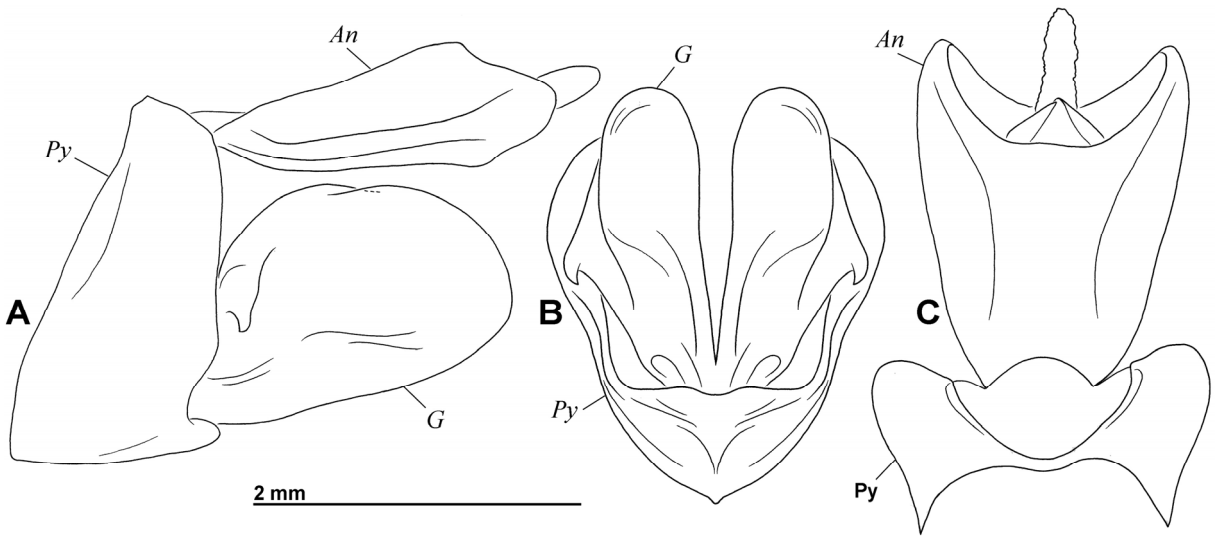

Fig. 11. *Pyrops azureus* sp. nov., male genitalia. A, pygofer, anal tube and gonostylus, left lateral view. B, pygofer and gonostyli, posteroventral view. C, anal tube and pygofer, dorsal view. *An*: anal tube; *G*: gonostylus; *Py*: pygofer.

Tegmina: (Fig. 2 A) uniformly black with dense reticulum of pale azure blue veins and cross-veins; corium with 3 transverse rows of slightly transverse pale azure blue markings, subbasal row fairly straight, the 2 others irregular, sometimes forming an X-shaped pattern; membrane with sparse azure blue markings, mostly small and rounded, with one larger, slightly transverse one at nodal line on costal margin, and another larger one near apicosutural angle. All spots and markings slightly deeper blue centrally. Tegmina elongate, broadening from base towards apex, rather narrow, with costal margin broadly rounded, apical margin oblique and apical angles rounded.

Hind wings: (Fig. 2 A) pale azure blue with apex and sutural margin largely brown-black; brown-black area getting paler and narrower from apex towards base along sutural margin and stopping at basosutural angle; veins in brown-black area progressively turning from black-brown at apico-costal angle, to pale bluish at basosutural angle. Hind wings strongly broader than tegmina.

Legs: (Fig. 2 A, D) anterior legs black with paler areas on coxae; mesotibiae and tarsi black, mesofemora turning from black apically to brown towoards base, mesocoxae dark brown with paler areas; posterior legs dark brown with femorotibial joint yellowish and coxae brown. Pro- and mesofemora broader than corresponding tibiae. Metatibiae with 5–6 lateral spines.

Abdomen: (Fig. 2 A, D) terga yellowish brown; sterna black; genital segments black.

Male genitalia: brown with anal tube darker. Pygofer higher than long, with posterior margin sinuate on ventral half in lateral view (Fig. 11 A). Gonostyli (Fig. 11 A–B) elongate, 1.57 times longer than high in lateral view, with posterior margin broadly rounded, not surpassing apex of anal tube; lateral hooks of gonostyli short, pointing ventrally (Fig. Fig. 11 A–B). Anal tube elongate (Fig. 11 A, C), 1.28 times longer than broad in dorsal view, broader at 4/5 of total length (Fig. 11 C); lateral margins very slightly sinuate (Fig. 11 C) and apical margin strongly notched in dorsal view (Fig. 11 C).

DISTRIBUTION. Andaman Islands: North, South and Long Islands (Fig. 12).

BIOLOGY. No host tree was identified for this species. It was observed on the trunk and buttress roots of a big tree together with specimens of *P. rogersi* in Lalaji Bay, Long Island.

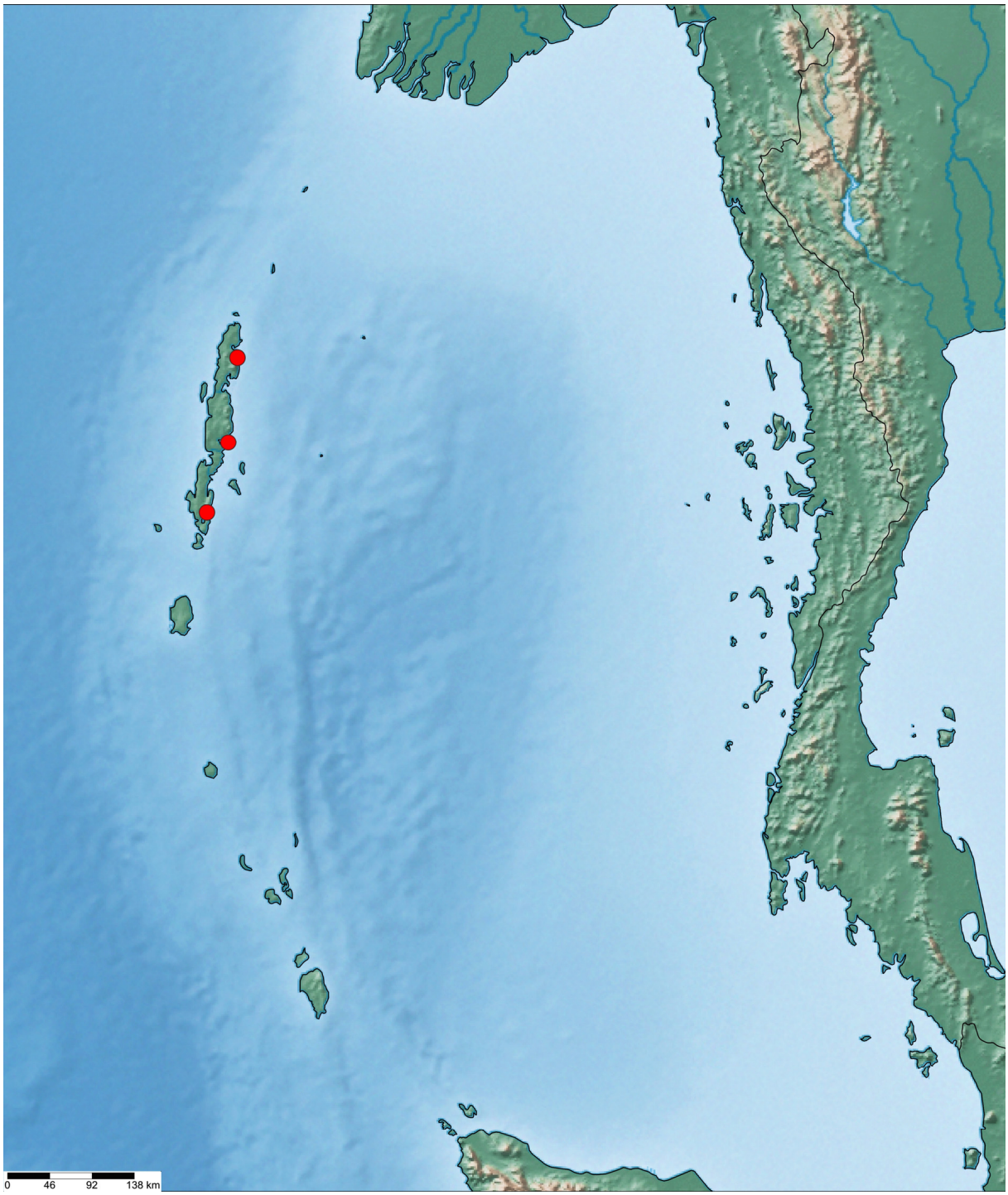

Fig. 12. *Pyrops azureus* sp. nov., distribution map.

Pyrops rogersi (Distant, 1906)
Figs 3, 10 D, 13 A–C, 14.

Fulgora rogersi DISTANT, 1906: 190 [description, key]. Type in BMNH.

Fulgora rogersi – SCHMIDT, 1911: 161 [compared with *Pyrops peguensis* (Schmidt, 1911)]. — DISTANT, 1914: 409 [compared with *Pyrops astarte* (Distant, 1914)]. — LALLEMAND, 1963: 80 [keyed, described, placed in the *P. pyrorhyncha* group].
Laternaria rogersi – METCALF, 1947 [transferred to *Laternaria*; catalogued].
Pyrops rogersi – NAGAI & PORION, 1996: 26 [transferred to *Pyrops*; catalogued], pl. 16 fig. 205 [dorsal aspect]. — LIANG, 1998: 44 [catalogued].

DIAGNOSIS. The species can be separated from all other species of *Pyrops* by the following combination of characters:
(1) posterior wings blue with apex and area along sutural margin black brown, with brown area paler and narrower towards basosutural angle (Fig. 3 A);
(2) cephalic process elongate, curved and narrowing apically (Fig. 3 C–D);
(3) head brown-black (Fig. 3 C–D);
(4) tegmina with ground colour brown beyond nodal line, contrasting with basal partwith ground colour black and dense reticulum of blue veins and veinlets; white spots dark blue or bluish brown centrally (Fig. 3 A).

MATERIAL EXAMINED.
TYPE MATERIAL. INDIA, Andaman and Nicobar Islands: holotype ♀ (Fig. 3): [Great Nicobar (Rogers)] [Fulgora rogersi Dist. Type] [Distant Coll. 1911—383.] [Type] (BMNH).

ADDITIONAL MATERIAL. INDIA, Andaman and Nicobar Islands: 1♂ (cephalic process broken at half length): Andaman, Crowley. bequest 1901—78. (BMNH); 1♂, 1♀ (examined from photographs): Nicobaren, det. E. Schmidt, 1907 (ZMPA).

MATERIAL EXAMINED FROM PHOTOGRAPHS IN NATURE. INDIA, Andaman and Nicobar Islands: 2 ex. (Figs. 10 D, 13 B): Long Island, Lalaji Bay, 27.V.2014, A.V. Mohan; 1 ex. (Fig. 13 A): North Andaman, 2.IV.2004, K. Wothe; 2 ex. (Fig. 13 C): Little Andaman, White Surf Waterfall, XII.2007, S. Dhanuka.

SUPPLEMENTARY DESCRIPTION.
Male genitalia: brown with anal tube darker. Pygofer higher than long, with posterior margin broadly rounded in lateral view and a posteroventral lamina projecting posteriorly (Fig. 14 A–B). Gonostyli (Fig. 14 A–B) elongate, 1.78 times longer than high with posterior margin rounded in lateral view, not surpassing apex of anal tube (Fig. 14 A); lateral hooks of gonostyli short, pointing lateroventrally (Fig. 14 A–B). Anal tube elongate (Fig. 14 A, C), 1.27 times longer than broad, broader at 3/4 of total length in dorsal view (Fig. 14 C); lateral margins slightly rounded towards apex and apical margin strongly notched in dorsal view (Fig. 14 C).

DISTRIBUTION. Great Nicobar; Andaman Islands: Long Island and Little Andaman.

Fig. 13. *Pyrops rogersi* (Distant, 1906) and *Penthicodes* (*Penthicodes*) *nicobarica* (Stål, 1869) in nature. A, *P. rogersi*, North Andaman, 2 Apr. 2004 (© K. Wothe). B, *P. rogersi*, Andaman Islands, Long Island, Lalaji Bay, 27 May 2014 (© A.V. Mohan). C, *P. rogersi*, Little Andaman, White Surf Waterfall, Dec. 2007 (© S. Dhanuka). D, *P. nicobarica*, Great Nicobar, Aug. 2016 (© S. Jha).

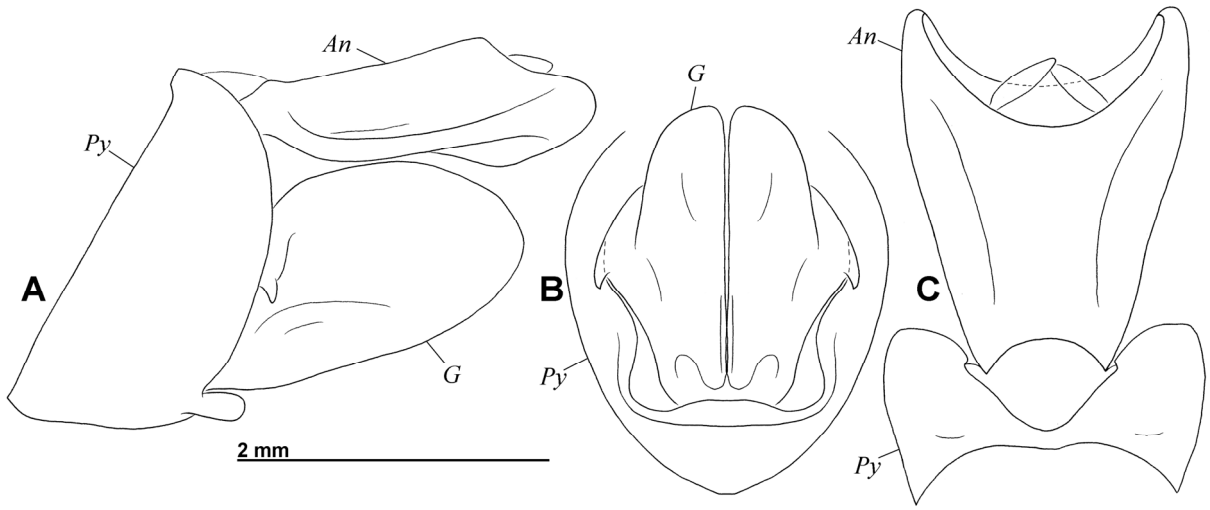

Fig. 14. *Pyrops rogersi* (Distant, 1906), male genitalia. A, pygofer, anal tube and gonostylus, left lateral view. B, pygofer and gonostyli, posteroventral view. C, anal tube and pygofer, dorsal view. *An*: anal tube; *G*: gonostylus; *Py*: pygofer.

Genus ***Penthicodes*** Blanchard, 1845

Penthicodes BLANCHARD, 1845: 424.
Type-species: *Penthicodes* (*Penthicodes*) *farinosa* (Weber, 1801).

Penthicodes (***Penthicodes***) ***nicobarica*** **(Stål, 1869)**

Figs 5, 13 D.

Aphana nicobarica STÅL, 1869: 241 [described]. Type in NHRS.

Aphana nicobarica – ATKINSON, 1885: 147 [described]. — DISTANT, 1906: 202 [described].
Aphaenina nicobarica – METCALF, 1947: 152 [transferred to *Aphaenina* Metcalf, 1947; catalogued].
Penthicodes nicobarica – LALLEMAND, 1963: 21 [transferred to *Penthicodes* Blanchard, 1845, *P. farinosa* group; keyed; described].
Penthicodes (*Penthicodes*) *nicobarica* – NAGAI & PORION, 1996: 20 [catalogued]. — CONSTANT, 2010: 4 [keyed], fig. 13 E [head and thorax, dorsal aspect].

MATERIAL EXAMINED.
TYPE MATERIAL. INDIA, Andaman and Nicobar Islands: holotype ♀ (Fig. 5): [Ins. Nicobar] [M. Haon] [Typus] [398 61] [Aphana nicobaria Stål] [NHRS-HEMI 000000077] (NHRS).

ADDITIONAL MATERIAL. INDIA, Andaman and Nicobar Islands: 1 ex. (examined from photograph): Great Nicobar, Govind Nagar forest, 11.V.1987, V.V. Belawadi (UASB); 1 ex. (examined from photograph): Great Nicobar, Govind Nagar, 28.II.2016, S.K. Rajeshwari (UASB).

MATERIAL EXAMINED FROM PHOTOGRAPHS IN NATURE. INDIA, Andaman and Nicobar Islands: 1 ex. (Fig. 13 D): Great Nicobar, VIII.2016 (© S. Jha).

DISTRIBUTION. The species is currently known only from Nicobar.

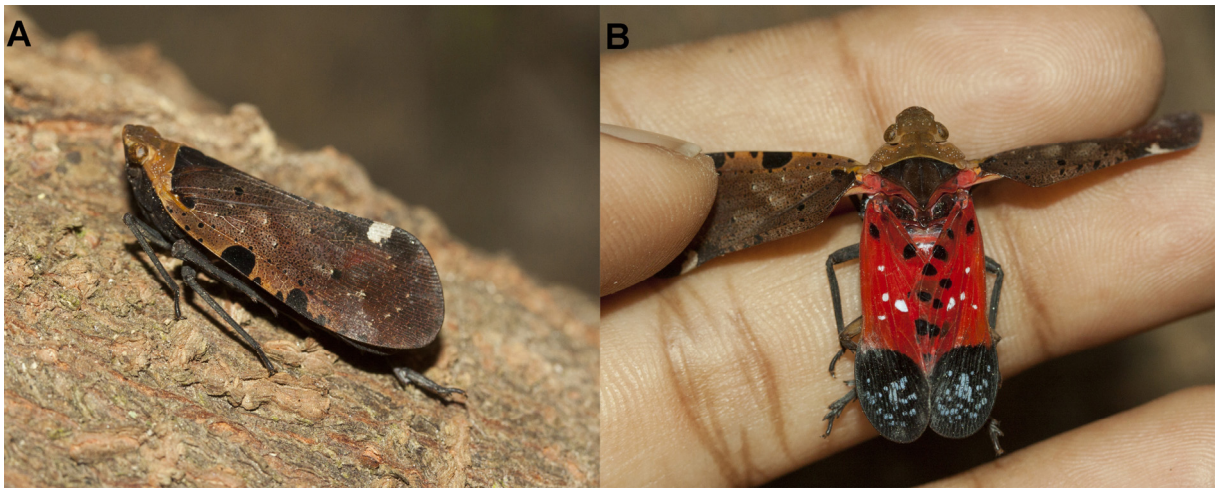

Fig. 15. *Penthicodes* (*Ereosoma*) *atomaria* (Weber, 1801). A–B, South Andaman, New Wandoor, 10 Mar. 2017, 18h30 (© A.V. Mohan).

Penthicodes (***Ereosoma***) ***atomaria*** (Weber, 1801)
Figs 6, 15.

Cicada atomaria WEBER, 1801: 113 [described].
Aphaena nigropunctata GUÉRIN MÉNEVILLE, 1838: 185 [described; synonymised by STÅL 1863: 232]
Penthicodes picta BLANCHARD *in* D'ORBIGNY, 1849: 20; pl. 3, fig. 2 [illustrated; synonymised by LALLEMAND, 1963: 27.
Penthicodes atkinsoni SCHMIDT, 1923: 19 [described; synonymised by NAGAI & PORION, 1996: 20].

Lystra atomaria – FABRICIUS, 1803: 57. — GERMAR, 1830: 52.
Penthicus atomarius – BLANCHARD, 1840: 171.

MATERIAL EXAMINED: INDIA, Andaman and Nicobar Islands: 6 ex. (Fig. 15): South Andaman Island, New Wandoor, 11°36'56.3"N 92°37'09.2"E, 10.III.2017, 6:30 PM, A.V. Mohan (IIS); 1 ♂: Middle Andaman Island, Karmatang village and surrounding forests, 12°49'39.2"N 92°55'31.7"E, 8.IV.2017, A.V. Mohan (IIS).

NOTE. The species was recorded from Bhutan, Cambodia, China, India, Indonesia (Java, Sumatra, Borneo, Lombok), Laos, Malaysia, Thailand and Vietnam (CONSTANT 2010). It is here recorded from Andaman Islands: South Andaman and Middle Andaman, for the first time.

Genus ***Polydictya*** Guérin-Méneville, 1844

Polydictya GUÉRIN-MÉNEVILLE, 1844: 358.
Type species: *Eurybrachys basalis* Hope, 1843 by monotypy.
Thaumastodictya KIRKALDY, 1902: 307; synonymized by DISTANT, 1906: 215.
Type species: *Polydictya krisna* Kirkaldy, 1902 by original designation [junior synonym of *Polydictya pantherina* Gerstaecker, 1895, see NAGAI & PORION, 1996].

Polydictya negrito Distant, 1906
Fig. 4.

Polydictya negrito DISTANT, 1906: 217 [described].

Polydictya negrito – METCALF, 1947: 87 [catalogued]. — LALLEMAND, 1963: 14 [keyed, described], pl. II fig. 1 [left tegmen]. — NAGAI & PORION, 1996: 13 [catalogued], pl. 2 fig. 26 [type, dorsal aspect]. — CONSTANT, 2016: 14 [compared with *P. jakli* Constant, 2016].

MATERIAL EXAMINED.
TYPE MATERIAL. INDIA, Andaman and Nicobar Islands: 2♂♂ syntypes: Andamans (De Roeps), Distant coll. 1911—383 (BMNH).

NOTE. The species is known only from the two syntypes collected more than one hundred years ago.

Discussion

The present paper adds two species of lanternflies to the fauna of the small territory of Andaman and Nicobar, with one of them new to science. Fulgorids were mentioned from the archipelago for the first time by STÅL in 1869 and five species were recorded in 1906. Four of them, *Penthicodes* (*Penthicodes*) *nicobarica* (Stål, 1869), *Polydictya negrito* Distant, 1906, *Pyrops andamanensis* (Distant, 1880), *P. rogersi* (Distant, 1906) are only known from the islands while the fifth species, *Penthicodes* (*Ereosoma*) *pulchella* (Guérin-Méneville, 1838) is widespread in Southeast Asia. It is worth noting that the addition of only 10 specimens and 6 photographic records to the 11 older specimens, has led to the addition of two species to the fauna of the archipelago, which leads us to postulate that more might be discovered in the future.
The two newly recorded species include the widespread *Penthicodes* (*Ereosoma*) *atomaria* (Weber, 1801) and *Pyrops azureus* sp. nov., which did not appear scarce. However, while recent records exist for *Pyrops rogersi* and *Penthicodes* (*Penthicodes*) *nicobarica*, three species (*Polydictya negrito*, *Pyrops andamanensis* and *Penthicodes* (*Ereosoma*) *pulchella*) have not been recorded for more than a century. Moreover, no information is available on the phenology, behaviour or host plants of any of these species, which is critical to ensure conservation of these (apparently) highly endemic iconic insects. We hope that the present work will encourage local biologists and citizen-scientists to identify, observe and record their natural history traits.

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