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### SHORT COMMUNICATION

#### A NEW SPECIES OF ZYGAENID MOTH *ELCYSMA ZIROENSIS* (LEPIDOPTERA: ZYGAENIDAE: CHALCOSIINAE) FROM INDIA

Punyo Chada, Monsoon Jyoti Gogoi & James John Young

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## A NEW SPECIES OF ZYGAENID MOTH *ELCYSMA ZIROENSIS* (LEPIDOPTERA: ZYGAENIDAE: CHALCOSIINAE) FROM INDIA

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**Abstract:** *Elcysma*, a small genus of zygaenid moths occurring in Nagaland, western China and Japan is recorded from Arunachal Pradesh, northeastern India for the first time. The other known species from northeastern India is *E. dohertyi*, so far known only from Nagaland by a single specimen collected by W. Doherty in 1889. A new species, *E. ziroensis* is hereby described. The other species of the genus is white in colour with prominent black veins whereas the new species has very broad black stripes along both sides of the veins taking over the white background on forewing and brown background on hindwing, making the moth look entirely blackish in colour. The new species also has the orange patch restricted to the upper base of forewing, whereas the other species of the genus has orange patch in whole of base of the forewing. The shape of the wing resembles that of *E. dohertyi* in being narrower forewing and hind wing. The wing venations is, however, markedly different from all other *Elcysma* species having five radius veins with three posterior radius sectors branching out to the apical area in forewing. The species also shows mimetic assemblage with *B. lidderdalii* which also flies together at the same locality.

**Keywords:** Arunachal Pradesh, *Elcysma ziroensis* sp. nov., Lepidoptera, northeastern India, Ziro, Zygaenidae.

During a field trip to Talle Wildlife Sanctuary we collected by a very torn deformed moth found to be an undescribed female *Elcysma*, at an elevation of 1,700m in Ziro, Arunachal Pradesh. This discovery represents the first record of *Elcysma* from Arunachal Pradesh,

northeastern India. We describe this new species based on its morphological features particularly its wing patterns and venation which are markedly different from the other three species of the same genus. Details of the life history were not recorded. Pictures of a female, however, were taken seemingly laying eggs on a branch of a species of *Prunus* of the Rosaceae family.

The genus *Elcysma* was established by Butler (1881) being a small genus of three known species so far, viz., *E. delavayi* Oberthür, 1891 (western China), *E. dohertyi* Elwes, 1890 (Nagaland, India), and *E. westwoodii* (Snellen van Vollenhoven, 1863) (Japan; Yen et al. 2005); type species *E. translucida* Butler, 1881 of Yokohama, Japan (Butler, 1881), synonyms: *E. westwoodii* (Snellen van Vollenhoven, 1863); *Elcysma westwoodii* (Snellen van Vollenhoven, 1863); synonyms: *E. caudata* Bremer, 1864 and *E. eleganticauda* Bryk, 1948; belonging to the subfamily Chalcosiinae, tribe *Aglaopini* of the Zygaenidae family. All taxa are large and brightly coloured diurnal moths, tailed at the medial veins at the hindwing. The life history of *E. westwoodii* is well documented in Japan. All the three species have a yellow/orange patch edged with a dark line at the edge

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of forewing including the specimen of *E. dohertyi* Elwes, 1890 occurring in Nagaland, but the new species has an orange patch restricted to the upper base of forewing. Also, the venation pattern of the species was different and distinct from the other species of the genus but supports allocation to the genus (Yen et al. 2005).

#### Notes on *Elcysma* species

1. *Elcysma delavayi*: The species has a broad orange patch edged with a dark line at the edge of forewing base (Image 2). Its adult and larval stages have been documented by Yen et al. (2005).

Distribution: The species occurs in western China.

2. *Elcysma westwoodii*: The second discocellular vein of the hindwing V6 some distance from the end of the cell (Image 3). The species has a yellow patch edged with a dark line at the edge of forewing base. *E. westwoodii* has three subcells in the forewing while the others have only two.

The photograph of museum specimen of the species is available at Siberian Zoological Museum ([http://szmn.sbras.ru/picts/Heterocera/Zygaenidae/Elcysma\\_westwoodi.htm](http://szmn.sbras.ru/picts/Heterocera/Zygaenidae/Elcysma_westwoodi.htm)) and at Fauna and flora of wiki ([http://fauna-and-flora.wikia.com/wiki/Elcysma\\_westwoodii](http://fauna-and-flora.wikia.com/wiki/Elcysma_westwoodii)). Its larval and adult stages are well documented in Japan.

Distribution: The species occurs in western Japan, Primorskii Krai (Russia) and China and is common and widely distributed in comparison to other species of this group.

3. *Elcysma dohertyi*: The species is allied to *Elcysma westwoodii* occurring in Japan. The species has a narrow yellow patch edged with a dark line at the edge of forewing base (Image 4b). The forewing is smokey, second discocellular vein of the hindwing V6 is forked

close to, instead of some distance from, the end of the cell. Expanse of forewing 66mm, length of hindwing 41mm, length of antenna 12mm. The recurrent vein in the cell of forewing is simple, and not forked. Costal vein of hindwing is forked near the base, the two branches being connected by a short transverse vein near the middle of the cell. The picture of the museum specimen is available in Yen et al. (2005) and Fauna and flora of wiki ([http://fauna-and-flora.wikia.com/wiki/Elcysma\\_dohertyi](http://fauna-and-flora.wikia.com/wiki/Elcysma_dohertyi)). The illustration of the species is also available in Elwes (1890).

Distribution: The only known record of the species is by W. Doherty from Nagaland, India at 1,542m in August, 1889 (Image 4a,b).

#### *Elcysma ziroensis* sp. nov.

(Images 1, 5A-5F, 7A,7B; Fig. 1D)

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**Holotype:** BNHS 25/2017, female, 19.ix.2016, Talle Wildlife Sanctuary, Ziro, Arunachal Pradesh, northeastern India, coll. James J. Young.

**Diagnosis:** The species differs in colour pattern considerably from other species of the genus. The other species of the genus are bright and white in colour and black veins being very prominently seen. The new species has very broad black stripes running along both sides of the vein almost taking over the white background on forewing and brown background on hindwing. The shape of the wing resembles that of *E. dohertyi* and is unlike the other two species, which have broader forewings and hindwing. The wing venations, however, are markedly different from all other *Elcysma* species having five radial veins with three posterior

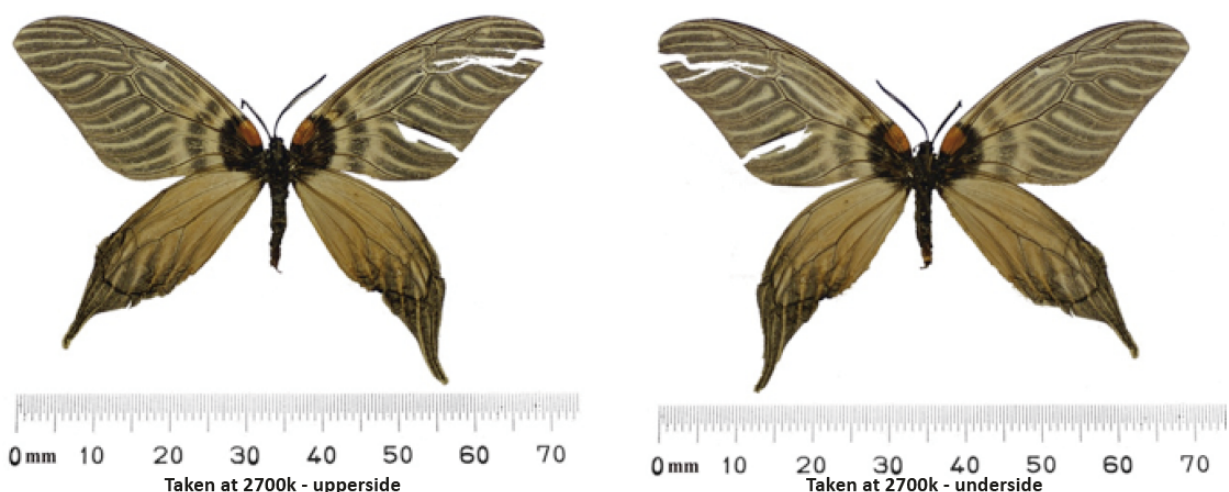


Image 1. *Elcysma ziroensis* sp. nov. female (the extended length of the ovipositor can also be viewed)





Image 2. *E. delavayi* - from Yen et al. 2005, page 178.

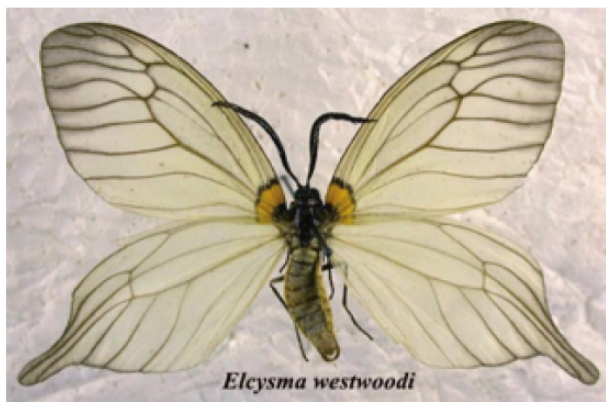


Image 3. *E. westwoodii* - retrieved from Siberian Zoological Museum, [http://szmn.sbras.ru/picts/heterocera/Zygaenidae/Elcysma\\_westwoodi.htm](http://szmn.sbras.ru/picts/heterocera/Zygaenidae/Elcysma_westwoodi.htm)

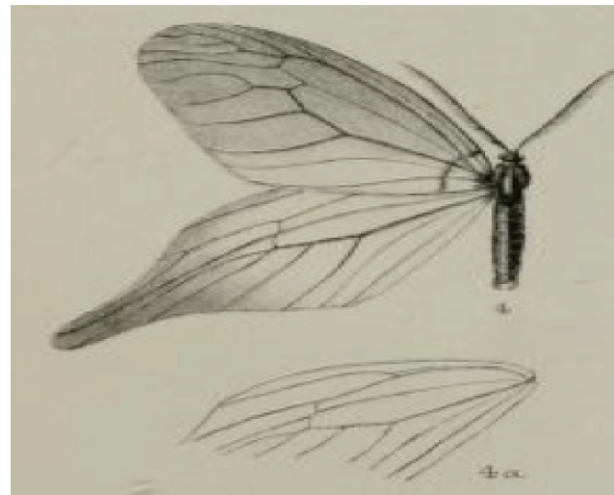


Image 4a. Illustration of *E. dohertyi* from Nagaland retrieved from Elwes (1890)



Image 4b. *E. dohertyi* - retrieved from Fauna and flora Wiki, [http://fauna-and-flora.wikia.com/wiki/Elcysma\\_dohertyi](http://fauna-and-flora.wikia.com/wiki/Elcysma_dohertyi)

radius sectors branching out to the apical area. The other three *Elcysma* species have four radial branches instead, as depicted (Fig. 1). The only radial vein in the hind wing, which is unbranched, extends to the costal area unlike the other three species, where it branches out to the termen and tornal area.

**Distribution:** Talle Valley, western Arunachal Pradesh.

#### DESCRIPTION

**Forewing** (Image 1): Wingspan 7.0cm. Length of wing from base to apex is 3.5cm. Elongated forewing narrower at apex contracting convexly but becoming broader at tornus; smoky creamy white base colour; not semi translucent; a reddish dotted margin at the base of the forewing enclosed by black convexly from the costa to dorsal at the basal area; a roll of black convex splashes running from the post basal to the dorsal area; stripes of grey black markings bordered the entire wing venations almost in entirety from the discal area to the termen. Two subcells having five radius veins with three

posterior radius sectors branching out to the apical area; four media veins running from the cells; cubitus with one main branch and two unbranched anal veins; veins raised in black; underside of wing resembling the upper surface (Image 5).

**Hindwing** (Image 1): Hindwing narrow extending into a long tail supported by media veins; partially covered with stripes of grey blacks bordered the wing veins almost from half-way to the tail; humeral and subcosta veins missing with only one radial vein branching out to the costal area; four media veins branching out from the two subcells with M2 and M3 extending to the end of the tail; the cubitus with two anterior branches arising from the subcell 2; other two anal veins branching out from the base; frenulum with two filaments arising from the hindwing; underside of wing resembling the upper surface but lighter in colour (Image 5).

**Head:** Image 5a. Length of antennae 11.4mm. Black



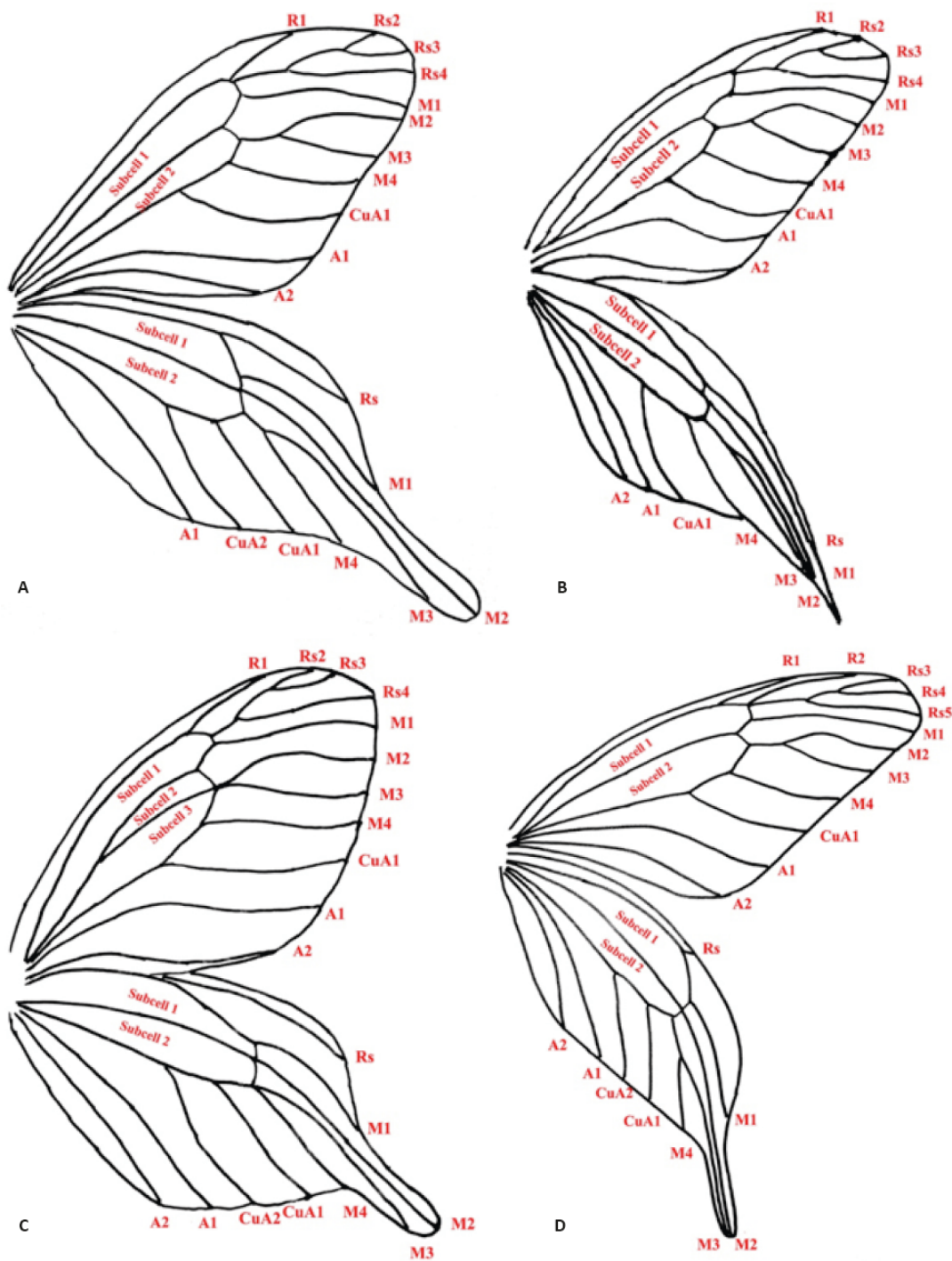


Figure 1 A–D. A - *Elcysma delavayi* Oberthür, 1891; B - *Elcysma dohertyi* Elwes, 1890; C - *Elcysma westwoodii* (Snellen van Vollenhoven, 1863); D - *Elcysma ziroensis* sp. nov.

The wing venations of the four species of *Elcysma* were reproduced from specimen and pictures from the following sources:

*E. delavayi* - from Yen et al. 2005, page 178; *E. dohertyi* - retrieved from Fauna and flora Wiki, [http://fauna-and-flora.wikia.com/wiki/Elcysma\\_dohertyi](http://fauna-and-flora.wikia.com/wiki/Elcysma_dohertyi);

*E. westwoodii* - retrieved from Siberian Zoological Museum, [http://szmn.sbras.ru/picts/Heterocera/Zygaenidae/Elcysma\\_westwoodi.htm](http://szmn.sbras.ru/picts/Heterocera/Zygaenidae/Elcysma_westwoodi.htm)

bipectinate antennae with scales at pedicel and scape; naked at shaft; head black with shine; non-hairy only posterior to eye clothed with dark brown hairs, eye

round without minute hair; black grey scales covering frontoclypeus and labial palpus; labial palpus reduced and non-porrected; proboscis unscaled; a pair of dome-

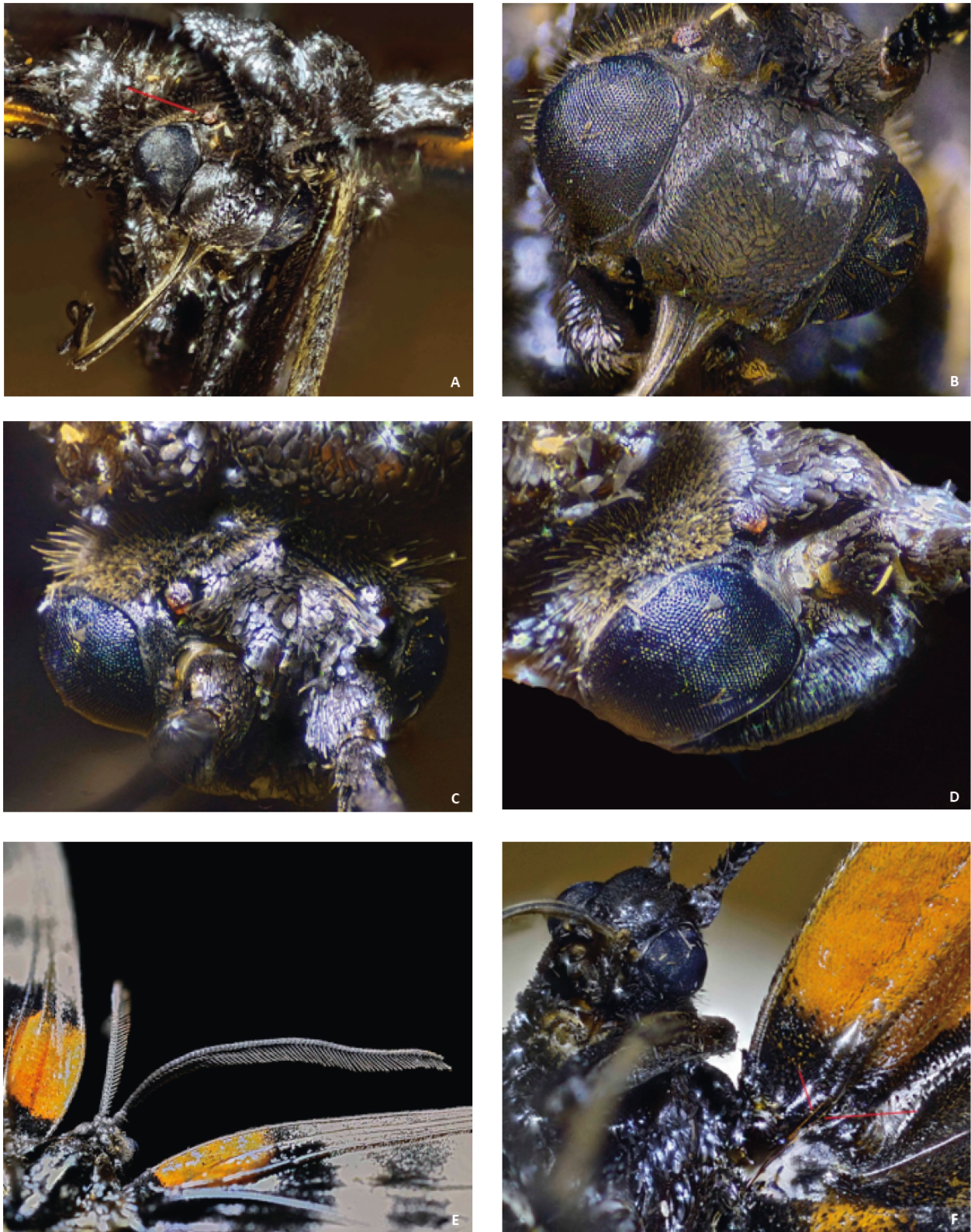


Image 5 A–F. *Elcysma ziroensis* sp. nov.

A - Frontal view of head portion showing the labial palpus and dome-shaped chaetosemata (Eltringham's organs) at dorsal; B - frontoclypeus, eye, labial palpus and dome-shaped chaetosemata at dorsal; C - posterior of the head portion; D - lateral view of the eye, chaetosemata and labial palpus; E - view of the bipectinate antennae; F - frenulum with two filaments arising from the hindwing. © Authors.





Image 6A. *Bhutanitis lidderdalii* Atkinson, 1873 puddling on puddle 01-09-2010. © Authors.



Image 6B. *Elcysma ziroensis* sp. nov. puddling on rock 17-09-2010 (possible male). © Authors.



Image 7A. *Elcysma ziroensis* sp. nov. female on host plant possibly a sp. of *Prunus*, Rosaceae family 18-09-2016. © Mohammad Arif Hussain



Image 7B. *Elcysma ziroensis* sp. nov. female laying egg showing the papillae anales inserting egg on crack of host plant 18-09-2016. © Mohammad Arif Hussain

shaped chaetosemata (Eltringham's organs) at dorsal to eye; thorax and abdomen black.

**Genitalia:** The genitalia of this female individual was damaged. Partially, the specimen revealed extended ovipositor as depicted in Image 1 & Image 6d.

**Etymology:** The name of the species is derived from the type locality Ziro, Arunachal Pradesh in northeastern India.

**Suggested common name:** Apatani Glory is given as the English common name based on the tribal people living in Ziro.

**Permit:** Permission obtained by the Government of Arunachal Pradesh, Office of the Principal Chief Conservator of Forests (Wildlife and Biodiversity) Itanagar with no. CWL/G/13(95)/2011-12/Pt.I/2362-63

dated 02 November 2016.

#### DISCUSSION AND CONCLUSION

This is a brightly coloured diurnal species with a slow and fluttering flight. Its flight period matches with *Bhutanitis lidderdalii* Atkinson, 1873 with similar wing patterns, which are seen flying at the same time in the same locality. Both are fairly common in Talle Wildlife Sanctuary in Ziro. As zygaenid moths are chemically protected and aposematic (Naumann et al. 1999) and *B. lidderdalii* feeds on *Aristolochiaceae* rendering them unpalatable to predators, there appears to be a commimetic assemblage of the two species. A possible male individual was photographed (Image 6b) drinking at puddles on 17/IX/2010. This species does not appear



to exhibit strong sexual dimorphism in wing pattern and size though the possible male appears to show a much darker ground colour and conspicuous markings than the female. The details of life history are unknown. Pictures of a female laying egg were taken on 18/IX/2016 and two photographs are depicted in Image 7a,b. From observations, this species has only been seen during autumn, notably in the month of September indicating that it is a univoltine species. This coincides with the laying of eggs in September. It is expected that the eggs will hatch in a few days and the larvae will hibernate in cracks in the trees where they are placed to survive during the cold winter at this high elevation of 1,700m in Ziro. The larvae will become active and feeding after diapause in the spring when new foliage appears. The final instar larvae will pupate in August and adults will appear again in September. This taxon appears to

share a similar life history with *E. westwoodii* (Owada, 1992). The host plant appears to be a species of *Prunus*, Rosaceae family.

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