

**DESCRIPTION OF THE FEMALE IMAGO AND EGGS OF  
INDIALIS BADIA PETERS & EDMUNDS  
(EPHEMEROPTERA : LEPTOPHLEBIIDAE)**

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**ABSTRACT.** The previously unknown female imago and egg of *Indialis badia* are described. An additional locality is given for the species in South India.

Peters and Edmunds (1970) established *Indialis* with *Indialis badia* Peters and Edmunds as the type-species. The species description was based on one male subimago and 49 nymphs collected by Dr. and Mrs. Peters in Kerala and Andhra Pradesh, India. Peters and Edmunds (1970) included the subimaginal description, as the one subimago died during subimaginal moult and the genitalia and abdomen were fully out of the subimaginal skin before death.

The female imago and egg structure of the same species are described herein. The nymphs and adults are associated by rearing. An additional locality is given for the species in Tamil Nadu (Madras State) in South India.

***Indialis badia* Peters & Edmunds (Figs. 1-8)**

*Indialis badia* Peters & Edmunds, 1970. *Pacific Ins.*, 12: 209; Peters, 1975. *Pan-Pacific Ent.*, 51: 159; Hubbard & Peters, 1978. *Oriental Ins. Suppl.*, 9: 23.

**Female imago** (in alcohol). Length: Body, 6.0 mm; fore wing, 7.0mm. Head light brown with black markings along median area of vertex. Antennae pale yellow, scape and pedicel washed with brownish yellow. Eyes indigo, separated on meson of head by a length 2.5x as great as maximum width of an eye. Basal half of ocelli black, apical half white. Thorax dark brown; carinae of pleurae and pronotum washed with black. Colour and markings of legs as in male imago, except colour of maculae and bands darker. Wings with longitudinal veins of fore and hind wings light brown, darker near base; cross-veins of fore wing light brown; membrane of fore and hind wings hyaline, brown at base, except cells C and Sc of fore wings washed with light brownish yellow. Abdomen with terga 1-9 washed with dark brown, with a greenish tint, lateral and posterior margins darker; a lighter, median, longitudinal band on anterior half of terga 2-8, band becoming wider progressively; sterna brown. Ninth sternum shallowly cleft apically, with a median furrow (Fig. 5); ninth sternum dark brownish yellow with dark brown lateral edges. Caudal filaments brownish yellow.

**Egs** (in Hoyers): Chorion with longitudinal sinuous ridges (Fig. 6). Attachment structures (Fig. 8) circular or subcircular, sucker-like at both polar ends. Micropylar device (Fig. 7) funnelform, rim 11.5-12.0  $\mu$ m in diameter.

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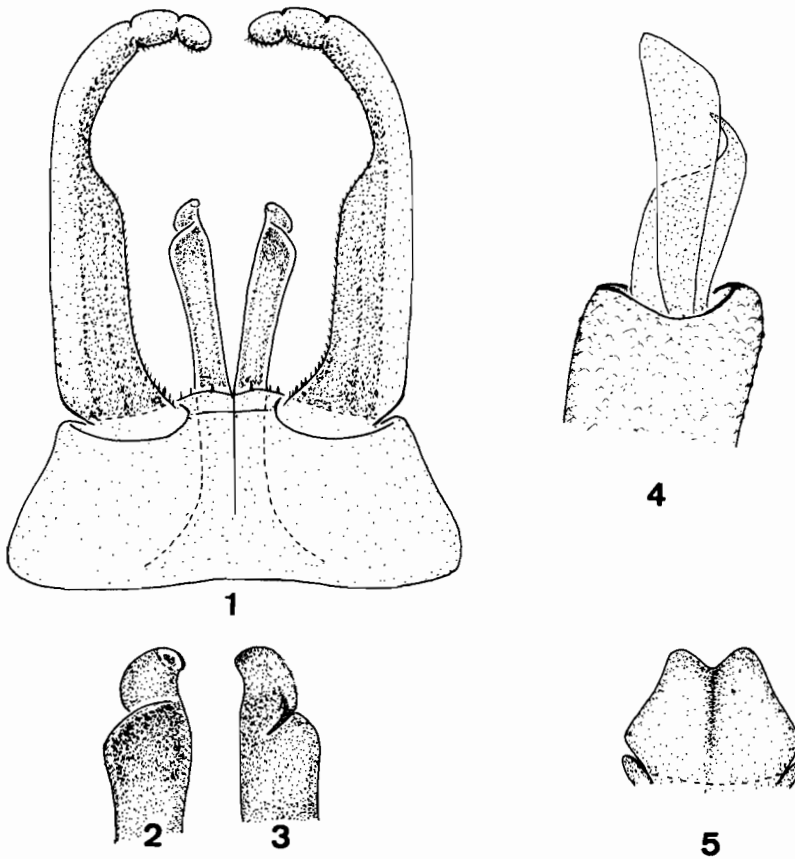
Specimens: India: Tamil Nadu: Thamraparani River, Papanasam, 250m, 2 M imagos, 2 F imagos, and 9 nymphs, 19.iii.1978, K.G.Sivaramakrishnan. All specimens in alcohol. Nymphs and imagos associated by rearing. 1 male imago, 1 female imago, and 5 nymphs deposited in Florida A&M University. 1 male imago, 1 female imago, and 4 nymphs in Sivaramakrishnan collection, Entomology Institute, Loyola College, Madras.

Discussion: The imago of *I. badia* is not redescribed as it is in conformity with the subimaginal description given in Peters and Edmunds (1970). They stated that the eyes of *badia* meet on meson of the head. Subsequently Peters (1975) pointed out that the head of the subimaginal holotype is shriveled and the eyes of *badia* might be separated on the meson of the head. The eyes of the male imago, reported herein are separated on the meson of head by a length equal to 0.25 the width of the median ocellus. The claws of the male imaginal fore legs are as in Fig. 4; and the male genitalia is as in Fig. 1. Variation in the shape of the apex of the penes between Fig. 98 of Peters and Edmunds (1970) and Fig. 2-3 may well be variation in imaginal age.

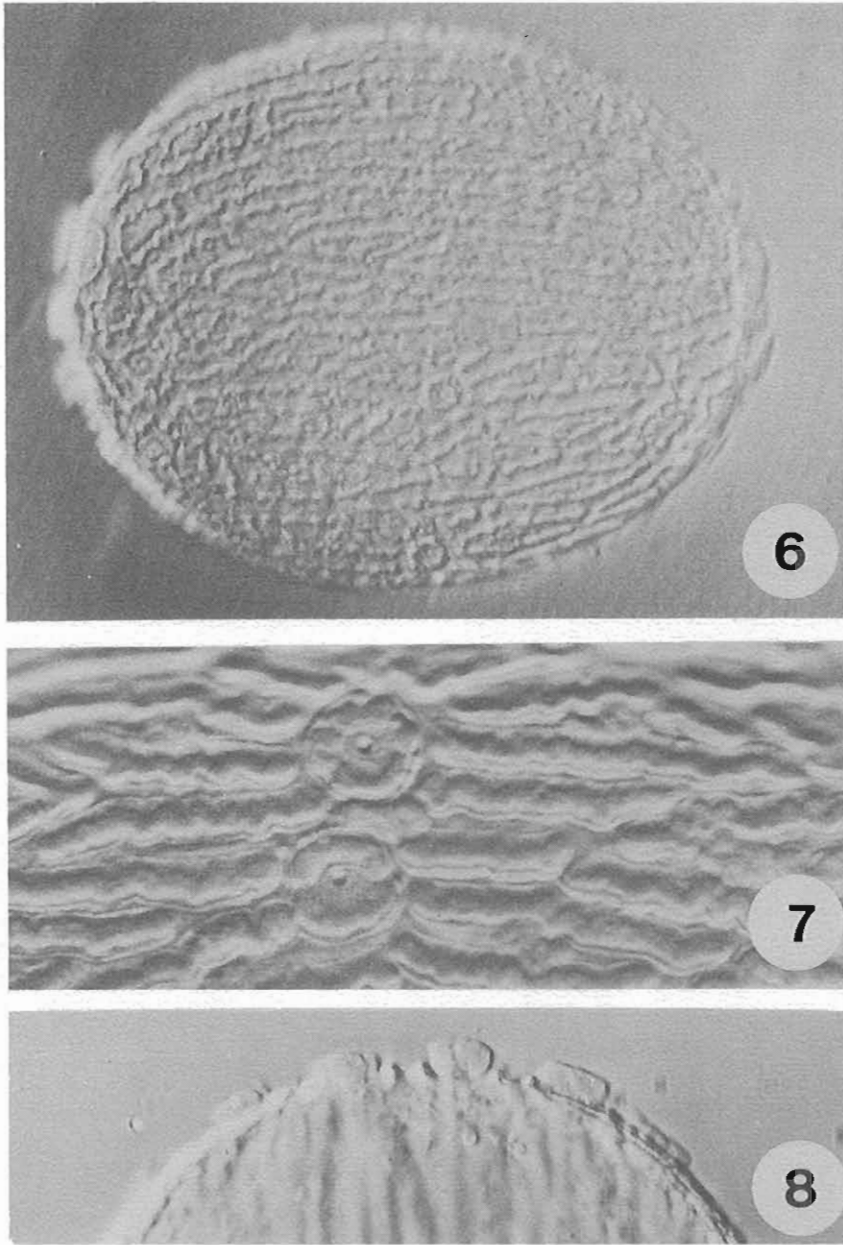
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#### REFERENCES

- HUBBARD, M. D., and PETERS, W. L., 1978. A catalogue of the Ephemeroptera of the Indian Subregion. *Oriental Ins. Suppl.*, 9: 1-43.
- PETERS, W. L., 1975. A new species of *Indialis* from India (Ephemeroptera: Leptophlebiidae). *Pan-Pacific Ent.*, 51: 159-161.
- PETERS, W. L., and EDMUNDS, G. F. Jr., 1970. Revision of the generic classification of the Eastern Hemisphere Leptophlebiidae (Ephemeroptera). *Pacific Ins.*, 12: 157-240.



Figs. 1-4. Indialis badia, male imago: 1, ventral view of genitalia; 2-3, apex of penis, ventral and dorsal views; 4, claws of fore leg. Fig. 5, Indialis badia, ninth sternum of female imago.



Figs. 6-8. *Indialis badia*, egg: 6, entire; 7, portion showing micropyle; 8, portion showing attachment structures.