

**THE LIFE HISTORY OF *NESOLYCAENA MEDICEA* BRABY  
(LEPIDOPTERA: LYCAENIDAE)**

S.J. JOHNSON<sup>1</sup> and P.S. VALENTINE<sup>2</sup>

<sup>1</sup>Oonoonba Veterinary Laboratory, PO Box 1085, Townsville, Qld. 4810

<sup>2</sup>Tropical Environment Studies and Geography, James Cook University, Townsville, Qld. 4811

**Abstract**

*Nesolycaena medicea* Braby is recorded breeding on *Boronia eriantha* Lindl. (Rutaceae) in the sandstone gorges of The White Mountains in inland northern Queensland. Larval and pupal durations are short during summer but pupae enter diapause with the onset of cooler, drier weather. Comments are made on adult variation.

**Introduction**

*Nesolycaena medicea* Braby was described from four adults taken in early spring, flying in deep sandstone gorges in The White Mountains National Park, near Torrens Creek in northern Queensland (Braby 1996), but the biology of the species has remained unknown. Further morphological information is now available and preliminary studies on the conservation biology of the species have uncovered details of the life history.

**Life history**

*Food plant.* *Boronia eriantha* Lindl. (Rutaceae).

*Egg* (Fig. 1). White, hemispherical, 0.65 mm wide, 0.4 mm high; surface finely pitted and overlaid with a reticulate pattern of crenulate ridges forming mostly quadrate pits; micropyle smooth.

*First instar* (Fig. 2). Pale yellow; entire margin slightly scalloped; each segment bearing a pair of setae dorsolaterally and 2-3 long pale setae on the lateral margin; mandibles brown; spiracles black; anal plate with faint brown markings.

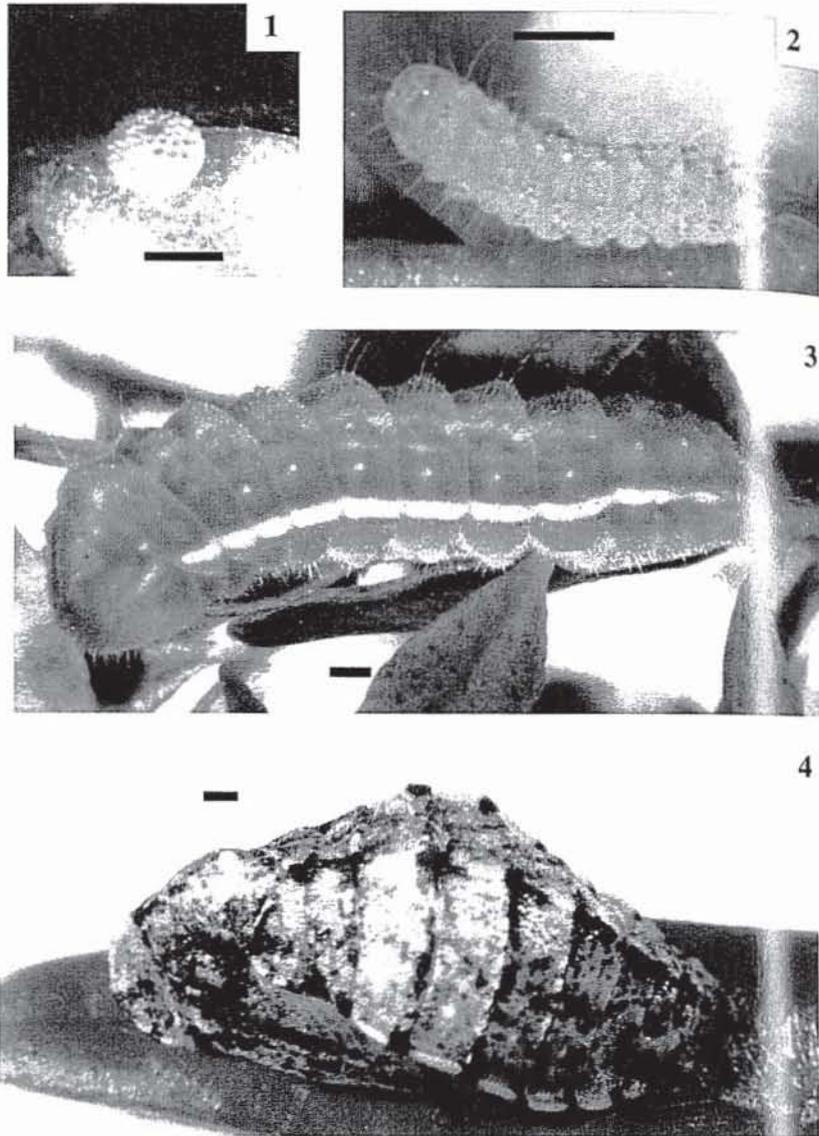
*Second to fourth instar.* Green; dorsal protuberances more pronounced and margin deeply indented; dense line of setae along ventrolateral margin; head retracted beneath prothorax; length 4-7 mm.

*Final instar* (Fig. 3). Green; dorsal heart darker green faintly edged white; prominent white lateral line; prothoracic plate smooth, grey, densely covered in reddish brown spots and flecks; spiracles cream; length 8-10 mm.

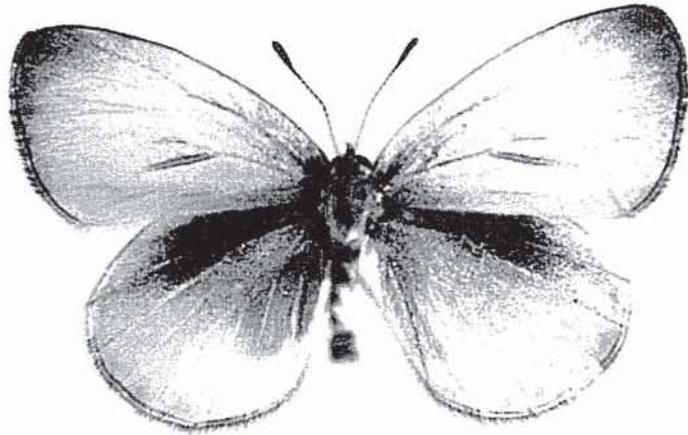
*Pupa* (Fig. 4). Cream brown, densely covered in black flecks and blotches more pronounced on lateral thorax, along dorsum and on intersegmental areas of abdominal flange; prothorax slightly concave; slight dorsal flange; a pair of rounded protuberances dorsally and laterally on mesothorax; lateral margin of abdominal segments flanged and occasionally suffused pink posteriorly; attached by cremaster and central girdle; length 8-9.5 mm.

**Discussion**

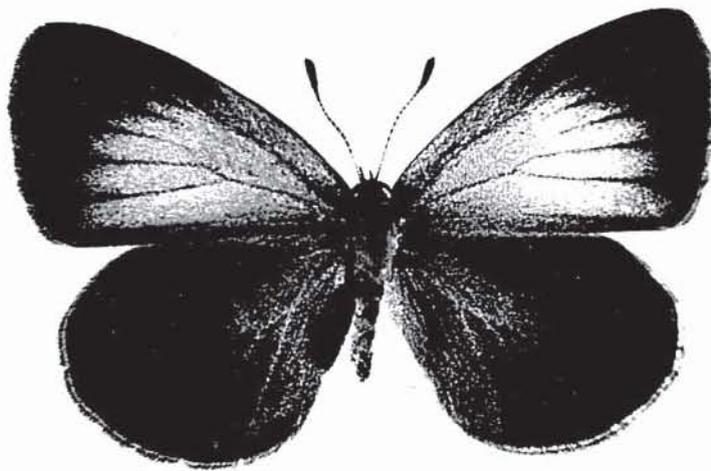
Eggs were usually laid singly on flower buds or on petals within opened flowers but occasionally under terminal leaves. First instar larvae did not feed on flowers but tunnelled into soft growing tips of the plant where they



**Figs 1-4.** *Nesolycaena medicea*: (1) egg; (2) first instar larva; (3) final instar larva; (4) pupa. Scale bars = 0.5mm.



5



6

**Figs 5-6.** *Nesolycaena medicea*: (5) male upperside; (6) female upperside.

remained almost completely buried for 48 hours before moving to the underside of a leaf to moult. Second instar larvae fed on the epidermis on the underside of mature leaves and later instars fed on the margins of leaves. Larger larvae remained fully exposed on the foliage, typically resting along the upper surface of a leaf with the head deflexed over the tip (Fig 3). In this position the larvae blended well and were difficult to see but were easily dislodged by gentle shaking of the plant. Several early instar larvae were transferred to *Boronia keysii* and completed development and emerged as full sized adults in similar time as other larvae reared on *B. eriantha*. In the field pupae were found in curled dead leaves adjacent to the base of the food plant. The size, shape and colour of the pupa closely matched the decomposed sandstone in which the host plants grew. Larvae and pupae were not attended by ants.

Egg, larval and pupal durations in December, February and March were 4-5, 24-26 and 10-12 days respectively. Some larvae pupating in late summer entered diapause. A pupa collected in the field on 14 March 1999 and taken to Townsville, emerged 235 days later on 4 November following a week of rain and high humidity. A similar pupal diapause has been reported by Common and Waterhouse (1981) for *N. urumelia* (Tindale) and is recorded here by us for *N. caesia* d'Apice & Miller, where a larva that pupated in Kalumburu on 11 April 1995 and taken to Townsville emerged 253 days later on 20 December.

Adults were common between December and April, flying in upper and lower gorges and usually confined to areas where *B. eriantha* grew but, in December 1998, several females were observed flying across a dry ridge separating the gorges of the Flinders River and Torrens Creek watersheds. In February 2000, following heavy rainfall that commenced in the previous October and November, adults were abundant and occasional specimens were observed flying in areas devoid of *B. eriantha*.

The collection and rearing of a much larger series of fresh material has enabled a better definition of adult variation. Males (Fig. 5) appear uniform and consistent with the original description except that the sex brand on the bases of veins  $CuA_1$  and  $CuA_2$  is more prominent than in the specimen illustrated by Braby (1996). Females are slightly more variable with occasional specimens (Fig. 6) showing reduced greyish-white suffusion on the upperside of both wings.

#### Acknowledgments

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#### References

- BRABY, M.F. 1996. A new species of *Nesolycaena* Waterhouse and Turner (Lepidoptera: Lycaenidae) from northeastern Australia. *Australian Journal of Entomology* 35: 9-17.
- COMMON, I.F.B. and WATERHOUSE, D.F. 1981. *Butterflies of Australia*. Angus and Robertson, Sydney; xiv + 682 pp.