

## NOTES ON THE LIFE HISTORY OF *HYPOCHRYSOPS HIPPURIS* *NEBULOSIS* SANDS (LEPIDOPTERA: LYCAENIDAE)

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### Abstract

Some larval stages and the pupa of *Hypochrysops hippuris nebulosis* Sands from northern Australia are described and illustrated. The fern *Pyrrosia lanceolata* (L.) Farw. (Polypodiaceae) is recorded as the larval food plant and the immature stages are attended by the ant *Philidris cordatus stewartii* (Forel).

### Introduction

*Hypochrysops hippuris nebulosis* Sands is known from south-western Papua New Guinea and the Claudie River area on Cape York Peninsula, Queensland (Sands 1986). Males have been observed regularly in the morning engaged in aggressive territorial behaviour on the summits of drier hills and ridges in the rainforest but females have been seen less commonly, usually along tracks. The life history was previously unknown. Searching in an area near Gordon Creek, where we have most commonly seen females, revealed feeding scars on a small blade-like fern. Further searching on the fern using lights at night revealed larvae which were reared to adults.

### Life history

*Foodplant.* *Pyrrosia lanceolata* (L.) Farw. (Polypodiaceae).

*Third and fourth instar larvae* (Fig. 1). Head brown; prothorax red brown with anterior margin scalloped, each protrusion bearing 3 long pale setae; prothoracic plate brown with scattered dark blotches; body reddish brown with variegated pale areas; pale green dorsal stripe extending ventrally on segment 1; abdominal segments each bearing a central dorsal rosette of red tubercles; abdominal segment 8 with a pair of raised circular black dots composed of concentric rings of erect short dark brown setae; spiracles black; abdominal segments 9 and 10 expanded laterally and posteriorly into rounded lobes, a central red triangular area and green lateral areas; body densely covered in short setae with stellate tips.

*Final instar larva* (Fig. 2). Flattened with scalloped margins; brown, variegated with pink, cream and green; a broad pale green dorsal stripe with central ridge tipped black; prothoracic plate pink; lateral green line along spiracles on abdominal segments 3-6; prominent black spots with pale centres laterally on abdominal segment 8; anal plate pinkish with lateral cream stripes bearing 3 small black spots; body densely covered in short stellate setae which are black overlying dark brown areas and pale brown overlying green, cream and pink areas; long pale setae ventrally and along lateral margins.





**Figs 1-3.** *Hypochrysops hippuris nebulosis*: (1) fourth instar larva; (2) final instar larva; (3) pupa. Scale bars = 2 mm.



*Pupa* (Fig. 3). Pale brown, densely mottled black; cream dorsal stripe on abdominal segments 2-6; pair of black blotches dorsolaterally on anterior mesothorax and on prothorax. Attached by anal hooks and central girdle. Length 13 mm. Pupal duration 19-21 days in Townsville in September.



Fig. 4. *Hypochrysops hippuris nebulosis* feeding scars on *Pyrrosia lanceolata*.

### Observations and discussion

Despite numerous searches over the past few years we have been unable to locate eggs or early instar larvae. We have observed female *H. h. nebulosis* walking on *P. lanceolata* but have not observed oviposition. An egg dissected from a freshly dead female was pale green, suggesting oviposition may be on the fern blades; however, much of the fern grows on smaller branches and high on trunks of trees and is inaccessible.

Larvae have only been found on fern growing on trees infested with the ant *Philidris cordatus stewartii* (Forel); however, the relationship between larvae and ants appears to be facultative because several larvae found feeding or wandering on the host tree were not attended by ants. Along the Claudie River and its tributaries at Iron Range, larvae of *H. h. nebulosis* often feed on *P. lanceolata* growing on large *Nauclea orientalis* (Rubiaceae) trees containing larvae of *H. elgneri barnardi* Waterhouse.

*P. lanceolata* 'is an uncommon species in Australia found only on trees in the monsoonal rainforests of the ranges of central Cape York Peninsula' (Jones and Clemesha 1976). Feeding scars (Fig. 4) made by larvae of *H. hippuris* are widespread along the Claudie River valley and we have observed them commonly on fern up to 15 metres high but less so on fern growing above this height. We have not found feeding scars on fern growing on trees not infested with *P. c. stewartii*. Greg Daniels collected a female



around a bird's nest fern but oviposition was not observed (Common and Waterhouse 1981). Bird's nest ferns commonly grow with *P. lanceolata* at Iron Range and, in our experience, frequently contain large nests of *P. cordatus*, but we have not found larvae or signs of larval feeding on these ferns. The trees supporting plants of *P. lanceolata* are also covered in mosses and the stems of the fern trap fallen leaves and detritus. Larvae reared on fern growing on recently fallen branches constructed shelters by tunnelling into the moss and detritus and the variegated green and pink colouration of the larvae afforded excellent crypsis. Pupation occurred in the larval shelter. Three larvae collected in July 1996 were parasitised by an unidentified braconid wasp.

*H. hippuris* Hewitson is only the second butterfly species known to use ferns as a food plant, although Sands (1986) observed a female of *H. dohertyi* Oberthür apparently engaged in oviposition behaviour around a fern in Papua New Guinea. The closely related *H. theon* C. & R. Felder uses the ferns *Drynaria quercifolia* (Daniels 1976) and *Platycerium hillii* (Lane 1993) in Australia and larvae are attended by the same ant as larvae of *H. h. nebulosis*. At Iron Range, *D. quercifolia* occurs commonly on the base of trees also hosting *P. lanceolata* and infested with *P. cordatus* but we have not observed larvae of the two butterfly species together.

The record by D.P.A. Sands (in Braby 2000) of *Polypodium* sp. as a food plant of *H. h. nebulosis* cannot be verified. No adults were reared to confirm the reputed larval identification and *Polypodium* is not known to occur in Queensland (Henderson 1997). *H. h. nebulosis* is known only from the Claudie River valley in Australia, suggesting that *P. lanceolata* may be its only food plant in Australia.

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