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# *HYPOLYCAENA ERYLUS* FEEDING ON MANGROVE APPLE AND ATTENDED BY *OECOPHYLLA* WEAVER ANTS, IN NORTH SULAWESI, INDONESIA (LEPIDOPTERA: LYCAENIDAE)

**MUTSUNORI TOKESHI, MAKOTO YOKO-O, J. R. PAHLANO DAUD and MARTIN DOMITS**

Amakusa Marine Biological Laboratory, Kyushu University, Kumamoto 863-2507, Japan

**ABSTRACT**.– Larvae of the common hairstreak of the Indo-Pacific tropics, *Hypolycaena erylus* (Godart), were observed for the first time to feed on the leaves of the mangrove apple, *Sonneratia alba* (Sonneratiaceae), in the intertidal habitats of Bunaken, North Sulawesi, Indonesia. *S. alba* appears to be a preferred host plant of *H. erylus* in mangrove habitats where larvae are attended by the Indo-Australian weaver ants, *Oecophylla smaragdina*. Early instars were found in the ants' arboreal nest, while late instars were free-roaming, being attended by the weaver ants.

**KEY WORDS**: Asia, behavior, biology, ecology, Formicidae, Hymenoptera, intertidal habitats, Indo-Pacific, larvae, mangroves, mutualism, ant-lycaenid association, myrmecophily, Rhizophoraceae, Sonneratiaceae.

Fig. 1. The 4th instar larva of *H. erylus* being attended by weaver ants, *O. smaragdina*. Note that one ant is imbibing sugary secretions from the dorsal nectary gland of the *H. erylus* larva.

While the ecological and evolutionary importance of tritrophic and mutualistic interactions involving lycaenid butterfly larvae, ants and terrestrial plants is widely recognised (e. g., Pierce, 1987, 1989; Fiedler, 1991a,b; Eastwood and Fraser, 1999; Blüthgen and Fiedler, 2002), such relationships have rarely been reported from intertidal mangrove environments.

The tropical common hairstreak, *Hypolycaena erylus* (Godart), is widely distributed in the tropics of the Indo-Pacific, ranging from Sikkim to Indo-China and through Sundaland to Papua New Guinea (Corbet and Pendlebury, 1978). The species is known to occur in all types of vegetation from coastal mangroves to hill forests, being attended by ants.

An extensive sampling of mangrove trees in the intertidal habitats of Bunaken (124° 45'E, 1° 37' N), North Sulawesi, between 2003-2005, revealed that *H. erylus* feeds on the leaves of the mangrove apple, *Sonneratia alba* (Smith) (Sonneratiaceae). *S. alba* was the most dominant mangrove tree in our study site in Bunaken, occurring in the frontal edge of the intertidal mangrove zone. Our survey and sampling involved checking the branches of *Sonneratia* trees along a 500m coastline on a boat at the time of high tide. We have collected larvae of all stages, invariably attended by the Asian weaver ant, *Oecophylla smaragdina* (Fabricius) (Fig 1), and successfully reared them to adults (both males and females). While no less than 24 plant species belonging to 16 families, and including mangrove trees of the family Rhizophoraceae *Brugiera cylindrica, Rhizophora apiculata* and *R. mucronata*), have previously been reported as host plants of *H. erylus* throughout the Indo-Malesian tropics, this is the first record of a species of another important mangrove family — Sonneratiaceae — being identified as a host for *H. erylus*.

As *Sonneratia alba* tends to form the outermost edge of mangrove zones in Southeast Asia, *H. erylus* inhabits the sea-side of a mangrove forest where tree branches are often no more than 1m above the water surface at the time of high tide and frequently

Fig. 2. Opened arboreal nest of the weaver ant *Oecophylla smaragdina* made of *Sonneratia alba* leaves spun together by the silk secretions of ant larvae (Bunaken, North Sulawesi). Two larvae of *Hypolycaena erylus* (arrows, top and centre left) are visible. Note also the brownish feeding marks on *Sonneratia alba* leaves, particularly to the left.

receive splashes of sea water. It is notable that younger instars of *H. erylus* were generally found in the arboreal nest of the *Oecophylla* weaver ant (Fig. 1-2), suggesting that the survival of young lycaenid larvae is dependent upon protection afforded by *Oecophylla* ants. Older instars, on the other hand, leave ant nests and forage more freely, probably because the amount of suitable leaves inside an ant's nest is limited. Nevertheless, they can be described as myrmecophilous (Hölldobler and Wilson, 1990; Fiedler, 1991a) as, inside or outside an ant's nest, lycaenid larvae were always attended by the weaver ant. In Australia, a closely related lycaenid species belonging to the same genus, *H. phorbas* (Fabricius), has also been reported as being associated with *O. smaragdina* (Moss, 1989; Hacobian, 1992).

Although tree species belonging to *Rhizophora* also occurred in the mangrove forest of Bunaken, often in the interior or towards the land-side, no *H. erylus* larvae have been found. This observation apparently points to the importance of *Sonneratia alba* as a host plant for *H. erylus*, as *S. alba* is predominant in sandy-muddy substrates of mangrove forests throughout the Indo-Pacific tropics (the species ranges from East Africa to New Caledonia; Tomlinson, 1986), which must facilitate the occurrence of *H. erylus* in all coastal areas of this region.

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