

# BEHAVIOUR AND NATURAL HISTORY OF *GRETA OTO* IN CAPTIVITY (LEPIDOPTERA: NYMPHALIDAE: ITHOMIINAE)

STEPHEN K. HALL

15 Chatsworth Crescent, Allestree, Derby, DE22 2AP, England

**ABSTRACT.**— The life cycle of *Greta oto* (Hewitson) (Nymphalidae: Ithomiinae) and the suitability of various foodplants are described. Its behaviour in captivity is discussed. The ability of this species and other butterflies to display apparently natural behaviour and breed in a small greenhouse emphasises the value of captive populations for behavioural research as well as for public exhibition.

**KEY WORDS:** Apocynaceae, breeding, Buddlejaceae, butterfly house, captivity, Central America, Coccidae, Compositae, courtship, egg, Homoptera, immature stages, larva, Neotropical, oviposition, Papilionidae, pupa, pyrrolizidine alkaloids, Rubiaceae, Solanaceae, Verbenaceae.

Since the early 1980's, butterfly houses have become very popular, and have been a source of interest for lepidopterists worldwide. A butterfly house is a simple and ingenious idea, consisting of a glasshouse planted with various flowering plants for adult butterflies and various larval foodplants so that the butterflies can breed in a controlled environment. There are two types of butterfly houses: the exhibition butterfly house, which is often a very large glasshouse working on the same principle as a zoo, with the public paying to enter (Collins, 1987), and the amateur butterfly house, which is often a small greenhouse on private property, run for the sole interest of the owner.

A butterfly house seems the ideal place to study butterfly behaviour and natural history, but one must remember that this is an unnatural environment. Butterflies often behave in a very different manner from that observed in the wild. Because the butterflies are enclosed, this makes them easier to monitor and more data can be obtained in this way than in the wild.

The subject of this paper, *Greta oto* (Hewitson), is a clearwing ithomiine from Central America. It is bred, mainly in Costa Rica, and then exported, as pupae, to butterfly houses around the world. It has been available for many years now. The life cycle of *G. oto* has been recorded (DeVries, 1987), but to my knowledge this species has not been described in detail. Young (1972) has described fully the life cycle of the close relative *Greta nero* (Hewitson) (as *Hymenitis nero*).

## METHODS

The results were obtained in an amateur greenhouse, 8ft (2.4m) x 12ft (3.6m) with an eave height of 5ft 4ins (1.6m) to an apex of 7ft (2.1m). The greenhouse is insulated with a layer of bubble polythene, with an inner layer of Papronet<sup>1</sup>. It is heated by a 3KW fan heater, and lit by

1. Papronet is a special netting made from cross-laminated polythene. It is used primarily as greenhouse shading. In strong sunlight, it cuts out 25% of the bright light, but in dull condition it lets 94% of the light in. This material also acts as an insulator, saving on heating costs during cold weather. Papronet is extensively used in butterfly houses. Available from Direct Wire Ties Ltd., Hull, England HU9 5NL.

two 5ft (1.5m) fluorescent lights, situated near the apex. The greenhouse contains many butterfly nectar sources and larval foodplants of species other than those used by *G. oto*. The observations took place over a three month period, from November to January. The temperature in the greenhouse varied from a minimum of 4.4°C (40°F) at night to a maximum of 30°C (86°F) during the day; the temperature outside went to minimum -5°C (23°F) to a maximum 11°C (52°F). A few specimens of the Papilionidae *Parides photinus* (Doubleday) and *Atrophaneura alcinous* (Klug) were also flying and breeding alongside *G. oto*.

The specimens of *G. oto* studied were the F<sub>1</sub> generation from two gravid females. These were obtained thanks to the generosity of Stratford-Upon-Avon Butterfly Farm, which has kept a breeding nucleus of *G. oto* for nearly two years. Their initial stock came from Costa Rica. Approximately 50 specimens were studied over the three month period. A maximum of 30 specimens were under observation at any one time. To assist in observations, the individuals were marked with several waterproof marker pens. The marks were placed on one of the hindwings and the combination of colours as well as the number and location of the marks were recorded alongside the available data on the individual, such as the time and date of emergence and sex. This enabled me to track these butterflies relatively easily.

## RESULTS

### Larval Foodplants

The larval foodplants of *G. oto* belong to the genus *Cestrum* (Solanaceae). In the wild, several *Cestrum* species have been recorded as hostplants, notably *C. standleyi* (Morton) and *C. lanatum* (Mart. & Gal.) (DeVries, 1987; Drummond and Brown, 1987). In captivity, *G. oto* use many *Cestrum* species, including *C. elegans* (Schlecht.), *C. aurantiacum* (Lindl.), *C. parqui* (L'Herit.), *C. newelli* (Nicholson), and *C. nocturnum* (L.). All these were present in the greenhouse. By far the preferred larval foodplant of *G. oto* was *C. nocturnum*. The other four species were only very occasionally used and many of the larvae on them died in the first instar, or developed more slowly. Various butterfly houses which have bred *G. oto* reported that development went extremely well in the past on *C. elegans*, contrary to