

advantage in communicating to wider, less specialised readers also. Amateur butterfly watchers probably use short communications in the *Journal* more often than professionals. The use of scientific names may create a special aura around the author, but utility of the article is greatly reduced.

To conclude, I would say that the article

by Ms. Shahabuddin was very useful but its value could have been greatly augmented by keeping the abovementioned points in mind.

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### 29. ROOSTING HABITS OF THE TAILED JAY BUTTERFLY *GRAPHIUM AGAMEMNON* (LINNAEUS) DURING THE RAINS

The Tailed jay butterfly, *Graphium agamemnon*, shows a wide range of distribution from S. India to Saurashtra, Kumaon to Assam, Ceylon and Burma (Wynter-Blyth, 1957: BUTTERFLIES OF THE INDIAN REGION). It is commonly found amidst human settlements on account of its preferred host plants, the mast tree (*Polyalthia longifolia*) and the custard apple (*Annona squamosa*). Unlike many other butterflies, the Tailed jay is active even during the hot hours of the day and may be seen fluttering restlessly over flowers. However, very little information is available on the resting locations of this butterfly during the monsoon and also the manner in which it rests.

In the monsoon of 1997, several individuals were observed roosting regularly in a densely wooded patch in a garden in Mumbai. The aggregation of butterflies in this shaded portion began as soon as it started to rain, where they continued to remain even after sunset. On drier days, however, they were found to be scattered in a wider area, even in places with scanty tree cover. However, a little shower was found to be enough to make them converge back

into the densely foliated region.

Another interesting aspect was the distance of the roosting sites from the ground which was on most occasions less than 2 m. This practice not only helps them to avoid direct exposure to rain, but also keeps them away from nocturnal winged predators like bats and owls.

There is a clear preference for plants with small, dark leaves. There is also a liking for thin drooping branches on which they are generally seen perched along the upper side, close to the tip. It may be that the thinner branches transmit stronger vibrations as they are more sensitive to the movement of tree dwelling predators like a lizard or a spider. Also, by sitting along the branch they look like extensions of the branch itself. This helps them to escape predators. Moreover, if disturbed, they immediately take off and settle on another branch after fluttering suspiciously for some time.

The Tailed jay always rests on the upper side of a leaf with the head pointing upwards, irrespective of the rains. The direction of the head probably depends on the likely approach route of a predator, and the ease with which they can



alight during an emergency. Moreover, the butterfly's camouflaging capability decides whether it needs to perch above or below a leaf.

The selection of a roosting site thus seems to be governed by a combination of defence strategies against nocturnal predators and

instinctive behaviour to cope with harsh weather.

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### 30. BIOLOGICAL CONTROL OF DISEASE TRANSMITTING FRESHWATER LEECHES *HEMICLEPSIS MARGINATA MARGINATA* (MULLER) ANNELIDA: GLOSSIPHONIIDAE

Because of their habit of sucking blood from man and economically important animals, and participation in spreading protozoan and helminth diseases in the concerned hosts, sanguivorous leeches have drawn the attention of a number of workers, Davies and Everett 1975, Mandal 1984. In India, the sanguivorous leech *Hemiclepsis marginata marginata* poses a serious threat to pisciculture, froggery and turtle fisheries in so far as occurrence and spread of haematozoan diseases are concerned. During the course of rearing *H. marginata* in the laboratory, destruction of eggs of this leech by a fungal strain (*Anguillospora* sp.: Moniliaceae) has been noted repeatedly and an account of the same is given below.

Of the 10 egg-bearing *H. marginata*, an unusual colouration of the body colour of five leeches and the eggs of these individuals was noted on January 15, 1990. On January 18, 1990 the colour of these eggs changed from white (original, normal colour of the eggs) to green. On January 21 and 22, 1990 all the eggs from the body of the five leeches dropped to the bottom of the container. These eggs were left undisturbed but the water of the container was regularly replaced by fresh pond water. The mother leeches gradually became sluggish and greenish. They did not even move to attack fishes to suck blood. Of the five, one died on January 27, three on January 28, and the last one died on January 29, 1990. The eggs did not hatch during the 16 days following detachment from the mother leeches

and finally became denatured and decomposed. Five other leeches thrived in the same container, their eggs hatched in due course and the hatchlings were normal and healthy.

Subsequently, in other containers, a similar type of fungal infection was seen in eggs and egg-bearing leeches. Experiments were initiated to find out whether the leeches, irrespective of age and life stages, are susceptible to attack by fungal parasites, or whether the attack is confined to egg-bearing leeches. Ten individuals in the categories of three age-groups, viz. 7-10 days, 30-33 days and 90-93 days from the laboratory stock were used. All the 90-93 day-old leeches had an elongated white patch on the ventral side of the body where the eggs remain attached until they hatch and the hatchlings are detached. The individuals in the three age-groups were released separately in three museum jars, each holding one litre of pond water. Five egg-bearing, fungus infected leeches were released in each jar.

The leeches belonging to 7-10 and 30-33 day age-groups were free from fungal infection for nine days during which, however, all the fungus infected leeches died. But six individuals out of 10 belonging to the 90-93 day age-group became infected by the fungal parasites. In all cases, the initial site of infection was either the eggs or the outer covering of the cocoon. Subsequently, this spread towards the anterior sucker. The infected leeches then became inactive and were seen hanging somehow on to the wall of the jar with the help of their posterior sucker.





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