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GENERAL NOTES

OVIPOSITION OF THE BUTTERFLY *BATTUS BELUS VARUS* (PAPILIONIDAE)

Members of the swallowtail genus *Battus* use as larval foodplants woody vines in the family Aristolochiaceae (Brower & Brower 1964, Zoologica 49: 137–159; Ehrlich & Raven 1965, Evolution 18: 586–608; Young 1971, Rev. Biol. Trop. 19: 210–240; Tyler 1975, The Swallowtail Butterflies, Naturegraph, California). The Aristolochiaceae, like many vines, reach their greatest diversity in the New World tropics (Pfeifer 1966, Ann. Missouri Bot. Garden 53: 1–114), where both *Battus* and the closely related *Parides* exploit them. Although the neotropical *B. polydamas* carefully deposits small clusters of eggs on various species of *Aristolochia* in Costa Rica (Young, op. cit.; pers. obs.), the temperate zone *B. philenor* is known to oviposit on plants other than Aristolochiaceae, which are not acceptable to larvae (Tyler, op. cit.). *Parides* always deposits eggs precisely on Aristolochiaceae (Young 1973, Psyche 80: 1–21; 1976, J. Lep. Soc. 31: 100–108). *Battus belus varus* Kollar ranges from Vera Cruz, Mexico to northeastern Ecuador and northern Venezuela (Rothschild & Jordan, 1906,

FIG. 1. *Battus belus varus* ovipositing on *Melothria guadalupensis* (Curcubitaceae) at Finca La Tigra, near La Virgen de Sarapiqui, Heredia Prov., Costa Rica, 19 February 1977, 1300 hrs.

Novitates Zool. 13: 27–753; Tyler, op. cit.); larval foodplants are various species of *Aristolochia* (e.g., Tyler, op. cit.). This note reports an observation of oviposition of *B. belus varus* on a plant other than a larval foodplant.

On 19 February 1977, a female *B. belus varus* was observed flying among several clumps of woody and herbaceous vines in a secondary forest at Finca La Tigra, near La Virgen de Sarapiqui, Heredia Province, Costa Rica. She finally began ovipositing on a vine, *Melothria guadelupensis* (Spreng.) Cogn. (Cucurbitaceae), intertwined with another vine, *Aristolochia constricta* Griseb.; the leaves of the two plants were similar in size and general shape. Oviposition lasted several minutes (Fig. 1). Forty-three eggs were deposited in a tight cluster on a single leaf of *M. guadelupensis* and no eggs were found on the *A. constricta*. In the laboratory, the freshly hatched larvae did not accept leaves of *M. guadelupensis*, but fed briefly on *A. ringens* Vahl (obtained from H. W. Pfeifer in 1971; locality not specified) before dying. *Aristolochia constricta* was not available for testing.

Tyler (op. cit.) mentions that *B. philenor* accepts only certain species of Aristolochiaceae as foodplants. Foodplant specificity is apparent where different species of *Aristolochia* occur in the same region (Scriber & Feeny 1976, J. Lep. Soc. 30: 70–71). An Australian *Aristolochia*-feeding swallowtail, *Ornithoptera priamus*, has been observed to deposit eggs on an introduced species of *Aristolochia*, and the larvae perished (Straatman 1962, J. Lep. Soc. 16: 99–103). The refusal of *A. ringens*, a plant species native to Costa Rica, by *B. belus* larvae, supports the possibility that *Battus* specializes on restricted larval foodplants within the Aristolochiaceae. Eggs of *B. philenor* have been found on Convolvulaceae and Polygonaceae, vines which generally look like *Aristolochia*. Larvae of another *Aristolochia*-feeding swallowtail, *Polydorus aristolochiae* (Fabricius), have been seen on various Cucurbitaceae in India, but their larvae refused to accept these plants in captivity (Ghosh 1914, Mem. Dept. Agr. India, Entomol. Sec. V(1): 53–587). Only certain species of *Aristolochia* are foodplants of *P. aristolochiae* (Munshi & Moiz 1967, J. Lep. Soc. 21: 127–128). It is possible that *B. belus varus* mistook the cucurbit vine for an *Aristolochia*. Perhaps the very close proximity of the *A. constricta* vine contributed to this confusion, by providing odoriferous and visual properties of a correct foodplant. Alternatively, the oviposition on the intertwined cucurbit might have been deliberate, possibly representing an adaptation to avoid waiting egg parasites and predators. Under this explanation, the newly hatched larvae would have rapidly found the correct foodplant. Further observations are needed to distinguish between these two hypotheses. If an adaptation for avoiding egg parasites and predators, such behavior might be more prevalent among vine-feeding butterflies in the tropics, where the intertwining of unrelated vines is common.

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MALFUNCTION OF ECDYSIS ALLOWING IMAGINAL EMERGENCE BUT CAUSING DEATH OF ADULT HACKBERRY BUTTERFLY (NYMPHALIDAE)

Insects must periodically shed their skins—a process known as ecdysis which allows growth or transformation of the individual. Each molt period is a dangerous time during which the insect is susceptible to predation or physiological malfunctioning, both of which may cause death. Natural selection has, therefore, perfected the process of ecdysis to such a degree that physiological failures are rare. I describe