

OVIPOSITION BY *HELICONIUS HECALE* (NYMPHALIDAE) ON A
GRASS INFLORESCENCE IN COSTA RICA

Oviposition by *Heliconius* butterflies (Nymphalidae: Heliconiinae) involves the use of innate or learned searching images (Gilbert, 1975, *In Coevolution of Animals and Plants*, pp. 210-240, L. E. Gilbert & P. H. Raven, eds., Austin: Univ. Texas Press, 246 p.; Benson et al., 1975, *Evolution* 29: 659-680). Such search images, which function to insure that *Heliconius* place eggs on the correct species and structures of Passifloraceae, their larval host plants (Ehrlich & Raven, 1965, *Evolution* 18: 586-608), represent sophisticated behavioral traits. *Heliconius* have been seen to ignore an inconspicuous host plant to inspect another plant resembling a *Passiflora* structure such as a tendrill (Benson et al., 1975, loc. cit.). However, it is not known whether *Heliconius* will actually place eggs on such incorrect hosts. Therefore observations made in the wild of any species of *Heliconius* placing eggs on inappropriate plants adjacent to a host plant are important. This note describes an observation of *Heliconius hecale* (Fabricius) placing an egg on a grass inflorescence near a small *Passiflora vitifolia* H.B.K. vine. This is the first published record of such behavior to my knowledge.

On 3 August 1978, a fresh female *H. hecale* spent several minutes inspecting a small (immature) vine of *P. vitifolia* tangled in grass (unidentified) at the edge of a mixed cocoa (*Theobroma cacao* L.) and rubber (*Hevea brasiliensis* Muell. Arg.) plantation at "Finca El Uno" near La Virgen (220 m elev.), Sarapiquí, Heredia Province, Costa Rica. A single egg was placed on the tip of a long uncoiled tendrill at 1015 h, and a few minutes later, another egg was placed on a grass inflorescence a few centimeters from the *P. vitifolia* vine (Fig. 1). The butterfly then flew away. A 20 min inspection of the vine and surrounding grass failed to turn up any additional eggs of *H. hecale* or other *Heliconius* (see also Young, 1978, *Entomol. News* 89: 81-89 for species using *P. vitifolia* at this locality). This vine was about 0.75 m long and, with the exception of the single uncoiled tendrill, it was tangled in the grass, and lying tucked away below the canopy of the grass. Other tendrills were tightly coiled around grass stems and leaves and they were hidden from view. No other vines of *P. vitifolia* were within 30-40 m of this one. This vine had five unfolded leaves and no *Heliconius* larvae were present.

While it is known that heliconiines such as *Dryas iulia* (Fabricius) and *Agraulis vanillae* (L.) place eggs on adjacent plants, dead leaves, and other objects near their passifloraceous host plants (Benson et al., loc. cit.), this behavior is less known for *Heliconius*. Coupled with a tendency for larvae to wander in search of the correct host plant, such behavior has been speculated to be adaptive in reducing losses of eggs to predators (Benson et al., 1975, loc. cit.). Most species of *Heliconius* exhibit precise oviposition on the correct host plants (e.g., Alexander, 1961, *Zoologica* 46: 1-24; Gilbert, 1975, loc. cit.; Benson et al., 1975, loc. cit.; Young, 1973, *Wasmann J. Biol.* 31: 337-350; 1975, *Pan-Pacif. Entomol.* 51: 76-85; 1976, *Pan-Pacific Entomol.* 52: 291-303; Smiley, 1978, *Science* 201: 745-747). Although the hypothesis that heliconiines (including *Heliconius*) lay eggs on plants and objects adjacent to host plants to reduce losses of eggs from predators, cannot be ruled out, a recent study (Smiley, 1978, loc. cit.) suggests that ecological factors determine oviposition preciseness in *Heliconius*. In Costa Rica *H. hecale* exhibits careful oviposition of eggs singly on the tips of both coiled and uncoiled tendrills of *P. vitifolia* (Young, 1975, loc. cit.; 1978, loc. cit.) and owing to this species' close affinities to *H. erato*, it is most likely monophagous locally (Smiley, 1978, loc. cit.). Given these ecological properties, the observed instance of oviposition on a grass inflorescence probably resulted from confusion in the searching image: the grass inflorescence probably was confused with the elongate uncoiled tendrill of *P. vitifolia* only a few cm away. However, the presence of only one free-hanging tendrill induced the butterfly to later oviposit on the grass inflorescence. Sometimes butterfly oviposition on incorrect or inappropriate plants is due to the rarity of the favored or correct host plant (Chew, 1977, *Evolution* 31: 568-579).

This observation and the general conceptual framework on *Heliconius* oviposition strategies and host plant exploitation (Gilbert, 1975, loc. cit.; Benson et al., 1975, loc. cit.) suggest that occasional instances of incorrect oviposition by *Heliconius* are in-



FIG. 1. Above: The position of the grass inflorescence used for oviposition by *H. hecale* relative to the position of the *P. vitifolia* vine (trilobed leaf in center) is shown. Arrow indicates location of the egg. Below: the position of the egg on the grass inflorescence, indicated by the arrow.

duced by ecological factors such as scarcity of the host plant, host plant patch size, scarcity of host plant structures suitable for oviposition, and resemblances of surrounding plants to the host plant. In the present instance, *H. hecale* might have been induced to oviposit on the grass inflorescence by these properties of the *P. vitifolia* "island."

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JAMES MASON HUTCHINGS (1824–1902): AN EARLY BUTTERFLY COLLECTOR IN CALIFORNIA

J. M. Hutchings is known to have supplied specimens of *Parnassius phoebis behrii* W. H. Edwards to Henry Edwards (cf. Edwards, 1878; Proc. Cal. Acad. Sci. 11–14). F. M. Brown (1975, Trans. Amer. Entomol. Soc. 101: 1–31) credited him with taking the type specimen of *P. behrii* near the summit of Mount Lyell, and as possibly being the collector of the type specimen of *Parnassius clodius baldur* W. H. Edwards. Hutchings undoubtedly collected Lepidoptera for Henry Edwards, and possibly for others. Biographical data on him will be important, especially if additional material originating from him should be discovered in other collections. He did not, however, collect the type specimen of *Parnassius behrii* (cf. accompanying note, Masters, J. Lep. Soc. 34: 47).

Hutchings was born in England in 1824. He came to the United States as a youth and to California in 1849 after news of the gold discovery reached him in New Orleans. He worked in the mines for a few years before turning to writing and publishing. From 1856 to 1861, he published Hutchings' California Magazine, which was widely acclaimed as one of the best illustrated magazines of its day. In 1855, accompanied by a daguerreian cameraman, he led the first tourist party into Yosemite Valley. His account of this trip appeared in his magazine and was widely reprinted; it is generally credited with stimulating most of the early interest in Yosemite.

Hutchings sold his magazine in 1861 and bought the "Upper Hotel" in Yosemite, which he renamed "Hutchings House." This he operated as a guest house. He was a permanent resident of Yosemite Valley from this time until his death in 1902. One of his first employees in Yosemite was John Muir, who worked for him as a carpenter. He and Muir soon parted company as a result of differences in philosophy involving Yosemite Valley. Hutchings wanted to see the valley commercially developed, while Muir wanted it preserved as a wilderness. [It is unlikely that either of them would be happy with Yosemite today. Although it is preserved in the National Park System, it is the most populated, commercialized, and highly developed part of that system.]

During Hutchings' Yosemite years he continued to explore California's unusual places, and he produced a series of privately published books concerning his travels (e.g., 1877, *A Guide to Yosemite*; 1886, *The Heart of the Sierras*; 1894, *Yosemite Valley and the Big Trees*). In none of these writings did Hutchings mention butterflies. However, he did publish a number of items on other phases of California natural history, including flowers, animals, horned toads and various articles on birds. More complete data on Hutchings is provided by Olmsted (1962, *Scenes of Wonder & Curiosity, Howell-North, Berkeley*) and by Farquhar (1965, *History of the Sierra Nevada, U. Calif. Press, Berkeley*).

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