

ROOSTING BEHAVIOR IN ADULT VANESSA CARDUI

Additional key word: Nymphalidae.

Nocturnal roosting behavior has been reported for many butterfly species, including *Heliconius charitonia* (Poulton, E. B. 1931, Proc. Roy. Entomol. Soc. London 6:71, and others), *H. erato* (Crane, J. 1955, Zoologica 40:167-197) and other species (Carpenter, G. D. H. 1931, Proc. Roy. Entomol. Soc. London 6:71; Clench, H. K. 1970, J. Lep. Soc. 24: 117-120; McFarland, N. 1971, J. Lep. Soc. 25:144-145). Below I describe apparent courtship activity and subsequent roosting for the night observed in *Vanessa cardui* L.

After a year of almost total absence in the Kalispell, Montana area (only one specimen seen in 1985), *V. cardui* was abundant throughout the Flathead River valley and the surrounding mountains in 1986.

In the Creston area E of Kalispell, the flood plain of the Flathead River consists of numerous sloughs and wetlands, many drained since the turn of the century. These are interspersed with remnant stands of spruce, and the sloughs are lined with cottonwood and other deciduous species. On 29 May 1986, Louis Nimeroff and I noticed large numbers of a medium-sized insect active around one cottonwood tree 18-19 m tall alongside the road, and about 30 m from any other tree. As it was shortly after 2100 h (MDT) and the sun had set, fading light did not allow us to identify the insects on the wing. Several attempts to net them failed, as they were flying rapidly about the tree, but eventually we succeeded, and found they were *V. cardui*. We stayed until flight ceased and available light was nearly gone. The insects seemed to be alighting on cottonwood leaves upon cessation of activity and roosting there for the night. We returned the following night for further observations.

On that evening, 30 June, we arrived at 2044 h and noted that the *V. cardui* were already engaged in the same activity as the evening before. Individuals were "chasing" close in to the cottonwood tree. Groups of 2 to 8 individuals "danced", flying rapidly in a circular motion around one another for 1 to 5 seconds, and then dispersed, each flying away in a different direction, although occasionally 2 or 3 would re-form into a new "dance" group and begin anew. This "dance" involved lateral as well as vertical displacement. At no time did any group fly vertically more than 4.5 m from the starting point before dispersing. This activity suggested courtship (Scott, J. A. 1985, The butterflies of North America, Stanford, California, p. 283) but attempts to net an entire group were not successful, and we were unable to determine sexual composition. At no time during the observation period, however, did we note mating.

Samples were taken opportunistically; nine males and two females were collected. All were worn, and were apparently new migrants into the area, although no obvious migration was noted. Fresh specimens did not appear in the area until mid-June.

Flight activity was observed up and down the tree, from ground level to the top. It was virtually constant, with individual insects pausing to rest on any convenient surface (ground, fence post, leaf, tree trunk, observer) for no more than 5 seconds. At rest, the wings were often held open so that the rays of the setting sun would fall full on them, but after sunset, which occurred at 2115 h, wings were held closed, and some were vibrated briefly in a manner reminiscent of sphingid and saturniid preflight warm-up. This thermoregulatory behavior has been noted elsewhere (Ferris, C. D. & F. M. Brown, eds. 1981, The butterflies of the Rocky Mountain states, Norman, Oklahoma, p. 31; and Scott 1986, above, p. 41). After sunset, resting became more frequent and prolonged.

Some individuals were noted chasing other flying insects that wandered into the area of activity, including a fly (Tabanidae) and a dragonfly. From time to time, an individual *cardui* would leave the area of the tree and fly into adjoining fields. Return activity was noted with about the same frequency, resulting in stability in the number of *cardui* active about the tree.

We checked the cottonwoods and other trees bordering the nearby slough, and noted *V. cardui* engaged in the same type of activity, but the insects were present at a lower density. The isolation of the cottonwood of our observations may well have acted to concentrate activity in its vicinity.

Activity ended abruptly. At 2148 h, flight and "dance" activity was still high. Two minutes later, only a few individuals were noted flying, and by 2154 h, all flight had ceased.

Individuals were observed flying into the tree and alighting on a leaf, where they remained at least as long as we could see them (until about 2200 h), and presumably passed the night there. All individuals observed (we estimate at least 100 insects present at any time) came to roost in the tree, but were widely dispersed, with no group roosting observed. We were unable to return to the site during the morning hours to observe dispersal for the day.

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OVIPOSITION BY *PARIDES* *ARCAS* *MYLOTES* (BATES) (PAPILIONIDAE) ON A GRASS LEAF-BLADE

Additional key words: Papilioninae, Troidini, *Aristolochia*, *Acroceras zizanoides*, Costa Rica.

Neotropical *Parides* oviposit exclusively on *Aristolochia* (Aristolochiaceae) plants (Moss 1919, Nov. Zool. 26:295-319; Cook, Frank & Brower 1971, Biotropica 3:17-20; Young 1973, Psyche 80:1-21; 1977, J. Lepid. Soc. 31:100-108; Brown, Damman & Feeny 1980, J. Res. Lepid. 19:199-226). Here I report a single observation of *Parides arcas mylotes* Bates ovipositing on the leaf-blade of grass.

At 1600 h on 28 July 1986, a "fresh" *P. arcas mylotes* was followed for ten minutes through the 10-20 cm high ground cover of grass and weeds in a small clearing within the cacao plantation "Finca Experimental La Lola" near Siquirres (10°06'N, 83°30'W; 50 m elev.), Limon Province, Costa Rica. The butterfly alighted on a 15 cm long *Aristolochia* sp. seedling partly concealed in dense grass, and placed one egg on a meristem leaf. The butterfly then flew around the vicinity of this vine, and returned a few minutes later and placed another egg on the leaf-blade of the grass *Acroceras zizanoides* (H.B.K.) Dandy (Graminae), about 25 cm from the *Aristolochia* (Fig. 1).

I collected both the *Aristolochia* and the *Acroceras zizanoides*, placing them in a tightly-closed plastic bag, to rear the two eggs. Roots of both plants were placed in a water-pik in the bag. I wanted to determine if the larva from the leaf-blade egg would feed on the grass, move to the *Aristolochia* vine (closest leaves about 10 cm away), or become disoriented and not feed at all. For the following two weeks of observation, neither larva fed on *Acroceras zizanoides*. The larva from the egg on the grass crawled to the *Aristolochia* without attempting to feed on the grass. Both larvae fed on the *Aristolochia*. I tentatively conclude that the oviposition on the grass leaf-blade was an aberrant behavior. Because troidine butterflies such as *Parides* are specialist herbivores on Aristolochiaceae (Brower & Brower 1964, Zoologica 49:137-159; and others), it would be of interest to determine the frequency of such behavior in the wild. Given that the meristem leaf of *Aristolochia* and the leaf-blade of *Acroceras zizanoides* are both narrow