

NOTES AND OBSERVATIONS ON THE BIOLOGY AND HOST  
PREFERENCES OF *VANESSA TAMEAMEA* (NYMPHALIDAE)

GLENN A. GORELICK  
University of California, Berkeley

and

RONALD S. WIELGUS  
San Mateo, California

The Kamehameha Butterfly (*Vanessa tameamea* Eschscholtz) was first described by Frederick Eschscholtz in 1821 while on a natural science expedition throughout the South Seas, and according to Zimmerman (1958), it was the first species of Lepidoptera to have been described from the Hawaiian Islands. This species is restricted to the forests of the Hawaiian Islands.

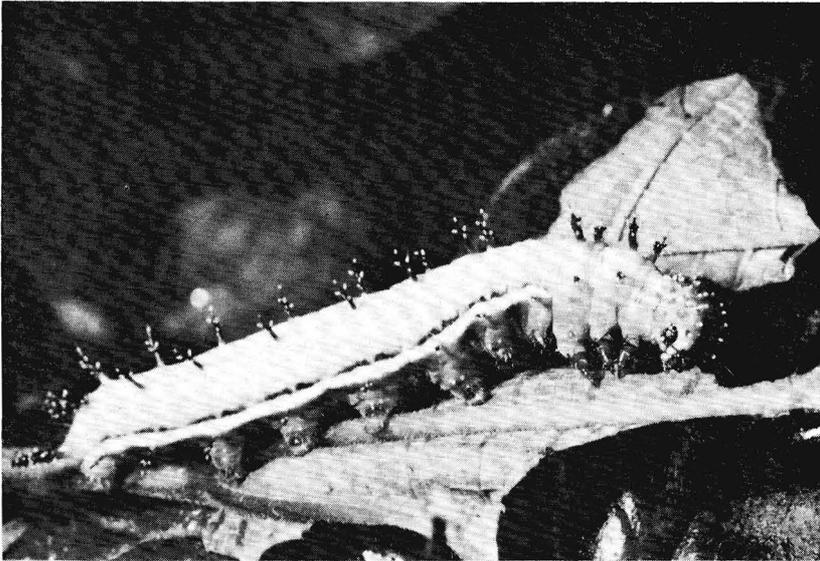
Observations were made on behavior of this butterfly by Wielgus on several trips to the Hawaiian Islands in 1966. Because of extensive cultivation and introduction of alien plants it was necessary to travel to high elevations to encounter the endemic flora where this butterfly occurs.

Some of the closest and most accessible of the native areas are the upper elevations of Mount Tantalus, which is a relatively low peak (2,013 feet) on Honolulu's northern limits. This was found to be an excellent locale for *Vanessa tameamea* in that the principal larval foodplant, *Pipturus albidus* Gray (Urticaceae) was growing on the slopes between 1,400 feet and 2,000 feet. Collecting was quite adequate along these slopes.

The first trip in mid-December, 1965, was primarily an exploratory one but only one *V. tameamea* was seen in flight in a mixed bamboo and broadleaf evergreen forest on the north face of Mount Tantalus at 2,000 feet.

The second trip to Honolulu occurred on January 20, 1966 and the foodplant, *Pipturus*, was located growing along the side of a road on Mt. Tantalus at about 1,800 feet. The plants were situated so that at that time of year the sun did not strike the leaves until 1:00 P.M. At about 11:30 A.M., however, a closer view of one *V. tameamea* was enabled, but it was not captured. *Pipturus* shrubs approximately five to ten feet in height were examined for evidence of larval activity without success.

On February 22 more favorable weather conditions prompted another excursion to the same area. The area came into sunlight between



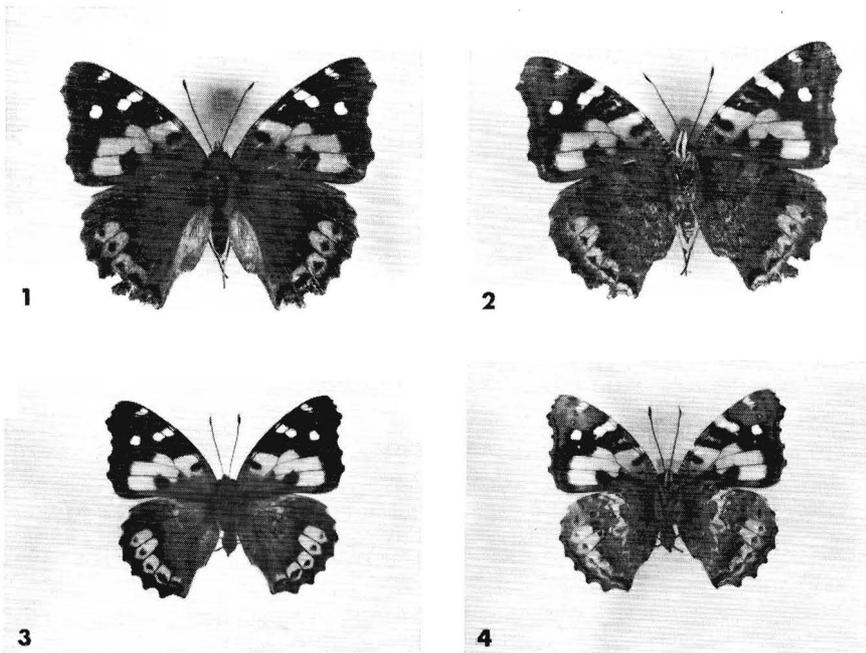
EXPLANATION OF FIGURE

Fifth instar mature larva of *Vanessa tameamea* Esch.

11:30 A.M. and noon and almost immediately *V. tameamea* began its rapid flight about the *Pipturus*. A female was observed ovipositing on the terminal leaves and was netted. Two others were seen along the trail and one of them, another female, was netted. The third, also a female, was netted after it had alighted.

The fourth trip, in March, was a general collecting trip and no *V. tameamea* were seen in the area previously described.

Between April 17 and 21 another area was explored by following a path on Mt. Tantalus marked "Trail No. 2," which begins at about 1,400 feet elevation on the west face of the mountain, circles around north-eastward and connects with Tantalus Drive on the east at the same elevation. Collecting was begun at 6:00 P.M. with many parts of the trail receiving the last hour of sunlight. A male *V. tameamea* was taken at approximately 1,500 feet. This capture prompted a search for the larval foodplant and one was found a short distance away, growing along the trailside between 1,500 and 1,600 feet. This shrub was not more than eighteen inches in height and was determined by Gorelick to belong to another genus of Urticaceae, *Boehmeria*, appearing to be *B. nivea* (L.) Gaud. The leaf of this species is characterized by a gradual tapering into a long-acuminate apex (Degener, 1957). One fifth instar larva



## EXPLANATION OF FIGURES

Comparison of adult females of *Vanessa tameamea* Eschscholtz:

1. Dorsal view, Mt. Tantalus (1,800'), Honolulu, Oahu, Hawaiian Islands, II-22-1966 (R. S. Wielgus, collector).

2. Ventral view, Mt. Tantalus, (1,800'), Honolulu, Oahu, Hawaiian Islands, II-22-1966 (R. S. Wielgus, collector).

3. Dorsal view, reared from larva on *Boehmeria nivea* (L.) Gaud., from Mt. Tantalus Trail No. 2, Honolulu, Oahu, Hawaiian Islands (Emerged: V-7-1966) (R. S. Wielgus, collector).

4. Ventral view, reared from larva on *Boehmeria nivea* (L.) Gaud., from Mt. Tantalus Trail No. 2, Honolulu, Oahu, Hawaiian Islands (Emerged: V-7-1966) (R. S. Wielgus, collector).

was found feeding on a leaf and was taken, along with sufficient numbers of *Boehmeria* leaves for rearing.

*Description, fifth instar larva:*

Body color pale, chartreuse green, with creamy white lateral stripe beginning at first abdominal segment, extending to anal opening. Head heart-shaped with numerous white-tipped short spines, with a maroon triangular-shaped patch on the front and a black spot at each eye. Second and third thoracic segments each with four black-tipped spines approximately 2.5 mm long; segments II-VIII each with four 1.2 mm spines, green at the bases, red at midpoints and black at the apices. Anal segment with two black spines with red bases approximately 6.5 mm long, projecting backward and giving the appearance of a forked tail. A description of the larval behavior was written by Williams (1928).

The larva was placed in a plastic container with *Boehmeria* leaves and on April 19 another mature larva was found, both were retained for rearing. Unfortunately much of the foodplant dehydrated, but the larvae ate the remaining leaves and the first larva pupated on April 24. Its pale gray-brown, angular chrysalis was suspended from a silken button spun on one of the leaves. The second larva pupated on April 26. The first produced a female on May 5, while a second female emerged on May 7.

Perhaps the most interesting of the observations made on this nymphalid was the variation inherent in the female adults. The reared specimens (fig. 3) were slightly smaller than normal and had a pinkish ground color on the upperside rather than the orange-red of field-captured specimens (fig. 1), while the undersides of the secondaries were olive green (fig. 4) rather than the grayish-brown observed in the field (fig. 2) by Wielgus. Zimmerman (1958) mentioned variation in the species but did not offer any hypotheses as to the causes of such color differences. Whether this variation is hereditary or is due to environmental factors has not yet been determined.

*Vanessa tameamea* appears to fly much of the year, especially on Mt. Tantalus where the native *Boehmeria* and *Pipturus* occur in vegetative form much of the year. On the mainland, the butterfly might possibly survive on native and Urticaceae introduced from Hawaii, including *Pipturus*, *Boehmeria*, *Urtica* (tends to be misidentified as *Hesperocnide* according to Degener, 1957), *Helxine*, *Pilea*, *Urera* and *Touchardia*. Rearing *V. tameamea* on *Urtica*, *Hesperocnide*, and *Parietaria* from the mainland to observe host preferences would also be of interest. Such transplant experiments involving native Hawaiian flora and fauna are not feasible under current U.S.D.A. regulations unless under strict quarantine. The results that might be obtained from such a study would produce, however, still more knowledge concerning the biology of this impressive Hawaiian nymphalid.

#### ACKNOWLEDGMENT

T. W. Davies of San Leandro kindly assisted by photographing the larva of *V. tameamea*.

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