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SUPPLEMENT I TO E. C. ZIMMERMAN, "INSECTS OF HAWAII" VOL. 7 (1958) MACROLEPIDOPTERA

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This supplement concerns species of the family Sphingidae (pages 425-444) introduced to Hawaii since 1958 and now firmly established. The introductions are connected with the rapid growth of airtraffic between Hawaii and SE Asia since the mid-1970s. Of special interest is the fast interisland colonization as reported in the HAWAII COOPERATIVE ECONOMIC INSECT REPORT (HCEIR), published by the State Department of Agriculture, Honolulu, HI until 1980, subsequently called HAWAII PEST REPORT.

The following species are presented according to the date of their first collection here.

1. **Theretra nessus** (Drury), 14 August 1974 at Campbell Indistrial Park, Oahu, nr. Hickam Air Force Base (HAFB), specimen in B. P. Bishop Museum. It spread quickly: 7 November 1974 Kauai (Kokee, approximately 1,100 m elevation); 8 March 1975 Maui; June 1975 Hawaii Island (Hilo); September 1975 Lanai; October 1975 Molokai. Members of the genus **Theretra** are well known as strong and rapid flyers. Larval food plant records are rare, so far all are of **Dioscorea** sp. in the Hawaiian Islands.

2. **Daphnis nerii** (Linnaeus), 18 September 1974 at HAFB, specimen in the US National Museum of Natural History, Washington, DC. On 4 October 1974 HCEIR reported 50 larvae of many instars and many eggs collected at HAFB, Pearl Harbor, and on the roadside oleander (**Nerium oleander**) along Nimitz Highway from the International Airport to Honolulu. The species spread rapidly throughout Oahu, in November reported already from Mililani through to Manoa, and the 1975 HCEIR annual summary reported the moth had become established on all major islands: Kauai February 1975; Maui August 1975; Lanai September 1975; Hawaii Island and Molokai October 1975; and from the collection of Bishop Museum is added one specimen with very worn and "used" forewings from Midway I. in May 1975!

An interesting contribution to the knowledge of insect distribution by airplane connected with the species under discussion is the following: Inoue (1967, 1974) reported **D. nerii** from Okinawa and Amami-ishima in the Ryuku Islands. He says "that the origin (or origines) of those strugglers [sic] are untraceable for us." The first specimens Inoue reported are from December 1960; then they were abundant in 1966/67 but seemed to have disappeared thereafter, only to reappear in numbers in November/December 1973. This question how **D. nerii**, basically an African species, came to Okinawa can also be solved in all probability in a similar way as its likely coming from Okinawa to Hawaii (there were to my knowledge no specimens of the species intercepted earlier than the first collection in the field at HAFB). In the years before and after Inoue's reports it was necessary to have uninterrupted oil (petrol) supplies to SE Asia for military use. The previously known range for **D. nerii** was throughout Africa, many parts of Europe, Asia Minor through India and Malaysia. From there the route to Okinawa also for the moth seems very possible.

Host plants of **D. nerii** in Hawaii in addition to oleander are: **Gardenia jasminoides, Gardenia Taitensis, Ervatamia divaricata, Alstonia macrophylla, Catharanthus roseus, Rauwolfia** sp., **Stemmadenia glaeottiana, Vinca** sp., **Adenium obesum** (all quoted from HCEIR). **Plumeria** sp. was also eaten by a reared laboratory-larva but it died after a few days.

The well known egg parasite **Trichogamma** sp. was ubiquitous according to HCEIR. Presently **D. nerii** is well established and stabilized in the Hawaiian Islands.

3. **Macroglossum pyrrhostictum** (Butler), 11 July 1976 at Honolulu (Makiki) inside a house on a window by entomologist R. C. A. Rice. Specimens in B. P. Bishop Museum. In 1976 it was also collected on Hawaii Island (4 October at Hilo) and on Kauai (22 November at Lihue) and one year later it was also present on Maui (5 August at Olinda). No records from other islands are known at this time.

On 20 October 1975 a dead female of the species had been collected by the US Department of Agriculture Quarantine at a commercial airplane coming from Thailand.

The larval food plant appears to be exclusively **Pedaera foetida**, called in Hawaii "maile pilau," an unpleasantly smelling rubiaceous climbing weed of wide distribution in the lowlands. It was also introduced in Hawaii. However in PROCEEDINGS OF THE HAWAIIN ENTOMOLOGICAL SOCIETY for 1977 (Vol. XXIII:163) one finds a note by C. J. Davis about the capture of adults at Volcano (Island of Hawaii) at 1,188-1,371 m elevation where "maile pilau" has not been observed. The adults were likely of lowland origin. Feeding tests of larvae were positive for **Coprosoma** sp. and **Gouldia** sp., however, negative for **Psychotria** sp.

4. **Psilogramma menephron** (Cramer) the latest newcomer had been intercepted alive by the USDA Quarantine in September 1976 in an airplane coming from Guam; specimen in B. P. Bishop Museum. It seems that other specimens simultaneously escaped and established. On 22 February 1977 a penultimate instar larva of the species was collected by G. Ching in Manoa Valley, about 10 km east of the Honolulu International Airport (see note by J. W. Beasrdsley in PRO. ENT. SOC. HAW., XXIV:181). Beginning in November 1977 more larvae were found near HAFB and adults were captured in different parts of Honolulu. In 1984 the species was evenly distributed over leeward and windward eastern Oahu. In March 1983 the first specimen was collected in northern Kauai (Haena) and in February 1984 in southeastern Kauai (Kipu nr. Lihue). There are no records yet from other islands.

Larval food plants in Hawaii are: **Olea africana, Oliva europaea, Jasminum multiflorum** and **sambac**. Beardsley in the above quoted note reports further: **Tabebuia pentaphylla, Catalpa longissima, Spathodea campanulata** (African tulip tree), all the hosts are Oleaceae or Bignoniaceae. Recently on Kauai R. C. A. Rice found and reared successfully larvae on an oriental species of **Ligustrum** and on **Clerodendron philippinum** (plants identified by Dr. H. St. John, Botany Dept., Bishop Museum).

5. Quarantine interceptions, not known to have established: The US Department of Agriculture Animal and Plant Health Inspection Service, shortly called "Quarantine," sometimes checks incoming planes at Honolulu airports, and among insects recently found alive were the following Sphingidae from foreign origins: **Daphnis torenia** Druce, from Samoa; **Gnathothlibus erotus** (Cramer), repeatedly from Guam; **Hippotion depictum** Dupont, from Guam; **Sphingonaepiopsis pusilio** (Boisduval), from Singapore. If not intercepted these species could have easily survived and multiplied in Hawaii.

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