

SCIENTIFIC NOTE
**Outbreak of *Achaea janata* (Linnaeus) (Lepidoptera:
Noctuidae) on Christmas Berry in Hawai'i**

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ABSTRACT. During the summer of 1992, an extensive outbreak of the croton caterpillar, *Achaea janata*, occurred on the shrub Christmas berry, *Schinus terebinthifolius*, along the west coast of the island of Hawai'i. The outbreak was first reported in July 1992, and follow-up surveys disclosed pockets of infested trees from Kailua-Kona to South Point. *Achaea janata* populations in some areas were heavy enough that trees were totally stripped of their foliage. Populations at any one site usually remained high for only one generation. Larvae were readily detected in affected areas until the infestations subsided in December 1992. By February 1993 there were no signs of *Achaea* activity on Christmas berry.

Achaea janata (Linnaeus) is a large, immigrant noctuid (wingspan ca. 6.5 cm) that is well established throughout the state of Hawai'i. It is a general foliage feeder and Zimmerman (1958) listed 25 host plants, but does not include the introduced plant Christmas berry, *Schinus terebinthifolius* Raddi. *Achaea janata* larvae are usually found infesting croton and castor bean plants and previously never observed by the authors attacking Christmas berry. Literature searches disclosed only one other outbreak recorded on Christmas berry that occurred nearly 40 years ago between Pahala and Na'alehu in Ka'u, Hawai'i Island, Hawai'i, in 1955 (Davis 1955).

In July 1992, complaints were received from residents located in the Lili'uokalani subdivision in Kailua-Kona, on the island of Hawai'i, concerning an outbreak of large caterpillars. Upon investigation, we found that the subdivision was surrounded by wild Christmas berry trees at an elevation of approximately 250 m. Many trees adjacent to the subdivision were completely defoliated by *A. janata*. Inspection of several residences confirmed complaints of large numbers of large (up to 5 mm), black larvae climbing lamp posts, shrubs, sides of buildings and cars, and even entering homes, thus generally causing a nuisance. The outbreak appeared to have originated on wild Christmas berry trees located just above the subdivision. After denuding the trees, the larvae moved down into the subdivision in search of food.

Although heavy feeding by *A. janata* larvae was observed on Christmas berry, the larvae appeared to ignore most other ornamental plants and shrubs with the exception of croton, *Codiaeum variegatum* (L.) Bl., and miniature white poinsettia, *Euphorbia* sp. In all, the *A. janata* infestation was estimated to cover an area more than 50 ha.

Most larvae observed appeared to be in the last instar, some of which had begun to pupate. Less than 1% of the population were larvae < 2 cm long. Over 200 caterpillars were collected from roadside Christmas berry trees by shaking the branches vigorously, causing *A. janata* to drop into a large collecting tray thereby allowing their size and instars to be determined. The outbreak also appeared localized, and surveys for *A. janata* in other localities where Christmas berry was abundant failed to detect even a single caterpillar.

The next report of an outbreak of *A. janata* on Christmas berry occurred in early September 1992 at Miloli'i, approximately 50 km south of the Kailua-Kona infestation.

Investigation disclosed heavy defoliation of Christmas berry trees along side the road leading from State Highway 11 down to the community of Miloli'i (250–500 m). Most larvae observed appeared full grown.

On the west coast of Hawai'i, Christmas berry forms a band at roughly 300–600 m elevation, stretching from Kona to the southern community of Na'alehu in Ka'u. A traverse of Highway 11, which passes through this band, was made in mid-September, and turned up 3 more sites where scattered Christmas berry trees had been stripped of their foliage by *A. janata* larvae. In October 1992, reports of another "explosion" of larvae defoliating Christmas berry were received from residents in the Green Sands subdivision, a small development near Wai'ohinu. Investigation of this area disclosed heavy infestations of *A. janata* larvae causing complete defoliation of some trees. The highest population of *A. janata* was observed at Green Sands, which is surrounded by one of the largest stands of Christmas berry in the state. Here the pattern was similar to that found in Kona, though less extensive since only 2–4 ha were severely affected. However, this outbreak was not as isolated as the one in Kona. During surveys of the remaining subdivision, an occasional branch could be seen defoliated, but generally the incidence of *A. janata* averaged less than 1 caterpillar per branch (50 branches were examined at random at various stops during the survey of the subdivision). When this area was revisited in November 1992, no caterpillars could be found, although numerous flying adults were noted. A follow-up survey made in January 1993 disclosed that populations had totally collapsed, and no larvae were detected on old and new Christmas berry foliage in the Green Sands subdivision. The infestations in the Green Sands subdivision appeared to have lasted for 2 generations according to reports from the residents.

Christmas berry is classified as a noxious weed in Hawai'i. Biological control efforts were initiated on this weed in the 1950s and 1960s, which resulted in the introduction and establishment of the defoliator, *Episimus utilis* Zimmerman (Lepidoptera: Tortricidae), and the seed weevil, *Lithraeus atronotatus* (Pic) (Coleoptera: Bruchidae). In the early 1980s, a new insect was found attacking the seeds of Christmas berry: an accidentally introduced seed chalcid, *Megastigmus transvaalensis* (Hussey) (Hymenoptera: Torymidae). Since 1984, a routine monitoring program has been conducted to determine the abundance and effectiveness of the Christmas berry insects (Yoshioka & Markin 1988). As part of this program, 20 locations around the island were visited 1–2 × a year and surveyed for insects attacking the foliage and seeds. From 1984 to 1991, no *A. janata* were detected or collected from Christmas berry. However, during the 1992 outbreak, visits to 5 of the 10 Christmas berry monitoring stations on the west side of the island revealed moderate to heavy infestations of *A. janata* larvae.

During the 1992 outbreak, ca. 500 larvae were collected from various localities and reared for parasites. Interestingly, when reared to adults, no parasites were recovered from the entire collection. Observations on host preference were conducted with croton, castor bean, and Christmas berry bouquets by simultaneously placing all 3 host plants in each of 3 sleeve cages, each containing 50 medium to late instar field-collected *A. janata* larvae. The larvae fed on the 3 host plants to complete their development. However, in another test under the same cage conditions, larvae from ca. 100 eggs laid in 3 cages by laboratory-reared adults fed only on croton and castor bean with no signs of feeding on Christmas berry. Although numerous larvae succumbed to a disease in the second test, the larvae showed a definite preference for croton and castor bean over Christmas berry when all 3 plants were placed together with the newly hatched larvae in the cages.

It is unknown why the outbreak took place when it did, although the Kona coast was unusually dry during the first half of the year. Perhaps dry climatic conditions and lack of preferred hosts contributed to the outbreak.

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