Research Notes

GEOGRAPHICAL DISTRIBUTION AND HOST PLANTS OF THE CACTUS MOTH, CACTOBLASTIS CACTORUM *(BERG) IN PUERTO RICO AND THE UNITED STATES VIRGIN ISLANDS*

The cactus moth, *Cactoblastis cactorum* (Berg)[1], was described from Argentina in 1885 in the genus *Zophodia*. Ragonot[2] transferred the species to the genus *Cactoblastis* in his 1901 monograph.

C. cactorum occurs endemically in the more northern provinces of Argentina: Entre Ríos, Corrientes, Santa Fe, the northern part of Córdoba, Santiago del Estero, Tucumán, Salta, Juyuy and the Chaco. In Uruguay, it has been recorded along the Uruguay and Plata Rivers from Piriápolis in the south, northward to Salta. The distribution extends from Corrientes in northeastern Argentina northward through Paraguay, where the insect has been observed at Villa de la Concepción and in the vicinity of Asunción, into the Brazilian province of Matto Grosso, where the larva has been recorded at Corumba on the Paraguay River.

Heinrich[3,4] discussed this species taxonomically in his 1939 and 1956 revisions of the moths belonging to the Phycitinae (Lepidoptera). The most complete account on the biological control of this species was given by Dodd[5] in 1940, while Mann[6] in 1969 furnished an excellent account of the distribution, host plants and biology of *C. cactorum*. Simmonds and Bennett[7] in 1966 discussed the introduction and host plants of the moth into the Leeward Islands of the West Indies (Nevis, Montserrat, Antigua, St. Kitts).

The eggs of *Cactoblastis cactorum* are laid in chains or egg sticks generally at the end of a cactus spine (fig. 1, A). It is well known that larvae (fig. 1, B) of this moth attack and destroy species of cacti belonging to the

[1] Berg, C. Quindecim lepidoptera nova. Faunae reipublicae Argentinae et Uruguayensis, Anales de la Sociedad Cientffica Argentina, *19*: 275–277, 1885.

[2] Ragonot, E. L. Monographie des Phycitinae et des Galleriinae. Mémoires sur les Lepidopteres, *8*(2): 15–17, 1901.

[3] Heinrich, Carl, The cactus-feeding Phycitinae: A contribution toward a revision of the American pyralidoid moths of the family Phycitidae, *Proc. U.S. Natl. Mus. 86*(3053): 331–413, 1939.

[4] Heinrich, Carl, American moths of the subfamily Phycitinae, U.S. Natl. Mus. Bull. 207 pp. VIII + 581, 1135 figs. 1956.

[5] Dodd, A. P., The biological campaign against prickly pear, Commonwealth Prickly Pear Board, Brisbane, Australia, 177 pp.; 1940.

[6] Mann, John, Cactus-feeding insects and mites, Smithsonian Inst. U.S. Natl. Mus. Bull. *256*: 1–158, 1969.

[7] Simmonds, F. J. and Bennett, F. D., Biological control of *Opuntia* spp. by *Cactoblastis cactorum* in the Leeward Islands (West Indies), *Entomophaga 11*(2): 183–189, 1966.

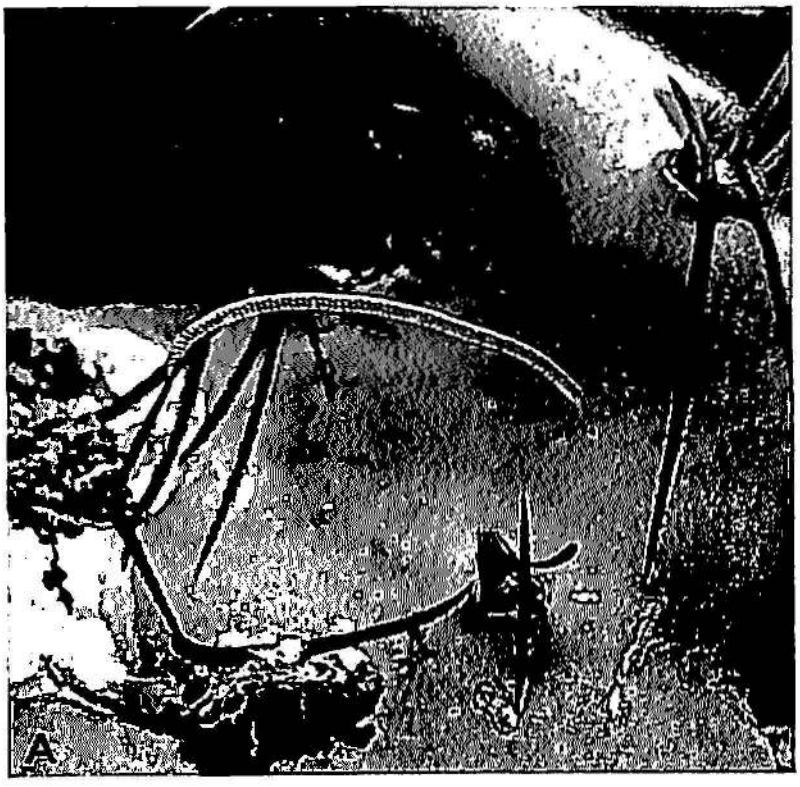

FIG. 1, A. Close-up of an "egg stick" laid at the very tip of a spine of *Opuntia dillenii*, at Guánica saltpools, Puerto Rico.

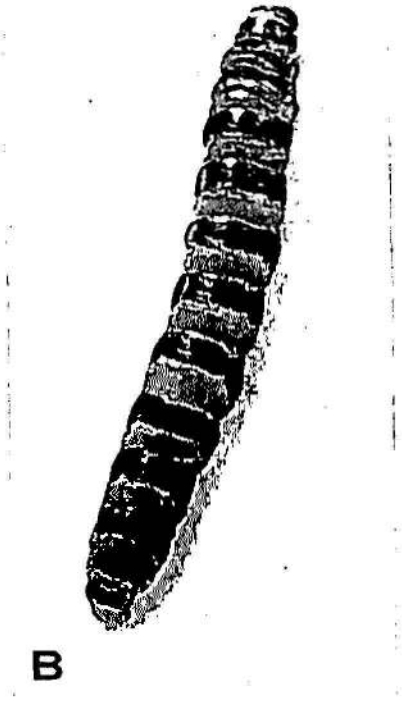

FIG. 1, B. Larva of *Cactoblastis cactorum* (Berg).

FIG. 1, C. Cactus pad opened to show *C. cactorum* larvae feeding within.

FIG. 1, D. *Opuntia dillenii* patch destroyed by *Cactoblastis cactorum* at Desecheo Island, Puerto Rico.

genus *Opuntia* (fig. 1, C, D). The insect has been used for the particular purpose of controlling cacti biologically in South Africa, Mauritius and Hawaii.

Leeward Islands: On April 4, 1957 the first shipment of *Cactoblastis*

(100 larvae and 300 "egg sticks") was received for release on wild cacti on the small island of Nevis in the Leeward group. Additional shipments of material were sent later from Trinidad and released in Nevis by personnel of the local Department of Agriculture. In total, 5,200 (eggs and small larvae) of *Cactoblastis* were introduced. Two species of coccids of the genus *Dactylopius* were also introduced simultaneously, but these proved unsuccessful there because of various reasons as stated by Simmonds and Bennett[7] in their interesting paper.

After the initial 1957 Nevis *Cactoblastis* release, field surveys made in 1959 and 1960 determined the establishment of the moth there, particularly attacking common *Opuntia triacantha.*

Antigua and Montserrat: Infested *Opuntia* pads were introduced in January, 1960 from Nevis to the nearby Leeward Island of Antigua, where the moth had become established by 1962. Infested *Opuntia* pads were taken from Nevis March 4, 1960 to the nearby island of Montserrat, where only two years later the insect was found attacking *Opuntia* in many places of the island.

St. Kitts: Simmonds and Bennett (*8*) state that no records exist of the introduction of *Cactoblastis* to St. Kitts, only four miles from Nevis, but indicated their belief that its arrival there by natural means was imminent. We know now that the moth is present at St. Kitts and in all probability it arrived there by flight.

St. Croix: Simmonds and Bennett[8] referred to the presence of *Cactoblastis* in the U.S. Virgin Islands as follows: "Dr. Philip Dowden, Acting Chief, Insect Investigation and Parasite Introduction Research Branch, U.S. Department of Agriculture, reported in January 1963 that *Cactoblastis* was present in the U.S. Virgin Islands. Apparently it was not introduced officially into this area. It is more probable that it was introduced by an interested land-owner rather than by the flight of the moths".

García-Tudurí and Martorell went to St. Croix on April 4–5, 1966 primarily to study the ecology and distribution of the arboreal termites of the genus *Nasutitermes* on that Island. They observed the presence of *Cactoblastis* attacking extensive patches of *Opuntia dillenii* the first day there while travelling through the extreme eastern end of the island. On asking personnel of the local Experiment Station, they were informed that the moth was introduced to St. Croix, but no official records exist of such introduction. We believe the moth arrived on St. Croix by flight and in the last few years has become so distributed through the entire chain of islands north and west of St. Croix.

St. Thomas and St. John: García-Tuduri and Martorell visited St.

[8] Simmonds, F. J. and Bennett, F. D., Biological Control of *Opuntia* spp. by *Cactoblastis cactorum* in the Leeward Islands (West Indies), *Entomophaga 11*(2): 183–189, 1966.

Thomas on April 1966 and August 1969. During the field surveys conducted there it was determined that *Cactoblastis* was attacking *Opuntia dillenii* in many shore areas there.

Smaller Islands near Puerto Rico: It has been determined subsequent to 1966 that *Cactoblastis cactorum* occurs abundantly on the following islands and keys near Puerto Rico: Culebra, Cayo Luis Peña, Cayo Diablo o Isla de Aves, Cayo Ratones, Icacos, Vieques, Palomino, Piñero, Caja de Muertos, Mona and Desecheo. The common host of *Cactoblastis* on these smaller islands and keys is the also abundant *Opuntia dillenii*, although occasionally it occurs on *Consolea rubescens* (= *Opuntia rubescens*).

During visits made to Desecheo in 1966 and 1968, however, the predator was found attacking *Opuntia dillenii*, (fig. 1, C) *O. triacantha* and *Consolea moniliformis* (= *Opuntia moniliformis*). The last-named species has been recorded only from Desecheo and Hispaniola. It is a very common cactus at Desecheo.

Puerto Rico: This insect species attacks several species of cacti in the Island, namely: *Opuntia dillenii*, *O. antillana*, *O. repens* and *O. ficus-indica*. Its range extends from the area of Salinas westward to Guánica State Forest and up to Cabo Rojo on the extreme southwestern corner. *Opuntia dillenii*, being very common, is its preferred host.

It now has been established that *Cactoblastis cactorum* is present in Puerto Rico, its nearby smaller islands and keys, and at the U.S. Virgin Islands, on the following host plants: *O. dillenii*, *O. antillana*, *O. repens*, *O. triacantha O. ficus-indica*, *Consolea rubescens* and *Consolea moniliformis*.

Conclusions: We believe *Cactoblastis* has been distributed naturally by flight from the islands of Nevis, Antigua and Monserrat since it was introduced to these islands. A similar case occurred in the Hawaiian Islands when *Cactoblastis* was released on the island of Hawaii on April 1950, and subsequently was found[9] along the Hawaiian Island chain: Lanai May 20, 1954; Maui, June 6, 1954; Oahu, September 10, 1954; Molokai, October 28, 1954; Niihau, June 10, 1957 and Kauai, September 1957. The moth thus spread through the islands, apparently by flight, in a period of 7 years.

José C. García Tudurí
Luis F. Martorell
Silverio Medina Gaud
Department of Entomology and Nematology

[9] Davis, C. J., Personal communication to Mr. John Mann, Director, Biological Section, Alan Fletcher Research Station, 27 Magazine Street, Sherwood, Queensland, Australia (copy sent to Dr. Luis F. Martorell, January 5, 1970).