LABORATORY AND FIELD INFESTATION STUDIES ON MONSTERA TO DETERMINE ITS HOST STATUS IN RELATION TO THE CARIBBEAN FRUIT FLY (DIPTERA: TEPHRITIDAE)

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The monstera or ceriman, *Monstera deliciosa* (Liebm.), is a widely cultivated aroid (Araceae) native to central America (Morton 1987). The fruit are cylindrical stalks 20 to 30 cm long, 5 to 9 cm in diameter with hard green plates covering segments. When ripe, the segments have a juicy pulp with a pineapple flavor (Morton 1987). The fruits have a small gourmet market, and are sometimes shipped from Florida to larger cities around the United States. The Caribbean fruit fly, *Anastrepha suspensa* (Loew), is the main fruit fly of quarantine importance in south Florida where monstera is grown. It has a wide host range (Swanson & Baranowski 1972), but monstera has not been reported as a host.

In 1998 laboratory and field studies were conducted with ripe monstera fruits from a mixed fruit grove in Dade County, Florida. Fruit were collected on July 16, Aug. 18 and Sept. 2, 1998. On each date 15 fruit were brought to the laboratory and divided randomly into 3 groups of 5 fruit. One control group was held without treatment to detect natural infestations. The other 2 groups were placed in cages ($1 \times 1 \times 1$ m) with 5 female and 5 male 10 day old Caribbean fruit flies. One of the treatments had pinholes placed in the fruit to allow flies to attempt to oviposit. For each date five heat-disinfested guavas exposed to an equal number of fruit flies were used as a positive control.

After exposure to fruit flies for 24 h (under conditions of 14/10 h of light/dark conditions) the fruits were removed from the cages and held three to four weeks (at about 25°C). Any emerging larvae or pupae were collected and counted.

Field tests were conducted in the mixed fruit grove on July 16, Aug. 18 and Sept. 2, 1998. Five monstera fruits were bagged on the plant individually with five female fruit flies for 24 h. A control group of four guavas was placed on the monstera plant in bags with five female fruit flies for 24 h to ensure that the flies were capable of laying eggs.

Fruit were placed in perforated plastic bags (45×45 cm) (Delnet pollination bag, Applied Extrusion Technologies, Inc., Middletown, DE) with water soaked cotton and a sugar cube. The bag was secured to the plant with wire ties. All fruit were taken to the laboratory where size and weight were recorded.

Four McPhail traps were placed in the grove and monitored for flies each week that the grove was sampled for fruits.

A total of 44 monstera weighing 23 kg were used. They weighed 523.1 ± 15.8 g and were 26.4 ± 3.3 cm long and 5.9 ± 0.6 cm in diameter.

No insects were recovered from any of the monstera fruits collected, therefore there was no natural infestation in the field. All of the control guavas had fruit fly larvae present (224.3 ± 163.3 larvae per 4 guavas). None of the treated fruit exposed to fruit flies in the laboratory had any fruit fly larvae.

No larvae were recovered from any of the monstera fruits bagged with fruit fly adults in the field. All of the guava control fruits were heavily infested (124.7 ± 46.4 larvae per 4 guavas). Caribbean fruit flies were present in the fruit grove used for the experiments (adults were trapped in McPhail traps), and guavas in the grove were so highly infested that the grower had abandoned commercial production of guavas.

Monstera are harvested in the summer and early fall in South Florida, so the tests in this study covered the fruiting season. Fruit fly populations were high in the grove and the flies in the field tests produced hundreds of larvae in the control guavas.

There are no reports of any fruit flies attacking monstera or any Araceae (Aluja et al. 1987; Norrbom & Kim 1988; White & Elson-Harris 1992). Morton (1987) states that unripe monstera contains oxalic acid, and are considered toxic to humans, causing oral and dermal irritation. Howard & Kenny (1987) found that cultivars of carambola with high levels of oxalic acid were poor hosts to the Caribbean fruit fly.

SUMMARY

Based on the protocol of Cowley et al. (1992) and the tests conducted, I conclude that Monstera is not a host to the Caribbean fruit fly and presents no risk of transporting *A. suspensa* to other states from Florida.

REFERENCES CITED

ALUJA, M., J. GUILLEN, G. DE LA ROSA, M. CABRERA, H. CELEDONIO, P. LIEDO, AND J. HENDRICHS. 1987. Natural host plant survey of the economically important fruit flies (Diptera: Tephritidae) of Chiapas, Mexico. Florida Entomol. 70: 329-338.

COWLEY, J. M., R. T. BAKER, AND D. S. HARTE. 1992. Definition and determination of host status for multivoltine fruit fly (Diptera: Tephritidae) species. J. Econ. Entomol. 85: 312-317.

HOWARD, D. F. AND P. KENNY. 1987. Infestation of carambolas by laboratory-reared Caribbean fruit flies (Diptera: Tephritidae): effects of fruit ripeness and cultivar. J. Econ. Entomol. 80: 407-410.

MORTON, J. F. 1987. Fruits of warm climates. Published by J. F. Morton, Miami, FL. 505 pp.

NORRBOM, A. L., AND K. C. KIM. 1988. A list of the reported host plants of the species of *Anastrepha* (Diptera: Tephritidae). APHIS 81-52.

SWANSON, R. W., AND R. M. BARANOWSKI. 1972. Host range and infestation by the Caribbean fruit fly,*Anastrepha suspensa* (Diptera: Tephritidae), in south Florida. Proc. Florida State Hort. Soc. 85: 271-274.

WHITE, I. M., AND M. M. ELSON-HARRIS. 1992. Fruit flies of economic significance: Their identification and bionomics. C.A.B. International, Wallingford, UK. 601 pp.