

Mexican Fruit Fly, *Anastrepha ludens* (Loew)(Diptera: Tephritidae), Addendum to the Bibliography 1986-1999

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ABSTRACT

The Mexican fruit fly is a major pest of tropical fruits including citrus and mangoes. Consequently it is a subject of active research with an extensive but scattered literature. The most recent bibliography, published in 1986, contained 205 citations. An update to this bibliography, covering the period 1986 to 1999, includes an additional 171 citations.

RESUMEN

La mosca mexicana de la fruta es una de las plagas más importantes de frutos tropicales dentro de los que se incluyen los cítricos y los mangos. Debido a esto, esta plaga se esta estudiando constantemente con la consecuente producción de una vasta pero dispersa literatura. La bibliografía más reciente, publicada en 1986, incluyó 205 citas. Una actualización de esta bibliografía, que cubre el período 1986-1999, incluye 171 citas adicionales.

Additional index words: citrus, quarantine, eradication, Rio Grande Valley.

The Mexican fruit fly, *Anastrepha ludens* (Loew), is a major quarantine pest which has been a recurrent problem for growers of citrus in the Rio Grande Valley of Texas. It is the target of an intensive suppression program in Texas and California, and an eradication campaign in the fruit producing regions of Mexico. Both countries support active research programs seeking new or enhanced technologies for the control of this pest, the development of disinfestation protocols, and knowledge of its' basic biology. These efforts have been aided by a Mexican fruit fly bibliography compiled by Holler & Calkins (1986) which included 205 citations covering nearly a century of published articles beginning with the first report of the "Morelos Orange fruit worm" as an economic pest by Howard (1888), to the proposed control of the Mexfly with the sterile insect technique by Holler et al. (1984).

The present addendum to the bibliography covers the 14 year period from 1986 through the end of the millenium, December 1999, and contains over 170 additional references. The increase in the rate of publication is testament to the importance of this quarantine pest to North American agriculture in the modern era. The bulk of this published research has emanated from three laboratories. Martin Aluja and associates based at the Instituto de Ecologia in Xalapa, Veracruz have actively pursued investigations in the areas of comparative ecology, host plant relationships, behavior, and natural enemies of the various pest species of *Anastrepha* including *A. ludens*. In support of the Mexican national campaign against fruit flies entomologists attached to the sterile fruit fly production program in Tapachula, Chiapas have

concentrated their efforts on improving diet, rearing methods, and the demographics of mass production.

The bulk of the research published in the last 14 years, however, nearly half of the total citations, was produced by the USDA-ARS Fruit Insect and Crop Quality research unit located in Weslaco, Texas. Here the emphasis has been on the development of attractants, quarantine treatments, novel chemical controls, and technologies in support of the Texas eradication program.

Consumer demand for tropical fruit has provided the impetus for much of this research. Concerns about health and the environment have brought pressure for reduction in the use of pesticides. Novel chemicals from natural (bacterial) sources or photoactive dyes with very low persistence in nature, and novel delivery systems such as bait stations, show promise as alternatives to broadcast insecticides (Mangan & Moreno 1995). Non-chemical treatments such as heat, radiation, and controlled atmospheres have proven to be at least as efficacious as methyl bromide for disinfesting fruit post-harvest (Shellie et al. 1997, Mangan & Hallman 1998, Hallman 1999). Yet, many problems remain to be solved. As pest management programs shift from control to eradication and the maintenance of fly-free zones the lack of an efficient trap has emerged as a glaring weakness. Lures much superior to the traditional torula yeast slurry are available (Robacker & Warfield 1993) but have not yet been tested in survey and detection programs beyond an experimental basis. Substantial changes in our approach to the Mexican fruit fly problem are clearly in the offing for the new millenium.

The format for citation follows that used by Holler & Calkins (1986) who followed that used by the Bulletin of the Entomological Society of America. I have sought to include all articles published in scientific journals but not those in newspapers, magazines or lay periodicals. Book chapters are included if the subject matter deals primarily with the Mexfly or species of *Anastrepha* including *A. ludens*. Otherwise, no effort was made to include all incidental references to the Mexfly. Likewise, abstracts, theses and unpublished technical reports are not included.

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The Mexican fruit fly also known as *Anastrepha ludens* is a species of fly of the *Anastrepha* genus in the Tephritidae family (fruit flies). It is closely related to the Caribbean fruit fly *Anastrepha suspensa*, and the papay fruit fly *Anastrepha curvicauda*. *A. ludens* is native to Mexico and Central America and is a major pest to citrus and mango agriculture in Mexico, Central America, and the lower Rio Grande Valley. The species exhibits high fecundity and relatively long lifespans compared to other