

# Pest Alert

DACS-P-01677

Pest Alert created 12-December-2005

**Florida Department of Agriculture and Consumer Services, Division of Plant Industry**  
**Charles H. Bronson, Commissioner of Agriculture**

---

## ***Zaprionus indianus* Gupta (Diptera: Drosophilidae), A Genus and Species New to Florida and North America**

**Gary J. Steck**, Gary.Steck@FreshFromFlorida.com, Taxonomic Entomologist, Florida Department of Agriculture and Consumer Services, Division of Plant Industry

**INTRODUCTION:** On 26 July 2005, Division of Plant Industry entomologist Ken Hibbard collected fruits of longan, *Dimocarpus longan* Lour. and Barbados cherry, *Malpighia emarginata* Sessé & Moc. ex DC., as part of a survey of fruit fly hosts in Central Florida. From these samples he reared adults of an unusual drosophilid fly. As nothing remotely similar was known from Florida, the specimens were sent to Dr. Carlos Ribeiro Vilela, a drosophilid taxonomist at the Universidade de São Paulo, Brazil. He authoritatively identified the fly as *Zaprionus indianus* Gupta. This fly is further unusual among species of the family Drosophilidae in being a serious, primary pest of at least one commercial fruit, figs in Brazil. Generally, drosophilids are sometimes considered nuisance flies - at worst, but are of great importance in genetic studies. It is native to tropical Africa, but has colonized various other areas, including Brazil, where its first appearance in the Western Hemisphere was recorded in 1999 (Vilela 1999).

**DESCRIPTION:** The body color is yellowish, with a pair of very distinctive white stripes dorsally that extend from the antennae to the tip of the thorax, and laterally from the leading edge of the thorax to the wing base. The thoracic white stripes are sandwiched between black stripes of similar width. On the head, the white stripe is bounded by a black stripe medially and the red eye laterally (Fig. 1). Body length is approximately 3.5 mm.

**BIOLOGY:** In laboratory studies (Setta and Carrereto 2005), flies survived up to 150 days, with an average of 82 and 93 days for males and females, respectively. Number of offspring per female averaged 58, with a maximum of 103. Development time from egg to adult was about 19 days. Laboratory flies from which these data were generated had been maintained in culture for several generations, and were reared on *Drosophila* culture media at a constant 25°C. Under natural field conditions, these data could vary markedly. Flies are probably capable of producing numerous generations in a single year. In Florida, flies have been reared in limited studies from fruit taken from the field over a 4-month time span (July-November). *Zaprionus indianus* has been reared together with various species of *Drosophila* from the same fruit samples in Florida, but the extent of its interaction with or possible displacement of native species remains unknown.

**HOSTS:** To date, *Z. indianus* has been reared from the following hosts in Florida: *Annona glabra* (pond apple), *Psidium guajava* (guava), *Psidium cattleianum* (strawberry guava), *Arbutus hexapetalus* (Annonaceae: climbing ilang-ilang), *Malpighia emarginata* (Barbados cherry, acerola), *Dimocarpus longan* (longan), *Anacardium occidentale* (cashew), *Punica granatum* (pomegranate), *Phoenix* sp. (a palm), *Xylocarpus microcarpa* (calamondin) and *Citrus sinensis* (sweet orange). In most cases, fruit from which flies were reared were ripe and damaged and taken off of the ground; however, in the case of *M. emarginata* and *D. longan*, all sampled fruit were ripe and taken directly from the tree, and only a small percentage of them may have been damaged. None of these hosts are native to Florida. In its native Africa, *Z. indianus* is known to infest 73 different kinds of fruit, both native and introduced. In Brazil, the fly has been found in association with a number of commercial fruits, including *Citrus*, but apparently only with damaged fruits.

**ECONOMIC IMPORTANCE:** In parts of the state of São Paulo, Brazil, *Z. indianus* has produced an estimated loss of 50% of the commercial fig production. In figs, flies oviposit in and around the ostiole, where larvae have easy access to the fruit interior (Vilela *et al* 2001). Possibly the fly is unable to act as a primary infester in other types of fruit in which the skin



**Florida Department of Agriculture and Consumer Services**  
**Adam H. Putnam, Commissioner**

is intact. In fact, because of the specific oviposition behavior in figs, one successful control method currently in use is to close the ostiole with a self-stick label previously used to identify the producer (Raga *et al* 2003).

**DISTRIBUTION:** The complex of species to which *Z. indianus* belongs is Afrotropical in origin. The genus *Zaprionus* includes 56 species in total, which are distributed variously in the Afrotropical, Australian, Oriental, and Palearctic regions. *Zaprionus indianus* is the most common member of the genus in Africa, where it has a widespread distribution. It has previously colonized India, some tropical islands of the Indian and Atlantic oceans, Saudia Arabia, widely in Brazil, and Uruguay. The highly polyphagous habits of *Z. indianus* and its history of rapid colonization in South America suggest that this fly will continue to expand its range.

**FLORIDA DISTRIBUTION:** *Zaprionus indianus* presently is known from the following counties, all in southeastern Florida: Broward, Indian River, Martin, Okeechobee, Palm Beach, and St. Lucie; also Leon Co. (van der Linde *et al*, unpublished manuscript).

#### REFERENCES CITED:

- Raga, A., M. F. Souza Filho and M. E. Sato. 2003. *Eficiência de protetores de ostíolo do figo sobre a infestação da mosca Zaprionus indianus* (Gupta) (Diptera: Drosophilidae) no campo. *Arq. Inst. Biol., São Paulo* 70: 287-289.
- Vilela, C. R. 1999. *Is Zaprionus indianus* Gupta 1970 (Diptera, Drosophilidae) currently colonizing the Neotropical region? *Drosophila Information Service* 82: 37-39.
- Vilela, C. R. , E. P. Teixeira and C. P. Stein. 2001. *Mosca-africana-do-figo, Zaprionus indianus* (Diptera: Drosophilidae), pp. 48-52 In E. F. Vilela, R. A. Zucchi, and F. Cantor (eds.), *Histórico e impacto das pragas introduzidas no Brasil*, Holos Editora, Ribeirão Preto, SP Brazil, 173 pp.
- Setta, N. de and C. M. A. Carareto. 2005. *Fitness components of a recently-established population of Zaprionus indianus* (Diptera, Drosophilidae) in Brazil. *Iheringia, Ser. Zool, Porto Alegre* 95: 47-51.
- van der Linde, K., G. J. Steck, K. Hibbard, J. S. Birdsley, L. M. Alonso and D. Houle. *First records of Zaprionus indianus* Gupta, 1970 (Diptera, Drosophilidae), a potential pest species, from Panama and the United States of America. (unpublished manuscript).



Fig. 1. *Zaprionus indianus* Gupta  
Photo credit: G. J. Steck