

A NITIDULID PARASITOID, *Zeteticontus insularis*  
(HOWARD) (HYMENOPTERA:ENCYRTIDAE) PRESENT IN SAO PAULO  
WITH CLARIFICATION ON ITS HOST <sup>1</sup>

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The parasitoid, *Zeteticontus insularis* (Howard) has been reported from as far north as the United States (Florida) to as far south as Argentina (Misiones) and several locations between (WILLIAMS et al., 1984). Eight references delineating known geographic distribution, along with other information on this encyrtid, are cited herein. One unfortunate mistake in the literature is that *Z. insularis* has been called a parasite of fly pupae (SAUER, 1946) and a parasite of the fruit fly, *Anastrepha ludens* (Loew) (KROMBEIN et al., 1979). BENNETT & BARANOWSKI (1981) pointed out that *Z. insularis* was actually collected from mass-collected puparia of the Caribbean fruit fly, *Anastrepha suspensa* (Loew) and not from *A. ludens*, the Mexican fruit fly. This parasite has never been successfully reared from *A. suspensa* or *A. ludens*, although it has been repeatedly reared as a gregarious parasite from the larvae of the nitidulid, *Lobiopa insularis* (Castelnau) (BENNETT & BARANOWSKI, 1981).

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A few reports exist concerning *Z. insularis* from South America; they are Posadas, Misiones, Argentina (DE SANTIS, 1964; PARKER et al., 1953); Nova Teutônia, Santa Catarina (NOYES, 1979); and Campinas, São Paulo (SAUER, 1946; DE SANTIS, 1980).

The first mention of *Z. insularis* in Brazil was by SAUER (1946) from specimens he had collected on *Psidium araca* L. fruit on 15 July 1939. The only other mention of this species in Brazil was a collection made by F. Plauman on 10 October 1935 (NOYES, 1979).

The information on the host(s) of *Z. insularis* in the literature is rather vague: guava infested with *Carpophilus* sp. (SUBBA RAO, 1972), fly parasites as listed above, unidentified Coleoptera in the family Nitidulidae (PARKER et al., 1953), etc. However, the studies by BENNETT & BARANOWSKI (1981) and WILLIAMS et al. (1984) confirm that *Lobiopa insularis* is a known host of *Z. insularis*. There may be additional hosts: a congener, *Zeteticontus utilis* Noyes was reported to successfully parasitize *Carpophilus hemipterus* (L.) and *C. mutilatus* Erichson in laboratory studies (BLUMBERG et al., 1984).

A systematic study of the natural enemies of sap beetles (Nitidulidae) was conducted in the area around Campinas, São Paulo for a period of six months (Dec.-May 1983/84). Every seven to ten days fallen overripe fruits of guava, *Psidium guajava* L., carambola, *Averrhoa carambola* L., figs, *Ficus carica* L. and hog plum or "caja", *Spondias lutea* L., were examined for the presence of natural enemies. Nine observations were made at regular intervals near Limeira, Piracicaba and Valinhos. Before the fruits on the ground were disturbed an aspirator was used to remove any microhymenoptera resting on the fruit. All Hymenoptera observed during the process of examining the fruit were collected. These specimens were labeled and preserved in 70% alcohol. In the laboratory, field collected nitidulid larvae were separated from all other larvae and held in cages for parasite emergence. Any parasites which emerged were also saved in 70% alcohol for determination. All specimens were sent to Dr. LUIZ DE SANTIS of the Facultad de Ciencias Naturales y Museo, La Plata, Argentina. In addition, studies were conducted in the Small Fruit Laboratory, The Ohio State University, Ohio Agricultural Research and Develop

ment Center (OARDC) at Wooster, Ohio, where parasites from nitidulid larvae were allowed to mate and be exposed to other nitidulid larvae to get an idea of host range.

## RESULTS AND DISCUSSION

In the process of surveying the insect fauna from ripe and overripe fruit in the County of Campinas, State of São Paulo, it was determined that our samples consisted primarily of Dipterous larvae and Coleopterous larvae and adults (predominantly Nitidulidae). It is no wonder that *Zeteticontus insularis* has been thought to attack fruit fly larvae since in many cases dipterous larvae outnumber nitidulids on such fruits. Therefore, unless larvae are separated, it is difficult, if not impossible, to determine the host.

Several species of microhymenoptera were sent to Dr. DE SANTIS for identification. It was determined that the predominant species collected at the fruits of hog plum, guava, carambola and fig was an encyrtid wasp, *Zeteticontus insularis*. The parasitoid, *Z. insularis* was encountered in samples from Valinhos, Piracicaba, and Limeira. This species has been extensively studied in the Small Fruit Laboratory at the OARDC. It was found to parasitize *Lobiopa insularis* but did not parasitize sap beetles in the following genera: *Carpophilus*, *Stelidota* and *Haptoncus*. Host suitability studies were not conducted on the genus *Coleopterus*. The major genera encountered in this study in Brazil were: *Carpophilus*, *Lobiopa*, *Haptoncus*, *Coleopterus* and *Stelidota*. Since *Lobiopa* larvae are larger than the other genera and have conspicuous external characteristics, they are easy to identify. When these larvae are parasitized and become mummified, it is easy to observe the cells formed by the parasitoids because they can be seen through the integument and they disfigure the external appearance of the mummy host prior to emergence. We have not seen any evidence of mummies in the other nitidulid genera nor have we seen exit holes typical of *Z. insularis* in any of the other genera.

It is interesting that the only previous collections of *Z. insularis* were made in the 1930's, and in the last 40+ years there has been no mention of them even though

a host, *Lobiopa insularis*, has risen to pest status in recent years (SALLES & WILLIAMS, 1983). Heavy damage to strawberry fruit by *Lobiopa insularis* in Rio Grande do Sul and Louisiana in the southern U.S. (KANTACK, 1956) would lead one to speculate that *Z. insularis* might be a good biological control agent to consider in a management program, perhaps through controlled release of this parasitoid.

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