

SCIENTIFIC COMMUNICATION

PARASITOIDS OF *ZAPRIONUS INDIANUS* GUPTA (DIPTERA: DROSOPHILIDAE) COLLECTED IN ITUMBIARA, GOIÁS, BRAZIL

C.H. Marchiori, S.B. Arantes, L.A. Pereira, O.M. Silva Filho, L.C.S. Ribeiro, V.R. Borges

¹Curso de Biologia do Instituto Luterano de Ensino Superior de Itumbiara–ILES–ULBRA, CP 23T, CEP 75500-000, Itumbiara, GO, Brasil.

ABSTRACT

The study surveyed the occurrence of parasitoids in pupae of *Zaprionus indianus* using traps with fruit baits in an urban area and wood, from March to November 2001, in Itumbiara, Goiás. Three groups of parasitoids were collected: 285 specimens of *Pachycrepoideus vindemiae*, 5 specimens of *Spalangia endius* and 3 specimens of *Leptopilina boucardi*. The rate of parasitism for the three species was 29.5%, 0.5% and 0.3%, respectively.

KEY WORDS: Hymenoptera, Diptera, parasitoids, biocontrol.

RESUMO

PARASITÓIDES DE *ZAPRIONUS INDIANUS* GUPTA (DIPTERA: DROSOPHILIDAE) COLETADOS EM ITUMBIARA, GOIÁS, BRASIL. Este trabalho teve como objetivo relatar a ocorrência de parasitóides em pupas de *Zaprionus indianus* obtidas usando armadilhas contendo frutas como isca, em área urbana e mata, no período de março a novembro de 2001, em Itumbiara, Goiás. Três grupos de parasitóides foram coletados: 285 espécimens de *Pachycrepoideus vindemiae*, 5 espécimens de *Spalangia endius* e 3 espécimens de *Leptopilina boucardi*. A taxa de parasitismo para as três espécies foi de 29,5%, 0,5% and 0,3%, respectivamente.

PALAVRAS-CHAVE: Hymenoptera, Diptera, parasitóides, controle biológico.

The genus *Zaprionus* is made up of by 56 species, and *Zaprionus indianus* Gupta (Diptera: Drosophilidae) seems to be the only species spreading out around the globe, mainly due to the international fruit trading. This Drosophilidae is probably from Africa, where it was registered in fruits of 74 plant species. (VILELA et al., 1999; VILELA et al., 2001).

The first record on the occurrence of this fly in the American continent refers to samples observed in persimmon fruit in Santa Isabel, São Paulo. Its poliphagy and relatively fast development in hot weather environment have contributed to its setting and dispersion. The fig production recorded a loss of 50% in the state of São Paulo due to this fly (TSACAS, 1980; LACHAISE & TSACAS, 1983, VILELA et al., 1999; VILELA et al., 2001).

Pachycrepoideus vindemiae (Rondani) is considered a solitary parasitoid of numerous Diptera from the families Anthomyiidae, Calliphoridae, Muscidae, Tachinidae and Tephritidae, among others (HANSON & GAULD, 1995).

Spalangia endius Walker (Hymenoptera: Pteromalidae) is considered a solitary parasitoid of a great number of Diptera in the families Anthomyiidae,

Calliphoridae, Muscidae, Sarcophagidae and Tephritidae (HANSON & GAULD, 1995).

Species of the genus *Leptopilina*, well-known parasitoids of Drosophilidae, may also be reared commonly from rotting fruit (WHARTON et al., 1998). This article reports the natural occurrence of parasitoids on *Zaprionus indianus* pupae.

This study was conducted at the College of Agronomy (Faculdade de Agronomia) located in Itumbiara County, State of Goias, Central Brazil (18°25'S; 49°13'W), Brazil. Flies were attracted to traps made of dull black tin cans (19 cm tall and 9 cm in diameter) with two blinder-like openings, located at the 1/3rd bottom part to allow flies to entry. A nylon funnel with opened extremities and base turned down was attached to the upper part of each can. These traps were then wrapped with plastic bags, which after removal would allow for the capture of flies and parasitoids. Fruits, deposited on top of a soil layer, were placed as baits inside each can. Five of these traps were randomly hung on *Eucalyptus* sp. trees at 1 m above the soil level, 2 m apart from each other and 50 m away from a domestic garbage deposit. The specimens collected were taken to the laboratory, killed with ethyl ether and stored in 70% ethanol for

further identification. After the removal of the insects, the content of each trap was individually placed into plastic containers layered with sand to serve as substrate for larvae and pupae development. After remaining 15 days in the field these substrata were sifted for extraction of the pupae obtained under natural environment. Pupae were then individually transferred to gelatin capsules (number 00) to obtain flies and/or parasitoids.

The prevalence of parasitism was computed using the following formula: $P = (\text{parasitized pupae} / \text{total of pupae}) \times 100$ (MARGOLIS *et al.*, 1982; BUSH *et al.*, 1997). Dr. Carlos Ribeiro Vilela, from the University of São Paulo, State of São Paulo, identified the Drosophilidae.

During the study, 963 *Z. indianus* pupae were obtained. The parasitoids recovered were 285 specimens of *Pachycrepoideus vindemiae* (Rondani) (Hymenoptera: Pteromalidae), 5 specimens of *Spalangia endius* Walker (Hymenoptera: Pteromalidae) and 3 specimens of *Leptopilina boulandi* Barbotin, Carton & Kelner-Pillaut (Hymenoptera: Figitidae). The rate of parasitism for the three species was 29.5%, 0.5% and 0.3%, respectively, totaling 30.4%. This prevalence was considered high and was probably due to the availability of resources, to the density of hosts and to the capacity of search of parasitoids.

The nature of this relation, however, has to be studied more deeply in order to permit a better evaluation of the impact of these parasitoids on the insect pest population. Since these parasitoids are natural enemies of insect pests, the feasibility of their use as biological control agents on the fig is an encouraging possibility.

REFERENCES

- BUSH, A.O.; LAFFERTY, K.D.; LOTZ, J.M.; SHOSTAK, A.W. Parasitology meets ecology on its own terms: Margolis *et al.* Revisited. *J. Parasitol.*, v.83, n.4, p.575-583, 1997.
- HANSON, P.E. & GAULD, I.D. *The Hymenoptera of Costa Rica*. Oxford: Oxford Univ. Press, 1995. 893p.
- LACHAISE, D. & TSACAS, L. Breeding-sites in tropical african drosophilids. In: ASBURNER, M.; CARSON, H.L.; THOMPSON, J.N.JR. (Eds). *The genetics and biology of Drosophila*. London: Academic Press, 1983. p.221-332.
- MARGOLIS, L.; ESCH, G.W.; HOLMES, J.C.; KURIS, A.M.; SCHAD, G.A. The use of ecological terms in parasitology (report of an ad hoc committee of the American Society of Parasitologists). *J. Parasitol.*, v.68, n.1, p.131-133, 1982.
- TSACAS, L. L'identite de *Zaprionus* Vittiger Coquillett et revision des especes afrotropicalies affines (Diptera: Drosophilidae). *Bull. Soc. Entomol. France*, v.85, p.141-154, 1980.
- VILELA, C.R.; TEIXEIRA, E.P.; STEIN, C.P. Nova praga nos figos: *Zaprionus indianus* Gupta, 1970. *Info. Soc. Entomol. Bras.*, v.4, n.2, p.1-5. 1999.
- VILELA, C.R.; TEIXEIRA, E.P.; STEIN, C.P. Mosca-africana-do figo, *Zaprionus indianus* (Diptera: Drosophilidae). In: VILELA, E.F.; ZUCCHI, R.A.; CANTOR, F. (Eds). *Pragas introduzidas no Brasil*. Ribeirão Preto: Holos, 2001. p.48-52.
- WHARTON, S.M.; OVRUSKI, S.M.; GILTRAP, F.E. Neotropical Eucilidae (Cynipoidea) associated with fruit-infesting Tephritidae, with new records from Argentina, Bolivia and Costa Rica. *J. Hym. Res.*, v.7, p.102-115, 1998.

Received on 21/11/02

Accepted on 7/4/03