

**First report of parasitoid  
*Pachycrepoideus vindemiae* Rondani  
(Hymenoptera: Pteromalidae) in pupae  
of *Zaprionus indianus* Gupta (Diptera:  
Drosophilidae) in Brazil**

**Carlos H. Marchiori**

Instituto Luterano de Ensino Superior de Itumbiara – ILES -ULBRA – Caixa Postal 23T  
CEP 75.500-000 – Itumbiara – GO

Aceito para publicação em 28/01/2003

**Abstract**

This paper reports the first occurrence of the parasitoid *Pachycrepoideus vindemiae* Rondani (Hymenoptera: Pteromalidae) found in pupae of *Zaprionus indianus* using traps with fruit baits in an urban area. The experiments were conducted “Faculdade de Agronomia” in Itumbiara, Goiás, Brazil, from March to November of 2001. A total of 285 *Pachycrepoideus vindemiae* specimens was obtained from 963 *Zaprionus indianus* Gupta (Diptera: Drosophilidae) pupae. The prevalence of parasitism was of 13.8%.

**Key words:** Hymenoptera, Diptera, biocontrol, natural enemy.

**Resumo**

Este trabalho relata a primeira ocorrência do parasitóide *Pachycrepoideus vindemiae* Rondani (Hymenoptera:

Pteromalidae) em pupas de *Zaprionus indianus* Gupta (Diptera: Drosophilidae) obtidas usando armadilhas contendo isca frutas, em área urbana. O experimento foi realizado na Faculdade de Agronomia em Itumbiara, Goiás, Brasil, no período de março a novembro de 2001. Foram coletados 285 espécimes de *Pachycrepoideus vindemiae* em 963 pupas de *Zaprionus indianus*. A prevalência de parasitismo foi de 13,8%.

**Unitermos:** Hymenoptera, Diptera, controle biológico, inimigo natural.

The family Drosophilidae is large, with about 60 genera containing nearly 3000 described species. Many genera present geographic distribution limited to the tropical regions of the world. Larvae of most species feed on microorganism in spoiled fruits, slime fluxes, fungi, rotting cacti, or other decaying organic matter (Mcalpine, 1985).

The genus *Zaprionus* is compounded 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 of species. The first record published on the occurrence of this fly in the American continent some references on samples observed in persimmon fruit in Santa Isabel, São Paulo. Its poliphagy and relatively fast development in hot weather environment have contributed for its setting and dispersion through this. The fig production recorded a loss of 50% in the state of São Paulo due to this fly (Tsacas, 1980; Lachaise and Tsacas, 1983, Vilela et al., 1999; Vilela et al., 2001).

The Pteromalidae is cosmopolitan in distribution and is one of the largest families of Chalcidoidea, containing 3000 recognized species belonging to nearly 600 genera. The Pteromalidae hosts are diversified and members of many other insects orders such as Hemiptera, Neuroptera, Coleoptera, Lepidoptera, Diptera,

Siphonaptera, Hymenoptera and Dermaptera. They attack eggs, larvae, pupae and more rarely, adults. It seems that the main contribution of pteromalids is their control on flies, especially the housefly and the stable fly (Hanson and Gauld, 1995).

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

The objective of this article is report the first occurrence of the parasitoid *Pachycrepoideus vindemiae* parasitizing pupae *Zaprionus indianus* in Brazil.

This study was conducted from March to November of 2001 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 foil cans (19 cm tall and 9 cm in diameter) with two blinders-like openings, located at the 1/3<sup>rd</sup> bottom part to allow flies entry. To the upper part of each can a nylon funnel with opened extremities and base turned down was attached. These traps were then wrapped with plastic bags, which after removal would allow the capture of flies and parasitoids. Fruits (divided banana, apple and pear) were replaced weekly and 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 removal of 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 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.

Between March to November of 2001, 285 specimens of *P. vindemiae* were obtained from 963 pupae of *Z. indianus*, representing 13.8% of parasitism. This prevalence was considered high and was probably due to the availability of recourses, to the density of hosts, and to the capacity of search of parasitoids.

The use of some insecticides to control this fly may result in high production costs, making it difficult the fruits exportation, causing damages to the environment and to human health as well. So, search for effective natural enemies may be a viable alternative to control this pest in a long-term control program.

This is the first report of *P. vindemiae* parasitizing pupae of *Z. indianus* in Brazil.

## References

- Bush, A. O.; Lafferty, K. D.; Lotz, J. M.; Shostak, A. W. 1997. Parasitology meets ecology on its own terms: Margolis et al. Revisited. **Journal of Parasitology**, **83** (4): 575-583.
- Hanson, P. E.; Gauld, I. D. 1995. **The Hymenoptera of Costa Rica**. Univ. Press, Oxford, 893 pp.
- Lachaise, D.; Tsacas, L. 1983. Breeding sites in tropical african drosophilids. In: Asburner, M.; Carson, H. L. & Thompson, J. N. Jr. (eds). **The genetics and biology of Drosophila**. Academic Press, London, p. 221-332.

Margolis, L.; Esch, G. W.; Holmes, J. C.; Kuris, A. M.; Schad, G. A. 1982. The use of ecological terms in parasitology (report of an ad hoc committee of the American Society of Parasitologists). **Journal of Parasitology**, **68** (1): 131-133.

**Mcalpine, J. E. 1985.** Manual of Nearctic Diptera. **Research Branche Agriculture Canada, Quebec, 1332 pp.**

Tsacas, L. 1980. L'identite de *Zaprionus* Vittiger Coquillett et revision des especes afrotropicales affines (Diptera: Drosophiidae). **Bulletin de la Societe Entomologique de France**, **85**: 141-154.

Vilela, C. R.; Teixeira, E. P.; Stein, C. P. 1999. Nova praga nos figos: *Zaprionus indianus* Gupta, 1970. **Informativo da Sociedade Entomológica do Brasil**, **4** (2): 1-5.

Vilela, C. R.; Teixeira, E. P.; Stein, C. P. 2001. Mosca-africana-do figo, *Zaprionus indianus* (Diptera: Drosophilidae). In: Vilela, E. F.; Zucchi, R. A. & Cantor, F. (eds). **Pragas introduzidas**. Holos, Ribeirão Preto, p. 48-52.