

New Record of *Trichospilus diatraeae* as a Parasitoid of the Eucalypt Defoliator *Thyriniteina arnobia* in Brazil

F.F. Pereira,¹ J.C. Zanuncio,^{1,*} M.T. Tavares,² P.L. Pastori,¹
G.C. Jacques¹ and E.F. Vilela¹

This is the first report of *Trichospilus diatraeae* Cherian & Margabandhu, 1942 (Hymenoptera: Eulophidae) parasitizing pupae of the eucalypt defoliator *Thyriniteina arnobia* (Stoll, 1782) (Lepidoptera: Geometridae). Parasitized pupae of this insect were collected in the field in Brazil. In view of this finding, the potential of this parasitoid for biological control of *T. arnobia* in eucalypt plantations in Brazil should be investigated.

KEY WORDS: Biological control; Lepidoptera defoliator; parasitized pupae.

Eulophidae species are parasitoids (1) or hyperparasitoids (6) and *Trichospilus* Ferrière is a small genus of this family, with eight species (2-4,15). Members of this genus are gregarious parasitoids, mainly of Lepidoptera pupae (7,9). *Trichospilus boops* Bouček, *Trichospilus ferrierei* Bouček and *Trichospilus vorax* Bouček were reported from Africa. *Trichospilus lutelineatus* (Liao) was recorded for Zhejiang, China (2). *Trichospilus striatus* Ubaidillah and *Trichospilus politus* Ubaidillah were described from Java and Sulawesi, Indonesia (13). *Trichospilus pupivorus* Ferrière was found in the New World tropics (1). *Trichospilus diatraeae* Cherian and Magabandhu was described based on individuals emerged from *Diatraea venosata* (Walker) (Lepidoptera: Crambidae) pupae collected in the south of India (3).

Both *T. pupivorus* and *T. diatraeae* have been used successfully for biological control of pests of sugar cane, corn and cotton in tropical Africa, Asia and America (2). *T. diatraeae* was introduced from India to Trinidad and Tobago (Antilles) in 1963 for laboratory tests with *Diatraea* spp. (Lepidoptera: Crambidae) as host (1). This parasitoid was reared from *Spodoptera*

frugiperda (J.E. Smith) (Lepidoptera: Noctuidae) collected in a corn plantation in 1984 in Trinidad and Tobago which may have resulted from a laboratory escape (2). *T. diatraeae* was also released in other areas of the Caribbean, notably Barbados, for control of Lepidoptera pests (1). It was first recorded in Brazil as a parasitoid of an unidentified Arctiidae (Lepidoptera) and of *Chlosyne lacinia saundersii* (L.) (Lepidoptera: Nymphalidae) pupae in Piracicaba, São Paulo State (7,9). It is not known how this parasitoid entered Brazil, but it is likely to have been accidentally.

Thyriniteina arnobia (Stoll) (Lepidoptera: Geometridae) is the main Lepidoptera eucalypt defoliator in Brazil (5,14). This species has been reared in environmental conditions on plants of *Eucalyptus cloeziana* (8) in the experimental area of the Laboratory of Forest Entomology of the Federal University of Viçosa in Viçosa, Minas Gerais State (20°45'S, 42°51'W, 651 m alt). Pupae of *T. arnobia* obtained from this rearing facility were conditioned in plastic pots at 25±2°C, 60±10% r.h. and 14:10 h L:D. Several individuals of a parasitoid species emerged from one of these pupae after 15 days and they were

Received Oct. 28, 2007; accepted Feb. 6, 2008; <http://www.phytoparasitica.org> posting June 12, 2008.

¹Depto. de Biologia Animal, Universidade Federal de Viçosa, 36.571-000, Viçosa, Minas Gerais State, Brazil.
*Corresponding author [e-mail: zanuncio@ufv.br].

²Depto. de Ciências Biológicas, Universidade Federal de Espírito Santo, 29.040-090, Vitória, Espírito Santo State, Brazil.

transferred to a glass chamber (2.2 cm diam x 14.0 cm height), covered with woven organza, with a drop of pure honey for adult feeding (10,12) and with 24–72-h-old *T. arnobia* pupae. Specimens of this parasitoid were removed from the tubes after 24 h and introduced into glass chambers, fixed in 70% alcohol and sent to Dr. Marcelo Teixeira Tavares (Dept. of Biological Sciences, Federal University of Espírito Santo, Vitória, Espírito Santo State, Brazil) for identification and deposit of vouchers.

The parasitoid was identified as *Trichospilus diatraeae* Cherian & Margabandhu (Hy-

menoptera: Eulophidae) (Fig. 1). This is the first report of this species parasitizing *T. arnobia* pupae in natural conditions in Brazil. *T. diatraeae* is a polyphagous parasitoid and its hosts include several species of Lepidoptera of at least four families (Crambidae, Noctuidae, Arctiidae and Nymphalidae) (1-3,7,9). Our finding increases the host range of *T. diatraeae* to a new species (*T. arnobia*) of a new family (Lepidoptera: Geometridae), and widening perspectives for research aiming to determine the potential of *T. diatraeae* for the biological control of the eucalypt defoliator *T. arnobia*.

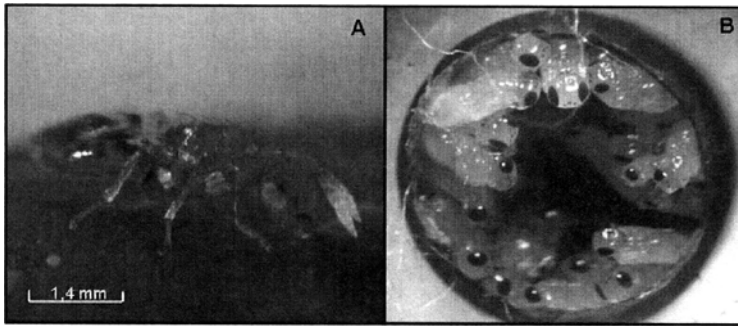


Fig. 1. Female of *Trichospilus diatraeae* (Hymenoptera: Eulophidae) (A) and pupa of this parasitoid inside a *Thyrinteina arnobia* (Lepidoptera: Geometridae) pupa (B).

REFERENCES

1. Bennett, F.D., Glenn, H., Yaseen, M. and Baranowski, R.M. (1987) Records of *Trichospilus diatraeae*, an Asian parasite (Hymenoptera: Eulophidae) from the Caribbean and Florida. *Fla. Entomol.* 70:184-186.
2. Bouček, Z. (1976) The African and Asiatic species of *Trichospilus* and *Cotterellia* (Hymenoptera, Eulophidae). *Bull. Entomol. Res.* 65:669-681.
3. Cherian, M.C. and Margabandhu, V. (1942) A new species of *Trichospilus* (Hym.: Chalcidoidea) from South India. *Indian J. Entomol.* 4:101-102.
4. Ferrière, C. (1930) Notes on Asiatic Chalcidoidea. *Bull. Entomol. Res.* 21:353-360.
5. Freitas, F.A., Zanuncio, T.V., Zanuncio, J.C., Conceição, P.M., Fialho, M.C.Q. and Bernardino, A.S. (2005) Effect of plant age, temperature and rainfall on Lepidoptera insect pests collected with light traps in a *Eucalyptus grandis* plantation in the State of Minas Gerais, Brazil. *Ann. For. Sci.* 62:85-90.
6. Lioni, A.S.R. and Cividanes, F.J. (2004) Ecological life table of the citrus leafminer, *Phyllocnistis citrella* Stainton (Lepidoptera: Gracillariidae). *Neotrop. Entomol.* 33:407-415.
7. Noyes, J. (2003) Universal Chalcidoidea Database. <http://www.nhm.ac.uk/research-curation/projects/chalcids/>
8. Oliveira, H.N., Zanuncio, J.C., Pedruzzi, E.P. and Espíndula, M.C. (2005) Rearing of *Thyrinteina arnobia* (Lepidoptera: Geometridae) on guava and eucalyptus in laboratory. *Braz. Arch. Biol. Technol.* 48:801-806.
9. Paron, M.R. and Berti-Filho, E. (2000) Capacidade reprodutiva de *Trichospilus diatraeae* (Hymenoptera: Eulophidae) em pupas de diferentes hospedeiros (Lepidoptera). *Sci. Agric.* 57:355-358.
10. Pastori, P.L., Monteiro, L.B., Botton, M. and Pratisoli, D. (2007) Capacidade de parasitismo de *Trichogramma pretiosum* Riley (Hymenoptera: Trichogrammatidae) em ovos de *Bonagota salubricola* (Meyrick) (Lepidoptera: Tortricidae) sob diferentes temperaturas. *Neotrop. Entomol.* 36:926-931.

11. Santos, H.J.G., Marques, E.J., Barros, R. and Gondim, M.G.C. (2006) Interaction of *Metarhizium anisopliae* (Metsch.) Sorok., *Beauveria bassiana* (Bals.) Vuill. and the parasitoid *Oomyzus sokolowskii* (Kurdjumov) (Hymenoptera: Eulophidae) with larvae of diamondback moth, *Plutella xylostella* (L.) (Lepidoptera: Plutellidae). *Neotrop. Entomol.* 35:241-245.
12. Soares, M.A., Leite, G.L.D., Zanuncio, J.C., Rocha, S.L., Sá, V.G.M. and Serrão, J.E. (2007) Flight capacity, parasitism and emergence of six *Trichogramma* (Hymenoptera: Trichogrammatidae) species from forest areas in Brazil. *Phytoparasitica* 35:314-318.
13. Ubaidilla, H.R. (2006) Eulophine parasitoids of the genus *Trichospilus* in Indonesia, with the description of two new species (Hymenoptera: Eulophidae). *Entomol. Sci.* 9:217-222.
14. Zanuncio, J.C., Zanuncio, T.V., Freitas, F.A. and Pratisoli, D. (2003) Population density of Lepidoptera in a plantation of *Eucalyptus urophylla* in the State of Minas Gerais, Brazil. *Ann. Biol.* 53:17-26.
15. Zhu, C.D., Lasalle, J. and Huang, D.W. (2002) A study of Chinese *Cirrospilus* Westwood (Hymenoptera: Eulophidae). *Zool. Stud.* 41:23-46.