



## SHORT COMMUNICATION

# ***Parastethorus histrio* (Chazeau) (Coleoptera: Coccinellidae) predator of the red mite *Oligonychus yothersi* (McGregor) (Acari: Tetranychidae), on Paraguay tea (*Ilex paraguariensis* A.St.Hil.) in Brazil**

Luis Francisco Angeli Alves<sup>1\*</sup> and Daian Guilherme Pinto de Oliveira<sup>2</sup>

Received: March 18 2009

Received after revision: April 09 2009

Accepted: April 23 2009

Available online at <http://www.ufrgs.br/seerbio/ojs/index.php/rbb/article/view/1189>

**ABSTRACT:** (*Parastethorus histrio* (Chazeau) (Coleoptera: Coccinellidae) predator of the red mite *Oligonychus yothersi* (McGregor) (Acari: Tetranychidae), on Paraguay tea (*Ilex paraguariensis* A.St.Hil.) in Brazil). This is the first record of *Parastethorus histrio* (Chazeau), feeding on eggs, nymphs and adults of the red mite *Oligonychus yothersi* (McGregor), on Paraguay tea (*Ilex paraguariensis* A.St.Hil.) in Brazil.

**Key words:** red mite, biological control, diversity.

**RESUMO:** (*Parastethorus histrio* (Chazeau) (Coleoptera: Coccinellidae) predador do ácaro-vermelho *Oligonychus yothersi* (McGregor) (Acari: Tetranychidae), em erva-mate (*Ilex paraguariensis* A.St.Hil.), no Brasil). Este trabalho tem por objetivo registrar, pela primeira vez no Brasil, o predador *Parastethorus histrio* (Chazeau), alimentando-se de ovos, ninfas e adultos do ácaro-vermelho *Oligonychus yothersi* (McGregor), em plantas de erva-mate (*Ilex paraguariensis* A.St.Hil.).

**Palavras-chave:** ácaro-vermelho, controle biológico, diversidade.

## INTRODUCTION

Paraguay tea, *Ilex paraguariensis* A.St.Hil. (Aquifoliaceae), which is commercially cultivated in monocultures in South America, is susceptible to several pests, especially the borer (*Hedypathes betulinus* Klug), psyllid (*Gyropsylla spegazziniana* Lizer & Trelles), the complex of Eryophiidae mites, and the red mite known as *Oligonychus yothersi* McGregor (Penteado 1995, Borges *et al.* 2003, Ferla *et al.* 2005).

*Oligonychus yothersi* occurs from the United States to Argentina, and is also a pest of avocado, mango, and eucalyptus (Moraes & Flechtmann 2008). It causes direct damage to the plants by first attacking a specific region of the monoculture and then, depending on environmental conditions, it can spread throughout the crop, causing deformations on the edges of leaves and leaf shriveling. As a consequence the leaves prematurely drop and severe defoliation can occur during a heavy infestation or drought (Alves *et al.* 2004).

The control of *O. yothersi*, as well as all pests of Paraguay tea, is hampered by the absence of commercial pesticides for this crop (Agrofit 2008). However, because it is a perennial plant, it has a lot of natural enemies, which makes biological control a viable option that could minimize the damage caused by these pests. Studies have shown that, in Paraguay tea, the red mite is a natural target of predatory mites (Ferla *et al.* 2005, Gouvea *et al.* 2006). Many of the coccinellids are also predators of mites, and according to Prado (1991) species of the genus *Stethorus*

Weise (Coleoptera: Coccinellidae) are specialized predators of mites in the family Tetranychidae, for example, *Panonychus ulmi* (Koch, 1836), *Panonychus citri* (McGregor, 1916), *Tetranychus urticae* (Koch, 1836), *Brevipalpus chilensis* (Baker, 1949), and *O. vitis* (Zah.-Shen, 1965).

Moreover, *Parastethorus histrio* (Chazeau, 1974), originally described in the genus *Stethorus* (Weise, 1885), has been reported to prey on *Oligonychus* sp. in trees of *Pinus* sp. in Australia (Houston 1980), and also specifically on *O. yothersi* in Chile (Prado 1991).

*Parastethorus histrio* was thought to be endemic to the Mascarene Islands (in the Indian Ocean), Australia, New Zealand, and New Caledonia. However, Gordon & Anderson (1979) found it in Chile feeding on mites of citrus, and it has been subsequently reported to occur in many regions of the Western Hemisphere, including the United States (Pollock & Michels 2003), several locations in Chile (Aguilera 1987, Prado 1991), the central coast of Peru (Guanilo & Martinez 2007), and Mexico.

The purpose of this paper is to report, for the first time, the occurrence of *P. histrio* preying on *O. yothersi*, in all of its developmental stages, on a crop of Paraguay tea in Brazil.

## MATERIAL AND METHODS

In March 2001, the presence of coccinellids larvae and adults was observed while sampling leaves in a commercial plantation of Paraguay tea

1. Universidade Estadual do Oeste do Paraná, Centro de Ciências Biológica e da Saúde, Laboratório de Zoologia de Invertebrados. Rua Universitária, 2069, CEP 85819-110, Cascavel, PR, Brazil. Productivity Grant (CNPq).

2. Universidade de São Paulo, Escola Superior de Agricultura Luiz de Queiroz, Departamento de Entomologia, Fitopatologia e Zoologia Agrícola, Caixa Postal 9, Piracicaba, SP, Brazil.

\* Author for correspondence. E-mail: lfaalves@unioeste.br

(*Ilex paraguariensis*) in Cascavel, Paraná, Brazil, (24°57'26.09"S, 53°24'17.67"W), during an investigation involving the population fluctuation of phytophagous mites. Some individuals were captured, packaged in bottles in a solution of 70% alcohol, and sent to the Zoology Department at the Federal University of Paraná (UFPR). These individuals were identified as *Parastethorus histrio*.

Subsequently, larvae and adults of the predator were transferred to Paraguay tea leaves containing only eggs, nymphs, or adults of the red mite. The leaves were placed on moistened cotton in open plastic containers and kept under incubation in a chamber (25±2°C, 14 hours of photophase), according to Oliveira *et al.* (2001). The feeding behavior of larvae and adults of the predator was observed daily, over a period of 15 days.

## RESULTS AND DISCUSSION

Intense activity was observed, both of larvae and adults, of the predator feeding intently on the mites during all of its stages of development. In addition, in field conditions, there was a higher incidence of *P. histrio* when the population of the red mite was the highest, corroborating information from Chazeau (1985).

Thus, the predator *P. histrio* has potential as a natural biological control of red mite feeding on Paraguay tea, suggesting the need for a detailed study that incorporates this biological control into a management program for this pest and plant, which is already being done for avocados in Chile (Vera 1994, Darrow 2000).

## ACKNOWLEDGMENTS

We thank Dr. Lucia de Almeida Massutti (Zoology Dept./UFPR) for the identification of the insect; Dr. Amarildo Pasini, State University of Londrina (UEL), for revising the manuscript and presenting suggestions; CNPq for granting scholarships for Produtividade and Iniciação Científica; and Fundação Araucária for the financial support to research Paraguay tea.

## REFERENCES

- AGROFIT. 2008. Sistemas de Agrotóxicos Fitossanitários. In: Ministério da Agricultura, Pecuária e Abastecimento - Coordenação-Geral de Agrotóxicos e Afins/DFIA/DAS. Available in: <[http://extranet.agricultura.gov.br/agrofit\\_cons/principal\\_agrofit\\_cons](http://extranet.agricultura.gov.br/agrofit_cons/principal_agrofit_cons)>. Accessed in: August 20, 2008.
- AGUILERA, A. 1987. Nuevas localidades para *Stethorus histrio* Chazeau (Coleoptera: Coccinellidae) en Chile. *Revista Chilena de Entomología*, 15: 33-36.
- ALVES, L. F. A., SPONGOSKI, S., VIEIRA, F. N. S. & MORAES, G. J. 2004. Biología e danos de *Oligonychus yothersi* (McGregor) (Acari: Tetranychidae) em *Ilex paraguariensis*. *Arquivos do Instituto Biológico*, 71: 211-214.
- BORGES, L. R., LÁZZARI, S. M. N. & LÁZZARI, F. A. 2003. Comparação dos sistemas de cultivo nativo e adensado de erva mate, *Ilex paraguariensis* St. Hil., quanto à ocorrência e flutuação populacional de insetos. *Revista Brasileira de Entomologia*, 47: 563-568.
- CHAZEAU, J. 1985. Predaceous insects. In: HELLE, W. & SABELIS, M.W. (Ed.) *Spider mites. Their biology, natural enemies and control*. Amsterdam : Elsevier Science Publishers. 405p.
- DARROUY, N. A. 2000. *Desarrollo de una crianza masiva de Stethorus histrio Chazeau, biocontrolador de la araña roja del palto (Oligonychus yothersi McGregor)*. 73f. Monografía (Graduação em Agronomia) – Facultad de Agronomía. Universidad Católica de Valparaíso, Valparaíso, 2000.
- FERLA, N. J., MARCHETTI, M. M. & SIEBERT, J. C. 2005. Acarofauna (Acari) de erva-mate (*Ilex paraguariensis* St. Hil.: Aquifoliaceae) no estado do Rio Grande do Sul. *Biociências*, 13: 133-142.
- GORDON, R. D. & ANDERSON, D. M. 1979. The genus *Stethorus* Weise (Coleoptera: Coccinellidae) in Chile. *The Coleopterists Bulletin*, 33: 61-67.
- GOUVEA, A., BOARETTO, L. C., ZANELLA, C. F. & ALVES, L. F. A. 2006. Dinâmica populacional de ácaros (Acari) em erva-mate (*Ilex paraguariensis* St. Hil.: Aquifoliaceae). *Neotropical Entomology*, 35: 101-111.
- GUANILO, A. D. & MARTINEZ, N. 2007. Predadores asociados a *Panonychus Citri* McGregor (Acari: Tetranychidae) en la costa central del Perú. *Ecología Aplicada*, 6: 1-2.
- HOUSTON, K. J. 1980. A revision of the Australian species of *Stethorus* Weise (Coleoptera: Coccinellidae). *Journal of Australian Entomological Society*, 19: 81-91.
- MORAES, G. J. & FLECHTMANN, C. H. W. 2008. *Manual de Acarologia – Acarologia básica e ácaros de plantas cultivadas no Brasil*. Ribeirão Preto: Holos. 308 p.
- OLIVEIRA, R. C., ALVES, L. F. A. & NEVES, P. M. O. J. 2001. Técnica para desenvolvimento de bioensaios com *Oligonychus yothersi* (Acari: Tetranychidae) em laboratório. *Arquivos do Instituto Biológico*, 68: 125-126.
- PENTEADO, S. R. C. 1995. Principais pragas da erva-mate e medidas alternativas para o seu controle. In: WINGE, H., FERREIRA, A. G., MARIATH, J. F. A. & TARASCONI, L. C. (org.). *Erva-mate: biologia e cultura no Cone Sul*. Porto Alegre: Ed. Universidade/UFRGS. 356 p.
- POLLOCK, D. A. & MICHELS, G. J. 2003. First records of *Stethorus histrio* Chazeau (Coleoptera: Coccinellidae) from the United States. *Southwestern Entomologist*, 28: 221-222.
- PRADO, E. 1991. *Artrópodos y sus enemigos naturales asociados a plantas cultivadas en Chile*. Santiago: Instituto de Investigaciones Agropecuarias. 207 p.
- VERA, S. T. 1994. *Estudios preliminares sobre la araña roja del palto Oligonychus yothersi McGregor (Acarina: Tetranychidae) y sus depredadores Stethorus histrio Chazeau (Coleoptera: Coccinellidae) y Oligota pygmaea Solier (Coleoptera: Staphylinidae)*. 77f. Monografía (Graduação em Agronomia) – Facultad de Agronomía. Universidad Católica de Valparaíso, Valparaíso, 1994.