

SCIENTIFIC COMMUNICATION

A MILLIPEDE INFESTATION OF AN URBAN AREA OF THE CITY OF
CAMPINAS, BRAZIL AND PRELIMINARY TOXICITY STUDIES OF
INSECTICIDE BENDIOCARB® TO THE *UROSTREPTUS*
ATROBRUNNEUS PIEROZZI & FONTANETTI, 2006

C.S. Fontanetti, I.B. Calligaris, T.S. Souza

Universidade Estadual Paulista, Instituto de Biociências, Departamento de Biologia, Av. 24A, 1515, CEP 13506-900, Rio Claro, SP, Brasil. E-mail: fontanet@rc.unesp.br

ABSTRACT

Millipede infestations of urban centers have received the attention of several researchers interested in understanding the causes of this phenomenon and to develop control measures. A great numbers of millipede *Urostreptus atrobrunneus* have invaded a district of Campinas, São Paulo, Brazil, during the spring and summer of the last three years, apparently becoming a nuisance to local residents. The toxicity of Bendiocarb® insecticide for *U. atrobrunneus* was tested in laboratory. High mortality was observed 24 hours after the insecticide application. However, this insecticide may cause environmental contamination (if used for millipede control).

KEY WORDS: *Urostreptus atrobrunneus*, diplopods, infestation.

RESUMO

INFESTAÇÃO DE UMA ÁREA URBANA NA CIDADE DE CAMPINAS, BRASIL, E ESTUDO PRELIMINAR DA TOXICIDADE DO INSETICIDA BENDIOCARB® PARA *UROSTREPTUS ATROBRUNNEUS* PIEROZZI & FONTANETTI, 2006. Infestações de milípedes em centros urbanos têm atraído a atenção de diversos pesquisadores preocupados em desvendar as causas desse fenômeno e em desenvolver métodos de controle desses animais. Este trabalho relata a invasão de grande número de milípedes da espécie *Urostreptus atrobrunneus*, num bairro da Cidade de Campinas, São Paulo, Brasil, durante as estações de primavera e verão dos últimos três anos, causando transtornos aos moradores do local. O inseticida Bendiocarb® foi testado em condições de laboratório em relação a sua toxicidade para *U. atrobrunneus*. Após 24h da aplicação ocorreu alta mortalidade dos diplópodos. Entretanto, esse inseticida pode causar contaminação ambiental (se utilizado para o controle de milípedes).

PALAVRAS-CHAVE: *Urostreptus atrobrunneus*, diplópodes, infestação.

Millipedes or diplopods are arthropods and often live in relatively damp and dark environments, usually under rocks and logs. They often feed on decomposing organic matter and through their burrowing activities enrich soils (HOPKIN; READ, 1992). Millipedes have few or no natural enemies, possibly due to the presence of calcium salts in their integument and the secretion of strong and unpleasant odors (RUPPERT; BARNES, 2005).

Millipedes are relatively scarce but population explosions may occur as a result of environmental disturbances, climate changes, and the use of pesticides that eliminate possible competitors (BOCCARDO; FERNANDES, 2000; BOCCARDO et al., 2002). Based on their work in Poland KANIA; TRACZ (2005) suggested that climate, food abundance, search or competition for food, and search for egg-laying or shelter sites

may explain the migratory behaviour and dramatic increases in the numbers of *Ommatoiulus sabulosus*.

Recently, the millipede *Urostreptus atrobrunneus* Pierozzi & Fontanetti, 2006 (Spirostreptida, Spirostreptidae) has infested the street José Aparecido Pavan, district of Parque das Universidades, an area located in the city of Campinas, São Paulo, Brazil. This street is directly connected with a farm through empty lots. This species has been recently described by researchers of UNESP/Rio Claro, São Paulo, Brazil (PIEROZZI; FONTANETTI, 2006), but its biology and behavior remain unknown.

According to reports of residents, the infestation began in 2005, and the number of millipedes may have been annually increasing. Since then, thousands of millipedes have moved from the farm into houses in overcast days during spring

and summer, which are warm and rainy periods of the year (Fig. 1).

Large amounts of thatch and shrubs surround the walls of houses bordering the farm, providing a suitable environment for these animals. Eggs were not yet found on the soil surface near infested sites but may be buried.

Repulsed and annoyed residents used barriers, insecticides and burned oil in order to prevent millipedes from entering their houses, however some of these measures were not effective.

In order to obtain toxicity information for the control of *U. atrobrunneus* populations, the insecticide Bendiocarb® was tested under laboratory conditions at the Department of Biology, (Institute of Biosciences, UNESP, Rio Claro campus). The experiment was performed at room temperature ($25 \pm 2^\circ\text{C}$). According to manufacturer recommendation (others arthropods), at a diluted concentration of 15 g:100 mL of water, the insecticide was topically applied in triplicate ($n = 30$ millipedes), all adults,

without distinction between males or females. These animals began contracting their bodies and expelling secretion through their repugnatorial pores. After 24 hours, all of them were dead while the control group (same number of insects not exposed to the insecticide) remained alive throughout the experiment.

Bendiocarb® contains 2,3 isopropylidene-dioxy phenyl methylcarbamate that acts on the central nervous system and caution must be exercised when using it because of its high toxicity to humans. Its use for millipedes control may be avoided in order to protect the environment.

As a prevention measure to minimize the problem of this millipede population expansion, cleaning of empty lots is necessary, as well as removal and burning of thatch near walls of houses. These procedures may reduce the number of suitable environments for its development. However, a study to examine the causes of infestations in this area of Campinas is still necessary and thus a study of the biology of *U. atrobrunneus* is essential.



Fig. 1 - The diplopod *Urostreptus atrobrunneus* infesting houses in the city of Campinas (Photos: Marcos Sousa).

REFERENCES

- BOCCARDO, L.; FERNANDES, M.N. Toxicidade do carbamato methiocarb para os diplópodos *Gymnostreptus olivaceus* e *Plusioporus setiger*. *Revista Brasileira de Toxicologia*, v.13, p.29-33, 2000.
- BOCCARDO, L.; JUCÁ-CHAGAS, R.; PENTEADO, C.H.S. Migration and population outbreaks of millipedes in the coffee plantations, region of Alto Paranaíba, MG, Brazil. *Holos Environment*, v.2, p.220-223, 2002.
- HOPKIN, S.P.; READ, H.J. *The biology of millipedes*. 2.ed. New York: Oxford University Press, 1992. 233p.
- KANIA, G.; TRACZ, H. Mass occurrence and migration of *Ommatoiulus sabulosus* (Linnaeus, 1758) (Diplopoda, Julida: Julidae) in Poland. *Peckiana*, v.4, p.57-66, 2005.
- PIEROZZI, P.H.B.; FONTANETTI, C.S. A new species of *Urostreptus* (Diplopoda, Spirostreptidae): description and chromosome number. *Iheringia*, v.96, n.2, p.209-212, 2006.
- RUPPERT, E.E.; BARNES R.D. *Zoologia dos Invertebrados*. 6.ed. São Paulo: Roca, 2005. 1029p.

Received on 5/11/07

Accepted on 9/12/09