

Bioaccumulation of fipronil in Magellanic penguin (*Spheniscus magellanicus*)

Paula Baldassin*¹; Satie Taniguchi¹; Rosalinda Montone¹; Maurício Tavares²; Viet Dang³; Nancy D. Denslow³

¹ - Laboratório de Química Orgânica Marinha, IO-USP, Praça do Oceanográfico, 191. São Paulo, SP, 05508-120, Brazil.

² - Centro de Estudos Costeiros, Limnológicos e Marinhos, Instituto de Biociências, Universidade Federal do Rio Grande do Sul (CECLIMAR/IB/UFRGS) e Grupo de Estudos de Mamíferos Aquáticos do Rio Grande do Sul (GEMARS), Av. Tramandaí, 976. CEP: 95625-000. Imbé/RS, Brazil.

³ - Department of Physiological Sciences, Center for Environmental and Human Toxicology, University of Florida, Gainesville, FL 32611, US.

*paulets@usp.br

INTRODUCTION

Anthropogenic chemicals pose a potential risk to human population and wildlife health. Organochlorine insecticide fipronil, was produced to combat insects when in abundance, helping in rice farming, management of large lawns and residential pest control. It is persistent in the environment, classified as highly toxic to some animals and can cause mortality to some birds at low concentrations. Its metabolite such as fipronil sulfone is more persistent and toxic than the parent compound. Since there are few studies about its accumulation and biotransformation in the aquatic environment, this research aimed to provide insight into bioaccumulation of fipronil in the Magellanic penguin (*Spheniscus magellanicus*).

MATERIALS AND METHODS

All the samples came from CECLIMAR/RS/BRAZIL (Fig.01). The animals were found death in the beach or died during treatment in the rehabilitation center. They were separated as sub-adult (n=09) and juveniles (n=06) as describes on the table 01.

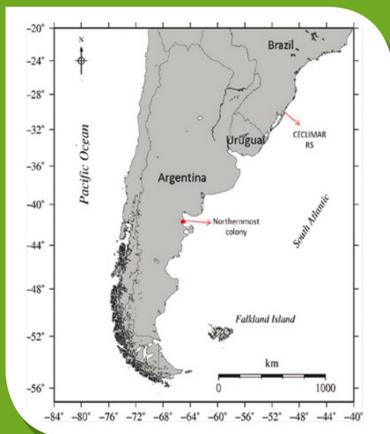


Fig. 01 - CECLIMAR
Location in Rio Grande do Sul, Brazil

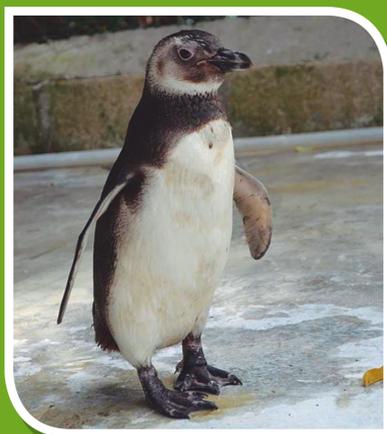


Fig. 02
Juvenile of Magellanic penguin

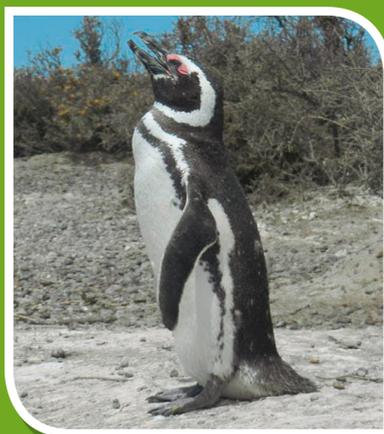


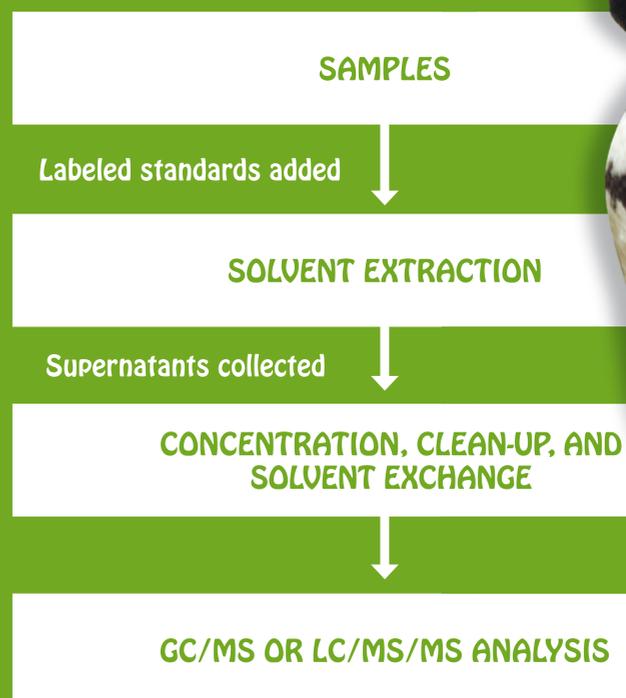
Fig. 03
Sub-adult of Magellanic penguin

All the necropsy were made in the Ceclimar/RS, following the Hocken (2002) protocol. The liver samples were collect according to Ohlendorf (1978) and by the student protocol. Fifteen samples were lyophilized and the powder was transferred to glass vials in the Laboratório de Química Orgânica Marinha, at Instituto Oceanográfico from the São Paulo University. They were sent by mail to the USA. The fipronil analyses were held in the Department of Physiological Sciences and Center for Environmental and Human Toxicology da Universidade da Flórida, USA.

TABLE 01 - ANIMALS IDENTIFICATION, SEX, AGE, DATES AND PLACE WHERE THEY WERE FOUND.

REGISTRATION NUMBER	REGISTRATION DATE	PLACE	DEATH DATE	SEX	AGE
2637	03/23/2011	Capão da Canoa - RS	06/23/2011	F	Juvenile
2316	11/01/2010	Torres - RS	11/01/2010	F	Juvenile
2332	11/16/2010	Capivari do Sul - RS	11/16/2010	F	Juvenile
2734	10/30/2011	Balneário Pinhal - RS	10/30/2011	F	Juvenile
AM353	07/06/2011	Arroio do Sal - RS	07/06/2011	F	Juvenile
2306	10/26/2010	Imbé - RS	10/26/2010	F	Sub - Adult
2620	06/22/2011	Tramandaí - RS	06/22/2011	F	Sub - Adult
2679	08/24/2011	Tramandaí - RS	08/24/2011	F	Sub - Adult
AM 356	08/19/2011	Tramandaí - RS	08/19/2011	F	Juvenile
AM 457	06/15/2012	Salinas - RS	06/15/2012	F	Sub - Adult
AM 361	08/19/2011	Cidreira - RS	08/19/2011	F	Sub - Adult
AM 470	06/22/2012	Capão da Canoa - RS	06/22/2012	F	Sub - Adult
AM 486	07/12/2012	Cidreira - RS	07/12/2012	F	Sub - Adult
AM 490	07/24/2012	-	07/24/2012	F	Sub - Adult
AM 570	11/22/2012	Mostardas - RS	11/22/2012	M	Sub - Adult

THE METHODOLOGY IS BASED ON:



Adapted from Gleslechter et al. 2005 & Dang et al. 2010

RESULTS AND DISCUSSION

- > The amount found of fipronil was below the detection limit of 20 ng g⁻¹.
- > More field work is needed to effectively assess the effects of this pesticide in seabirds. Even because the insecticide in question is relatively new, not getting enough time to assess their risks and its environmental contamination (TINGLE et al., 2000).
- > According to Boersma (2008) and Becker (1989), penguins are sentinels of the marine environment through which scientists can learn about the rates and nature of changes occurring in the South Atlantic.
- > Penguins face changes in the environment, whether climatic changes or negative factors stemming from human activities and *S. magellanicus* is increasingly threatened by human activities in coastal areas along its migration path (PÜTZ et al., 2007).