

Multielemental Analyses of *Lonomia obliqua* (Lepidoptera, Saturniidae) Caterpillar Using XRF and NAA Techniques

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The elemental composition of the *Lonomia obliqua* caterpillar Walker, 1855 (Lepidoptera, Saturniidae) was investigated using X-Ray Fluorescence (XRF) and Neutron Activation Analyses (NAA) techniques. The need of this study is related to morphological changes (mainly size and color) observed in some caterpillars used for preparation of antivenom (*antilonomic* serum). This species is poisonous and has the ability to cause serious and fatal hemorrhagic effects in humans after contact characterized by hemorrhage, disseminated intravascular coagulation, and acute renal failure [1, 2]. The first case of poisoning (registered in Brazil) occurred in 1989 and the average number of accidents is closer to 500 / year [3]. To reverse these effects, a specific antivenom (*antilonomic* serum) is currently produced by Instituto Butantan (Research Center at São Paulo city).

For this investigation, the samples were classified as healthy (caterpillars of control) and unhealthy (caterpillars visibly modified). The XRF measurements were performed in an EDXRF Spectrometer SHIMADZU Co. model Rany 720 and the NAA measurements in the IEA-R1 nuclear reactor (both facilities of IPEN, Research Center at São Paulo city).

The results show significant differences (high concentration) for several elements in unhealthy caterpillars that can affect the development of this specie as well as the quality and yield of the antivenom. Furthermore, the elemental characterization of this species can also contribute for the understanding the potential pharmacological (pro-coagulant and anti-thrombotic) in the prevention of life-threatening blood-clots.

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[2] Alvarez Flores MP, Zannin M, Chudzinski-Tavassi AM. New insight into the mechanism of *Lonomia obliqua* envenoming: toxin involvement and molecular approach. *Pathophysiol Haemost Thromb.* 2010;37(1):1-16.

[3] Ministério da Saúde (2018), Casos de acidentes por lagartas. Brasil, Grandes Regiões e Unidades Federadas. 2000 a 2017, in: <http://portalms.saude.gov.br/saude-de-a-z/acidentes-por-animais-peconhentos/13702-situacao-epidemiologica-dados>