

Lonomia obliqua Walker, 1855 (Lepidoptera: Saturniidae): First report in the Zona da Mata Mineira region, Southeast Brazil

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ABSTRACT: *Lonomia accidents* occur by contact to caterpillar bristles that penetrate the skin of the victim. This moth presents toxins in its larval stage, which has hemorrhagic effects that can cause accidents and even death in humans. This study presents the first report of *Lonomia obliqua* in the Zona da Mata Mineira, Southeast Brazil. As the species abundance and phenology are still little known in the region further studies are important, so that prevention and educational measures can be adopted.

Accidents caused by *Lonomia obliqua* Walker, 1855 are a public health problem because its larval stage have a powerful toxin, responsible for innumerable cases of contact with human beings (Duarte *et al.* 1990). Although there are over 20 species of the genus *Lonomia* Walker 1855 recorded to the Americas (Lemaire 1972), only accidents with *L. obliqua* and *Lonomia achelous* Cramer, 1777 were reported provoking hemorrhagic effects when in contact with human beings (Arocha-Piñango and Layrissé 1969; Lorini 1999; Córdoba *et al.* 2011) and, though the venoms of both present different components, the clinical picture is similar (Carrijo-Carvalho and Chudzinski-Tavassi 2007).

The toxin present in *L. obliqua* caterpillar may cause hemorrhagic accidents by contact, in which specialized structures as bristles or spikes penetrate the skin of the victim, rupture it, and inject the poison that causes immediate pain and a strong burning sensation, which can radiate to other regions of the body (Duarte *et al.* 1990; Veiga *et al.* 2001; Garcia and Danni-Oliveira 2007). The body's parts touched by the caterpillar presents redness and swelling, and hemorrhages may occur in any part of the body, such as gum and fresh wound bleeding, as well as intra-articular, abdominal, pulmonary, and glandular hemorrhages. Haematoma and haematuria are also frequent symptoms (Garcia and Danni-Oliveira 2007; Pinto *et al.* 2010). Death cases may occur, although in smaller scale (Burigo and Rubio 2001; Abella *et al.* 2006).

In Brazil, *L. obliqua* has its occurrence recorded in South and Southeast regions, presenting a high population density in the north of Rio Grande do Sul State and west of Santa Catarina State. Most accidents occur in Santa Catarina (Zannin *et al.* 2003), Paraná (Kowacs *et al.* 2006; Garcia and Danni-Oliveira 2007) and Rio Grande do Sul

State, all located at Brazilian Southern region, being the latter the location for the first records of accidents with *L. obliqua* caterpillar bristles (Duarte *et al.* 1990). From 1997 to 2005, more than a thousand accidents have been registered to this State (Abella *et al.* 2006).

In the other hand, reports in the Southeast region are rarest when compared to the Southern records (Fan *et al.* 1998; Malaque *et al.* 2006). According to Jader (2007), in Minas Gerais State, the Departamento de Saúde has been alerting the population concerning the risks of accidents with caterpillars, since the state started to register accidents with this species since December 2002. Thenceforth, 51 accidents were notified in municipalities of the Northeast, East, Jequitinhonha, Center, South Center, West, and South Macroregions (Figure 1).

The Ministério da Saúde registered, in 2008, an incidence of eight lepidopteran poisonings per 100000 inhabitants in Southern Brazil, followed by the Southeast (1.5/100000). In relation of accidents caused by the genus *Lonomia*, mostly of them occurred at rural areas and death occurrences are associated with delay in the prompt emergency care and lack of knowledge for the correct treatment by professionals (SVS 2009). In 2011, 1242 cases of accidents involving bees and caterpillars were registered only in Minas Gerais State despite the low incidence of death (3 cases) (Almeida 2012) and in 2012, 98 cases of *Lonomia* accidents were confirmed in this State until November (Torres 2012).

L. obliqua requires attention from the public health organs, since the number of victims is increasing in the rural and also in urban areas (Lorini 1999; Lorini *et al.* 2007). According to Pinto *et al.* (2010), in the rural areas the cases are poorly reported and, therefore this numbers

are greatly underestimated. Another point that should be highlighted is that *L. obliqua* has gregarious habits and due that reason, the accidents usually involve contact with a colony containing hundreds of caterpillars lying on the trees.

In order to reduce the number of accidents and the damages caused to the human population that inhabit the same places that *Lonomia* occur, it becomes necessary to clarify the geographical distribution of this species. Considering the importance of this lepidopteran to public health, the aim of this study was to describe the first report of the occurrence of *Lonomia obliqua* in the Zona da Mata Mineira region, located in southeast of Minas Gerais State.

Three specimens, two males and one female, were collected manually in the Juiz de Fora municipality (21°45'48"S; 43°20'56"W), between 2004 and 2006. One male specimen was collected in the Biological Reserve of Poço D'Anta (Southeast region), the other in the Granjas Betânia neighborhood (Northeast region) and the female specimen in the Salvaterra neighborhood (South region). The places of occurrence are located near fragments of native vegetation of varied sizes. The specimens were deposited at the Museu de História Natural do Centro de Ensino Superior de Juiz de Fora (CES)/Colégio Academia de Comércio under the records 2008.5.030.22.001.000.01.07.1, 2008.5.030.23.001.000.01.07.2 and 2008.5.030.24.001.000.01.07.3.

The collection of these individuals motivated the survey in the first two places (Southeast and South regions of the city), which were chosen due to their suitability to conduct the methodology, carried out in August 2006. A luminous trap consisting of a gas lamp covered with a white cloth measuring 40cm of a 2.0 x 2.70m was kept at 1.5 m height from the ground (Zanúncio *et al.* 1989; Buzzi 2002). The trap was set with weekly exposure between 17 and 23 hours (from August 19, 2006 to March 25, 2007). The efficiency of the trap to capture the insects was not considered satisfactory due to the number of captured

individuals per hour of exposition. To increase the possibilities of capturing *L. obliqua*, the collection method was changed and a luminous trap, "Luiz de Queiroz" model, was used (Silveira-Neto and Silveira 1969). This modification had a higher efficiency of collection, with a mean of 3.85 (\pm 2.15) insects/hour. The new trap was set for seven months (from April 29, 2007 to November 22, 2007); however, moths of *L. obliqua* species were not captured during this interval of time.

To complement the samplings, an epidemiological inquiry was conducted in the Hospital de Pronto Socorro (HPS) of Juiz de Fora, by examining accident reports to venomous animals, which demonstrated that, between 2003 and 2007, no accidents that could be attributed to *L. obliqua* occurred in the city. Although cases of erucism were reported during this period, they did not present similar symptomatology to those accidents caused by *L. obliqua*, since the symptoms presented by patients were restricted to local manifestations not presenting alteration in blood coagulation time.

A case of erucism reported in Teresópolis municipality (Rio de Janeiro State), located approximately 120km from Juiz de Fora, presented symptomatology characteristic of accidents with specimens of *Lonomia* (Corrêa *et al.* 2004). Although located in different states, both cities are nearby and present a very similar climate and vegetal covering. The appearance of *L. obliqua* in Juiz de Fora corroborates the diagnosis in the case of Teresópolis and highlights the importance and the need of attention to the problem in the Zona da Mata Mineira and Região Serrana in Rio de Janeiro. *Lonomia* accidents reported in Minas Gerais State (Jader 2007; SVS 2009; Almeida 2012; Torres 2012) also found close the study area and put Juiz de Fora in a relevant place in relation to Zona da Mata Mineira.

The environmental changes, as well as the expansion of agricultural borders and urbanization, reduction of forested areas and replacement of the native forest by fruit tree plantation, may increased the contact zone of this species (Pinto *et al.* 2010), causing it to live close to human beings, and thus increasing the risk of accidents by contact with the caterpillars. According to Garcia and Danni-Oliveira (2007), external factors may contribute to increasing number of accidents that interfere in the insect life cycle, incrementing it.

However, the presence of *L. obliqua* was reported in Juiz de Fora in occasional encounters, since it was not systematically surveyed and the absence of accident reports with symptomatology for accidents. This could reflect a low density of the species in urban areas. Thus, this work aims to help health professionals and agencies responsible for the possibility of *Lonomia* accidents in the study region. Furthermore, studies that aim the monitoring of this insect population and that consider not only the population fluctuation, but also its phenology, may be essential for the adoption of actions that aim to minimize the risks of accidents.

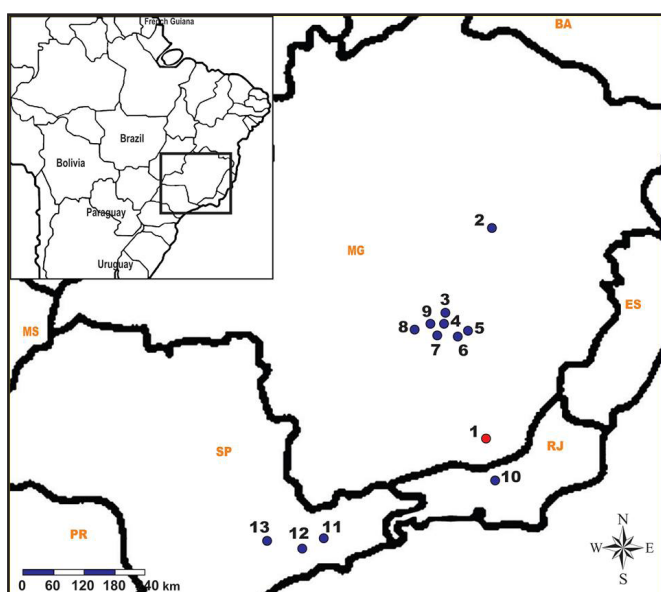


FIGURE 1. Main occurrence of accidents caused by *Lonomia obliqua* in Southeast states of Brazil. Blue circles = literature records; Red circle = present record. Municipalities: 1. Juiz de Fora; 2. Felício dos Santos; 3. Matozinhos; 4. Ribeirão das Neves; 5. Caeté; 6. Nova Lima; 7. Betim; 8. Pará de Minas; 9. Esmeraldas; 10. Teresópolis; 11. Mogi das Cruzes; 12. São Bernardo do Campo; 13. Mairinque.

LITERATURE CITED

- Almeida, C. 2012. *Secretaria de Saúde alerta para acidentes com animais peçonhentos em períodos de chuva*. Accessible at <http://www.saude.mg.gov.br/>. Captured on 09 June 2013.
- Abella, H.B, M.G.B. Marques, K.R.L.M. Silva, M.G. Rossoni, J.B. Torres. 2006. *Acidentes com lagartas do gênero Lonomia registrados no Centro de*

- Informação Toxicológica do Rio Grande do Sul no período de 1997 a 2005; p. 29-34. In A. Nicoletta (ed.). *Toxicovigilância - toxicologia clínica: dados e indicadores selecionados*. Porto Alegre: Secretaria da Saúde Fundação Estadual de Produção e Pesquisa em Saúde, Centro de Informação Toxicológica.
- Arocha-Piñango, C.L. and M. Layrisse. 1969. Fibrinolysis produced by contact with a caterpillar. *The Lancet* 3-7.
- Burigo, G. and G. Rubio. 2001. Vigilância epidemiológica da distribuição da lagarta *Lonomia obliqua* Walker, 1855, no Estado do Paraná, Brasil. *Cadernos de Saúde Pública* 17(4): 1036.
- Buzzi, J.Z. 2002. *Entomologia didática*. Curitiba: Editora UFPR. 347 p.
- Carrijo-Carvalho, L.C. and A.M. Chudzinski-Tavassi. 2007. The venom of the *Lonomia* caterpillar: an overview. *Toxicon* 49(6): 741-757.
- Córdoba, A.M., J.F. Sarmiento, H.H. Mulett, J. Godoy. 2011. Accidente ionômico: estado del arte. *Acta Colombiana de Cuidado Intensivo* 11(3): 254-260.
- Corrêa, M.S., R. Siqueira-Batista, A.P. Gomes, A. Franco-Barbosa, A.C.A. Verzola, F.R.Q. Oliveira, F.A. Squeff, J.M. Motta-Leal-Filho, R.H. Tavares, D.S. Amorim, N.L. De-Maria-Moreira and S.S. Santos. 2004. Erucismo por *Lonomia* spp em Teresópolis, RJ, Brasil. Relato de um caso provável e revisão da literatura. *Revista da Sociedade Brasileira de Medicina Tropical* 37(5): 418-421.
- Duarte, A.C., J. Caovilla, I. Lorini, D. Lorini, G. Mantovani, J. Sumida, P.C. Manfri, R.C. Silveira and S.P. Moura. 1990. Insuficiência renal aguda por acidentes com lagartas. *Jornal Brasileiro de Nefrologia* 12(4): 184-187.
- Fan, H.W., J.L.C. Cardoso, R.D. Olmos, F.J. Almeida, R.P. Viana and A.P.P. Martinez. 1998. Hemorrhagic syndrome and acute renal failure in a pregnant woman after contact with *Lonomia* caterpillars: a case report. *Revista do Instituto de Medicina Tropical* 40(2): 119-120.
- Garcia, C.M. and I.M. Danni-Oliveira. 2007. Occurrence of accidents caused by *Lonomia obliqua* Walker, in the State of Paraná between 1989 and 2001. *Revista do Instituto de Medicina Tropical* 40(2): 242-246.
- Jader, R. 2007. *Saúde estadual alerta para riscos de acidentes com lagartas*. Accessible at <http://www.saude.mg.gov.br/>. Captured on 17 June 2010.
- Kowacs, P.A., J. Cardoso, M. Entres, E.M. Novak and L.C. Werneck. 2006. Fatal intracerebral hemorrhage secondary to *Lonomia obliqua* to caterpillar envenoming. *Arquivos de Neuro-Psiquiatria* 64(4): 1030-1032.
- Lemaire, C. 1972. Revision du genre *Lonomia* Walker, Lep., Attacidae. *Annales de la Société Entomologique de France* 8: 767-861.
- Lorini, L.M. 1999. *A taturana: aspectos biológicos e morfológicos da Lonomia obliqua*. Passo Fundo: EDIUPF. 67 p.
- Lorini, L. M., P.H.G. Zarbin and C.D. Tedesco. 2007. Biology of Laboratory-Reared *Lonomia obliqua* (Lepidoptera: Saturniidae). *The Florida Entomologist* 90(4): 770-771.
- Malaque, C.M.S., L. Andrade, G. Madalosso, S. Tomy and F.L. Tavares. 2006. Short report: a case of hemolysis resulting from contact with a *Lonomia* caterpillar in southern Brazil. *American Journal Tropical Medicine and Hygiene* 74(5): 807-809.
- Pinto, A.F.M., M. Berger, J. Reck Jr., R.M.S. Terra, J.A. Guimarães. 2010. *Lonomia obliqua* venom: in vivo effects and molecular aspects associated with the hemorrhagic syndrome. *Toxicon* 56: 1-10.
- Silveira-Neto, S. and A.C. Silveira. 1969. Armadilha luminosa modelo "Luiz de Queiroz". *O Solo* 61(2): 19-2.
- Secretaria de Vigilância em Saúde (SVS), Ministério da Saúde. 2009. Situação Epidemiológica das Zoonoses de Interesse à Saúde Pública. *Boletim Eletrônico Epidemiológico* 9 (1): 17.
- Torres, G. 2012. *Acidentes com animais peçonhentos aumentam no período chuvoso e no verão*. Accessible at <http://www.saude.mg.gov.br/>. Captured on 09 June 2013.
- Veiga, A.B.G., B. Blochtein and J.A. Guimarães. 2001. Structures involved in production, secretion and injection of the venom produced by the caterpillar *Lonomia obliqua* (Lepidoptera, Saturniidae). *Toxicon* 39: 1343-1351.
- Zannin, M., D.M. Lourenço, G. Motta, L.R. Dalla Costa, M. Grando, G.P. Gamborgi, M.A. Noguti and A.M. Chudzinski-Tavassi. 2003. Blood Coagulation And Fibrinolytic Factors in 105 Patients with hemorrhagic syndrome caused by accidental contact with *Lonomia obliqua* caterpillar in Santa Catarina, Southern Brazil. *Thromb Haemost* 89(2): 355-64.
- Zanúncio, J.C., G.P. Santos, R.C. Sartório, N. Anjos and L.C.C. Martins. 1989. Levantamento e flutuação populacional de lepidópteros associados à eucaliptocultura: 3 - Região do Alto São Francisco, Minas Gerais, março de 1988 a fevereiro de 1989. *IPEF* 41-42: 77-82.

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