



## New occurrence of lepidopterism by *Hylesia nigricans* (Berg, 1875) (Lepidoptera: Saturniidae) in Rio Grande do Sul, Brazil

## Nova ocorrência de lepidopterismo por *Hylesia nigricans* (Berg, 1875) (Lepidoptera: Saturniidae) no Rio Grande do Sul, Brasil

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### ABSTRACT

Adult forms of lepidopterans can cause health problems. This type of incident is known as Lepidopterism, which is caused by contact with urticating setae released by adults, such as those from the *Hylesia* Hübner (Saturniidae) genus. In this study, the objective is to document a new occurrence of lepidopterism caused by specimens of *Hylesia nigricans* (Berg, 1875) (Lepidoptera: Saturniidae). The outbreak took place in the summer of 2017 in the municipality of Três Coroas, Rio Grande do Sul, Brazil. During this period, approximately 300 people were affected by dermatitis in the municipality. The outbreak resulted from the release of two types of urticating setae by female moths in the area. We want to emphasize that in case of proliferation of this moth species, it is essential to instruct the population to avoid direct contact with these insects. Monitoring these groups of lepidopterans is fundamental in facilitating decision-making and ensuring public health.

**Keywords.** Dermatitis, Environmental Health Surveillance, Moths, Pruritus, Public Health.

### RESUMO

Formas adultas de lepidópteros podem causar problemas de saúde. Esse tipo de acidente é conhecido como lepidopterismo, causado pelo contato com cerdas urticantes liberadas por adultos, como as do gênero *Hylesia* Hübner (Saturniidae). Neste estudo, o objetivo é registrar uma nova ocorrência de lepidopterismo causado por espécimes de *Hylesia nigricans* (Berg, 1875) (Lepidoptera: Saturniidae). O surto ocorreu no verão de 2017, no município de Três Coroas, Rio Grande do Sul, Brasil. No período, aproximadamente 300 pessoas foram acometidas por dermatite no município. O surto foi causado pela liberação de dois tipos de setas urticantes das mariposas fêmeas no ambiente. Ressaltamos que na ocorrência da proliferação dessa espécie de mariposa, é importante instruir a população a evitar o contato direto com esses insetos. O monitoramento desses grupos de lepidópteros é fundamental para facilitar a tomada de decisões e garantir a saúde pública.

**Palavras-chave.** Dermatite, Vigilância Ambiental em Saúde, Mariposas, Prurido, Saúde Pública.

## INTRODUCTION

The lepidopterans (butterflies and moths), represent a group of insects relevant to public health. Some species of this order stand out due to the adverse reactions caused by direct or indirect contact with the larval forms (erucism) or with adult insects (lepidopterism)<sup>1</sup>. The most relevant episodes of erucism in Brazil are often associated with accidents caused by some *Lonomia* (Saturniidae) species, from which the larvae venom affects blood clotting mechanisms in humans<sup>2</sup>.

Adult forms of some lepidopterans can also cause health problems, although it is less common<sup>3,4</sup>. This kind of accident is known as Lepidopterism, caused by contact with urticating setae released by adults, such as from the *Hylesia* Hübner (Saturniidae) genus<sup>1,5,6</sup>. So far, studies suggest that only *Hylesia* females have urticating setae<sup>7,8</sup>, normally used to cover and protect their eggs after laying<sup>3,6-8</sup>. In contact with human skin or mucosa, these setae may cause several reactions, such as swelling, itching, erythema, pruritic spots, fever, and malaise<sup>9</sup>.

The *Hylesia* group presents around 110 species with neotropical distribution from Mexico to Argentina<sup>10</sup>. Outbreaks of lepidopterism are usually associated with the high density of these insects. Events of this nature have been described in Central and South America, in countries such as Mexico, Costa Rica, French Guiana, Suriname, Venezuela, Peru, Argentina and Uruguay<sup>11-14</sup>.

In Brazil, the first record of an outbreak occurred officially in Amapá in May 1960<sup>15</sup>. The presence of *Hylesia* species adults in the region was related to several cutaneous reactions in the local population. In 1980, Mascarenhas et al<sup>16</sup> described an outbreak in the municipality of Montes Claros, Minas Gerais State. In São Paulo State, 12 cities registered cases of dermatitis from December 1989 to December 1991. Bertioiga municipality stands out due to 612 hospital notifications where the local health authorities identified *Hylesia paulex* (Dognin, 1922) as the species causing the outbreak<sup>17</sup>.

In the Rio Grande do Sul State (RS), the first outbreak of lepidopterism was reported between December 1999 and January 2000. Specimens of the moth *Hylesia nigricans* (Berg, 1875) (Lepidoptera: Saturniidae) were identified as the cause of dermatitis in the municipalities of Três Coroas and Igrejinha in the Vale do Rio Paranhana, with the latter registering 168 cases<sup>3</sup>. A new outbreak occurred over the summer of 2017 in the Três Coroas municipality, which motivates the present report. In this context, this paper aims to record the occurrence of lepidopterism caused by *H. nigricans* and discuss morphological and ecological aspects involved in the event.

## MATERIAL AND METHODS

The municipality of Três Coroas (29°31'3"S 50°46'16"W) is located in Rio Grande do Sul, covering an area of 185.5 km<sup>2</sup> distributed along the state highway RS-115, adjacent to the Serra Geral highway (RS-120). The city is situated 53 meters above sea level and is approximately 91 km from the state capital, Porto Alegre, with around 30,000 inhabitants. The municipality falls on the boundary of the humid subtropical warm and humid subtropical temperate climates, according to the Köppen classification. The average annual temperature is around 20 °C, and the average rainfall varies from 1,900 to 2,200 mm/year<sup>18</sup>.

In January 2017, the Municipal Health Secretariat of Três Coroas notified the State Center for Health Surveillance (CEVS), an organ of the State Health Secretariat, about a significant increase in cases of dermatitis in the local hospital.

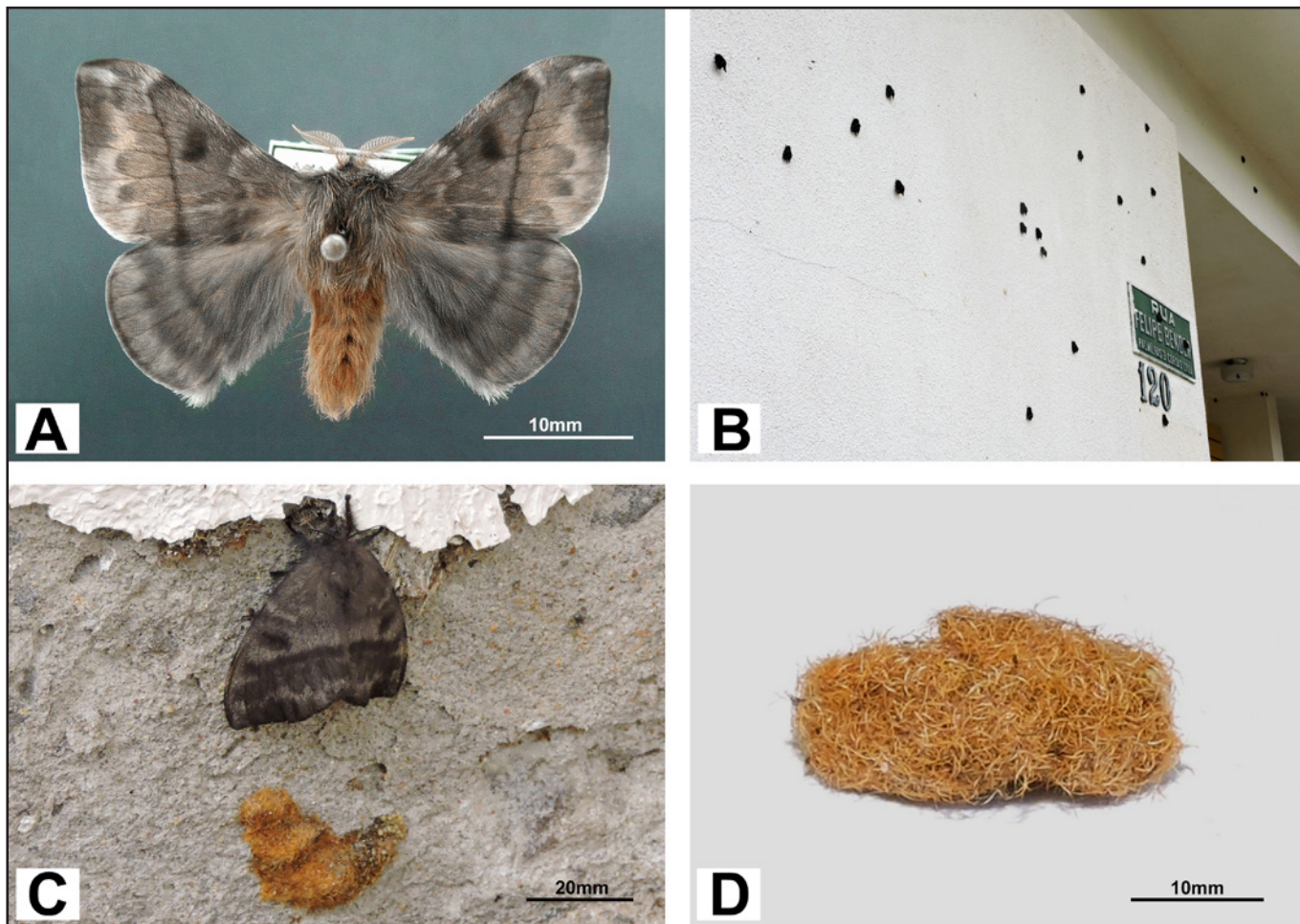
On January 10, 2017, members of the Environmental Health Surveillance Division (DVAS) of CEVS went to Três Coroas to support the municipal Epidemiological and Environmental Surveillance team. During the investigation, some specimens of moths (males and females) were collected and placed in

containers containing 70% alcohol for identification. The taxonomic identification of the specimens took place in the Insect Morphology and Behavior Laboratory of the Federal University of Rio Grande do Sul (UFRGS) using taxonomic references (e.g., Lemaire<sup>19</sup>, Specht et al<sup>20</sup>, and Bonatto et al<sup>21</sup>).

## RESULTS

According to the data made available to DVAS, 297 cases of dermatitis were recorded between December 15, 2016, and January 15, 2017. Of these, 275 were registered in urban areas and 21 patients were from rural areas. Notably, one of the reported cases had no description of the location of occurrence.

The moths collected in the municipality during the lepidopterism outbreak were identified as *Hylesia nigricans* (Figure Part A). The species has grayish-dark wings with a large number of golden yellow setae covering the ventral and lateral abdominal region. However, sexual dimorphism occurs in the species as males are lighter in color with a smaller wingspan than females. Many adult specimens were recorded resting on building facades in the urban area (Figure Part B). Moreover, several eggs covered with setae were laid in these locations (Figures Parts C-D). A total of 1.1% of the Três Coroas population was affected by dermatitis. Compared with the last outbreak in the state<sup>3</sup>, it represents a high number.



**Figure.** A. *Hylesia nigricans* (Berg, 1875), dorsal view (♂); B. Specimens occurring in urban area during lepidopterism outbreak; C. *H. nigricans* (♀) near the egg mass; D. Egg mass of *H. nigricans*

## DISCUSSION

*Hylesia nigricans* is widely distributed from southeastern to southern Brazil, with occurrence in neighbouring countries like Argentina and Uruguay<sup>19,21</sup>. The species exhibits a remarkable sexual dimorphism, with wingspan measurements – anterior wing ~36 mm (males) / ~49 mm (females) and hind wing ~19 mm (males) / ~25 mm (females), corroborating the morphology of the specimens collected in this study<sup>19,21</sup>.

This moth species is considered univoltine, spending the winter or dry seasons in egg form and emerging between spring and summer<sup>8,20</sup>. Moreover, climate variations can alter this species' life cycle, leading to earlier or later larvae hatching. The species was recorded in January, February, March, May, October, November and December, according to other studies in the state<sup>8,21</sup>.

In the state, the first outbreak of lepidopterism caused by *H. nigricans* was recorded in early summer, coinciding with the outbreak period recorded in this study. The occurrence of lepidopterism outbreaks varies according to the period of the emergence of adults. In southern Brazil, adult specimens are usually observed between November and May<sup>20</sup>.

The habit of *H. nigricans* is crepuscular and/or nocturnal, and the specimens are attracted by the light<sup>22</sup>. The nighttime illumination of the urban area of Três Coroas was possibly one of the factors responsible for attracting many *H. nigricans* specimens.

Scales are found on both females and males of *H. nigricans*. The scales appear to have no urticating action, unlike the setae, which have such properties<sup>8</sup>. The setae morphology resembles those described for *H. metabus* Cramer and *H. oratex* Dyar<sup>6,7</sup>. The S3 seta, according to Rodriguez et al<sup>7</sup> is cylindrical and has tiny barbs directed toward the distal end, possibly related to allergic reactions caused by penetration into human skin. The S4 seta is cylindrical at the base and flattened towards the apex, with numerous barbs and pores that may be associated with allergic reactions through penetration and contact with the irritating substance released by the seta<sup>6-8</sup>.

Lepidopterism by *Hylesia* does not necessarily involve direct contact with the moths; usually, the contact that triggers dermatitis is with the setae detached from the insect's body and present in the environment<sup>23</sup>. Mechanical stimuli can easily promote the detachment of these setae, mainly during adult flight, possibly forming floating clouds carried by the wind until they come into contact with the skin or objects manipulated by humans<sup>15,24</sup>. Moreover, people may come into direct contact with the urticating setae that cover the egg masses laid on the leaves of host plants<sup>25</sup>. *Hylesia nigricans* uses more than 30 plant species to lay eggs and feed larvae<sup>20</sup>.

The number of dermatitis cases in rural areas is considered low compared to that in urban areas. In the outbreak described here, 92.6% of the patients were reported in urban areas, and only 7.1% were from rural areas, corroborating other data in the literature<sup>17</sup>. Rural areas may serve as breeding grounds, and at opportune moments these insects may migrate to urban centres when attracted by brightness. However, this has not put rural areas at higher risk. Nevertheless, it may highlight the importance of better understanding the involvement of these municipalities in this type of mechanism. In this context, it is important to consider that whenever events of higher moth proliferation are detected, it is essential to instruct the population to avoid any direct contact with the insects or with their setae spread in the environment.

Iserhard et al<sup>3</sup> had already recommended the monitoring of dermatitis records by the local authorities of Igrejinha and Três Coroas, as well as the adoption of primary preventive measures. As prophylactic methods, the manual destruction of egg masses, the washing of walls in buildings and residences, and the reduction of public lighting may reduce the number of dermatitis cases. However, it's important to note that these suggestions should only be implemented in an outbreak situation when there is an imbalance in the *Hylesia* populations, treating them as harmful synanthropic pests that can be controlled<sup>26</sup>. We emphasize that these practices should only be carried out by professionals from health and surveillance agencies.

Some feasible measures can be recommended to the local population as a preventive method, external to an installed outbreak or in outbreak situations. For example, keeping doors and windows closed or protected with screens, especially during in the twilight when moths are more active; cleaning all surfaces in the house with a damp cloth and using gloved hands; handling bedding with care, washing it regularly, and keeping it in closed closets.

Moreover, when in direct contact with the setae, it is recommended to wash the affected area with fresh water and neutral soap and seek medical attention in case of worsening allergic reactions. Furthermore, if there is negligence regarding the care of this type of dermatitis/accident (lepidopterism) in humans, it is even greater in animals. Thus, it is also worth pointing out the importance of observing possible allergic processes in pets to seek the appropriate veterinary treatment.

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### CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest.

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### AUTHORS' CONTRIBUTIONS

All the authors contributed to the study delineation, writing the manuscript, analysis, data compilation and critical review. Diego Dutra Silveira, Jáder da Cruz Cardoso, Rosângela Brito and Wilson Sampaio de Azevedo Filho elaborated the figures and discussed the data. All authors approved the final content.

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## REFERENCES

1. Hossler EW. Caterpillars and moths. *Dermatol Therapy*. 2009;22(4):353-66.  
<https://doi.org/10.1111/j.1529-8019.2009.01247.x>
2. Carrijo-Carvalho LC, Chudzinski-Tavassi AM. The venom of the *Lonomia* caterpillar: An overview. *Toxicon*. 2007;49(6):741-57.  
<https://doi.org/10.1016/j.toxicon.2006.11.033>

3. Iserhard CA, Kaminski LA, Marchiori MO, Teixeira EC, Romanowski HP. Occurrence of Lepidopterism caused by the moth *Hylesia nigricans* (Berg) (Lepidoptera: Saturniidae) in Rio Grande do Sul State, Brazil. Neotrop entomol. 2007;36(4):612-5.  
<https://doi.org/10.1590/S1519-566X2007000400022>
4. Moreira SC, Lima JC, Silva L, Haddad Junior V. Descrição de um surto de Lepidopterismo (dermatite associada ao contato com mariposas) entre marinheiros, ocorrido em Salvador, Estado da Bahia. Rev Soc Bras Med Trop. 2007;40(5):591-3. Available from:  
<https://www.scielo.br/j/rsbmt/a/DtWM6T89GH6zbwqXJVwczbs/?lang=pt&format=pdf>
5. Cardoso JLC. Erucismo e Lepidopterismo. In: Cardoso JLC, França FOS, Wen FH, Malaque CMS, Haddad Junior V, organizadores. Animais peçonhentos no Brasil: biologia, clínica e terapêutica dos acidentes. 1 ed. São Paulo: Editora Sarvier; 2003. p. 220-3.
6. Brito R, Specht A, Filho WSA, Fronza E, Mielke CGC. Abdominal macrochaetae of female *Hylesia oratex* Dyar, 1913 (Insecta: Lepidoptera: Saturniidae): external morphology and medical significance. An Acad Bras Cienc. 2015;87(3):1763-70.  
<https://doi.org/10.1590/0001-3765201520130141>
7. Rodriguez J, Hernández JV, Fornés L, Lundberg U, Piñango CLA, Osborn F. External morphology of abdominal setae from male and female *Hylesia metabus* adults (Lepidoptera: Saturniidae) and their function. Fla Entomol. 2004;87(1):30-6.  
[https://doi.org/10.1653/0015-4040\(2004\)087\[0030:EMOASF\]2.0.CO;2](https://doi.org/10.1653/0015-4040(2004)087[0030:EMOASF]2.0.CO;2)
8. Specht A, Corseuil E, Abella HB. Lepidópteros de importância médica: principais espécies no Rio Grande do Sul. Specht A, editor. 1 ed. Pelotas: Editora USEB; 2008. 220 p.
9. Battisti A, Holm G, Fagrell B, Larsson S. Urticating hairs in arthropods: their nature and medical significance. Annu Rev Entomol. 2011;56:203-20.  
<https://doi.org/10.1146/annurev-ento-120709-144844>
10. Camargo AJA. A new species of de *Hylesia* Hübner (Lepidoptera, Saturniidae, Hemileucinae) from Brazilian Cerrado. Rev Bras Zool. 2007;24(1):199-202.  
<https://doi.org/10.1590/S0101-81752007000100025>
11. Leger M, Mouzels P. Dermatose prurigineuse déterminée par des papillons saturnidés du genre *Hylesia*. Bull Soc Path Exot. 1918;11:104-7.
12. Fornés L, Hernández JV. Algunos aspectos de la biología de *Hylesia metabus* (Cramer 1775) (Lepidoptera: Saturniidae). Bol Entomol Venez. 2000;15:127-45.

13. Fornés L, Hernández JV. Reseña histórica e incidencia en la salud pública de *Hylesia metabus* (Cramer) (Lepidoptera: Saturniidae) en Venezuela. *Entomotropica*. 2001;16(2):137-41.
14. Willat G, Capdevila A, Martinez M, Benavides C, Carballo R. Brotes de dermatitis urticante por mariposas del género *Hylesia* em Uruguay. *Rev Salud Pública*. 2003;2:4-6.
15. Gusmão HH, Forattini OP, Roberg A. Dermatite provocada por lepidópteros do gênero *Hylesia*. *Rev Inst Med Trop*. 1961;3(3):114-120.
16. Mascarenhas CS, Vulcano MA, Pereira FS. Nova constatação de dermatite provocada por lepidópteros do gênero *Hylesia* Hubner. *Lundiana*. 1980;1:143-8.
17. Glasser CM, Cardoso JL, Carréri-Bruno GC, Domingos MF, Moraes RHP, Ciaravolo RMC. Surtos epidêmicos de dermatite causada por mariposas do gênero *Hylesia* (Lepidoptera: Hemileucinae) no Estado de São Paulo, Brasil. *Rev Saúde Públ*. 1993;27(3):217-20.  
<https://doi.org/10.1590/S0034-89101993000300011>
18. Alvares CA, Stape JL, Sentelhas PC, Gonçalves JLM, Sparovek G. Köppen's climate classification map for Brazil. *Meteorol Zeitschrift*. 2013;22(6):711-28.  
<https://doi.org/10.1127/0941-2948/2013/0507>
19. Lemaire C. The Saturniidae of America: Hemileucinae. Keltern: Goecke & Evers; 2002. Vol. 3, 1388 p.
20. Specht A, Formentini AC, Corseuil E. Biologia de *Hylesia nigricans* (Berg) (Lepidoptera, Saturniidae, Hemileucinae). *Rev Bras Zool*. 2006;23(1):248-55.  
<https://doi.org/10.1590/S0101-81752006000100018>
21. Bonatto LD, Azevedo Filho WS, Fronza E. Saturnídeos: guia ilustrado das mariposas de Bento Gonçalves. Porto Alegre: Editora Evangraf; 2019. 158 p.
22. Cabrerizo S, Spera M, Roodt A. Accidentes por lepidópteros: *Hylesia nigricans* (Berg, 1875) o “mariposa negra”. *Arch Argent Pediatr*. 2014;112(2):179-82.  
<https://doi.org/10.5546/aap.2014.179>
23. Salomon OD, Simon D, Rimoldi JC, Villaruel M, Perez O, Perez R et al. Lepidopterismo por *Hylesia nigricans* (mariposa negra). Investigación y acción preventiva en Buenos Aires. *Medicina* 2005; 65(3):241-6. Available from:  
<http://sgc.anlis.gob.ar/handle/123456789/116>

24. Novak F, Pelissou V, Lamy M. Comparative morphological, anatomical and biochemical studies of the urticating apparatus and urticating hairs of some lepidoptera: *Thaumetopoea pityocampa* Schiff., *Th. processionea* L. (Lepidoptera, Thaumetopoeidae) and *Hylesia metabus* Cramer (Lepidoptera, Saturniidae). Comp Biochem Physiol. 1987;88(1):141-6.  
[https://doi.org/10.1016/0300-9629\(87\)90112-5](https://doi.org/10.1016/0300-9629(87)90112-5)
25. Casalá A, Bianchi C, Sánchez Navarro JV, Bianchi O, Balsa R. Granuloma de las manos por nidos de lepidópteros (*Hylesia nigricans*). Arch Argent Dermat. 1967;17(4):307-13.
26. Ministério do Meio Ambiente (BR). Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis. Instrução Normativa nº 141, de 19 de dezembro de 2006. Regulamenta o controle e o manejo ambiental da fauna sinantrópica nociva. Diário Oficial da União. Brasília, DF, 20 dez 2006. Seção 1(243):139-40.

