

Title: First report of cutaneous lepidopterism by *Hylesia invidiosa* (Lepidoptera: Saturniidae): outbreak description and review of the literature

Running head: Cutaneous lepidopterism by *Hylesia invidiosa*

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Abstract

Cutaneous lepidopterism associated with exposure to setae from *Hylesia* moths has been frequently reported in the Americas. Despite efforts to understand its pathophysiology, little is known about moth biology, treatment approaches, and outbreak prevention and control for the implicated species. This affects the direction of clinical management and exacerbates the social and public health implications of lepidopterism. In March 2024, the Ministry of Health of Costa Rica was alerted about human cases of dermatitis in the Tucurrique district, Cartago province, which residents attributed to moths. Fifteen adult moths were collected in the surroundings of a school in the affected community. The specimens were morphologically identified as *Hylesia invidiosa*. A fragment of the cytochrome *c* oxidase subunit I (*cox-I*) gene was amplified and sequenced from one specimen for molecular confirmation of the species, yielding complete homology to reference DNA sequence data (GenBank accession number JQ569633.1). Moreover, in March 2025, a second outbreak with the same characteristics was reported in the Tuis district, Cartago province. To the best of the authors' knowledge, this is the first published report of lepidopterism outbreaks associated with *H. invidiosa*. Herein, we also provide a historical overview of *Hylesia* lepidopterism in Latin America and discuss previously reported treatment approaches, control actions, and measures to prevent and mitigate the effects of *Hylesia* outbreaks.

INTRODUCTION

The moth genus *Hylesia* Hübner, 1820 (Lepidoptera: Saturniidae: Hemileucinae) comprises 283 species, distributed from the north of Mexico to Argentina.^{1,2} Morphologically, adult females are characterized by the presence of narrow and dentate antennae and epiphyses; both sexes lack a median dorsal mesoscutal ring as well as white stripes in the forewings, with the M₁ vein on the forewing originating in the discal cell's apical angle.³ In general, information on the biology, ethology, and ecology of *Hylesia* is very limited, and only recorded for a few species, such as *Hylesia metapyrrha*, *Hylesia nanus*, *Hylesia nigricans*, *Hylesia acuta*, *Hylesia continua*, *Hylesia umbrata*, and *Hylesia paulex*.⁴⁻¹¹ Natural history descriptions are only available for a limited number of species, but the tendency shows that their feeding preferences include a wide range of host plant families.^{7,8}

Hylesia invidiosa Dyar, 1914 was described from Taboga Island, Panama, and has been recorded in other countries, such as Colombia and Costa Rica.^{12,13} The morphological features of *H. invidiosa* include a soft gray color, forewings with a discal mark presenting as a dark cloud, indistinct pale lines converging toward the inner margin, and a marginal pale space on its lower half. The hindwings present a single, nearly straight, pale band beyond the end of the cell.¹² Unfortunately, biological data, including life cycle duration, seasonality, and morphology of its immature stages, are not well known.

The medical importance of *Hylesia* moths is well-documented, considering that setae from the larvae and adults may cause envenomation leading to erucism and cutaneous lepidopterism, respectively, after they come in contact with or penetrate the cutaneous or subcutaneous tissue of humans. In this regard, various species (e.g. *Hylesia metabus*, *H. nigricans*, *H. paulex*) have been

implicated in outbreaks of dermatitis, also known as Caripito itch, throughout Latin America.^{9,14-}

²¹ Caripito itch typically presents as a pruritic papular and urticarial eruption, appearing minutes to hours after accidental or occupational exposure of the skin to the moth's setae, with symptoms persisting for up to a week after contact with the source is terminated.¹⁴ Other less common manifestations include systemic reactions and anaphylaxis.^{14,19}

Herein we describe outbreaks of cutaneous lepidopterism by *H. invidiosa* related to the moth's seasonal mass emergence in Costa Rica, which, to the best of our knowledge, represent the first report of lepidopterism associated with this species. Additionally, we provide an overview of reported cases of *Hylesia* dermatitis in Latin America, including previously reported treatment approaches, control actions, and measures to prevent and mitigate the effects of *Hylesia* outbreaks.

MATERIALS AND METHODS

Outbreak alerts and specimen collection

In October 2023, the Ministry of Health of Costa Rica (MHCR) was notified of the occurrence of an outbreak of dermatitis cases, which presumably presented a few minutes after human contact with moths. The alert was issued by the residents of the Tucurrique district, a small town situated approximately 777 meters above sea level (masl) in the Jiménez canton, Cartago province (9.8533° N, 83.7212° W). As these moths had not previously been recorded in the locality nor recognized as a public health concern, specimens were not collected, and individual cases were not investigated further at that time. However, in March 2024, a second outbreak of moth-related dermatitis in the community was reported to the local MHCR authorities by a public health center and concerned citizens, with cases requiring medical attention (**Figure 1A, B**). Following alerts, MHCR personnel manually collected 15 adult moths in the surroundings of a school in the affected

community and transported them to the Medical Entomology Laboratory of the School of Microbiology, University of Costa Rica (UCR), for identification. In March 2025, the MHCR was alerted again regarding moth-related dermatitis cases, this time, in the Tuis district of the Turrialba canton, Cartago province (9.8391° N, 83.5808° at approximately 735 masl). In this case, 19 adult moth specimens were collected by MHCR officials and transported to UCR for identification. After the outbreaks, MHCR officials gathered and summarized the epidemiological and clinical information available from the local clinics and residents who made the reports.

Specimen identification

Fourteen specimens were pinned, and morphology was compared to Lepidoptera reference material deposited in the Arthropod Collection of the National Museum of Costa Rica (MNCR). For confirmation, genomic DNA was extracted from a complete set of legs from one specimen using the NucleoSpin Tissue Kit (Macherey-Nagel). Subsequently, a 710 bp fragment of the cytochrome *c* oxidase subunit I (*cox-I*) gene was amplified by end-point PCR using the LCO1490 and HCO2198 primers, as previously described.²² The PCR product was purified with an enzymatic EXO/FastAP mixture (ThermoFisher Scientific) and sent to Macrogen Inc. (South Korea) for Sanger sequencing. In addition, one voucher specimen was deposited in the University of Costa Rica's Medical Entomology Collection, while the remaining were processed for analyses not included in this work.

Literature search

A scoping review of the literature was conducted to provide an overview of *Hylesia* lepidopterism outbreaks in Latin America, with focus on the following aspects: i) implicated

species, ii) employed treatment, iii) prevention measures and iv) control actions. For this purpose, articles including original research papers, reviews, short communications, theses, and letters to the editor written in English, Spanish, Portuguese or French were retrieved from three electronic databases, namely PubMed, SciELO, and ScienceDirect. A combination of keywords (e.g. “*Hylesia*”, “lepidopterism”, “dermatitis”, “moth”, “Latin America”) with Boolean operators was employed to iteratively refine the search. After retrieval, articles were qualitatively screened for adherence to scope and suitability. Finally, selected articles were reviewed, and the abovementioned metadata were extracted.

RESULTS

Moth identification

Collected specimens were provisionally identified as *Hylesia invidiosa* after comparison to voucher specimens MNCR-A2223379 (♂), MNCR-A1008367 (♂), MNCR-A1378915 (♂), MNCR-A1008358 (♀), and MNCR-A956785 (♀) (**Figure 1C**). Morphological comparisons were established based on parameters listed by Dyar (1914) in the original species description. Moreover, the color patterns in the collected material agreed with those in a male specimen illustrated elsewhere, further supporting its identification as *H. invidiosa*.²³ In addition, morphological identification was confirmed molecularly, with the resulting *cox-1* sequence showing 100% homology with available *cox-1* *H. invidiosa* reference sequences (GenBank accession number JQ569633.1). The sequence obtained in this study was deposited in GenBank with accession number PV464750.

Outbreak descriptions

During the 2024 outbreak, teachers in the Tucurrique community notified health authorities regarding the occurrence of generalized swelling and dermatitis in school children after playing with moths. Other reports included occupational exposure to moth setae, which occurred in at least one patient while cleaning the remnants of live and dead moths in a public health center, as well as direct contact with moths, described by another patient while waiting in line for routine testing in the same establishment. In this outbreak, the MHCR authorities received individual alerts directly from several concerned residents, although the precise number of affected patients is still unknown. Overall, those affected mentioned that symptoms presented a few minutes to hours after exposure, which lasted up to two weeks in one case. Clinical manifestations included fever, generalized rash, erythema in the affected areas, and irritability. No systemic reactions were recorded. In general, treatments recommended by local physicians included loratadine, dexamethasone, chlorphenamine, and topical calamine, followed by the resolution of symptoms. Finally, after the report and resolution of these cases, there were no further sightings of *H. invidiosa* adults in the community, even without application of control measures for moths.

As for the 2025 outbreak, cases presented in school children, presumably after contact with moths. During this event, no patients were known to seek medical attention. Thus, information regarding specific symptoms and treatment measures is not presented. Nonetheless, one author of the present report experienced typical *Hylesia*-associated dermatitis upon handling specimens for analysis (**Figure 1A**). Symptoms began minutes after exposure to moth setae and intensified over the following 48 hours. These included the presence of a maculopapular pruritic rash on the extension of the dorsum and venter of both forearms, which were the exposed areas, as well as nausea during the first 24 hours after contact. Clinical manifestations were resolved after two weeks without treatment.

Review of the literature

A total of 23 articles describing over 2000 *Hylesia* lepidopterism cases in Latin America were retrieved for review and have been summarized by species in **Table 1**. Including this report, article publication dates range from 1947 to 2025, and reports depict the clinical manifestations associated with cutaneous lepidopterism due to *Hylesia alinda*, *Hylesia frigida*, *Hylesia lineata*, *H. continua*, *H. invidiosa*, *H. metabus*, *H. nigricans*, *H. paulex*, and at least one unidentified *Hylesia* species. Publicly available records include reports for a total of 9 countries, namely Mexico, Costa Rica, Panamá, Colombia, Venezuela, French Guiana, Brazil, Argentina, and Trinidad and Tobago (**Figure 2**). Altogether, treatment course has only been described for lepidopterism cases associated with 5 species (i.e., *H. invidiosa*, *H. metabus*, *H. nigricans*, *H. paulex*, and *Hylesia* sp.), and is largely focused on symptomatic treatment involving analgesia, antihistamines, corticosteroids, and other normally prescribed drugs for dermatitis management. Finally, prevention and control measures include general actions which may be applicable to a wide range of *Hylesia* species, which are only sparsely mentioned throughout the available literature involving *H. alinda*, *H. metabus*, *H. nigricans*, and *H. paulex*.

DISCUSSION

The genus *Hylesia* occurs exclusively in the Americas and is the second most diverse within the Hemileucinae (Lepidoptera: Saturniidae), which presents its greatest distribution in the Neotropics with 670 known species distributed in 49 genera.¹ In Costa Rica, 61 hemileucine moth species have been described, and as opposed to most saturniids, some of them present diurnal

males; larvae are gregarious and possess defensive spine-like tubercles.¹¹ Moreover, pupation is reported to occur in leaf litter rather than in the soil, and imaginal formation occurs in a cocoon.²³

Hylesia invidiosa has been reported in Central America since 1914¹²; in Costa Rica, it has been collected at altitudes ranging from 0 to 1200 masl in all provinces except Heredia.²⁴ Locality (district-canton) records by province are as follows: Puntarenas, in San Vito-Coto Brus (1200 masl), Sierpe-Osa (200 masl), Jimenez-Golfito (0-100 masl), and Tárcoles-Garabito (50 masl); Guanacaste, in Santa Cecilia-La Cruz (700 masl) and San Antonio-Nicoya (100 masl); Limón, in Bratsi-Talamanca (70 masl) and Valle La Estrella-Limón (100 masl); Alajuela, in Upala-Dos Ríos (650 masl); San José, in San Juan Mata-Turrubares (500 masl); and Cartago, in Santa Teresita-Turrialba (1000 masl), in addition to Tucurrique-Jiménez and Tuis-Turrialba, which are described in this report.

In Guanacaste, *H. invidiosa* larvae have been reported to feed on *Hymenolobium mesoamericanum* (Fabaceae) and *Hampea appendiculata* (Malvaceae); however, other records indicate that it can also feed on *Byrsonima crassifolia* (Malpighiaceae) and *Cedrela odorata* (Meliaceae) (Janzen, D.H. and Hallwachs, W., personal communication, 2024). In Tucurrique and Tuis, both *H. appendiculata* and *C. odorata* are common in secondary forests, riverbanks, and pastures. *Byrsonomia crassifolia* is less frequent but can be found on farms or in gardens as ornamentals, whereas *H. mesoamericanum* is not common to the area and is distributed below 400 masl.²⁵ Since *H. appendiculata* is found in both Guanacaste and other localities where *H. invidiosa* has been reported, further research regarding its role as a host plant for this moth species is required.

Currently, knowledge about *H. invidiosa* is limited to adult morphology and distribution, with no available information regarding its life cycle, seasonality, ethology, ecology or immature

instar morphology.^{12,23} Seasonality has been reported for other species (i.e., *H. metabus* in French Guiana), wherein infestations may be more important during the dry season.²⁰ In this sense, even though more observations are required to confirm a pattern in seasonality for *H. invidiosa* in Costa Rica, the occurrence of consecutive outbreaks during the dry season is highly suggestive of such a pattern.

From the standpoint of medical entomology, this report constitutes the first description of lepidopterism by *H. invidiosa*, as well as the first formal record of lepidopterism outbreaks by *Hylesia* species for Costa Rica. Anecdotally, in a paper describing the natural history of *Hylesia lineata* in Costa Rica, one researcher reported an intense burning and itching sensation when exposing their skin to the moth's setae, even after specimens had been conserved in alcohol for two years.²⁶

Historically, outbreaks of lepidopterism associated with *Hylesia* moths have been reported in Latin America since 1918, with a total of eight identified species as well as at least one unidentified species implicated in clinical cases, spanning thirteen countries: Mexico, Costa Rica, Panama, Colombia, Venezuela, Trinidad and Tobago, Suriname, French Guiana, Brazil, Peru, Chile, Uruguay, and Argentina (**Table 1, Figure 2**).²⁷ Although there are reported cases from Peru and Uruguay, details about these records could not be retrieved by any means and thus are not included in this work.²⁸⁻³⁰ In the same manner, while cases have been presumably reported from Chile and Suriname, no references related to such reports are available in the literature.^{9,16} In the case of Brazil, French Guiana, Argentina, and Venezuela, an annual seasonal recurrence is reported, with an entomological surveillance system established in the latter.³¹⁻³³ It is worth noting that, due to the common occurrence of *Hylesia* lepidopterism in these countries, as well as the

anecdotal mention of epidemics without further specifications in different publications, a substantial underreporting of cases is expected.^{20,34-36}

Moth-related lepidopterism outbreaks due to *Hylesia* species are particularly relevant in mass emergencies, with moths presenting in numbers associated with human dwellings. Other contexts of interest include piers and watercraft, where important infestations have been associated with moth swarms at nighttime, affecting crewmembers by direct contact with moths or setae left on ship surfaces.^{14,17,18,34,37,38} Less common individual encounters include strikes with moths during a forest excursion, driving, and specimen manipulation during scientific research.^{9,19}

Remarkably, Brazil alone accounts for the highest number of reported cases per country, holding a count of 1541 cases, including epidemics and one publication comprising the highest number of cases in a published report, with 707 cases.^{15,16,39,40} Among these reports, the presence of large numbers of moths, together with the lack of appropriate clothing and abundant surrounding vegetation have been identified as risk factors for lepidopterism. Overall, these cases have been described as a pruritic erythematous dermatitis linked to *H. paulex*, *H. nigricans*, and an unidentified *Hylesia* species. Venezuela records over 179 cases associated with either *H. metabus* or an unidentified *Hylesia* species, which include typical symptoms as well as conjunctivitis, secondary lesions with erosion and infection, insomnia, presence of confluent herpetiform vesicles with intense burning and stabbing pain, fever, emesis, dyspnea, and profuse sweating.^{14,17,19,34,35,37,38,41}

In Panama, recurrent outbreaks due to an unidentified species (with one involving at least 268 cases, mostly children) have been attributed to the moth's seasonal migration between September and October and have been extensively covered in the country's national press by the Panamanian Ministry of Health.⁴² Scientific records on these events are scarce, nonetheless,

historical anonymous records and personal communications of outbreaks occurring over more than four decades in the Panama Canal Watershed have been summarized elsewhere.¹⁰ In the case of French Guiana, various epidemics due to *H. metabus* have been reported, as well as one case involving 20 crew members aboard an oil tanker who presented a generalized pruritic dermal reaction with most of them recovering spontaneously.^{18,20} In Mexico, at least 112 cases were recorded during various outbreaks associated with *H. alinda*, while another outbreak with an unspecified case count was associated with *H. frigida*.⁴³⁻⁴⁵ In these cases, symptoms included dermatitis, pruritic rash, erythema, and fever after exposure to moths.

In Argentina, all 56 reported cases have been associated with *H. nigricans*, including typical symptoms, as well as fever, shivers, and an intense burning sensation.^{21,32,46} Furthermore, in Colombia, 2 researchers studying sexual dimorphism in *H. continua* reported experimenting an erythematous rash with intense pruritus after specimen manipulation.⁹ Finally, various countries are involved in an outbreak of dermatitis reported in 22 crewmembers aboard a commercial vessel departing from Venezuela and sailing to Trinidad and Tobago.¹⁷ The vessel finally docked in Brazil, where the situation was assessed and lepidopterism due to an unidentified *Hylesia* sp. was confirmed. In this case, patients developed typical symptoms immediately after contact with migrating moths in both Venezuela and Trinidad and Tobago, and lesions lasted up to 14 days with treatment.

Although the epidemiology of cutaneous lepidopterism outbreaks may differ depending on the biology of the implicated moth species, case treatment seems standard. One initial recommendation is to remove all remaining moth setae using adhesive tape or forceps.⁴⁷ In addition, symptoms may be alleviated effectively with the use of cold compresses or warm compresses with sodium bicarbonate, as well as the application of local anesthetics (lidocaine,

tetracaine) and astringent/antipruritic lotion (calamine).^{15,19} Other commonly reported pharmacological treatments for *Hylesia* dermatitis include oral and/or topical antihistamines (chlorpheniramine maleate, dexchlorpheniramine, loratadine, cetirizine, etc.) and corticosteroids (hydrocortisone, triamcinolone, etc.) (**Table 1**). However, their effectiveness may be limited in some cases.¹⁹

Strategies for prevention of lepidopterism due to *Hylesia* spp. include, essentially, education, awareness, and application of behavioral measures aimed at limiting contact with moths and their setae.¹⁵ For example, limiting the use of external light sources and switching to yellow light bulbs has been suggested as an effective way to decrease moth attraction to human dwellings.^{16,20,21,45} Additional recommended actions include installing cloths or nets on doors and windows to prevent moths from entering houses; avoiding shaking clothes, bedding, towels and alike before washing; avoiding hanging clothes outdoors to dry during outbreaks; pouring water on the floor before sweeping to minimize dispersal of setae; cleaning walls, utensils, furniture, and other objects with a damp cloth to remove setae; and using protective clothing when at risk of contact with moths or setae.^{15,16,20,21} Moreover, epidemiological and entomological surveillance are required to identify possible risk factors and outbreak seasonality, which can be used as input for early warning and preparation efforts.³²

In the event of an outbreak, wherein there is severe impact that cannot be contained with the previously outlined prevention measures, control measures may be implemented. These include removal and elimination of eggs and larvae from known host plants and affected human settlements, use of light traps for adult collection, and targeted application of pyrethroids, organophosphates, and residual insecticides at specific sites.^{15,16,20,21} However, the indiscriminate use of light traps and insecticides is not recommended due to the irreversible impact on beneficial

insects and other organisms, as well as the possibility of promoting insecticide resistance.¹⁶ As an alternative, the use of *Bacillus thuringiensis kurstaki* (Btk) has been proposed; nonetheless, spraying Btk in forests and undeveloped land also affects populations of other moths and butterflies, in which case a more specific and targeted approach is preferred.^{21,33,48,49}

For the first time, *H. invidiosa* is specifically associated with lepidopterism outbreaks, which included typical clinical manifestations and conservative treatment measures, with no further sightings of moths after the episodes. Overall, *Hylesia* lepidopterism outbreaks constitute events of public health concern in Latin America. At the same time, these events serve as an opportunity to establish appropriate prevention and control measures for future outbreaks, as well as providing public health officials and residents with information regarding such measures, expected symptoms, and treatment. Finally, the occurrence of these outbreaks highlights the need to further study the biology, ethology, ecology, and morphology of *H. invidiosa* and other species that can affect human health.

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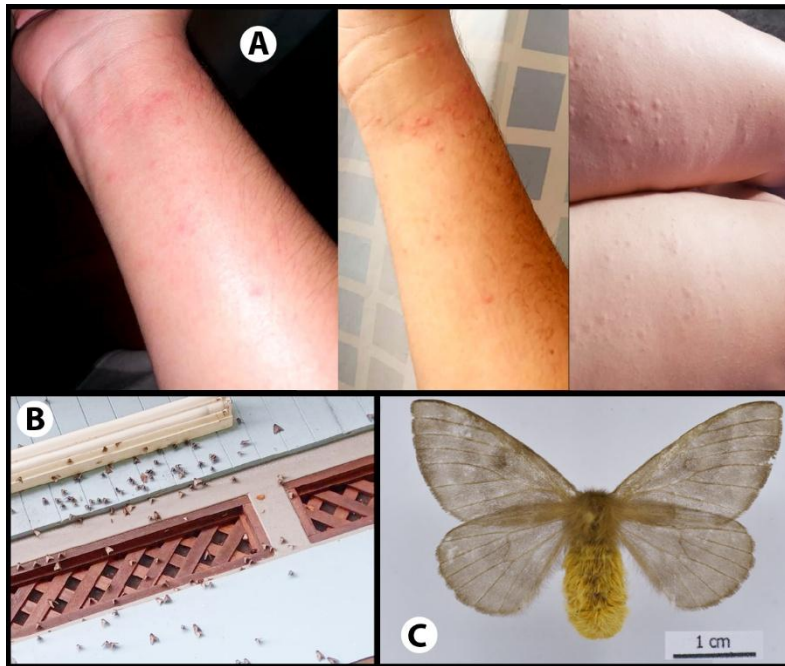


Figure 1. Outbreak of lepidopterism reported in Tucurrique, Costa Rica, March 2024. (A) Moth-associated dermatitis. (B) *Hylesia invidiosa* adults spotted in the locality. (C) *H. invidiosa* adult female, Arthropod Collection, MNCR.

Figure 1. Alt text: An image panel of skin lesions and moths showing *H. invidiosa* dermatitis in venter of forearms and dorsum of thighs as well as a cluster of *H. invidiosa* specimens on a building wall and a pinned reference specimen.

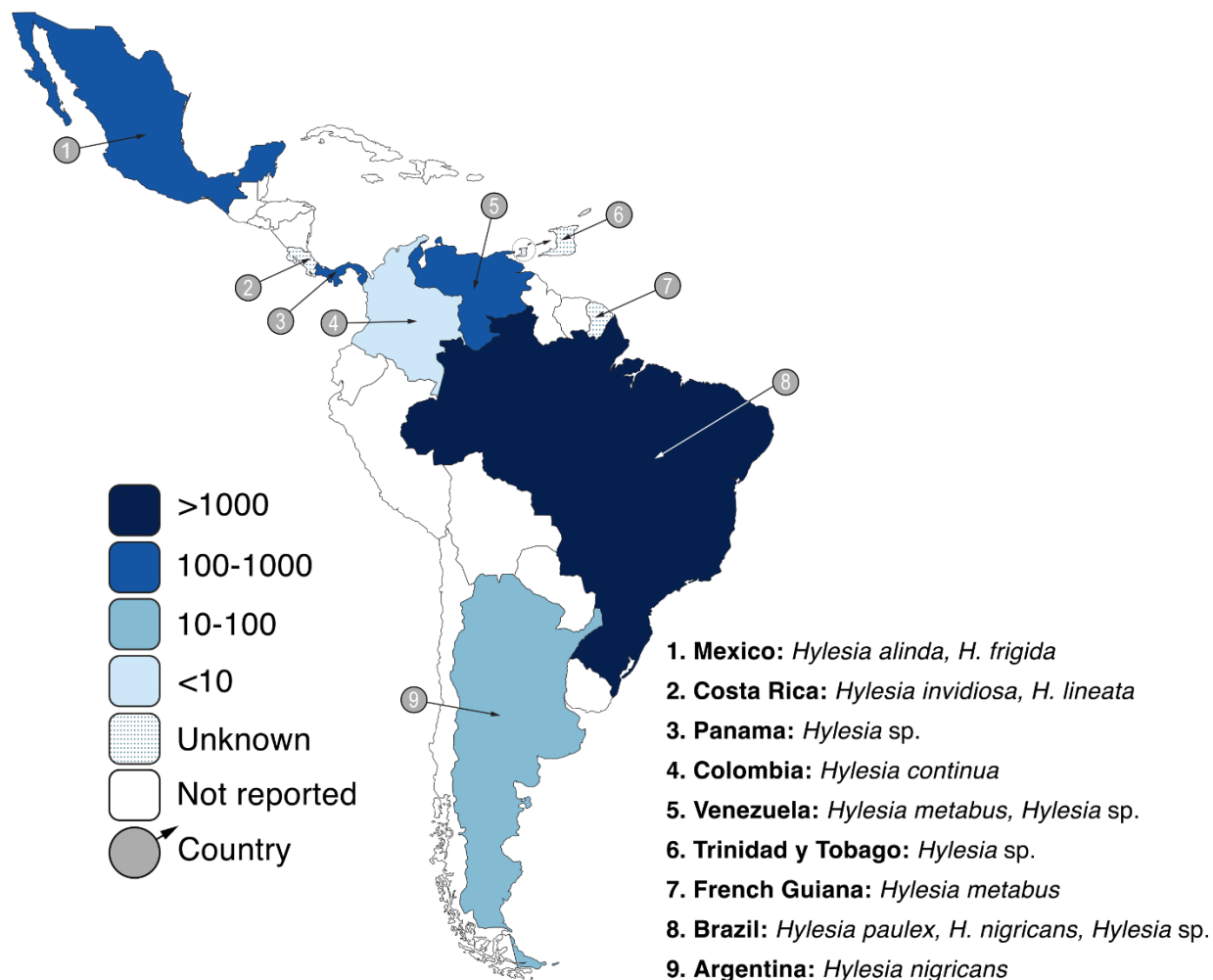


Figure 2. Distribution of dermatitis cases associated with *Hylesia* species. The color scale depicts the number of cases per country.

Figure 2 Alt text: A map diagram of Latin America showing the distribution of *Hylesia* species and dermatitis cases.

REFERENCES

1. Lemaire C, 2002. The Saturniidae of America 4: Hemileucinae. Keltern, Germany: Goecke & Evers.
2. Dell’Erba R, 2023. Phylogenetic analysis of *Hylesia* Hübner, 1820 (Lepidoptera, Saturniidae, Hemileucinae) [doctoral thesis]. São Paulo, Brazil: Museum of Zoology, University of São Paulo.
3. Michener CD, 1952. The Saturniidae (Lepidoptera) of the Western Hemisphere, morphology, phylogeny, and classification. *Bull Am Mus Nat Hist* 98: 339–502.
4. Wolfe K, 1988. *Hylesia acuta* (Saturniidae) and its aggregate larval and pupal pouch. *J Lepid Soc* 42: 132–137.
5. Santos GP, Zanuncio TV, Dias OS, Zanuncio JC, 1996. Biologia de *Hylesia nanus* (Walker) (Lepidoptera: Attacidae). *Ano Soc Entomol Brasil* 25: 479–482 .
6. Specht A, Formentini AC, Corseuil E, 2005. Biological aspects of *Hylesia metapyrrha* (Lepidoptera; Saturniidae; Hemileucinae), in laboratory. *Braz J Biol* 67: 173–177.
7. Specht A, Formentini AC, Corseuil E, 2006. Biologia de *Hylesia nigricans* (Berg) (Lepidoptera, Saturniidae, Hemileucinae). *Rev Bras Zool* 23: 248–255.
8. Pereira AIA, Zanuncio VV, Lorenzon AS, Bolognani H, Fernandes BV, Hendrik Mielke OH, Serrão JE, Zanuncio JC, 2009. Biological and morphological characteristics of *Hylesia paulex* (Lepidoptera: Saturniidae) fed with *Eucalyptus urophylla* (Myrtaceae). *Interciencia* 34: 645–649.

- 395 9. Álvarez-García DM, Díaz-Pérez JA, Amarillo-Suárez Á, 2015. *Hylesia continua* (Walker,
396 1865) (Lepidoptera: Saturniidae) en una localidad del norte de Colombia: Dimorfismo en
397 pupas y lepidopterismo. *Acta Zool Mex* 31: 327–330.
- 398 10. Aiello A, Young V, 2018. *Hylesia umbrata* (Saturniidae: Hemileucinae): A Mystery. *J Lepid*
399 *Soc* 72: 35–43.
- 400 11. Murillo-Hiller LR, 2025. Butterflies and moths of Costa Rica. New York, USA: Cornell
401 University Press.
- 402 12. Dyar H, 1914. Report on the Lepidoptera of the Smithsonian biological survey of the Panama
403 Canal Zone. *Proc U S Natl Mus* 47:139–350.
- 404 13. Comoglio L, Brechlin R, 2023. An updated checklist of the wild silkmoths (Lepidoptera,
405 Saturniidae) of Colombia. *Zookeys* 1178: 191–264.
- 406 14. Dinehart S, Archer E, Wolf J, McGavran M, Reitz C, Smith E, 1985. Caripito itch: Dermatitis
407 from contact with *Hylesia* moths. *J Am Acad Dermatol* 13: 743–747.
- 408 15. Moreno-Glasser C, Cardoso J, Carréri-Bruno G, Fátima-Domingos M, Pinto-Moraes R,
409 Carvalho-Ciaravolo R, 1993. Epidemic outbreaks of dermatitis caused by *Hylesia*
410 (Lepidoptera: Hemileucidae), in S. Paulo State, Brazil. *Rev Saude Pública* 27: 217–220.
- 411 16. Isehard C, Kaminski L, Marchiori M, Teixeira E, Romanowski H, 2007. Occurrence of
412 Lepidopterism Caused by the Moth *Hylesia nigricans* (Berg) (Lepidoptera: Saturniidae) in
413 Rio Grande do Sul State, Brazil. *Neotrop Entomol* 36: 612–615.

- 414 17. Moreira S, de Lima JC, Silva L, Haddad-Junior V, 2007. Description of an outbreak of
415 lepidopterism (dermatitis associated with contact with moths) among sailors in Salvador,
416 Estado da Bahia. *Rev Soc Bras Med Trop* 40: 591–593.
- 417 18. Hassing RJ, Bauer A, 2008. Pruritic Dermatitis on an Oil Tanker After a Visit to French
418 Guyana. *J Travel Med* 15: 464–465.
- 419 19. Paniz-Mondolfi A, Pérez-Alvarez A, Lundberg U, Fornés L, Reyes-Jaimes O, Hernández-
420 Pérez M, Hossler E, 2011. Cutaneous lepidopterism: dermatitis from contact with moths of
421 *Hylesia metabus* (Cramer 1775) (Lepidoptera: Saturniidae), the causative agent of caripito
422 itch. *Int J Dermatol* 50: 535–541.
- 423 20. Jourdain F, Girod R, Vassal J M, Chandre F, Lagneau C, Fouque F, Guiral D, Raude J, Robert
424 V, 2012. The moth *Hylesia metabus* and French Guiana lepidopterism: centenary of a public
425 health concern. *Parasite* 19: 117–128.
- 426 21. Cabrerizo S, Solera M, de Roodt A, 2014. Accidents due to Lepidoptera: *Hylesia nigricans*
427 (Berg, 1875) or “mariposa negra”. *Arch Argent Pediatr* 112: 179–182.
- 428 22. Folmer O, Black M, Hoeh W, Lutz R, Vrijenhoek R, 1994. DNA primers for amplification of
429 mitochondrial cytochrome *c* oxidase subunit I from diverse metazoan invertebrates. *Mol Mar*
430 *Biol Biotechnol* 3: 294–299.
- 431 23. Chacón I, Montero-Ramírez J, 2007. Mariposas de Costa Rica / Butterflies and moths of Costa
432 Rica. Heredia, Costa Rica: Instituto Nacional de Biodiversidad (INBio).

- 433 24. Museo Nacional de Costa Rica (MNCR). *Sistema de Búsqueda de Colecciones Historia*
434 *Natural*. Available at: <https://biodiversidad.museocostarica.go.cr/>. Accessed February 10,
435 2026.
- 436 25. Jiménez Q, Rojas E, Rojas V, Rodríguez L, 2011. Árboles Maderables de Costa Rica:
437 Ecología y Silvicultura. Segunda Edición. Heredia, Costa Rica: Instituto Nacional de
438 Biodiversidad (INBio).
- 439 26. Janzen DH, 1984. Natural history of *Hylesia lineata* (Saturniidae: Hemileucinae) in Santa
440 Rosa National Park, Costa Rica. *J Kansas Ent Soc* 57: 490–514.
- 441 27. Leger M, Mouzels P, 1918. Dermatose prurigineuse déterminée par des papillons saturnidés
442 du genre *Hylesia*. *Bull Soc Path Exot* 11: 104–107.
- 443 28. Delgado A, 1968. Lepidopterismo por *Hylesia* spp. (Lepidoptera) 1. Observaciones
444 biocenóticas en la Región de Rupa - Rupa del departamento de Huanuco, Perú. *Rev Peru*
445 *Entomol* 11: 96–102.
- 446 29. Salvatella R, 2003. Episodio de lepidopterismo en Uruguay por *Hylesia nigricans* Berg.
447 Available at: <https://higiene.edu.uy/lepidopterismo.html>. Accessed January, 2023.
- 448 30. Willat G, Capdevila A, Martinez M, Benavides C, Carballo R, 2003. Brotes de dermatitis
449 urticante por mariposas del género *Hylesia* em Uruguay. *Rev Salud Pública* 2: 4–6.
- 450 31. Centre National d'Expertise sur les Vecteurs (CNEV), 2011. *Réponse à la saisine Stratégies*
451 *et méthodes de lutte optimales contre Hylesia metabus*. Réf CNEV 001. Available at:

https://www.anses.fr/system/files/CNEV-Ft-Aout2011-Avis_Papillonite_Guyane.pdf.

Accessed February 10, 2026.

32. García-Zambrano B, 2020. Epidemiological surveillance system for lepidopterism by *Hylesia metabus* in Sucre state, Venezuela. *Bol Malariol Salud Amb* 60: 30–37.
33. Salomón OD, Simón D, Rimoldi JC, Villaruel M, Pérez O, Pérez R, Marchan H, 2005. Lepidopterismo por *Hylesia Nigricans* (mariposa negra): Investigación y acción preventiva en Buenos Aires. *Medicina (B. Aires)* 65: 241–246.
34. Dao L, 1963. Dermatitis causadas por mariposas del género *Hylesias*. *Inter J Dermatol* 2: 238–240.
35. Fornés L, Hernández J, 2001. Reseña histórica e incidencia en la salud pública de *Hylesia metabus* (Cramer) (Lepidoptera: Saturniidae) en Venezuela. *Entomotropica* 16: 137–141.
36. García B, Alvarado G, López R, 2009. Conocimientos y prácticas sobre *Hylesia metabus* (Cramer, 1775) y lepidopterismo en Capure, estado Delta Amacuro, Venezuela (Julio-Agosto 2005). *Bol Mal Salud Amb* 49: 293–301.
37. Hill Q, Rubinstein D, Kovacs J, 1948. Dermatitis resulting from contact with moths (genus *Hylesia*). *JAMA* 138: 737–740.
38. Zaias N, Ioannides G, Taplin D, 1969. Dermatitis From Contact With Moths (Genus *Hylesia*). *JAMA* 207: 525–527.
39. Gusmão H, Forattini O, Rotberg A, 1961. Dermatite provocada por lepidópteros do genero *Hylesia*. *Rev Inst Med Trop Sao Paulo* 3: 114–120.

- 472 40. Benvenuti LA, Cardoso JLC, Moraes RHP, 1998. Cutaneous leucocytoclastic vasculitis from
 473 contact with *Hylesia* moths (Lepidoptera: Saturniidae). *Trans R Soc Trop Med Hyg* 92: 428–
 474 429.
- 475 41. Rodríguez-Acosta A, Rubiano H, Reyes M, Fernández CT, 1998. Dermatitis causada por
 476 *Hylesia metabus* (Lepidoptera: Hemileucidae) en la región costera del Estado del Delta del
 477 Amacuro, Venezuela. *Rev Cubana Med Trop* 50: 215–217.
- 478 42. Chacón J, 2019. *Alerta: aumentan los casos de alergia causados por pelusa de la polilla*
 479 *'Hylesia.'* Panamá América. Available at:
 480 [https://www.panamaamerica.com.pa/sociedad/alerta-aumentan-los-casos-de-alergia-](https://www.panamaamerica.com.pa/sociedad/alerta-aumentan-los-casos-de-alergia-causada-por-pelusa-de-la-polilla-hylesia-1145024)
 481 [causada-por-pelusa-de-la-polilla-hylesia-1145024](https://www.panamaamerica.com.pa/sociedad/alerta-aumentan-los-casos-de-alergia-causada-por-pelusa-de-la-polilla-hylesia-1145024). Accessed January, 2023.
- 482 43. Beutelspacher C, 1986. Ciclo de la vida de *Hylesia frigida* Schaus (Lepidoptera: Saturniidae),
 483 una plaga forestal en Chiapas. *An Inst Biol Univ Auton Mex* 56: 465–476.
- 484 44. CDC, 1990. Moth-associated dermatitis—Cozumel, Mexico. *MMWR Morb Mortal Wkly Rep*
 485 39: 219–220.
- 486 45. Fernandez G, Morales E, Beutelspacher C, Villanueva A, Ruiz C, Stetler HC, 1992. Epidemic
 487 dermatitis due to contact with a moth in Cozumel, Mexico. *Am J Trop Med Hyg*, 46, 560–563.
- 488 46. Arias-Obarrio H, Saraceno EC, Calviello RC, 1981. Dermatitis por *Hylesia nigricans*. *Arch*
 489 *Argent Dermatol* 31: 171–180.

- 490 47. Brito R, Specht A, Filho WSA, Fronza E; Mielke CGC, 2015. Abdominal macrochaetae of
491 female *Hylesia oratex* Dyar, 1913 (Insecta: Lepidoptera: Saturniidae): external morphology
492 and medical significance. *An Acad Bras Ciênc* 87: 1763–1770.
- 493 48. Hernández JV, Osborn F, Herrera B, Liendo-Barandiaran CV, Perozo J, Velásquez D, 2009.
494 Parasitoides larva-pupa de *Hylesia metabus* Cramer (Lepidoptera: Saturniidae) en la región
495 nororiental de Venezuela: un caso de control Biológico Natural. *Neotrop Entomol* 38: 243–
496 250.
- 497 49. Ciminera M, Auger-Rozenberg MA, Caron H, Herrera M, Scotti-Saintagne C, Scotti I,
498 Tysklind N, Roques A, 2019. Genetic Variation and Differentiation of *Hylesia metabus*
499 (Lepidoptera: Saturniidae): Moths of Public Health Importance in French Guiana and in
500 Venezuela. *J Med Entomol* 56: 137–148.

501 **Tables and table legends:**

502 **Table 1.** Summary of available lepidopterism case reports associated with *Hylesia* in Latin
 503 America, including implicated species, country, total cases, year of report and reported treatment.

Species	Country	Total cases	Year	Treatment	Reference
<i>H. alinda</i>	Mexico	111	1990	Not reported	44, 45
<i>H. continua</i>	Colombia	2	2015	Not reported	9
<i>H. frigida</i>	Mexico	Not reported	1985	Not reported	43
<i>H. invidiosa</i>	Costa Rica ^a	Unknown	2023, 2024, 2025	Loratadine, dexamethasone, chlorphenamine and topical calamine	This report
<i>H. lineata</i>	Costa Rica	1	1984	Not reported	26
<i>H. metabus</i>	Venezuela ^a , French Guiana ^a	59	1997, 2008, 2011	Lidocaine, chlorpheniramine maleate, cetirizine, gabapentin, dexamethasone	18-20, 41
<i>H. nigricans</i>	Brazil ^a , Argentina ^a	222	1981, 2000, 2001, 2002	Cold compresses, antihistamines, corticosteroids	16, 21, 33, 46
<i>H. paulex</i>	Brazil	613	1981, 1989	Systemic antihistamines, topical corticosteroids, cold compresses.	15, 40
<i>Hylesia</i> sp.	Brazil, Venezuela, Panama ^a , Trinidad and Tobago	>1000	1947, 1960, 1969, 1971, 1972, 1975, 1980, 1984, 1991, 1998, 2000, 2003, 2006, 2008, 2014, 2019	Dexchlorpheniramine	10, 14, 15, 17, 23, 34, 38-40

504 ^aCountries where annual recurrence is reported.

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