

SHORT REPORT: LEPIDOPTERISM DUE TO EXPOSURE TO THE MOTH *HYLESIA METABUS* IN NORTHEASTERN VENEZUELA

ALFONSO J. RODRIGUEZ-MORALES, MELISSA ARRIA, JOSE ROJAS-MIRABAL, EDUARDO BORGES, JESUS A. BENITEZ, MELFRAN HERRERA, CARLOS VILLALOBOS, ANDREA MALDONADO, NESTOR RUBIO, AND CARLOS FRANCO-PAREDES*

Direction of Environmental Sanitary Epidemiological Surveillance, General Direction of Environmental Health and Sanitary Control, Ministry of Health and Social Development, Maracay, Venezuela; Environmental Health and Malariology Sucre State Office, Carúpano, Sucre, Venezuela; Epidemiology Department, Cajigal Sanitary District, Yaguaraparo, Sucre, Venezuela; Emory University, Atlanta, Georgia

Abstract. Lepidopterism refers to a spectrum of medical conditions in humans that usually involves the skin and results from contact with the adult or larval forms of certain butterflies and moths. We analyzed the epidemiologic and clinical features associated with exposure to the moth *Hylesia metabus* between 1970 and 2002 in the Cajigal district, Sucre, Venezuela. Fifty cases of lepidopterism mostly affecting individuals under 18 years of age were identified during this period and manifested as pruritic dermatitis with or without associated respiratory symptoms. With increased travel to endemic areas of lepidopterism, travel and tropical medicine practitioners should be aware of the clinical spectrum of this condition.

Human contact with caterpillars or adult forms of different families of moths or butterflies can be associated with significant morbidity.¹ These manifestations may vary from urticarial dermatitis and atopic asthma to consumption coagulopathy and renal failure.¹ Lepidopterism refers to a group of dermatologic manifestations and allergic reactions in humans that result from contact with adult or larval forms of certain butterflies and moths.^{1–3} The moths associated with lepidopterism account for less than 0.1% of all species of butterflies and moths.² *Hylesia metabus* (Lepidoptera: Saturniidae, Cramer 1775) has been recognized as the main cause of lepidopterism in Venezuela. It was first identified in Caripito, located in the Northeastern region of Venezuela near the Orinoco River, hence the term “Caripito itch,” and has also been identified in locations near Lake Maracaibo.^{3–6} These reactions are a result of contact with the urticating hairs and spines or setae of the female moth.^{1–4,7,8} In addition, cases of consumptive coagulopathy have been described in Venezuela associated with contact with the moth *Lonomia achelous*.^{3,4,7,8} Reports of lepidopterism affecting crews of oil tankers between 1937 and 1969^{9,10} in Venezuela were followed by an epidemiologic silence between 1970 and 1988.^{4–6} However, unpublished data indicate persistence of this moth’s population within the Northeastern region of Venezuela.

This study describes the epidemiologic and clinical features associated with the occurrence of severe allergic reactions resulting from exposure to the moth *Hylesia metabus* cases registered in Venezuela between 1970 and 2002 in the Cajigal district of Sucre, Venezuela. This district is located in a rain forest area, at an altitude of 0–800 m. The population is composed of roughly 8,000 individuals dispersed among 8 main villages. Ecological conditions in this region are conducive to the presence of *H. metabus*. Moth habitats tend to be close to human settlements. We retrospectively reviewed cases of individuals with the clinical diagnosis of lepidopterism due to *H. metabus* from medical records at the Cajigal District Hospital and Sanitary District Registries. The diagnosis of lepidopterism was established by the history of exposure and

close contact with adult moths or its urticating hairs or spines and its temporal association with the onset of signs and symptoms. Entomological field observations associated to these cases also confirmed the indoor and outdoor presence of moths, such as *H. metabus*, in all cases.

In all, 50 cases of lepidopterism were found. Among these, 58% were males, and the mean age at the time of diagnosis was 14 years. There were at least 2 to 3 cases per year during the study period, except for those years when there was a drought. However, many cases were seen in 1995 (27 patients, 54%) coinciding with a heavy rainy season and floods during that year. Most cases were observed 2 to 3 months after the onset of rainy season (last trimester of the year) except for those that manifested with respiratory symptoms, which tended to occur during dryer seasons. Most individuals lived in the town of Yaguaraparo, Cajigal (48%). All adult patients identified having been exposed when they were cleaning their houses, especially elevated areas of the house, such as lamps and light bulbs. Most patients (98%) developed skin manifestations (96% pruritic dermatitis and 2% dermatitis with severe edema in both arms). Eye lesions were also seen: 6% conjunctivitis and 2% conjunctivitis with associated periorbital edema. Upper and lower respiratory tract manifestations were observed in 6% of cases (4% atopic bronchitis and 2% with acute pharyngitis). All patients that presented with respiratory symptoms had concomitant pruritic dermatitis. None of the patients presented with recurrent episodes of *Hylesia metabus* related reactions. The most commonly affected group (70%) were children and adolescents, of which 23% occurred among children in the first year of life. In this age group, skin lesions were more severe than those seen in adults. Atopic bronchitis was the most common respiratory manifestation in children. All patients received topical drugs (steroids and antihistamines) and responded successfully. No further complications or sequelae were seen in this particular population.

In the past few decades there have been increasing reports of dermatologic, pulmonary, and systemic reactions after encounters with moths and butterflies worldwide.^{1,11–14} Pruritic dermatitis from contact with urticating hairs of “palometa peluda” (popular designation in Venezuela of *Hylesia metabus*) has been reported in many areas of Central and South America.¹¹ In Venezuela, although isolated cases were pre-

* Address correspondence to Carlos Franco-Paredes, M.D., M.P.H., Division of Infectious Diseases, Emory University School of Medicine, 69 Jesse Hill Jr. Drive, Atlanta, GA 30303. E-mail: cfranco@sph.emory.edu

viously reported, an epidemiologic study was not previously conducted. In our study, we identified a large number of children who were in direct contact with *Hylesia metabus*. This reflected the presence of these moths near human dwellings in all villages included in this study, particularly in the Yaguaraparo location. Not only were they near their dwellings, but many patients also found and collected spines or setae of *H. metabus* inside their homes. Children are prone to exploring their surroundings, which puts them at an even greater risk of developing lepidopterism; therefore, this condition should be included in the differential diagnosis of pruritic dermatitis in children living in infested areas.¹² The occurrence of cases during the rainy season correlates with favorable environmental conditions such as humidity, increased number of plants to feed on, and temperature to promote the development and life cycle of these particular insects in this region in Venezuela. However, it should be noted that the pulmonary manifestations of lepidopterism were mostly during the dryer seasons probably reflecting the ability of the setae to enter the respiratory tract and provoke mucosal and bronchial hyperreactivity.

In Yaguaraparo, there were reports of high concentrations of *Hylesia* flying at night near lighted white light bulbs. In addition, the risk of exposure was probably higher in this location given the fact that it represents the highest populated town (52% of the total population) of this municipality.⁵ Yaguaraparo has suitable ecological conditions for the development of *Hylesia metabus* as well many other insects, with wetland and mangroves in most municipality areas. We believe that there is underreporting of cases due to mild or moderate manifestations of disease that partially explain the variation in the number of cases throughout the 32 years of the study.

Human contact with the larval or adult forms of certain moths and butterflies that bear highly specialized external netting or urticating hairs and breakaway spines are responsible for the clinical manifestations of lepidopterism.¹⁻⁴ They use these parts to defend against attacks by predators and enemies.¹ Inflammatory response from contact with hairs of *Hylesia* is not only reflected in skin lesions seen among these patients¹³ but also as atopic bronchitis primarily among the pediatric population (an uncommon manifestation of this allergic response resulting from exposure to *Hylesia* moths). Histamine, kinin activators, and other as yet undefined proteins are responsible for the cutaneous and pulmonary symptoms of lepidopterism.¹ Mild cases of lepidopterism will resolve spontaneously. Therapy for more serious cases of lepidopterism is mainly supportive. No specific antivenom exists. Topical use of corticosteroids and pramoxine hydrochloride may provide some relief for cutaneous contacts.² The absence of recurrent episodes of reactions may reflect evidence of immune tolerance to the antigenic components of the moth's hairs after the initial exposure, but this needs to be further studied.

In response to the findings of this epidemiologic study, a national control program was initiated (including entomological, epidemiologic, and clinical surveillance programs), as lepidopterism has also been described in other regions of Northeastern Venezuela (Sucre, Monagas and Delta Amacuro). Vector control programs are considered of utmost importance. Currently, some entomological studies report potential biological tools such as the use of pathogenic bacteria

for control of the *Hylesia metabus* life cycle.¹⁴ In our experience, the use of the bacteria *Bacillus thuringiensis var. kurstaki* during different periods may also reflect the variability on the disease expression during the study period. One particular strategy that should be emphasized during presentations of control programs is that the surfaces of furniture, lamps, and light bulbs should be free of dust, to avoid accumulation of spines or setae of moths in infested areas. However, education to avoid exposure must be considered a fundamental strategy for populations living in areas where cases of lepidopterism have been previously reported. Given the increasing number of reports in many regions of the world,¹ travel and tropical medicine practitioners should be aware of the dermatologic and systemic effects of moths' envenoming.

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Authors' addresses: Alfonso J. Rodriguez-Morales, Direction of Environmental Sanitary Epidemiological Surveillance, General Direction of Environmental Health and Sanitary Control, Ministry of Health and Social Development, Maracay, Venezuela, and Environmental Health and Malariology Sucre State Office, Carúpano, Sucre, Venezuela, E-mail: ajrodriguezmd@hotmail.com. Melissa Arria, Jose Rojas-Mirabal, Eduardo Borges, and Jesus A. Benitez, Direction of Environmental Sanitary Epidemiological Surveillance, General Direction of Environmental Health and Sanitary Control, Ministry of Health and Social Development, Maracay, Venezuela. Melfran Herrera and Carlos Villalobos, Environmental Health and Malariology Sucre State Office, Carúpano, Sucre, Venezuela. Andrea Maldonado and Nestor Rubio, Epidemiology Department, Cajigal Sanitary District, Yaguaraparo, Sucre, Venezuela. Carlos Franco-Paredes, Emory University, Atlanta, GA.

Reprint requests: Carlos Franco-Paredes, M.D., M.P.H., Division of Infectious Diseases, Emory University School of Medicine, 69 Jesse Hill Jr. Drive, Atlanta, GA 30303, Telephone: 404-686-5885, Fax: 404-686-4508, E-mail: cfranco@sph.emory.edu.

REFERENCES

1. Diaz J, 2005. The evolving global epidemiology, syndromic classification of caterpillar envenoming. *Am J Trop Med Hyg* 72: 347-357.
2. Lee D, Pitetti RD, Casselbrant ML, 1999. Oropharyngeal manifestations of lepidopterism. *Arch Otolaryngol Head Neck Surg* 125: 50-52.
3. Benaim-Pinto C, Pernía-Rosales B, Rojas-Peralta R, 1991. Dermatitis caused by moths of *Hylesia* Genus (Lepidoptera, Saturniidae) in Northeastern States of Venezuela: I. Bioecology of *Hylesia metabus* Cramer. Clinical features of Lepidopterism determined by this species. *Am J Contact Dermatol* 2: 213-221.
4. Dinehart SM, Archer ME, Wolf JE Jr, McGavran MH, Reitz C, Smith EB, 1985. Caripito itch: dermatitis from contact with *Hylesia* moths. *J Am Acad Dermatol* 13: 743-747.
5. Martínez J, 1986. Informe sobre invasión de mariposas alergizantes. Hospital Centro de Salud "Irapa." Dirección Regional de Salud, Cumaná, Venezuela.
6. Creole Oil Company, *Revista Farol*. 1939. Creole Oil Company, Monagas, Venezuela.
7. Arocha-Pinango CL, Marval E, Guerrero B, 2000. *Lonomia* genus caterpillar toxins: biochemical aspects. *Biochimie* 82: 937-942.
8. Wirtz RA, 1984. Allergic and toxic reactions to non-stinging arthropods. *Annual Review of Entomology* 29: 47-69.
9. Zaias N, Ioannides G, Taplin D, 1969. Dermatitis from contact with moths (genus *Hylesia*). *JAMA* 207: 525-527.

10. Ducombs G, Lamy M, Michel M, Pradinaud R, Jamet P, Vincendeau P, Maleville J, Texier L, 1983. French Guiana "papillonnite" (lepidopterism). Clinical and epidemiological study. *Ann Dermatol Venereol* 110: 809–816.
11. Fernandez G, Morales E, Beutelspacher C, Villanueva A, Ruiz C, Stetler HC, 1992. Epidemic dermatitis due to contact with a moth in Cozumel, Mexico. *Am J Trop Med Hyg* 46: 560–563.
12. Maier H, Spiegel W, Kinaciyan T, Honigsmann H, 2004. Caterpillar dermatitis in two siblings due to the larvae of *Thaumetopoea processionea* L, the oak processionary caterpillar. *Dermatology* 208: 70–73.
13. Benvenuti LA, Cardoso JLC, Morales RHP, 1998. Cutaneous leucocytoclastic vasculitis from contact with *Hylesia* moths (Lepidoptera: Saturniidae). *Trans R Soc Trop Med Hyg* 92: 428–429.
14. Osborn F, Berilos L, Vitelli-Flores J, Monsalve W, Dorta B, Rodriguez-Lemoine V, 2002. Pathogenic effects of bacteria isolated from larvae of *Hylesia metabus* Krammer (Lepidoptera: Saturniidae). *J Invertebrate Pathol* 80: 7–12.