

Stings in humans by a parasitoid wasp of the genus *Sclerodermus* (Hymenoptera: Bethyridae) in Venezuela

Picaduras en humanos por una avispa parasitoide del género *Sclerodermus* (Hymenoptera: Bethyridae) en Venezuela

Charles Brewer-Carías¹, Karen Brewer² & Jorge M. González³

¹Director de Expediciones, Sociedad Venezolana de Ciencias Naturales; Miembro Correspondiente, Academia de Ciencias Físicas, Matemáticas y Naturales, Caracas, Venezuela.

²Fundacion Explora, Caracas, Venezuela.

³Austin Achieve Public Schools, Austin, Texas; Research Associate, McGuire Center for Lepidoptera and Biodiversity, USA.

Correspondence: J. M. González: gonzalez.jorge.m@gmail.com

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Wasps of the family Bethyridae are very diverse, with over 2,920 described species. They range from small to medium-sized, are frequently dark-colored and commonly known as flat wasps (Azevedo *et al.* 2018, Colombo *et al.* 2020). The females of many bethyrids are ant-like in appearance, frequently apterous, but some species are polymorphic and females could be both apterous and macrop-terous (Richards 1939, Evans 1964, 1978, Colombo & Azevedo 2020). Flat wasps parasitize larvae of Lepidop-tera and Coleoptera and few species have been reported to sting humans, causing slight to severe pain and allergic reactions to those who suffered the wasp attack (Oda *et al.* 1981, Harris 1996, Lee *et al.* 2014, Papini 2014, Almeida 2017, Skvarla 2018). Wasps in this family, like many other wasps, have the property of inoculating an anesthetic that paralyzes their host, which is later taken as food for the wasp's offspring (González & Terán 1996, Matthews *et al.* 2009, Lee *et al.* 2014, Almeida 2017).

Among flat wasps, the cosmopolitan genus *Scleroder-mus* Latreille, 1809, contains over 80 species worldwide (Almeida *et al.* 2017, Azevedo *et al.* 2018, Skvarla 2018). They are small wasps measuring 1.5 to 6 mm, and para-sitize several wood-boring beetle larvae in the families Cerambycidae, Buprestidae, Bruchidae, Bostrychidae, Te-nebrionidae, Kalotermitidae, and Curculionidae (Evans 1964, 1978, Azevedo *et al.* 2018, Skvarla 2018).

One of the authors (CBC) has encountered this tiny wasp species several times at his house in Caracas, Ven-ezuela. He was always taken by surprise by the tiny wasp (<3mm) (Figs. 1-2), thin as a thread, that looks like a little ant. This flat wasp species appears to be *Sclerodermus* nr. *domesticus* (Klug, 1809) based on Evans (1964, 1978). These wasps seem to be about 2.3 – 2.5 mm; with head and thorax not entirely light yellow and not uniformly cas-taneous; with mesoscutum slightly wider than long; meso-scutum and mesopleura considerably darker than pronotum and metapectal-propodeal complex; subangular sides of metapectal-propodeal complex (Figs 1-2).

These wasps can easily move through the clothes with-out difficulty and be able to sting the bearer multiple times, most especially if the victim can hold the insect by pressing it between his/her finger and his/her skin. As a result of its defensive action, the anesthetic toxin inoculated by each sting causes a pain similar to that of a cigarette burn. Then, papules of about 5 to 10 mm in diameter and about 1 mm high appear (Fig. 3), and the stinging sensation and reac-tion remain for a few minutes. The small lumps can take up to five days to disappear. How can such a small wasp sting and be so noticeable to a human? In the case of flat wasps, the typical prey is larger, thus the wasp's sting is efficient and powerful, making it painful to humans who have the misfortune to contact them (Gauld & Bolton 1988).



Figure 1. Apterous female of *Sclerodermus* nr. *domesticus* (Photo: Karen Brewer).

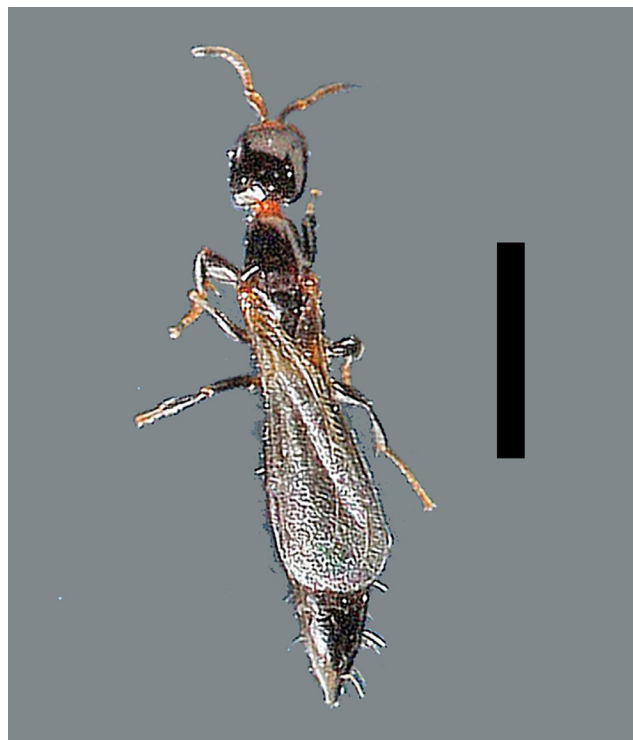


Figure 2. Macropterous male of *Sclerodermus* nr. *domesticus* (Photo: Karen Brewer)..



Figure 3. Leg skin of the first author of this note showing several papules up to 10 mm in diameter after three days of being stung by the flat wasp *Sclerodermus* nr. *domesticus*.

People sharing the same household with the first author have frequently been stung by these tiny wasps. The ceiling structure of this house has been built with Wild Cane or “Caña Amarga” [*Gynerium sagittatum* (Aubl.) P. Beauv.], Poaceae). It seems that small beetles of the family Curculionidae (Scolytinae) that bore the Wild Cane

ceiling could be the hosts of this flat wasp. One day, while driving, (CBC) felt the sting and when trying to capture or stop the culprit, a wasp slit through his trousers and was able to sting him eight times on the thigh. Almost immediately, inflammatory reactions appeared (Fig. 3). Even though the toxins injected by the wasp might have an anesthetic effect on its natural hosts, it certainly produces a stinging sensation. However, the wasp can move quickly and unnoticed and if unaware, it is sometimes difficult to find the origin of such stinging. Similar wasps might have produced this kind of damage and reactions, which we have experimented with while walking through the forest (Brewer Carias 2014).

Even though the wasp has been preliminarily identified as *Sclerodermus* nr. *domesticus*, some typical characteristics of that species could not be observed, but the females seem to be very similar, however, it could be a new species due to some noticeable differences, but to describe it as new, a molecular analysis is needed (W. Colombo, pers. comm.). However, this is the first time, as far as we know, that the genus *Sclerodermus* is mentioned for Venezuela, nonetheless it has been known previously from several other American countries (Evans 1964, 1978). Physicians, dermatologists, medical doctors, and medical entomologists, as well as public health workers, should be aware of the risk of exposure to these tiny flat wasp stings.

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REFERENCES

- Almeida, H. L. de, Jr., M. M. de Andrade, T. Scotti & R. Ferreira Krüger. 2017. Domestic infestation by *Sclerodermus* sp. with associated skin manifestation. *Anais Brasileiros de Dermatologia* 93(4): 582–584.
- Azevedo, C. O., I. D. C. C. Alencar, M. S. Ramos, D. N. Barbosa, W. S. Colombo, J. R. Vargas & J. Lim. 2018. Global guide of the flat wasps (Hymenoptera, Bethylinidae). *Zootaxa* 4489(1): 1–294.
- Brewer Carias, C. 2014. *Desnudo en la selva, supervivencia y subsistencia*. Caracas: Imprenta Altholitho, 220 pp. + 500 fotografías.
- Colombo, W. D. & C. O. Azevedo. 2020. Revalidation of the polymorphic genus *Acephalonomia* (Hymenoptera: Bethylinidae) and description of a new species from Micronesia. *European Journal of Entomology* 117: 235–242.
- Colombo, W. D., E. E. Perkovsky & C. O. Azevedo. 2020. Phylogenetic overview of flat wasps (Hymenoptera, Bethylinidae) reveals Elektroepyrinae, a new fossil subfamily. *Palaeoentomology* 003(3): 269–283.
- Evans, H. E. 1964. A synopsis of the American Bethylinidae (Hymenoptera, Aculeata). *Bulletin of the Museum of Comparative Zoology* 132: 1–222.
- Evans, H. E. 1978. The Bethylinidae of America North of Mexico. *Memoirs of the American Entomological Institute* 27: 1–332.
- González, J. M. & J. B. Terán. 1996. Parasitoides del género *Melittobia* Westwood (Hymenoptera: Eulophidae) en Venezuela. Distribución y hospederos. *Boletín de Entomología Venezolana* N.S. 11(2): 139–147.
- Gauld, I. & B. Bolton. 1988. *The Hymenoptera*. London: British Museum (Natural History) / Oxford University Press, 322 pp.
- Harris, A. C. 1996. The effects on a human of the sting of *Goniozus antipodum* (Hymenoptera: Bethylinidae). *New Zealand Entomologist* 19: 49.
- Latreille, P. A. 1809. *Genera crustaceorum et insectorum secundum ordinem naturalem in familias disposita, iconibus, exemplisque plurimis explicata*. Parisiis et Argentorati: Amand König, 4: [2]+ 399 pp., pls. 13–16.
- Lee, I-Y., S. Chang-Seob, S. Seobo, P. Jung-Won & Y. Tai-Soon. 2014. Human sting of *Cephalonomia gallicola* (Hymenoptera: Bethylinidae) in Korea. *Korean Journal of Parasitology* 52(6): 681–684.
- Matthews, R. W., J. M. González, J. R. Matthews & L. D. Deyrup. 2009. Biology of the parasitoid *Melittobia* (Hymenoptera: Eulophidae). *Annual Review of Entomology* 54: 251–266.
- Oda, T., A. Mori, K. Fujita, L. Monkada, T. Tachikawa & S. Tanaka. 1981. A case of the sting of a parasitic wasp, *Sclerodermus* sp. (Hymenoptera: Bethylinidae). *Tropical Medicine (Nagasaki)* 23: 213–216.
- Papini P. A. 2014. A case of stings in humans caused by *Sclerodermus* sp. in Italy. *Journal of Venomous Animals and Toxins Including Tropical Diseases* 20: 11.
- Richards, O. W. 1939. The British Bethylinidae (s. l.) (Hymenoptera). *Transactions of the Royal Entomological Society of London* 89: 299–305.
- Skvarla, M. J. 2018. A review of *Sclerodermus* Latreille, 1809 (Hymenoptera: Bethylinidae) infestations and report of the first case in North America North of Mexico. *Journal of Medical Entomology* 55(3): 752–756.