Polybia paulista Ihering, 1896

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Wasp is found mainly in the southeastern region of Brazil. This species of wasp gained international prominence when scientists discovered the MP1 substance in its venom, which has a high power to damage cancer cells. **Size:** About 1.5cm. **Black** color (Figure 1) [1-3].

Figure 1. *Polybia paulista* Ihering, 1896. Source: https://oglobo.globo.com/saude/estudo-mostra-como-veneno-de-vespa-brasileira-pode-matar-celulas-de-cancer-17373131.

Diet: The paulistinha wasp captures caterpillars and takes them to the nest to feed their larvae. They can also feed on insects and dead animals. **Habitat:** The wasp builds closed nests generally in soils. These strongholds are made from the fibers of dead wood trunks and branches. **Impact:** Wasps can cause health problems for people allergic to stings. It can even cause death in extreme cases. They can spread damage caused by other pests and diseases [3-5].

The species gained international notoriety after researchers found in its venom a toxin called MP1, with high power to destroy cancer cells. Considering that the toxin does not affect healthy cells, but only cells that harm the body, scientists believe that further studies on it could revolutionize cancer treatment. Its venom is so powerful and complex that it has

captured the attention of scientists for decades (Figure 2) [5-7].

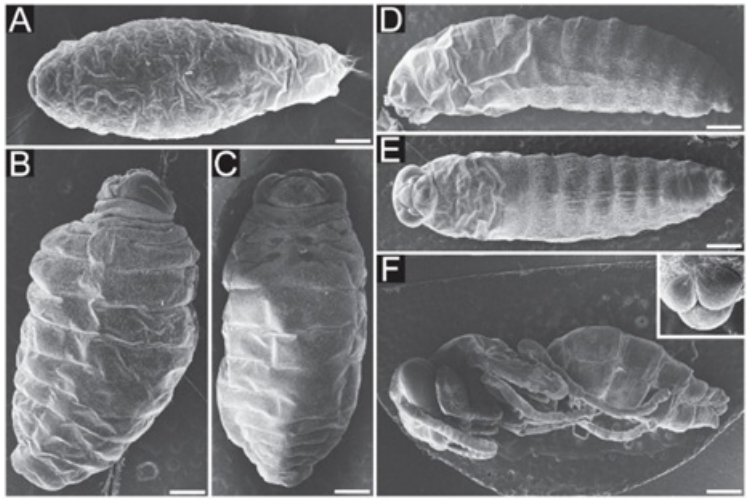

Figure 2. Immature stages of *Polybia paulista* Ihering, 1896: (A) ventral view of first instar larva; (B) side view of a fifth instar larva; (C) ventral view of a fifth instar larva; (D) lateral view of the prepupa; (E) ventral view of the prepupa, showing the last abdominal somite in insertion; (F) side view of the pupa. Scale bar sizes: (A) 0.185 mm; (B) 0.575mm; (C) 0.650mm; (D) 0.925mm; (E) 0.925mm; (F) 1,200mm. Source: https://www.researchgate.net/figure/Immature-stages-of-Polybia-paulista-A-ventral-view-of-a-first-instar-larva-B-side_fig2_262090938.

More than a hundred proteins and peptides smaller molecules have already been discovered and it is suspected that there are still more to be discovered. One of these peptides has a powerful antibacterial action, allowing the paulistinha to keep its nests protected against bacteria. Hence the scientific interest in its poison arose. It could be an alternative to overcome the growing resistance to antibiotics. This peptide, known as MP1, also attacks cancer cells of some types of cancer [8-9].

This cytotoxic effect is not uncommon, but the detail is that MP1 does this by binding with two lipids (fat molecules) that cells with some types of cancer prostate and bladder, as well as an especially drug-resistant variant of leukemia expressed on the outside of their membranes, and in healthy cells they remain “hidden” in their inner wall. That is why a medicine based on this compound has the potential to kill only diseased cells (Figure 3) [10-12].

Figure 3. *Polybia paulista* Ihering, 1896 observed in Brazil.Source: Joás (licensed under http://creativecommons.org/licenses/by-nc/4.0/ and https://www.inatu.../photos/351087139.

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