

# Isolation of microorganisms from Brazilian Caatinga green propolis and botanical origin

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Propolis is a mixture of resinous substances, mainly from flower buds and exudates from various parts of plants, and beeswax. There are approximately 13 types of propolis in Brazil, including the green propolis from Caatinga, discovered in recent years, which is predominantly produced with *Mimosa tenuiflora* (Willd.) Poir (jurema-preta) resins by *Apis mellifera* bees. For a long time, it was considered that propolis was a sterile compound due to its antimicrobial properties. However, there are few studies isolating and identifying the microorganisms present in propolis from other countries. Because of that, the objective of this work was to isolate microorganisms from the Brazilian Caatinga green propolis and its main botanical origin, the jurema-preta shoots. The materials were collected in January 2023 in the city of Remanso, Bahia state. Three replicates were generated from each propolis collector ( $n = 5$ ) and a composite sample was generated with resin coating leaves of jurema-preta. Each replica was represented by three grams of propolis and was immediately placed in a sterile falcon tube with 27 mL of Phosphate - Buffered - Saline (PBS) solution, and jurema's shoots were collected from three plants placed in a falcon tube with PBS, and stored in styrofoam boxes containing ice packs and transported to the Microbiology and Natural Products Laboratory at ESALQ/USP. Then, the samples were homogenized and, with a 1 mL aliquot, serial dilutions were made up to  $10^{-6}$  for bacteria and  $10^{-4}$  for fungi and actinobacteria, followed by plating in culture medium. The plates were incubated at 28 °C and inspected daily. As microorganisms were visible, they were transferred to new plates until total purification of the isolates. After 24 hours of incubation, it was possible to observe the growth of bacteria, while fungi and actinobacteria began to grow a week after plating. 31 microorganisms were isolated from propolis and 19 from jurema-preta shoots. Of these, 37 bacteria and 13 filamentous fungi were isolated, and no actinobacteria was isolated. The identified morphotypes of the bacteria were brown, yellow, white, gray and green; for fungi were black, white, black and white, brown and gray. With this, we realized that there are microorganisms associated with propolis that may come from its botanical origin, and it would require further investigation to understand this complex system.

**Key words:** Morphotype; *Mimosa tenuiflora*; *Apis mellifera*; jurema-preta

## Isolamento de microrganismos da própolis verde da Caatinga brasileira e de sua origem botânica

A própolis verde da Caatinga tem a *Mimosa tenuiflora* como principal fonte de resina e por muito tempo considerou-se que a própolis era um composto estéril devido às propriedades antimicrobianas. Porém, existem alguns estudos isolando microrganismos deste material. Por isso, objetivamos com este trabalho isolar microrganismos dessa própolis e sua respectiva origem botânica. O material foi coletado em Remanso, Bahia, e transportada para o Laboratório de Microbiologia e Produtos Naturais da ESALQ/USP, onde foram feitas diluições seriadas e plaqueamento. Foram isolados 31 microrganismos da própolis e 19 dos brotos de *M. tenuiflora*. Assim, concluímos que existem microrganismos associados à própolis.

**Palavras-chave:** Morfotipo; *Mimosa tenuiflora*; *Apis mellifera*; jurema-preta.

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