

SMALL HIVE BEETLE (*AETHINA TUMIDA*) IN AFRICANIZED HONEYBEE COLONIES IN COSTA RICA: STRATEGIES FOR DETECTION AND MONITORING

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Introduction: The small hive beetle (SHB), *Aethina tumida*, is a pest of honeybee (*Apis mellifera*) colonies. Endemic to sub-Saharan Africa, this pest has been reported in Africanized honeybee (AHB) colonies in North, Central, and South America. Specifically in Central America, it was first found in El Salvador in 2013, in Nicaragua in March 2014, and in Guatemala in August 2020. In Nicaragua, the SHB was confirmed in AHB colonies in San Juan del Sur, Department of Rivas, approximately eight kilometers north of the Costa Rican border, which increased the risk of entry to this country.

Objective: In this study the strategies for the SHB detection and monitoring in AHB colonies in Costa Rica are presented.



Figure 1. Dorsal view of an adult small hive beetle, *Aethina tumida*, in AHB's (Calderón & Ramírez, 2015).

Materials and methods: After the SHB was confirmed in Nicaragua, a sentinel apiary with four AHB colonies was established close to the border in Santa Cecilia, La Cruz, province of Guanacaste, Costa Rica. In addition, an epidemiological surveillance was conducted in the main beekeeping areas of the country (2015 - 2022) to determine the SHB's possible distribution. Beehives were monitored visually by examining all individual honeycombs, hive covers, and bottom boards. Furthermore, training was offered to beekeepers such as workshops and fieldwork, and training materials were distributed such as brochures focused on SHB recognition and identification, and methods for colony inspection.

Results: SHB was detected and confirmed in the sentinel apiary in August 2015 in La Cruz, Guanacaste, Costa Rica, where only adult beetles were detected inside AHB colonies. In addition, in September 2018, adult SHBs were found in a honeybee swarm located in Heredia-Central Valley in the middle of the country, about 265 km south from the first detection site. Furthermore, in October 2019, the SHB was confirmed in a apiary in Liberia, province of Guanacaste, approximately 25 km south from the initial point of detection in the country. Nowadays (2025), the SHB has been found in different apiaries in collaboration with trained beekeepers, especially in the provinces of Guanacaste, Heredia, Alajuela and San José. Adult beetles are the most frequent observed in AHB's, while larvae have been detected in weak colonies.



Figure 2. A larva of the small hive beetle detected in weak AHB colonies in Costa Rica (Calderón, 2023).

Conclusion: Implementing strategies to detect and monitor the SHB, as it spreads to new countries or beekeeping areas, requires implementing sentinel apiaries, developing of epidemiological surveillance, and providing training activities for beekeepers, as demonstrated in the case of Costa Rica.

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The small hive beetle (SHB), *Aethina tumida*, is a pest of honeybee (*Apis mellifera*) colonies. Endemic to sub-Saharan Africa, this pest has been reported in Africanized honeybee (AHB) colonies in North, Central, and South America. Specifically in Central America, it was first found in El Salvador in 2013, in Nicaragua in March 2014, and in Guatemala in August 2020. In Nicaragua, the SHB was confirmed in AHB colonies in San Juan del Sur, Department of Rivas, approximately eight kilometers north of the Costa Rican border, which increased the risk of entry to this country. After the SHB was confirmed in Nicaragua, a sentinel apiary with four AHB colonies was established close to the border in Santa Cecilia, La Cruz, province of Guanacaste, Costa Rica. In addition, epidemiological surveillance was conducted in the main beekeeping areas in the country (2015-2022) to determine the SHB's possible distribution. Beehives were monitored visually by examining all individual honeycombs, hive covers, and bottom boards. Furthermore, training was offered to beekeepers such as workshops and fieldwork, and training materials were distributed such as brochures focused on SHB recognition and identification, and methods for colony inspection. SHB was detected and confirmed in the sentinel apiary in August 2015 in La Cruz, Guanacaste, Costa Rica, where only adult beetles were detected inside AHB colonies. In addition, in September 2018, adult SHBs were found in a honeybee swarm located in the province of Heredia-Central Valley in the middle of the country, about 265 km south from the first detection site. Furthermore, in October 2019, the SHB was confirmed in a commercial apiary in Liberia, province of Guanacaste, approximately 25 km south from the initial point of detection in the country. Nowadays, the SHB has been found in different commercial apiaries in collaboration with trained beekeepers, especially in the provinces of Guanacaste, Alajuela and San José. In conclusion, implementing strategies to detect and monitor the SHB, as it spreads to new countries or beekeeping areas, requires implementing sentinel apiaries, developing of epidemiological surveillance, and providing training activities for beekeepers, as demonstrated in the case in Costa Rica.