**UMR CNRS 6023 Laboratoire Microorganismes : Génome et Environnement (T. SIME-NGANDO)**

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**Validation of new polyphenol-based treatments against bee nosemosis and deciphering of the mechanism of action**

Microsporidia are obligate intracellular eukaryotic parasites related to fungi and have a broad spectrum of hosts, from insects to humans. *Nosema ceranae* is responsible for an intestinal disease of the honeybee called nosemosis. This pollinator is widely recognized as a beneficial insect in economic and ecological fields. From several years, a phenomenon of bee weakening and massive mortalities have been deplored and is due to a deleterious impact of environmental and biological factors including *N. ceranae*. The only effective treatment to fight *N. ceranae*, Fumidil® B (fumagillin) is no longer available, justifying the need to find alternatives to this drug.

Natural products of plant origin have shown their ability to reduce the mortality of bees infected with *N. ceranae* and the parasitic load per bee during laboratory assays and under semi-field conditions (filled patent). Among them, ethylgallate, the most active against *N. ceranae*, was chosen to be evaluated under natural conditions. The objective of the thesis will be to evaluate the ethylgallate on naturally-infected colonies. A partnership with our local Beekeeping Health Defense Association (GDSA63) will allow us to have privileged contact with beekeepers for this assay. The second objective will be to decipher the mechanism of action of this product, especially with an emphasis on bee immunity. This project will allow to propose a new strategy for fighting honeybee nosemosis.