

POTENTIAL OF PORTUGUESE PROPOLIS AS SOURCE OF BIOFUNGICIDES

Patrícia Cruz ¹, Catarina Passão ¹, Ana Cunha ^{1,2,3,4}, Cristina Almeida-Aguiar ^{1,2,3,4}

¹ *Biology Department, University of Minho, Campus de Gualtar, 4710-057 Braga, Portugal*

² *Centre for the Research and Technology of Agro-Environmental and Biological Sciences (CITAB), Biology Department, Minho University, 4710-057 Braga, Portugal*

³ *CEB - Centre of Biological Engineering, University of Minho, 4710-057 Braga, Portugal.*

⁴ *CBMA - Centre of Molecular and Environmental Biology, University of Minho, 4710-057 Braga, Portugal.*

Agriculture provides livelihoods for 40% of worldwide population¹. Due to the rapid human population growth, it is estimated that global food production will need to increase by 60% to feed over 9.8 billion people by 2050². The use of pesticides contributes to high crop yields and effective farm management³. Globally, 4.6 million tons of chemical pesticides are sprayed into the environment every year^{4,5}. Out of the total consumption of pesticides, 17.5% are in the form of fungicides⁵. Although efficient, these chemical controls have undesirable characteristics, such as the development of pathogen resistance, environmental pollution, long degradation periods, bioaccumulation in the food chain and toxicity to non-target organisms⁶. Therefore, alternative paths to the intensive use of crop protection chemicals are needed, such as the use of natural products which are effective, biodegradable and leave no harmful residues.

Propolis is a natural resinous mixture made by honeybees (particularly *Apis mellifera* L.) from various plant sources and bee wax. Hundreds of different compounds have been identified so far in propolis, including several bioactive compounds such as flavonoids and phenolic acids and terpene derivatives, generally associated to its antibacterial, antifungal, antiviral and antioxidant activities, among others⁷.

Previous work showed that propolis ethanol extracts (EEs) can be explored as source of biofungicides for application in a sustainable agriculture management⁸. In this study we evaluated the antifungal activity of EEs from Portuguese propolis samples against a range of phytopathogenic fungal species that affect economically important crops in Portugal. Interestingly, results showed that different propolis samples have distinct fungitoxic activities but also that different fungi species exhibit distinct susceptibilities.

References:

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