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**Short communication**

## Use the dregs of propolis of *Apis mellifera* in replacing the pesticide in horticulture

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### ARTICLE INFO

*Article history,*

Received 23 March 2014

Accepted 19 April 2014

Available online 28 April 2014

**Keywords,**

Organic agriculture

Vegetables

Chemical contamination

Propolis

### ABSTRACT

Products from horticulture are, generally consumed in natura, which increases the risk of human contamination by pesticides used to combat the frequent pests in this culture. The use of the dregs of propolis as substitute of agrochemicals comes to be an alternative to combat the pests of agriculture. In a small area of 50 m<sup>2</sup> were planted the vegetables broccoli and arugula that received daily application of dregs of propolis at 30 %. The result of this treatment was the absence of pests common in horticulture, in addition to a greater development of leaves when compared whit witness. Was produced, therefore, healthy food, free of contamination by agricultural pesticides that are harmful to human health and the environment.

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## 1. Introduction

The use of chemical pesticides in vegetable production and the consequent contamination of soil and water can be understood as a potential aggressor to the environment (Peres; Moreira, 2003).

Propolis is a natural product known for its diverse biological properties with approximately 200 elements already identified as flavonoids, fatty acids, alcohols, amino acids, vitamins and minerals (Bezerra et al., 2013).

The use of propolis as agricultural defensive still does not have scientific evidence, a fact substantiated by the lack of literature on the subject. However, empirically, some tests of its use are being carried out by a small producer of the municipality of Magé, located in the State of Rio de Janeiro, with positive results.

The dregs of propolis has no use for any other purpose, not having commercial value and your use can provide additional economic benefits for farmers that do not have to spend a large amount on the purchase of pesticides, also, indirect economic benefit to the final consumer and the fact of not being aggressive to health (Santos et al., 2013).

This work has the objective of demonstrate, by means of an Observation Unit, that the use of the dregs of the propolis can be effective in fighting the pests of agriculture and, therefore, capable of replacing the chemical pesticides currently used.

## 2. Materials and methods

The present study was developed from an Observation Unit installed on the farm Pedra D'água that works with family farming and apiculture, located in Magé, Rio de Janeiro, latitude of 22°65'30.122``S and longitude 43°06'22.999``W. The characteristic climate is tropical, AW according to the classification of Köpen-Geiger, with annual average temperature of 25°C and average rainfall of 137 mm per year (PMM, 2013).

On May 07, 2013, an area of 50 m<sup>2</sup> was divided into 10 equal plots, one of them being used as jobsite witness and planted seedlings of vegetables: broccoli (*Brassica oleracea* var. *italica*) and arugula (*Eruca sativa*).

All the sites, except the jobsite witness, received spraying with dregs of propolis. The amount of water and fertilizer (horse manure) used in cultivation was the same for all the jobsites.

The dregs of propolis resulted from the by-product of the manufacture of alcoholic extract of propolis. After the decantation of the dregs, the alcoholic strength supernatant was removed with a syringe remaining at the bottom of the container only the dregs of propolis, which was diluted to 30% in water (15 ml of dregs for half a liter of water).

The product was applied from the 5th day after the planting of seedlings (12 May), daily, always at dusk by be on nights that there is a larger attack of pests and lower frequency of insect pollinators (Zambolim, 2000).

The results were followed up for 20 to 20 days, photographed and analyzed regarding the development and presence of pests or of its action in the leaves of vegetables.

## 3. Results and discussion

On 29 May the growth of the seedlings was within the expected range, but it was already noticeable that at jobsites which the treatment was applied there was no attack of pests and the development of the vegetables was more accelerated. Other visits to the jobsites were made on 20 June, 11 and 31 July 2013.

In august 17, 2013, the arugula was already at the point of harvest. On this occasion, the vegetables in the jobsite witness were in a stage of development much lower when compared to those who received the treatment (figure 1 and 2) similar to results of Pereira et al. (2007) who believe that propolis can be used as nutrient in agriculture with advantages such as easy to obtain, risks almost spoilt the health and low environmental impact.

On the same date, the vegetables in the jobsite witness showed clear signs of the presence of pests (figure 3), which did not happen in vegetables treated with the dregs of propolis that were free of pests (figure 3 and 4), similar to results obtained by Medeiros et al. (2008) who report efficiency in the use of bordeaux mixture + alcohol and propolis extract 0.3 %, for the control of *Phytophthora infestans* in arracacha (*Arracacia xanthorrhiza*) and Aker et al. (2011) who had promising results using spraying with ethanolic extract of propolis in different concentrations against the coffee berry borer (*Hypothenemus hampei*) and the coffee leafminer (*Leucoptera coffeella*).



**Fig. 1.** August 17, 2013. Jobsite witness evidencing the size of cultivars.



**Fig. 2.** August 17, 2013. Jobsite who received affusion with dregs of propolis.



**Fig. 3 .** August 17, 2013. Foliage of broccoli witness showing traces of the action of pests (arrow).



**Fig. 4 .** August 17, 2013. Foliage of broccoli of one jobsites treaties showing absence of signs of action of pests.

#### **4. Conclusions**

Beneficial effects in vegetables (broccoli and arugula) grown in ownership of agribusiness family in Mage - RJ were perceived as a result of the spraying of dregs of propolis at 30 %, away from pests that commonly cause damage to horticulture during the observation period, suggesting be viable replacement of agrochemicals by dregs of propolis.

New studies with different concentrations of the product, in order to make a better use and dissemination of this practice are necessary, being sure that there will be a great contribution to mankind, taking into account the attendance to the principle of sustainability.

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