Analysis of the Use of an Organic Pesticide Synthesized with Ursolic Acid as a Substitute for Pesticides with Neonicotinoids to Maintain Stable Sperm Production in Apis mellifera Drones

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The neonicotinoids pesticides is the best according to its efficiency in the elimination of pests. These pesticides cause the reduction of up to 40% of the sperm production of the Apis mellifera drones (Straub, 2016). A. mellifera is in danger of extinction with a total reduction of its species of 33% worldwide (FAD, 2013). An alternative pesticide method could be the use of ursolic acid synthetize from Pyrus malus L. as an organic pesticides that can inhibit certain larvae activity. To solve this problem, a group of drones was treated with 75% neonicotinoid imidacloprid and a group with the organic pesticide for 21 consecutive days. During the process, the tests of body temperature, flight speed and sperm production were carried out. The spermogram analysis using a Neuber chamber cell count formula indicate that neonicotinoids reduce up to 36.1% of the sperm production of the drones, obtaining a production of 1.25 million sperm of 1.98 million that they originally produce. Meanwhile, the organic pesticide manages to maintain a stable production of 89.9%, equivalent to 1.75 million sperm average. The organic pesticide maintains an optimal sperm production while being cost effective and ecofriendly. As a future projection, we intend to carry out a study evaluating the effects of the neonicotinoid pesticide in the different social classes of A. mellifera, emphasizing its effects on the queen and larvae production by swarming season.

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