

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 synthesized 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.