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HISTOLOGICAL EVALUATION OF THE SMALL INTESTINE OF WORKER BEES AFTER THE USE OF ESSENTIAL OILS

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Abstract: The paper presents the results regarding the influence of additional feedings with essential oils (mint, thyme, basil, oregano, cloves, cinnamon, rosemary, juniper) on the development of intestinal villi of the worker bees that came from bee colonies fed for 3 weeks with sugar syrup and the essential oils mentioned. Between 30.03.2021 and 21.04.2021, 18 worker bee samples were analyzed. Significant changes in the development of intestinal villi were observed in all analyzed groups. The best results in terms of the development of intestinal villi were shown in the group fed with sugar syrup and the addition of mint essential oil (141.2 μm), followed by the group with the addition of cinnamon oil (96.56 μm) and the batch with added essential oil of oregano (81.28 μm).

Keywords: bees, supplementary feeding, essential oils, intestinal villi, histological examination

• Introduction

The importance of this study can provide valuable information for the discovery of new natural products (essential oils) with beneficial effects on the development of intestinal villi with a role in increasing the absorption surface of nutrients.

• Material and method

For the histological analysis of worker bees' intestines, after 3 week- administration of sugar syrup with added essential oils, 18 samples of worker bees were collected (2 samples from each batch subjected to the experiment).

• Results and discussions

Graph 1 shows the height of the intestinal villi following the use of essential oils. It can be seen that all bee colonies fed with sugar syrup and added essential oil showed an increase in intestinal villi compared to the control.

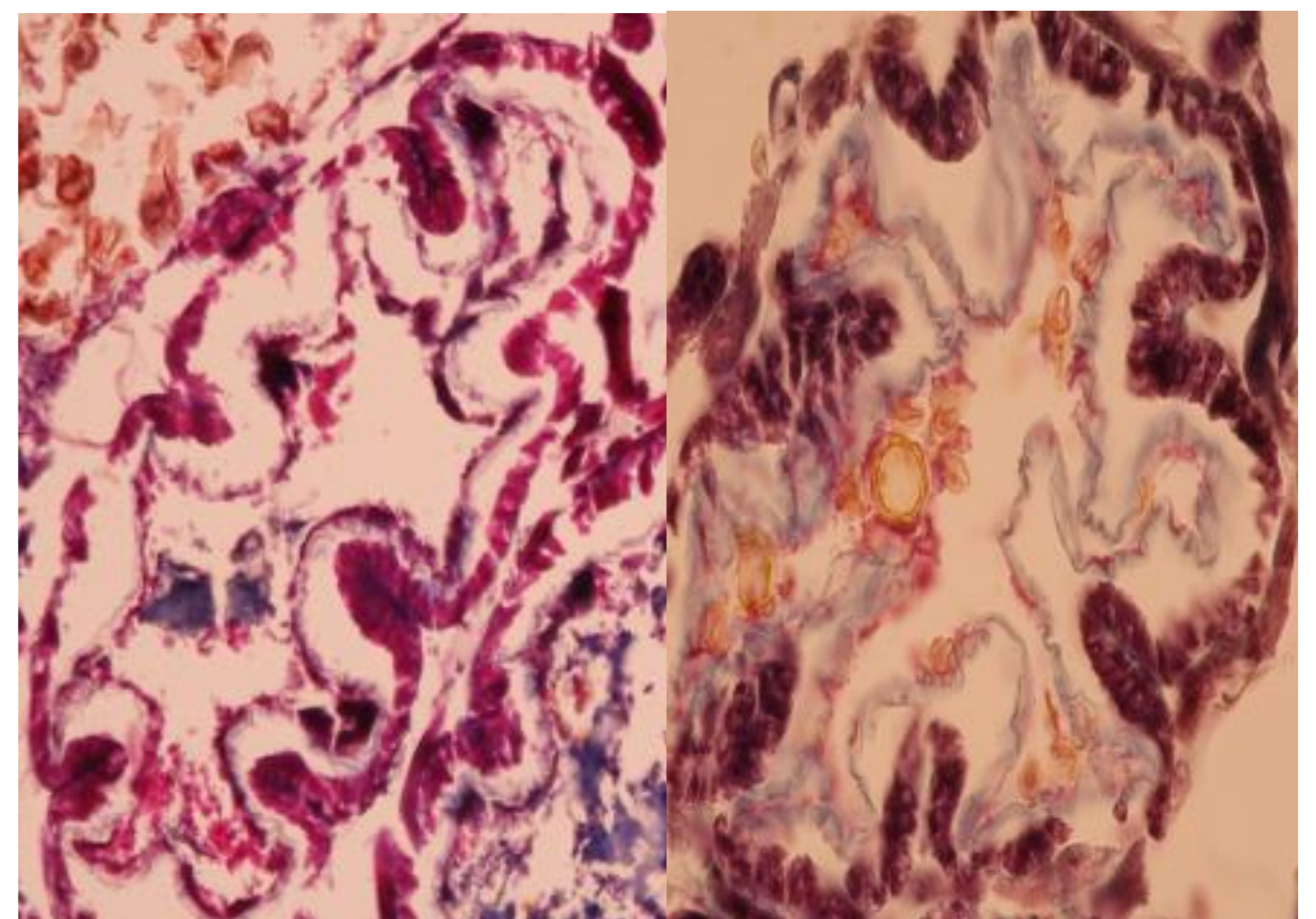
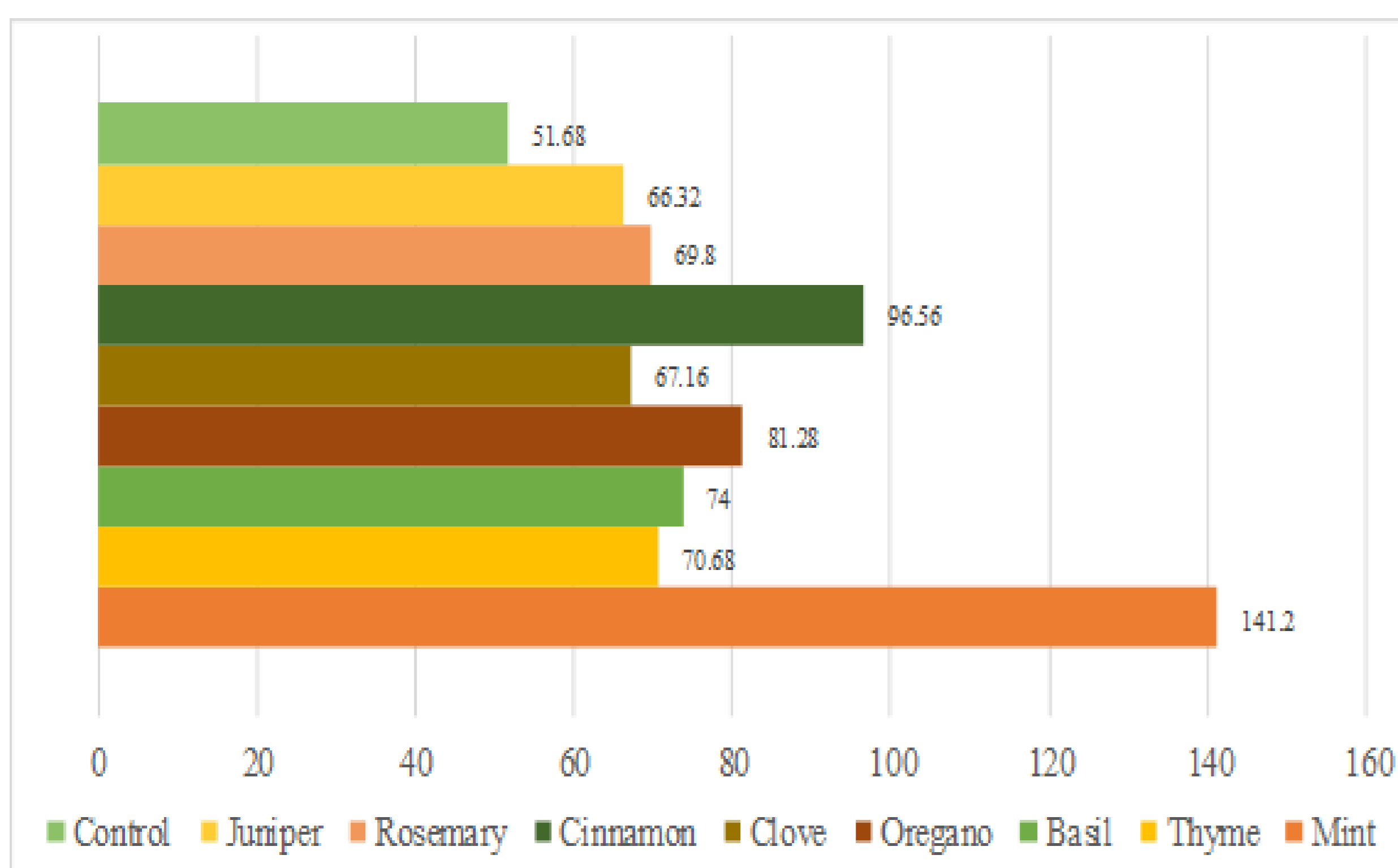


Figure 1. Representative figures of the small intestine with the highlighting of the intestinal villi (original photo)
a. Highlighting of intestinal villi in the batch with the addition of mint essential oil (20x); b. Highlighting of intestinal villi in the control batch (20x);

• Conclusions

In conclusion, we can state that each essential oil had a positive influence on the development of intestinal villi, the development of the chorion, the integer appearance of the epithelium, the highlighting of the striated plateau located at their apical pole.