ORGANIZERS

Brotherhood of Ukrainian Beekeepers
Non-Governmental Organization

XXXXIII
International Apicultural Congress
29 September — 04 October 2013
Kyiv, Ukraine

Discover the European Honeyland

Apimondia
Kyiv, Ukraine 2013

Scientific Program

BEYOND THE HIVE: BEEKEEPING & GLOBAL CHALLENGES

Oral presentation abstracts & poster list

PLATINUM SPONSOR

SODRUZHESTVO

CHEMICAL AND BIOLOGICAL CHARACTERIZATION OF PORTUGUESE PROPOLIS USING THIN-LAYER CHROMATOGRAPHY

Letícia M. Estevinho, Vanessa B. Paula, Luís G. Dias
Mountain Research Centre (CIMO), School of Agriculture, Polytechnic Institute of Bragança, Campus Stª Apolónia, Apartado 1172, 5301-854 Bragança, Portugal: leticia@ipb.pt

Introduction and Objectives

Propolis is a resinous substance obtained by honey bees Apis mellifera, a product considered "natural antibiotic" which plays an important role in defending the hive, protecting it from microorganisms, fungi, bacteria and viruses. This product has a large variety of compounds in its composition, giving greater emphasis to the phenolic compounds, which are attributed strong antioxidant and antimicrobial activities. The main objective of this work is to optimize the technique of thin layer chromatography (TLC) to analyze qualitatively, using the two-dimensional technique, the phenolic compounds of propolis.

Material and Methods

The original sample of propolis, collected from several hives of an apiary installed in the Sierra de Bornes was solid. For the extraction of phenolic compounds, it was used a mixture of methanol (HPLC grade) and sample of propolis, at 1:1 ratio. The mixture was allowed to stir overnight and, subsequently, it was filtered. The methanol extract was placed in a refrigerator at +5 °C and, after 12 hours, it was performed new filtration to remove the wax. The obtained methanol extract was evaporated till dryness using a rotary evaporator. To the extract solid was added 100 ml of diethyl ether and 100 ml of water, in order to obtain two phases. The supernatant was removed and again taken to dryness, obtaining a dry purified extract of propolis. This extract was redissolved in ethanol and applied to TLC plates which were previously cleaned and activated in an oven at 120 °C for 30 minutes.

Fig.1- Solid propolis

Fig.2- Methanol extract

Fig.3- Propolis extract

Fig.4- Treated with diethyl ether extract

Fig.5- Dry extract

Fig.6- Solution of propolis phenolic compounds

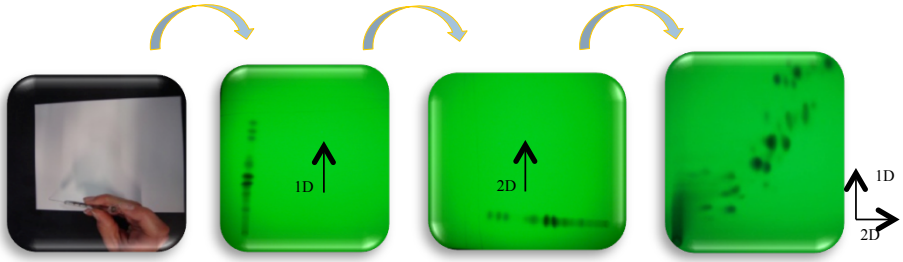
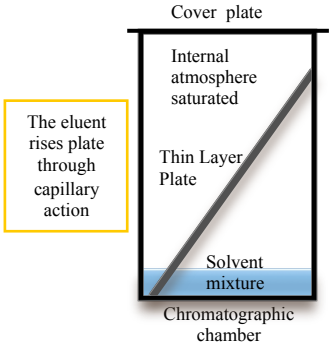


Fig.7- Following the two-dimensional analysis



Results and Discussion

To visualize the phenolic compounds in the TLC plate, the following reagents were used: aluminum chloride, iron chloride, Folin Ciocalteu method, DPPH and vanillin.

Fig.8- Aluminum chloride

Fig.9- Iron chloride

Fig.10- Folin Ciocalteu

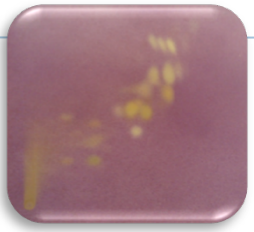


Fig.11- DPPH

Fig.12- Vanillin

Conclusions

The aluminum chloride reagent allowed to visualize the highest number of spots on the plate TLC (phenolic compounds) and better defined. The reagents Folin-Ciocalteu and DPPH besides allowing to visualize the phenolic compounds in the TLC plate also lets to check if the spots have compounds with antioxidant activity.

Apimondia Kyiv, Ukraine 2013