

# ANTIOXIDANT PROPERTIES OF PROPOLIS ANTIOXIDANT PROPERTIES OF PROPOLIS

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## INTRODUCTION

In the pathogenesis of many illnesses, free oxygenic radical play significant role. Their presence in cells cause adverse metabolism changes. That is why diet rich in products containing antioxidants (vitamins C, E, carotenoids, polyphenols, anthocyanins, tannins) became very important as they neutralize free radicals. Some foods, e.g. bee products, gained in importance as they were proved to be diversified source of antioxidants.

**The aim of the study** was to select and verify methods of determination of the antioxidant properties of propolis and identification and characteristics of the main phenolic compounds in the propolis samples obtained from apiaries located among different vegetation.

## MATERIAL AND METHODS



Material for the study comprised of propolis samples from 2011 (10 samples) and 2012 (6 samples). Samples from 2011 were obtained from the experimental apiaries of the Research Institute of Horticulture, Apicultural Division, situated in the vicinity of Puławy, Poland, near the levee of the Vistula River, grasslands and wastelands periodically flooded by the waters of the Vistula River. Samples from 2012 originated from the following localities around Puławy: Rudy, Końskowola, Młynki, and Pożóg. The apiaries were located in orchards and near mixed forests and grasslands.



## RESULTS

The sample containing the highest amount of phenolic compounds – 1283 mg/100 g was obtained from the apiary located in Rudy (mixed forest).

Obtained results confirm high antioxidant properties of propolis. Elimination of free radical DPPH on average – 84% (Fig 2) and high level of phenolic compounds, on average 1150 mg/100 g in gallic acid equivalents (GAE) (Fig 3).

Determination of the content of chosen phenolic compounds in the extracts of propolis was conducted using chromatographic technique (HPLC-DAD) (Fig 1).

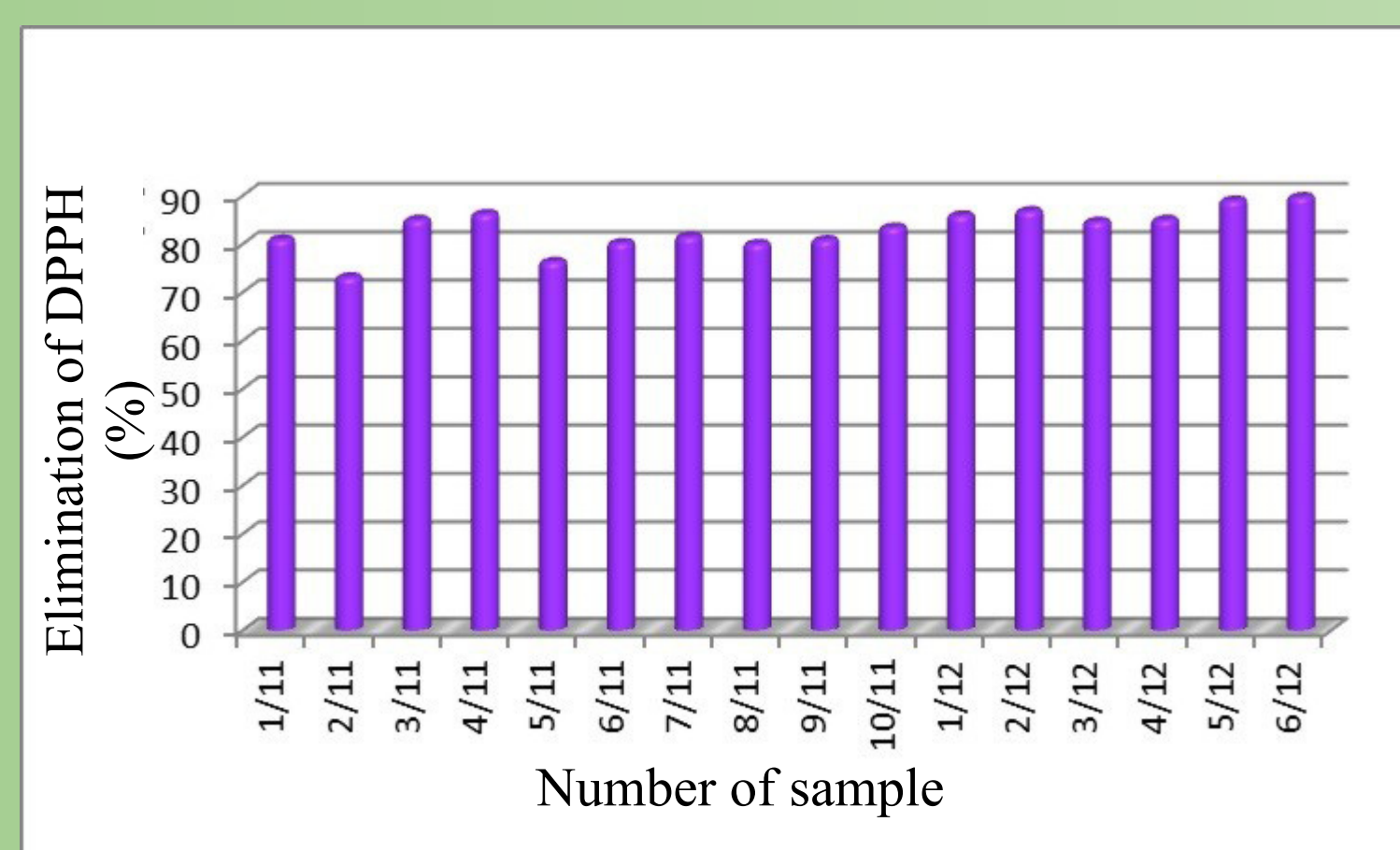


Fig. 2 Antioxidant properties of propolis extract

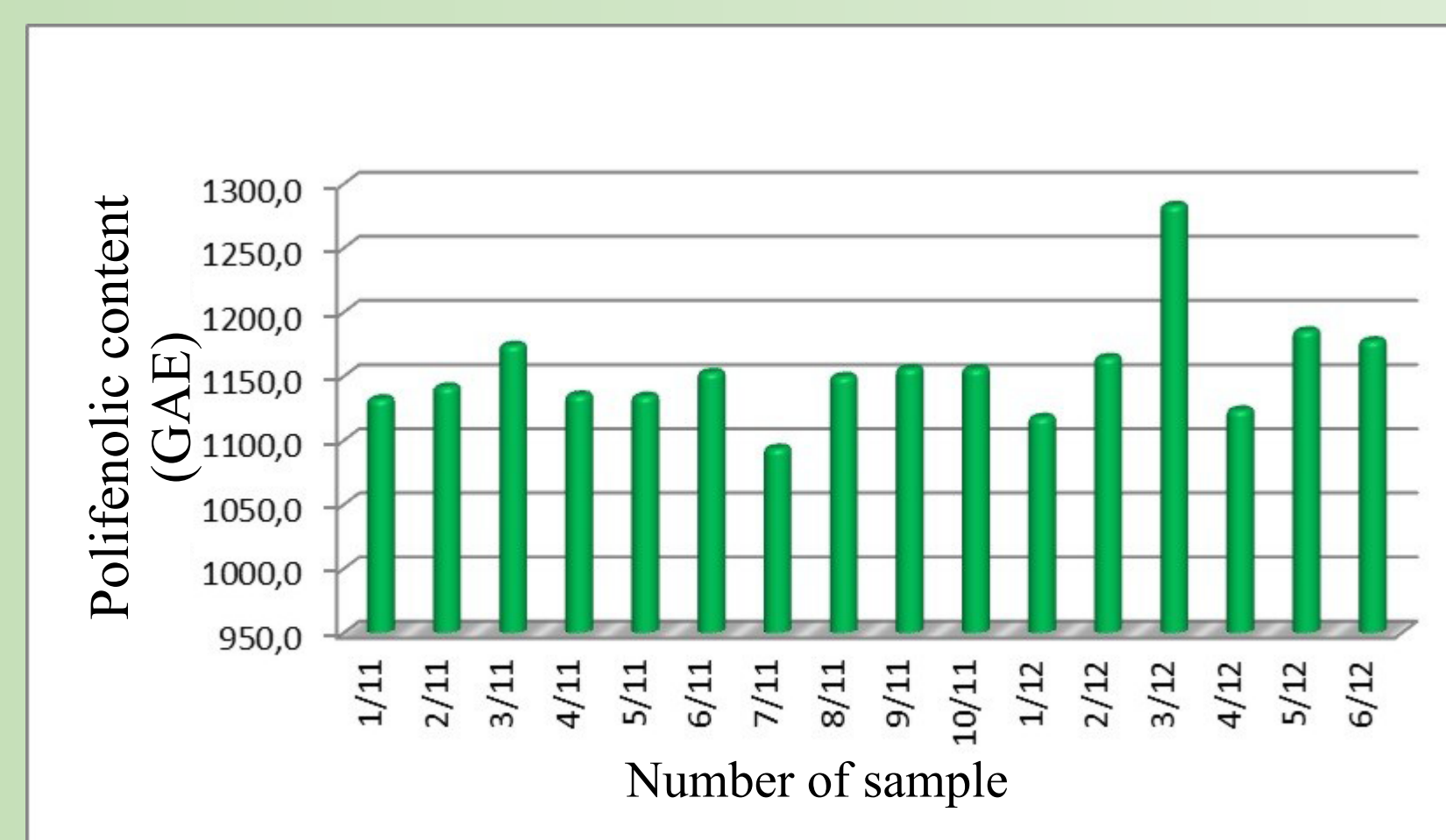


Fig. 3 Total content of phenolic compounds determined by Folin-Ciocalteu amethod

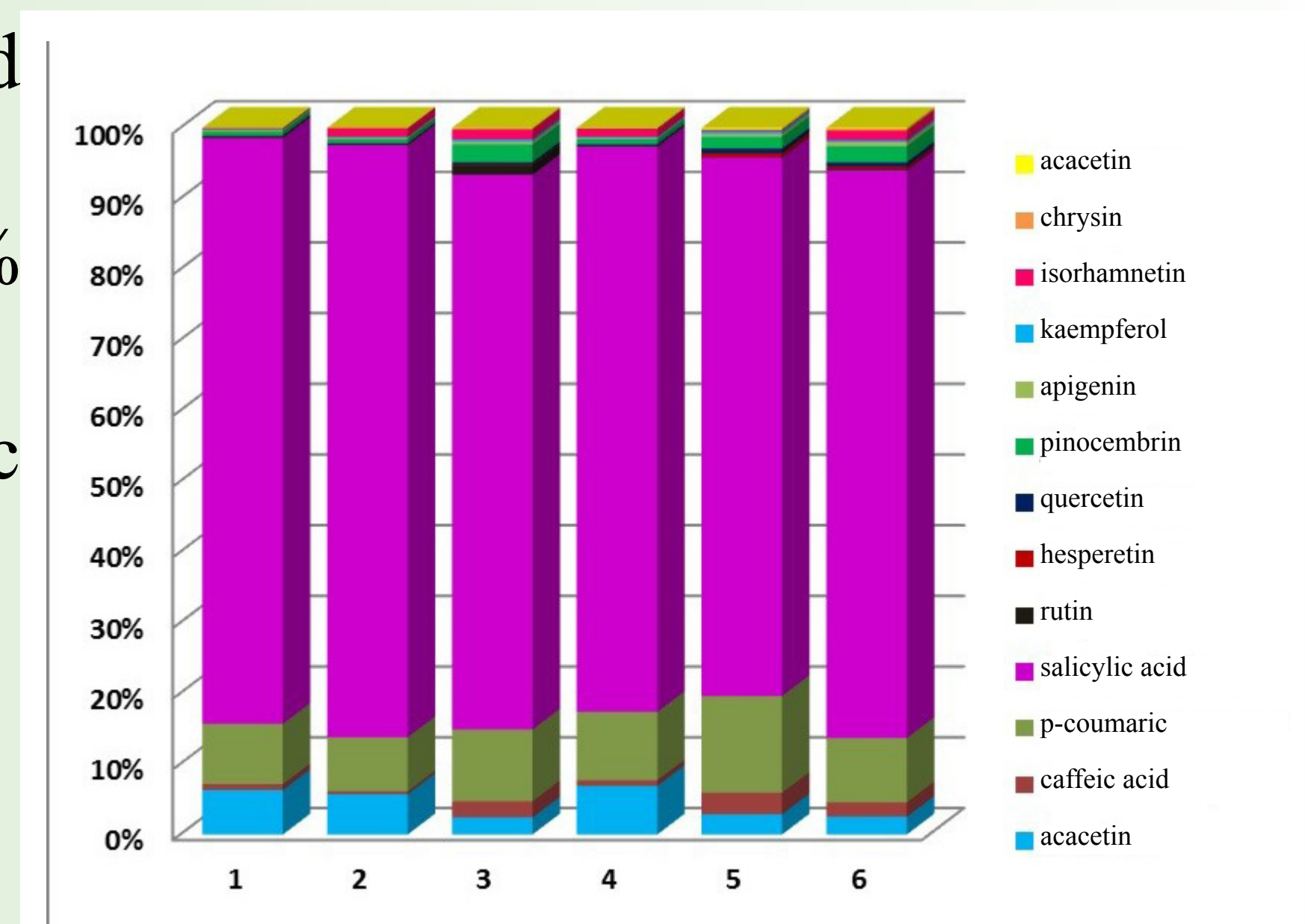


Fig. 1 Percentage of phenolic compounds determined in propolis extract (ethanol - water) by HPLC-DAD

## SUMMARY

The quantitative analysis of phenolic compounds in propolis showed very high qualitative and quantitative diversity resulting from different botanical origin of the resinous substances – raw material for propolis.

2. The presence of high amounts of some compounds (e.g. salicylic acid) can indicate a habitat of the apiary from which the propolis sample was obtained (e.g. around willow trees growing on floodlands of the Vistula River and its tributary Kurówka).

Chromatographic analyses of the quantitative determination of the phenolic compounds using the developed method are being continued.