In vitro antioxidant activity and total phenolic content of different extracts of Himalayan Balsam (*Impatiens glandulifera* Royle)

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INTRODUCTION

Himalayan Balsam (HB) is a large annual plant (therophyte) that is classified as an invasive alien plant species. It is considered one of the most virulent plants in Europe and elsewhere in the world, as it is one of the main causes of biodiversity loss. As a result, alternative uses are being sought [1].

At the molecular level, HB is known to contain several compounds of academic and industrial interest [2]. It has been suggested that extracts of *Impatiens* species could be used as natural sources of antioxidants. Several studies have indicated that certain HB extracts could have some degree of antioxidant activity, but the main contributing compounds have not been identified in these mixtures. It is assumed that phenolic compounds (polyphenols) are at least partially, if not largely, responsible for the observed biological activity [3].

PURPOSE OF THE RESEARCH

This paper reports preliminary results on the *in vitro* antioxidant activity of HB extracts. Given the considerable number of possible different HB extracts, chemical characterization was performed to determine the total phenolic content (TPC).

EXPERIMENTAL METHODS

HB extracts were obtained by maceration with three different solvents (ethanol (EtOH), water (H_2O) and acetone) at three extraction temperatures (room temperature (RT), 50 °C and 70 °C) where possible. Otherwise, the extracts were obtained at RT and under reflux. The extracts were prepared at a ratio of 1:100 to 1:100 000. *In vitro* antioxidant properties were determined by a combination of complementary colorimetric assays (DPPH, ABTS and FRAP). The TPC determination based on the Folin-Ciocalteu reagent was also carried out spectrophotometrically.

RESULTS

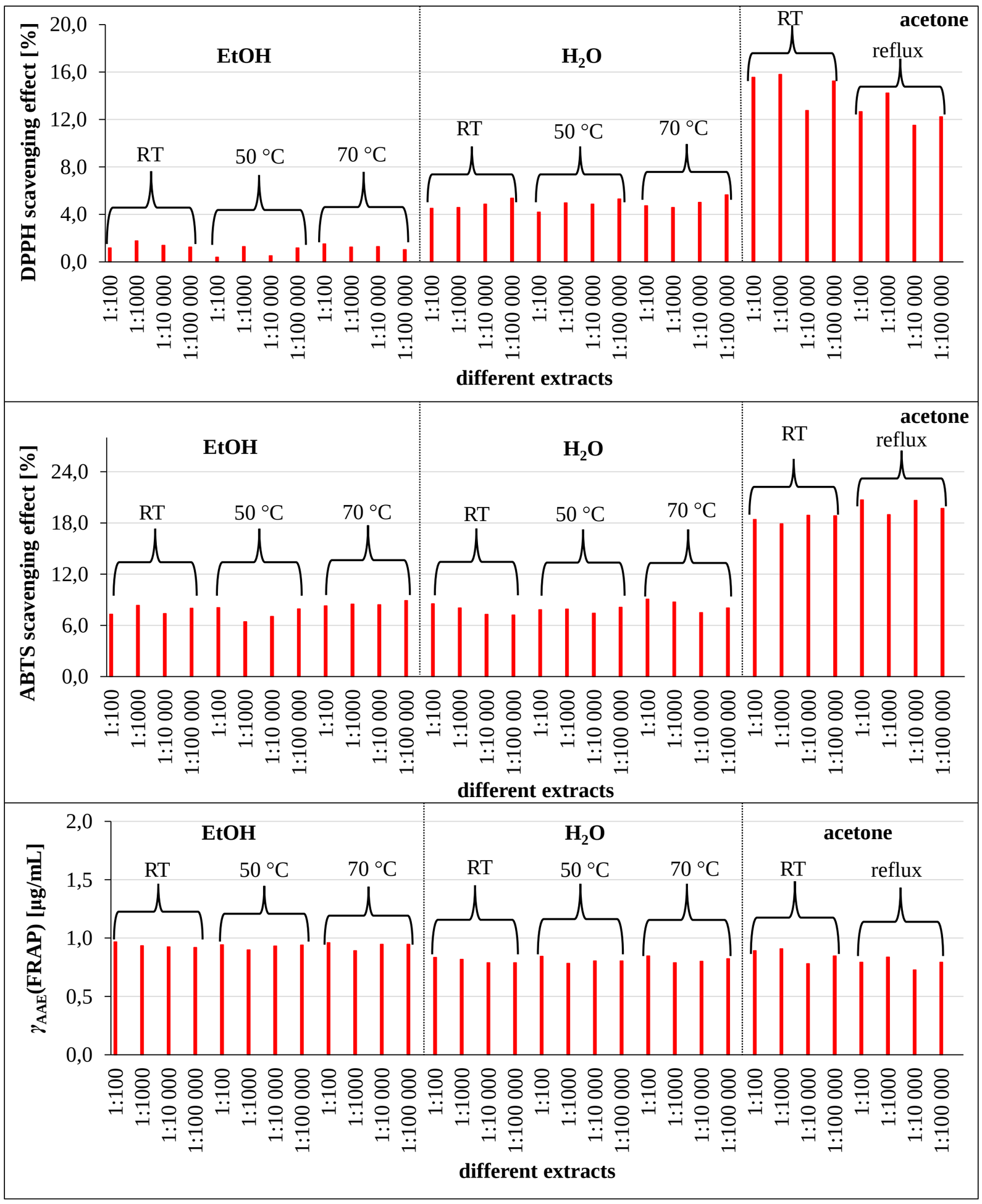

Fig. 1. *In vitro* antioxidant properties of HB extracts of the whole plant. The abbreviation AAE stands for ascorbic acid equivalent.

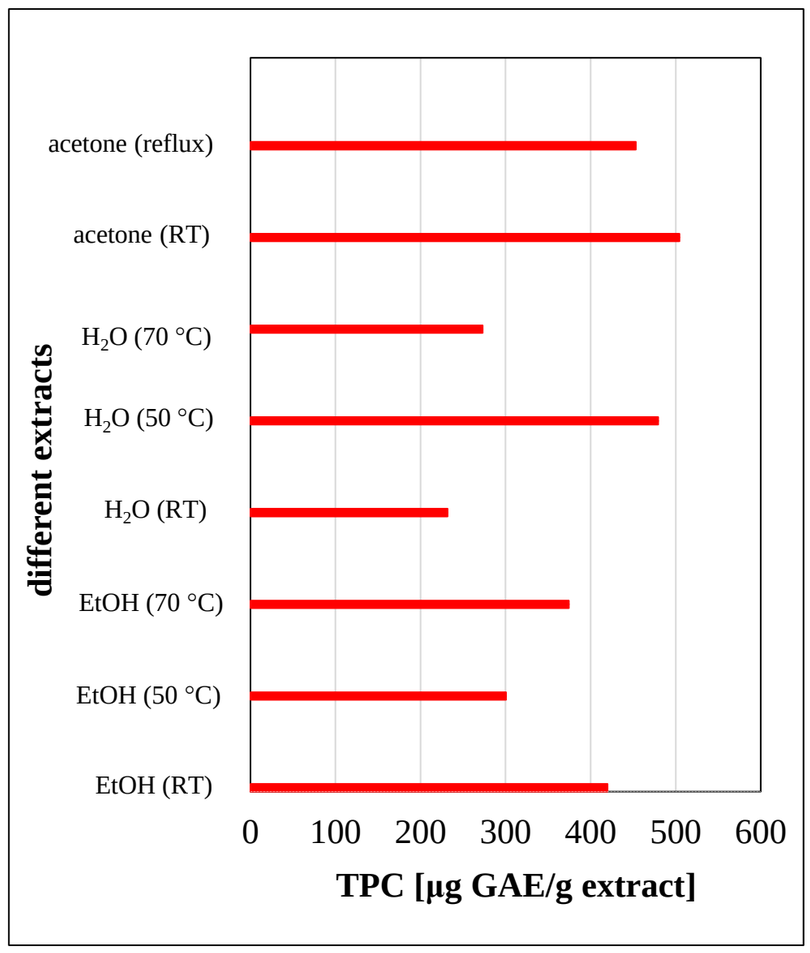

Fig. 2. Determination of the TPC of EtOH, H_2O and acetone extracts, expressed in µg of gallic acid equivalent per g of extract.

CONCLUSIONS

The results of all three *in vitro* antioxidant assays (Fig. 1) showed weak antioxidant activity of the extracts tested. The presence of TPC (Fig. 2) was detected in all extracts tested. Their concentrations ranged from 231.74 to 504.37 µg GAE/g extract. Since phenolic compounds are considered potent antioxidants, we will perform further *in vitro* measurements of antioxidant properties in the future by increasing the amount of plant material or decreasing the amount of extraction solvents used, as we conclude that the extracts obtained in this case were not sufficiently concentrated. We will also perform a more detailed chemical characterization of the extracts to determine which group of compounds contributes the most to their antioxidant activity.

REFERENCES

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