

ORIGINAL PAPER

Content of selected secondary metabolites in wild hop[‡]

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We focused on the determination of biologically active secondary metabolites in wild hops over the course of the vegetation period in four selected sites in Piešťany. Hop was collected in four collection periods in 2010. The objects of research were the leaves of male and female plants, and female cones. Analysis of the extracts from wild hop confirmed differences in total content of polyphenols, flavonoids between the localities and in the growing seasons over the vegetation period. The extracts from leaves from the first harvest in localities “Sldkoviova” and the river Vh showed higher levels of polyphenols (4.91–6.93 mg g^{–1} of dry mass), flavonoids (2.28–2.99 mg g^{–1} of dry mass) than the extracts from cones collected at the end of the vegetation period (polyphenols 3.63–5.33 mg g^{–1} of dry mass, flavonoids 1.86–2.16 mg g^{–1} of dry mass). The extracts from leaves from the first harvest from the “tennis courts” site showed lower values of polyphenols and flavonoids. Our findings were that the leaves from the first harvest at the beginning of the growing season contained higher amounts of the secondary metabolites investigated than the cones at the end of the growing season. The content of α -bitter acids in wild hop cones ranged from 1.64 % to 2.91 %, in leaves from 0.11 % to 0.99%. Concentration of β -bitter acids in cones varied from 1.63 % to 1.93 % and in leaves from 0.02 % to 0.61 %.

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Introduction

In this work, we studied the possibility of using wild hop as a potential source of secondary metabolites. Our aim was to test the influence of the vegetation period and localities on the content of some secondary metabolites in hop, which displayed a wide range of biological and pharmacological properties.

Wild hop is unique for its content and production of a number of secondary metabolites, which are not typical of other plants. Hop has recently been studied as a source of biologically active phytochemicals (Delmulle et al., 2006; Zanol & Zavatti, 2008).

The cones of hop contain 12–17 % of water, 15–24 % of nitrous substances, 2–6 % tannins, 15–24 % resins, and about 1 % of essential oils. The most important essential oils are α -humulen, β -humulen, and

β -myrcen. All these substances are present in varying quantities in different parts of the plant, (De Keukeleire et al., 2003). It also contains waxes, plant hormones, fytocins, chalcones, flavanones, and phenolic substances (Collin, 2001). One of the large groups of substances present in the hop plant is a group of polyphenol compounds (Hofta et al., 2004). Polyphenols in the leaves can be of benefit when using the leaves as raw material for the extraction of these substances (eh et al., 2007). Polyphenols in hop have a similar anti-oxidant effect to the synthetic anti-oxidants- added to food (Piendl & Biendl, 2000). The most interesting of them are flavonoids, which are among the compounds most widespread in nature. The major components of hop flavonoids are catechin, epicatechin, rutin, quercetin, and prenylated chalcon xanthohumol.

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