HOP BREEDING ON HIGH CONTENTS OF DESMETHYLXANTHOHUMOL

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Hop breeding had been aimed nearly entirely at the demands of brewing industry for a long time. Nevertheless, hops have been becoming still more and more important within pharmaceutical industry recently. The objective is hop breeding on higher contents of desmethylxanthohumol (DMX), which is known to be isomerized at 8-prenylnaringenin, the most potent phytoestrogem currently known.

The average content of DMX was determined at the level of 0.09%. Variability of this substance amounted to 56.2%. The lowest content of DMX was 0.01% (wild hops from Caucasus and hop varieties Wyoming, Target and Pride of Ringwood). On the contrary, the highest content was revealed in the genotypes within the hop breeding material group (0.46%). High variability issues from obtaining genotypes with extremely high content of DMX. From Figure 1 it is evident that the most numerous are the genotypes in the group with DMX content in the range 0.08–0.12%. The basic statistical data show that both normality as well as homogeneity were rejected.

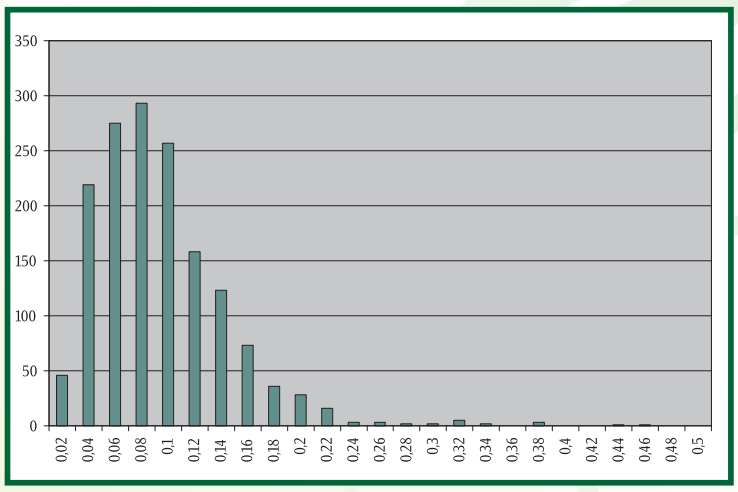

Figure 1:
Frequency of desmethylxanthohumol (DMX) contents

Parameter	Taurus x 00/13	Taurus x OP	Vital x 00/15	Vital x OP
Number	179	59	51	72
Min. (% w/w)	0,01	0,05	0,01	0,09
Max. (% w/w)	0,16	0,27	0,27	0,38
Average (% w/w)	0,08	0,11	0,15	0,19
Standard deviation	0,028	0,062	0,041	0,047
Coef. of variability (%)	35,2	32,1	37,4	31,0

Table 1:
Variability in DMX contents

Hop crossing was carried out according to a methodology worked out by Hop Research Institute in Zatec. A German variety Taurus as well as a Czech variety Vital were chosen for model crossing. A male plant 00/13 originated from Agnus and the other male 00/15 originated from Magnum. The both plants were naturally pollinated – natural choice of pollen. Their seedlings were planted in field conditions. Samples of hops for chemical analyses were taken in the first growing year. DMX analyses were carried out by liquid chromatography on Shimadzu LC 10A and LC 20A. The methodology issued from EBC 7.7 method.

It is evident from Table 1 that Taurus progenies showed lower DMX contents than Vital progenies. Only Vital x OP progenies show statistically conclusive difference within the contents of DMX.

A new Czech hop variety "Vital" was registered in 2008 with the help of selection within breeding material in Hop Research Institute in Zatec. Vital shows not only high contents of alpha (14-17%) and beta acids (8-11%) but very high contents of DMX (0.3-0.4%) as well.

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