

Determination of capsaicinoids in different genotypes of *Capsicum* by validated HPLC method

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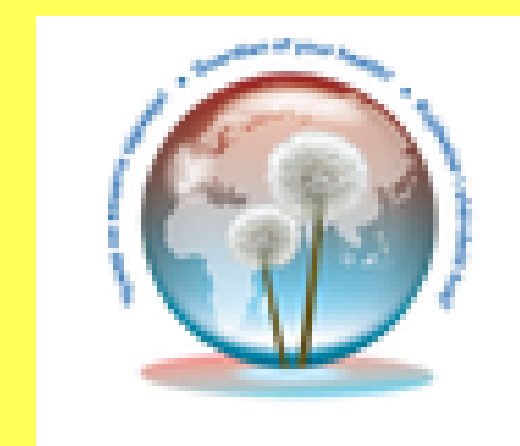


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Introduction

Capsaicin is a commonly used phytochemical, well-known by its pharmacological properties as analgesic, antidiabetic, hypolipidemic and antitumor agent.

The aim of this study was to determine capsaicinoids (capsaicin, dihydrocapsaicin and nordihydrocapsaicin) in ethanolic extracts of 11 different genotypes of pepper fruits from Republic of Macedonia with a validated simple and sensitive HPLC method.

Materials and methods

Fruits, dried and grounded, were used as a plant material for Soxlet extraction by using a 96% (V/V) ethanol as a solvent (70°C, for 5 hours). Quantification of a capsaicin and dihydrocapsaicin was performed on a RP-HPLC (reverse phase-high performance liquid chromatography) system by using a Zorbax SB-C18 column, (5 µm, 250 × 4.6 mm), mobile phase: H₂O/CH₃CN, 50:50 (V/V), flow rate: 1.5 mL/min and diode array detection at 220 nm.

Results

The analytical method was validated by using the protocols set out in the International Conference on Harmonization (ICH) guidelines. Experimental data showed the highest concentration of capsaicin, 2835 µg/g and for dihydrocapsaicin 2443 µg/g in dry weight in *Feferona* genotype.

Table 1. LOD and LOQ of the method

	RT (min) ¹	LOD (µg/mL) ²	LOQ (µg/mL) ³	Linearity range (µg/mL)
capsaicin	7.65	0.075	0.230	1.52-380
dihydrocapsaicin	10.82	0.109	0.331	1.12 -279

¹ Retention time ² Limit of detection ³ Limit of quantification

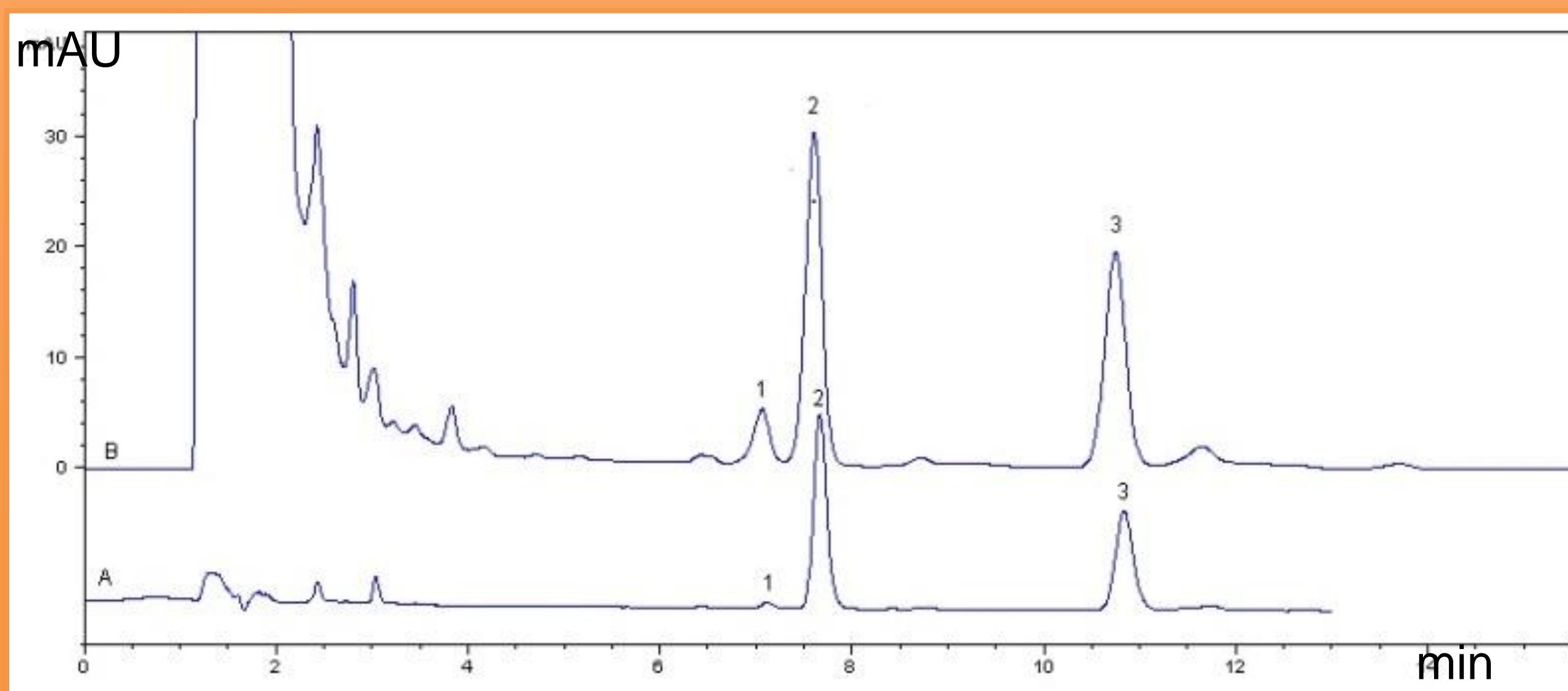


Figure 1. Chromatogram of mixed standard solutions of capsaicin (2), dihydrocapsaicin(3) and nordihydrocapsaicin (1) (A), and chromatogram of the ethanolic pepper extract of feferona genotype (B)

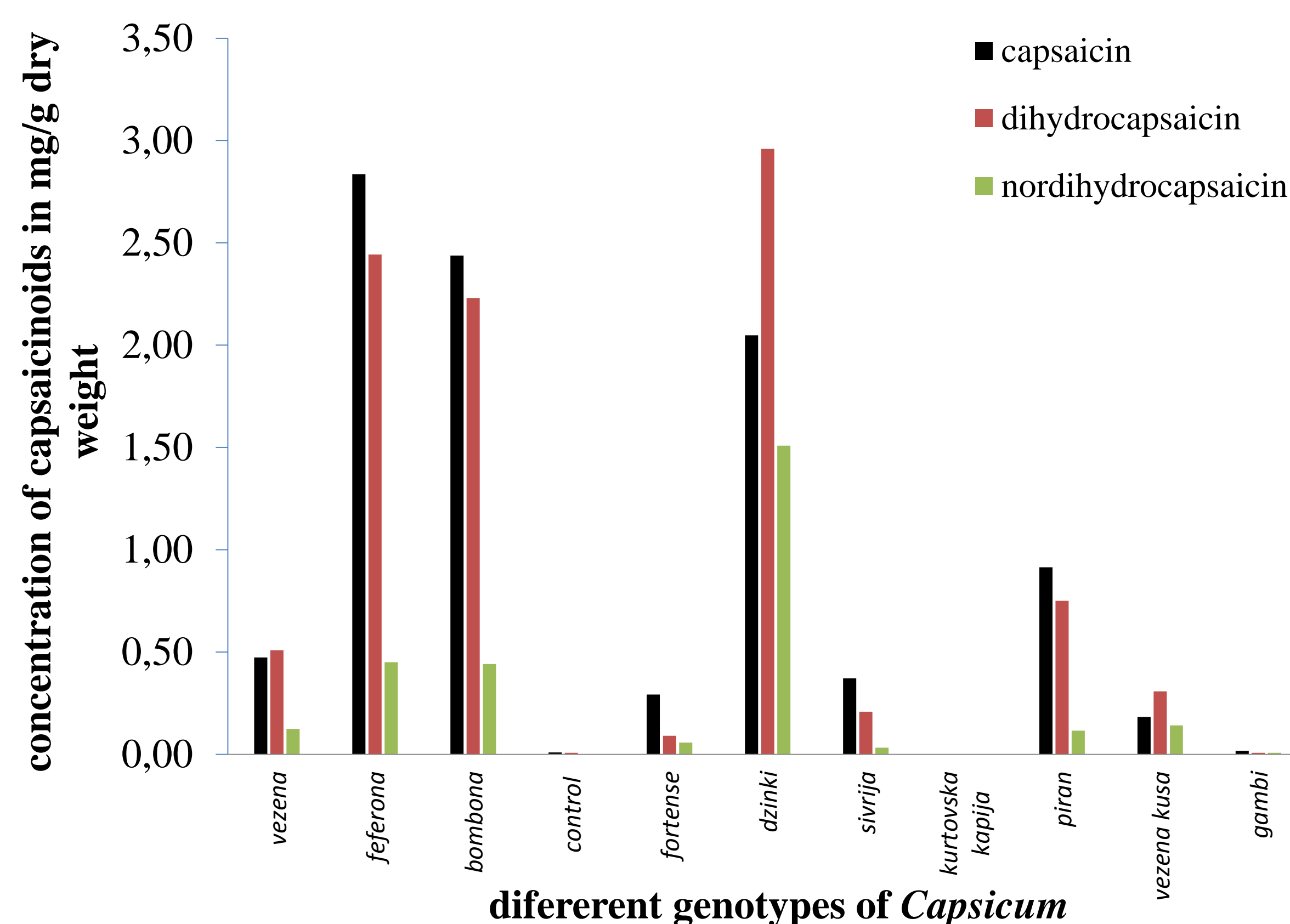


Figure 2. Concentration of capsaicin and dihydrocapsaicin in different genotypes of *Capsicum*

Conclusion

The results showed that this method can be employed as quantification method for determination of capsaicinoids in the *Capsicum* oleoresins. Development of a simple method for extraction and quantification of capsaicin from hot pepper fruits (*Capsicum annuum* L.) gives a chances for effective exploitation of this highly represented agro culture in Republic of Macedonia, and brings an opportunity for further investigations on its pharmacological activity.