

## ANTHOCYAN GLUCOSIDES FROM *Urtica dioica*

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The aerial part of dioecious nettle (*Urtica dioica* L., Urticaceae) collected in October 2001 in Hob region (western Georgia) was investigated.

The air-dried ground raw material was extracted with  $\text{CHCl}_3$  and then  $\text{CH}_3\text{OH}$  containing HCl (1%) in the dark at room temperature.

The  $\text{CH}_3\text{OH}$  extract was concentrated in vacuum at 35-40°C and chromatographed over a column of cellulose powder with elution by aqueous HCl (0.5%). Fractions were collected as the anthocyan bands eluted. Eluates of pure compounds were combined, condensed in vacuum to a small volume, and treated with diethylether (10:1). The precipitate was separated, washed with ether, and dried in vacuum. Three compounds were obtained.

Compound **1** was a crystalline dark-red powder, mp 260°C (dec.), PC  $R_f$  0.06 (0.5% HCl). UV spectrum (MeOH containing 0.1% HCl,  $\lambda_{\text{max}}$ , nm): 280, 530.

Acid hydrolysis of **1** and **2** produced the aglycon with mp >300°C (dec.). The aglycon was identified as pelargonidin. This was confirmed by decomposing it with  $\text{Ba}(\text{OH})_2$  solution (15%) to phloroglucinol and *p*-hydroxybenzoic acid and by chromatography with authentic pelargonidin, prepared by reduction of kaempferol. UV spectrum (MeOH containing 0.1% HCl,  $\lambda_{\text{max}}$ , nm): 270, 520.

UV spectra of the glycosides measured with methanolic  $\text{AlCl}_3$  (5%) showed that ring B had no dihydroxy group [1].

The carbohydrate part of **1** and **2** was D-xylose.

The attachment site of the carbohydrates to the aglycon was determined by oxidation of the anthocyan glycosides **1** and **2** with  $\text{H}_2\text{O}_2$  [2]. This revealed that the former contains D-xylose; the latter, biose, acid hydrolysis of which produced D-xylose.

Stepwise acid hydrolysis of **2** formed **1** and D-xylose.

These results indicate that **1** is pelargonidin monoxyloside; **2**, pelargonidin xylobioside.

These anthocyanins are described by us for the first time.

Compound **3**, PC  $R_f$  0.70 (0.5% HCl). UV spectrum (MeOH containing 0.1% HCl,  $\lambda_{\text{max}}$ , nm): 280, 530. Acid hydrolysis produced the same aglycon, pelargonidin, and the sugars D-glucose and L-rhamnose.

The structures of **1-3** are still under investigation.

The total anthocyan content of dioecious nettle that was determined by a spectrophotometric method [3] calculated for cyanidin-3,5-diglucoside was 0.3%.

## REFERENCES

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3. USSR State Pharmacopoeia, *Meditina*, Moscow (1990), Vol. 2.