

20-HYDROXYECDYSONE CONTENT OF SEVERAL REPRESENTATIVES OF THE FAMILIES ASTERACEAE AND CARYOPHYLLACEAE

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Plants of the families Asteraceae Dumort. (genera *Rhaponticum* Adans. and *Serratula* L.) and Caryophyllaceae Juss. (genera *Lychnis* L. and *Silene* L.) have been recognized as promising sources of ecdysteroids [1–3]. Therefore, screening of plants from these families for 20-hydroxyecdysone (20E) content is especially urgent.

Our goal was to study plants of the families Asteraceae and Caryophyllaceae growing or cultivated in the Republic of Kazakhstan for 20E content using HPLC.

It is known the ecdysteroid-containing plants within various families occur in groups of closely related species [4]. For this reason, we studied six species of the genera *Serratula*, i.e., *S. kirghisorum* Iljin, *S. cardunculus* (Pall.) Schischk., *S. erucifolia* (L.) Boriss., *S. gmelinii* Tausch, *S. radiata* (Waldst. et Kit.) M.B., and *S. quinquefolia* M.B., the first three of which grow in Central Kazakhstan and the last of which are cultivated in regions of it with a distinctly continental climate [5]. Also, we studied nine plant species indigenous to Kazakhstan of the family Caryophyllaceae, i.e., *Minuartia kryloviana* Schischk., *Melandrium noctiflorum* (L.) Fries, *Silene cretaceae* Fisch., *Silene fruticulosa* (Pall.) Schischk., *Silene wolgensis* (Hornem) Bess., *Arenaria stenophylla* Ldb., *Lychnis yunnanensis* Bak. f., *Lychnis Alba* Mill., and *Lychnis coronaria* (L.) Desr. [6]. Table 1 lists the results for several representatives of the families Asteraceae and Caryophyllaceae.

The quantitative 20E content was determined by analyzing extracts from the aerial organs of these species by HPLC.

Thus, the quantitative 20E content in *S. cardunculus* (0.61%) and *S. cretaceae* (0.51%) was determined for the first time. A high 20E content in *S. wolgensis* (1.76%) that exceeded this value in *S. coronata* was observed for the first time and makes the use of this species promising as one of the principal sources of 20E.

TABLE 1. 20E Content in Plants of the Families Asteraceae Dumort. and Caryophyllaceae Juss.

Plant species	Plant organ	20E quantitative content, %	
		in extract	in raw material*
<i>Asteraceae</i> Dumort.			
<i>Serratula gmelinii</i> Tausch	Stems	1.18	0.22
	Leaves	0.25	0.13
	Inflorescences	0.57	0.17
<i>Serratula cardunculus</i> (Pall.) Schischk.	Inflorescences	0.09	0.03
	Veg. parts	1.75	0.61
<i>Serratula kirghisorum</i> Iljin	Inflorescences	0.006	0.0018
	Veg. parts	0.16	0.06
<i>Serratula radiata</i> (Waldst. et Kit.) M.B.	Inflorescences	0.71	0.18
	Leaves	0.20	0.12
	Stems	1.20	0.20
<i>Serratula quinquefolia</i> M.B.	Inflorescences	0.16	0.05
	Leaves	0.22	0.05
	Stems	0.09	0.03
<i>Serratula erucifolia</i> (L.) Boriss.	Aerial part	0.51	0.1
<i>Caryophyllaceae</i> Juss.			
<i>Silene cretaceae</i> Fisch.	Aerial part	1.4	0.51
<i>Silene fruticososa</i> (Pall.) Schischk.	Aerial part	0.42	0.08
<i>Minuartia kryloviana</i> Schischk.	Aerial part	0.01	0.003
<i>Melandrium noctiflorum</i> (L.) Fries	Aerial part	0.02	0.005
<i>Silene wolgensis</i> Fisch.	Aerial part	3.8	1.76
<i>Arenaria stenophylla</i> Ldb.	Aerial part	0.02	0.005
<i>Lychnis yunnanensis</i> Bak. f.	Aerial part	0.03	0.016
<i>Lychnis alba</i> Mill.	Aerial part	0.01	0.003
<i>Lychnis coronaria</i> (L.) Desr.	Aerial part	0.24	0.07

*Raw material mass 1 g.

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