ECDYSTERONE ACCUMULATION DYNAMICS IN *Rhaponticum integrifolium*

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Plants of the genus *Rhaponticum* are rhizomous herbaceous plants with large spherical flowerheads. There are 12 species in the flora of the CIS, of which 9 are indigenous to Central Asia [1].

R. integrifolium C. Winkl (Asteraceae) under natural conditions is distributed over Central Asia, in particular, in Surkhandarin and Kashkadarin Oblasts and in the Fergan Ridge and Pamir-Alai.

Knowledge of the accumulation dynamics of ecdysteroids in separated plant organs during development phases and growth stages of ontogenesis is needed to produce plant raw material as a source of them and to determine the optimal times for collecting plant material.

Species of the genus *Rhaponticum* turned out to be promising plants in a search for ecdysteroids among representatives of the domestic flora [2-8]. Herein we report the accumulation dynamics of ecdysterone in *R. integrifolium* cultivated in the Fergan valley.

The plant was propagated by sowing seeds in October-November. It formed a rosette of juxtahilar leaves during the first year. Flowering and fruiting occurred during the second year. Second-year specimens began to grow in the third decade of March; budding was observed at the end of April to the beginnig of May; flowering, in the middle of May; ripening, in June. The plant grew vigorously in April-May. It reached 120 cm during this time. All 1000 seeds weighed 19.2 g.

We analyzed roots, aerial parts, and seeds collected during vegetation in the first decade of May-July in the second year of growth (2007).

Ground roots, seeds, and aerial parts were extracted with CH_3OH. The CH_3OH extract was condensed and diluted with water. The aqueous solution was treated with $CHCl_3$. Total ecdysteroids from the aqueous layer were extracted exhaustively with butanol. The butanol was distilled off. The solid was chromatographed over silica gel ($CHCl_3$:CH_3OH, 9:1) to isolate pure ecdysterone.

Table 1 lists the quantitative content of ecdysterone in the various plant organs during its development phases. It can be seen that various plant organs (roots, aerial part, seeds) differed in ecdysterone content. The aerial part during flowering and seeds at the end of vegetation contained the most ecdysterone.

TABLE 1. Ecdysterone Content of *R. integrifolium* in Development Phases

Development phase	Ecdysterone amount, % of absolute dry weight		
	roots	aerial part	seeds
Rosette	0.89	0.55	-
Budding	0.67	0.82	-
Flowering	0.44	0.98	-
Fruiting	0.32	0.47	1.42
End of vegetation	0.43	0.21	-

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Thus, the ecdysterone content varied from 0.21 to 1.42% in the plant depending on the development phase and organ. The ecdysterone content was maximum in seeds (1.42%), in roots at the start of vegetation (0.89%), and in the aerial part during vegetation (0.98%).

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