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Short communication

COMPARATIVE INVESTIGATION OF SOME PERIANTH TRIATS IN THE TWO MORPHS OF *PRIMULA VERIS* AND *P. VULGARIS*

K. KÁLMÁN and E. MIHALIK

Department of Botany, József Attila University, H-6701 Szeged, P. O. B. 657, Hungary

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During the last two decades there has been a resurgance of interest in heterostyly. On one hand, studies have been extended to taxa in which heterostyly was previously not investigated, e. g. to species of Boraginaceae (WELLER and ORNDUFF, 1989), Menyanthaceae (OLESEN, 1986) and Turneraceae (BARRETT and SHORE, 1987). On the other hand, recent studies have employed the up-to-date techniques of cytochemistry (HESLOP-HARRISON *et al.*, 1981; DULBERGER, 1987), molecular genetics (CLARKE *et al.*, 1989) and electron microscopy (SCHOU, 1984).

We investigated the morphological features in the distylous plants, as in our preliminary studies we found differences not only in the style length and the stamen position but also in the dimension of perianth characters, such as the lengths of calyx, corolla-tube and corolla-lobes. We examined separated natural populations of *Primula veris* L. and *P. vulgaris* L. in 1996. The aim of this work was to describe the morphological differences of perianth between the two species and between the pin (long-styled) and thrum (short-styled) morphs of the species. We carried out statistical analysis of the data and the means were compared by Student's t-test. We also prepared frequency-distribution diagrams of the characters to reveal the background of the differences.

The comparison of the species shows that the means of corolla-tube length and corolla-lobe length differ significantly in both morphs at a level of significance of 0.1% (Table 1). The most striking difference was found in the corolla-lobe length where the mean value of *Primula veris* was approximately 50% of the mean of *P. vulgaris* in both morphs (Table 2). In the case of the calyx length, a significant difference between the species was found only in the thrum morphs (level of significance is 1%).

The other important difference between the species is that the standard deviation of all the characters examined was higher in *Primula vulgaris* than in *P. veris*, especially in the pin morphs (Table 2).

The comparison of the two morphs shows that it is reasonable to differentiate between the morphs not only on the basis of style length and stamen position. The means of the perianth characters of the morphs also differ from each other in both species. Consequently it is not sufficient to characterize the species by the means

calculated from the whole populations but it is necessary to add the means of each morphs (Table 2).

Table 1. Level of significance of the diffrence between *P. veris* and *P. vulgaris* and between the pin and thrum morphs of these species (means were compared by Student's t-test).

	P. veris: P. vulgaris			*pin: thrum*	
	whole pop.	pin	thrum	*P. veris*	*P. vulgaris*
calyx length	N.S.	N.S.	1 %	5 %	N.S.
corolla-tube length	0.1 %	0.1 %	0.1 %	0.1 %	0.1 %
corolla-lobe length	0.1 %	0.1 %	0.1 %	1 %	10 %

Table 2. Means and standard deviations of the perianth characters.

	Primula veris			*Primula vulgaris*		
	whole pop.	pin	thrum	whole pop.	pin	thrum
calyx length	1.78±0.15	1.74±0.14	1.83±0.16	1.73±0.17	1.76±0.18	1.71±0.17
corolla-tube length	1.46±0.15	1.54±0.12	1.38±0.14	1.76±0.17	1.68±0.18	1.84±0.14
corolla-lobe length	0.74±0.11	0.77±0.11	0.70±0.09	1.40±0.15	1.44±0.17	1.37±0.13

The largest difference between the morphs was detectable in the corolla-tube length at a significance level of 0.1% in both species. The calyx length and the corolla-lobe length did not differ siginficantly between the morphs, or if they did, the level of significance was higher than 0.1% (Table 1).

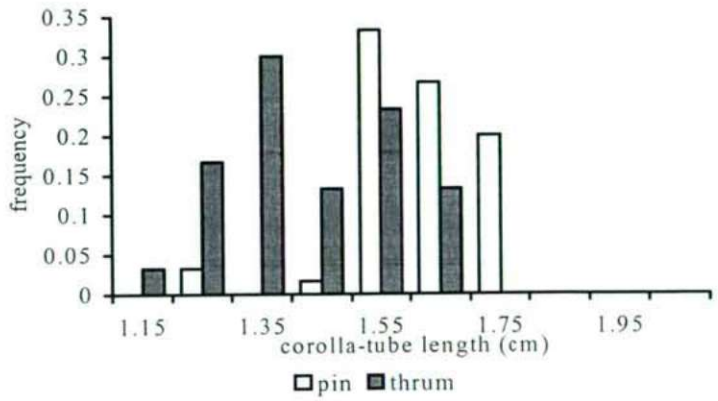

Fig. 1. Frequency-distribution diagram of corolla-tube length in pin and thrum morphs of *Primula veris*

We also prepared the frequency-distribution diagrams of the characters. In the corolla-tube length, the most differing feature, we found that the most frequent category of thrum morphs (category of 1.35 in *Primula veris* and category of 2.05 in *P. vulgaris*) have the frequency of zero in pin morphs (Figs 1 and 2). The diagrams of the corolla-

lobe length are very similar to each other in the morphs while the diagrams of the calyx length are quite random and the difference can not be related unambiguously to the morphs so these features appear not suitable to distinguish the morphs from each other.

On the basis of our results the corolla-tube length and corolla-lobe length seem to be suitable to distinguish the species of *P. veris* and *P. vulgaris* as the means separate from each other quite sharply.

To distinguish the morphs, only the corolla-tube length seems to be applicable on the basis of the means and the difference of the frequency-distribution diagrams.

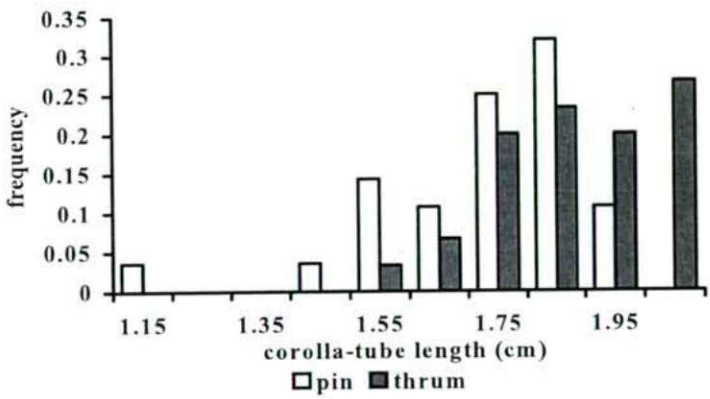

Fig. 2. Frequency-distribution diagram of corolla-tube length in pin and thrum morphs of *Primula vulgaris*

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