EXPERIMENTS ON FORCING WILD *INULA* AND *ASTER* SPECIES

Teodóra TAR, SCHMIDT GÁBOR
teodora.tar@uni-corvinus.hu
Corvinus University of Budapest Faculty of Horticultural Sciences
Department of Floriculture and Dendrology
1118 Budapest, Villányi st. 35-43.

***Abstract**: For floriculture using of native species is important to know their ecological demands, morphological and phenological features to create the value of them. In this experiment following phenological features were observed: appearance of flowering bud, beginning, end and length of flowering. Some morphological features were measured, too: number of inflorescences per stem, diameter of opened inflorescences, length of zygomorphic flowers. Experiments were situated in the glasshouses of Department of Floriculture and Dendrology. Examined species were:*

Inula ochulus-christi L.
Inula ensifolia L.
Inula britannica L.
Aster amellus L.
Aster linosyris (L.) BERNH.
Hieracium pilosella L.

Plants were grown in pots placed into heated benches. Supplemental light were applied as well and caused 20-30 days earlier flowering in the case of all the species. On the grounds of best morphological and phenological features (e.g. earliest flowering time or longest zygomorphic flowers in the case of Inula ochulus-christi) plants were selected to further growing.

INTRODUCTION

A desirable trend would be in Hungary to use native plants in the various fields of floriculture. Native plants have better abilities to tolerate the ecological and climatic circumstances of the area and have less risk of become invasive plants if getting back to the nature. Furthermore they usually have the same or nearly the same decoration value as the species from foreign countries in use. In many countries cultivation of native plants became an important programme of floriculture. For this reason there are some experiments with native compositae species of Hungary in the Corvinus University of Budapest, Faculty of Horticultural Sciences Department of Floriculture and Dendrology. Compositae species have a great diversity of size, shape, flowering time and ecological demand, and a large number of them have the requisite features to be an ornamental plant. (Vlahos n.d.)

Inula and *Aster* species cultivated in Hungary are mainly perennials or cut flowers enlarging the choice (e.g. *Inula ensifolia* L., *Inula orientalis* LAM., *Aster ericoides* L., *A. novae-angliae* L., *A. novi-belgii* L). (Nagy 1975) Propagation of them is mainly cutting (e.g. *Aster ericoides* L., *Aster novae-angliae* L., *Aster*

novi-belgii L.), but two native species, *Aster linosyris* (L.) Bernh. and *Aster amellus* L. may be propagated from seeds, too.

In this experiment morphological and phenological features of forced Inula and Aster species were observed.

MATERIALS AND METHODS

Examined species of the experiment were as followes: *Inula ochulus-christi*, *Inula ensifolia*, *Inula britannica*, *Aster amellus*, *Aster linosyris* and *Hieracium pilosella*. All the examined species belong to the *Asteraceae* family.

Inula ochulus-christi L. is a rare and protected species according to Hungarian low with an ideal value is 2000 HUF (approx. 8 euro). It appears in the Hungarian Mountains of Medium Height, in the south part of Transdanubia and in the Transdanubian part of the Grate Plain. The main habitats of it are dry grasslands, rocky grasslands and forest steppes. It grows to 60-80 cm height, have a rosette and flowering stem with 4-6 leaves. The total plant is covered by feathery hair. Flowering time is from June to August, its colour is yellow. Fig. 1.

Inula ensifolia L. is native on dry grasslands (*Festucetalia valesiacae*), frequent in the Hungarian Mountains of Medium Height. It requires a little bit more calciferous soil. Height is 40-50 cm, leaves are threaded-lanced shape, diameter of inflorescences are 3-5 cm. Colour is yellow, duration of flowering is from June to August. Fig 2.

Fig. 1. *Inula ochulus-christi*

Fig. 2. *Inula ensifolia*

Inula britannnica L. is frequent on wet grasslands and sometimes appears in secondary, weedy habitats as well. It can grow all over the country. Height is 50-70 cm, flowering time is from July to October, its colour is yellow. Fig. 3.

Aster amellus L. is more or less frequent in the Hungarian Mountains of Medium Height and in the west part of Transdanubia, and rare in the Hungarian Plain. It is a protected species according to Hungarian low with an ideal value is 2000 HUF (approx. 8 euro). Habitats are dry steppes, forest steppes and forest borders. It has a flowering time in autumn, from August to October. The stem is 50-70 cm height, colour of the flowers are from light blue to dark violet. Fig. 4.

Fig. 3. *Inula britannica*

Fig. 4. *Aster amellus*

Fig. 5. *Aster linosyris*

Fig. 6. *Hieracium pilosella*

Aster linosyris (L.) Bernh. is frequent in the Hungarian Mountains of Medium Height and sporadic on the west and south part of Transdanubia and on the Grate Plain. It requires an indifferent or slightly calciferous soil, the main habitats of it are rocky grasslands, slope steppes and forest steppes, loess steppes and karst shrub forests, but it appears on sandy grasslands and sometimes in oak forests as well. It grows to 60-80 cm height, leaves are narrow-threaded, sprinkled placed, the length of internods (based on habitats or growing circumstances) are changed from 1-2 mm to 1,5 cm. Flowering time is from end of July to early October. The yellow inflorescences contain only tubuliflor flowers. Fig. 5.

Hieracium pilosella L. can be found everywhere on undisturbed dry grasslands or wet fields, meadows and hay-fields. It has long and thin runners. Thought the plant itself is not more than 10 cm height or so, but the leafless flowering stem can grow approx. 25-30 cm height. The yellow inflorescences contain only liguliflor flowers. (Simon 1992, Soó 1968) Fig. 6.

Experiments were situated in the glasshouses of Corvinus University of Budapest, Department of Floriculture and Dendrology. Plants were grown in pots placed into heated benches. Supplemental light were applied as well. After flowering plants were put into open-ground circumstances.

The following phenological and morphological features were observed: appearance of flowering bud, beginning, end and length of flowering, number of inflorescences per stem, diameter of opened inflorescences, length of zygomorphic flowers.

RESULTS AND DISCUSSION

The measured phenological data is shown in Table1. below. It can be seen, that applied supplemental light caused 20-30 days earlier flowering in the case of all the species.

Table 1.

Measured phenological features

Species	Appearance of flowering bud		Flowering time	
	with light	without light	with light	without light
Inula ochulus-christi	03.16.	04.19.	04.07-05.27.	05.07-06.12.
Inula ensifolia	03.26.	04.28.	04.16-05.20.	05.22-06.29.
Inula britannica	-	04.26.	-	05.19-07.10.
Aster amellus	04.07.	04.26.	05.03-06.26.	05.20-08.06
Aster linosyris	03.22	04.05.	04.24-05.18.	05.16-06.07.
Hieracium pilosella	-	02.03.	-	03.13-05.21.

Table 2.

Comparison table for flowering data

Species	February			March			April			May			June			July		
In. och-ch.																		
In. och-ch.																		
In. ens.																		
In. ens.																		
In. brit.	No data.																	
In. brit.																		
Ast. am.																		
Ast. am.																		
Ast. lin.																		
Ast. lin.																		
Hier. pil.	No data.																	
Hier. pil.																		

In Table 2. you can see on the first line the flowering data of the plants treated by supplemental light and heated bench, on the second line the data of the plants treated by only supplemental light. Green colour means the flowering bud stage while red colour means the flowering stage.

Table 3. shows the length of the flowering period in days. The longest flowering period was observed by *Aster amellus*, but *Hieracium pilosella* and *Inula ochulus-christi* had long flowering time as well. The length of flowering period was influenced by treatment and the data of cutting, too.

It must be noticed, that the inflorescences of *Hieracium pilosella* were opened only one-two days, but the number of opened inflorescences per plant were 14-22 together.

Table 3.

Flowering time in days

Species	Flowering time (days)	
	with light	without light
Inula ochulus-christi	51	37
Inula ensifolia	35	39
Inula britannica	-	23
Aster amellus	55	78
Aster linosyris	25	23
Hieracium pilosella	-	70

The examined species can be described by the following morphological data, you can see on Table 4.

Hieracium pilosella forms inflorescences on leafless flowering stem so in this case there is no reason for speaking inflorescences per stem, only inflorescences per plant.

Because of *Aster linosyris* has only tubuliflor flowers, in its case there were no measure of diameter of opened inflorescences and length of zygomorphic flowers.

Table 4.

Measured morphological features

Species	Inflorescences per stem (pc.)			Diameter of opened inflorescences (cm)			Length of zygomorphic flowers (cm)		
	Aver.	Min.	Max.	Aver.	Min.	Max.	Aver.	Min.	Max.
Inula och.-ch.	7,6	5	16	4,1	2,8	5,5	1,2	0,9	1,7
Inula ensifolia	4,1	1	8	4,0	3,2	4,8	1,5	1,0	1,8
Inula britannica	1,2	1	2	4,7	3,9	5,6	1,6	1,3	2,1
Aster amellus	7,8	4	15	4,3	2,4	6,4	1,5	0,8	2,5
Aster linosyris	17,1	4	45	-	-	-	-	-	-
Hieracium pilosella	-	-	-	-	-	-	-	-	-

CONCLUSION

In the case of all the examined species forcing caused earlier flowering time than it was expected in the nature. Supplemental light caused another 20-30 days earlier flowering. On the grounds of best morphological and phenological features plants were selected to further growing. The examined species provide further opportunities of using wild compositae species on various parts of floriculture. Fig.7.

Fig. 7. Using wild species in bouquet

REFERENCES

1. Nagy B. (ed. 1975): *Dísznövénytermesztés*. Mezőgazdasági Kiadó, Budapest

2. Simon, T. (1992): *A magyarországi edényes flóra határozója. Harasztok – virágos növények*. Budapest, Nemzeti Tankönyvkiadó

3. Soó, R. (1968): *A magyar flóra és vegetáció rendszertani-növényföldrajzi kézikönyve III., IV*. Budapest, Akadémiai Kiadó

4. Vlahos, J.C. (1970): *Ebenus cretica. An attractive endemic plant of Crete with many possibilities for cultivation and floricultural use*. Tech. Edu. Inst. Iraklion, Crete