



Introduction the Potential Wild Plant Species of Iran as a Source of New Ornamentals

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Abstract

Iran is a great country which harbor more than 8000 plant species. It has one of the richest plant biodiversity in the world which arise from its varied climatic and topographic regions. Hence, it is important to have definite strategies for the conservation and exploitation of these valuable plant germplasm. Certain wild species have the great potential to be used in floriculture industry as this market always sought after the novel cultivar and species with outstanding form, size and colors. Therefore the introduction and the use of native species with valuable ornamental features are of great importance. In this study the preliminary investigation of the flora of Iran resulted in the selection of about 100 candidate species with ornamental potential which later were narrowed to the limited numbers based on their aesthetic and physiological characteristics. Drought tolerance was also considered as one of the main traits beside other criteria like the propagation method, flowering period, life cycle and breeding method. Consequently 20 species which obtained the highest scores among others were chosen for the more extensive research that can lead to the release of new cultivar or species to the market. Currently different research groups from all around Iran are performing initial researches on different aspects of the selected species.

Keywords: Native species, Propagation, Breeding, Physiology

Introducing wild plant species of Iran as sources of new ornamentals

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Abstract

Iran is a large country that harbors more than 8000 plant species. It has among the richest plant biodiversity in the world, which arises from its varied climatic and topographic regions. Hence, it is important to have definite strategies for the conservation and exploitation of this valuable plant germplasm. Certain wild species have great potential to be used in the floriculture industry, as this market is always seeking novel cultivars and species with outstanding form, size and colors. In this study, the preliminary investigation of the flora of Iran resulted in the selection of about 100 candidate species with ornamental potential, which was later narrowed to a limited number based mainly on their drought-tolerant, esthetic and physiological characteristics. Consequently, 20 species that obtained the highest scores were chosen for more extensive research that can lead to the release of new cultivars or species to the market. Currently, different research groups from all around the country are performing initial research on different aspects of the selected species.

Keywords: native, ornamental plant, germplasm selection

INTRODUCTION

Iran has among the richest plant diversity in the Middle East (Yavari and Shahgolzar, 2010). The climate of Iran is extremely continental, with hot and dry summers and very cold winters, particularly in central areas (Farahmand and Nazari, 2015). The average annual rainfall of Iran is about 240 mm (Heshmati, 2007). The unique environment and rich flora of Iran, as well as its ancient civilization, have attracted many biologists and orientalists to this region (Yavari and Shahgolzar, 2010).

There are about 8000 species of flowering plants in Iran, of which 1700 are endemic (Eftekhari and Ramezani, 2004). More than 200 species of bulbous plants grow in Iran, and play an important role in the colorful display of flowers to be found in the plains, mountains and forests (Wendelbo, 1977).

Today, the floriculture industry is looking for novel traits in ornamental plants. These can be obtained either by breeding existing cultivars for new forms, colors and sizes or by selecting new ornamentals from wild species. Wild plants can be considered as a rich and invaluable source to be used as new ornamental species. In general, there is no precise information in many countries regarding various aspects of native and endemic species with ornamental potential (Heywood, 2003). This lack of information could be due to difficulties in accessing these plants, the existence of little primary information about their growth

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requirements, and difficulties in their propagation (Thomas and Schrock, 2004). Nevertheless, native plants are valuable species in many aspects. Currently, the demand to use indigenous plants, especially in urban landscapes, has increased, which could help to establish more sustainable green spaces (Brzuszek et al., 2007).

MATERIALS AND METHODS

Introduction and the use of native species with valuable ornamental features are of great importance. Therefore, in this study, the wild plant species of Iran that had the potential to be used as sources of new ornamentals were investigated.

The preliminary investigation of the flora of Iran resulted in the selection of a number of candidate species with ornamental potential, which was later narrowed to a limited number based on defined criteria related to their esthetic and physiological characteristics. The criteria that were used in the selection of the plants included: drought tolerance, plant water requirements, reproduction method, natural blooming period, managed blooming period, life cycle and breeding methods. For each criterion, subclassifications were defined (Table 1) and, accordingly, 100 selected plants were scored. Finally, based on the scores given to each species, the plants with the highest scores were selected as potentially valuable ornamental species.

Table 1. Criteria and scoring method for selection of wild plant species with ornamental value.

Feature criterion	Scores
Drought tolerance	High (5), satisfactory (3), low (1), very low (0)
Irrigation interval	8-10 days (5), 6-8 days (4), 4-6 days (3), 2-4 days (2), every day (1)
Propagation method	Difficult (1), satisfactory (3), easy (5)
Natural blooming period	>40 days (5), 30-40 days (4), 20-30 days (3), 10-20 days (2), <10 days (1)
Managed blooming period	>6 months (5), 6 months (4), 4 months (3), 2 months (2), <1 month (1)
Life cycle	Perennial (5), biennial (3), annual (1)
Usage	Landscape (1), cut flower (1), medicinal (1), pot plant (1), dry flower (1)
Breeding requirement	Introduction only (3), requires breeding (1)

Table 2. Native plant species of Iran with potential ornamental value.

Scientific name	Family
<i>Achillea millefolium</i>	Asteraceae
<i>Althaea officinalis</i>	Malvaceae
<i>Anthemis</i> sp.	Asteraceae
<i>Capparis spinosa</i>	Capparaceae
<i>Crambe orientalis</i>	Brassicaceae
<i>Dianthus deltoides</i>	Caryophyllaceae
<i>Echeveria sempervirens</i>	Crassulaceae
<i>Echium amoenum</i>	Boraginaceae
<i>Eryngium billardieri</i>	Apiaceae
<i>Glaucium oxylobium</i>	Papaveraceae
<i>Isatis cappadocica</i>	Brassicaceae
<i>Othonna cheirifolia</i>	Asteraceae
<i>Perovskia atriplicifolia</i>	Lamiaceae
<i>Physalis alkekengi</i>	Solanaceae
<i>Pyrethrum</i> sp.	Asteraceae
<i>Salvia officinalis</i>	Lamiaceae
<i>Sedum</i> spp.	Crassulaceae
<i>Tanacetum parthenium</i>	Asteraceae
<i>Verbascum thapsus</i>	Scrophulariaceae
<i>Veronica</i> sp.	Plantaginaceae

RESULTS AND DISCUSSION

According to the specified criteria, 20 of the 100 plant species were selected from Flora Iranica (Table 2; Figure 1). These plants were chosen for their high drought tolerance, perennial life cycle and long flowering period. Moreover, they had medicinal properties in addition to their ornamental features.



Figure 1. Some of the wild plant species of Iran with ornamental potential. (a) *Achillea millefolium*; (b) *Salvia officinalis*; (c) *Capparis spinosa*; (d) *Crambe orientalis*; (e) *Othonna cheirifolia*; (f) *Perovskia atriplicifolia*; (g) *Eryngium billardieri*; (h) *Anthemis triumphettii*; (i) *Glaucium haussknechtii*; (j) *Echium amoenum*; (k) *Veronica* sp.; (l) *Isatis cappadocica*.

The scores ranged from 17 to 23. Higher scores mean that the relevant species are more capable of being used in landscapes, especially in arid and semi-arid areas. Accordingly, genera belonging to the family *Asteraceae*, including *Pyrethrum*, *Achillea*, and *Tanacetum*, obtained the highest scores. *Salvia sclarea* and *Echeveria sempervirens* gained the lowest scores.

Wild plant species are known for their lower water requirements and low maintenance. In addition, these plants are best adapted to the climate conditions of the regions that they are living in, and can demonstrate better survival rates under adverse environmental conditions (Tamimi, 1999; Thomas and Schrock, 2004).

Studies have indicated that the use of native plants in urban and rural landscape designing has increased in the United States. This could be due to the better establishment of native species to the hard conditions of the selected site. It has also been stated that the use

of indigenous plants in floriculture is expanding, especially in the southern regions of the United States, which has motivated growers of these plants and led to the emergence of the market in this area (Tamimi, 1999).

CONCLUSIONS

Twenty wild plant species with ornamental potential that had superior ornamental features were selected from the Flora Iranica. These species were selected in terms of high drought tolerance, low water requirements, easy propagation, perennial life cycle and better performance under hard climatic conditions. Currently, certain research groups from all around Iran are performing initial research on different aspects of the domestication of these selected species.

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