Pak. J. Bot., 41(4): 1573-1576, 2009.

ESTABLISHED FORMS OF *FRITILLARIA IMPERIALIS* L. -A NATURALLY GROWING SPECIES IN TURKEY

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Abstract

Turkey is a rich country in terms of geophytes. *Fritillaria* genus is a part of this natural wealth with its 39 species that grow naturally. The most popular of these is *Fritillaria imperialis* L. Naturally, *Fritillaria imperialis* L., spreads on a wide area. This plant is found from Anatolia to Iran, Iraq, Afghanistan, Pakistan, Kashmir, and high in the Himalayan Mountains. The bulbs of this plant were taken from Anatolia to Europe and then to Australia by the French botanist Carolus Clusius (1525-1609) in 1583. Even though in the past new varieties were developed on the basis of the exported bulbs in Europe, no special breeding programs were carried out. However, in nature the species shows variation. The work presented in this paper, includes the results of observations made during the efflorescence period of the plant in its natural habitats. Significant variations were observed with respect to those characteristics mentioned.

Introduction

Anatolian soils are very rich in terms of geophytes. In Turkey, there are about 40 genuses of geophytes and totally there are 700 species. Many of the geophytes which ornament the European gardens today have originated from the Anatolia. For instance, tulip bulbs were among the plants that O. G. Busbecq, the ambassador of the Austria-Hungary Empire before Sultan Süleyman, took with himself from Istanbul to Europe. *Fritillaria imperialis* L., another geophytes species, is known to have been taken from Turkey to Vienna in 1576 by the French Botanist Carolus Clusius (Baytop, 1998, Pavord, 1999, Grismshaw, 2002; Ekim et al. 2005).

There are 41 species and sub-species of *Fritillaria* type grow in Anatolia, 14 of which are endemic. The rate of endemism is 35.2%. Considering the fact that around one third of the *Fritillaria* species which grow all exist in the world grow naturally in our country and 15% of them exclusively grow here, the significance of our country with regard to the *Fritillaria* species is better understood (Rix, 2001; Arslan, 2002; Tübives, 2008).

Among these, *F. imperialis* and *F. persica* species are produced for export. Gathering of the other species from the nature and their export is banned. However, it is also known that some species which endemically grow in our country are grown by the lovers of *Fritillaria* in the other countries. This comes to mean that, if produced conveniently, these endemic species can be traded (Arslan, 2002; Alp, 2006).

Since *F. imperialis* was taken from Turkey to Vienna, it is known in the Western Europe as "Crown Imperial" for more than 400 years. This naming most possibly originates from the old name of the plant in our language which was Tuğ-u şahi (Royal Crown) and still exists in some sources.

F. imperialis is the oldest ornamental plant and known in Iran and Eastern European part from a very long time ago. It is known that this plant was as popular as tulip, hyacinth and narcissus during the Ottoman era, and a significant harvest was done in

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1570's to cultivate it. After being introduced to Europe, *F. imperialis* was categorized among the basic gramineous plants which can resist cold whether. (Pavord 1999, Clark & Grey-Wilson, 2003).

In the 18th century, efforts were made to make new forms of this flower where it was quite popular. The layered yellow and orange colors started to be mentioned in the western European garden literature around 1600's. Yet, the newly developed varieties couldn't survive the World War II. It is said that the last of these was grown in 1946 by George Morrison Teyler (Grismshaw, 2002; Clark & Grey-Wilson, 2003).

Today, cultivated varieties like the orange red colored "Rubra Maxima", range color "Aurora", light yellow colored "Lutea" have been added. New cultivated varieties like "Aureomarginate" with its yellow-green leaves have been added to these through selection works in the recent years. Today 16 forms are embellishing the European gardens (Pratt & Jefferson-Brown, 1997).

In this study, the differences in the blooming forms, number of blossoms, colors of blossoms and fragrances of *F. imperialis* species, which are exported, were determined and recorded by observing them in their natural growth environment in Anatolia in their efflorescence period. In the end of this study, production of different forms of these determined species will make a contribution in increasing the use of these species.

Material ad Methods

The subject of this work is the natural populations of *Fritillaria imperialis* L., which is spread in different areas of Anatolia. Before the area trips started, the records of the areas where the populations have spread were screened and the regions were singled out. New regions were added by us to these existing ones. Since the habitat features of the areas in the Anatolia where the populations were spread, there were differences in the efflorescence periods. Information was sought from the local people of those regions and area trips were conducted in the natural growth areas of the plant in Inner Anatolia, South Anatolia and East Anatolia regions. The differences in the colors of the flowers, flower structure, number of flowers, state of flowers and colors of the leaves were determined and recorded.

Results and Discussion

F. imperialis has been likened to the brides who leave their parent's house and hence has been called "Weeping Bride" as it has a lowered head and drops nectars. Apart from this name, it is also called 'ters lale' (invert tulip), Şah Tuğu (Royal Crown) and Hakkari lalesi (Hakkari Tulip). Differences which were detected in the morphology of the plant in the field studies are examined under the following titles (Figs. 1& 2).

Differences in the colors of the plant bodies: The body color is generally anthocyanin, but there are also partially green and fully green colors. The body color of the plants with pure yellow flowers is also always green.

Differences in the colors of the flowers: The color and shape of the flower have an important role in the use of the plant as an eye-catching and ornamental plant. Significant differences have been detected in the colors and shades of the flowers during the area Works. These differences are red color and its shades, orange color and its shades and yellow color and its shades.

Fig. 1. Morphologic differences noticed in *Fritillaria imperialis* L.

Fig. 2. Flowers differences noticed in *Fritillaria imperialis* L.

Although *F. imperialis* has a vast spread in the nature, it is generally known as uniform species (Clark & Grey-Wilson, 2003). This is confirmed by the area workers. The most wide-spread and dominant color is the brick red - orange color. The information regarding the yellow form of this species which is known as "Lutea" dates back to 1665 and is referred to hybrid of *F. chitralensis* and *F. imperialis*. There is no information regarding its origin. However, we found natural plants with yellow flowers in Anatolia. This shows that the yellow form is not a hybrid.

Differences found in the flower state (inflorescence): The flower state of *F. imperialis* is in the form of a basic umbel flower pendulus (invert umbrella). These flowers grow with a pedicle as a single circle over the top of the plant body. The flowers open simultaneously. In some plants, the flowers have been seen to be connected to the plant body in an alternating shape.

Differences noticed in the bract leaves: There is a bunch of thin spear shaped leaves on top of the body of *F. imperialis* and over its flowers. In some plants, these leaves grow from the body top with a wide angle and fully cover the flowers and make them look broader, while in some others the leaves grow with a straight angle and make the plant look taller.

Differences noticed in the number of flowers: The number of flowers located at the top of the plant body varies according to the size of the bulb and its nourishment. In our in-site works, we noticed 1-12 flowers per plant. Plants with 4-7 flowers were seen the most abundant. In some plants, the flowers had grown in two layers at top of each other.

Differences noticed in the flower organs: Generally, both the male and the female organs of the *F. imperialis* flower have the same length as the flower petals. It was noticed in some plants that the male organs have elongated and exceeded the petal length. In these plants the white male organ makes the flower color look more beautiful.

Differences noticed in the flower pedicel: The flowers are connected to the plant body through the flower pedicel. Researches have shown that flower pedicels have different

length and development forms. The flower pedicel is told to be 2 to 3 cm in average. The length of the flower pedicel and its connection angle to the plant body makes the flower look in different forms.

All significant variations have been detected in the populations of the species naturally growing in Anatolia. Although, the bulbs produced as a result of the production activities which have started by using these populations as the maternal ovary material, show morphological differences, they are exported overseas without any separation. These plants should be categorized and must be produced according to their differences and new forms and varieties should be developed in the long run. While this species has developed varieties overseas, it is very surprising and noticeable that we do not have any varieties despite of being their origin. Such a development will cause the uses of these plants as ornamental plants to increase and hence, will increase our share in the ornamental plant market.

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Tübives 2008. http://wwweski.tubitak.gov.tr/tubives/ (Reaching23/06/2008)

(Received for publication 1 September 2008)