ACADEMICIA

ISSN: 2249-7137 Vol. 11, Issue 3, March 2021 Impact Factor: SJIF 2021 = 7.492

ACADEMICIA
An International Multidisciplinary Research Journal
(Double Blind Refereed & Peer Reviewed Journal)

DOI: 10.5958/2249-7137.2021.00784.9

CHARACTERISTICS AND ECOLOGICAL SIGNIFICANCE OF CRATAEGUS L. PLANTS IN THE CONDITIONS OF KARAKALPAKSTAN

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ABSTRACT

The article provides information on the aim of our work is to study the biological features of the species of the genus hawthorn, in connection with their introduction in the conditions of the Southern Aral Sea region. Introduction of new plant species is an important issue for the Republic of Karakalpakstan, characterized by severe soil and climatic conditions. Hawthorn was first introduced in England in 1750. Already in the XVIII and XIX centuries, hawthorns appeared in Holland, France, Denmark, and Sweden, but only up to 40 species were used in landscaping. In many botanical gardens of the former USSR in the 1930s-1940s, work began on the introduction of hawthorns into culture.

KEYWORDS: *Hawthorn, Crataegus L., introduction, flowers bloom, vitamins, flora, Botanical Gardens, Southern Aral Sea region.*

INTRODUCTION

The generic name of the hawthorn Crataegus comes from the Greek word «cratanos», meaning strong, sturdy. This name was given to hawthorn for its outstanding durability (up to 400 years), resistance to adverse conditions, and for its strong, solid wood. Sharp thorns - that is what people noticed when they first met this plant [2, p. 272].

Hawthorn was first introduced in England in 1750. Already in the XVIII and XIX centuries, hawthorns appeared in Holland, France, Denmark, and Sweden, but only up to 40 species were used in landscaping. In many botanical gardens of the former USSR in the 1930s-1940s, work began on the introduction of hawthorns into culture [1, p. 222].

A number of research papers are dedicated to the study of hawthorn. A. Raeder points out that more than 1000 species of hawthorn naturally grow in North America. According to the scientist, the genus has 1250 species worldwide, of which 1125 species grow in America [8, p. 514-577].

In the Botanical Gardens of Central Asia, work on the introduction began in the post-war years. In Central Asia, the introduction and study of the biology and ecology of hawthorn was first carried out in the central botanical garden of the Republic of Turkmenistan [10, p.10-15].

Especially widely in Central Asia, work was carried out in Uzbekistan, the collection of hawthorns was considered the largest in the post - war years, it numbered 120-130 species [1, p.222].

The introduction of new plant species is an important issue for the Republic of Karakalpakstan, characterized by severe soil and climatic conditions.

Taking this into account, along with local breeds, it is necessary and possible to introduce new breeds from the flora of other zones in order to create a rich and diverse planting material of fast-growing, long-lasting ornamental trees and shrubs for the early implementation of landscaping in the populated areas of the Republic of Karakalpakstan.

Among the many plants introduced by the Karakalpak branch of Academies of sciences of Republic of Uzbekistan of Botanical Garden, species of the hawthorn genus Crataegus L. from the Rosaceae family are of great interest.

Plants of the genus Hawthorn (Crataegus L.) according to the traditional classification and the structure of the flower and fruit belong to the family of Rosaceae (Rosaceae Juss.), the subfamily of Apple trees (Maloideae) [11, p.611]. The scientific name of the genus comes from the Greek words crata (strong, strong) and agein (lead, act).

Hawthorn - Crataegus L. belongs to the Rosaceae family. These are trees or large shrubs, in the best growing conditions it reaches a height of 10-15 m, most species have a height of 5-8 m. The maximum trunk diameter of 40-50 cm is noted in some species of American hawthorns. Deciduous, rarely semi-evergreen trees 3-5 m., sometimes up to 10-12 m in height, often multi-stemmed or growing or fractured, in some species exfoliating with small plates [5, pp. 57-62,].

The flowers bloom in spring or early summer later than the leaves – a period when the latter have not yet reached normal size; protogenic, honey-bearing, but have an unpleasant smell and are pollinated mainly by various flies, as well as beetles and bees; at the end of flowering, when the stamens are fully developed, self-pollination is also possible [8, p.514-577]. Inflorescences are

corymbose or umbellate, in a few species the flowers are single or two or three, a corolla of five petals, columns from one to five, stamens from 5 to 20, their color is diverse. The fruits are apple-shaped, spherical, ellipsoidal or pear-shaped, yellow-orange, red or black [3, p. 154-155].

Many species of the genus of hawthorns, for example, Altai hawthorn – Crataegus altaica, blood-red hawthorn – C. sanguinea, Almaati hawthorn – C. almaatensis, Songarsk hawthorn – C. songarica, Korolkov's hawthorn – C. corolkovii – ornamental, fruit, medicinal, vitamin plants, at the same time they are resistant to adverse conditions of our republic, well tolerate salinity and dryness of the soil. All species can tolerate shading, but in open areas they develop well and bloom profusely.

PURPOSE AND OBJECTIVES OF THE STUDY

The aim of our work is to study the biological features of the species of the genus hawthorn, in connection with their introduction in the conditions of the Southern Aral Sea region. Introduction of new plant species is an important issue for the Republic of Karakalpakstan, characterized by severe soil and climatic conditions.

Taking this into account, along with local breeds, it is possible and necessary to introduce new breeds from the flora of other zones in order to create a rich and diverse planting material of fast-growing, long-lasting ornamental trees and shrubs for the early implementation of landscaping in populated areas of the Republic of Karakalpakstan.

In the conditions of the city of Nukus, in 1989, several scientists studied the appearance of vegetative and reproductive organs on the buds of some species of the genus hawthorn [5, p. 57-62, 4, p. 145-147].

RESULTS AND DISCUSSION

In the Botanical Garden of Karakalpak branch of Academies of sciences of Republic of Uzbekistan, it grows from March 25 to October 30. The growth of shoots is observed from April 9 to May 20, with an annual increase of more than 25 cm. In the conditions of the garden, the pinnately cut hawthorn grows well, does not suffer from dry air, it is quite winter and frost-resistant. It is of great interest as an ornamental plant. Suitable for creating hedges. Because of beautiful flowers, it is bred in gardens and streets for decorative purposes. It grows in a variety of soil and climatic conditions, both in mountainous areas and on plains with forest and steppe vegetation, and has very broad adaptive properties, which greatly facilitates its introduction in new conditions.

Introduced hawthorn species in the conditions of Karakalpakstan grow intensively in April-May, when the relative humidity is quite high and the temperature is relatively low. During these months, most hawthorn species show the greatest growth compared to other months. During this period, plants are provided with up to 80-90%, and in some cases the entire annual growth. The nature of the growth varies within a single plant and depends on their position on the shoot, age status, environmental conditions (light intensity, temperature, relative humidity of the air and soil).

Hawthorn is especially valued for its fruits. The fruits of many species are large, fleshy and edible. Fresh hawthorn berries can be eaten, used for making jam, marmalade, jelly [4, p. 8-10; 9, p. 25; 6, p. 145-147; 12, p. 860-863].

Ripe fruits in fresh form are soft, mealy and delicious, with little medicinal value inferior to rosehip. The sugar content ranges from 4 to 11 %, it mainly consists of fructose, so that they can be consumed in diabetes, as well as a complex of biologically active compounds — tri terpenic acids (oleic, ursolic and krategic), choline and acetylcholine, quercetin, tannins, phyto sterols, tartaric and citric acid, vitamins A, C, P. The acid content is small and ranges from 0.26 to 0.93%. The vitamin content reaches: vitamin C-31-108 mg/% (in American species up to 257.3 mg/%), vitamin P-330-680 mg/%, carotene 2-4 mg/% (in American species up to 75 mg/%). Fruits contain quite a lot of pectin, which not only forms jelly during processing, but also removes heavy metal salts and other harmful compounds from the body [7, p.287].

The use of hawthorn in medicine has been known for a very long time. Dioscorides wrote about this plant: "It is a tree covered with thorns... It has small fruits, similar to apples, but smaller. They are red, sweet, and each fruit has three grains." Later Avicenna wrote: "The fruit of this tree is round and edible, tart to the taste. Hawthorn binds more strongly than rowan, suppressing bile and locking up the flow more strongly than any other fruit" [2, p. 272].

In ethno science, hawthorn was used for palpitations, insomnia. The fruits were widely eaten fresh, as well as in the form of flour made from dried ground fruits. Sweetbread was baked from this flour. Hawthorns are great honey plants. Honey collected from their flowers is famous for its wonderful aroma and healing properties.

The hawthorn tree serves to protect nature, protects the soil from wind and water erosion. In the practice of green construction, for landscaping squares, parks, alleys, hawthorns are planted both in groups and alone. They make very beautiful hedges.

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