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IMPORTANCE OF NATAL PLUM *(Carissa grandiflora)* AS A LANDSCAPE PLANT IN TURKEY

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ABSTRACT
The species used in landscape design studies include aesthetic properties as well as functional features in our country. In this sense, there are many uses for selected species, such as noise control, boundary creation, routing.Working with our country with limited use of space as a kind of Carissa grandiflora plant utilization opportunities in landscape studies were examined. Carissa grandiflora and Carissa macrocarpa are known these names and belongs to the Apocynaceae family.In addition to its aesthetic value as an ornamental plant, the species that can be used in the fight against erosion is located in the bush class and can be shaped by pruning.Many regions have arid and semi-arid climes in our country. Traditional landscape plants are used that have been adapted to these regions. Carissa grandiflora plant was determined in terms of physiology as a species that could be adapted to the deficit rainy, arid and more difficult conditions in our country. In addition to all these features, it is emphasized that it is green all year round; it is resistant to drought, it is necessary to spread its usage throughout the country with its fruit and flower feature. Especially, those who are living need these kinds of plants in the arid and hot regions of our country.Natal plum is a visual, beautiful fragrance and fruit with a new known and will widely use a plant in this region.

Keywords: *Carissa grandiflora, landscape, adaptation, arid climate.*

1. INTRODUCTION

The Carissa grandiflora is native to the coastal region of Natal, South Africa, and is cultivated far inland in the Transvaal. It was first introduced into the United States in 1886 by the horticulturist Theodore L. Meade. Then, in 1903, Dr. David Fairchild, heading the Office of Foreign Seed and Plant Introduction of the United States Department of Agriculture, brought in from the Botanical Garden at Durban, a large quantity of seeds. Several thousand seedlings were raised at the then Plant Introduction Garden at Miami and distributed for testing in Florida, the Gulf States and California, and much effort was devoted to following up on the fate of the plants in different climatic zones. The carissa was introduced into Hawaii in 1905 and over the next few years was extensively distributed throughout the islands. It was planted in the Bahamas in 1913. It first fruited in the Philippines in 1924; is grown to a limited extent in India and East Africa. It was widely planted in Israel, flourished and flowered freely but rarely set fruit. Elsewhere, it is valued mainly as a protective hedge and the fruit is a more-or-less-welcomed by-product (Morton 1987). This intensive shrub grows rapidly up to 3 m in height and 4.5 m in width naturally occurring on the edges of green forests on the east coast of South Africa. Among the small rounded leaves are long, very sharp thorns. White flowers are visible from spring to summer. Their fruits are red, fleshy and oval and can be made into a delicious jelly.Carissa macrocarpa can tolerate salty soils (Botanica 2004). A vigorous, spreading, woody shrub with abundant white, gummy sap, the carissa may reach a height of 15 to 18 ft (4.5-5.5 m) and an equal breadth. The branches are armed with formidable stout, double-pronged thorns to 2 in (5 cm) long. The handsome, evergreen, opposite leaves are broad-ovate, 1 to 2 in (2.5-5 cm) long, dark-green, glossy, leathery. Sweetly fragrant, white, 5-lobed, tubular flowers to 2 in (5 cm) broad are borne singly or a few together at the tips of branchless all year (Fig.1).

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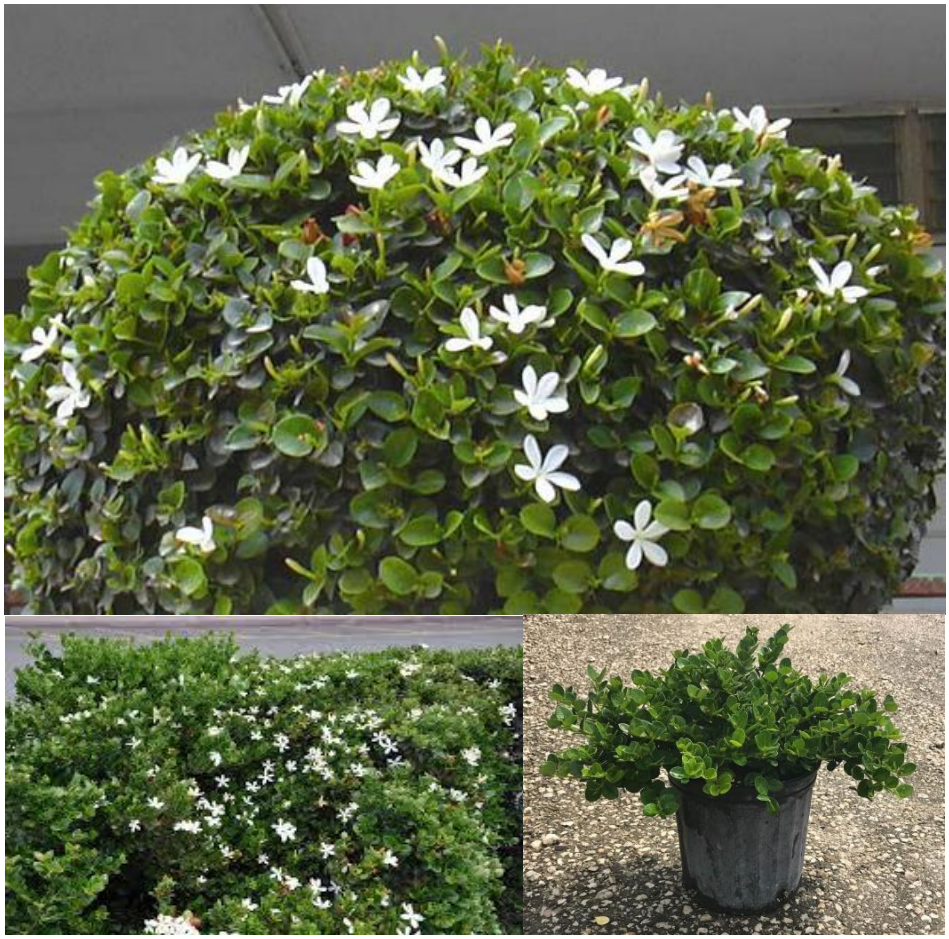

Figure 1. Carissa grandiflora's General View

Some plants bear flowers that are functionally male, larger than normal and with larger anthers, and stamens much longer than the style. Functionally female flowers have stamens the same length as the style and small anthers without pollen (Morton 1987).The plant grows at medium speed and is a kind of evergreen shrub, it has bright dark green and oval leaves. The flowers are white and star-shaped with jasmine fragrance. Carissa grandiflora is bright red, edible, similar to the taste of cranberry plum-shaped fruit (Gilman 2015). Carissa macrocarpa is documented as occurring outside of cultivation in Texas. Several colonies were found growing on shell middens in Nueces County. It is suspected that seeds were dispersed from landscape plantings in the Corpus Christi area. Carissa macrocarpa has moderate invasive potential along the Texas coast (Singhurst, J.R. and W.C. Holmes. 2010).

Climate. The Carissa grandiflora is subtropical to near-tropical, thriving throughout the state of Florida and enduring temperatures as low as 25º F (-3.89º C) when well-established. Young plants need protection when the temperature drops below 29º F (-1.67º C). Best growth is obtained in full sun.

Soil. The shrub thrives in dry, rocky terrain in Hawaii; in red clay or sandy loam in California, and in sandy or alkaline soils in Florida, though the latter may induce deficiencies in trace elements. The plant has moderate drought tolerance and high resistance to soil salinity and salt spray. It cannot stand water-logging.It can be sandy, train, adapt to any kind of land (Nemutlu, 2012).

Growing Season. While the Carissa grandiflora flowers and fruits all year, the peak period for blooming and fruiting is May through September. The 5-pointed calyx remains attached to the plant when the fruit is picked.
Fertilization. Carissa grandiflora fertilizer a standard, well-balanced fertilizer suffices except on limestone where trace elements must be added.

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Irrigation. Carissa grandiflora benefits from periodic irrigation, although rainfall is usually adequate to sustain the plant.

General Uses. Carissa grandiflora is using bonsai; foundation; screen; border; mass planting;container or above-ground planter; fruit; espalier; groundcover; superior hedge; small parking lot islands (< 100square feet in size); medium-sized parking lot islands(100-200 square feet in size); large parking lot islands (>200 square feet in size)(Gilman 2015).Natal Plums have shiny, deep green leaves and snowy white flowers. Their scent intensifies at night and they bloom for months at a time. The fruit appears in summer and fall, or fall and winter in warmer climates, and at the same time as it blooms.

Culture. Steel, seed. Steels can be taken any time of the year. The body steels must be 7.5-10 cm long. Planted in moist sand from the bottom together with the heat given rooting rooting hormone is easy.

For Natal plum (carissa grandiflora) it is best to have at least 4 hours of direct daylight, with night temperatures of 10 - 18C and daytime temperatures of 20^{o}C and above. Natal plum is suitable for compost rich soil 2 parts 1 part peat moss and 1 part sand. Keep it moist and fertilize every 3-4 months. It can be pruned at any time of the year. It is a wonderful plant for Bonsai (Fig 2.) (www.agaçlar.net) Carissa grandiflora is also suitable for Bonsai construction at the same time as its pruning feature.

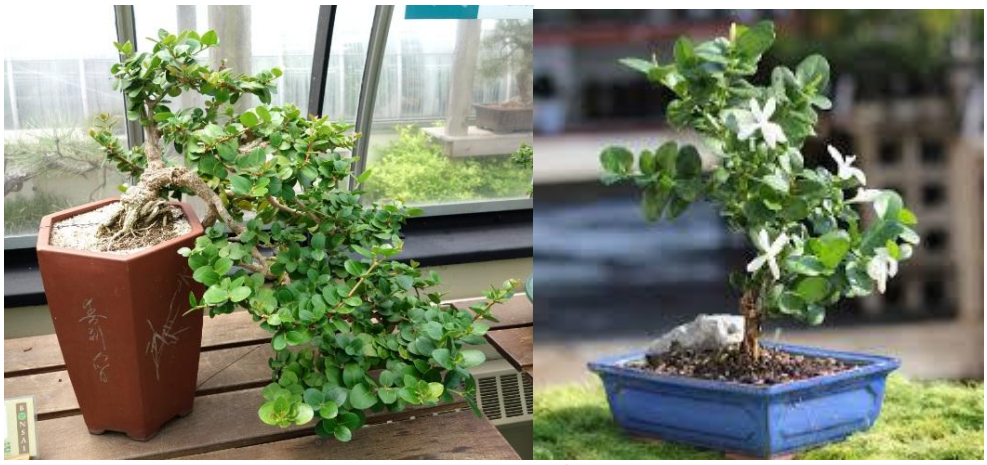

Figure 2. Natal Plum (Carissa grandiflora) as a Bonsai Usage

Natal Plum (*Carissa grandiflora)* FruitsUsage. According to the some researchers; carissa grandiflora fruits is widely used in the food industry for years. Researchers reported that it first fruited in the Philippines in 1924 and is grown to a limited extent in India and East Africa. The species is valued mainly as a protective hedge, while the fruit is edible and suitable for fruit salads, cakes, puddings ice cream, pies, and tarts. The summary information above on Carissa macrocarpa is taken from (Fig 3.)(Morton 1987).

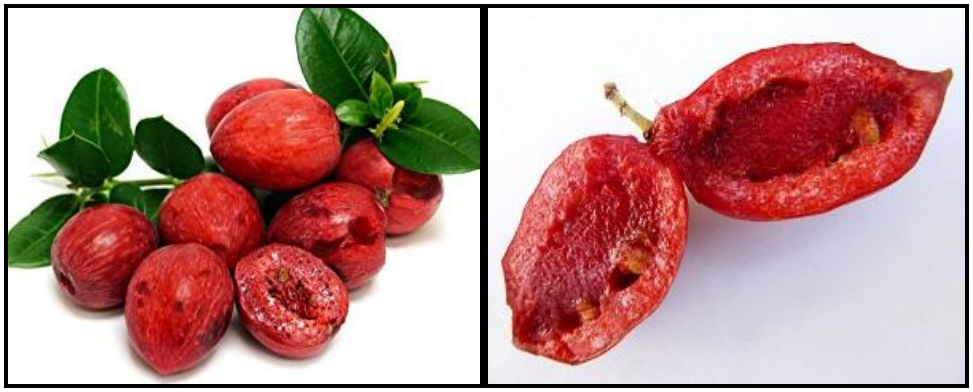

Figure 3.Natal plum (carissa grandiflora) Fruits

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Food Uses. The carissa must be fully ripe, dark-red and slightly soft to the touch to be eaten raw. It is enjoyed whole, without peeling or seeding, out-of-hand. Halved or quartered and seeded it is suitable for fruit salads, adding to gelatins and using as topping for cakes, puddings and ice cream. Carissas can be cooked to a sauce or used in pies and tarts. Stewing or boiling causes the latex to leave the fruit and adhere to the pot (which must not be aluminum), but this can be easily removed by rubbing with cooking oil.Carissas are preserved whole by pricking, cooking briefly in a sugar sirup and sterilizing in jars. Peeled or unpeeled, they are made into jam, other preserves, sirup or sweet pickles. Jelly is made from slightly underripefruits, or a combination of ripe and unripe to enhance the color. Natal plum (carissa grandiflora) fruit maturation process is given (Fig 4.).

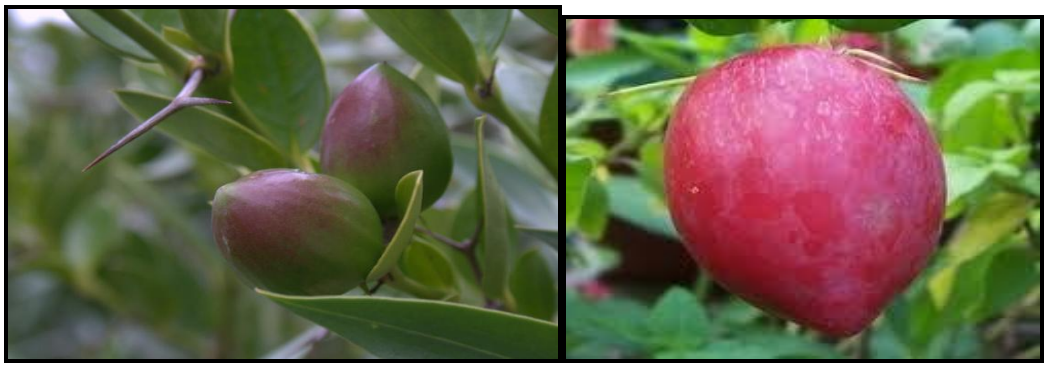

Figure 4.Natal Plum (Carissa grandiflora) Fruits Maturation

Nutritive Value. Analyses made in the Philippines show the following values: calories, 270/lb (594/kg); moisture, 78.45%; protein, 0.56%; fat, 1.03%; sugar, 12.00%; fiber, 0.91%; ash, 0.43%. Ascorbic acid content has been calculated as 10 mg/100 g in India.

Figure 5.The Image of Thorns And Flowering Period

It has a dense barbed structure. Thorns besides there are delicate flowers are take places a long time (Fig 5.).

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Pests and Diseases. Spider mites, thrips and whiteflies, and occasionally scale insects, attack young plants, especially in nurseries and in the shade.A number of fungus diseases have been recorded in Florida; algal leaf spot and green scurf caused by *Cephaleurosvirescens;* leaf spot from *Alternaria* sp..*Botryosphaeriaquerquum*,*Fusarium*sp., *Gloeosporium* sp., *Phyllostictas*pp. and *Colletotrichumgloeosporioides* which also is responsible for anthracnose; stem gall from *Macrophoma* sp., *Nectria* sp., *Phoma* sp., *Phomopsis* sp., and both galls and cankers from *Sphaeropsistumefaciens;* dieback caused by *Diplodianatalensis* and *Rhizoctoniasolani;* thread blight from *Rhizoctoniaramicola;* root rot resulting from infection by *Phytophthoraparasitica* and *Pythium* sp.

Uses in Landscape and Importance. Using a combination of plants, it can be used for purposes such as forming a boundary along a certain line, routing. It is also very suitable for building impervious fences with frequent sewing, and the barbed structure is a feature that contributes to this sense (Fig 6.).

Figure 6.Carissa grandiflora Usage as Border

In areas where it is desired to cover or cover, it covers the area completely with its thick leaf texture. In this sense, being a prunable species can help keep the plant level at the desired height (Fig 7.).

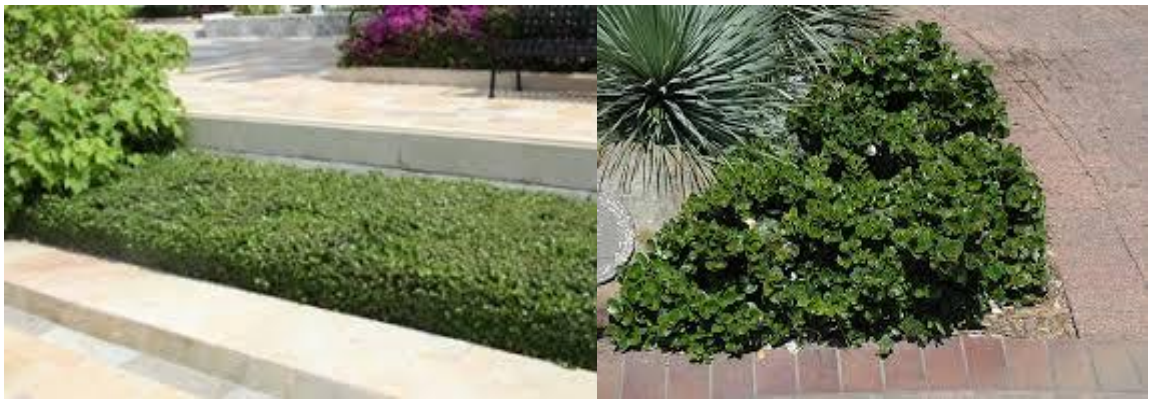

Figure 7.Carissa grandiflora Usage as Covering

(Nemutlu, 2012)The use of Espalier in herbal design and the examination in the case of Çanakkale indicate that the Carissa grandiflora line is suitable for Espalier use (Fig 8.).

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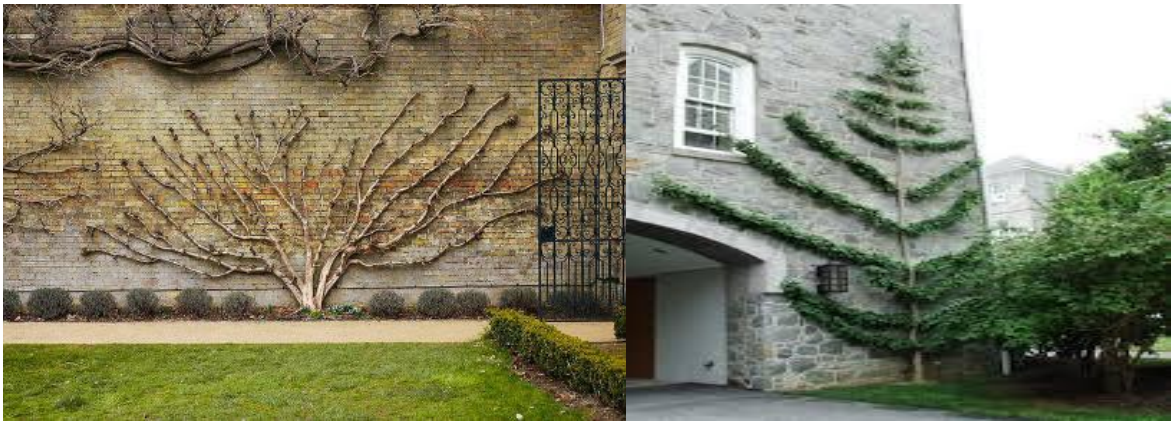

Figure 8.Carissa grandifloraUsage as Espalier

With this application which provides a volumetric benefit in narrow spaces, different species are shaped by pruning and orientation. In addition to having a fruit and a scented flower, which is an evaluable species in this sense, it also suggests that it is quite suitable for applying espalier.

2. CONCLUCION

Many regions of our country receive high temperatures and low rainfall due to global warming.Maintenance and bred is to bring to the forefront the use of simple types in this case. In this sense, Carissa grandiflora plant, which is the kind to provide all kinds of breeders convenience, comes to the forefront with the fight against erosion, adaptation to bad soil conditions, resistance against wind and opinion about water demand. Especially in our small cities, people has yearn for the green environment in our country. The diversity of plants, flowering, fruit characteristics and aesthetic appearance are important in these areas. For this reason, it is necessary to expand the use of the whole country, especially Kilis, which has arid climatic conditions. Because of the evaluation of fruits as jam, pastry cream, bread, pickle and soup and being a medicinal plant, promotion and use of this plant in our country needs to be widespread. There is a limited production of seedlings in the Mediterranean and Aegean regions. As a result this work, it is suggested to increase our awareness in our climatically compatible areas. Thus, the species diversity is increasing with carissa and the utilization rate of ornamental plants will be supported in our country

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