TAMARISKS FOR SOUTHWESTERN PLANTING

Tamarisks, or salt cedars, also called flowering cypresses, are shrubs or small trees native principally to northern Africa, southern Europe, and southern Asia. They are most abundant in the general region of the Mediterranean, Red, Black, and Caspian Seas, being characteristic plants of the floras of northern Africa, Egypt, Arabia, Turkestan, and Persia. No tamarisks are indigenous to the Western Hemisphere, though a few species have become naturalized in parts of our country, particularly in the Southern States. In their native countries tamarisks grow in arid or semi-arid regions, usually where there is considerable salt or alkali in the soil. There are more than 60 species of these plants, a few of which grow to be trees.

The writer became interested in tamarisks about ten years ago while making a preliminary study of the commoner ornamental plants that were growing successfully in our State under cultivation. These plants appeared to succeed almost everywhere planted, though their growth was most robust in alkaline soils. In one instance tamarisk plants were noted growing successfully in the Salt River Valley in extremely alkaline soil from which ink weed, or burro weed (Dondia magnifica) and greasewood (Sarcobatus vermicularis) had been cleared. The presence of these latter species invariably indicates strongly alkaline conditions. Tamarisks have been observed, from time to time, to grow well in western Texas and parts of New Mexico, where conditions are quite similar to those in Arizona. As a result of this study tamarisk plants were secured from various nurseries in the country, and, in addition, two species from northern Africa. These were set out in the plant introduction garden on the University grounds, where they have been carefully studied with reference to habits of growth, general hardiness, and utility. From
this work the species noted in this paper have been identified and described briefly.

Since tamarisk plants grow rapidly and propagate very readily from cuttings, a considerable number of these have been distributed in small lots over the State to interested persons for growing under different soil and climatic conditions. In almost every instance the plants sent out have made a good showing. Tamarisks are coming to be so well known now that several of the more valuable kinds can be purchased from local nurseries. It is to be hoped that nurserymen and others will make use of the information in this paper, and grow such varieties as are most useful for general planting and ornamentation. A key has been prepared to assist the grower in recognizing the various species, which are generally difficult to identify except during their flowering period.

Hardiness and adaptability: Tamarisks are interesting from our standpoint because of their notable adaptability to arid and semi-arid regions and their tolerance to large amounts of alkali in the soil. At the Date Palm Orchard near Tempe, Arizona, they have made growths of 5 to 12 feet in a season, developing into attractive ornamental and hedge plants. The soil at the Date Palm Orchard is strongly alkaline, and, in addition, flooded with seepage water during much of the year. Besides the date palms growing there, only a few species of native saltbushes and similar alkali resistant plants thrive. Such plants as the pomegranate, beefwood (Casuarina Cunninghamiana) and cultivated asparagus can not be grown successfully. In addition to this, tamarisks are not injured with extreme aridity and summer heat, and they grow well with a minimum amount of soil moisture. They tolerate temperatures as low as 10° or 15° F. below zero, and one, in particular, cultivated in South Dakota, is injured very little with a temperature of 35° F. below zero. They are hardy plants, therefore, from many viewpoints, and when established require little attention.

Botanical characters: Tamarisks resemble closely low juniper or cypress trees. Their leaves are minute, scale-like and more or less crowded on the slender stems. They differ, however, from these evergreens in that their leaves, together with the small twigs produced during late summer months, drop off with severe frosts. During their growth, however, they are plants of distinct and graceful appearance. Their light, feathery sprays of twigs and foliage together with the racemes or panicles of pink or whitish flowers are always pleasing. The flowers are very small and are produced in great numbers, usually in terminal clusters, so that they are quite showy. They are slightly fragrant and last but a few days, but often there is a succession of them. They are visited by bees, though they are regarded as of little value for honey purposes. They are 4-merous, i.e., with 4 sepals, 4 petals, and 4 stamens, or 5-merous, i.e., with 5 sepals, 5 petals, and 5 stamens. The ovary is one-celled and mostly 3-carpellary, with 3 styles and 3 stigmas. There is usually a minute brownish disk below the pistil. The fruits are small capsules similar to those of willows, which open at maturity.
and set free a number of small cottony seeds. These are easily carried by the wind and under favorable conditions the plant may be spread in this way.

Some tamarisks, like *Tamarix parviflora*, which is a common species in cultivation, blossom early in the spring, before the leaves appear, while in others the flowers appear with the leaves or from time to time during the spring and summer seasons. Most tamarisks have bright green foliage which is occasionally slightly glaucous, *Tamarix hispida* and one or two others in cultivation have a silvery or grayish-green color due to a fine bloom on the leaves and young stems. Again, some species have a careless, spreading habit of growth, for example, *Tamarix gallica* and some of its varieties, while others like *Tamarix juniperina* and *T. chinensis* grow nearly erect, with but few small branches from the base. The two latter species are very attractive because of their splendid plumose foliage. Of the various species of tamarisks grown at the introduction garden, only one, *Tamarix articulata*, is evergreen. This is a small, attractive tree, with bluish-green foliage, resembling the Arizona cypress.

During their dormant period tamarisks are not interesting plants since they often present an untidy appearance because of the dead twigs which collect in the forks of the branches. Fortunately, they begin growth early in spring, and keep their foliage until late in the season, so that they are without foliage for but three or four months of the year. Almost any of the kinds of tamarisks may be trained to grow as trees if sufficient care is given. The erect-growing varieties, particularly *Tamarix chinensis* and *T. juniperina*, with plumose foliage, are best suited for this purpose. As these trees grow older they become more branched above and develop broadly rounded heads. They should not be planted along streets, or sidewalks, or paths, as (heir fine leaves and twigs become a source of annoyance in the autumn when they drop in quantity on one's clothing. Fortunately, the fall of leaves and twigs takes place during only a very short time. With age some varieties of tamarisks are inclined to become scraggily and unsightly, unless kept carefully pruned. Such plants may be cut back at the beginning of the season and allowed to grow again from the base. Tamarisks are propagated readily from seeds which mature soon after flowering time and also from cuttings. The cuttings can be made from mature wood of the season's growth, or from two-year-old wood, during the dormant season. No difficulty is experienced in starting them to grow, if the soil is kept moist or wet during the time that the plants are becoming rooted and established. The best results, perhaps, have come from cuttings made in December after the foliage had dropped. These were buried in a bed of clean, moist sand which was moistened from time to time. The location was shady and had good drainage. The cuttings were planted about the first of March.

*Uses for tamarisks* Tamarisks are quite certain to find a place, under Southwestern conditions, as ornamental and hedge plants. They respond readily to pruning and as hedge plants appear about
as well during their period of growth as many other plants far more difficult to grow. They are excellent for windbreaks and ornamental planting in dry farming communities, where they require little attention when established. They make a compact, bushy growth from the ground, and will grow to heights of 15 to 25 feet according to soil and cultural conditions. One or more rows of tamarisks may be planted profitably about the home orchard and garden in dry farming communities, to lessen the injurious effects of cold spring winds and to prevent in some degree sand from drifting, and thus killing tender garden plants. A windbreak like this should be set at some little distance — 15 to 25 feet — from the cultivated land, to prevent moisture and plant food being taken from the garden or orchard soil. In the absence of smaller trees tamarisks make excellent shade for poultry and small stock like calves, sheep, and hogs. Alkaline spots which are worthless for most purposes may be set to tamarisks and thus be made to supply fuel for the home. In such soil the taller growing tamarisks might also produce posts and stays for fences, though little is known concerning the value or durability of tamarisk wood. Doubtless these plants will be put to other uses as they come to be better known.

In parts of northern Africa along the Mediterranean Sea tamarisks have been planted extensively to prevent sand from drifting, and also to lessen the injurious effects of salt sea air on tender foliage. They are being planted to some extent along the seashore in parts of southern California where they grow splendidly even in the spray of the salt water. The bark of *Tamarix gallica* is sometimes used for tanning and dyeing, and galls, known as Mogador galls, produced on these plants through an insect's sting, are a source of tannic acid, of which they are said to contain as high as 25 to 40 per cent. In some countries of southern Europe the matured twigs are used for making coarse brushes and brooms.

**List of Tamarisks Studied**

1. *Tamarix articulata* Vahl. This is a handsome, erect-growing, evergreen tree, 20-25 feet tall with rather smooth, grayish-brown bark and graceful ascending branches. The twigs are pendulous, much-branched, dull bluish-green, very slender and appear minutely jointed from the numerous small, nearly cylindrical leaves which are continuous around the twigs and bluntly acuminate on one side. The flowers are terminal, rather inconspicuous, and produced late in summer and fall. They are light pink and 5-merous. This tree is tolerant to extreme heat and drought, but is injured with temperatures below 10° or 12° P. in winter. Trees were killed to the ground in the introduction garden on the University campus with a temperature of 6° F. It promises to be a good ornamental for planting in the warmer sections of the State. The first plants were received from Dr. Trabut, Algiers, and later Dr. A. E. Vinson brought cuttings from northern Africa.

2. *Tamarix parviflora* DC. This is a large shrub, often 15 feet tall, with ascending or spreading branches and bright green foliage.
The bark of the stems is dull brownish and that of the twigs light brown and glossy. The leaves are small, minutely punctate and closely appressed to the steins. The flowers are very abundant and produced early in the spring before the leaves appear, on the last year's branches. They are 4-merous and the petals persist until the seeds mature. This plant is very showy in the spring with its wealth of light pink flowers, while in summer the green, juniper-like foliage gives a refreshing appearance. This species is very common in gardens in the Southwest and one of the most desirable of the forms with spreading branches. It is often sold under the name of *Tamarioc gallica*, and is indigenous to southern Europe.

3. *Tamarioc* sp. This is a large shrub with irregular, wide-spread- ing branches. The bark on the older branches is dull, light grayish- brown. The young twigs are reddish-brown. The leaves are small, closely appressed to the stem and bluish-green in color. The ra- cemes are about two inches long, and one-fourth inch thick, being large for tamarisks, and produced laterally toward the ends of last year's branches. The flowers are 5-merous, crowded, white and quite fragrant, the petals being strongly reflexed and one-eighth inch long. This is a spreading shrub, scarcely desirable as a wind- break, but perhaps of some use for shade in poultry yards. It is extremely drought resistant and has not been listed heretofore in cultivation in the United States. This species was brought from northern Africa by Dr. Vinson.

4. *Tamarioc gallica* Linn. (French Tamarisk). This is a large diffuse-growing shrub with spreading branches; the older stems have grayish-brown bark, the twigs are reddish-brown or chestnut-brown. The leaves are small, dull green or bluish-green and appressed to the twigs. The flowers are small and crowded in slender racemes which are about two inches long and borne toward the ends of the previous year's branches. They are of short duration, rather incon- spicuous and 5-merous. The fruits are reddish. Shrubs of this species often grow to be 20 feet high with as great a spread of branch. They can be trained with care into low, broad-headed trees. Like other species with this habit of growth, the French tamarisk is not as desirable for general planting as those growing more erect. Most tamarisks sold under this name are in truth *Tamarioc parviflorus*. This species is native from the Himalaya Mountains to the Mediterranean region.

5. *Tamarioc gallica* Narbonnensis Ehrenb. A shrub very similar to the last with spreading branches, light grayish bark, reddish twigs and small, bluish-green leaves closely appressed to the slender twigs. It may be recognized by its shorter flower racemes, an inch or so long, which are borne on growth of the present season, and appear three or four weeks later than those of *Tamarioc gallica*. The plant is very drought resistant, but gives little shade. It is native to southwestern Europe.

6. *Tamarioc chinensis* Lour. Chinese or Black tamarisk. This is a low tree or tall erect shrub 15 to 25 feet high with riekrly smooth shining, blackish or purplish-black bark and deep green, somewhat
plumose foliage. The twigs are reddish-brown. The flowers are pink, and the early ones appear with the leaves in lateral racemes borne near the tips of last year's branches, later, great numbers of flowers are produced in showy panicles at the ends of the taller branches. The flowers are 5-merous and the small petals persist long after withering. This is one of the best varieties for general planting, being excellent for windbreaks and ornamental purposes. The stems are quite straight and often 12 or 15 feet long without branching; they give promise of being good for posts. The species thrives in strongly alkaline soils and may be recognized from any other species by its blackish bark, 5-merous flowers and plumose foliage. It is a native of China.

7. Tamarix juniperina Bunge. (Tamarix japonica and T. plumosa Hort.). Ostrich Plume tamarisk. This species is similar to the above in general appearance and apparently as valuable. It grows rather erect, has dull chestnut-brown bark, reddish-brown twigs and is beautifully and densely plumose, with green pendent foliage. It is a rather shy bloomer and the flowers appear in the spring in lateral racemes with the leaves, toward the ends of the branches. The flowers are small, pink in color, 5-merous and persist long after withering. The splendid foliage commends this species for ornamental planting, though the plant is equally valuable for windbreaks. There are several trees of this species growing at Mesa, Arizona, with trunk diameters of 12 inches and a height of 25 feet or more. It is indigenous to China and Japan.

8. Tamarix hispida Willd. (Tamarix Kashgarica Hort.). This is a large, showy shrub with erect or ascending branches, 8–20 feet tall, grayish-drab bark, glossy, drab-colored twigs, and bluish-green or silvery foliage. The flowers are borne in terminal panicles and are fragrant, deep pink and produced from May until August. The leaves are coated with a fine, white mealiness, in age they become more or less roughened. Toward the latter part of the season this plant occasionally becomes ragged in appearance, a condition remedied by heavy pruning the following spring. This plant is easily recognized by its bluish foliage and deep pink flowers produced throughout the summer. As an ornamental it is valuable on account of its color and long flowering season. It is also useful for hedges and windbreaks.

9. Tamarix odosyyana Stev. (Tamarix amurensis Hort.). This is an erect-growing shrub 12 to 20 feet tall with grayish, rose-tinted bark and reddish-brown twigs. The foliage is green or slightly bluish-green and the leaves are closely appressed to the twigs. The flowers appear during May and June and are borne in slender, graceful, drooping panicles at the ends of nearly all the branches. The petals are pink or lighter in color and always remain partly closed. The plant has a wealth of flowers and feathery foliage, though this is not plumose. There are several stems from the same root and the species is well adapted for a variety of purposes, including planting as hedges, windbreaks and individual specimens. This species may be recognized by its habit of growth, color of foliage,
Tamarix juniperina, four years old, growing in the introduction garden.
University farm.
and beautiful sprays of flowers which remain half closed. The plants of this species were purchased from different nurseries under various names, including *Tamarix amurensis* and *T. gallica* Linn. This plant is a native of the Caspian region.

**KEY FOR DETERMINING THE SPECIES OF TAMARISKS DESCRIBED ABOVE**

A. Erect-growing evergreen tree with bluish-green foliage; leaf scales continuous around the twigs. 1. *T. articulata*

[A. Erect-growing or spreading, deciduous trees or shrubs with green or bluish-green foliage; leaves scale-like, not continuous around the twigs.

B. Flowers 4-merous, appearing before the leaves, in lateral racemes along last year's branches. 2. *T. parviflora*

B. Flowers 5-merous, appearing with or sometime after the first leaves, produced toward the ends of last year's branches.

C. Shrubs with wide-spreading branches; petals usually deciduous soon after withering.

D. Racemes stout, one-fourth inch thick in flower; petals white, reflexed, about one-eighth inch long; capsules short-acuminate. 3. *Tamarisc*

D. Racemes slender, one-eighth inch thick in flower; petals pink, not reflexed; one-twelfth inch long; capsules long-acuminate.

E. Flowers appearing after the leaves; racemes short, produced on branches of the present year. 5. *T. gallica narbonnensis*

E. Flowers appearing with the leaves; racemes longer, produced on last year's wood. 4. *T. gallica*

C. Low trees or tall erect shrubs; petals persisting after withering.

D. Tree-like plants with foliage more or less plumose.

E. Bark blackish-brown, shining; foliage slightly plumose; leaves appressed to the twigs. 6. *T. chinensis*

E. Bark chestnut-brown or lighter; foliage densely plumose; leaves somewhat spreading. 7. *T. juniperina*

D. Erect-growing shrubs with foliage feathery; flowers on twigs of the present year's growth.

E. Plants bluish-green in summer; leaves spreading; petals bright pink, spreading. 8. *T. hispida*

E. Plants green; petals light pink, appearing half-closed. 9. *T. odesseyana*

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