

Euphorbia dendroides L.: a semi-succulent shrub

by Massimo Afferni

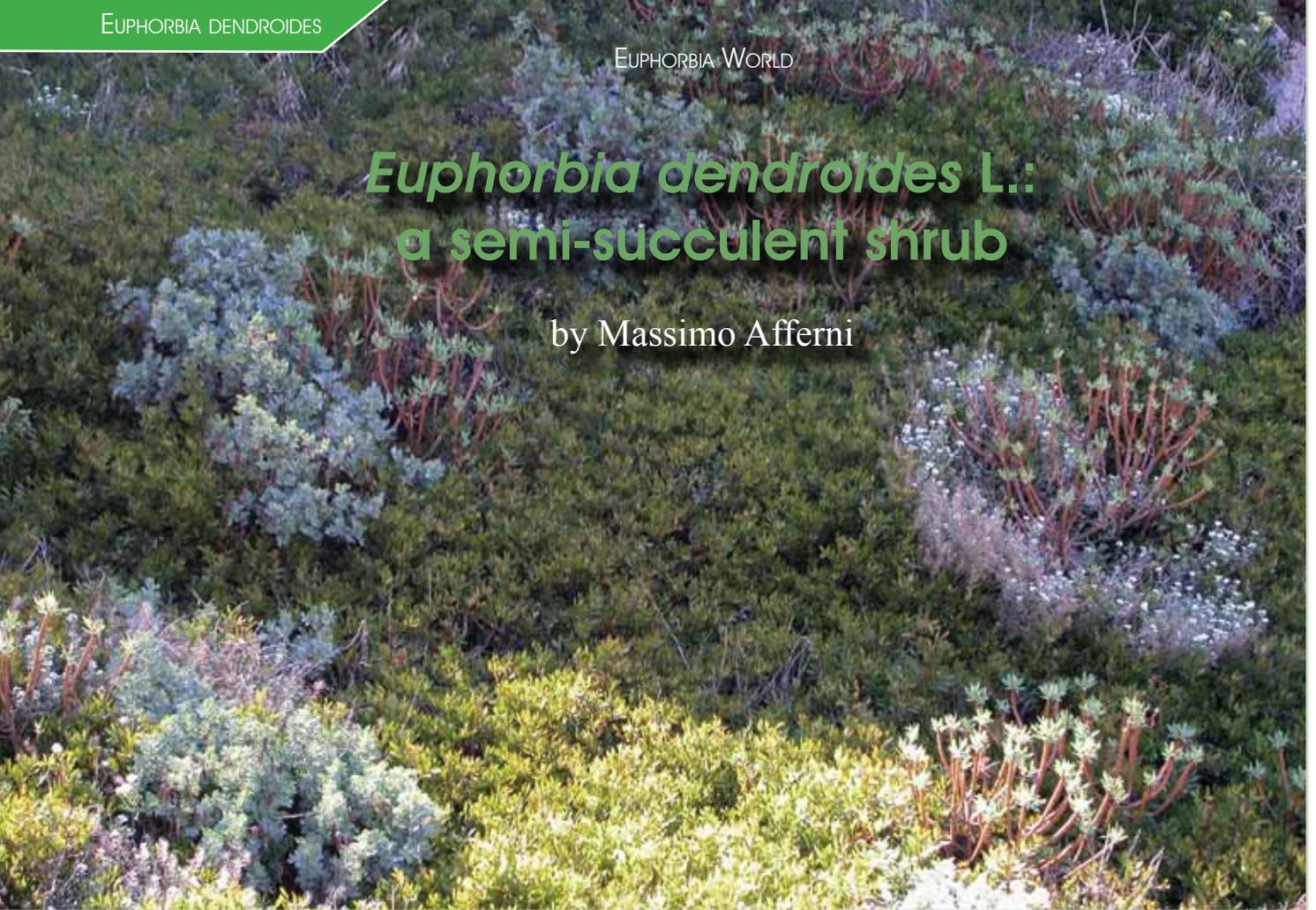


Fig. 1: *Euphorbia dendroides* can easily be recognized from long distance by its reddish branches (photo: Raffaele Miceli)

Among the enthusiasts, collectors and cultivators of succulents, the genus *Euphorbia* is no doubt one of the best known and above all probably the one containing the highest number of succulent species, although woody plants, annual and perennial herbs are appreciated as well. The genus is found in all continents with varying concentrations of species.

On the European continent – geographically speaking because for example the Canary Islands, although politically part of Spain, geographically belong to the African continent – euphorbias are characterised by herbaceous plants with the exception of *Euphorbia dendroides* L., this species being a semi-succulent shrub as defined by Jacobsen (1981).

This *Euphorbia* is considered to be of tropical origin, probably a relic of the Tertiary age, whose habitat was reduced by the glaciations of the Quaternary age. *Euphorbia dendroides* grows naturally along the Mediterranean coasts, up to an altitude of about 700 m above sea level, mainly in Spain (Balearic Islands), France (including Corsica), Italy (including Sardinia, Sicily and smaller islands), the coasts and islands of former Yugoslavia, Albania, Greece and its islands, Malta, Turkey and some restricted coastal areas of North Africa, in Egypt, Libya, and Algeria. It has also been introduced

into other parts of the world, e.g. Southern California, Argentina and Australia.

It is a typical Mediterranean plant known from antiquity as can be read in the books of the botanist Pedanius Dioscorides (ca. 40-90) and the scientist Pliny the Elder (23-79). Already the name *Euphorbia* had been derived from ancient times, as its generic epithet reminds us of Euphorbos, physician of King Juba II of Mauritania (1st century B.C.) in the time of the Roman emperor Octavius Augustus Caesar. Euphorbos was the first to use plants of the genus *Euphorbia* for medical purposes. The species epithet *dendroides* however comes from Greek and means “having features of a tree”.

Here is a translation of a brief description of *Euphorbia dendroides* (synonym *Tithymalus arboreus* Tourn., *E. divaricata* Jacq. and *E. laeta* Aiton) taken from the Forum Acta Plantarum (www.actaplantarum.org). “Woody plant with latex, taking the form of a rounded shrub or small tree up to 3 m tall, trunk with leafy branches, dichotomous or trichotomous, corky trunk at the base but with satin-like epidermis on higher branches, greenish glaucous or pinkish with clear scars left by the fallen leaves. Leaves alternate, spaced out, oblong-lanceolate, entire, attenuate at the base, and somewhat mucronate at the tip, rounded or

sub-truncate, glabrous and with single vein, colour light green, up to 7 cm long, lower leaves pendulous and often reddish, upper ones semi-erect and those under the inflorescence erect on the young branches, remaining from autumn to the beginning of summer when they take on a reddish colour by producing anthocyanin pigments, and then fall (aestivation) to limit transpiration and so better combat dehydration in summer.

Inflorescence in bracts similar to flowers, in terminal umbels with 5-8 (15) dichotomous rays, very narrow and short, involucrate at the base of the fork of the free bracts, opposite, yellowish, rhomboidal-suborbiculate. Nectar glands yellow-orange, suborbiculate, truncate, without margin, and irregular lobate with obtuse angles. Style 3-4 mm. The fruit is a tricarpellate dehiscent capsule, grey-green in colour, 5-6 mm long, containing 3 smooth seeds, laterally compressed, 3 mm long and greyish-black in colour. Anthesis: November-April. Pollination: wind. Seed dispersal: direct and by ants. Systematics note: it is the only arborescent euphorbia in our flora and the largest of the European euphorbias”.

It is interesting to comment on the unusual characteristics of its geometrical form of growth using bush geometry, methods of determining the possible age of a plant: Towards the end of the seventies of the last century the Hungarian biologist Aristid Lindenmayer (1925-1989) developed a theoretical mathematical language called ‘L-system’, by which it is possible to model

growth patterns of entire plants. It is very interesting to apply the theory of ‘L-systems’ to the geometry of a bush, to understand the development of a plant habit even in extremely complex forms.

Euphorbia dendroides is a fairly simple application of the ‘L-systems’ graphics because its stem and branches can be represented by a line (initially vertical) of a certain length terminating in a node. From this point, in relation to the ideal length of the stem, two equal branches emerge, one to the right and the other to the left, at equal angles to the stem. Repeating this construction of the branches from node to node with the same procedure you obtain a drawing of the shrub in question, in this case *Euphorbia dendroides*.

For arborescent plants, it is possible to calculate their age accurately enough (paying attention to certain factors in the calculation) by counting the growth rings revealed by a section of the trunk, or, using a less invasive method, by removing a fine cylinder of material from the bark to the pith. In the case of *Euphorbia dendroides*, being a semi-succulent shrub, this is not possible and so another sufficiently precise system (given the difficulty of evaluation in the oldest part of the plant, the basal trunk) was found (Eichberger, 2003). The basis of the system is that every year the plant produces branches which end in a node, from which two (dichotomous) or three (trichotomous) branches are produced the following year with the same growth form of earlier



Fig. 2: *Euphorbia dendroides* flowering (photo: Stefano Mosti)



Fig. 3: Branching pattern of *Euphorbia dendroides* (photo: Volker Buddensiek)

ones. So by counting the nodes in a straight line of growth, it is possible to work out the age of the plant. By applying this method, Eichberger (2003) found specimen to reach an age of 47 on Mallorca, Balearic Islands, Spain.

Euphorbia dendroides, like all members of the genus, exudes an irritant latex when cut, which in the past was used in full strength to burn warts and verrucas and very diluted as a strong purgative or in even lighter concentration as an emetic. Powder from the roots was used to cure rheumatic pains. It is important, should one get the latex on one's hands, not to transfer it to the eyes, where it is extremely irritating and will require urgent medical attention to avoid damage to the sight. It is said that certain Asian peoples use the plant to combat snake bites and also to disinfect animal water troughs to rid them of blood-sucking and aquatic insects, making sure, of course, that the animals do not drink from the trough immediately after treatment. Recent pharmacological studies carried out at the University of Naples, have shown that certain components of the latex can be used to assist in the treatment of tumours.

An ancient legend tells that the latex of *Euphorbia dendroides* has magical properties and it is said that the Mage Circe, who lived

on the Circeo Promontory, which is rich in this plant, used it for various spells. In more recent times, the latex was used by fishermen, scattering it in the water to stun the fish and facilitate their catch.

Euphorbia dendroides propagates itself easily in the coastal areas by seeds, although a notable recent evolution in propagation has arisen as a result of fires, which burn the plants completely and then stimulate regrowth which is stronger and denser.

I would like to conclude this brief paper on *Euphorbia dendroides* by pointing out that it is not particularly unusual to find in habitat plants of this species with cristate branches; the strange thing is that, as far as I know, there are no plants entirely subject to this teratology, but only with a few isolated branches exhibiting this form of fasciation.

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Fig. 4: *Euphorbia dendroides* developing both regular and cristate branches (photo: Stefano Mosti)