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Autor: Brullo, Salvatore / Pavone, Pietro

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Cremnophyton lanfrancoi: a new genus and species of Chenopodiaceae from Malta

SALVATORE BRULLO
&
PIETRO PAVONE

RÉSUMÉ

BRULLO, S. & P. PAVONE (1987). Cremnophyton lanfrancoi, genre et espèce nouvelle de Chenopodiaceae de Malte. *Candollea* 42: 621-625. En anglais, résumés français et anglais.

Cremnophyton lanfrancoi est une espèce nouvelle décrite des falaises calcaires de l'Archipel maltais. Cette espèce appartient à un nouveau genre monotypique, qui se rapproche d'*Atriplex,* mais qui s'en distingue par quelques caractères morphologiques, caryologiques et écologiques primitifs. Effectivement son nombre chromosomique $2n = 20$, ses exigences chasmophiles et la présence de bractéoles florales révèlent l'origine ancienne de ce taxon.

ABSTRACT

BRULLO, S. & P. PAVONE (1987). Cremnophyton lanfrancoi, a new genus and species of Chenopodiaceae from Malta. *Candollea* 42: 621-625. In English, French and English abstracts.

Cremnophyton lanfrancoi is described from limestone cliffs of the Maltese Archipelago. This species belongs to a new monotypic genus, which is related to *Atriplex,* but differs from this genus by the occurrence of some primitive morphological, caryological and ecological characters. In fact its chromosome number $2n = 20$, its chasmophilous requirements and the presence of floral bracteoles indicate the ancient origin of this taxon.

Introduction

In the course of taxonomic studies on the Maltese flora, a strange shrub was collected in various rupestrian sites of Malta and Gozo. It showed leaves very similar to those of *Atriplex portulacoides* L. [= *Halimione portulacoides* (L.) Aellen]. In fact, from both herbarium researches and literature data, sterile specimens of this plant were previously attributed to this species. Effectively, *Atriplex portulacoides* occurs in the Maltese Archipelago too, but in different habitats, as salt-marshes and coastal sandy soils. Besides, some differences can be observed in its habit: *Atriplex portulacoides* is characterized by stems procumbent, very long, herbaceous, indurate below, while the rupestrian plant is a nanophanerophyte with stems erect, short, woody, much branched. The successive examination of the flowered and fructified materials, collected in autumn, allowed to verify that this plant shows effectively some relationships with the species of the genus *Atriplex;* in particular the fruiting valves are like those of *Atriplex mollis* Desf. The occurrence in this plant of some very peculiar characters regarding floral morphology, caryology and ecology differentiate it very well from the species of *Atriplex* and of allied genera.

This plant is new to the science and at the same time cannot be assigned to an existing genus. This species is attributed to the new genus *Cremnophyton* and is dedicated to the Maltese botanist Edwin Lanfranco, who always helped us in our taxonomical researches on the Maltese flora.

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Cremnophyton Brullo & Pavone, **gen. nov.**

Typus: *Cremnophyton lanfrancoi* Brullo & Pavone

Planta monoica, fruticosa, cano-lepidota. Folia integerrima, linearia vel lanceolata. Flores in laxam paniculam dispositi. Inflorescentia laxe paniculata, floribus sessilibus in numerosis fasciculis bisexualibus dispositis. Flores staminiferi tetrameri, rare pentameri, 1-bracteolati, tepalis conniventibus, stamibus exsertis. Flores pistilliferi nudi, duobus perigonialis valvis liberis, insertis ad axillas unius foliaceae bracteolae valvis subequalis vel longioris. Ovarium complanatum, 2 stigmatibus divaricatis. Fructiferae valvae orbiculares, omnino liberae, adhaerentae nisi sub insertione fructuum. Utriculus semine adhaerens. Semina verticalia, lateraliter compressa, radicula embryonis sursum directa.

Atriplex L. affinis a quo imprimis differt floribus praeditis bracteolae foliaceae, floribus staminiferis tetrameris rare pentameris.

Cremnophyton lanfrancoi Brullo & Pavone, **spec. nov.** (Fig. 1).

Typus: Malta, Mtahleb, Wied Migra Ferha, 14.11.1986, *Brullo & Pavone s.n.* (holotypus CAT).

Frutex monoicus, ramosissimus, erectus, sempervirens, ad 1 m altus, argenteus vel argenteo-glaucescens, ramis hornotonis et annotinis costato-angulosi, dense foliosis. Folia opposita vel alterna, integra, lineari-lanceolata vel linearia, uninervia, in brevem petiolum attenuata, obtusa vel acutiuscula ad apicem, 10-30 × 1-4 mm. Flores unisexuales, sessiles aggregati in fasciculis plerumque compositis 1 flore pistillifero superne circumdato 3 floribus staminiferis. Fasciculi isolati vel bini in laxam terminalem paniculam dispositi, foliis basi ramorum primariorum. Flores staminiferi tetrameri rare pentameri, ca. 1 mm diametro, parvula bracteola 0.2-0.3 mm longa praedites; tepala membranacea, conniventia, breviter connata ad basim, extus farinoso-papillosa; stamina exserta, tepalis alternantia, filamentis subtilibus ca. 5 mm longis et antherie luteolis bilocularibus 0.3-0.4 mm longis. Flores pistilliferi nudi, duobus perigoniales valvis liberis vel leviter connatis ad basim, crassiusculis, dorsaliter convexis, 0.8-1 mm longis, extus papillosis, insertis ad axillas unius foliaceae bracteolae ovato-triangularis, ventraliter excavatae, 0.7-1.3 mm longae; ovarium complanatum 0.5-0.6 mm longum, stylus brevis, duobus stigmatibus subulatis, divaricatis, e valvis exsertis. Fructiferae valvae orbiculares, rotundatae vel retusae ad apicem, 5-9 mm late, extus laeves vel 1-2 tubercolis plus minusve auctis. Utriculus membranaceo-papillosus, semine adhaerens. Semina ovata, brunnea, laevia, ca. 2 × 1.5 mm, verticalia, lateraliter compressa; radicula embrionis sursum directa. Numerus cromosomatum $2n = 20$.

Specimens examined

Insula Melita (hodie Malta), Imtahaleb, in rupibus maritimis, 6.4.1907, *Sommier s.n.* (FI); ibid., 6.5.1907, *Sommier s.n.* (FI); Insula Gozo, Cala Dueira, in rupibus maritimis, 23.4.1907, *Sommier s.n.* (FI); Migra Ferha (Imtahleb), 9.1977, *Briffa 5798* (CAT); ibid., 25.10.1984, *Briffa s.n.* (CAT); Malta, Mtahleb, Wied Migra Ferha, 12.4.1984, *Brullo & Ronsisvalle s.n.* (CAT); ibid., 24.9.1985, *Brullo & Pavone s.n.* (CAT); ibid., 29.11.1985, *Brullo & Pavone s.n.* (CAT); ibid., 30.11.1985, *Brullo & Pavone s.n.* (CAT); ibid., 14.11.1986, *Brullo & Pavone s.n.* (CAT); Malta, Ghar Hasam, 26.9.1985, *Brullo & Pavone s.n.* (CAT); Gozo, Ta Cenc, 29.6.1973, *Brullo & Ronsisvalle s.n.* (CAT); ibid., 25.9.1985, *Brullo & Pavone s.n.* (CAT); ibid., 30.11.1985, *Brullo & Pavone s.n.* (CAT); Gozo, Dwejra, 11.4.1984, *Brullo & Ronsisvalle s.n.* (CAT); Gozo, S. Dimitri Point, 11.4.1984, *Brullo & Ronsisvalle s.n.* (CAT); Gozo, fra Dwejra Point e S. Dimitri, 15.11.1986, *Brullo & Pavone s.n.* (CAT).

Cremnophyton lanfrancoi is a strictly chasmophilous shrub, which grows exclusively on the vertical cliffs of Malta and Gozo, mainly on the coralline and globigerine limestones (Oligo-Miocene period). It is a very peculiar habitat markedly influenced by the sea, harbouring a specialized flora rich in paleoendemics, viz: *Palaeocyanus crassifolius* (Bertol.) Dostàl, *Chiliadenus bocconei* Brullo, *Darniella melitensis* (Botsch.) Brullo, *Helichrysum rupestre* (Rafin.) DC. var. *melitense* Pignatti, *Daucus rupestris* Guss., ecc. From the phytosociological point of view, this

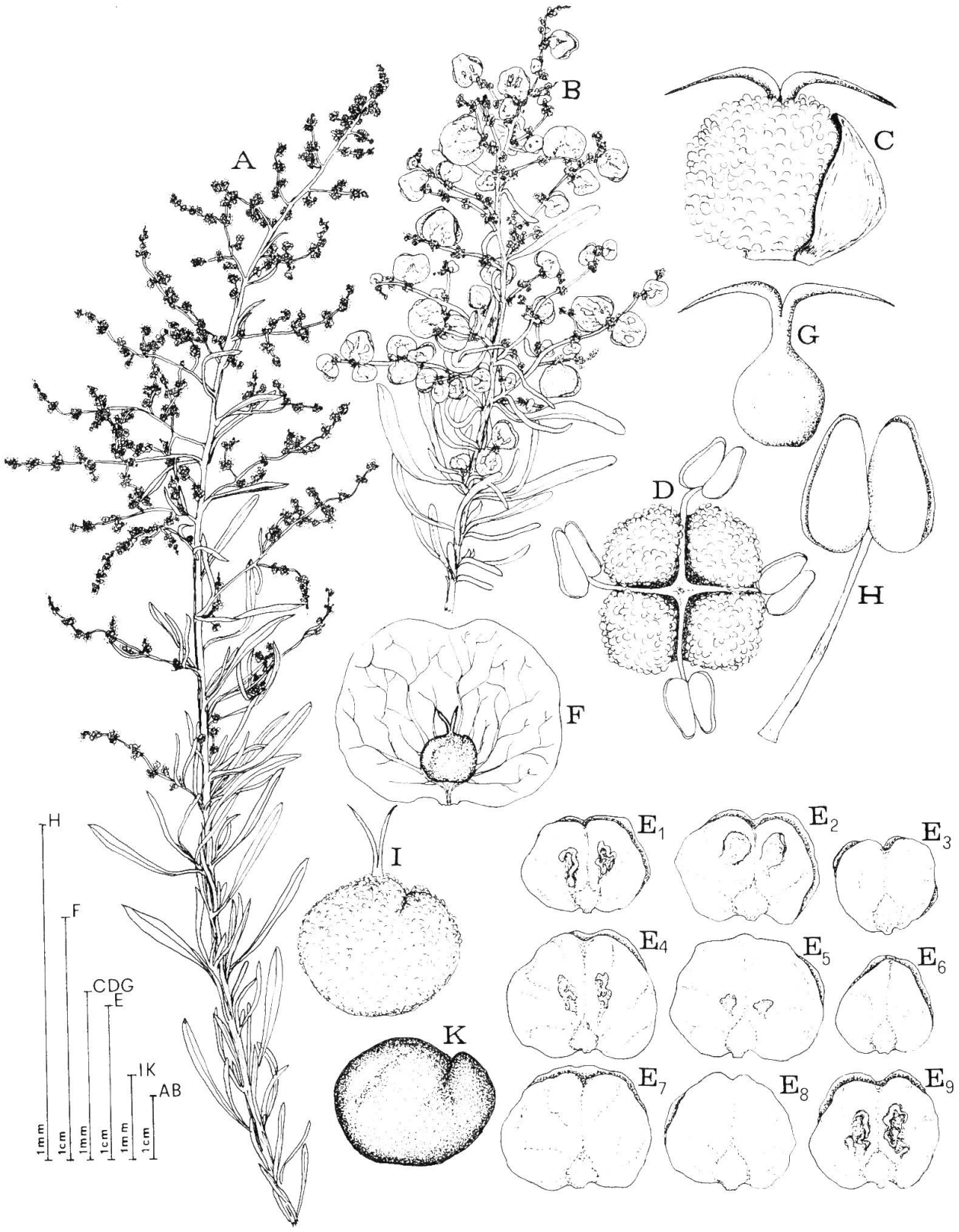

Fig. 1. — *Cremnophyton lanfrancoi* Brullo & Pavone, spec. nov.
A, flowered branch; **B,** fructified branch; **C,** pistilliferous flower with valves and bracteole; **D,** staminiferous flower; **E,** fruiting valves; **F,** ventral side of fruiting valve and position of the utricle; **G,** pistil; **H,** stamen; **I,** utricle; **K,** seed.

Fig. 2. — Mitotic chromosome plate of *Cremnophyton lanfrancoi*.

vegetation must be referred to *Triadenio-Chiliadenetum bocconei,* a rupestrian association described by BRULLO & MARCENO (1979), which is endemic of the Maltese Archipelago.

In these sites the concentration of a lot of rare taxa, belonging to the old Tertiary flora, attests that the Maltese Islands represent a refuge area of species having survived the marine transgression of the Pliocene. Therefore, according to the model proposed by BOCQUET & al. (1978) on the Messinian salinity crisis of the Mediterranean basin, these taxa could be considered as relictual populations.

On the whole, *Cremnophyton lanfrancoi* is a very isolated species, having only some relationships with the species of *Atriplex.* The main diacritical characters, which allow to separate the genus *Cremnophyton* from *Atriplex,* are the following: staminate flowers normally with 4 tepals (occasionally pentamerous), presence of floral bracteoles which are very small in staminate flowers (1/4-1/5 the length of tepals) and bigger in pistillate ones (subequalling or 1/2 longer than the valves). The floral bracteoles never occur in *Atriplex* and the allied genera, while the tetramerous flowers occasionally do (see AELLEN, 1937, 1938, 1940).

The somatic chromosome number of *Cremnophyton lanfrancoi* is $2n = 20$ (Fig. 2). The count was made on root-tips of specimens coming from S. Dimitri (Gozo) and cultivated in the Botanical Garden of Catania; this material was pretreated with 8-hydroxyquinoline, fixed in Carnoy and stained according to the Feulgen technique. This species is a diploid with a basic number $x = 10$, while in the species of *Atriplex* and the allied genera the basic number is always $x = 9$ (FEDEROV, 1969; GOLDBLATT, 1981, 1984). This unusual chromosome number confirms the remarkable isolation of *Cremnophyton lanfrancoi* and its very old origin. In fact, it is quite probable that the aploid number $x = 9$ could have its origin in the more primitive $x = 10$ with the loss of one chromosome.

Apart the chromosome complement, other ancestral characters occur in *Cremnophyton lanfrancoi.* Among these its ecology, as the casmophily is characteristic to most primitive species and not shown by any species of *Atriplex,* and also the occurrence of floral bracteoles, which in the genus *Atriplex* were probably lost in the course of the evolution.

Therefore *Cremnophyton lanfrancoi* seems to represent a very primitive taxon, related to the species of *Atriplex,* but probably more closely to their ancestors.

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Address of the authors: Istituto di Botanica, Università di Catania, via A. Longo 19, I-95125 Catania.