Contribution to knowledge of the genus *Salicornia* L. *(Chenopodiaceae)* in Italy

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ABSTRACT – The author proposes a new arrangement of the genus *Salicornia* L. in Italy. *S. patula* Duval-Jouve, *S. emerici* Duval-Jouve, *S. veneta* Pign. et Lausi and *S. dolichostachya* Moss are recognized. The key of the genus, a description and original drawings for each species are given.

KEY WORDS – Salicornia, taxonomy, Italy

INTRODUCTION

In recent years taxonomic problems, chorology and phytosociology of genus *Salicornia* L. (glassworts) have received increased attention both in Europe and in Italy (Géhu *et al.*, 1984a; Géhu *et al.*, 1984b; Géhu, 1992; Géhu and Biondi, 1994; Taffetani and Biondi, 1992; Pirone, 1995; Iberite and Frondoni, in press). Some entities not considered in past monographs have been taken into consideration, whereas for others new or neglected distinctive characters have been adopted and the area of distribution has been redefined. For these reasons, the keys available today can be regarded as unsatisfactory (Pignatti, 1982). Recent studies on the flora and the halophytic vegetation of the central Tyrrhenian coast have led to the present contribution which attempts to present the state of the art in the investigation of annual species of the genus.

DISCUSSION

The annual species of glassworts can be grouped into two series, a diploid one (2n=18) and a tetraploid one (2n=36), which are easily distinguished also at

the morphological level (Ball and Tutin, 1959). Whereas the latter series is made up of quite stable taxa, in the diploid one includes extremely different forms which vary in their habit and in the structure of the spike; this variability is due mainly to the autogamy of the species belonging to this series (Ball, 1964).

The taxonomic characters described in the keys are derived principally from Géhu (1992); descriptions of species are mainly based on field observations in Latium, Tuscany and the Venetian Lagoon, on fresh material from Sardinia, Sicily, Abruzzo and Molise, on examination of recent herbarium specimens, and on bibliographic data.

In the present work all the Italian populations belonging to the diploid series and previously ascribed to *S. europaea* L. or to *S. ramosissima* J.Woods, are to be grouped under the binomial *Salicornia patula* Duval-Jouve; the presence of any other taxa will have to be supported by further taxonomic and floristic studies.

Identifications should be made on fresh material (as the diagnostic features of exsiccata profoundly change) and on several specimens. Taxonomic identification is usually easiest when the plants are mature, in full bloom or starting to bear fruits. In Italy this period usually goes from October to the end of November.

KEY TO THE ITALIAN SPECIES OF SALICORNIA

1 – Fertile segments inflated, sometimes distinctly torulose. Lateral flowers smaller than the central ones (diploid series) ..... **S. patula**

1 – Fertile segments cylindrical. Lateral flowers almost equalling the central ones (tetraploid series) 2

2 – Stem profusely branched from the base, decumbent; terminal spikes tapering towards the apex, with 12-30 fertile segments; lateral spikes as long as the main one. Dark green plants, becoming dull yellow and finally brownish ..... **S. dolichostachya**

2 – Stem branched starting from 1/4 of the base, erect to fastigiate; spikes cylindrical with at most 20 segments, lateral ones shorter than the main one. Plants green, becoming red at anthesis 3

3 – Plants robust, 30-60 cm high; spikes 4-7 mm wide, with 10-16 fertile segments ..... **S. veneta**

3 – Plants slender, 20-50 cm high; spikes narrower with 10-20 fertile segments ..... **S. emerici**

DESCRIPTIONS

Salicornia patula Duval-Jouve, Bull. Soc. Bot. France, 15: 175. 1868

ICONOGRAPHIA – fig. 1

Annual plant usually 10-40 cm high, dark green, becoming yellowish or often red at first in the fertile segments, and then dark purplish. Stem erect, usually much-branched from the base, the branches spreading at angle of about 90° (patent); segments 5-12 mm. Terminal spikes 10-40(50) mm, slender, usually obtuse, with 8-15 fertile segments. Floral shield concave; fertile segments with quite hollow sides which arise level with the scarious foliar border, in a prominent point reflected on the flowers of the distal cyme; for this reason the spikes are wavy and torulose. Middle flower larger than the lateral ones. Seeds at maturity with long, hooked, snail-shaped hairs.

FLOWERING PERIOD – September-November.

ECOLOGY – Salt-pans and saline habitats, dried banks of ponds and marshes, on sandy muds.

GENERAL DISTRIBUTION – Mediterranean region and Black Sea.

LOCAL DISTRIBUTION – Along Italian coasts, including islands.

Salicornia emerici Duval-Jouve, Bull. Soc. Bot. France, 15: 176. 1868

ICONOGRAPHIA – fig. 2

Annual plant 10-50(60) cm high, light green, becoming orange or red at maturity. Stem erect, little-branched; branches ascending, plant almost fastigiate. Segments 15-25 mm; spikes 30-60 mm, cylindrical, slightly tapering, with 10-20 fertile segments 3,5-4,5 mm wide. Foliar border evident. Flowers nearly equal in size. Seeds, when mature, with straight or rarely slightly curved hairs.

FLOWERING PERIOD – September-November.

ECOLOGY – Littoral saline habitats, banks of ponds, on sandy muds.

GENERAL DISTRIBUTION – Western Mediterranean region.

LOCAL DISTRIBUTION – Along coasts of Friuli-Venezia Giulia, Venetian Lagoon, Emilia-Romagna, Tuscany, Latium, Puglia, Sicily and Sardinia.

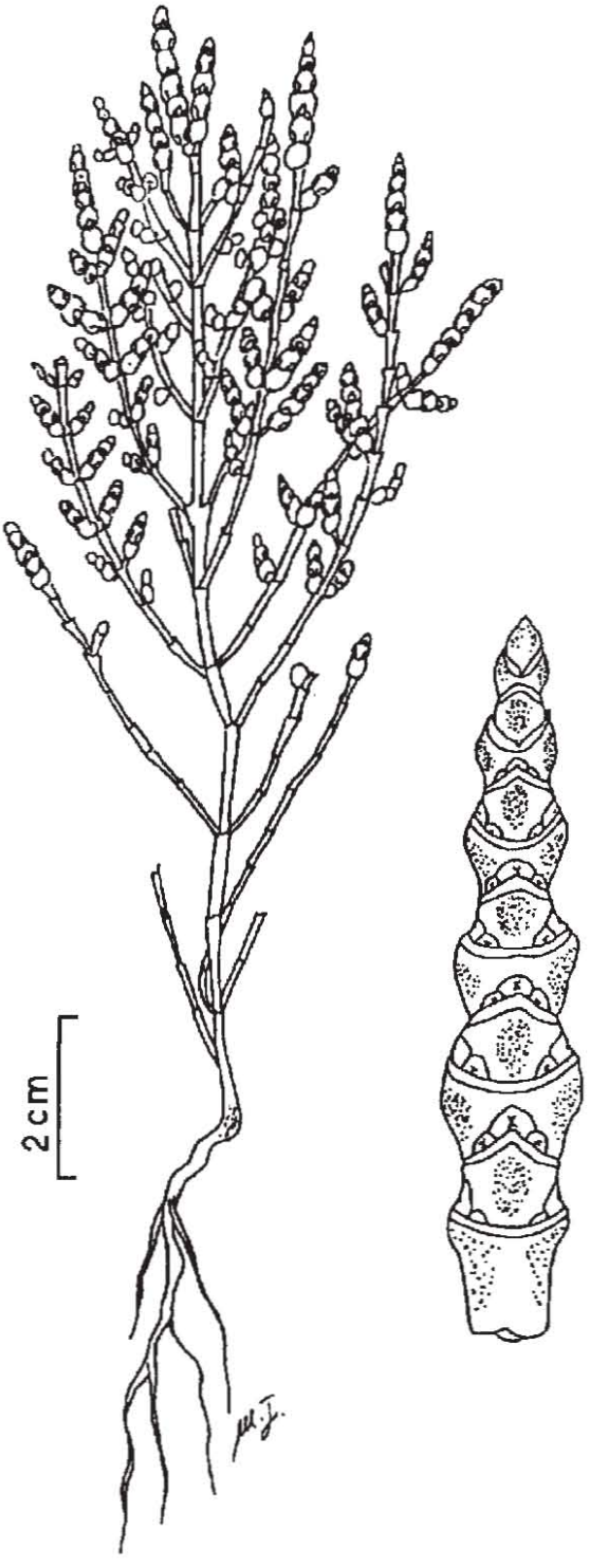

Fig. 1 – *Salicornia patula* Duval-Jouve

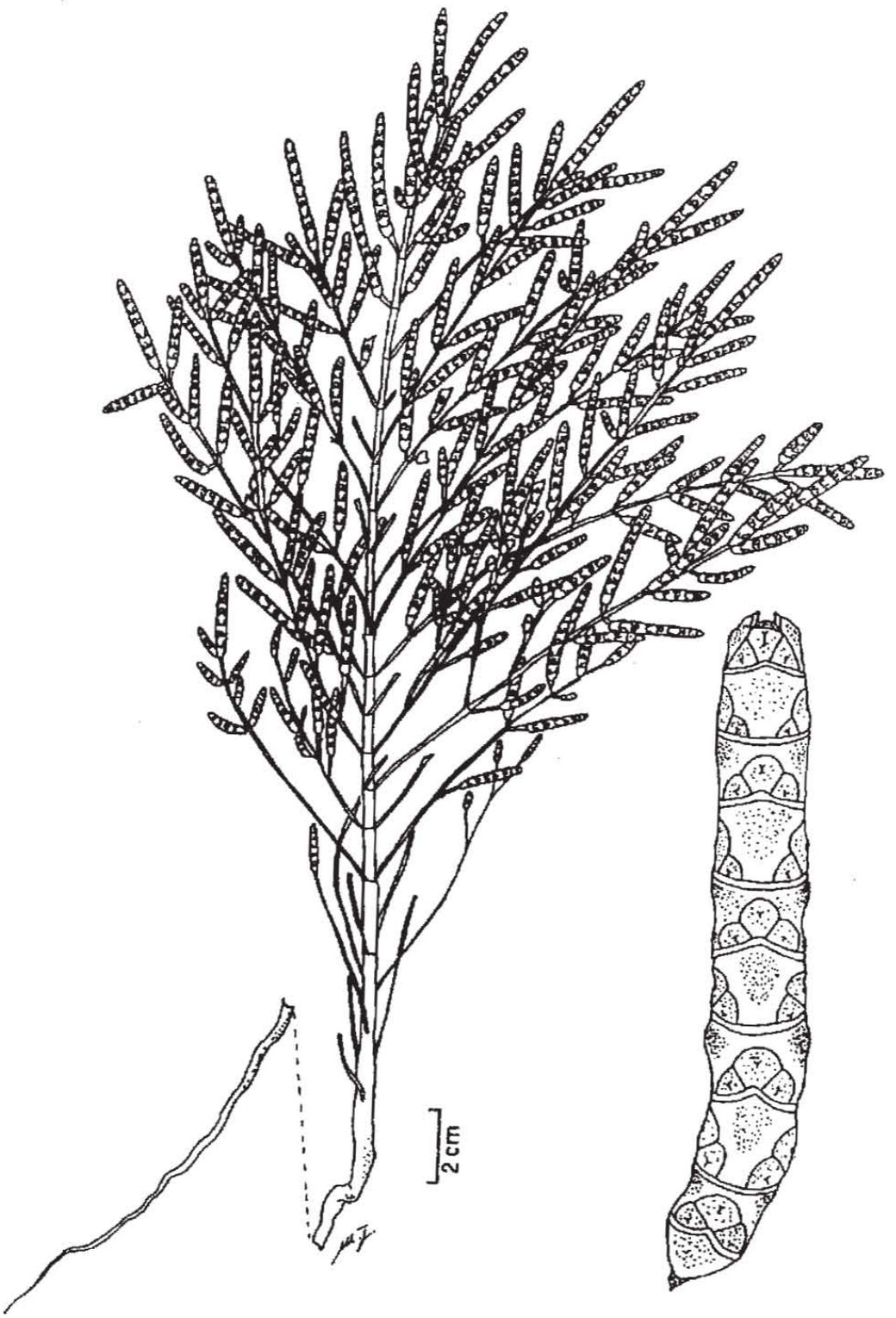

Fig. 2 – *Salicornia emerici* Duval-Jouve

Salicornia veneta Pign. et Lausi, Giorn. Bot. Ital., 103(3): 185. 1969

ICONOGRAPHIA – fig. 3

Annual plant 10- 60 cm high, green, becoming yellowish or red. Stem erect, branched and pyramidal; lower branches erect up to 2/3 of the main stem; primary branches curving upwards distally. Terminal spikes up to 5 cm long and 4-7 mm wide, cylindrical, slightly tapering; fertile segments cylindrical, rarely slightly convex. Stamens 2 (1 in the lateral flowers), exserted, ; anthers 0,7 mm. Seeds densely pubescent.

FLOWERING PERIOD – September-October.

ECOLOGY – On slimy muds of the intertidal zone.

DISTRIBUTION – Muddy banks of the Venetian Lagoon; observed also in the salt marshes of Rosolina (Polesine - Rovigo) and near Porto Garibaldi (Comacchio - Ferrara). Endemic.

Salicornia dolichostachya Moss, New Phyt., 11: 409. 1912

ICONOGRAPHIA – fig. 4

Annual plant 10-30 cm high, dark green, becoming yellowish and then brownish. Stem prostrate-ascending, rarely erect, much-branched; form fastigiate, primary branches as long as the main stem. Terminal spikes cylindrical, tapering, 5-12(20) cm long with 12-30 fertile segments. Fertile segments 3 mm wide and 6 mm long. Lateral flowers almost as large as the central one. Stamens generally 1. Seeds covered with long hairs.

FLOWERING PERIOD – September-November.

ECOLOGY – Littoral saline habitats, on sandy and dried muds.

GENERAL DISTRIBUTION – Atlantic coasts from the North Sea to the Cantabrian Region; Italy (Latium).

LOCAL DISTRIBUTION – Southern Latium: Circeo National Park, between Caprolace and Monaci Lakes.

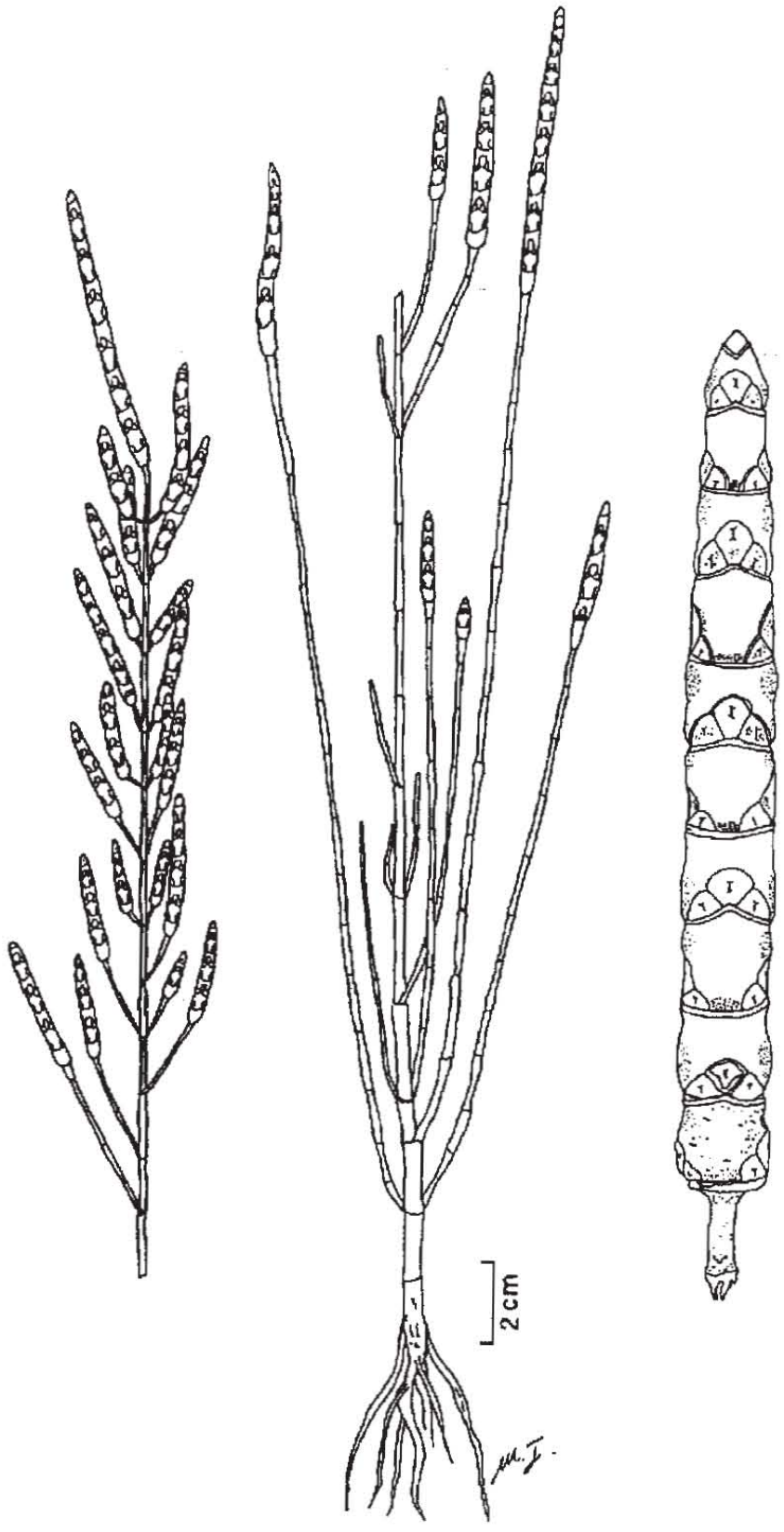

Fig. 3 – *Salicornia veneta* Pign. et Lausi

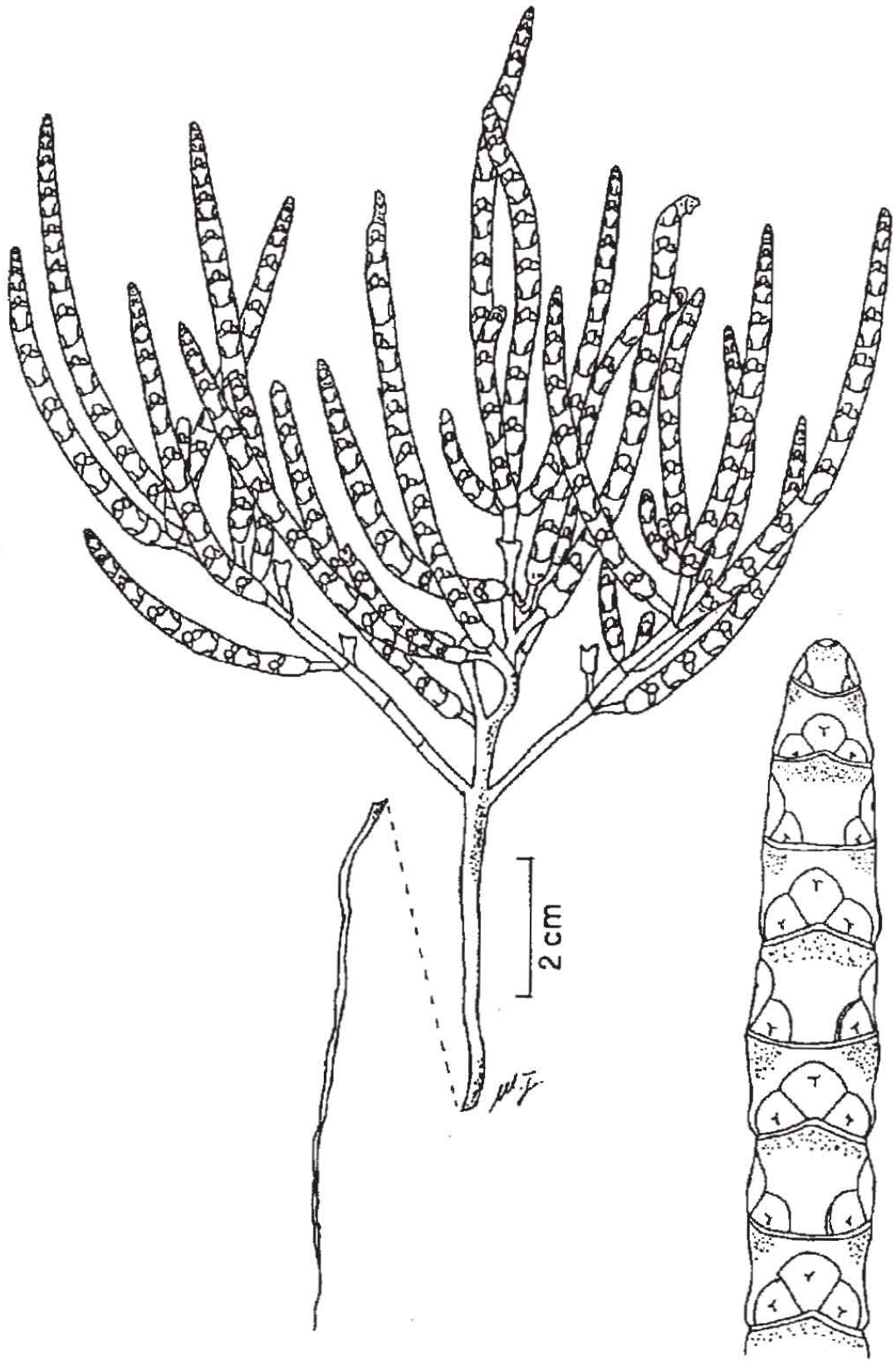

Fig. 4 – *Salicornia dolichostachya* Moss

OBSERVATIONS – This species was found in the southern part of Corsica (Lahondere and Dutartre, 1988; Géhu, Lahondere and Paradis, 1990) sub *S. oliveri* Moss, but later (Géhu and Biondi, 1994) the Corsican populations were recognized as a distinct form *«dolichostachyoide»* of *S. patula* Duval-Jouve. In Latium, the station of Lago Lungo cannot be confirmed because here, after the first record (Iberite and Macario, 1992), *S. dolichostachya* has not been found probably because the area has been drained. For this reason this species is known only from Circeo National Park, but it may exist also in other Mediterranean sites.

RIASSUNTO

Viene proposto un nuovo assetto del genere *Salicornia* L. in Italia; sono riconosciute *S. patula* Duval-Jouve, *S. emerici* Duval-Jouve, *S. veneta* Pign. et Lausi e *S. dolichostachya* Moss. Vengono fornite inoltre le chiavi analitiche del genere, una descrizione ed una nuova iconografia per ogni specie.

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