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Hyoseris frutescens, a new species from Gozo (Malta)

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RÉSUMÉ

BRULLO, S. & P. PAVONE (1988). *Hyoseris frutescens*, une nouvelle espèce de Gozo (Malta). *Candollea* 43: 717-726. En anglais, résumés français et anglais.

Hyoseris frutescens est une espèce nouvelle décrite des falaises calcaires de Gozo (Malte). Son nombre chromosomique ($2n = 16$) et ses relations avec les autres espèces du genre *Hyoseris* sont examinés.

ABSTRACT

BRULLO, S. & P. PAVONE (1988). *Hyoseris frutescens*, a new species from Gozo (Malta). *Candollea* 43: 717-726. In English, French and English abstracts.

Hyoseris frutescens is a new species described from the limestone cliffs of Gozo (Malta). Its chromosome number ($2n = 16$) and its relationships with the other species of the *Hyoseris* genus are examined.

Introduction

Aim of the present paper is the examination of a critical species belonging to the genus *Hyoseris* coming from the Maltese archipelago. It is an evergreen plant flowering all the year, which has a pulvinate habit with fleshy and shining leaves.

Previously (cf. SOMMIER & CARUANA-GATTO, 1915; BORG, 1927; HASLAM & al., 1977), it was identified, probably on account of leaf features, as *Hyoseris lucida* L.; but this attribution is clearly a mistake. In fact, the examination of specimens of the true *H. lucida*, coming from N Egypt (which is the *locus classicus*), evidenced that it is a stemless plant, with stout taproot, living on the coastal dunes. Besides, it resulted well differentiated from the Maltese plant in the leaf outline as well as in the shape of the capitula and of the cypselas.

Another species of *Hyoseris* with fleshy and shining leaves is *H. taurina* (Pamp.) Martinoli, but on the basis of the inspection of the type material (FI), it shows marked differences from the Maltese plants. They regard mainly the habit, the leaf lobes, the bracts and the cypselas.

As a whole, the herbarium investigation and the literature data evidenced that the plant occurring in Malta is a very isolated species, which is new for the science.

***Hyoseris frutescens* Brullo & Pavone, spec. nov.** (Fig. 1).

Typus: Malta, Gozo, Cala Dweira, costa rocciosa, 13.4.1987, *Brullo, Pavone & Ronsisvalle s.n.* (holotypus CAT):

Planta glabra, fruticosa, pulvinata, sempervirens. Caulis erectus vel prostrato-ascendens, valde lignosus, usque 8-10 cm longus, ex basis ramosus, Folia viridia, rosulata apice ramorum, crassa, sublyrata, plus minusve longe petiolata, rare lasse dentata, 3-15(-25) cm longa, pinnatifida, lobis 8-14, distantibus, rotundatis vel repandis margine. Capitula solitaria, 11-15 mm longa, pedunculis



Fig. 1. — *Hyoseris frutescens* Brullo & Pavone, spec. nov.



Fig. 2. — Mitotic chromosome plate of *Hyoseris frutescens*.

8-25(-40) cm longis. Involucrum urceolatum, phyllis biseriatis, rare subtriseriatis, exterioribus 8-10, valde inaequilongis, 2-6 cm longis, dilatatis basi et longe acuminatis apice, interioribus 11-13 aequilongis, anguste lineari-ovatis, acutis apice, 2.5-3 × 11-15 mm. Flores lutei, 16-20 mm longi, tubo 4-5 mm longo, coronula pilorum glandulosarum 0.3-0.7 mm longarum praedito ad apicem. Ovarium planum, 1.5 mm longum. Achenia brunnea; exteriora, cylindrica, 1.2-1.5 × 7.5-8.5 mm, curvata, late bicostata in dorso, pappo breve, 0.5-0.7 mm longo; intermedia ovata, late alata 3 × 6.5-7 mm, anguste bicostata in dorso, pappo 6-7 mm, setibus inaequalibus; interiora longe cylindrica, 1 × 6-7 mm, longitudinaliter sulcata in dorso, pappo 5-6 mm longo setibus inaequalibus.

Specimens examined

Malta, Gozo, Cala Dweira, Costa rocciosa, 13.4.1987. *Brullo, Pavone, Ronsisvalle s.n.* (CAT); *ibid.*, 25.9.1985, *Brullo & Pavone s.n.* (CAT); *ibid.*, Dweira Point, 15.11.1986, *Brullo & Pavone s.n.* (CAT); *ibid.*, Dweira, 11.4.1984, *Brullo & Ronsisvalle s.n.* (CAT); *ibid.*, 17.4.1984, *Brullo & Ronsisvalle s.n.* (CAT); *ibid.*, Xlendi, 29.6.1973, *Brullo & Ronsisvalle s.n.* (CAT); *ibid.*, Xlendi Valley, 15.11.1986, *Brullo & Pavone s.n.* (CAT); *ibid.*, Bardan, 26.6.1973, *Brullo & Ronsisvalle s.n.* (CAT); *ibid.*, St. Dimitri Point, 25.9.1985, *Brullo & Pavone s.n.* (CAT); *ibid.*, 11.4.1984, *Brullo & Ronsisvalle s.n.* (CAT).

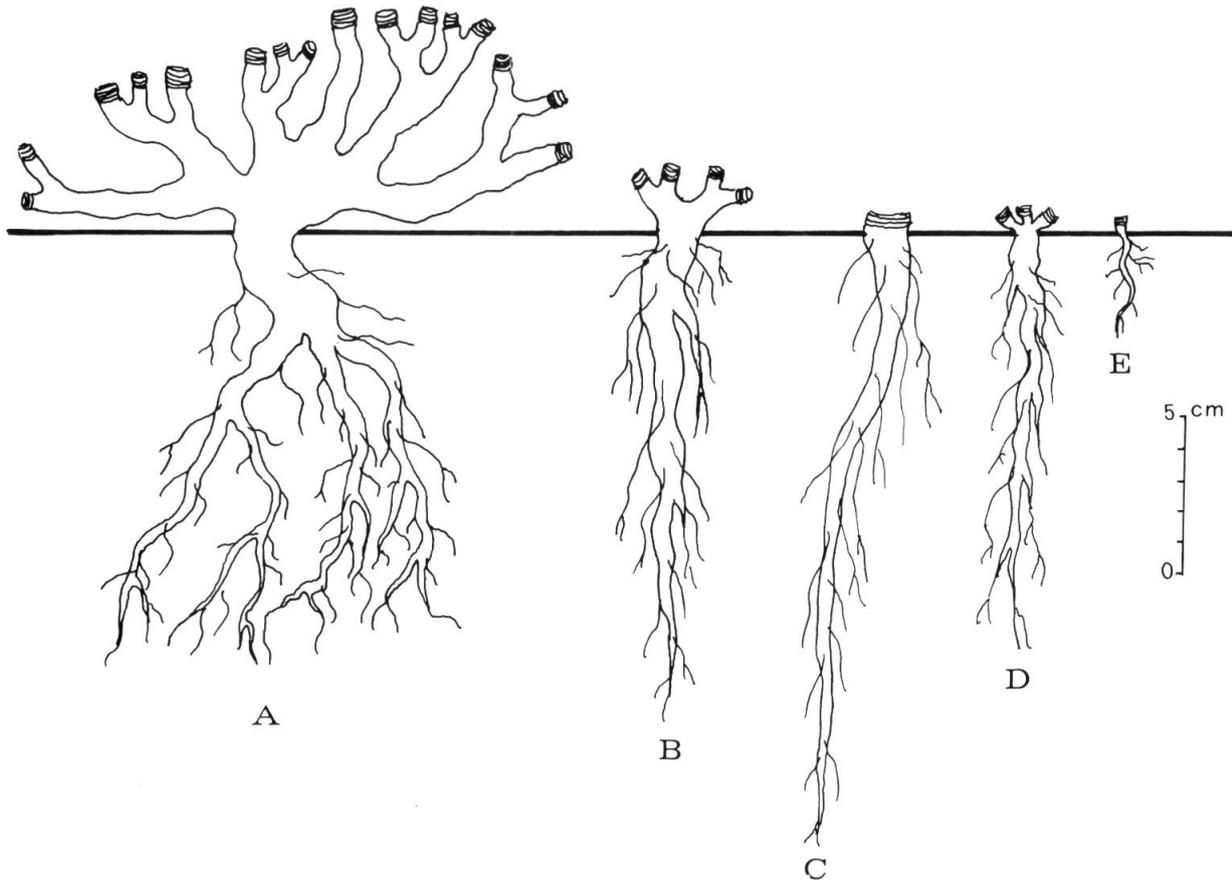


Fig. 3. — Habit (caule and root) of *H. frutescens* (A), *H. taurina* (B), *H. lucida* (C), *H. radiata* (D), *H. scabra* (E).

Ecology

Hyoseris frutescens is endemic of Gozo in the Maltese Archipelago, where it is localized in the stretch between St. Dimitri Point and Xlendi. It is a strictly chasmophilous species growing along the coastal places, mainly limestone cliffs. It is normally associated with other rare chasmophytes, as *Palaeocianus crassifolium* (Bertol.) Dostàl, *Cremnophyton lanfrancoi* Brullo & Pavone, *Chiliadenus bocconeii* Brullo, *Darniella melitensis* (Botsch.) Brullo, *Helichrysum melitense* (Pignatti) Brullo & al., *Daucus rupestris* Guss., *Matthiola incana* (L.) R. Br. subsp. *melitensis* Brullo & al., etc.

Caryology

The chromosome number of *H. frutescens* is $2n = 16$ (Fig. 2). The count was made on root-tips of specimens coming from Cala Dweira (Gozo) and cultivated in the Botanical Garden of Catania; this material was pretreated with 8-hydroxyquiniline, fixed in Carnoy and stained according to the Felgen method. This species shows a karyotype characterized by metacentric and submetacentric chromosomes except one subtelocentric pair, which is macrosatellited. The same somatic number was found in other species of *Hyoseris* (MARTINOLI, 1953; HUMPHRIES & al., 1978; BARTOLO & al., 1978; NORDENSTAM, 1972; DAHLGREEN & al., 1971), but the karyotype of *H. frutescens* is significantly different. The most remarkable peculiarity is the occurrence of two satellited chromosomes, which are lacking in all the other species, as it results from the literature and personal unpublished data.

Relationships

Apart from the caryology, *H. frutescens* is well differentiated from the other taxa of *Hyoseris* in a lot of morphological characters. The most important differences are the following:

- a) Habit — *Hyoseris frutescens* is a true chamaephyte with a very developed caule (Fig. 3), which is woody, robust, many-branched, pulvinate, with a strong and branched root. The other species have a herbaceous habit, as *H. scabra* L. which is a therophyte, or as *H. radiata* L. and *H. lucida* L. which are hemicryptophytes, while *H. taurina* (Pamp.) Martinoli is shortly caulescens.
- b) Leaf — The various species of *Hyoseris* result well differentiated in the leaves too (Fig. 4). In fact, *H. frutescens* has leaves with spaced lobes, rounded or obtuse at the apex, with repand margin; *H. taurina* has leaves with spaced lobes except the upper ones which are succubous, acute at the apex and dentato-angulate at the margin, *H. radiata* has subruncinate leaves, with upper lobes partially succubous, long acute-beached at the apex and incise-dentate at the margin; *H. lucida* has leaves typically runcinate, with the most part of lobes succubous, acute-apiculate at the apex and dentate at the margin; *H. scabra* has very short leaves, with lobes spaced and dentate-angulate at the margin.
- c) Involucre and cracts — The shape and the morphology of the involucre bracts show remarkable diagnostic characters (Fig. 5). In fact, *H. frutescens* has an urceolate involucre with inner bracts long ovate-triangular, 2.5-3 mm wide and narrowly margined, and with outer bracts dense uniseriate or sub-biseriate, ovate, abruptly terminating in a more or less long point; *H. taurina* has involucre lightly urceolate with inner bracts narrowly ovate-triangular, 3-3.5 mm wide and quite large hyaline margin, and with outer bracts laxly uniseriate, ovate-linear, gradually terminating in a long point; *H. lucida* has subcylindrical involucre with inner bracts oblong-linear, 3-3.5 mm wide and widely margined, and with outer bracts ovate-triangular terminating abruptly in a wide and short point; *H. radiata* has involucre urceolate with inner bracts oblong-linear, 2-2.5 wide and narrowly margined, and with outer bracts long triandular, acute and acuminate at the apex.
- d) Florets — The differences occurring in the florets concern mainly the ovary shape and the annulus of hairs arranged in several rows which are localized in the upper part of the corolla tube (Fig. 6). As regards these hairs, they are very short in *H. frutescens* (up to 0.6 mm), while *H. radiata* as well as *H. taurina* show hairs up to 1 mm long and *H. lucida* has hair up to 1.5-1.7 mm long.
- e) Cypseles — Very important diacritic characters are found in the fruit (Fig. 7). *H. frutescens* has cypseles 6-8 mm long, the marginal subterete, the median winged-ovate, the inner lightly sub-compresse, ribbed and 1-1.2 mm wide; *H. taurina* has cypseles 5-7 mm long, the marginal compressed and lightly winged, the median winged-compressed with oblong outline, the inner terete, sulcate, 0.5-0.7 wide; *H. lucida* has cypseles 8-9 mm long, the marginal compressed and widely winged, the median winged-compressed with linear elliptical outline and manifestly retuse at the base, the inner narrowly cylindrical, sulcate, 0.5-0.6 mm wide; *H. radiata* has cypseles 8-11 mm long, the marginal compressed and lightly winged below, the median winged-compressed with linear-elliptical or linear-ovate outline (with the pappus hairs often replaced by few linear scales), the inner subterete, sulcate, 0.8-1 mm wide.

As regards the distribution of the *Hyoseris* species, *H. frutescens* is exclusive of Gozo where it grows on the high sea cliffs, *H. taurina* (= *H. lucida* and *H. baetica* auct. Fl. Ital. p.p.) results distributed in S Sardinia (cf. ARRIGONI, 1981) and N. Sicily where it is localized along the rocky coast, *H. lucida* is circumscribed to the sandy coast of N. Libya and N. Egypt; *H. radiata* is widespread in the Mediterranean territories where it is prevalently synantropic as it grows in the walls, side of the road and meadows; at last *H. scabra* is frequent in the ephemeral xerophilous communities occurring in many countries of the Mediterranean area.

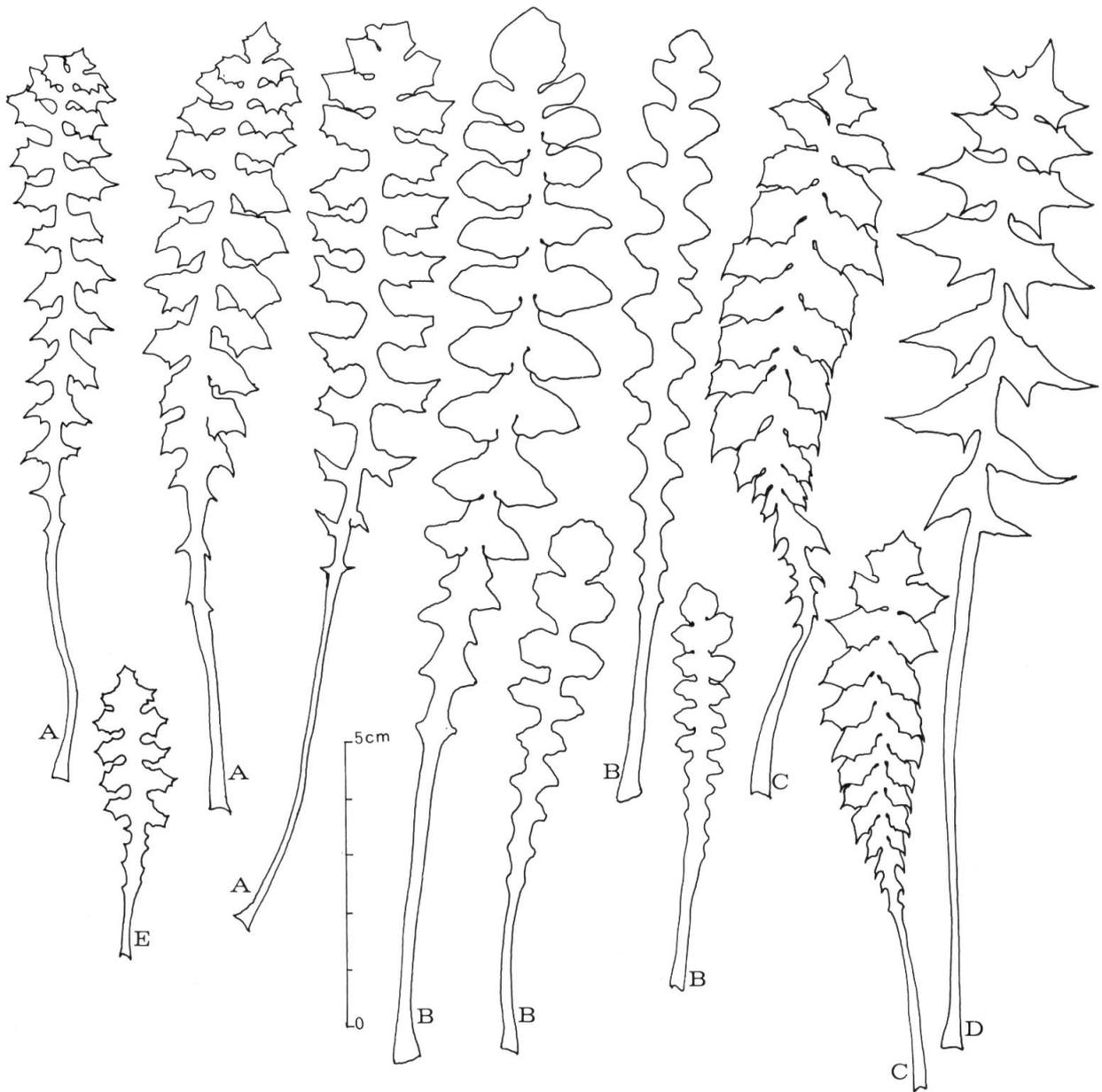


Fig. 4. — Leaf outline of *H. taurina* (A), *H. frutescens* (B), *H. lucida* (C), *H. radiata* (D), *H. scabra* (E).

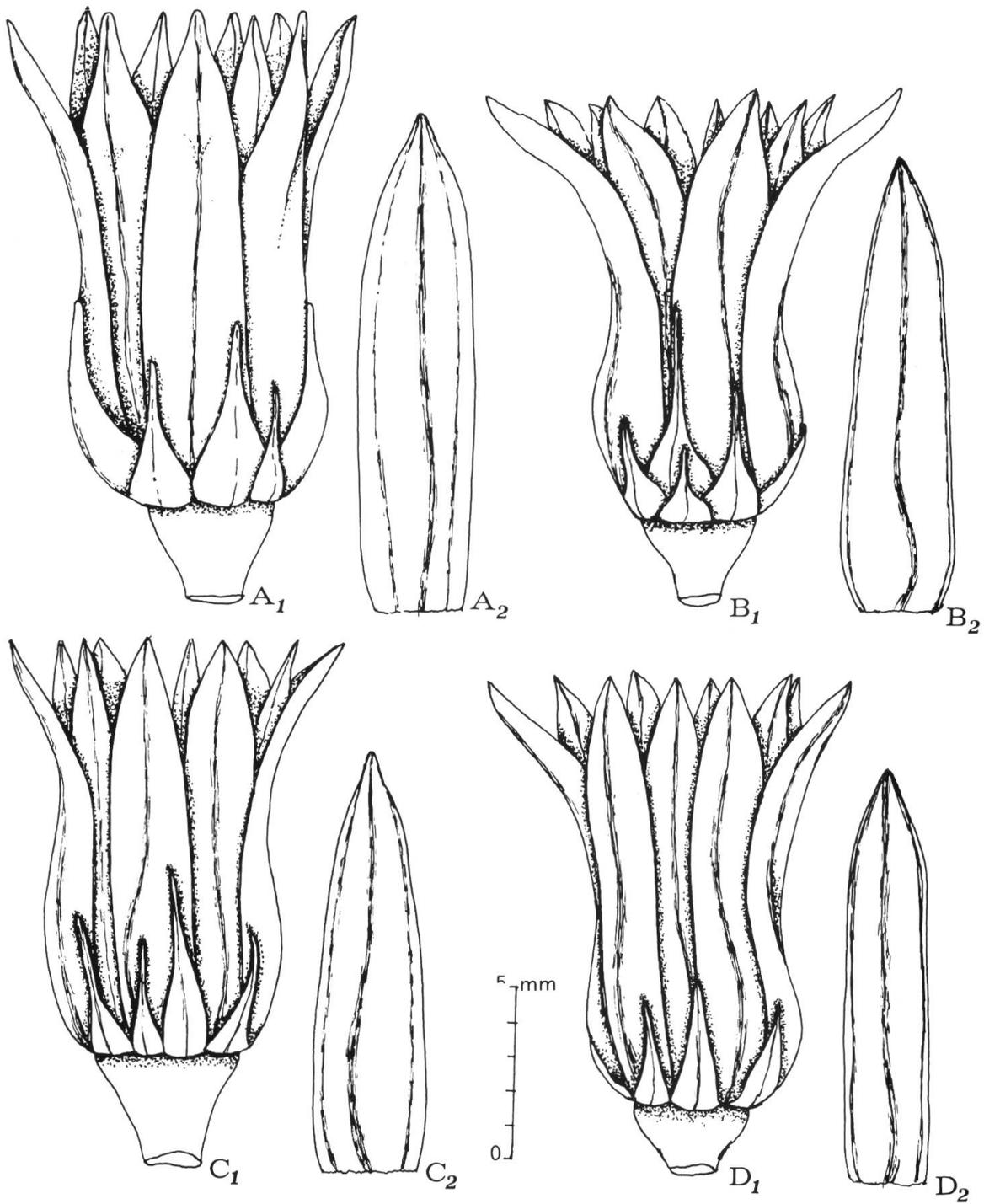


Fig. 5. — Involucre and bract of *H. lucida* (A), *H. frutescens* (B), *H. taurina* (C), *H. radiata* (D).

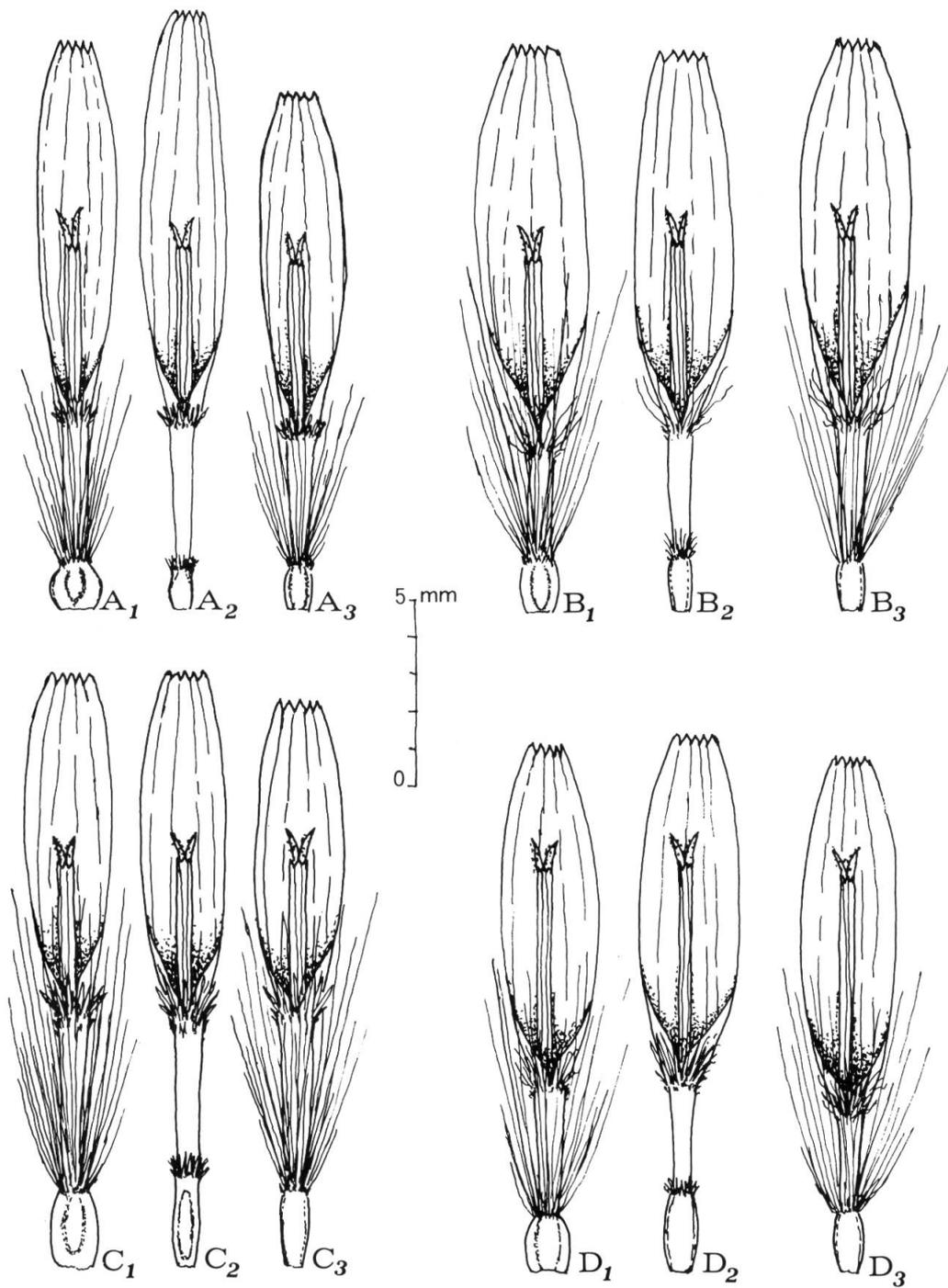


Fig. 6. — Florets of *H. frutescens* (A), *H. lucida* (B), *H. radiata* (C), *H. taurina* (D). Median (1), marginal (2), and inner (3).

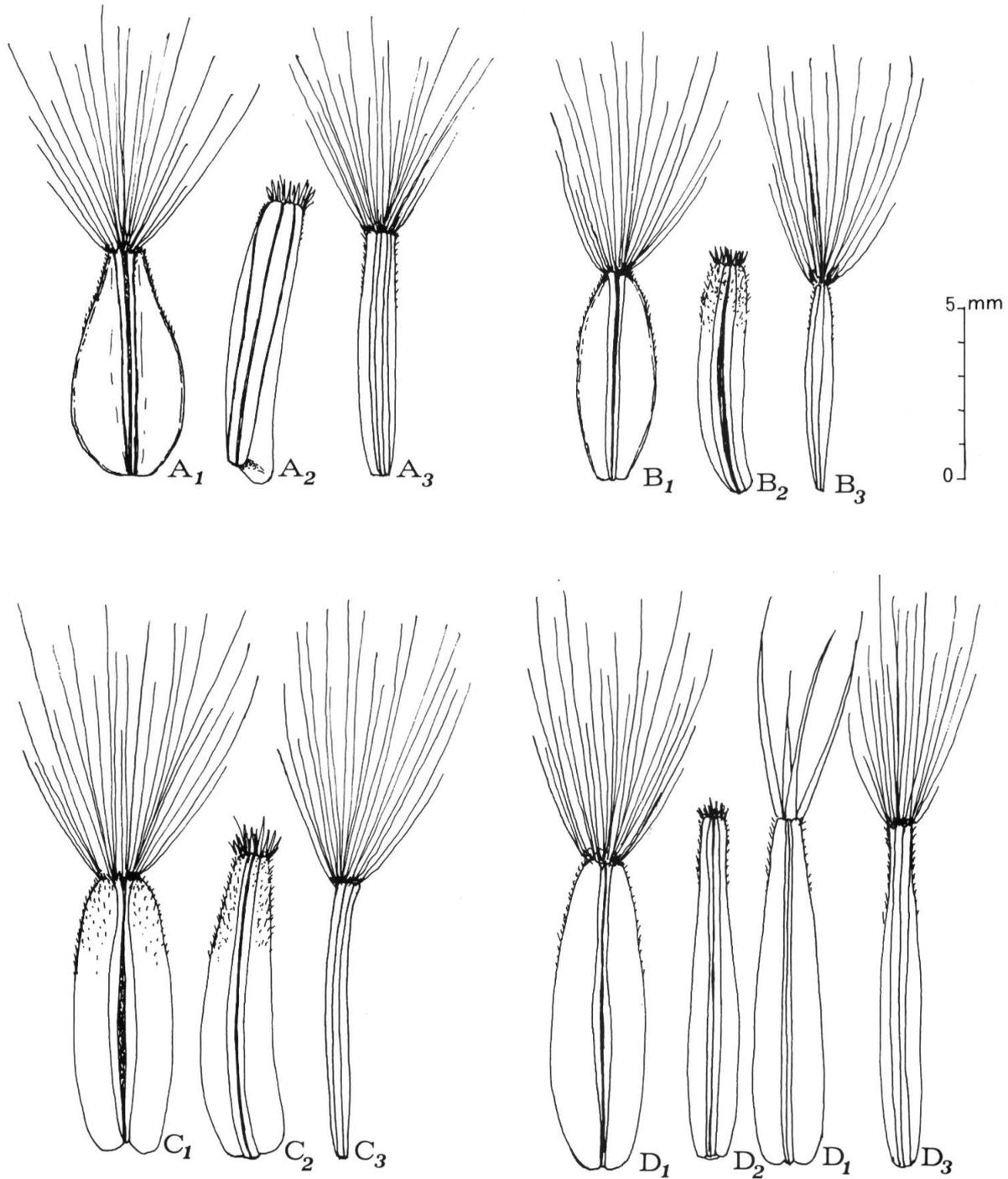


Fig. 7. — Cypselae of *H. frutescens* (A), *H. taurina* (B), *H. lucida* (C), *H. radiata* (D). Median (1), marginal (2), and inner (3).

Within the genus *Hyoseris*, it is clear, on the whole, that *H. frutescens* is taxonomically very isolated. In particular for its habitat and its cushion-like habit, it results the most ancestral species. Among the known species of *Hyoseris*, *H. frutescens* shows closer relation with *H. taurina*, mainly for the fleshy leaves and for the woody caule. Besides, the latter species can be considered as the intermediate between *H. frutescens* and *H. radiata*, while *H. lucida* probably originated directly from the suffruticose type in consequence of its adaptation to the dune environment.

The occurrence of an old species on the limestone cliffs of Malta is not something exceptional, because in these places are localized a lot of rare taxa belonging prevalently to the Tertiary flora. In particular the sea cliffs of Malta (cf. BRULLO & PAVONE, 1987; BRULLO & al., 1988) represent the refuge area of many primitive plants, which during the Messinian period had probably a wider distribution.

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