

N.W. Morocco, where it is known from only two localities, one certainly and the other probably at a low elevation.

A photograph of the type is in Herb. UC.

This subspecies, like the next, is of special interest because it appears to be a connecting link between the more advanced subspecies, such as subsp. *taraxacifolia* and *typica*, on one hand, and, on the other hand, such primitive species as those comprising sec. 7, particularly *C. achyrophoroides* and the tall, single-stemmed forms of *C. albida*. It is with the idea that this subspecies represents a transitional stage in the evolution of the genus and, in this sense, that it was preliminary to the more recently evolved forms that it is given the name subsp. *proleptica*. I was at first inclined to recognize it as a species; but the discovery of the very similar subsp. *congenita*, which is evidently hybridizing naturally with subsp. *taraxacifolia*, and the fact that the only other specimen of subsp. *proleptica* known to me besides the type is somewhat atypical, seemed sufficient reason to recognize both subsp. *proleptica* and *congenita*.

As already stated, this subspecies is intermediate between *C. achyrophoroides* of Abyssinia and *C. vesicaria taraxacifolia* of N.W. Africa and S.W. Europe. It also resembles somewhat the taller subspecies of *C. albida* which are endemic in Spain. Apparently, *C. vesicaria proleptica* represents an intermediate phase in the evolution of subsp. *typica* and *taraxacifolia* and other widespread species the advanced phylogenetic position of which is marked by greater reduction in size of heads, flowers, and fruits, and further specialization of the finely beaked achenes.

The robust appearance of the plants of subsp. *proleptica* naturally suggests that this may be a polyploid species. But in the type the pollen is abundant and the grains are 3-pored, regular in size, averaging about  $28\mu$  in diameter. (In two normal plants of subsp. *taraxacifolia* the pollen was 3-pored and averaged  $26-28\mu$  in diameter.) In m.v. 78 the pollen is also abundant, but the grains are irregular, ranging from  $21$  to  $32\mu$  and averaging  $27\mu$  in diameter. Such irregularity could be caused by either environmental or genetic conditions; the size of the grains seems to indicate that this variant is a diplont, but it may be a hybrid of some sort.

That subsp. *proleptica* shows strong affinity with *C. achyrophoroides* is shown by the habit of the plant, the size and shape of the leaves, the indumentum of leaves, stem, involucre and corolla, and the straw-colored, coarsely beaked achenes. That it is a more advanced form is shown by the more numerous, smaller heads, the reduced outer involucral bracts, the smaller florets and achenes, and the shorter, finer, white pappus. These latter features and the green style branches of subsp. *proleptica* indicate an approach to subsp. *taraxacifolia*.

**Morocco:** Casablanca Prov., Rabat R., *Grant* in 1888 (K, UCf) type; around Tangier, rich meadows, *Salzmann misit Aug., 1825* (K) m.v. 78.

*Minor Variant of C. vesicaria proleptica*

78. Caudical leaves lyrate pinnately parted, terminal segment rhomboid, subcordate, lateral segments broad, rounded, recurved; involucre with or without dark setules; outer bracts somewhat broader than in the type of the subspecies and with wider scarious margins; corolla 16 mm long; corolla tube pubescent, as in type, except that the acicular hairs at summit of tube and base of ligule are more numerous, coarser, somewhat tortuous, and up to 1 mm long. Otherwise typical. *Salzmann misit, Aug., 1825* (K), fertile meadows around Tangier, Morocco.

181, *h. Crepis vesicaria congenita* subsp. nov. Herba perennis vel biennis 5-7 dm alta; caudex ligneus 0.5-1.5 cm latus; folia caudicalia 12-30 cm longa 3-7 cm lata, oblanceolata dentata vel subpinnatifida; folia caulina similia vel sessilia amplexicaulia; caulis erectus 8-10-ramosus, ramis inferis elongatis ad summitatem cymose

ramosis; pedunculi 3–11 cm longi stricti vel arcuati hispidulosi; capitula 50–60-flora; involucria 9–11 mm longa 5–7 mm lata pallida; squamae exteriores 6–8 lanceolatae, interiores 12–16 lanceolatae ad maturitatem carinatae et spongioso-incrasatae; receptaculum alveolatum strigosum, setis crassis flavis; corolla 12 mm longa, ligula 1.75 mm lata flava in dorso purpurea, tubo 4–5 mm longo pubescenti; antherae 3.75 mm longae; stylus flavus, ramis 1.75 mm longis flavis; achaenia uniformia fusco-flava 6–7 mm longa 0.5 mm lata in rostro tenuo gradatim attenuata 10-striata; pappus albus 4 mm longus 2–4-seriatus.

Plant 5–7 dm high; caudex woody, 0.5–1.5 cm wide; caudical leaves 12–30 cm long, 3–7 cm wide, oblanceolate, obtuse or acute, sinuate-dentate, gradually attenuate into a long or short winged petiole; upper cauline leaves lanceolate, acute or acuminate, auriculate-amplexicaul; stem erect, remotely 8–10-branched beginning near base, lower branches elongated, strict, cymosely branched above, forming few-headed open corymbiform clusters; peduncles 1–9 cm long, slightly thickened at base of fruiting heads, glabrescent or sparsely setulose with yellow or green glandless setules; heads erect, medium, 50–60-flowered; involucre 9–11 mm long, 5–7 mm wide, pale grayish-green, the dorsal keels of the inner bracts brownish-yellow, setules yellowish-green; outer bracts 6–8, lanceolate, acute,  $\frac{1}{4}$ – $\frac{1}{3}$  as long as the inner; inner bracts 12–16, strongly nerved and pubescent on inner face with coarse shining hairs, becoming carinate dorsally, spongy-thickened near base; receptacle strigose, the trichomes coarse, yellow, shining; corolla 12 mm long; ligule 1.75 mm wide, yellow, reddish-purple on outer face; ligule teeth 0.2–0.4 mm long; corolla tube 4–5 mm long, pubescent with stout stalked yellow or hyaline hairs, papilliform at base of tube, increasing to 1 mm long at base of ligule and then several-celled; anther tube  $3.75 \times 1$  mm dis.; appendages about 0.7 mm long, linear, acute; filaments 0.75 mm longer; style branches 1.75 mm long, 0.15 mm wide, yellow (in some variants 2 mm long, light green); achenes brownish-yellow, 7–8 mm long, 0.5 mm wide, 10-ribbed, the beak finer and less definitely ribbed than in subsp. *proleptica*; pappus 4 mm long, 4-seriate (2-seriate in some variants). See pl. 35; fig. 284.

Spain, at a few localities in the south (Granada Prov. and S. Jaen Prov.) and in the east (Alicante Prov. and Teruel Prov.); 125–1150 m alt.

A photograph of the type is in Herb. UC.

This subspecies is of special interest, first because of its close resemblance to subsp. *proleptica* and, second, because it appears to have hybridized with subsp. *taraxacifolia*, producing amphidiploid derivatives which resemble one or the other of these two subspecies (cf. m.v. 61–63 and 67 under subsp. *taraxacifolia*, and 79–81 below). Unopened florets of some of these forms contain both 3-pored and 4-pored pollen grains which are larger in size than those of the putative parents. In the type of subsp. *congenita* and another specimen from Granada, the pollen is very scanty and irregular in size, but is 3-pored. This condition may be due to a genetic factor for pollen abortion. In the two specimens from Teruel Prov. there is abundant pollen and the grains are regular, 3-pored, and average  $30\text{--}31\mu$  in diameter. But in m.v. 67, which is presumably an amphidiploid hybrid, the pollen is abundant and both 3-pored and 4-pored, and the grains vary in diameter from 24 to  $34\mu$ , averaging  $30\mu$ . This irregularity in the pollen may indicate irregularity in chromosome distribution which would account for the existence of numerous derived forms. These forms are very variable, but they can be referred to one or the other of the two subspecies. Field studies are needed on the present distribution of this subspecies as well as of subsp. *proleptica*.

Spain: Granada, *Winkler* (Po 17721) type; *ibid.*, *Winkler* ? (UC); Jaen Prov., Sierra Magina, Golondrina, N. slope, calcareous rocks, 1150 m, *Cuatrecasas* in 1926 (Bar) m.v. 79; Alicante

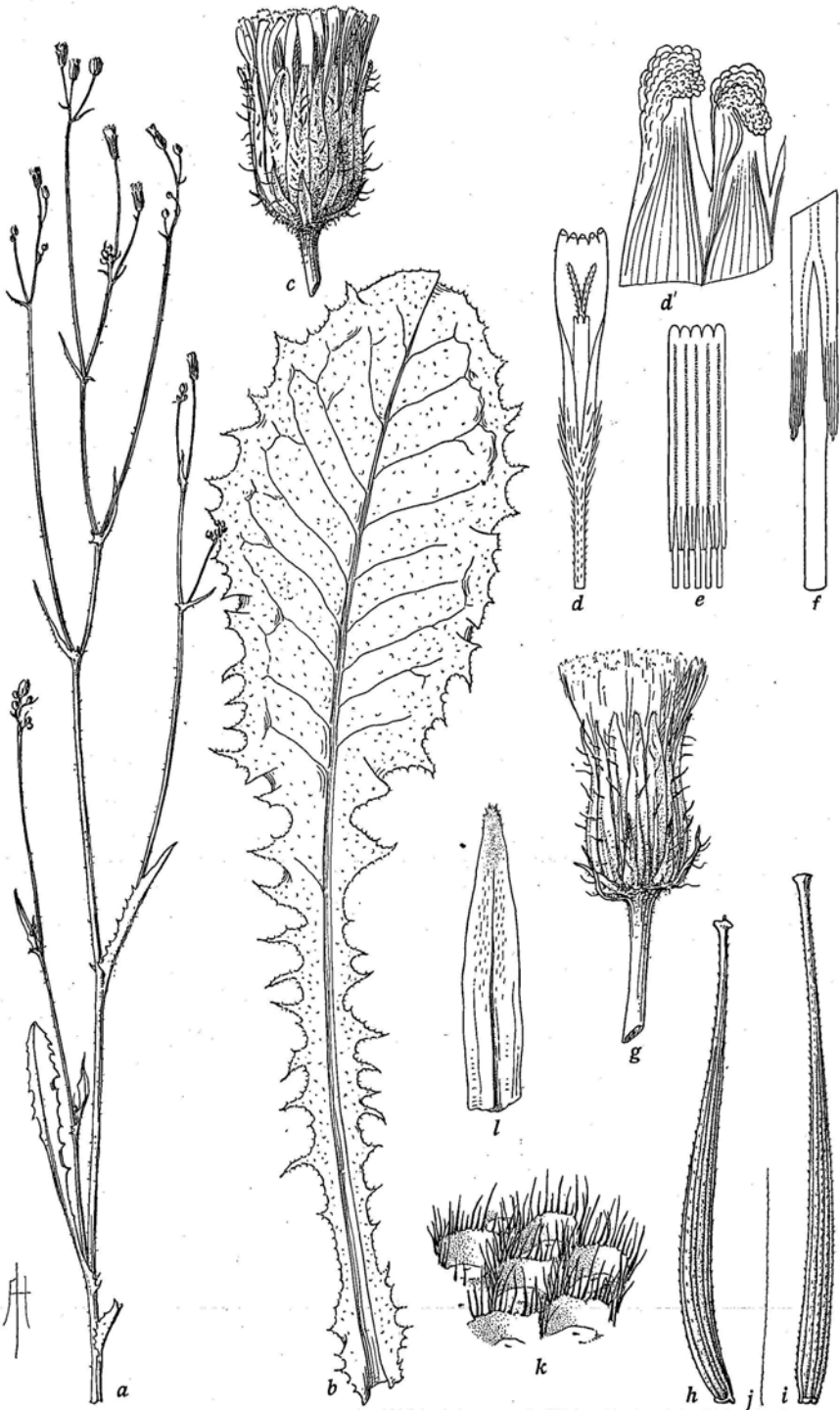


Fig. 284. *Crepis vesicaria congenita*, a-f, from type (Po 17721); g-l, from Winkler (Po 17625): a, part of plant,  $\times \frac{1}{4}$ ; b, basal cauline leaf,  $\times \frac{1}{2}$ ; c, flowering head,  $\times 2$ ; d, floret lacking ovary,  $\times 4$ ; d', detail of ligule teeth,  $\times 50$ ; e, anther tube,  $\times 8$ ; f, detail of appendages,  $\times 32$ ; g, fruiting head,  $\times 2$ ; h-j, achenes and pappus seta,  $\times 8$ ; k, detail of receptacle,  $\times 25$ ; l, inner involucrel bract, inner face,  $\times 4$ .

Prov., Mt. Hifac, 125 m, *Font Quer* in 1923 (Bar, UC) as *C. vesicaria* var. *glabrifolia* Fiori ad *taraxacifoliam* *verg.* = m.v. 81; E. Teruel Prov., Penarroja, *Winkler* (Po, UCF); *ibid.*, Loscos (Po); *ibid.*, Monreal del Campo, *Benedicto* in 1894 (Bar) as *C. taraxacifolia* = m.v. 80.

*Minor Variants of C. vesicaria congenita*

79. Very robust, although only 5 dm high; caudical leaves lacking; cauline leaves large, deeply pinnatifid with narrow acute lateral segments; involucre sparsely setulose and gland-pubescent, setules short, dark; outer bracts ovate-lanceolate,  $\frac{1}{3}$  as long as the inner; corolla 15 mm long; anther tube 4–5 mm long; style branches 2.5 mm long, greenish-yellow; achenes brownish-yellow, 7–8 mm long; pappus 2-seriate. Probably an amphidiploid derivative from subspp. *congenita* × *taraxacifolia*. The pollen is plentiful and apparently all 3-pored. The grains range from 24 to 32 $\mu$ , averaging 29–30 $\mu$  in diameter. *Cuatrecasas* in 1926 (Bar), calcareous rocks, 1150 m, N. slope, Golondrina, Sierra Magina, Jaen, Spain.

80. Achenes, as in subspp. *taraxacifolia*, finely beaked and finely ribbed, the involucre rather dark, and the setules on the inner involucre bracts short and dark. Although closely resembling subspp. *congenita* in most respects, yet the characters mentioned above are unmistakable evidence of hybridization with subspp. *taraxacifolia*. The pollen, however, is apparently all 3-pored and too small for a polyploid, ranging from 23 to 30 $\mu$  and averaging 26 $\mu$  in diameter. Probably this is a diploid hybrid derivative. *Benedicto* in 1894 (Bar), Monreal del Campo, Teruel Prov., Spain.

81. Stem reddish near base; caudical leaves only 10–14 cm long, runcinately dentate or sub-pinnatifid, shortly petioled, glabrate above; involucre setules absent, much reduced or glandular; pappus 2-seriate. The pollen is very irregular, ranging from 23 to 37 $\mu$ , and averaging about 30 $\mu$  in diameter. Probably some of the largest grains are 4-pored. Presumably another amphidiploid derivative. *Font Quer* in 1923 (Bar, UC, as *C. vesicaria* ad *taraxacifoliam* *verg.*), among herbs, tree-covered slope, Mt. Hifac, "Regno Val." (= Mongo, between Denia and Jenea, Alicante Prov.), Spain.

*Relationship*

*Crepis vesicaria* sen. lat. includes a remarkable array of subspecies and forms. The eight subspecies are at least partly isolated, either geographically or ecologically, except, perhaps, subspp. *proleptica*, about which very little is known. Seven of these subspecies are diploids or have diploid forms, which can be arranged, in ascending order from more primitive to more advanced types, approximately as follows: subspp. *proleptica*, *congenita*, *hyemalis*, *andryaloides*, *taraxacifolia*, *typica*, and *myriocephala*. The hybrid swarm, including amphidiploids, which has been designated subspp. *stellata*, is of course more advanced chronologically than its putative parents, subspp. *taraxacifolia* and *myriopocephala*, although it is for the most part intermediate between them morphologically. The most primitive subspecies, *proleptica* and *congenita*, exhibit marked resemblances to *C. achyrophoroides* and the tall forms of *C. albida*, both of sec. 7. Subsp. *hyemalis* is more primitive than subspp. *taraxacifolia* and may be considered as intermediate between it and subspp. *typica*, on one hand, and *C. Clausonis* and *C. spathulata*, on the other. Similarly, subspp. *andryaloides* may be considered as intermediate between subspp. *taraxacifolia* or subspp. *typica* and *C. divaricata* or *C. canariensis*.

Thus, *C. vesicaria* sen. lat. includes forms which show some affinity with species in one of the more primitive sections of the genus, and others which approach the most advanced species in this section, *C. Marschallii*. The allocation of a phylogenetic position in this section to *C. vesicaria*, therefore, is purely arbitrary. On the basis that its most advanced forms, comprising subspp. *typica*, reveal the high degree of advancement which has been reached in this inclusive species, it has been placed next to *C. Marschallii*.

182. *Crepis Marschallii* (C. A. Mey.) F. Schultz

Flora 23: 718. 1840. (Fig. 285.)

Biennial, 3–8 dm high; root straight, tapering, woody; caudex slightly swollen, marked with scars of old leaves, leafy above; caudical leaves up to 18 cm long, 3.5 cm wide, spatulate or oblanceolate, acute or obtuse, dentate to lyrate-runcinate-