

## Cytotaxonomic Studies in the Genus *Sonchus*

### 1. *Sonchus gigas* Boulos nov. sp., a new tetraploid Egyptian species

By LOUTFY BOULOS

The Herbarium, Agricultural Museum, Cairo, Egypt

#### Introduction

The writer is collecting material for the preparation of a monographic treatise on the genus *Sonchus*. Six species of this genus are recorded in Egypt namely, *Sonchus oleraceus* L., *S. asper* (L.) Hill, *S. maritimus* L., *S. nymanni* Tin. et Guss., *S. arvensis* L. and *S. tenerrimus* L. (Täckholm 1956). The writer has not yet seen authentic Egyptian material of the last three species and their records need further scrutiny. *S. oleraceus* is the most wide-spread, *S. asper* is less widely spread and *S. maritimus* is of a very limited distribution, being confined to the oases and the district around Suez.

Cytologically, *S. oleraceus* has a chromosome number  $2n=32$  and is suggested by Stebbins (1953) to be an amphidiploid species having received 18 chromosomes from *S. asper* and 14 from *S. tenerrimus*. The former is a cosmopolitan whereas the latter is a Mediterranean species.

This paper reports on a new species discovered by the writer in Egypt.

#### Distribution

The writer collected from a few localities in the Nile Delta specimens of what seemed to be a new species of *Sonchus*. Its striking height of over one metre and its leaves measuring up to 50 cm. in length distinguish it from the common *S. asper* to which it is closely related. This species was suspected to be a polyploid of *S. asper*.

It was collected from the following localities:

Egypt, endemic. Sherbin, in a rice field 3/10 1909 (Maire!), along the agricultural road between Kafr el-Sheikh and Disuq, growing on Fa-

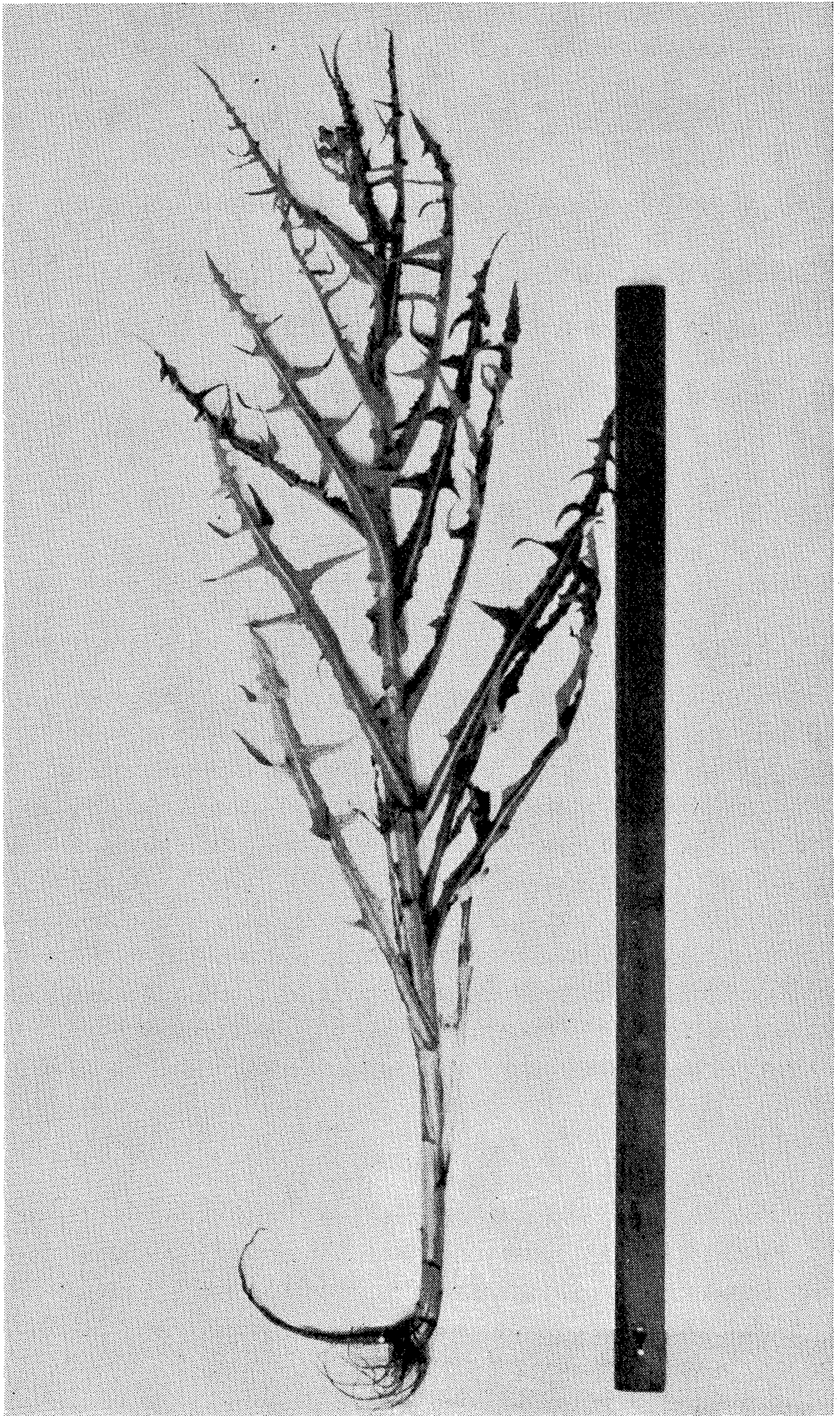


Fig. 1. *Sonchus gigas* Boulos nov. sp. A complete plant, scale represents 1 m.  
Collected from El Tawila, N. of Mansura, 9/5 1959 by L. Boulos.

raoun Drain 24/4 1958 (Boulos!), El Zeini, 4.5 Kms. S. of Borullos Lake 24/4 1958 (Boulos!), El Tawila, N. of Mansura on a canal 25/4 1958 and 9/5 1959 (Boulos!). Material from all these localities is kept in the herbarium of the Faculty of Science, Cairo University.

### Description

It is proposed to name this new species *Sonchus gigas* because of its gigantic growth.

It may be described as follows:

*Sonchus gigas* Boulos nov. sp. Folia sensim attenuata, in laciniis numerosas triangulari-acuminatas, interdum recurvatas, runcinatim pinnatifida. Achenia magna, 4.5—5.5 mm. longa, 1.7 mm. lata, late alata, in media superficie utrinque approximate tricostata, in typo laevia, non rugulosa nec tuberculata. Pappus acheniorum omnium (in maturitate) caducissimus. Numerus chromosomatum  $2n=36$ .

### Extended description

*General habit:* Annual erect herb, up to 130 cm. tall, unbranched, of vigorous growth, rich in latex. — *Root:* Tap-root, up to 30 cm. long, 12 mm. broad at the caudex. — *Caudex:* Unbranched or with few branches. — *Stem:* Stiff, erect, usually unbranched, rarely few-stemmed from the caudex, glabrous, hollow except at the nodes, green or with pinkish stripes or areas, 4—15 mm. broad, sharply angled of the decurrent keeled midribs of the leaves with concave faces between the angles. — *Caudical leaves:* Absent or when present pinnatisect, 7—10 cm. long, 2.5—3 cm. broad; margin irregularly prickly-dentate. Faces sometimes with few easily detached viscid hairs. — *Cauline leaves:* 10—50 cm. long, 2—3 cm. broad along the midrib, pinnatipartite to pinnatisect, side-lobes 4—6 cm. long, patent or occasionally recurved, long-acuminate from a 2 cm. broad base, sharply acute. Midrib whitish, very prominent, forming like a white ribbon on the flat upper surface and a thick swollen costa beneath, which is keeled with the keel continuous on the stem, thus making the stem angled. Leaf blade glabrous, only in a very juvenile stage sometimes with a sparse indumentum of a few soon deciduous viscid hairs scattered on the lower surface, veins reticulate, margin spiny-dentate, base auriculate with rounded spiny-dentate auricles.

*Inflorescence:* Of about 6—12 heads in an umbelled terminal cluster, sometimes also with a few heads in the upper leaf axils. Peduncles about



Fig. 2. *Sonchus gigas* Boulos nov. sp. Achenes 5× (pappus deciduous).

3 cm. long, unibracteate, in a juvenile stage frequently white-floccose towards the apex, forming a white tomentum below the young heads. — *Heads*: At first subglobose, then broadly cylindrical, finally, after anthesis, constricted at apex and thus of a more or less conical aspect; average size 15 mm. long, 13 mm. broad, in fruit up to 20 mm. across; flowers numerous, up to 240 in one head. — *Involucre*: Glabrous with a few dark sessile glands, inner ones green herbaceous about 19 in number, oblong-linear, obtuse, scarious-margined, 10—12 mm. long, 2—3 mm. broad; outer ones about 10, unequal, shorter and narrower than the inner ones, with the base frequently white-floccose, uninerved, with the nerve becoming indurated when the head ripens. — *Receptacle*: Concave, with rough irregular elevations arranged without order.

*Corolla*: Yellow, hairy, with the linear ligules much shorter than the tube, 4—5 mm. long, 1 mm. broad, with 5 short obtuse teeth, lower part hairy. Tube narrow, hairy above, 8 mm. long, broader above, attenuated beneath. — *Anther-tube*: Yellow with dark throat, shorter than the ligule, 2.5 mm. long. — *Style-branches*: 1 mm. long, light brown.

*Achenes*: Numerous, up to 240 in a head, 4.5—5.5 mm. long, 1.7 mm. broad, light brown, oblong to narrow-elliptical, plus minus flattened, with broad wings and three close longitudinal ribs in the middle, typically smooth, wrinkles and tubercles etc. being absent. — *Pappus*:

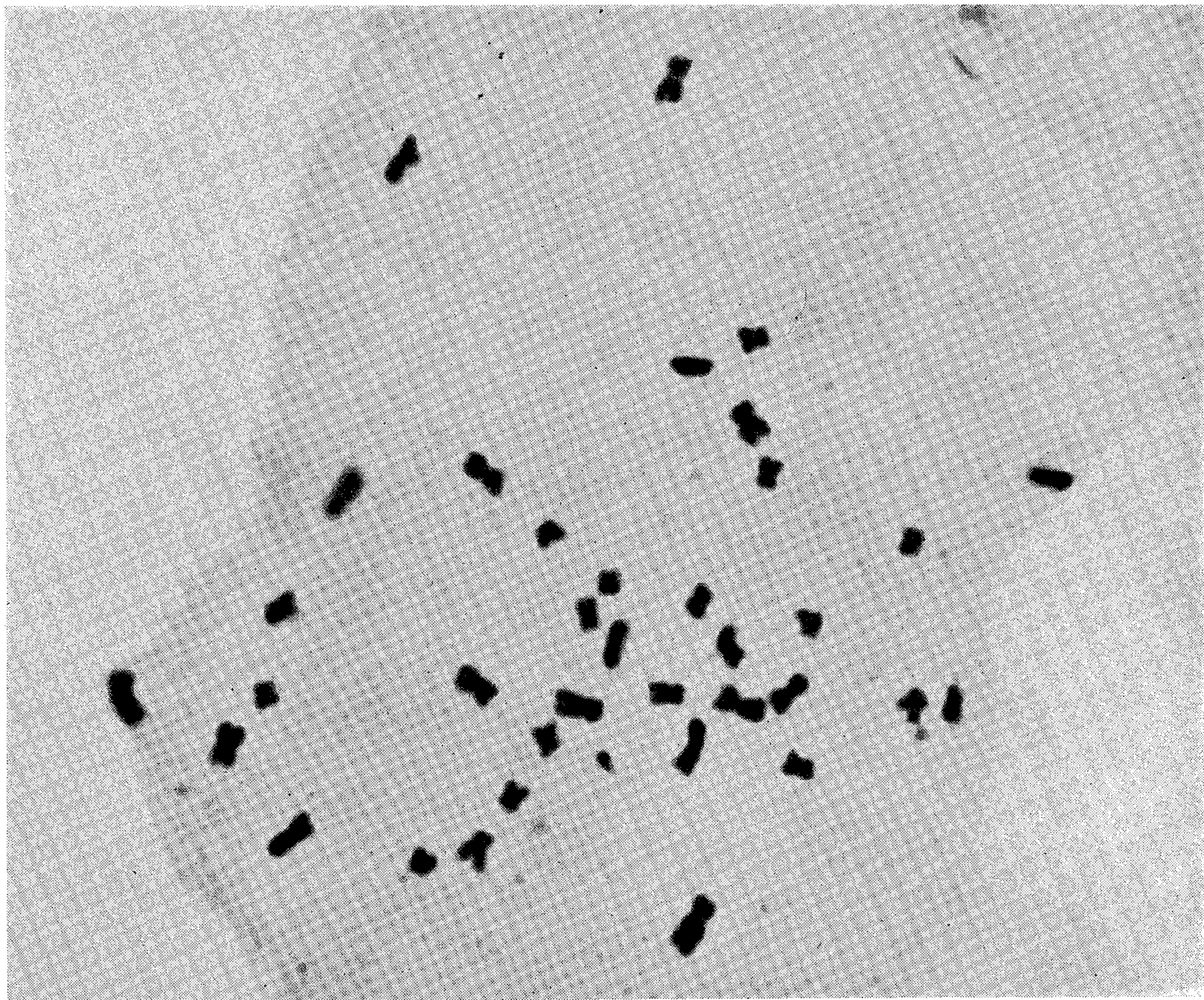


Fig. 3. *Sonchus gigas* Boulos nov. sp. A plate showing the 36 chromosomes (about  $\times 2650$ ).

Sessile, 8 mm. long, of two kinds, bristles which are white shining finely ciliated and tapering towards the apex, and fine hairs which are white, neither shining nor ciliated. The bristles are highly deciduous, the hairs a little more persistent. Because of the former being more abundant than the latter, the pappus may be considered deciduous.

### General Comment

Cytological examination carried out by W. K. Henin at Lund (Sweden), using Feulgen stain, shows that the new species is a tetraploid with chromosome number  $2n=36$ . *S. asper* is known to be diploid,  $2n=18$  (Barber 1941).

Only a few species within the genus *Sonchus* are known to be polyploid (Wulff 1937 and Stebbins 1953 in Darlington 1955). These are:

*S. arvensis* L.  $2n=64$ , an octaploid species from Europe and W. Asia, *S. javanicus* Spreng.  $2n=54$ , a hexaploid from Indonesia and *S. grandifolius* T. Kirk, a tetraploid from Chatham Islands near New Zealand which has  $2n=36$ , the same as *S. gigas*. However, *S. grandifolius* is a rhizomatous, not a tap-rooted annual as *S. gigas*. The latter species could be easily separated from allied species by its large-sized achenes and its characteristic gigantic growth. In *S. oleraceus* L. achenes are half as long as in our species, wingless, naviculate with tuberculate longitudinal ribs. *S. asper*, which is the nearest to *S. gigas*, possesses compressed broadly winged, much shorter and narrower seeds. In addition, the leaves of *S. asper* are more rough and less dissected and the plant of a less vigorous growth. *S. arvensis* L., *S. maritimus* L. and *S. palustris* L. differ from our species in being perennial. The first possesses dark roughly-muricate seeds with elevated ribs, the third has cream-yellow seeds with narrow striations between its 4 inflated ribs and faint transverse wrinkles. *S. maritimus* possesses small yellowish achenes with 3 elevated ribs and in addition has linear-lanceolate almost entire leaves. As a rule the seeds in *Sonchus* constitute the most reliable characteristic in differentiating between the species.

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