

## TARAXACUM SECT. PALUSTRIA DAHLSTEDT

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(*'s Gravenhage*)

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### ABSTRACT

A revision of *Taraxacum* sect. *Palustria* Dahlst. is given; 48 species are dealt with, of which 29 are new; the descriptions of the latter partly have been borrowed from comments and provisional descriptions by Dahlstedt and Haglund, found in herbaria. *T. lividum* (Waldst. & Kit.) Petermann, *T. tenuifolium* (Hoppe) Koch and *T. udum* Jord., so often and for so many years hidden in the lists as synonyms, are considered to be good species. The area of distribution, in a broad sense, covers the central part of Europe with an offshoot extending into Asia Minor. Due to agronomical measures the rich vegetations formed in the past by species of the section have sometimes dwindled considerably; some species even seem to have died out.

### 1. SECTIO PALUSTRIA DAHLSTEDT (1912 NOMEN) 1928

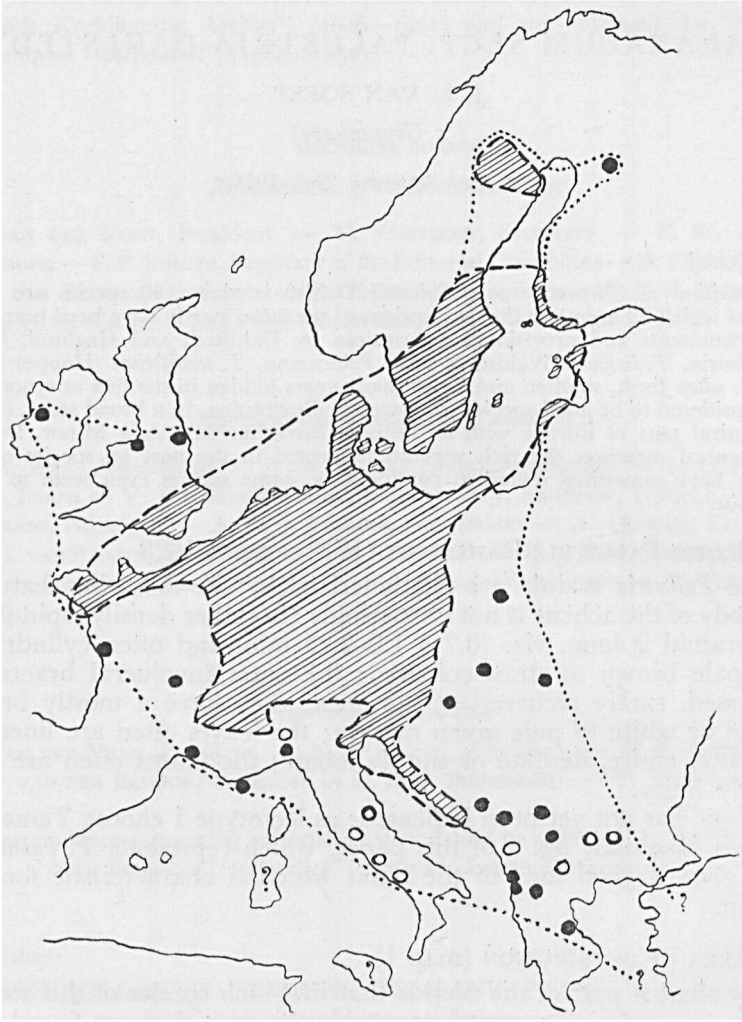
The *Palustria* mainly are characterized by the following features: the body of the achene is not or sparingly (to rather densely) spinulose; its pyramid is long, viz. (0.7-) 1.0-2.25 mm, and often cylindrical; it is pale brown to straw-coloured; the outer involucre bracts are appressed, rarely recurved at the apex; they have a mostly broad, purple or white to pale green margin; the leaves often are linear to lingulate, entire, dentate or simply lobate; the plants often are only slightly hairy.

A type has not yet been indicated; as lectotype I choose *Taraxacum suecicum* Haglund; fig. 4 of this paper, which represents *T. bavaricum* v.S., gives a good idea of the habit which is characteristic for this section.

### 2. AREA OF DISTRIBUTION (map 1)

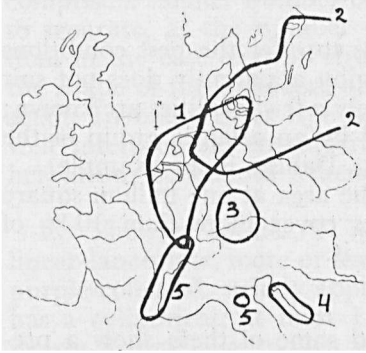
The shaded part of the map is that in which species of this section are or were relatively common; outside this part they are found only locally; black dots indicate the localities from where I have seen specimens, open circles those from where species have been reported with sufficient certainty. The total area covers a large part of Europe, but not more, except for an offshoot penetrating into Asia Minor, where in a very few localities one or two species which may belong to the section are known to occur. All reports from other parts of the world are erroneous; v. HANDEL-MAZZETTI (1907), for instance, included in *T. paludosum* Scop. (more or less identical to the section) *T. bicolor* (Turcz.) DeC from Asia, but this species belongs to sect. *Sinensia* v.S.

The *Palustria*, apparently, avoid regions with such long and cold winters that the humid soil, which is needed by the species of the section, is frozen during a too long period of the year. From the

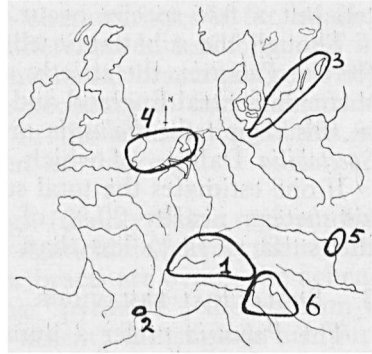


Map 1: Area of sect. *Palustria* (see § 2).

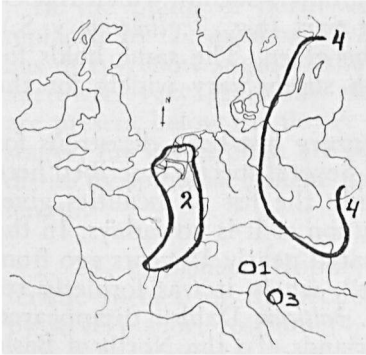
arctic-boreal region only one species is known (*T. crocodes* Dahlst.) and this species shows in its flowers a special provision for safe achene production, viz.—besides apomictic multiplication—tubular and  $\pm$  closed, orange-coloured corollas. In the alpine zone the section is rare; however, in a very few cases it is found up to 2400 m altitude. Besides *T. murbeckianum* Hagl. from the Taurus, four endemic species, which probably are no relics, are known from the Alps; two from the southern part of the Grisons (*T. candriani* v.S., *T. fuornense* v.S.) and two from S. Tirol (*T. dolomiticum* v. S., *T. lacustre* v. S.); in the alpine zone of Europe the section is mainly replaced by sect. *Fontana* v. S. and sect. *Rhodocarpha* v. S. All other species of the *Palustria* grow



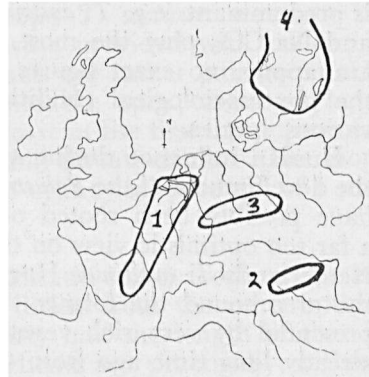
Map 2: approximate area of 1. *T. austrinum*, 2. *T. balticum*, 3. *T. bavaricum*, 4. *T. illyricum*, 5. *T. udum*.



Map 3: approximate area of 1. *T. balticiforme* (excl. f. *fusco-squameum*), 2. *T. brachysquameum*, 3. *T. limnanthes* ssp. *limnanthes*, 4. ssp. *limnanthoides*, 5. *T. limosum*, 6. *T. tenuifolium*.



Map 4: approximate area of 1. *T. dolomiticum*, 2. *T. hollandicum*, 3. *T. lanibasis*, 4. *T. lividum*.



Map 5: approximate area of 1. *T. gelricum*, 2. *T. olivaceum*, 3. *T. Pollichii*, 4. *T. vestrogothicum*.

in the plains and on the lower mountains, viz. up to 1000 m altitude or exceptionally up to 1500 m.

Under strictly and more severe continental conditions the section is only present in one species, viz. *T. lividum* (Waldst. & Kit.) Peterm.; the area of this species, however, does not extend into Russia, from where no *Palustria* are known. In this part of the continental region the section is replaced by sect. *Leptocephala* v. S., which flowers in the autumn, e.g. *T. bessarabicum* (Hornem.) Bess., which grows on humid and saline soil. At the borders of the Neusiedler-See (Burgenland, Austria) and near Pest (Hungary) *Leptocephala* and *Palustria* are growing together.

Warm climates are not profitable either for this section. In the mediterranean region it is lacking in the most western part; from

Montpellier to Dalmatia a few species are known; in the Balkans too but a few species occur.

Though the subatlantic climate seems to offer the best conditions for the *Palustria*, the strictly atlantic region apparently does not suit them; in central England and Ireland only a few localities are known; in this region the *Palustria* are replaced by an atlantic group of the *Spectabilia* Dahlst., of which *T. faeroense* Dahlst. is an example.

If one estimates the total surface of the area at one million square kilometers, nearby 20 % of the species cover more than 10 % of this surface, 15 % less than 0.01 % of it.

### 3. ECOLOGICAL BEHAVIOUR

The *Palustria* prefer a humid soil and some of them show a predilection for rather saline conditions. The species seem to have rather sharply defined demands with regard to the pH, and the kind and degree of salt composition. Certain species prefer regions with fresh water (e.g. *T. hollandicum* v. S.), others are bound to the acid litter fen pastures (e.g. *T. friscum* v. S.) or to marshes on a chalky soil (e.g. *T. suecicum* Hagl.). Some prefer saline soil in which NaCl is predominant (e.g. *T. austrinum* Hagl.), others such in which K<sub>2</sub>CO<sub>3</sub> and Na<sub>2</sub>CO<sub>3</sub> play the most important part (e.g. *T. limosum* v. S.). Unhappily, no exact figures can yet be given. The same holds for the phytosociological conditions, which surely vary widely for the various species.

Human influence during the last century has been disastrous for the development of the *Palustria* species. Several species described here have possibly been rooted out; certainly the list of localities gives a far too optimistic view on the distribution as it is nowadays. In the Netherlands *T. austrinum* Hagl. disappeared nearly 15 years ago from the area round the former "Zuiderzee", where it was formerly represented by very rich vegetations. *T. balticum* Dahlst. disappeared already long time ago from the Netherlands. To the North of Basle rich localities have disappeared (AELLEN, letter), and so forth.

### 4. A SHORT REVIEW OF THE SPECIES

In a schema with two dimensions the relations between the species are shown in a more or less artificial way; of course, as many of the characteristics impress us as independent, the presentation of such relations would need a more-dimensional space. The interconnections must not be interpreted from a genetical or taxonomical point of view; these are only meant to be a bit helpful—in addition to the key—to give us some insight in the complex situation. Certainly, many species are nearly allied, whereas others seem to be rather isolated; in the schema shortness of the interconnections does not always mean a close relationship.

From a taxonomical point of view the section belongs to the most difficult ones found in *Taraxacum*. Certainly, the *Vulgaria* Dahlst. are very difficult, because of the enormous variation, which results in an endless series of microspecies; the *Palustria* are less heterogeneous and

comprise a smaller number of species, but the latter are very difficult to separate, as the number of suitable characteristics is far smaller than in the case of the *Vulgaria*. The differences in leaf form and in the shape of the involucre and of the involucral bracts are generally small. In many cases ripe achenes are necessary to find stable and well interpretable characteristics, but in the material available in herbarium collections achenes too often are lacking.

1. The type species, *T. suecicum* Hagl. (mainly Baltic region), has linear-lanceolate, more or less distinctly denticulate leaves; the vividly purple-coloured, strictly appressed outer bracts are ovate; the achene has a cylindrical, at most 1.5 mm long "pyramid"; the rostrum is nearly 8 mm long; pollen is (mostly) absent; the stigmas are pure yellow; araneous hairs are rare and absent on the flower scapes. It shows relations to several species, e.g. to *T. bavaricum* v. S., *T. austrinum* Hagl. and *T. tenuifolium* (Hoppe) Koch.

*T. bavaricum* (mainly S. Germany) is distinct from *T. suecicum* e.g. by its dirty-yellow to greenish stigmas, less vividly coloured involucre; the petioles of the leaves are as a rule remarkably purple-coloured.

In the plains of north-western Europe *T. suecicum* seems to be replaced by *T. austrinum*, which is always provided with pollen; it has dirty-yellow stigmas; the outer bracts are rather pale-green and narrower, very gradually elongated into the apex; araneous hairs are present below the flower head, at least in the first developmental stages; the leaves often are lanceolate and sinuate-dentate. The more distinctly spinulose achene has a conico-cylindrical pyramid of 1 mm length.

2. *T. tenuifolium* (Hoppe) Koch (Adriatic coast) too is a characteristic species for the section, but it differs from the other species by a very short rostrum (4 mm), nearly half the length of that in most other species of the section. The achenes are, practically, without spinules; the cylindrical pyramid is 1.5–2 mm long; the scapes are glabrous; the leaves more or less linear and entire with an obtuse apex; the stigmas are pure yellow; pollen is absent. A very characteristic feature is the narrow, more or less cylindrical involucre.

*T. bosniacum* v. S. and *T. lanibasis* v. S., both from the same region, seem to be closely allied to *T. tenuifolium*; both differ from the latter by greenish stigmas, the presence of pollen, larger flower heads and so on; *T. lanibasis* has a remarkably hairy plant base. In the southern part of the alpine region four, more or less endemic species appear which show some features pointing in the direction of *T. tenuifolium*, especially by the shape of the leaves; however, their relationship to this species is not very convincing. *T. dolomiticum* v. S. and *T. lacustre* v. S. appear in the south-eastern Alps; the latter shows some of the characteristics of an alpine plant: flower heads which are relatively large in regard to the dimensions of the vegetative parts; see the taxonomical and geographical survey. *T. fuornense* v. S. (S. E. Grisons), as well as *T. candriani* v. S. (Bernina region), must be mentioned

here; both are glabrous, have pale-yellow stigmas, linear and obtuse leaves, pale-yellow ligules, practically without stripes at the outside; the last-mentioned species has very small flower heads with short ligules, which leave the stigmas free; it lacks pollen, whereas *T. fuornense* is provided with it.

Finally, *T. olivaceum* v. S. and *T. carniolicum* v. S. can be mentioned here. The first one (Austria) is slightly reminiscent of *T. tenuifolium*; however, it is three to four times as large, the stigmas are greenish and pollen is present. The second one (Croatia) has yellow stigmas and, as *T. tenuifolium*, it lacks pollen; in the shape of the achenes it points in the direction of the following species.

3. Let us now pay attention to a more or less east-European species, viz. *T. lividum* (Waldst. & Kit.) Peterm., with practically smooth achenes, dirty-yellow to greenish stigmas and more or less distinctly dentate leaves; it produces no pollen. Its identity with *T. lissocarpum* Dahlst. is discussed in the taxonomical and geographical survey. Possibly, *T. lividum* is related to species from the pannonic region.

4. In N. Europe a species occurs with relatively aberrant characteristics: *T. crocodes* Dahlst.: involute flowers which are orange-coloured at the outside. The leaves are dentate as in many species of the section, see below under 5, 6 and 7.

5. *T. limnanthes* Hagl. and its allies (Baltic- and North-sea region) have dentate or shortly lobate leaves, the apex of the lobes recurved. This species lacks pollen and has, in its typical form, yellow stigmas and glabrous scapes, whereas ssp. *limnanthoides* v. S., which replaces the typical form (from the Baltic region) in N.W. Europe, has dirty-yellow stigmas and hairy scapes. *T. hoëdicense* v. S. (France) is a related species, but is provided with pollen and has dark-yellow flowers. *T. ciliare* v. S. (eastern France) too shows some relationship with *T. limnanthes*, but also with *T. balticiforme* Dahlst.

*T. decolorans* Dahlst. (Sweden) resembles *T. limnanthes* in its leaf form; stripes are lacking at the outside of the ligules.

6. *T. turfosum* (SB) v. S. (mainly Bavaria) differs from the foregoing species by partly narrow and acute, loosely appressed outer involucre bracts; this species of small size shows, on the other hand, some relationship with *T. vindobonense* v. S., see below. Often, the leaves of *T. turfosum* are very shortly lobate. A species of larger size, also with acute but still narrower outer bracts, which are partly recurved at the apex, is rare in the same region; this is *T. vollmannii* v. S.

7. *T. balticiforme* Dahlst. (mainly Switzerland) is a heterogeneous species. I did not succeed in splitting it up into microspecies and have only paid attention to some of its more strongly deviating forms. Whereas the typical form is provided with pollen and has dirty-yellow stigmas and more or less narrowly lobate leaves, its counterpart

(f. *subpalustre* Hagl. pro spec., ined.) lacks pollen, has yellow stigmas and dentate leaves; however, intermediate forms exist, I believe, in a relatively large quantity. Some other forms are discussed in our taxonomical and geographical survey; one of these (f. *fuscosquameum* m) seems to have a wider distribution. A species related to *T. balticiforme* seems to be *T. huterianum* v. S. (S. Tirol, endemic) with distinctly conical involucre.

8. We gradually come to species with more distinctly lobate leaves; most of the following species show this characteristic. One of the species, which occupies a rather isolated position is *T. balticum* Dahlst. (Baltic region), whose leaves have linear, spreading lobes; it has pure yellow stigmas and lacks pollen; it points in the direction of both *T. suecicum* Hagl. and *T. limnanthes* Hagl., two species which are found in the same region.

9. A not very sharply defined group of six west-European species is formed by *T. heleonastes* Hagl., *T. deLanghii* v. S., *T. alsaticum* Hagl., *T. germanicum* v. S., *T. friscicum* v. S. and *T. gelricum* v. S. This group can be considered to be a transition between the species treated above, which are mostly of small dimensions, provided with small flower heads and mostly with rather long and cylindrical pyramids on the often slightly spinulose achenes, to species of larger dimensions with larger flower heads and mostly conical and broader pyramids on the upwards densely spinulose achenes; *T. hollandicum* v. S. is a good example of the latter group.

It is risky to suggest connections between *T. limnanthes*, *T. balticiforme* (and so on) and this latter group, though it must be said that *T. friscicum* and *T. gelricum* are found in the same area as *T. limnanthes*, whereas *T. heleonastes* and *T. alsaticum* are found in the same area as *T. balticiforme*.

*T. friscicum* v. S. (W. Europe) is furnished with pollen and has a dark-green involucre with a vague margin to the bracts; like *T. heleonastes* Hagl. (C. Europe), a species which lacks pollen, it has regularly lobate leaves, though of different shape. *T. deLanghii* v. S. (Belgium, E. France) resembles *T. heleonastes*, but differs from it by the presence of pollen, by the less-pronounced margin to the outer bracts and by leaves with a shorter terminal lobe.

*T. gelricum* v. S. (W. Europe) is doubtless allied to *T. limnanthes* Hagl.; it reminds one at the ssp. *limnanthoides* v. S. and especially of its f. *visserianum* v. S., but differs by the remarkably short and obtuse spinules on the achenes. *T. alsaticum* v. S. (Upper-Rhine valley) is allied to *T. germanicum* v. S. (W. Germany); the latter has brownish involucre bracts with an indistinct margin.

10. We now come to the group of species around *T. hollandicum* v. S. (W. Europe), to which *T. crassiceps* Hagl. (Upper-Rhine valley) is very closely allied. The species of this group have large and broad, ovate outer involucre bracts provided with a distinct margin; the

stigmas are dirty yellow and pollen is present. The three following species differ in several respects: *T. divulsifolium* v. S. (western C. Europe), *T. laeticolorifrons* Hagl. (eastern France) and *T. neo-Aellenii* v. S. (western C. Europe). The latter shows some resemblance to a species occupying a rather isolated position in the schema, viz. *T. pollichii* v. S.; this species has short ligulas, small flower heads and yellow stigmas; pollen is lacking.

11. *T. vestrogothicum* Dahlst. (Sweden) may be treated now. In some way the leaves are reminiscent of those of *T. limnanthes* Hagl., but the side lobes are mostly longer; pollen is present; in dried condition the stigmas are often blackish; the involucre are pale-green and the outer bracts are rather long and broad. In leaf form this species resembles *T. apiculatum* v. S. (Germany and Netherlands) from which it differs in several other respects. In the shape of the outer bracts there is a surprising similarity between *T. vestrogothicum* and *T. illyricum* Dahlst. (Adriatic coast) and more or less with *T. vindobonense* v. S. (mainly Austria). Possibly there is some closer relationship between those three species, as all have a somewhat eastern distribution within the total area of the section. Probably *T. egregium* Markl. (Baltic isles) has to be included into this group.

12. From *T. hollandicum* v. S. there is a link to *T. udum* Jord. (S.W. Europe), which species is often considered to be "*T. paludosum* x *officinale*", on account of the not strictly appressed outer bracts with their indistinct margin and conspicuously lobate leaves. *T. udum* shows, on the other hand, some affinity to *T. albanicum* v. S., which species is related with *T. vindobonense* v. S. The latter species (mainly Austria), for the same kind of reasons, is considered to be "*T. paludosum* x *officinale*"; this is here too the result of a too superficial examination. *T. vindobonense* seems to be closely allied to *T. limosum* v. S. and *T. pseudo-balticum* v. S., species found in the same area, viz. the outskirts of the pannonic region, often (or only?) growing in brackish soil, in which the carbonates of sodium and potassium are predominant in the salt composition. There may be some affinities to *T. lividum* (Waldst. & Kit.) Peterm., see above.

13. We now come to a single species: *T. brachysquameum* v. S. (one locality, French mediterranean coast), which seems to occupy an isolated position in the section; in certain respects it is reminiscent of *T. bessarabicum* (Hornem.) Bess., belonging to sect *Leptocephala* v. S., which differs by a brownish pappus and extremely narrow outer involucre bracts. However, the two species are certainly not closely allied, the similarity being only superficial.

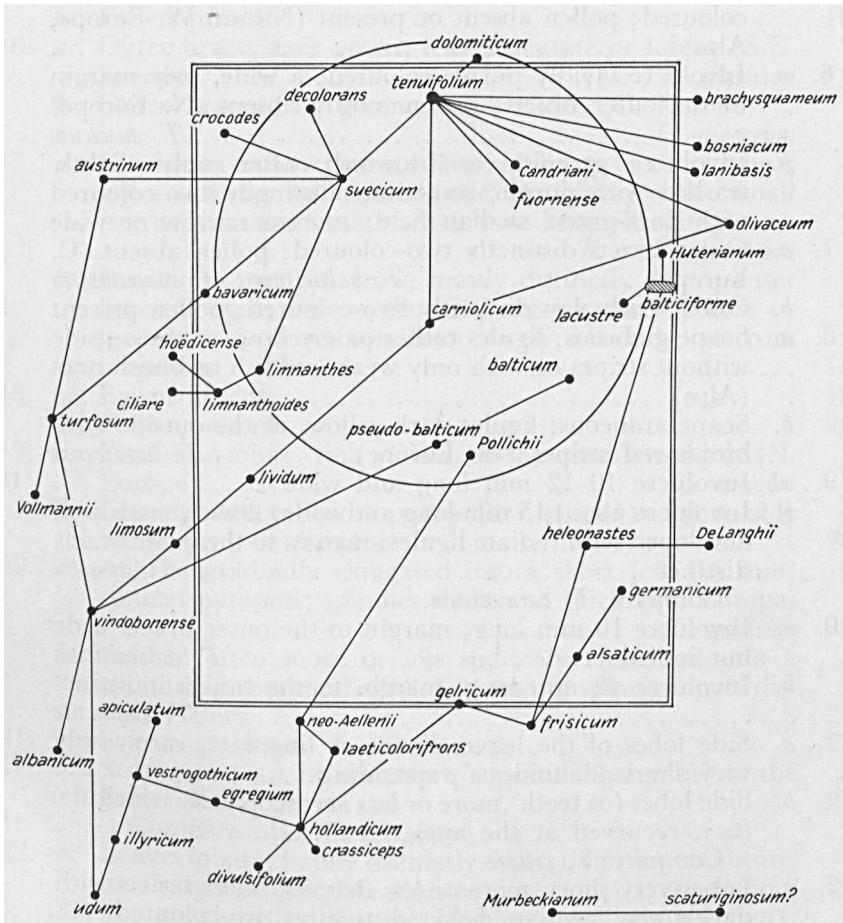
14. Finally, may be via *T. albanicum* v. S. (Balcans), there is a weak link to *T. murbeckianum* Hagl. (and *T. scaturiginosum* Hagl.), both species from Greece, Turkey and the Near East. Haglund did not indicate to which section both species belong, but these may



be placed into sect *Palustria*, at least the first one. In the Orient, for the rest, the *Palustria* are replaced by the *Orientalia* HM, of which *T. stevenii* (Spreng.) DeC is the representative in Asia Minor.

5. KEY TO THE SPECIES (vid. scheme)

- 1. a. Stigmas pure yellow, in dried condition neither dirty-yellow nor greenish; styles always pure yellow . . . . 2
- b. Stigmas dirty yellow or greenish, in dried condition sometimes blackish; styles mostly dirty-yellow or greenish 14
- 2. a. Ligules at the outside without coloured stripes, or with but faintly pink ones; pollen absent; scapes glabrous 3
- b. Ligules with grey-purple or grey-violet stripes; pollen present or absent; scapes glabrous or hairy . . . . . 4



Scheme, representing the species; within the circle: species with yellow stigmas; within the rectangle: species in which pollen is lacking.

- 3. a. Ligules narrow, partly canaliculate, leaving the style and stigmas partly free; flowers pale yellow; flower head 1.5 cm wide; outer bracts greenish (Alps) . . . *T. candriani*
- b. Ligules rather wide; flowers pure yellow; flower head 2-3 cm wide; outer bracts purplish (N. Europe). . .  
    . . . . . *T. decolorans*
- 4. a. Well-developed leaves denticulate or entire, rarely remotely and shortly dentate; scapes glabrous; pollen present or absent . . . . . 5
- b. Well-developed leaves distinctly dentate or lobate; scapes glabrous or hairy; pollen absent . . . . . 11
- 5. a. Rostrum short, 4-5 mm long; involucre narrow, more or less cylindrical during flowering time, ca. 7 mm wide, green; pollen absent (S. Europe). . . . *T. tenuifolium*
- b. Rostrum long (7-8 mm); involucre ovate, often purple-coloured; pollen absent or present (N. and W. Europe, Alps) . . . . . 6
- 6. a. Involucre vividly purple-coloured; a wide, pale margin to the outer bracts; pollen mostly absent (N. Europe)  
    . . . . . *T. suecicum*
- b. Involucre greenish or brownish, often only slightly washed with purple, sometimes distinctly two-coloured with dark-green median field; margin narrow or wide . . . . . 7
- 7. a. Outer bracts distinctly two-coloured; pollen absent (C. Europe) . . . . . *T. balticiforme* (f. *subpalustre*)
- b. Outer bracts less distinctly two-coloured; pollen present . . . . . 8
- 8. a. Scape glabrous; ligules rather pale yellow, at the outside without stripes or with only weak, reddish or bluish ones (Alps) . . . . . 9
- b. Scape araneous; ligules dark yellow, at the outside with brown-red stripes (W. Europe). . . . . *T. hoëdicense*
- 9. a. Involucre 10-12 mm long and wide . . . . . 10
- b. Involucre about 15 mm long and wide; flower heads well developed with radiate ligules; margin to the outer bracts distinct . . . . . *T. lacustre*  
    Compare *T. carniolicum*.
- 10. a. Involucre 10 mm long; margin to the outer bracts wide but indistinct. . . . . *T. dolomiticum*
- b. Involucre 12 mm long, margin to the bracts indistinct . . . . . *T. fuornense*
- 11. a. Side lobes of the leaves linear or lingulate, rarely only very short (deltoid  $\triangleright$ ), spreading . . . . . 12
- b. Side lobes (or teeth) more or less acroscopically triangular ( $\triangleright$ ), recurved at the apex. . . . . 13  
    Compare *T. ciliare*.
- 12. a. Lobes very short, more or less deltoid; outer bracts with dark-green median field, distinctly two-coloured (C. Europe). . . . . *T. pseudo-balticum*

- b. Lobes mostly longer, linear or lingulate; outer bracts more or less pale green (N. Europe) . . . *T. balticum*
- 13. a. Involucre more or less conical during flowering time; outer bracts lanceolate (Alps) . . . . . *T. huterianum*
- b. Involucre ovate; outer bracts ovate (N. Europe) . . . . . *T. limnanthes*
- 14. a. Achenes not or only inconspicuously spinulose, often only with tubercles at the apex. . . . . 15
- b. Achenes upward distinctly spinulose, but spinules often short or few . . . . . 17
  - Compare *T. bosniacum*, *T. laeticolorifrons*, *T. lanibasis* and *T. vindobonense*, of which achenes are unknown; all furnished with pollen.
- 15. a. Pollen absent; outer bracts very broad at the base, often brownish-green (E. Europe) . . . . . *T. lividum*
- b. Pollen present . . . . . 16
- 16. a. Outer bracts dark green; leaves dentate or lobate (S.E. Europe) . . . . . *T. illyricum*
- b. Outer bracts pale green; leaves entire (C. Europe). . . . . *T. olivaceum*
- 17. a. Involucres narrow; outer bracts small (up to 4 mm long); styles and stigmas in dried condition black; pollen small (sterile?); rostrum short, 5–6 mm long (Meditt.) . . . . . *T. brachysquameum*
- b. Involucres rarely narrow, mostly distinctly ovate; outer bracts longer; styles yellowish, stigmas dirty yellow or greenish, in dried condition rarely blackish; rostrum longer . . . . . 18
- 18. a. Pollen absent. . . . . 19
- b. Pollen present . . . . . 26
- 19. a. Ligules involute, rich yellow, at the outside reddish (N. Europe) . . . . . *T. crocodes*
- b. Ligules flat, yellow or pale yellow, stripes at the outside bluish grey or purplish . . . . . 20
- 20. a. Achene gradually elongated into a short (ca. 0.6 mm) conical pyramid; spinules short and thick (W. Europe) . . . . . *T. gelricum*
- b. Achene often more or less suddenly elongated into a cylindrical pyramid (0.8–1.0 mm); spinules not distinctly thick . . . . . 21
- 21. a. Scapes glabrous. . . . . 22
- b. Scapes at least in immature condition hairy below the flower head . . . . . 23
  - Compare also *T. egregium*.
- 22. a. Leaves lobate; ligules distinctly short; outer bracts obtuse, partly acuminate (W. Europe) . . . . . *T. pollichii*
- b. Leaves entire or dentate; ligules not distinctly short; outer bracts partly acute (C. Europe) . . . . . *T. bavarium*

23. *a.* Outer bracts rather narrow, ovate-lanceolate (1:3),  
2–2.5 mm wide (W. Europe) . . . . . *T. alsaticum*
- b.* Outer bracts ovate (1:2) . . . . . 24
24. *a.* Outer bracts pale brown; margin indistinct (W. Europe)  
. . . . . *T. germanicum*
- b.* Outer bracts green with a distinct, pale or purplish  
margin . . . . . 25
25. *a.* Leaves linear or lanceolate, dentate or sublobate; apex  
of teeth and lobes more or less recurved (W. Europe)  
. . . . . *T. limnanthes* ssp. *limnanthoides*
- b.* Leaves deeply and regularly lobate; lobes spreading,  
apex not recurved (C. Europe) . . . . . *T. heleonastes*
26. *a.* Outer bracts partly acute and narrow . . . . . 27
- b.* Outer bracts always obtuse . . . . . 30
27. *a.* Achenes small with the pyramid included 4 mm long or  
shorter (C. Europe). . . . . *T. turfosum*
- b.* Achenes 4.5 mm long or longer . . . . . 28
28. *a.* Outer bracts strictly appressed (W. Europe). . . . .  
. . . . . *T. deLanghii*
- b.* Outer bracts at least partly spreading or recurved at  
the apex. . . . . 29
29. *a.* Leaves dentate; involucre more or less turbinate (C.  
Europe) . . . . . *T. vollmannii*
- b.* Leaves lobate; involucre ovate-orbicular (S.E. Europe)  
. . . . . *T. albanicum*
30. *a.* Outer bracts (during flowering period) 3 mm broad or less 31
- b.* Outer bracts 4 mm broad or more. . . . . 34
- Compare *T. apiculatum* and *T. vestrogothicum*.
31. *a.* Margin to the outer bracts wide (ca. 1 mm), white or  
purple; leaves entire, dentate or lobate, lobes up to 5 mm  
long, often with recurved apex (C. Europe) . . . . .  
. . . . . *T. balticiforme*
- b.* Margin narrower, often pale green or brownish . . . 32
32. *a.* Leaves denticulate or dentate (W. Europe) . . . . .  
. . . . . *T. austrinum*
- b.* Leaves (if well developed) lobate; lobes 5–10 mm long 33
33. *a.* Outer bracts 6–8 mm long; lobes short, deltoid (western  
C. Europe) . . . . . *T. divulsifolium*
- b.* Outer bracts 3.5–4.5 mm long; lobes narrower, linear  
or lingulate (eastern C. Europe) . . . . . *T. limosum*
34. *a.* Involucre (in dried condition) dark green, nearly  
blackish, with indistinct margin (W. & C. Europe) .  
. . . . . *T. friscicum*
- b.* Involucre less dark, margin broader and distinct, pale  
green (W. Europe) . . . . . 35
35. *a.* Outer bracts scarcely 4 mm broad; leaves narrow with  
narrow lobes . . . . . *T. neo-Aellenii*
- b.* Outer bracts at least 4 mm broad; leaves oblanceolate or  
ovate, with teeth or lobes with acute or obtuse apex. 36

36. a. Leaves distinctly bluish green . . . . . *T. crassiceps*  
 b. Leaves grass-green or slightly grey . . . . . 37
37. a. Outer bracts strictly appressed, with pronounced and  
 wide margin . . . . . *T. hollandicum*  
 b. Outer bracts loosely appressed without pronounced margin  
 or with a narrow one. . . . . *T. udum*

## 6. TAXONOMICAL AND GEOGRAPHICAL SURVEY

### Abbreviations

h	herbarium
pp	pro parte
Dahlst.	H. Dahlstedt
Hagl.	G. E. Haglund
HM	H. von Handel-Mazzetti
v. S.	J. L. van Soest

### 1. *Taraxacum albanicum* v. Soest **spec. nov.** (Fig. 1).

Planta 4–20 cm alta, basi paulo araneosa.

Folia petiolis purpureis instructa, gramineo-viridia, subtus araneosa, lobata; lobi laterales (utrinque 2–5) triangulares, subretroversi, acuti, dorso interdum acute dentato vel denticulato, interlobis saepe elongatis, 2–6 cm, longis, 1–2 cm latis; lobus terminalis elongato-sagittatus vel sublingulatus, interdum incisus et denticulatus, apice acutus ad subobtusus, lobulis basalibus triangularibus acutis retroversis saepe longis instructus, nervo mediano praesertim in parte inferiore purpureo. Folia anni precedentis saepe persistentia, lanceolata ad obovata, retroverso- vel patente lobata vel dentata, ad 20 cm longa.

Scapi subaraneosi, cupreo-purpurei.

Involucrum mediocre vel sat magnum, ad 14 mm longum, ad 14 mm latum, obscure viride. Squamae exteriores anguste asymetrico-ovatae vel -ovato-lanceolatae, pro parte acutae, ad 8 mm longae, ad 3 mm latae, margine pallido lato instructae, laxe patentibus vel apice recurvatae.

Calathium radians, ad 2 cm diametro, dilute luteum. Ligulae marginales extus stria atro-violacea notatae. Antherae polliniferae. Stylus subluteus, stigmata virescentia.

Achenium stramineum, 4.5–4.7 mm longum (pyramide inclusa), ± per totam longitudinem tuberculis brevibus et latis dense obtectum, in pyramidem conico-cylindricam 1–1.2 mm longam subabrupte abiens; rostrum 7–8 mm longum; pappus albus, 6 mm longus.

*Typus*: Albania: Fieri, Jora, 20.3.1908, J. Schneider (h W 1949/393); *co-typus fructifer*: Fieri, Artenica, 15.3.1908, J. Schneider (h W 1949/394, 395).

Furthermore:

Albania: Fieri, "nasse Wiesen" 80 m, 22.3.1908; Fieri, Levani, "feuchte Au" 50 m, 3.3.1908; Biškeznis, Ljušna, 10 & 11.3.1908, all Schneider (h W).

Greece: Macedonia: Peristeri, "Wiesen" pr. Dolenci 800 m, III.1918, Gross (h M).

The leaves which developed in the fore-going year, are, probably owing to the mild climate, partly present in spring during the flowering time; these leaves are obovate or broadly lanceolate, rather obtuse and furnished with short side lobes or teeth; the leaves expanding in spring have rather narrowly triangular side lobes and a sagittate terminal one, mostly with a long and linear apex. The shape of the subsequent leaves is similar to that of the leaves of *T. vindobonense* v. S.; these two species seem to be closely allied, but there is a distinct difference in the achenes; those of *T. albanicum* are rather densely, and far downward, tuberculate, those of *T. vindobonense* have only near the top of the achene body very short tubercles.

All other species of the section differ in leaf form. *T. albanicum* seems to be allied to *T. murbeckianum* Hagl. from Greece and Turkey, see below; *T. udum* Jord. (from S.W. Europe) too seems to be related to it.

## 2. *Taraxacum alsaticum* v. Soest **spec. nov.** (Fig. 2).

*T. stenolepis* Hagl. in h. Aellen (cum descriptio), nec. *T. stenolepis* (Brenner 1906) Hjelt 1926, nec. *T. stenolepium* HM 1907.

The description given by Haglund runs as follows:

Planta humilis ad mediocriter alta.

Folia subprasino-viridia  $\pm$  longa, anguste lingulato-lanceolata ad lineari-lanceolata vel linearia, glabriuscula, petiolis angustis, sat rubro-violaceis; lobi laterales deltoidei, sat breves, latiusculi, deorsum subito decrescentes, interiores minute denticulati, superiores vulgo integri, apice acuto patento ad subrecurvo praediti. Interlobia mediocriter longa, superiora breviora, sat angusta, ut plurimo integra. Lobus terminalis longus, sat angustus,  $\pm$  longe mucronatus, lobulis basalibus sat parvis.

Scapi sub involucri araneosi.

Involucrum parvum, sat laete vel subobscure viride, basi ovato-turbinatum. Squamae exteriores adpressae, ovato-lanceolatae, ca. 2 mm latae, sat anguste albido- vel roseo-marginatae, in apicem  $\pm$  longum attenuatae, interiores sublineares, apice subobscurae. Antherae polline carentes. Styli et stigmata virescentia.

Achenium (maturum non visum) fusco-stramineum, ca. 4 mm longum (pyramide inclusa), superne spinulis parvis sat dense munitum, in pyramidem sat cylindricam ca. 0,8 mm longam abiens.

*Typus*: France: Ht-Rhin: Neudorf, Heide, Sumpf bei der Eisenbahnbrücke, 20.4.1936, P. Aellen (h, h v. S.).

Furthermore: — Neostadt, Z. (hL).

This species is similar to *T. germanicum* v. S., see below. From most other species of the section, *T. alsaticum* differs by its narrow and at the same time rather long outer involucrial bracts; the terminal lobes of the leaves are long and acute.

3. *Taraxacum apiculatum* v. Soest **spec. nov.** (Fig. 3).

Planta ca. 10 cm alta, basi araneosa.

Folia numerosa suberecta vel erecta, laete canescenti-viridia glabra petiolo angusto intense purpureo incluso ad 10 cm longa. Folia exteriora lanceolata minus divisa; interiora linearia vel lanceolata lobata; lobi laterales (utrinque ca. 4) ad 12 mm longi, triangulares vel falcati, saepe unguiculati, erecto-patentes vel plerumque retroversi, acuti et mucronulati, interlobiis angustis ad 1 cm longis; lobus terminalis acutus vel subacutus, anguste hastatus ad 2 cm longus, lobulis basalibus ad 10 mm longis, lobulo apicali lingulato.

Scapi cuprei, floriferi foliis subaequilongis, sub involucre paulo araneosi.

Involucrum 12–13 mm longum, ca. 12 mm latum, subobscure viride. Squamae exteriores adpressae, late ovatae, 3.5 mm latae, 5–6 mm longae, margine pallido, vel roseolo instructae.

Calathium planum, radians, ad 2.5 cm diametro, luteum. Ligulae marginales planae, extus stria fusco-violacea notatae. Antherae polliniferae; Stylus luteus; stigmata sublutea vel paulo fuscescentia.

Achenium stramineum parvum, 3.8–4 mm longum (pyramide inclusa), superne dense et breviter spinulosum, ceterum laeve, in pyramidem cylindricam 0.5–0.6 mm longam subabrupte abiens. Rostrum 6.5 mm longum; pappus albus 5 mm longus.

*Typus*: Germany: Thüringen: Artern, 6.5.1903, F. Kappel, as "*Leontodon erectus?* Hoppe" (h M); two other sheets from the same place, date and collector, as "*Leontodon erectus* Hoppe", belong to another species. A summerform with identical achenes, from the same locality: "salzhaltige Wiesen", VI.1896, Sagorski (h JE) pp.

Furthermore:

Germany: Thüringen: Weimar, "früher sumpfige, jetzt trockene Wiese im Nohraer Holze", 10.6.1893, Torger (h JE), summerform; Bechstedtwaagdt, 20.5.1895, Haussknecht (h JE), together with *T. litorale* Raunk.; the plant belonging to *T. apiculatum* was identified by Dahlstedt as *T. vestrogothicum* Dahlst.

Netherlands: Friesland: Zwarte Brekken, Wymbritseradeel, 18.5.1929, Koopmans-Forstmann & Koopmans (h L) with a longer rostrum (8 mm); Sorremorre, between Grouw and Akkrum, humid pasture, 18.5.1960, Willemsma (h v. d. Ploeg).

In leaf form this species is similar to *T. vestrogothicum* Dahlst., but it differs from the latter by its short and dark-green outer involucre bracts and by the nearly yellow stigmas; the achenes are remarkably small and have a shorter rostrum than those of *T. vestrogothicum*.

4. *Taraxacum austrinum* Haglund 1946, p. 343.

*T. palustre* (Ehrh.) Dahlst. in v. Soest 1942, fig. 2, *pro max. parte*, non *T. palustre* (Ehrh.) Dahlst. in Haglund's interpretation, which is *T. suecicum* Hagl.; *Leontodon palustre* was first described by Lyons 1/63, afterwards by Ehrhart 1790; the specimen described by Lyons does not belong to sect. *Palustria*.

*Typus*: Denmark: Sjaelland, Sorø (Flanen), 1913, Ostenfeld.

*T. austrinum* seems to be a rather rare species occurring in the western part of the European continent (map 2.1). Identification of dried plants often is difficult in case achenes are not available; moreover, the rather pale yellow colour of the flowers is difficult to recognize in dried condition.

According to Wiinstedt in Raunkiaer 1950 this species is found in Denmark: Sjaelland, Lolland and Møen. According to v. S. 1942 it is found in the Netherlands along the former Zuiderzee: Kampen (Zwartendijk), Elburg ('t Goor), Doornspijk and Nunspeet; modern agricultural methods introduced after the war period have made this species extremely rare in that region. According to v. S. 1954 *T. austrinum* has been found in France: Seine et Marne, and to v. S. 1956b its presence in Belgium is uncertain.

The following localities can be given in addition:

Germany: Brandenburg: Berlin, Bauer (h M); Niedersachsen: Braunschweig, Vogel (h ZT), is pollen lacking?; Blexen, Unterweser, 11.5.1893, Focke (h Z), stigmas pure yellow; Nordrhein-Westfalen: Kleve, Herrenkohl (h L); Rheinland-Pfalz: Speyer, 15.6.1824, Mann (h M) veris.  
Netherlands: Maasland, "vlietlanden", 27.5.1938, Kern (h); Zegveld, low pastures nearby the Gref, 1953 & 1954, v. d. Voo (h).  
France: Saar: Emmersweiler, "auf den Salzwiesen", 3.5.1911, Ludwig (h M).  
Switzerland: Neuchâtel: St-Sulpice, De Laharpe (h L).

Possibly this species occurs in Silesia (Breslau region), but the plants I have studied are difficult to identify; the group seems to be homogeneous: Rothsürben, 12.7.1893, Ziesché, Callier Fl. Siles. exsicc. 848 (h L, O); zwischen Radzina and Pavlowitz, Uechtritz (h W); . . . bei Breslau, Heuser (h WAG, W); Hauffner Wiesen bei Obernigk, 22.5.1879, Pax (h L); one of the plants of the latter locality has nearly ripe achenes, which seem to be larger than in typical *T. austrinum* and, especially, have a very long rostrum; this fact raises some doubts whether this group of plants really belongs to *T. austrinum*, though the general habit is much alike.

The achenes of *T. austrinum* have a rather short pyramid (0.7 mm); pollen is present, the stigmas are greenish or dirty yellow, not pure yellow as in *T. suecicum* Hagl. The latter also is different by the vividly coloured involucre, intensively washed with purple; in *T. austrinum* these generally are smaller, olive-green, often slightly purplish, with a darker median field, the pale margin not being sharply marked. The outer bracts are more or less ovate, gradually and not abruptly elongated into an obtuse apex; in *T. bavaricum* v. S. and *T. turfosum* (SB) v. S., both from central Europe, these bracts are partly acuminate and acute. The leaves are very constant in shape: lanceolate and sinuate-dentate or -denticulate. Araneous hairs, present below the flower head, often disappear in the course of the flowering time; in *T. suecicum* hairs are always absent at the base of the flower head.

##### 5. *Taraxacum balticiforme* Dahlstedt 1933, p. 719.

This species is rather common in Switzerland and neighbouring countries; it seems to be rather variable. Plants collected by Aellen



near La Chaussée (Ht-Rhin, France) and studied by Haglund, who was unable to finish this study, are named *T. angustatum* Hagl. in h. Aellen and provided with a latin description; these plants surely do not differ from *T. balticiforme*. On another sheet from the same locality plants were named: "*T. subpalustre ad. inter.*"; in fact, the plants from both sheets differ in several respects: the plants of "*T. subpalustre*" are slightly more hairy, the leaves only shortly dentate, the outer involucral bracts shorter (up to 6 mm) with a short, obtuse apex and a sharply defined white margin; those of *T. balticiforme* are elongated (up to 8 mm) with a broad margin, which, however, is not sharply defined against the median field of the bract. Pollen is lacking in "*T. subpalustre*" and the stigmas are nearly yellow, whereas in *T. balticiforme* pollen is present and the stigmas are darker and greenish. Unhappily, ripe achenes are not available in the "*T. subpalustre*"-plants. In vain I tried to separate the rich Swiss material according to these characteristics; I believe that both must be considered to be strongly diverging forms of the same species. Variability to such a degree is quite rare in *Taraxacum*, in which most species are apomictic; may be, *T. balticiforme* sens. lat. is, at least partly, fertile: as many species of the section are tetraploid (and not triploid) this is not impossible. Another reason for my inability to arrive at a conclusion may be my insufficient insight into the taxonomical situation within this spec. sens. lat., which is partly caused by the lack of sufficiently ripe achenes in the collections.

Below I will describe some "forms" to give some impression of the variability. I am doing this with the hope that this may lead in future to a better understanding of the situation in this group.

*Lectotypus*, according to Haglund 1939: France: Ht-Rhin: Neudorf, 16.5.1930, P. Aellen (h S, also in h Aellen and h v. S.); from the same locality I saw: 26.4.1890, Binz (h RUEB, ZT), V.1890, Müller (h RUEB), 20.4.1936, Aellen (h).

Furthermore (map 3.1):

France: Ht-Rhin: "Sumpf bei "La Chaussée, 23.4.1936, Aellen (h, h v. S.); "unterhalb Basel, Fischzuchtanstalt", 12.4.1906, Binz (h Z); Michelfelden, "Sumpfwiese", 17.5.1939, St-Louis, 12.5.1964, both Aellen (h).

— Htes-Alpes: Gap, V.1853; Blanc, exsicc, Billot 1252 (h BR); Gap, Marais du Col de Bayard 1200 m, V.1886, Girod (h GE) pp.

Germany: Bavaria: "Hochebene", Isartal pr. Ascholding (Kr. Wolfratshausen), 16.5.1954, Gutermann (h), pp?

— Baden-Württemberg: Ufer Reichenau 395 m, 12.4.1954, Gutermann (h); Mainau, 30.4.1950, Zöttl (h Merxmüller); Wollmatingerried 410 m, 7.5.1899, Knetsch (h Z), and 15.4.1906 and 5 & 7.5.1907, Baumann (h Z, ZT); Insel Reichenau, Bauernhorn, 9.5.1907, Streichen, 10.4.1904, Markelfingen-Allensbach, 14.5.1907, all Baumann (h ZT); Rheinau pr. Mannheim, 14.4.1894, Kneucker (h JE) pp; Rot am See, Berger (h M) pp., Bietingen pr. Singen, Kelhofer (h Z).

Switzerland: Thurgau: Untersee, Insel Langenrain, 10.5.1909, Uferried pr. Mammern, 16.5.1909, Uferried im Böschen Ermatingen, 9.5.1909, all Baumann (h ZT); Stein am Rhein, IV.1880, Sulger-Büel (h Z) and 5.5.1912, Baumann (h ZT); Gotlieben, 5.5.1907 & 10.5.1909, Baumann (h Z, ZT); apud coenobium paradisum pago Thurgoviens, Gaertner (h L); Frauenfeld, Oberhungersbühl, "feuchte Waldwiese", 13.4.1893, Fischer (h ZT); Diessenhofen 401 m, 13.5.1928, Sulger-Büel (h ZT); Kultobel ob Tobelhof 560 m. 20.7.1951, Hugentobel (h ZT).

- Schaffhausen: Schaarau, "auf Sumpfwiesen", 12.4.1869, Schalch (h ZT); Riedl, 12.4.1909, Bachenmündung pr. Büsingen, 27.3.1912, both Kelhofer (h Z).
- Zürich: Correns (h M); Herdern, "im Sumpfwiesen", 28.4.1910, Wernkli (h Z); Zürichberg 540 m, "Sumpfwiesen mit *Eriophorum latifolium* Hoppe, *Carex Buxbaumii* Whlbnbg.", 13.5.1899, Rikli (h Z), and 500 m, 3.5.1919, Jenny (h ZT); Ebmatingen, 11.5.1919, and Wehrenbachtobel, 3.5.1919, 24.4.1920 & 1.5.1927, both Thellung (h Z); Wytikon, "Torfwiesen mit *Primula farinosa*, *Pinguicula alpina*, *Salix repens* L", 5.5.1906, Landolt (h Z), VI.1881, Schibler (h Z) and V.1913, Beger (h RUEB); Geroldsrüte-Adliswil, 1881, Forster (h Z); Katzenssee, 24.5.1897 (h ZT) and 14.5.1899, Hanhart (h Z), and Egli (h Z); Katzenbach 441 m, "mit *Orchis latifolia* L, *Cirsium palustre* Scop.", 14.5.1899, Keller (h ZT); Kammoor pr. Babikon, 10.5.1892, Schröter (h ZT); ob Rüschtikon, Sumpf, 25.4.1885, Käser (h Z) and V.1885, Baumann (h Z); Godlieben-Hinwil 660 m, 14.4.1894, Benz; Otaltingen (?), 6.5.1903, Rikli; Greifensee, Kölliker (all h ZT); Dietikon, "offene Sumpfwiesen", 9.5.1931, Frey; Herrliberg, Egli; Hausersee-Ossingen, "Riedwiesen", 12.5.1907, Baumann; Glattkanal, 12.5.1891, Bosshard; Teufe-Hombretikon 450 m, "Riedwiese mit *Carex Davalliana* Sm.", 8.4.1894, Volkart; Hörnligebiet, ob Tösstal, 26.4.1894, Brunner; Boppelsen, *Parvo-Caricetum*, 16.4.1914, Weber; Buchenloo, 6.5.1920, Freymann; Robenhausen, "Torfmoor", 23.5.1923, Messikomm (all h Z); Albiskette, Türlensee, 12.5.1904, Stauffer (h ZT).
- Aargau: Fischbad-Sulz, Verlandung der alten Reuss, V.1918, Thurnheer (h Z); Teufental-Dürrenäsch, 17.4.1890, Suter (h Z); Bötzenegg, IV. 1897, v. Tavel (h ZT).
- Basle: Güterbahnhof Wolf, Aellen (h), det. Dahlstedt, but I have not seen the plants; les marais pr. "Basle", de Clairville (h Z) pp.
- Solothurn: Walterswil, 3.5.1891, Wauwilermoos, 25.4.1910 and Grencher-Witi, 17.5.1903, all Fischer-Sigwart (h Z).
- Zug, Bamberger (h WAG).
- Luzern: Weggis-Vitznau, 13.3.1897, Lehmann (h ZT); Seetal, "Sumpfwiese" Baldegg, 22.4.1907, Meier (h Z).
- Bern: Belpmoos, IV.1881, v. Tavel (h Z); Allmendingen, Aare 510 m, 17.4.1920, Michalski (h Z); Oberried, 1.5.1927, H.W. (h ZT) pp; Münsingen, Aare-Ufer, 5.5.1907; Napfgebiet, Lüdern, "Sumpfwiese" 1150 m, 8.6.1924, both Lüdi (h. RUEB).
- Vaud: Lavey, 4.5.1860, Favrat (h ZT).
- Valais: marais de Riddes, VI.1910, ... (h RUEB); Champlan, IV.1863, Wolf (h Z); Sion, 26.7.1873, Favrat (h ZT); Sarvaz pr. Sailloz, 24.4.1915, Gams (h Z) pp; Foully, 4.4. ... (h ZT) pp; le Rosel, "sable humide gazonné", IV.1917, Jaquet (h Z).
- Genève: Bellerive, 1888, La Vicca (h CHUR); au dessus D'Archamp, 29.5.1839, Correns (h M); la Chapelle de Pescuj—Saconnex, "Terrains marécageux", 9.5.1879, Meylan (h GE).
- St. Gallen: Rüti, Rheintal, 17.4.1873, Zollikofer pp; Ried am Häusliberg ob Ebnat 900 m, 3.5.1914, Vogt; "drainiertes Ried" zwischen Ullisbach und Wattwil 620 m, 4.5.1914, Vogt (all h Z); Schloss Grynnau, 1.4.1921, Streuli; St. Gallen, 21.4.1883, Meister; Mühlebach südöstlich von Weite-Wartau 470 m, 8.5.1938, Sulger-Büel (all h ZT); Walenstadtberg, Engenrieter 830 m, V.1910, 10.5.1911 & 13.4.1912, Müller (h Z).
- Grisons: ST. Peter, "*Schoenetum nigri*", 18.4.1960, Müller-Sehn (h CHUR); Churwalden, "Sumpfwiese", 28.5.1861, Theobald, (h CHUR); Rheinauen unterhalb Fläsch 500 m, 25.5.1926, W. Koch (h ZT); Samnaun, 10.8.1908, Gadiant (h Z); Landquart-Maienfeld, Sumpf-Riedwiesen 550 m, 23.4.1916, Schibler (h Z).
- Tessino: Locarno, Maggia-Delta, Wiesenmoore, 9 & 26.4.1917, Jäggli (h Z).
- Italy: S. Tirol: um Meran, Bamberger (h L); Trento, 8.5.1886, ... (h AMD).  
Istria: Monte Maggiore, Recina, "in humidis ad rivulum" 700 m, 27.5.1928, Rechinger (h W).

The achenes of *T. balticiforme* have a long pyramid in which the achene body is more or less gradually elongated. The two-coloured,

ovate outer involucre bracts often provided with a short apex are characteristic. The narrow and rather long leaves vary widely in shape; sometimes they are only scarcely dentate, but often, as in *T. balticum* Dahlst., short side lobes are present; however, the teeth and side lobes are mostly recurved backwards at the apex.

Of the five following "forms" the first one equals Dahlstedt's type, the second one Haglund's "*T. subpalustre*". The three other forms diverge in different ways; only of these three forms localities are mentioned.

f. *balticiforme*: pollen present; stigmas rather dark or pale green; outer involucre bracts ovate-elongate with a wide (1 mm), vaguely defined margin, green-purple, in a small number of rows; araneous hairs below the flower head present, at least in the beginning; leaves glabrous, with retroverted teeth or small side lobes.

f. *subpalustre*: pollen absent; stigmas nearly yellow or very slightly greenish; outer bracts shorter, with dark-green field and white, rather narrow (0.25–0.5 mm), well defined margin, in a small number of rows; scapes glabrous; leaves lanceolate or linear-lanceolate with short teeth, slightly or not hairy. Many intermediate forms with the fore-going form seem to exist.

f. *multilepis*: pollen present; stigmas dark-green or smooth yellow; outer involucre bracts imbricate, in 3 or more rows, short with acuminate, obtuse apex; median field dark-green, with the white or purplish margin extending to the apex of the bract; scape araneous; leaves lanceolate or lingulate with rather strong deltoid teeth or short, spreading side lobes; distinctly hairy (W. Switzerland); might represent a taxon of a higher rank; ripe achenes unknown to me.

f. *fusco-squameum*: outer involucre bracts short, brownish, with the margin but little accentuated; leaves mostly lanceolate, dentate or rarely sublobate. The area of distribution of this form is rather wide; f. *fusco-squameum* might include other, not yet described forms; unhappily ripe achenes are scarcely present in the dried material. In some cases it might be confused with *T. lividum* (W. & K.) Peterm., with practically non-spinulose achenes; the base of the outer bracts in that species, moreover, is very broad; in other cases confusion with *T. austrinum* Hagl. may occur, which has a achene with a short pyramid.

f. *tenerum*: involucre narrow; outer bracts lanceolate or ovate-lanceolate with a greenish or brownish margin, rather pale and only indistinctly two-coloured; leaves lanceolate, dentate; it imitates *T. huterianum* v. S.

*f. multilepis*:

Switzerland: Fribourg: Lavapesson 570 m, "marais", 10.5.1916, Jaquet (h Z).

— Neuchâtel: Travers-Tal, Ponts 1000 m, 22.5.1909, Wirth (h Z).

— Vaud: près Echallens, "prairies marécageuses", IV.1882 & 25.4.1883, Favrat (h Z, ZT); Aigle, "prairies humides marécageuses", IV. 1912, Jaccard (h RUEB) pp; Villars-Morges, VIII.1884, Jaccard (h ZT) pp.

— Genève: pr. Jussy, 25.4.1896, Kohler (h GE); Boud pr. Confignon, 22.4.1852, Huet du Pavillon (h GE).

*f. fusco-squameum:*

- France: Htes-Alpes: Gap, V.1853, Blanc (h L, WAG) exsicc. Billot 1252.  
 — Cantal: Courbelimagne pr. Rauhac, "pré marécageux" du Bois-Grand 780 m, 21.5.1885, Jordan de Puyfol. Soc. Dauph. 1889. 5624 (h FI, GE).  
 — Bas-Rhin: Wissembourg, "prairies humides", 29.4.1863, Schultz Herb. norm. 87 (h GE, L, W, Z) pp; Bitche, "prairies humides", Schultz. Bip. 45 (h GE, L) pp.  
 Germany: Thüringen: Jena, Gembdewiesen, V.1881, Schulze (h Z) veris. and 29.4.1897, Schulze (h JE); plants from this locality have been revised by Dahlst. as *T. vestrogothicum* Dahlst. and *T. lissocarpum* Dahlst. forma; Weimar, Eichelborn, "feuchte Trift", 1895, Kromayer (h JE); "Sumpfwiese" im Schillertal, 1.6.1881, Leimbach (h JE).  
 Switzerland: Schaffhausen: Herblingertal, V.1909, Kelhofer (h Z).  
 — St. Gallen: Rüti, Rheintal, 17.4.1873, Zollikofer (h Z) pp.  
 — Zürich: Neuburg pr. Winterthur 500 m, 24.5.1903, Thellung (h Z); Dübendorf, 7.5.1836, . . . (h Z) veris.  
 Austria: Carinthia: Weissenfels, 20.5.1910, Schneider (h W).  
 — Austria inf.: Dornbach, "in pratis humidis", Cazgl (h Z) pp.  
 — Stiria Salisburgensis, "in pratis mont. et udis", . . . (h P); Windisch-Feitritz, "in pratis humidis", 22.4.1893, Przybylski (h AMD, JE).  
 Italy: Aemilia, pr. Modena, "in pratis humidis", Fontanazzi della Madonnina, 14.5.1911, Fiori & Béguinot, Exsicc. 1594 bis (h Z); "prati umidi" nei dintorni di Modena, IV.1883, Ferrari (h M) together with *T. tenuifolium* (Hoppe) Koch.

*f. tenerum:*

- France: Htes-Alpes: Mont Dauphin, "sables humides" près de la Durance, 12.7.1957, Delvosalle (h); Hte-Savoie: Gruige, "marais", 15.4.1859, Jordan (h Z) pp.  
 Germany: Baden: Rheintal nördlich Sponeck 185 m, 15.4.1900, Knetsch (h Z).  
 Switzerland: Wallis: Rhône-"Sümpfe" bei Mazembroz, 5.5.1914, Beger (h RUEB); Sarvaz pr. Saillon, 18.5.1914, Beger (h Z) pp.  
 — Zürich: Oerlikon, Ried, 1.5.1895, Hanhart (h Z) pp; Altikorn, Lutz (h Z); Benken, 6.5.1891, Suter (h Z).  
 — St. Gallen: Murgtal, Reischiege gegen den Walensee 430 m, V.1911, Roth; Ebnat, "auf festgetretenem Weg" 640 m, 3.5.1914, Vogt (both h Z).  
 — Thurgau: Schaaren, VI.1879, Amstad (h Z).  
 — Schwyz: "Sumpfwiesen" bei Feusisberg, 17.5.1931, Schwere (h Z).  
 — Grisons: Plessurgebiet: Gastiel, Katzenwald 1200 m, 18.5.1914, Beger (h Z); Ried "der Gadenstatte Tschierschen 1280 m, 1.6.1920 and "Alpwege" ob Parvig 1400 m, V.1914, both Beger (h RUEB); Lenzersee, "auf Kalktuf im Schlamm", 11.6.1857, Theobald (h RUEB).  
 Italy: S. Tirol: Moorwiesen Uttenheim, 1000–1100 m, 16.5.1890, Treffer (h AMD).

6. **Taraxacum balticum** Dahlstedt 1905, p. 162–1907, p. 3, fig. 1, tab. I a–b, II, III. 1, map IV. 4—1928, p. 29, fig. 8, tab. 4, map 5—v. Handel-Mazzetti 1907, p. 89, tab. III, V. 2.

*Lectotypus*, according to Haglund (1939): Sweden: Upland, Blidö, Furnsund, 13.6.1893, Borén (h S!).

*Area*: Baltic region, and southward to Thüringen, westward to western Germany and the Netherlands (map 2.2):

1. Fenno-Scandinavian Baltic area: Finland! in 4 districts; Sweden! in 13 districts; Denmark! in 5 districts. *Exsicc.*: Pl. Finl. exsicc. 397, 1427, 1428, 1429!; Tar. Scand. exsicc. Dahlstedt I.14, V.1! Extensive literature by Dahlstedt, Florstroem, Haglund, v. Handel-Mazzetti, Hjelt, Holmgren, Lindberg, Lundevall, Marklund, Palmgren, Pettersson, Raunkiaer, Saarsoo and so forth.
2. German Baltic area: Schleswig-Holstein!, Mecklenburg!, Brandenburg! Literature: Dahlstedt 1905, 1907, v. Handel-Mazzetti 1907. Additional localities,

- not earlier mentioned in literature, e.g.: Schleswig-Holstein: Flensburg, Hansen (h K); Priwall pr. Travemünde, 1.6.1902, Junge (h JE); Mecklenburg: Prenzlau, 1878, Grantzow (h P) pp; Hindenburg, V.1876, Grantzow (h GE); Stralsund, 1889, Berg (h JE); Greifswald, Bisse (h, h GFW); Rostock, westlich von Reutershagen, 9.5.1981, and Allershagen, 1.5.1959, Duty (h, h v. S.); Güstrow, 1831, John (h JE); Brandenburg: Nauen, 21.5.1861, Schweinfurth (h BR, JE); Potsdam, 13.5.1903, Gallasch (h M) pp.
3. Furthermore: Germany (Thüringen!, Sachsen!, Niedersachsen!); the Netherlands! Literature: v. Handel-Mazzetti 1907, v. Soest 1942 with map. The localities given by Dahlstedt 1910, belong, in my opinion, to other species (Breslau, Obersdorf, Bayreuth); the locality Münster given by HM, Hegi and v. S. is still uncertain for this species. Additional localities: Niedersachsen: Sachsa, Sachsenstein (Harz), Vocke (h JE); Wolfenbüttel, Regel (h ZT); Celle, Schweinebruch, V.1879, Nöldeke (h Z); Thüringen: Numburg, Vocke, several years (h AMD, JE, M); Jena, Löbersohnitz (?), 1856), Schultes (?) (h ZT). This species does not belong to the British Flora, as indicated.

*T. balticum* lacks pollen; the stigmas are pure yellow; the apex of the ligulas often is slightly orange-coloured; the achenes mostly have only few and small spinules, see Lindberg 1935 tab. 6. The leaves are very characteristic, the mostly narrow side lobes are spreading; the ovate outer involucre bracts are olive-green, the rather narrow margin is somewhat paler.

The characteristic leaf form led v. Handel-Mazzetti 1907 to separate *T. balticum* from the rest of the species; this rest he considered 1) as *T. paludosum* Scop. or 2) as intermediate forms between *T. paludosum* and *T. vulgare* Schrk. There is, however, no reason at all to treat *T. balticum* in another way as the other species, say as *T. suecicum*, *T. tenuifolium* or *T. turfosum*.

### 7. *Taraxacum bavaricum* v. Soest **spec. nov.** (Fig. 4).

Planta tenera, mediocriter alta (8–25 cm), tota glabra.

Folia erecta prasino-viridia, linearia vel lineari-lanceolata, integra vel minute et remote denticulata, petiolo intense purpureo incluso ad 12 cm longa.

Scapi cuprei. Involucrum parvum, ovatum, 7–9 mm latum, 10–12 mm longum, obscure viride. Squamae exteriores adpressae ovatae, pro parte longe acuminatae, ca. 5 mm longae, ca. 3–3.5 mm latae, conspicue albo- vel purpureo-marginatae.

Calathium ad 2 cm diametro. Ligulae marginales planae, flavae, extus stria cano-violacea notatae. Antherae polline carentes. Stylus subluteus, stigmata virescentia. Floret vere.

Achenium olivaceo-stramineum 4.5 mm longum (pyramide inclusa) superne parce et breviter spinulosum in pyramidem conico-cylindricam 0.9 mm longam subsensim abiens; rostrum 7 mm longum; pappus albus, 5.5 mm longus.

*Typus*: Germany: Bavaria: Obere Hochebene, Anfangsmoor des Muhlfelder Bachtals under der Strasse von Herrsching–Erling, ca. 600 m, 29.4.1947, W. Freiberg (h M); *co-typus fructifer*: Bavaria: Untere Hochebene, "Moorwiese" bei Obermoos nächst Moos pr. Klattling, ca. 315 m, 10.5.1950, Freiberg (h M).

- : Furthermore (map 2.3):  
 Bavaria: Oberbayern: Freisingermoos, v. Biberstein, pp; Isar-Auen pr. Grosshesselohe, 1.5.186, Schnabl; Traunstein, "im Wasser" des Chiemsees, VI.1935, Weber, pp; Ennigalpe pr. Garmisch 1540 m, 30.6.1907, Vollmann (*f. stylosa*); "sumpfige Wiesen" zwischen Bernried und Seeshaupt, 27.4.1913, Henle; Allachermoor, 6.5.1885, Correns; Erdingermoor, bei den Goldachhöfen, 22.5.1910, J. Mayer; Tützing-Bernried, 27.4.1892, Nägele; Dilling am Donau, Kalkflachmoor westlich von Petersworth pr. Gundelfingen, 15.5.1961, Doppelbaur; "Moor" pr. Lochhausen, 11.5.1895, Binsfeld; "Torfwiesen" des Ulmerrieds, 13.5.1881, Hegelmaier; Oberfranken: Memmelsdorf, "moorige Wiese" pr. Senhof 260 m, 2.5.1904, Höfer; Schwaben: Augsburg, Lechfeld pr. Mering, 1.6.1876, Holler and 9.5.1886, Henle (all h M); furthermore: Starnbergersee, Bisschoff (h L) pp; Allgäuer Alpen, Stillach-Auen südlich von Oberstdorf 800 m, VI.1958, Gutermann (h).  
 Thüringen: Jena, "in pratis ulig.", V.1880, Schulze, with abundant araneous hairs on the scapes; "Sumpfwiese" im Schillertal, 1.6.1881, Leimbach (both h JE), both together with *T. balticiforme* Dahlst. *f. fusco-squamum*.  
 Austria: Obersteiermark: Liezen, zur Hochmolbinghütte, 1100 m, 25.6.1961, Melzer (h).

*T. bavaricum* resembles *T. tenuifolium* (Hoppe) Koch in leaf form, but the involucre are ovate and not more or less cylindrical, the stigmas are greenish, the pyramid of the achene is rather short and the rostrum rather long. From *T. suecicum* Hagl. it differs by greenish stigmas, smaller and darker-coloured outer involucral bracts and by a more conical, less cylindrical and much shorter pyramid of the achene.

### 8. *Taraxacum bosniacum* v. Soest **spec. nov.**

Planta 5–7 cm alta, basi subaraneosa.

Folia ad terram adpressa, canescenti-viridia, glabra, facile plicantia, petiolis (nervique mediani parte inferiore) roseolis, angustis. Folia exteriora integra, linearia vel oblanceolata interiora lanceolata, obtusa, integra, denticulata vel ad subgrosse sinuoso-dentata; dentes ad 3 mm longi, subacuti, integri, paulo retroversi vel patentis.

Scapi arcuati, glabrescentes.

Involucrum parvum, angustum, 11 mm longum, 7 mm latum, basi ovatum. Squamae exteriores subadpressae, apice saepe paulo erecto-patentes, lanceolatae vel anguste ovatae, ad 6 mm longae, 1.5–2.5 mm latae, pallide virides, late sed inconspicue viridi-marginatae apice atro-purpureae.

Calathium planum, radians, ad 2.5 cm diametro, flavum. Ligulae marginales planae, extus saepe roseolae, stria cano-purpurea vel cano-violacea ornatae. Antherae polliniferae; Stylus subluteus; stigmata fusco-virescentia. Floret vere. Achenium ignotum.

*Typus*: Bosnia: Trebovič pr. Serajevo, 20.4. . . ., V. Curčić (h W 5629, 5482 pp), in company with *T. illyricum* v. S.

Because of the narrow involucre this species must be related to *T. tenuifolium* (Hoppe) Koch, but it differs from it by larger flower heads, mostly broader leaves, greenish stigmas and the presence of pollen.

9. *Taraxacum brachysquameum* v. Soest **spec. nov.** (map 3.2).

Planta ca. 18 cm alta, glabra.

Folia erecta, laete gramineo-viridia, sublutescentia, tenera, petioliis angustis purpureis. Folia exteriora oblanceolata, sinuoso-denticulata; interiora lobata; lobi laterales (utrinque 3-4) deltoidei, 3-5(-8) mm longi, subobtusius (vel inferiores angustius, interdum grosse dentati et acuti), subremoti, in interlobia lata abeuntes; lobus terminalis indistincte determinatus, ad 2 cm longus, late lingulatus vel semi-ellipticus, interdum dentatus, obtusus.

Scapi subcrassi, floriferi foliis aubaequilongis.

Involucrum sat parvum, angustum, ad 13 mm longum, ca. 10 mm latum. Squamae exteriores adpressae vel subadpressae, ovatae, 4-6 mm longae, ad 2.5 mm latae, obtusae, subobscurae virides, subanguste albo- vel viridi-marginatae, saepe erosae vel ciliolatae.

Calathium laete luteum, ca. 15 mm diametro. Ligulae marginales planae, extus stria cano-violacea notatae; antherae vacuae vel parce polliniferae; stylus et stigmata siccitate nigra. Floret vere.

Achenium dilute brunneum 4 mm longum (pyramide inclusa), superne spinulis patentibus obtectum, ceterum laeve, in pyramidem conicam, 0.7-0.8 mm longam, subabrupte abiens. Rostrum 5-6 mm longum. Pappus niveus, 5 mm longus.

*Typus*: France: Hérault: Villeneuve (pr. Montpellier), 23.2.1913, Jos. Braun & E. Furrer (h Z); this locality is nearby the lagoon district; also: Maurin, 1892, Luglio (h FI).

This is the only species of the section with, at least in dried condition blackish styles and stigmas; the narrow involucrems remind us of those of *T. tenuifolium* (Hoppe) Koch, which is distinct by pure yellow stigmas, linear to lanceolate leaves and by the nearly complete absence of spinules on the achenes; however, the two species are not closely allied. On account of the shape of the leaves and its tender appearance *T. brachysquameum* resembles *T. bessarabicum* (Hornem.) HM, which belongs to the *Taraxaca Rhodotricha* HM (owing to the brownish pappus) and more precisely to sect. *Leptocephala* v. S. The outer involucral bracts of *T. bessarabicum* are very narrow (lanceolate or linear), narrower than the inner ones and quite distinct from those of *T. brachysquameum*.

10. *Taraxacum candriani* v. Soest **spec. nov.**

Planta gracilis, 6-12 cm alta, glabra.

Folia linearia vel lineari-lanceolata, obtusa, integra vel minute et remote denticulata, petioliis angustis roseo-purpureis.

Scapi subcrassi  $\pm$  cuprei.

Involucrum parvum, 6-8 mm latum, ca. 9 mm longum, olivaceo-viride. Squamae exteriores adpressae, lanceolatae vel ovatae, 1.5-2.5 mm latae, ad 6 mm longae, sublate albo- vel roseolo-marginatae, apice versus acuminatae, extremo obtuso atro-purpureo.

*Calathium subclausum*. Ligulae flavae, angustae planae, pro parte apice canaliculatae, stylosae, extus plerumque estriatae, paululo roseolae, interdum temen stria pallide griseo-purpurea notatae. Antherae vacuae. Stylus et stigmata laete lutea.

Achenium (maturum ignotum) dilute brunneum, apice spinulosum, in pyramidem conicam subbrevev sensim (?) abiens, rostratum. Pappus albus.

*Typus*: Switzerland: Graubünden: Muntarutsch pr. Samaden, zwischen Schiesshütte und Scheibenstock, "in Sumpfstelle", 20.6.1920, Candrian (h Z); from the same locality: 24.6.1920 & 8.7.1923, Candrian (h Z). By Candrian 1928, p. 157, this locality is mentioned for *T. officinale* Web. ssp. *paludosum* Crép., 1800 m.

Furthermore, from the same district: am Fussweg nach Samaden, Godin, VI.1890, Gadiant (h Z); Albula-See, Albulapass, VII.1874, Lehmann (h Z, ZT). Both localities are only a few miles from the type locality; in the latter case a mountain ridge is in between.

*T. candriani* is a remarkable, probably endemic species. It differs from all other species of sect. *Palustria* by the very small flower heads; the short ligulas—which leave the upper part of the pure yellow styles and stigmas free—are of a pale yellow colour and, practically, without stripes at the external side.

## 11. *Taraxacum carniolicum* v. Soest **spec. nov.**

Planta glabra, sat humilis.

Folia suberecta, glauco-viridia, lingulata, ad 8 cm longa (petiolo purpureo inclusa), ad 8 mm lata, obtusa, indivisa, interdum minute et remote denticulata.

Scapi ca. 2 glabri.

Involucrum ca. 13 mm longum, ca. 11 mm latum, pallide viride. Squamae exteriores adpressae, parvae, apice obscurius viride, obtusae.

*Calathium planum*, radians, ad 3 cm diametro. Ligulae marginales flavae, extus stria cano-violacea notatae. Antherae vacuae. Stylus et stigmata laete lutea, raro stigmata subvirescentia. Floret vere.

Achenium 5.5 mm longum (pyramide inclusa), laeve, in pyramidem conico-cylindricam ca. 1.5 mm longam subsensim abiens; rostrum 7 mm longum. Pappus albus 5 mm longus.

*Typus*: Yugoslavia: Croatia: Schernbühl, prato verbo carniolico sic dicto Žnožet, V.1874, Rastern (h ZT); also at the same locality: Labači (Laibach), castellum Schernbühl, "in pratis humidis", 2.4.1861, Rastern (h Z, ZT) and 1871 (?) in h BR; also V.1871, Laibach in exherb. Favrat (h ZT).

Furthermore: Austria: Tirol: Mesurino-See, VII.1872, Strauss, Maly & Brandmayer (h W), with narrow outer bracts.

This species is related to *T. tenuifolium* (Hoppe) Koch and similar in shape, but different, especially in the characteristics of the achenes. Those of *T. tenuifolium* have a long pyramid and a short rostrum,



those of *T. carniolicum* have a short pyramid and a long rostrum. Pollen in *T. carniolicum* seems to be mostly absent and the flower heads are larger and broader than in *T. tenuifolium*, smaller than in *T. olivaceum* v. S. From *T. lividum* (W. & K.) Peterm., which has not very different achenes, it differs, for example, by pale yellow stigmas.

## 12. *Taraxacum chlorocranum* Haglund **nov. spec. ad inter.**

In h S I saw plants labelled by Haglund in 1946, from Sweden: Gotland; Hejnum, 16.5.1943, B. Pettersson, of a probably new species: no achenes seem to be available. I leave it for further examination to Swedish specialists; I believe the same form has also been collected in Oeland (h M, S).

## 13. *Taraxacum ciliare* v. Soest **spec. nov.** (Fig. 5).

Folia gramineo-viridia, subtus  $\pm$  araneosa. Folia exteriora lanceolata, integra vel denticulata; interiora lingulata, dentata vel breviter lobata, petiolo angusto roseo vel pallido incluso ad 10 cm longa. Lobi laterales ad 6 mm longi, integri, deltoidei vel triangulares, plerumque patentes vel apice recurvi, acuti et mucronulati, interlobiis subangustis 4–8 mm longis; lobus terminalis indistincte determinatus vel elongato-hastatus, interdum dentatus vel denticulatus, ad 8 mm latus, saepe acuminatus, lobulis basalibus brevibus acutis apice saepe recurvis.

Scapi sub involucre subaraneosi vel glabrescentes.

Involucre mediocre, sat angustum, 13–14 mm longum, ca. 10 mm latum, subobscure fusco-viride. Squamae exteriores adpressae ovatae, ca. 5–6 mm longae, 3 mm latae, obtusae, anguste et pallide marginatae, pro parte conspicue ciliatae.

Calathium paulo radians (?), pallide (?) luteum. Ligulae marginales extus stria atro-violacea notatae. Antherae polliniferae. Stylus luteus, stigmata sublutea.

Achenium (maturum ignotum) stramineum, superne dense spinulosum, ceterum rugosum, basi laeve, in pyramidem conico-cylindricam ca. 0.8 mm longam subabrupte abiens. Pappus sordide albus.

*Typus*: France: Vosges; "prés humides" à Gerbamont, V.1887, D. Pierrat (h Didier, h v. S.).

Furthermore:

France: Charente-Inf.: prairie de Rhosne près Rochefort, 11.4.1887, Foucaud & Jousset, Soc. Rochelaise Exsicc. 2185 (h P).

This species is characterized by dark brownish-green involucre, and by the margin to the outer bracts which is pale green and narrow; the bracts are ciliate. The characteristic leaf form is similar to that of *T. limnanthes* Hagl., which differs from this species by lack of pollen and a broad margin to the outer bracts. *T. ciliare* resembles *T. baltici-forme* Dahlst. f. *fusco-squameum*, but the outer bracts (of nearly the same colour) are different by the narrower margin.

14. **Taraxacum crassiceps** Haglund † **spec. nov.** (Fig. 6).

Planta humilis ad mediocriter alta.

Folia lingulato-lanceolata vel lanceolata, subprasino-viridia, subglabra, petiolis subangustis pallidis vel paulo violascentibus instructa; interiora et intermedia breviter lobata; lobi laterales 2-4(-5) deltoidei, lati vel latissimi, integri, breviter acuti, dorso convexo; lobus terminalis mediocris, sagittatus vel hastatus, integer, breviter mucronatus vel apice contracto, lobulis basalibus parvis; interlobia vix vel bene evoluta, latiuscula vel subangusta, integra. Folia exteriora pro parte integra, parce et breviter dentata vel sublobulata.

Involucrum breve, crassum, basi ovatum. Squamae saepe paulo brunneo-violascentes, exteriores adpressae, late ovatae ca. 5 mm latae, subobscurae virides angustissime marginatae, in apicem brevem subobtusam contractae, interiores sublineares apice atro-violaceo.

Calathium 3-4 cm diametro subobscurae luteum. Ligulae marginales subtus stria fusco-violacea ornatae. Antherae parce polliniferae. Stylus et stigmata virescentia.

Achenium brunneo-stramineum, ca. 4.5 mm longum (pyramide inclusa), superne latius, spinulis vel tuberculis minimis acutis praeditum, subsensim in pyramidem ca. 0.5 mm longam subcylindricam vel sat conicam abiens; rostrum 9-10 mm longum; pappus albus, 5-6 mm longus.

*Typus*: France: Ht-Rhin: "Sumpf" bei La Chaussée, 23.4.1936, P. Aellen (h, h v. S.).

Furthermore:

France: Ht-Rhin: Haberhäuser-Blotzheim, "sumpfiges Gelände" auf dem Fussballplatz, 21.4.1936, Aellen (h, h v. S.).

Netherlands: Hasselt, 26.4.1934, Siertsema (h NBV), together with *T. hollandicum* v. S.

This species is closely allied to *T. hollandicum* v. S., may be even identical to it. But its leaf form is very characteristic and the colour of the leaves is darker green and more bluish; the outer involucre bracts are still larger than in *T. hollandicum*; pollen seems to be less abundant.

15. **Taraxacum crocinum** (Dahlstedt 1911) Haglund **inedit.**

*T. palustre* (Ehrh.) Dahlst. ssp. *crocinum* Dahlstedt 1911, p. 6-7.

In later literature Dahlstedt did no longer mention this form; Lundevall (in mscr.) mentions that Haglund did not publish it as an independent species, though he considered it as such. It is known from Gotland (according to Dahlst.) and Småland (according to Lundevall). It differs from other *Palustria* species by clearly orange- or purple-tipped ligules; pollen is of rather dark yellow colour; the styles are pure yellow. It seems to be related to *T. suecicum* Hagl. I leave it to Scandinavian experts to discuss or describe this critical form.

16. **Taraxacum crocodes** Dahlstedt 1907, p. 18, fig. 5, tab. III.5, map IV.1—1928, p. 11, fig. 3, tab. II. 1–10, map 2—Wendelbo 1949, cum iconibus.

*Area:* Sweden, Norway and Finland, north of 62° latitude.

Norway: Trondjems Amt!; see also Lid 1952, cum iconibus.

Sweden: Härjedalen, Jemtland!, Medelpad, Ångermanland, Åsele and Lycksele Lappmark; Exsicc.: Tar. Scand. exsicc. Dahlst. II.13 and IV.8!

Finland: Ostrobotnia kajanensis!; Exsicc.: Pl. Finlandiae, Lindberg 1430!; see also Lindberg 1908 and 1935.

This species is characterized by more or less tubular, dark yellow flowers with redbrown stripes at the external side; pollen is absent, the stigmas are dark yellow, the leaves dentate; the distinctly spinulose achenes are short (3.0–3.2 mm) see Lindberg 1935, tab. 6. A modification with flat ligules is reported from Jemtland.

There is another species belonging to sect. *Palustria* provided with tubular flowers, viz. *T. candriani* v. S., differing in many respects and not closely allied; its area is the central Alps.

17. **Taraxacum decolorans** Dahlstedt 1926, p. 8—1928, p. 21, fig. 5, tab. III, map 4; *T. palustre* (Ehrhart) Dahlstedt ssp. *concolor* Dahlstedt 1907, p. 14, fig. 3, non *T. concolor* Lindberg 1910.

*Area:* Sweden, Esthonia:

Sweden: Väster- and Öster-Götland!, Upland, Gotland!; Småland, mentioned by Dahlst. 1907, seems to be incorrect, as it is not mentioned again by Lundevall 1962 (compare *T. crocinum*); Oeland, mentioned by Dahlst. 1926, belongs to *T. limnanthes* Hagl. and *T. lissocarpum* Dahlst. (see *T. lividum* (W. & K.) Peterm.), according to Saarsoo & Haglund 1962. Material from Väster-Götland, not mentioned in the literature, is present in h. Lundevall from Österplana 1962 and in h O from Kinnekulle, 1938, Albertson.

Esthonia: Emoc and Emor; litt.: Dahlst. 1907, Marklund 1938, Saarsoo 1940, 1947.

*T. decolorans* is easily distinguishable from other species by the lack of coloured stripes at the external side of the bright yellow ligules; the teeth are often reddish, pollen is absent, the stigmas are of pure yellow colour, the leaves shortly lobate or distinctly dentate. In a few cases the coloured stripes are more or less absent in other species of the section too (compare *T. crocinum*), partly as modifications. The other characteristics mentioned above may lead in that case to the correct identification.

18. **Taraxacum deLanghii** v. Soest **spec. nov.** (Fig. 7).

Planta 10–15 cm alta, basi subaraneosa.

Folia luteo-viridia, glabra, lobata, petiolis (nervoque mediano purpureo-colorato) subangustis; lobi laterales utrinque 4–5, triangulares, lingulati vel subfalcati, subobtusiusculi vel superiores obtusi, ad 10 mm longi, pro parte retrorsivi, dorso saepe recto raro dentato vel denticulato, margine inferiore integro, interlobiis ca. 5 mm longis 3 mm latis plerumque purpureo-coloratis; lobus terminalis sagittatus vel

deltoideus 6–15 mm longus subacutus ad obtusus, lobulis basalibus ad 8 mm longis subacutis ad obtusis subretroveris.

Scapi cuprei, floriferi foliis aequilongi, sub involucri araneosi vel denique glabrescentes.

Involucrum crassiusculum, ad 15 mm longum, ad 15 mm latum, subobscure olivaceo-viride purpurascens. Squamae exteriores ovatae, ad 8 mm longae, vix conspicue purpureo-marginatae.

Calathium planum, radians, ad 3 cm diametro, luteum. Ligulae marginales planae, extus stria fusco-violacea notatae. Antherae polliniferae. Stylus et stigmata fusco-virescentia.

Achenium 4.8 mm longum (pyramide inclusa), stramineum, superne argute et dense spinulosum, ceterum rugosum, basi laeve, in pyramidem cylindricam 1 mm longam abrupte abiens. Rostrum 10 mm longum. Pappus niveus, 5.5 mm longus.

*Typus*: Belgium: Distr. Calcaire Mosan: Fagnolle, 1960, J. E. de Langhe (h, h v. S.); also: vallée du Ruisseau de Fagnolle, "prairie humide moussue à *Scorzonera humilis* L", 28.4.1960, Lambinon (h).

Furthermore:

France: Ht-Rhin: Michelbach, Fusse der Vogesen "auf Sumpfwiesen", 19.4.1890, Binz (h ZT), a dwarf form.

This species is similar in leaf form to *T. heleonastes* Hagl., but in the latter the endlobe is much longer; pollen is lacking in *T. heleonastes* and it has a very pronounced margin to the outer bracts.

19. ***Taraxacum divulsifolium*** v. Soest **spec. nov.** (Fig. 8).

*T. divulsum* Haglund ined. in Aellen, non *T. divulsum* Haglund 1950.

The description is borrowed from Haglund with only a few minor additions.

Planta humilis—mediocriter alta.

Folia subprasino-viridia, subglabra, lingulato-lanceolata — lanceolata, petiolis angustis,  $\pm$  violascentibus. Lobi laterales deltoidei breves, latissimi, integri, saepius sine limine distincto in interlobium abeuntes, dorso paulo convexi, apice brevi, patente vel subresupinato instructi. Interlobia vulgo  $\pm$  longa, integra; lobus terminalis mediocris — sat magnus, vulgo integer, breviter acutus, marginibus lateralibus paulo convexis, lobulis lateralibus parvis.

Scapi sub involucri araneosi.

Involucrum mediocre brunneo-olivaceum, basi subovatum—paulo turbinatum. Squamae exteriores adpressae ovato-lanceolatae, ca. 2.5 mm latae, brunneo-violascentes, anguste marginatae, sat acuminatae, interiores sublineares, apice atro-violaceae.

Calathium radians, 3 cm diametro. Ligulae marginales planae, extus stria fusco-violacea notatae. Antherae polliniferae. Stylus et stigmata subobscure viridia.

Achenium fusco-stramineum, ca. 4.7 mm longum (pyramide inclusa), superne spinulis acutis, sat tenuibus praeditum, ceterum tuberculatum—basi laeve, in pyramidem subcylindricam ca. 1 mm longam abiens. Rostrum 7 mm longum. Pappus albus, 5 mm longus.

*Typus*: France: Ht-Rhin: "Sumpf" bei La Chaussée, 24.4.1936, P. Aellen (h, h v. S.).

Furthermore:

Switzerland: Zürich: "Sumpfwiesen" pr. Altstätten, IV.1914, Berger (h RUEB).  
Germany: Oberbayern: Freisinger Moos, v. Biberstein (h M), verisim.

## 20. *Taraxacum dolomiticum* v. Soest *spec. nov.*

Planta gracilis, 12 cm alta, tota glabra.

Folia luteo-viridia, oblanceolata, 8 cm longa (petiolo angusto pallido inclusa), integra vel obsolete denticulata, subacuta ad obtusa.

Involucrum parvum, 10 mm longum, 9 mm latum. Squamae exteriores adpressae anguste ovatae 2.5 mm latae, 6 mm longae, obtusae, zona inconspicuo et lato pallide marginatae.

Calathium pallide luteum; ligulae marginales concolores; styli et stigmata laete lutea, antherae polliniferae.

Achenium 4.2 mm longum (pyramide inclusa), superne brevissime spinulosum, ceterum laeve, in pyramidem conico-cylindricam 0.7 mm longam subabrupte abiens. Rostrum 7 mm longum. Pappus albus, 6 mm longus.

*Typus*: Italy: S. Tirol: Passo di Pordoi 2200 m, along brook, Keuchenius (h).

Furthermore (map 4.1):

Südtiroler Dolomiten, Seiser Alpe, "sumpfige Stelle", 22.7.1954, Melzer (h), with faint stripes on the ligules.

With *T. candriani* v. S. and *T. decolorans* Dahlst. this species has in common the absence of coloured stripes at the external side of the ligules; these two species lack pollen, the first one has short, involute ligules of a very faint colour, the second one has distinctly dentate or lobate leaves and is indigenous in N. Europe.

## 21. *Taraxacum egregium* Marklund 1938, p. 89, fig. 7; non v. Soest 1942.

According to Marklund this species is closely allied to *T. vestrogothicum* Dahlst.; it is not closely related to *T. hollandicum* v. S., as I suggested in 1942. The leaves are characteristic: the side lobes are acuminate from a broad and short base and the terminal lobe is short and acute; the stigmas are rather dark grey; the achenes have been figured by Lindberg 1935, fig. 54 under the name *T. vestrogothicum* Dahlst. *T. egregium* is known from the Estonian isles; in addition, Saarsoo & Haglund (†) 1962 mention the Swedish isles Oeland and Gotland.

## 22. *Taraxacum friscum* v. Soest 1956a, p. 96, fig. 1.

*Typus*: Netherlands: Friesland: Akkerwoude, Lytsen, "litter fen pasture", 1953, v. d. Ploeg (h, h L, h v. S.).

In v. Soest 1956a a few localities, all from Friesland, have been given; since then the number of localities from this province has increased considerably: Ouddeel pr. Leeuwarden, Oudgaren pr. Roodkerk, Giekerk, Heeg, Oudega, IJlst, Sneek and Sneekermeer, Akkrum, Warns, all in litter fen, v.d. Ploeg (h). In v. Soest 1956b two localities from Belgium are reported, only one being correct (Roche-fort). This species now can be reported from Germany: Weimar: "moorige Waldwiese" pr. Nohra, 18.5.1887, Torges (h JE).

*T. friscum* is closely allied to *T. heleonastes* Hagl.; the latter lacks pollen, the achenes are less densely spinulose and the margin to the outer involucre bracts is broad, whereas it is extremely narrow in *T. friscum*. The shape of the leaves of both species is similar. From *T. vestrogothicum* Dahlst. *T. friscum* differs in many respects, the first one having much darker-coloured stigmas, especially in dried condition.

### 23. *Taraxacum fuornense* v. Soest **spec. nov.**

Planta 10–15 cm alta, glabra.

Folia linearia, obtusa, integra vel remote et minutissime denticulata, petiolo roseolo incluso ad 10 cm longa.

Involucrum rufo-olivaceum, 1.2 cm latum, 1.2 cm longum. Squamae exteriores laxe adpressae, ovato-lanceolatae, inconspicue vel non-marginatae, apice paulo vel non acuminatae, extremo obtuso.

Calathium paulo radians, pallide luteum. Ligulae marginales angustae vel canaliculatae, extus  $\pm$  griseo-purpureae. Antherae polliniferae. Stylus et stigmata laete lutea.

Achenium (immaturum) pallide brunneum, ca. 4 mm longum (pyramide inclusa), superne parce, subgrosse et breviter spinulosum, ceterum sublaeve, in pyramidem conico-cylindricam subsensim abiens. Rostrum 6–7 mm longum. Pappus albus, 5–6 mm longus.

*Typus*: Switzerland: Graubünden, Ofenpass Gruppe, "an einem Tümpel" auf dem Schaflager von Murtera(s) 2160 m, 28.7.1902, Brunies (h Z); also in h M. Furthermore in the same region: Günsplan, 18.7.1903, Brunies (h Z); Plan Matun, 26.7.1926, La Vicca (h CHUR), slightly different.

The narrow ligules, pale-coloured and without distinct stripes at the external side are characteristic; the leaves are linear and obtuse.

### 24. *Taraxacum gelricum* v. Soest **spec. nov.** (Fig. 9).

Planta sat robusta vel humilis, ad 20 cm alta, inferne parce araneoso-pilosa.

Folia subprasino-viridia, dorso in nervo mediani parce araneosa, petiolo angusto sat longo roseolo vel purpureo incluso ad 15 cm longa. Folia exteriora oblanceolata, paulo dentata; inferiora lanceolata vel lingulata, breviter dentata vel plerumque patento-lobata; lobi laterales (utrinque 2–3) triangulares, ad 5 mm longi, acuti vel subobtusii,

interdum dorso breviter dentato, in interlobos sensim abeuntesi, margine inferiore recto vel  $\pm$  concavo; lobus terminalis saepe indistincte determinatus, elongatus (ad 3 cm longus), subobtusus, lobulis basalibus nullis vel parvis casu quo ad 3 mm longis, patentibus.

Scapi saepe curvati, crassi, sub involucrio araneosi.

Involucrum crassiusculum, ad 15 mm longum, ad 15 mm latum. Squamae exteriores adpressae, late ovatae, ca. 4 mm latae, ca. 6 mm longae, acuminatae, olivaceo-virides purpurascens, inconspicue purpureo-marginatae. Squamae interiores late lineares, apice purpureae.

Calathium planum ad 3 cm diametro, subsaturate luteum. Ligulae marginales planae, extus stria cano-purpurea ornatae. Antherae vacuae vel polliniferae. Stylus sordide luteus, stigmata fusco-virescentia. Floret vera.

Achenium ca. 4.5 mm longum (pyramide inclusa), costulatum, stramineum, superfe late subgrosse spinulosum, ceterum rugosum—basi laeve, in pyramidem conicam 0.6 mm longam (tuberculis saepe praeditam) sensim abiens. Rostrum 7 mm longum. Pappus albus, 6.5 mm longus.

*Typus*: Netherlands: Guelders district: between Veenendaal and Renswoude, Allemanskamp, "in *Cirsieto-Molinietum*" Sissingh & de Vries, together with *T. adami* Claire, *T. hamatum* Raunk., *T. lucidum* Dahlst., 7.5.1960, S. E. de Jongh (h), C. G. v. Leeuwen, J. L. v. Soest & V. Westhoff; Tar. Neerl. Exsicc. (1960) 98, s.n. *T. limnanthes* Hagl. (h BR, S, U, W, Saarsoo, v. S.); from the same locality: 5.5.1956, M. T. Jansen (h v.d. Ploeg). From the type locality plants with and without pollen have been collected.

Also in the same region: Bennekomsche Meent, with and without pollen (h de Jongh, v. S.) and Veenendaal, 't Meeuwenkampje, with and without pollen (h v. S.), both same date and same collectors as above, on the latter spot also 5.5.1956, Jansen (h v. d. Ploeg).

Furthermore (map 51):

Netherlands: Guelders district: Halle (Veluwe) and Voorst, V. 1834, Wittewaal (h NBV); in this district probably more, but no achenes are available.

— Haff district: Eernewoude, "in litter fen", 12.5.1956, Franke & v. d. Ploeg (h); Akkerwoude, Heechfinne, "humid pasture in peat bog", 20.5.1954 & 8.6.1956, v. d. Ploeg (h).

— Dune district: Rockanje, dune valley, 6.5.1949, Haglund, Sipkes & v. Soest (h), together with *T. limnanthes* Hagl. ssp. *limnanthoides* v. S., *Carex trinervis* Degl., *Epipactis palustris* (L.) Crantz, *Gentiana uliginosa* Willd., *Parnassia palustris* L. and *Schoenus nigricans* L.

France: Seine et Oise: Mantes, Le Coudray, 21.4.1891, de Schoenefeld (h P). — Hte-Vienne: St-Germain, "marais", 29.5.1891, de Schoenefeld (h P).

This species is well characterized by the shape of the achenes; the pyramid of conical form arises gradually out the achene body and often is provided with a few tubercles or short spinules. If the leaves are lobate with triangular lobes, confusion with other species is improbable, but often the leaves are only sinuate-dentate; in that case *T. gelricum* may easily be confused with *T. limnanthes* ssp. *limnanthoides* f. *visserianum* v. S. and with other not yet well recognized

species from C. Europe. This f. *visserianum*, from W. Europe, has different achenes, see under *T. limnanthes* Hagl.

The outer involucrel bracts are often rather broad: up to 4 mm; in that case confusion might arise with *T. hollandicum* v. S. (pollen present, obtuse leaves, different achenes) and with *T. friscum* v. S. (pollen present, different lobes of the leaves, different achenes).

**25. *Taraxacum germanicum* v. Soest spec. nov.** (Fig. 10).

*T. alsatico* v. S. similior sed squamae involucris exteriores late ovatae saepe zona pallida- vel brunnescente marginatae, in apicem brevem  $\pm$  subito attenuatae; antherae  $\pm$  vacuae vel parce polliniferae (pollen sterile?). Folia araneosa, lanceolata, saepe sinuoso-dentata vel sinuoso-denticulata sed saepissime breviter lobata; lobi laterales patententes vel erecto-patentes, apice non recurvati; lobus terminalis elongatus. Scapi araneosi. Achenium 4 mm (pyramide inclusa), saepe minute et parce spinulosum, in pyramidem 0.8 mm longam abiens; rostrum 7 mm longum.

*Typus*: Germany: Hessen: Wetterau, "moorige Salzwiesen" pr. Wisselsheim, 12.5.1876, Oertel, Exsicc. Baenitz Herb. Eur. (h GFW), also in h GE, JE, K, Z; from the same locality, 27.5.1877, Oertel (h JE).

Furthermore:

Germany: Holzhof, "in prato humido", Kummer (h M) pp.

**26. *Taraxacum heleonastes* Haglund 1950, p. 236, fig. 4.**

*Typus*: Switzerland: St. Gallen: Jona pr. Rapperswil, Flachmoor 410 m, 4.5.1940, W. Koch, kultiviert in Zürich (h S, ZT).

Furthermore:

France: Ht-Rhin: "sumpfiges Gelände" auf dem Fussballplatz Haberhäuser-Blotzheim, 21.4.1936, Aellen (h).

Switzerland: Bern: Alpnachdorf (?) im Oberried, 1.5.1927, H.W. (h ZT).

Italy: Appenines of Genoa: M. Getto, 2.4.1893, Haussknecht (h JE), carrying pollen.

This species is very characteristic in leaf form, in which it slightly resembles *T. deLanghii* v. S. and *T. friscum* v. S.; for both compare above. Pollen is normally lacking; the Italian plants seem to make an exception.

**27. *Taraxacum hoëdicense* v. Soest spec. nov.**

A *T. limnantheo* Haglund characteris sequentibus bene divisum: scapi araneosi; ligulae saturate luteae, subaurantiaca; antherae polliniferae; stylus luteus; stigmata paulo virescentia.

*Typus*: France: Morbihan: île de Hoëdic, "prairie humide à *Carex divisa*", 25.4.1962, VandenBerghen (h, h v. S.); furthermore on the same isle: "prairie à *Anthemis*, sable humide", 20.4.1962, VandenBerghen (h).



Furthermore:

Netherlands: Texel: Dijkmanshuizen in brackish pasture, in company with *Orchis Morio* L, *Ranunculus sardous* Cr. and *Rhinanthus glaber* Lamk, 5.5.1964, P. A. Bakker (h).

France: Aveyron: Fontaine Saint Martin a St. André-de-Vezines, "tourbière alcaline", 850 m, 18.4.1960, VandenBerghen (h).

The leaves often are but slightly dentate; even in that case the plants are easily distinguishable from *T. austrinum* by the dark yellow colour of the flowers, those of *T. austrinum* being pale yellow.

28. **Taraxacum hollandicum** v. Soest 1942, p. 224, fig. 4.

*T. egregium* v. S. 1942, non Marklund 1938; *T. ovaticeps* Hagl. in sched. (h Aellen).

*Typus*: Netherlands: Groot-Ammers, Lek valley, IV.1934, v. Soest (h. 9495).

The general area of this species (map 42) is restricted to W. Europe; some related species, like *T. crassiceps* Hagl., *T. laeticolorifrons* Hagl. and *T. neo-Aellenii* v. S. occur in the same region, but are much more rare.

Netherlands; those given by v. S. 1942 are not repeated here.

1. Riverdistrict: Bokhoven, Maas valley, 27.4.1948, v. S. (h), together with *Sanguisorba officinalis* L<sup>1</sup>, see also under *T. laeticolorifrons* Hagl.; Ewijk, 23.4.1943, Jansen & Reichgelt (h), 29.4.1946 & 7.5.1947, Jansen, Kern & Reichgelt (h); Waspik, along the Oude Maas, 27.4.1948, v. S. (h); Maassluis, 4.4.1943, de Bruyn & Vervoort (h L); Oud-Alblas, 5.5.1949, Haglund, Kloos & v. S. (h); Zegveld, along the Grift, 1954 and Kamerikse Nessen, 26.4.1957, both v. d. Voo (h), both localities belong to the Haffdistrict; Kille-Schans, 10.5.1958, v. Brakel, Groot & v. S. (h), "together with *Cardamine amara* L"; Sleeuwijk, 4.5.1957, de Roon (h U); Spijk, Linge valley, 9.5.1958, v. Brakel, Groot & v. S., exsicc. v. S. Tar. Neerl. 44 (h, h BR, S, U, W, h Saarsoo); Asperen, Linge valley, 9.5.1958, same collectors, exsicc. 65 (same herb.), "together with *Hierochloë odorata*" (L) PB; nearby the same locality, 7.5.1960, de Jongh, v. Leeuwen, Westhoff & v. S., exsicc. no. 97 (same herb. and h de Jongh); Vuren, Tielerwaard, 1960, v. S.; Ameide, 1949, Haglund & v. S. (h).
2. Guelders district: Bennekom, Meent, 7.5.1960, de Jongh, v. Leeuwen, Westhoff & v. S. (h).
3. Region of the former Zuiderzee: Hulshorst-Hoophuizen, 20.4.1952, v. S. (h); Harderwijk-Nunspeet, 21.5.1947, v. S. (h); Nunspeet, Zeebad, 9.5.1956, Bakker (h YS)<sup>1</sup>; Elburg, 't Goor, 23.4.1949, v. S. (h), 11.5.1954, Bakker (h YS); Doornspijk, Kerkdijk, 20.4.1946-22.5.1947, v. S. (h); Elburg, 18.4.1949, v. S. (h), 12.5.1951, v. S. (h BR, NBV), 3.5.1954, v. Brakel & v. S. (h, h v. d. Ploeg); Kampen, Zwartendijk, 6.5.1956, Diender (h YS), and 4.5.1958, Bakker, Groot, De Jongh, Kern & v. S. (h); Ketelmond, 1954; Staart van Urk, 12.5.1954; Urk, Noordoostpolder, 1956 and Oost-Flevoland, 1954, all Bakker (h YS); Vollenhove, Kadoelen, 4.5.1958, Bakker, Groot, de Jongh (h), Kern & v. S. (h); Gaast, Workumerwaard, 7.5.1960, de Jong & v. d. Ploeg (h).
4. Region of the "Zwarte Water" and "Overijsselsche Vecht": Zwartsluis-Meppel, 4.5.1958, Bakker, Groot, de Jongh, Kern & v. S. (h), 3.5.1954, v. Brakel & v. S. (h, h v. d. Ploeg), "together with *Hierochloë odorata* (L) PB and *Sanguisorba officinalis* L<sup>1</sup>"; Zwartsluis, 3.5.1954, v. Brakel & v. S., Exsicc. v. Soest Tar. Neerl. 13 (h, h BR, S, U, W, h Saarsoo), "together with *Fritillaria meleagris* L<sup>1</sup>";

<sup>1</sup>) h YS stands for Herb. of the IJsselmeerpolders, Ens.

- Genemuiden-Hasselt, 1956, Bakker (h YS), "together with *Fritillaria meleagris* L.; Hasselt-Zwartsluis, 3.5.1954, v. Brakel & v. S. (h, h BR), "together with *Fritillaria meleagris* L", and 4.5.1958, de Jongh (h); Zwolle-Meppel, Berkumerbrug, 2.5.1954, Reichgelt (h L); Schoterzijl, 1954, v. Brakel & v. S. (h); Bruggenhoek, Huis te Haarst, Gemminger buitenland, Streukel, all 8.5.1964, v. Leeuwen & v. S. (h), "together with *T. anglicum* Dahlst., *Fritillaria meleagris* L, in *Calthion*".
- Belgium: those given in v. S. 1956 b for Distr. Campinien and Distr. Calcaire-Mosan are not repeated here. Furthermore: Distr. Calcaire-Mosan: Mariembourg 1957, Duvigneaud (h Lambinon); Distr. Ardennais: Habay-la-Vieille, station à *Gentiana germanica* Willd., marne rouge du Keuper, 26.5.1956, d'Ansembourg (h BR) pp; entre Chiny et Izel, vieille manière hettangien, 19.5.1956, d'Ansembourg (h BR) pp; Distr.?: Warmingies (?), 26.5.1867, Crépin (h BR), Wandignies, 30.4.1865, Lelièvre (h BR) pp.
- Luxembourg: Luxembourg-Hollerich and Reichlange-station, both 1957, Reichling (h LUX).
- France: those given in v. S. 1954 for the following Départements are not repeated here: Meuse, Loir-et-Cher, Moselle, Isère, Côte d'Or, Cantal; only Montpellier, listed there is a false indication (belongs to *T. udum* Jord.). Furthermore: Marne: Athis pr. Epernay, 17.5.1891, Mouillefarine (h GE); Meuse: Luzy-St. Martin, Duvigneaud (h, h Lambinon); Meurthe-et-Moselle: Nancy, Willemot (h S); Bas-Rhin: Buxweiler, Buchinger (h L); Wissembourg, 29.4.1863, F. Schultz, Exsicc. Herb. norm 87 (h M, W, Z) pp; Ht-Rhin: Sumpf pr. La Chaussée, 23.4.1936, Aellen, as *T. ovaticeps* Hagl. ined.; Hte-Saône: Confracourt, Bertram (h ZT) pp.
- Germany: Pfalz: Landau, Dreihof, VI.1929, d'Alleizette, exsicc. Duffour 5919 (h GR, Z, de Retz), s.n. *T. lanceolatum* Poiret, pp; Landau, "prairies tourbeuses" vers Godramstein, 1929, d'Alleizette (h. Didier, v. S.); . . . : Holzhof, Kummer (h M) pp.
- Switzerland: St. Gallen: "sumpfige Riedwiesen" pr. Rüti, Rheintal, 17.4.1873, Zollikofer (h Z); Walenstadtberg, Ried 830 m, V.1910, Müller (h Z) pp; Zürich: Ried pr. Oerlikon, 1.5.1895; Hanhart (h Z) pp; Eisfeld pr. Oerlikon, 9.5.1895, v. Tavel (h ZT) pp; Solothurn: Grencher-Witi, 17.5.1903, pp, and Wauwilermoos, 25.4.1910, both Fischer-Sigwart (h Z); Fribourg: Les Chéseaux sous Morlon 725 m, V.1914, Jaquet (h Z) pp; Neuchâtel: Cortaillod, "prairies humides", 7.5.1849, Jeanjaquet (h ZT) pp; Genève: "in pratis", 23.4.1883, Déséglise (h M).

In the Netherlands *T. hollandicum* is mostly found in hay fields on rather humid spots, just outside the *Caltha palustris*-vegetation, which prefers still more humidity; it is associated with several species of phytosociological interest, such as *Cardamine amara* L, *Cochlearia officinalis* L, *Fritillaria meleagris* L, *Hierochloë odorata* (L) PB, *Ranunculus auricomus* L., *Sanguisorba officinalis* L.

Not only in vegetational, but also in morphological aspect *T. hollandicum* shows variability; however, there is to my view no sufficient reason to split this species in a series of smaller units, at least not in the Netherlands. However, the situation in the Rhine valley to the north of Basle seems to be somewhat different; Aellen collected in that region rich material which Haglund recognized as belonging to several species (not edited!); in fact, in that region a swarm of well defined and well distinguishable forms seemed to be present; one of these is *T. ovaticeps* Hagl., identical to typical *T. hollandicum*; for the others, compare *T. crassiceps* Hagl., *T. laeticolorifrons* Hagl., *T. neo-Aellenii* v. S.

29. **Taraxacum huterianum** v. Soest **spec. nov.** (Fig. 11).

Planta 8–15 cm alta, glabra.

Folia lanceolata, subobtusata vel subacuta, dentibus triangularibus, breviter retroverso-dentatis vel interdum sinuato-dentata, contracta in petiolulum roseolum.

Involucrum basi conspicue turbinatum, ad 15 mm longum. Squamae exteriores obscure olivaceo-virides, ad 8 mm longae, ad 3 mm latae, lanceolatae vel ovato-lanceolatae, in apicem obscure viridum subsensim contractae, sublata inconspicue viridi-marginatae.

Calathium pallide luteum; ligulae marginales extus stria  $\pm$  griseo-violacea notatae. Antherae vacuae. Stylus luteus, stigmata paululo virescentia.

Achenium dilute brunneum, ca. 4.5 mm longum (pyramide inclusa), superne breviter et argute spinulosum ceterum rugosum—basi laeve, in pyramidem conico-cylindricam ca. 1.5 mm longam subsensim abiens. Rostrum 7–8 mm longum. Pappus albus, 5 mm longus.

*Typus*: Italy: S. Tirol: Pusteria, Sexten, "loc. irrigatis palustribus" ad Stadl Wiesele in Fischlein, sol. calcareo 1450 m, 19.6.1878, K. Huter (h BR, also h K, M); also 21.6.1873 (h FI).

Plants from the following locality are much alike and may belong to this species; the scapes are slightly araneous below the flower head; unhappily, ripe achenes are lacking: Switzerland: Zürich: "Sumpfwiese" pr. Schwarzenbach, 7.5.1864, Brügger (h ZT).

The most striking characteristic of this species is the turbinate flower head; otherwise it seems to be allied to *T. balticiforme* Dahlst., resembling its f. *tenerum*.

30. **Taraxacum illyricum** Dahlstedt apud v. Soest, **spec. nov.** (Fig. 12).

Planta 15–20 cm alta, glabra.

Folia petiolo angusto purpureo incluso 10–25 cm longa, pallide viridia, nervo mediano pallido, anguste lanceolata vel lingulata, remote subretroverso-dentata vel denticulata, apicem versus integra, subobtusata vel subacuta.

Scapi numerosi, pallide cuprei vel roseoli.

Involucrum crassiusculum, obscure viride, 1.5 cm longum, ca. 1.5 cm latum. Squamae exteriores adpressae ovatae, paulo acuminatae, 6(–8) mm longae, 4 mm latae, anguste roseolo-marginatae (0.2 mm), omnes apice atro-purpureae.

Calathium paulo apertum, ad 2.5 cm diametro, pallide luteum. Ligulae marginales planae, extus stria griseo-violacea notatae. Antherae polliniferae. Stylus et stigmata virescentia.

Achenium stramineum 4 mm longum (pyramide inclusa), superne tuberculatum, ceterum laeve, in pyramidem subcylindricam 1 mm longam subsensim abiens. Rostrum 6.5 mm longum. Pappus albus, albus, 5–6 mm longus.

*Typus*: Montenegro: Kastar, inter Cattaro et Cetinje, "in herbis siccis solo calcareo", 25.5.1905, H. Lindberg (h S); cultivated in Bergianske Botaniska Trädgården, 19.6.1907, by Dahlstedt (h S).

Furthermore (map 2.4):

Bosnia: Lapisnica-Schlucht pr. Serajevo, 8.5.1903, Maly (h W); Trebovič pr. Serajevo, Čurčić, 20 4. . . (h W), araneous hairs below the flower head; inter Bukovizza et Travnik, 16.4.1847, Sendtner, Pl. Bosn. 356 (h M).

Croatia: Jannica, "in pratis", V.1859, Farkas-Vukotinović (h W), araneous hairs below the flower head.

Istria: Zaale, 28 4. . . , de Tommasini (h W); Muggia, 10. 4. . . , de Tommasini (h W), both as *T. tenuifolium* (Hoppe) Koch, the first one as "var. fol. denticulatis", the second one with "?".

Hungary: comit. Nittriense, 1821 . . . (h L).

### 31. *Taraxacum lacustre* v. Soest **spec. nov.**

Planta 6–10 cm alta, glabra.

Folia lingulata, integra vel parcissime et minute denticulata, apice mucronulata, petiolo inconspicuo, brevi, roseolo vel pallido.

Involucrum submagnum, 15 mm longum, 15 mm latum, subobscure olivaceo-viride; squamae exteriores laxe adpressae, numerosae, ovatae, breves (ad 6 mm longae), in apicem obtusum attenuatae, zona latissima pallida marginatae, in parte mediano apicem versus obscure virides.

Galathium submagnum, planum, radians, ad 3 cm diametro. Ligulae marginales planae, flavae, extus stria cano-violacea notatae. Antherae polliniferae; stylus et stigmata aurea. Achenium ignotum.

*Typus*: Italy: S. Tirol: Dreizinnenhütte, 2300 m, "Seeufer", 8.8.1909, J. Schneider (h W).

The relatively large flower heads on short scapes may be regarded as an alpine characteristic of this species; species of this section are extremely rare at this altitude.

Plants with a striking resemblance were collected in Pontebba (N. Italy), 30.4.1893, Reching (h W), differing, however, by slightly green stigmas, araneous hairs below the flower head and on other parts of the plant, ligules washed with purple or with partly grey stripes at the external side.

### 32. *Taraxacum laeticolorifrons* Haglund (†) **spec. nov.** (Fig. 13).

Planta humilis ad mediocriter alta.

Folia laete subprasino-viridia, glabriuscula, late linearia ad linearilanceolata, petiolis angustis vel anguste alatis, pallidis vel paulo violascentibus. Lobi laterales utrinque 4–6, sat parvi, saepe subtriangulares, integri, breviter acuti. Interlobia vulgo longa, recta, integra. Lobus terminalis parvus triangulariter sagittatus, apice non raro sat contractus, acutiusculus ad subobtusus.

Involucrum breve, crassum, subobscure viride, basi ovatum. Squamae exteriores adpressae, ± late ovatae, 4–7.5 mm latae, subobscure virides, anguste albedo-vel roseo-marginatae, in apicem obtusiusculum attenuatae.

*Calathium* sat obscure luteum. Ligulae marginales extus stria fusciolacea ornatae. Antherae polliniferae. Stylus et stigmata virescentia. Achenium maturum non visum.

*Typus*: France: Ht-Rhin: "Sumpf" bei La Chaussée, 23.4.1936, P. Aellen (h, h v. S.).

This species, described by Haglund in h Aellen, was not yet published; Haglund added some observations in German, which are translated here: "*T. laeticolorifrons* is an easily recognizable species. Already very characteristic are the leaves of a pale green colour with nearly triangular side lobes, separated by long, straight and non-dentate interlobia. The broad and short flower heads with very broad outer involucral bracts are also very remarkable. The leaves of *T. laeticolorifrons* are similar to those of *T. laeticolor* Dahlst., belonging to sect. *Vulgaria* Dahlst."

This species is certainly closely related to *T. hollandicum* v. S., which shows a rather wide range of variability in the shape of the leaves; plants found in the Netherlands (Bokhoven in N. Brabant) and provided with green or pink petioles look very similar to *T. laeticolorifrons*, but they differ from the latter by more or less entire or dentate external leaves; in this respect they resemble *T. hollandicum* which was found on the same spot.

Slightly different, but surely closely related, are plants collected by Duvigneaud (h): France: Ardennes: Vrizey, Vallée de l'Aisne, "plaine alluviale, prairie à faucher aux Grands Saules", 11.5.1963. The outer involucral bracts are longer (up to 10 mm), the involucre more uniformly pale green; the midribs of the leaves are broader (6–8 mm). At the same spot *T. neo-Aellenii* v. S. has been collected; though the plants from La Chaussée and Vrizey look much alike, I have the impression that both forms must have originated independently within the *T. hollandicum*-complex.

### 33. *Taraxacum lanibasis* v. Soest **spec. nov.**

Planta 6–10(–15) cm alta, basi valde araneoso-lanigera, ceterum glabra.

Folia decumbentia, canescenti-viridia, lanceolata, integra, remote sinuoso-dentata, subobtusata vel obtusa, petiolis angustis roseolis.

Involucrum mediocre, 10–12 mm longum, 10 mm latum, olivaceo-viride, basi subovatum. Squamae exteriores adpressae ovatae, 4–5 mm longae, 3–3.5 mm latae, valde obtusae, zona latissima pallidamarginatae.

*Calathium* planum, ad 2–3 cm diametro, flavum. Ligulae marginales planae extus stria cano-violacea notatae. Antherae polliniferae. Stylus et stigmata fusco-virescentia. Floret vere. Achenium ignotum.

*Typus*: Yugoslavia: Fiume, "Salzwiesen", III. . . . , Noë in h L (h Koch, sub nomine *Leontodon salinus* Poll.), also in h L as *L. lividum*, leg. ?, from Fiume (map 4.3).

The very short outer involucre bracts are very characteristic and are similar to those of *T. tenuifolium* (Hoppe) Koch, which is distinct by relatively narrower involucres, the absence of pollen and by pure yellow styles and stigmas.

34. **Taraxacum limnanthes** Haglund 1946, p. 343, fig. 2; Saarsoo & Haglund (†) 1962.

*Typus*: Sweden: Oeland, Böda, 1936, Waldheim (h S).

During a visit which Haglund paid to the Netherlands in 1949, this species was noticed by us at Elburg, Volendam and Rockanje; afterwards it appeared to me that none of these plants did correspond with the typical form of *T. limnanthes*; from the two first localities plants were collected with greenish stigmas and araneous scapes; from the third locality the collected plants were not homogeneous. All the other plants from the Netherlands considered to be *T. limnanthes*, differed in the same way. The typical *T. limnanthes* from the Baltic countries has pure yellow stigmas and glabrous scapes. Below, the Dutch plants are separated from the typical forms as ssp. *limnanthoides* n. sp.

Earlier (1942) I mentioned several plants which I include in this sp., as *T. lissocarpum* Dahlst.; at that time in Scandinavia too the interpretation of *T. lissocarpum* was not at all clear. The true *T. lissocarpum*, treated in this paper as identical to *T. lividum* (W. & Kit.) Peterm., has non-spinulose or only very faintly-tuberculate achenes, whereas *T. limnanthes* and its ssp. have distinctly spinulose ones.

It seems that *T. limnanthes* itself is a rather rare species almost entirely confined to the Baltic area; a few localities are mentioned below from elsewhere; but plants from those localities are as a rule slightly different in certain respects.

ssp. **limnanthes** (map 3.3):

Sweden: Oeland! Gotland!, Södermanland (Mörkom, 20.5.1934, Lindström in h S, sub nomine *T. vestrogothicum* Dahlst.); Blekinge and Småland, according to Lundevall 1962.

Germany: Mecklenburg: Fischland, Wustrow, 8.5.1960, Duty (h, h v. S.), scapes araneous.

Outside the Baltic area this species is collected only in diverging forms:

Belgium: Vance, 10.5.1956, Delvosalle (h BR).

Germany: Bavaria: Leutstetten pr. Starnberg, 22.5.1935, Hepp (h M), differing by shorter, obtuse spinules of the achenes; Allach pr. München, 5.5.1892, Naegele (h M) with araneous scapes.

ssp. **limnanthoides** v. Soest **subspec. nov.**

Differt a *T. limnantho* Haglund subspec. *limnantho*, cui valde simile est, notis his: stigmata virescentia, interdum valde obscura; scapi sub involucro araneosi.

*Typus*: Netherlands: Kampen, Zwartendijk, "in brackish pasture", 11.5.1941, v. Soest (h); also IV.1930, v. S. (h).

Furthermore (map 3.4):

Netherlands; only localities along the North Sea coast or the former Zuiderzee coast: Terschelling, Boschplaat, V.1962, de Fouw (h U); southwest of Workum, 29.4.1928, Koopmans (h L); Volendam, "in salt pasture", 4.5.1949, Hagl. & v. S. (h); Sloten, van de Sande Lacoste, Rombouts & Merkus Doornik (h NBV) veris.; Waalsdorp, "humid dune valley", 1844, de Bruyn (h NBV) and Vrijdag Zijnen (h NBV); Rockanje, "dune valley", 6.5.1949, Hagl., Sipkes & v. S. (h) together with *T. gelricum* v. S. (compare above); Oostvoorne, "humid dune valley", 25.4.1957, and "along humid foot paths" in the dunes, 28.4.1957, both Keuchenius (h U); Goeree, Kwade Hoek, 13.5.1964, v. Leeuwen (h RIVON) <sup>1)</sup> & v. S. (h), "in *Loto-Trifolion* with *Scirpus planifolius* Grimm. and *Carex distans* L"; Goeree, Westhoofd, 13.5.1964, v. Leeuwen (h RIVON) & v. S. (h); Dordrecht, 28.4.1939, Kloos (h v. S.); Ierseke, Moer, "in salt pasture", 6.5.1951, Groot & v. S. (h); Nieuw en St. Joosland, V.1877, "on salt clay and along creeks", Walraven & Lako (h AMD, GR, NBV); Hoedekenskerke, "in low pastures", IV. 1861, Walraven (h L, NBV); Domburg, "dunes", V.1877, Walraven (h NBV); Colijnsplaat, IV.1915, Huisson (h L, NBV).

Germany: Hüls pr. Crefeld, 1875, Vigener (h FI).

Also in England: Strettham Fen (Cambridge), V.1838, Stevens (h M); probably most of the plants from England quoted as belonging to sect. *Palustria*, belong to this subspecies.

A form, growing in higher grass or among higher plants, such as *Juncus maritimus* Lmk, differs from ssp. *limnanthoides* by erect growth, a height of 20–30 cm, lanceolate and only denticulate leaves. At first view it has such a different aspect, that it looks like a new species, but—though the achenes seem to be very slightly larger—there is no single characteristic of specific importance to separate it from ssp. *limnanthoides*; intermediate forms too can be found. This form is very similar to *T. gelricum* v. S. if plants of this species occur with practically smooth, lanceolate leaves (compare fig. 9, two plants); achenes are needed to distinguish them, those of *T. gelricum* having strong, obtuse spinules at the apex and being rough far downwards, whereas the achenes of *T. limnanthes* and its forms have more delicate and sharp spinules and are smooth downward.

*f. visserianum* v. Soest *forma nov.*

Planta ad 20–30 cm alta; folia erecta lanceolata, denticulata; achenia ca. 4.9 mm longa (pyramide inclusa).

*Typus*: Netherlands: Hoek, Koudenspolder, "humid pasture", 28.4.1961, A. de Visser (h L), also 22.5.1964, de Visser (h, h v. S.).

Furthermore:

Netherlands: Oostvoorne, grassy path in dunes, 22 & 23.4.1957, Keuchenius (h U); Goeree, Kwade Hoek, "together with *Juncus maritimus* Lamk." 13.5.1964, v. Leeuwen & v. S. (h) pp; Westerschouwen, Renesse-Haamstede, 21.5.1964, v. Leeuwen (h RIVON, h v. S.).

Belgium: "Marécages" entre Coxyde et Oostduinkerke, 8.5.1920, Magnel (h BR).

Germany: Pfalz: Landau, Godramstein, VI.1929, d'Alleizette, exsicc. Duffour 5920 (h Z); see also *T. hollandicum* v. S.

<sup>1)</sup> h RIVON stands for herb. of the State Institute for Field Biological research in behalf of the Protection of Nature.

35. *Taraxacum limosum* v. Soest **spec. nov.** (Fig. 14).

Planta 5–15 cm alta.

Folia interiora cano-viridia, petiolo angusto purpureo incluso ad 10 cm longa, lobata; lobi laterales (utrinque 3–4) erecto-patentes, deltoidei vel lingulati, ad 1.2 cm longi, saepe obtusi, interdum acuti, dorso interdum grosse dentati, nervo dorsali saepe  $\pm$  purpureo subaraneoso; interlobiis ad 1 cm longis, angustis vel sublatis, integris; lobus terminalis brevis, lobulis basalibus 5 mm longis deltoideis vel linearibus, lobulo apicali lineari ad 1 cm longo vel lingulato. Folia exteriora minus divisa lanceolata, sinuato-dentata vel breviter lobata.

Scapus glabrescens.

Involucrum obscure viride, mediocre, angustum, ca. 10 mm latum, ca. 12 mm longum, basi ovatum, squamis exterioribus adpressis, parvis ovato-lanceolatis (vel inferioribus lanceolatis interdum in bracteolas decrescentibus), 3.5–4.5 mm longis, viridi- vel purpureo-marginatis.

Calathium ca. 1.5 cm diametro, paulo radians, pallide (?) luteum. Ligulae marginales extus stria cano-violacea notatae. Antherae polliniferae. Stylus et stigmata virescentia.

Achenium dilute brunneum, 4.5 mm longum (pyramide inclusa), superne dense argute spinulosum, ceterum rugosum—basi laeve, in pyramidem subcylindricam subangustam 1–1.2 mm longam subabrupte abiens; rostrum 8–9 mm longum. Pappus albus 5–6 mm longus.

*Typus*: Austria: Burgenland: St. Andrä, “in limosis salsis” ad lac. Zicklacke, 18.5.1930, K. H. Rechinger (h), also in h K.

Furthermore in the same region of the Neusiedler See (map 3.5): “in limosis salsis” inter Neusiedl et Weiden a/See, 1.5.1926; “salzige Stellen” zwischen Weiden und Podersdorf, 13.5.1926; Neusiedlersee, südlich von Weiden, 16.5.1926, all Rechinger (h W); Neusiedlersee zwischen Weiden und Podersdorf, and: “Moorboden” am Rande einer Lacke in den Neusiedler Wiesen zwischen Weiden und Podersdorf, both 1.5.1932, Korb (h W) pp; Podersdorf, In der Stölle and: am Oberstinler See, 13.4.1954, Melzer (h) verisim.; Podersdorf, “Sumpf”, 15.5.1958, Rechinger (h W, h v. S.); Illmitz, 21.6.1956, Rechinger (h W) pp. Probably in the same region: Rattersdorf pr. Güns, “feuchte Wiesen”, 28.4.1890, Waisbecker, (h M); St. Georgen, “Sumpfwiesen” im Schur, 10.5.1908, . . . (h W), among the ten or more localities named St. Georgen, there is one near Bratislava, not far away from the region mentioned. Plants looking similar, but not with certainty identifiable, have been found in northern Bohemia.

The Neusiedler region was visited by me in the summer of 1963; I collected plants belonging to sect. *Palustria* and possibly to this species. *T. bessarabicum* (Hornem.) HM too is common in that region, but this species belongs to sect. *Leptocephala* v. S. An analysis of water from there showed:  $P_H = 7.5$ ; 427,5 mg  $HCO_3^-$ , 14 mg  $CO_2$  and 34.2 mg  $Cl^-$  per 1000  $cm^3$ ; a flame-photometric analysis, furthermore, learned that the ratio of potassium to sodium was 6:5.

*T. limosum* is allied to *T. vindobonense* v. S.; the involucre is not as dark as in that species, the outer bracts smaller, the stigmata greenish, the scapes less hairy. The lobes of the leaves are deltoid and either spreading or, often, directed slightly upward; in *T. vindobonense*,



the lobes are mostly triangular and never directed upward; they are, moreover, often less lobate and only sinuate-dentate.

*Taraxacum lissocarpum* Dahlst., see under *T. lividum*.

36. **Taraxacum lividum** Petermann 1849 (used in a broad sense); *Leontodon lividus* Waldstein & Kitaibel 1805 s. str., tab. 11.5; *T. palustre* (Ehrhart) Dahlstedt ssp. *lissocarpum* Dahlstedt 1907; *T. lissocarpum* Dahlstedt 1928, p. 24, fig. 6, tab. 3.

The extensive description given by Waldstein & Kitaibel—may be not as precise as is required nowadays in describing *Taraxacum* micro-species—is not amended here, as I feel sure that this species is identical to *T. lissocarpum*, of which a complete description was given by Dahlstedt. In 1905, Dahlstedt discussed *T. palustre* (Ehrh.) Dahlst. and *T. lividum* (W. & Kit.) Peterm.; the first one should lack pollen whereas the second one should have it; later on Dahlst. did no longer discuss *T. lividum*, and, on the other hand, he also mentioned forms of *T. palustre* furnished with pollen. Nowadays *T. palustre* is replaced by *T. suecicum* Hagl. (see below) and partly by *T. austrinum* Hagl. The first one rarely produces pollen, the second one always has pollen. Since I have seen the plants of *T. lividum* (*Leontodon lividus*) reported from Hungary, I observed that these too were lacking pollen, thus opposite to what Dahlst. had reported. The at the base very broad outer involucre bracts are characteristic as well in *T. lividum* from E. Europe as in *T. lissocarpum* from Scandinavia. Though Dahlst. in his description of *T. lissocarpum* mentions yellow stigmas, I noticed greenish ones in his type material; this type is based on cultivated plants of luxurious growth.

The name *lividum* afterwards was used in a far more general way as it was intended by Waldstein & Kitaibel; this has led to much confusion of which probably Dahlstedt too was a victim.

In *T. lividum* pollen is absent; the styles are yellow and the stigmas greenish; the involucre bracts are broad, shortly ovate; the margin to these is large, membraneous and often brown-bronze-coloured; spinules are lacking on the achenes; at most, a few small tubercles are present.

*Area of distribution* (map 4.4):

Hungary: the localities given by Waldstein & Kitaibel are: "loc. ulig. subsalsis" agri Pesthensis velut supra rivum Rákos & versus Soroksár pr. Danubium. From the first locality I know plants collected by Láng as *L. lividus* (h K, L, M, P); the plant in h M I have chosen as *lectotypus*. Furthermore: Budam, "in uligin.", Láng, as *T. lividum* (h L); Budapest, 21.5.1876, Hippe (h Z).

Poland: Breslau, Lissaer Wiesen pr. Maschelwitz, 28.4.1878, Ansoerge (h ZT) pp; nach Stabelwitz zu, V.1874, Ansoerge (h M) pp; Silesia, Kaberwitz, Muenke (h W); Bresa-Muckerau pr. Breslau, 13.5.1877, Ansoerge (h Z) pp.

Czechoslovakia: Prag, "in paludibus", Poech (h GE, Z); Monacho-Hradeca, Sekera (h BR) verisim.; Iglau, Reichardt (h W).

- Austria: Austria inf., Laxenburg, "feuchte Wiesen", 14.5.1922, Rechinger (h W), with small pollen grains; Neuwaldegg, "in pratis paludosis silvaticis", Pernhoffer, Fl. Exsicc. Austro-Hung. 3753 (h L, M, W, Z, ZT) pp.
- Germany: Mecklenburg: Prenzlau, Grantzow, V.1871 (h BR) and VI.1878 (h P pp, W); Prenzlau, Wiese pr. Hindenburg, Heiland (h BR), also Grantzow V.1875 (h GE) pp; Brandenburg: Lychen in der Uckermark, Heiland (h W) pp; Brandenburg, Schramm (h BR); Potsdam, "in prat. pal.", 13.5.1903, Gallasch (h M) pp; Sachsen: "auf sumpfigen Wiesen" pr. Aschersleben, 10.5.1882 & 12.5.1883, Preusse (h JE, M); Langenheimersdorf pr. Pirna, "Sumpfwiesen", 21.5.1876, Hippe (h L) pp; Nietleben, "in pratis humidis" ... (h ZT) pp; Leipzig, Delitzsch, Alioth (h GE) pp.
- Sweden: several districts mentioned by Dahlst. 1928, but mainly Oeland and Gotland; from the latter isle the type of *T. lissocarpum* originated, which was cultivated in Stockholm!
- Finland: mentioned by Lundevall 1962 (as *T. lissocarpum*). Recordings from *T. lissocarpum* from the Netherlands (v. S.) and Denmark (Raunkiaer) are erroneous.

### 37. *Taraxacum murbeckianum* Haglund 1939, p. 538, fig. 3.

*Typus*: cultivated specimen from: Turkey: Armenischer Taurus, Massiv oberhalb dem Dorfe Darnis Ashagi, nördlich von Shatak, 2500 m, 26.6.1936, Frödin (h S!).

Furthermore:

Turkey (Asia): Renkoei, in mont., 10.4.1884, Sintenis, It. Trojanum 1883.260 (h K, det. v. S.).

Greece: Parnassus (h S!), compare Hagl. 1939, p. 539.

Hagl. did not indicate to which section *T. murbeckianum* belongs, but to my view the plants belong to sect. *Palustria*; there is only one exceptional character: the outer involucrel bracts are partly provided with small gibbositities. Though HM 1907 mentions this characteristic for "*T. paludosum*", he most probably based this conclusion on specimens from central Asia, which do not belong to sect. *Palustria*. *T. scaturiginosum* Hagl. ap. Samuelsson too possibly belongs to this section: Greece, Turkish Asia.

### 38. *Taraxacum neo-Aellenii* v. Soest *spec. nov.* (Fig. 15); *T. aellenii* Haglund nomen, cum descr. in h. Aellen, non *T. aellenii* v. Soest 1960.

Planta humilis ad mediocriter alta.

Folia subprasino-viridia, glabriuscula, vulgo linearia, petiolis angustis alatis, ± rubro-violaceis. Lobi laterales parvi, subtriangulares vel deltoidei, acuti, integri, dentibus paucis et minimis muniti. Interlobia mediocriter longa vel longa, latiuscula vel angusta, integra. Lobus terminalis parvus, breviter sagittatus vel hastato-sagittatus, ± acutus, non raro utrinque dente parvo instructus.

Involucrum mediocre ad sat magnum, subobscurum viride, basi sat ovatum. Squamae exteriores adpressae, ovatae vel ovato-lanceolatae, ad 4 mm latae, anguste albido- vel roseolo-marginatae, in apicem obtusiusculum attenuatae, interdum sublineares, apice obscurae.

Calathium sat saturate luteum. Ligulae marginales extus stria fusco-violacea notatae. Antherae polliniferae. Stylus et stigmata virescentia.

Achenium (maturum non visum) fusco-stramineum, ca. 4 mm longum (pyramide inclusa), superne breviter et sat dense spinulosum, ceterum humile tuberculatum, basi laeve, in pyramidem ca. 0.7 mm longam subcylindricam abiens.

*Typus*: France: Ht-Rhin: "sumpfiges Gelände" auf den Fussballplatz Haberhäuser-Blotzheim, 21.4.1936, P. Aellen (h, h v. S.).

Furthermore:

France: Hte-Saône: Confracourt, "prés humides", à Magny-Robert, V.1895, Bertrand (h M), "together with *T. udum* Jord."; Aisne: Laon, 1.5.1899, Lüscher (h ZT); Ardennes: Virzy, vallée de l'Aisne, 11.5.1963, Duvigneaud (h, h v. S.), "together with *T. laeticolorifrons* Hagl.", see above; Saarbrücken, 25.4.1885, Wirtgen (h W) pp?; Bitche, "prairies humides", V. . . ., F. G. Schultz, Exsicc. Schultz-Bip. 45 (h L) pp; Wissembourg, "prairies humides et lieux marécageux", 29.4.1863, F. Schultz, Herb. norm. 87 (h L, M, W) pp.

Belgium: distr. Campinien: Wintershoven, IV.1876, Bamps (h BR), in v. S. 1956b, as *T. limnanthes*.

Switzerland: Zürich, Eisfeld pr. Oerlikon, 9.5.1895, v. Tavel (h ZT) pp.

This is a rather critical species. The typical material, which was collected in abundance (however, without achenes), is well-defined, but the plants from the other localities are dubious. Haglund's description, published above as given by him, mentions a short pyramid on the (immature!) achene; from Saarbrücken I saw ripe achenes with a long cylindrical pyramid. The outer involucre bracts are mostly rather narrow in comparison to those found in other species allied to *T. hollandicum* v. S.; Haglund says of them "up to 4 mm wide", but this is, I think, generally too much; these bracts mostly are attenuate towards the top, and not acuminate.

The leaf form is rather characteristic, but it must be said that the same shape can be found in aberrant forms of *T. hollandicum*; earlier (1942) I reported those plants as *T. egregium* Marklund; this was wrong. *T. hollandicum* always has broad, ovate outer involucre bracts and more yellowish-green leaves.

### 39. *Taraxacum olivaceum* v. Soest spec. nov.

Planta sat magna ad 30 cm longa, glabra.

Folia gramineo-viridia, petiolo angusto purpureo inclusa ad 17 cm longa, lanceolata, ad 1.5 cm lata, subobtusata, inconspicue sinuato-denticulata, nervo mediano pallido vel partim purpureo.

Scapus pallide cupreus, crassiusculus.

Involucrum basi ovatum, olivaceum. Squamae exteriores adpressae, ovatae, 4-6 mm longae, 3-4 mm latae, in apicem obtusam abrupte contractae, zona sublata pallida marginatae.

Calathium flavum, radians ad 4 cm diametro. Ligulae marginales extus stria fusco-violacea vel -purpurea notatae. Antherae polliniferae. Stylus luteus; stigmata virescentia.

Achenium olivaceo-stramineum, 5 mm longum (pyramide inclusa), superne parce et minutissime tuberculatum, ceterum laeve, in pyra-

midem subcylindricam 1.3 mm longam subabrupte abiens. Rostrum 8 mm longum. Pappus albus, 5 mm longus.

*Typus*: Austria inferior: Moosbrunn, "Sumpfwiese mit *Carex davaliana* Sm., *flacca* Schreb. and *hudsonii* A. Benn.", 17.5.1959, Metlesics (h Melzer); also: 10.5.1919, Zerny (h W), involucre rather darkgreen.

Furthermore (map 5.2):

Austria inf.: "Sumpf" pr. Münchendorf, 9.5.1907, Vetter (h W); Kärnten: Villach, Sumpfwiese, 15.5.1958, Melzer (h) with the extreme outer involucre bracts partly ovate-lanceolate.

This species looks like a "magnification" of *T. tenuifolium* (Hoppe) Koch, but the involucre are in *T. olivaceum* relatively less narrow and pollen is present. It is related to *T. carniolicum* v. S.

#### 40. *Taraxacum pollichii* v. Soest *spec. nov.* (Fig. 16).

Planta 7–12 cm alta, basi araneoso-pilosa, ceterum glabra.

Folia pallide viridia ad glauco-viridia, oblanceolata, breviter lobata vel sinuato-dentata, obtusa petiolo subangusto roseolo incluso 8–12 cm longa, 1.3 cm lata. Lobi laterales subacuti, patentes ad 4 mm longi, deltoidei interdum dorso denticulato; interlobis ad 6 mm latis, saepe paulo evolutis; lobus terminalis sat brevis, anguste sagittatus vel saepissime indistincte determinatus, lobulis basalibus patentibus deltoideis ad 3 mm longis, lobula apicali sublingulato, ad 15 mm longo, ad 8 mm lato, integro. Folia exteriora parva, integra.

Scapi foliis subaequilongi, praesertim fructiferi arcuati.

Involucrum crassum, basi ovatum, breve, 10–12 mm latum, ad 10 mm longum. Squamae exteriores adpressae, ovatae 3–3.5 mm latae, 6 mm longae, interdum sublonge acuminatae, obscure olivaceo-virides, zona sublata pallida vel roseola marginatae.

Calathium flavum, 2 cm diametro. Ligulae breves, extus pro parte stria atro-violacea notatae. Antherae polline carentes. Stylus subluteus, stigmata leviter fusciscentia.

Achenium 3.8 mm longum (pyramide inclusa), superne breviter et obtuse spinulosum, ceterum laeve, in pyramidem cylindricam 0.8 mm longam abrupte abiens. Rostrum 8 mm longum. Pappus albus, 4 mm longus.

*Typus*: Germany: Pfalz: Dürkheim, "in pratis salinas", 30.4.1841, Schulz-Bip. (h BR), the same exsicc. Cichoriaceothesca 71, also in h K, L, P; moreover, not as this exsicc. 71, in h GE and h Koch (h L). *Cotyphus fructifer*: Thüringen, "auf feuchten Wiesen" um Oberndorf pr. Arnstadt, Lucas no. 2043 (h GE, L, ZT, pro parte). Finally (map 5.3): Sachsen, "in pratis humidis" ad Nietleben, . . . (h ZT) pp.

*T. pollichii* is allied to *T. neo-Aellenii* v. S., from which it differs by the paler-coloured stigmas, lack of pollen and the presence of araneous hairs on the scapes; the ligules are shorter; *T. alsaticum* v. S. is easily distinguishable by narrower, nearly lanceolate outer involucre bracts.

*Leontodon salinus* Pollich, Hist. pl. Palatinat (1777) p. 380, is de-

scribed in a very general way, such that all species of the section with *glabrous* scapes and *denticulate* leaves could be identified with it. Though Pollich mentions the same locality for this species, I hesitate to identify both species, as just glabrous scapes and dentate leaves do not apply to *T. pollichii*. The exsiccatum by SB, referring to *L. salinus* Pollich, is named *T. salinum* SB, see also in Bischoff 1851, p. 155.

#### 41. *Taraxacum pseudo-balticum* v. Soest **spec. nov.**

Planta sat robusta, ad 18 cm longa, inferne  $\pm$  araneoso-pilosa, ceterum glabra vel sub calathio paulo araneosa.

Folia linearia vel lineari-lanceolata, breviter patento-lobata vel sinuato-dentata vel -denticulata. Lobi laterales ad 5 mm longi, deltoidei vel lingulati; petiolis purpureis.

Involucrum crassiusculum ad 13 mm latum, ad 15 mm longum, basi rotundatum. Squamae exteriores adpressae, late ovatae, ad 8 mm longae, ad 6 mm latae, breviter acuminatae, zona latissima pallida vel purpurea marginatae (ad 1.5 mm), ceterum obscure virides.

Calathium paulo radians, flavum. Ligulae marginales  $\pm$  planae, angustae, extus stria atro-violacea notatae. Antherae vacuae. Stylus luteus, stigmata lutea vel paulo virescentia. Floret vere. Achenium ignotum.

*Typus*: Austria: Burgenland: Neusiedlersee, "im Schilf" am Rande des Sees pr. Weiden, 1.5.1932, Korb (h W) pp; a form with entire leaves, same date and collector: "auf Schilf- und Moorboden" am Rande des Sees (h W) pp, to be considered as co-type; both in company with *T. vindobonense* v. S.

Furthermore:

Austria: Burgenland: "auf Moorboden" am Rande einer Lacke zwischen Weiden und Podersdorf, 1.5.1932, Korb (h W) pp; for the salt-composition of the Neusiedlersee, see under *T. limosum* v. S.; Austria infer.: Laab im Walde, "Sumpfwiese" an der Tiergartenmauer, 2.5.1908, Vetter (h W), together with *T. vindobonense* v. S.

Germany: Bavaria: Schliersee, 27.5.1888, . . . (h M); Attaching-Freising, Erdinger Moos 435 m, 1900, Stadler, Fl. Exsicc. Bavar. 543 a (h GE, M) pp.; from this locality unripe achenes are present, showing tubercles and a long conical pyramid.

Apparently, this species is allied *T. vindobonense* v. S., with which it is often found together; it is easily distinguishable from that species by the lack of pollen, yellow stigmas, a broader margin to the outer involucre bracts, and by the mostly glabrous scapes.

42. *Taraxacum suecicum* Haglund apud Hård av Segerstad 1952. p. 364; Borgvall & Haglund 1957; Saarsoo & Haglund (†) 1962; *Leontodon palustre* Ehrhart 1790, non Lyons 1763; *T. palustre* Dahlstedt 1905 pro maxima parte, 1907, 1928, non Lamarck & De Candolle 1806.

Already Dahlstedt mentioned the long cylindrical pyramid of the achene, which reaches a length of 1.5 mm; characteristic, furthermore, are the very sparingly spinulose achene, the involucre, which is washed vividly purple on a pale green background, and the pure yellow

stigmas. Pollen is mostly lacking; rarely it is found provided with pollen (Oeland!, Gotland!). Though not reported elsewhere, I think the lack of araneous hairs below the flower head is characteristic too.

*T. suecicum* has a few characteristics in common with *T. tenuifolium* (Hoppe) Koch from S. Europe; the latter is well distinguishable by its narrow, nearby cylindrical involucre, by the grey-green colour of the leaves and by the pure-green involucre.

The area of distribution of *T. suecicum* is rather small: it is common in the central! and southern! part of Sweden and on the isles Gotland! and Oeland!; an exsicc. Dahlst. IV.7 (1914)! from Gotland bears the name *T. palustre*. I have not seen material from other Fenno-Scandinavian countries; in Denmark it is replaced by *T. austrinum* Hagl. Outside this region, Dahlst. 1905 mentioned for *T. palustre*: Preussen and Thüringen; 1907: Preussen: Prenzlau, Hindenburg, leg. Grantzow 1878, 1880; from the last-mentioned locality I know plants in several collections, of which none, I think, belong to *T. suecicum*.

In fact, this species seems to be rare outside Sweden. Plants, closely resembling it, can be reported from the following localities:

- Germany: Brandenburg: "auf nassen Wiesen", 13.5.1854, Schramm (h P, W); Nauen, 1961, Ascherson (h JE); Nauen, "saure Wiese" beim Bredower Forst, 22.5.1881, Heusger (?) (h AMD); Potsdam, "in pratis palustribus", Golma Bruch, 7.5.1904, Gallasch (h Z) with rather spinulose achenes; westlich von Brieselang, 10.5.1857, W. Müller (h JE); Paulinen-Aue, "Wiesen" nördlich von der Station, 3.6.1883, Scheppig (H AMD).
- Thüringen: Erfurt, h Vogel (h ZT), partly with a few araneous hairs on the scape; Gütterlitzer Moore pr. Auma, 1.6.1899, Naumann (h JE).
- Niedersachsen: Misburg, 1883, Busch (h AMD); Celle, Schweinebruch, V.1879, Nöldeke (h Z) pp.
- Pfalz: "pratis" pr. Wolfstein, h Koch (h L).
- France: Loir-et-Cher: Maray, "prairies humides", 5.5.1917, Segret (h Didier, v. S.), involucre only sparingly coloured.

43. ***Taraxacum tenuifolium*** (Hoppe) Koch, Flora I (1840), p. 374; Syn. Fl. Germ. & Helv. 2e ed. (1843), 3e ed. (1857); Taschenb. Deutschl. Fl. (1844); *Leontodon tenuifolius* Hoppe apud Sturm 1821; *T. palustre*  $\gamma$  *tenuifolium* Hoppe apud De Candolle 1838. Accepted as species by many authors. *Icones*: Sturm l.c., V, as *L. tenuifolius* Hoppe & Sturm; Reichenbach, Icon. Fl. Germ.-Helv. 1858 tab. 52, as *T. tenuifolium*.

*T. tenuifolium* is perfectly characterized by: linear, non-dentate, glabrous leaves with obtuse apex, glabrous scapes, narrow flower heads with strictly appressed, short and obtuse outer bracts, lack of pollen, pure yellow stigmas, smooth or only very slightly tuberculate achenes with a very long cylindrical pyramid (up to 2 mm), with a very short rostrum (4 mm, twice as short as in *T. suecicum* and in many other species of the section). Generally, *T. tenuifolium* is very constant in each detail, only the Modena plants carry pollen or have slightly araneous scapes; just at that place they are found together with *T. balticiforme* Dahlst. f. *fusco-squameum*.

*Area of distribution* (map 3.6):

- Istria: Zaule, Marchesetti, Exsicc. Fl. Austr.-Hung. 72 (h P) and 205 (h K, L, P); "in pratis salinis" pr. Zaule, III.1920, Marchesetti, Exsicc. Fiori & Béguinot 2792 (h K, P, Z); Zaule, 1802, Vallem (h S), 1857 and IV.1869, de Tommasini (h W), 1874 (h M), (h Z); pr. Saule in vicinia Tergeste, Hoppe (h Z); "in pratis paludosis praesertim salsis" pr. Servola et Zaule, 1821, Schiede (h BR, M); "prairies marécageuses" pr. Servola et Zaule, 20.4.1865 & 1.5.1865, de Tommasini, F. Schultz Herb. norm. 891 (h BR, K, L, M, P, W); "Salinen" ausser Servola, 8.4.1883, Kammerer (h W); "in pratis udis" pr. Tergestum, 24.8.1840, de Tommasini, Schultz-Bip. Cichor. 70 (h BM, Br, K, L, O, P, S, W); Triest, "salzige Sumpfwiesen", de Tommasini (h CHUR, M), Freyer (h M), Lagger (h Z), Fischer (h M), 1826, Fleischer (h BR, K, P), Breindl (h K), Schiede (h BR), 1866, Braig (h BR); Opčima pr. Triest, Meebold no. 5963, IV. 1923 (h M); Monfalcone pr. Triest, Meebold no. 5964, V.1927 (h M); Panzano, 11.4.1908, Knetsch (h Z); im Walde Milare pr. Triest, 22.4.1856, Mirich (h L, W) and Kick (h Z); Muggia, in fossis lapidosis montis templi S. Brigidae, 5.4.1905, Evers (h Z); S. Clement pr. Muggia, de Tommasini (h W); Besca, auf der Insel Veglia, de Tommasini (h W); Capo d'Istria, Vatova (h K), 1863, Loser (h S).
- Modena: prato delle manovre, V.1882, IV.1885, Vaccari (h M), 1887, Vaccari (h AMD); "prati umidi", IV.1883, Ferrari (h M) pp, 8.4.1885, Mori (h M, Z). IV.1892, Mori (h Z), both with pollen; "in pratis humidis", 1882, Gibelli (h L, ZT); "Sumpfwiesen", 12.4.1889, Mori (h W), IV.1889, Certo (h M), "prati presso", V.1899, Mori (h Z) pp; Campo di Marte, IV.1891, Mori (h M, W, Z) with pollen. The plants from Modena generally have shorter pyramids on the achenes.
- Venetia: "in herb. hum. (et subsals.?)" pr. Mestre ad margines Lacunae, 15-30. 4.1910, Exsicc. Fiori et Béguinot 1594 (h Z, ZT), *forma luxuriosa*.
- Dalmatia: Zara, Prior (h K), 14.4.1911 and Salona, 9.4.1908, both Schneider (h W); Buccariza, 1885, D. Hircz (?) (h AMD), a weak form.

44. **Taraxacum turfosum** (Schultz-Bip.) v. Soest 1961, p. 281, fig. 3; *T. salinum* var. *turfosa* Schultz-Bip., Cichoriaceotheca 72.

*Typus*: Austria super.: "in turfosis" circa Wasserlos pr. Mondsee, Hinterhuber (h L), also in h BM, BR, K, P.

In the description the achenes, which are lacking in the type material, have not been mentioned; I now have seen abundant material from this species from C. Europe, though ripe achenes are rarely present:

Achenium stramineum, 3.7 mm longum (pyramide inclusa), superne paulo argute spinulosum, ceterum laeve, in pyramidem 0.7 mm longam cylindricam abrupte abiens; rostrum 10 mm longum; pappus niveus, 5-6 mm longus.

In 1961 I could give only two localities from Upper-Austria and Bavaria; I now can add:

- Bavaria: Oberfranken, Memmelsdorf, "moorige Wiesen" pr. Senhof 260 m, 2.5.1904, Höfer (h M) pp; Bayreuth, Bindlach, V.1853, Walther (h L), 29.4.1877, Meyer (h JE), 3.5.1877, Meyer (h L); Weilheim, Paterzell, VI.1925, Weisenbeck (verisim.); Hochstädter Moos, 21.5.1850, Sendtner; Neuburg, Burgheim, 3.5.1903, together with *Primula farinosa* L and *Gentiana verna* L, Gugler; Dachauer Moor, pr. Karlsfeld, 5.5.1886, Schnabli; Fürstenfeldbruck, Maisach, 10.5. 1904, Naegele; unter Schliessheim, 7.5.1904, Naegele; Ebersberg-Eding in Schwaben, 10. 5.1925, Weisenbeck (verisim.), all (h M); Rieden (Füssen) in Schwaben, 23.5.1900, Zick, Fl. Exsicc. Bavar. 543 b (h GE, M); München, Kummer (h M), Spitzel (h M), Brügger, Freimann, 22.5.1852

- (h, Z, ZT); Moosach, 11.5.1871, Prantl (h W); München, Isar-insula, 1824, Zuc-carini (h M); Lamsdorfer Moor, 11.5.1902, Vollmann, Memmingen, Kardorfer Weiher 606 m, 23.4.1882, Holler; Peissenberger Zone, Adulsreut pr. Wolfrats-hausen, 20.5.1863, Schwarz; Türkenfeld nördlich des Ammersees, 18.5.1904, v. Schoenau, all (h M); Starnbergersee, Bischoff (h L); Schliersee, and Berchtes-gaden, 31.5.1944, both Merxmüller (h).
- Baden: Staad-Mainau, Ueberlingersee 410 m, 6.5.1899, Knetsch (h Z).  
Hessen: "Torfmoor" pr. Marburg, V.1892 . . . (h M).
- Saxony: Elbsandsteingebirge, Langenheimersdorf, 19.5.1912, Weder, Pl. Crit. Saxon. 21 (1918) 514 (h GE, M, Z); Frankenheim, "in pratis salsis", . . . h Lejeune (h BR); Numburg, "in prato palud. salso", 2.5.1882, Vocke (h M) pp; Allendorf pr. Göttingen, 1882, . . . (h M).
- Silesia: Tischen, 15.6.1915, Schneider (h W).
- Czecho-Slovakia: "Wiesen" pr. Jablunka, V.1912, Machaček, Fl. Bohem.-Morav. Exsicc. 1168 (h ZT).
- Rumania: Cluj, Val Valea, 1923, Nujorean & Nyárády, Fl. Roman. Exsicc. 1586 (h GE, K, O, P, Z).
- Austria: Wien, Dornbach, Czagl (h ZT) pp; Kalksburg, "Sumpfwiesen", V.1874, Wiesbaur (h M); Neuwaldegg 300 m, Pernhoffer, Fl. Exsicc. Austr.-Hung. 3753 pp et verisim. (h L, W, Z, ZT); Tirol, Windschmatrei, 1866, Gander (h JE, K); Telfes, Stubaital 1100 m, Bakker (h); Achain, 1912, Korb (h W).
- Switzerland: Kant. Schaffhausen, 2.5.1936, Kummer (h ZT); Lenzersee (Grau-bünden), 11.6.1857, Theobald (h CHUR).
- Italy: S. Tirol: Massera, Vettenheim pr. Sand-Taufers 1000-1200 m, 28.5.1881, Treffer (h M).

Like *T. austrinum* Hagl. and *T. balticiforme* Dahlst., this species is polliniferous, has smooth yellow stigmas, araneous hairs below the flower head and lanceolate, dentate or shortly lobate leaves; the lobes in *T. turfosum* often are triangular; *T. austrinum* has ovate, appressed and obtuse outer involucre bracts; *T. turfosum* has more or less lanceolate and partly acute outer bracts, which are recurved at the apex. In *T. bavaricum* v. S. and *T. vindobonense* too the extreme-outer bracts are sometimes acute, but these species differ in many respects from *T. turfosum*. *T. balticiforme* has, at least in most of its forms, clearly two-coloured outer bracts, viz. a white or purple-coloured margin and a dark-green median field; *T. turfosum* has bracts with a more homogeneous colour distribution, viz. olivaceous, washed with purple; if such colour is found in certain forms of *T. balticiforme*, the latter can be distinguished from *T. turfosum* e.g. by the fact that the outer involucre bracts are never acute.

#### 45. *Taraxacum udum* Jordan 1852; Verlot 1872; Fig. 17.

This species has erroneously and on a very heterogeneous way been interpreted by several authors; mainly it has been considered to be an intermediate form between *T. paludosum* Scop. and *T. vulgare* Schrk. There is no doubt that the species described by Jordan belongs to sect. *Palustria* Dahlst. Material identified by Jordan confirms this view. The area of distribution is restricted to W. Switzerland, S.E. France and N. Italy (map 2.5).

As in many *Taraxacum* species, the leaves appearing in different seasons of the year are different in shape; those of the flowering period are considered as "typical". In countries with a mild climate,



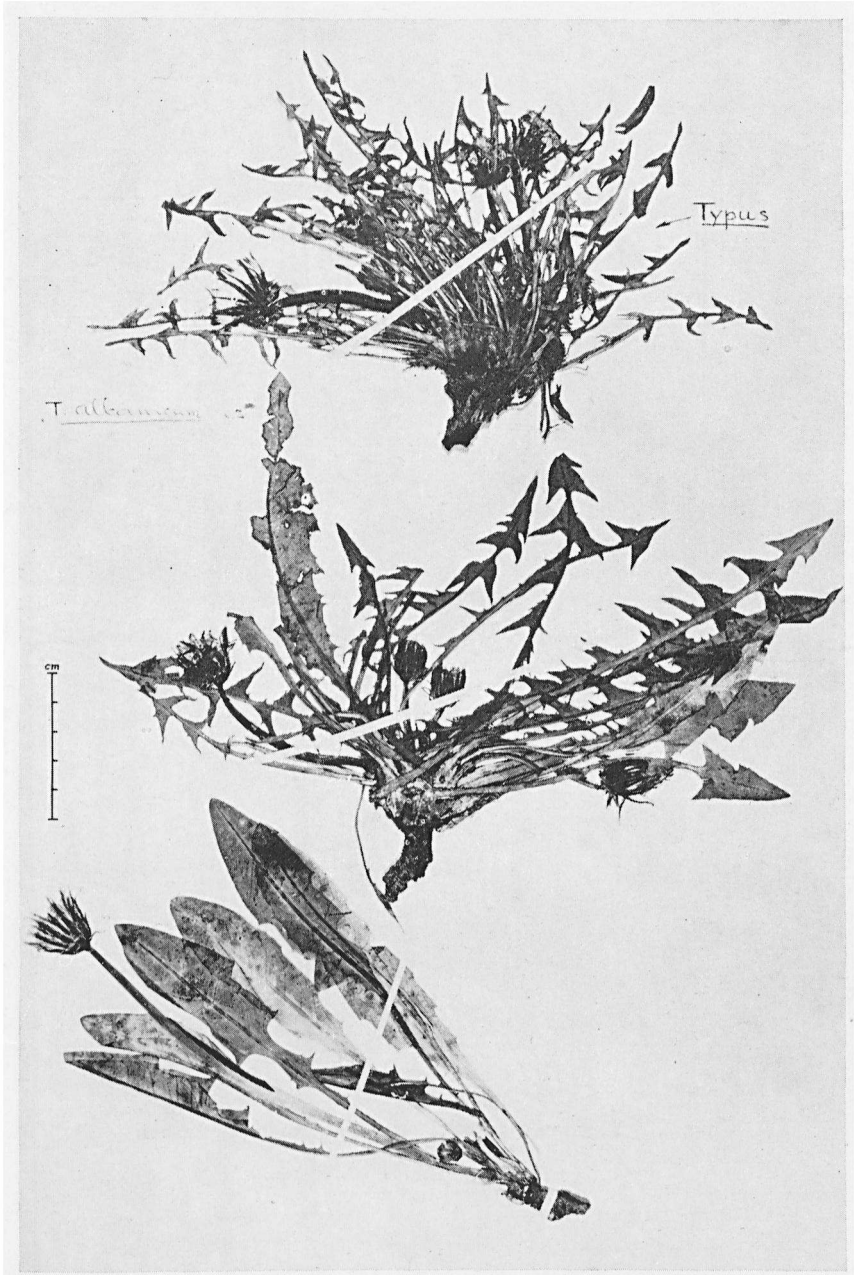


Fig. 1. *T. albanicum* v. S., Albania: Fieri, Schneider.

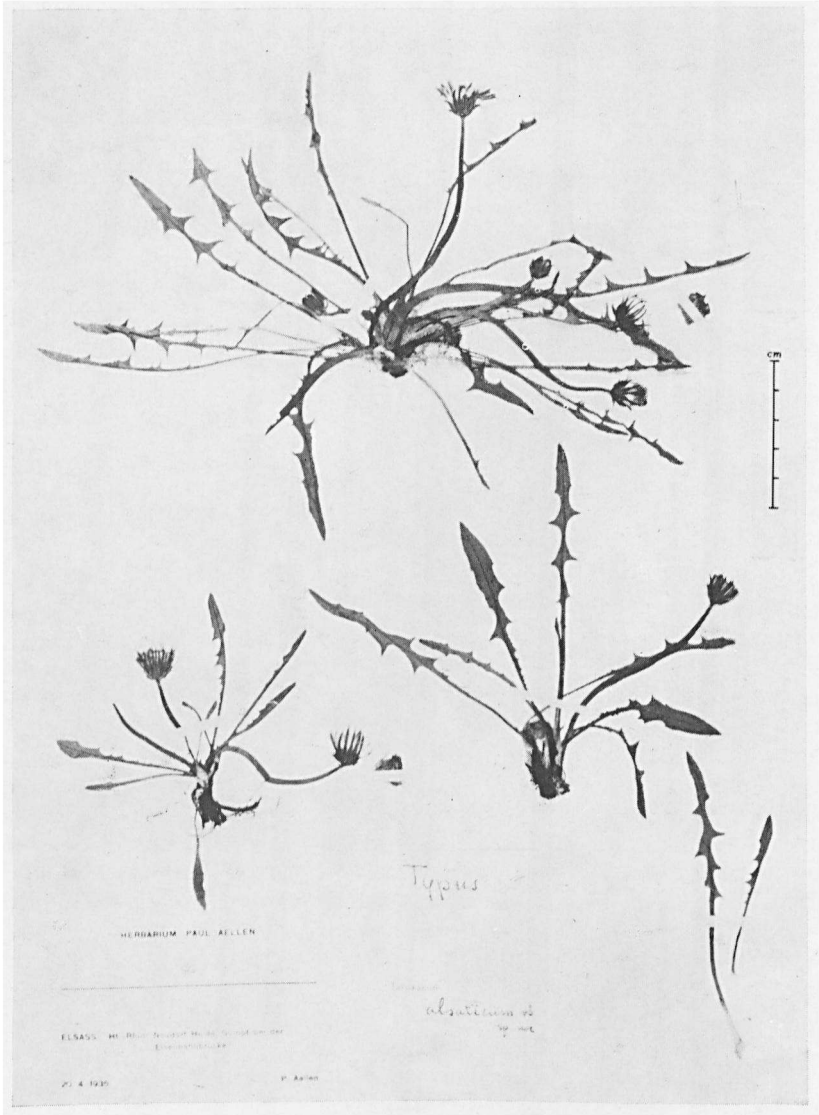


Fig. 2. *T. alsaticum* v. S., Ht-Rhin: Neudorf, Aellen.



Fig. 3. *T. apiculatum* v. S., Thüringen: Artern, Kappel.

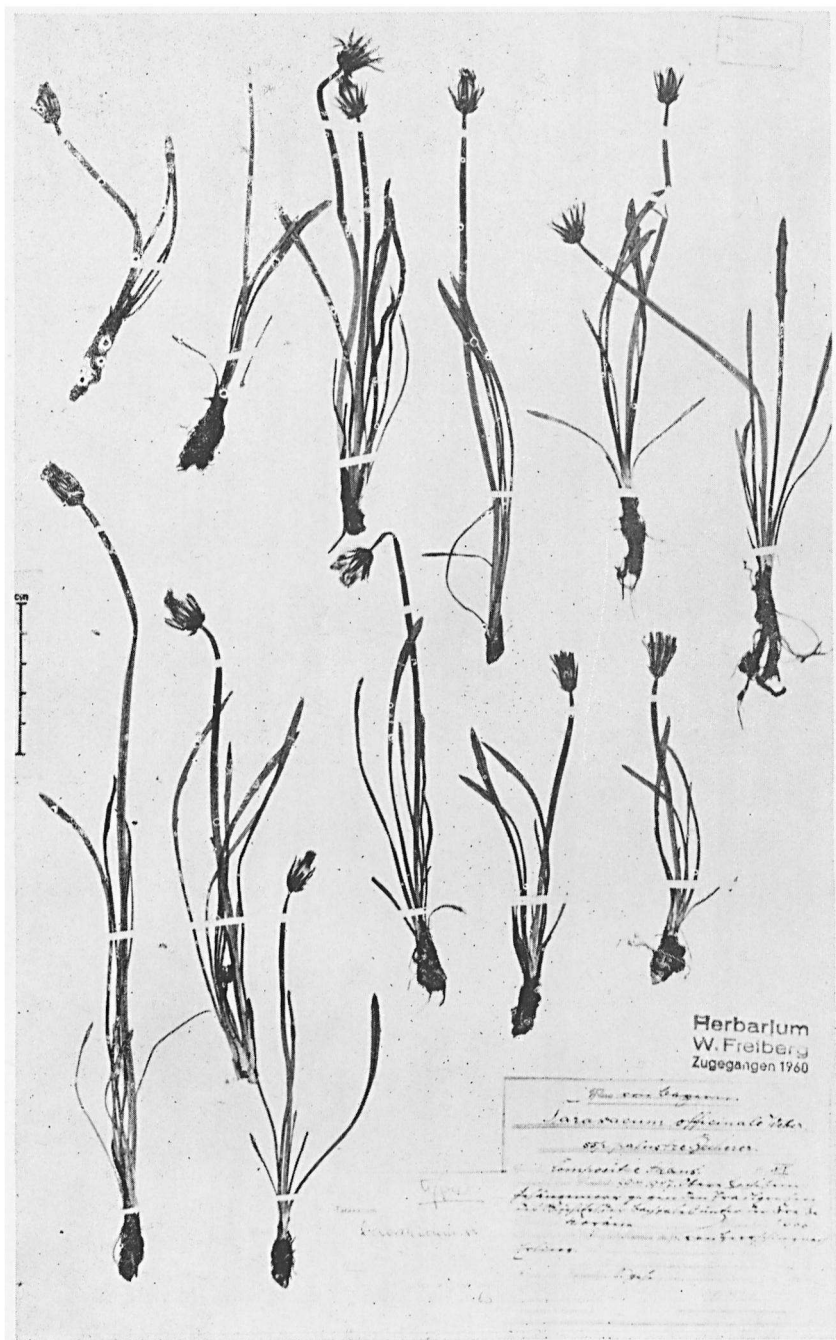


Fig. 4. *T. bavaricum* v. S., Bavaria: Herrsching-Erling, Freiberg.

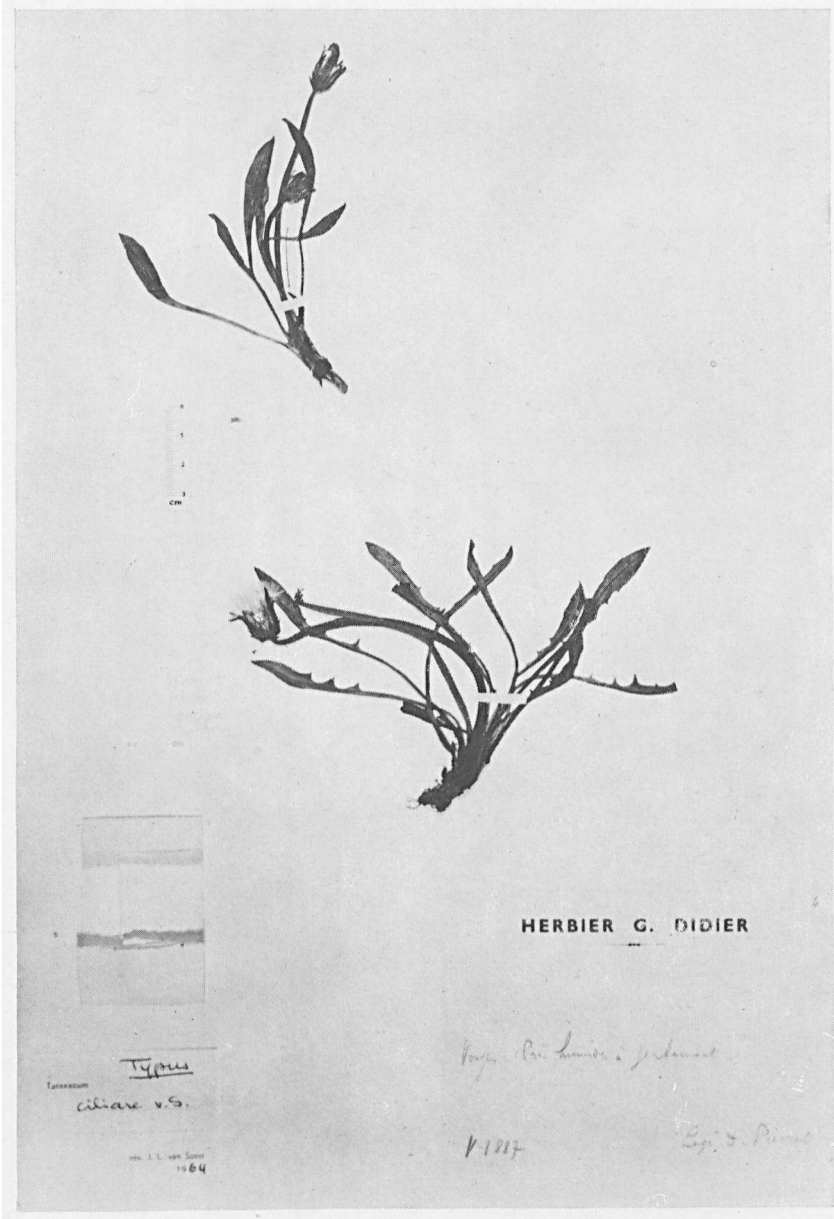


Fig. 5. *T. ciliare* v. *s.*, Vosges: Gerbamont, Pierat.

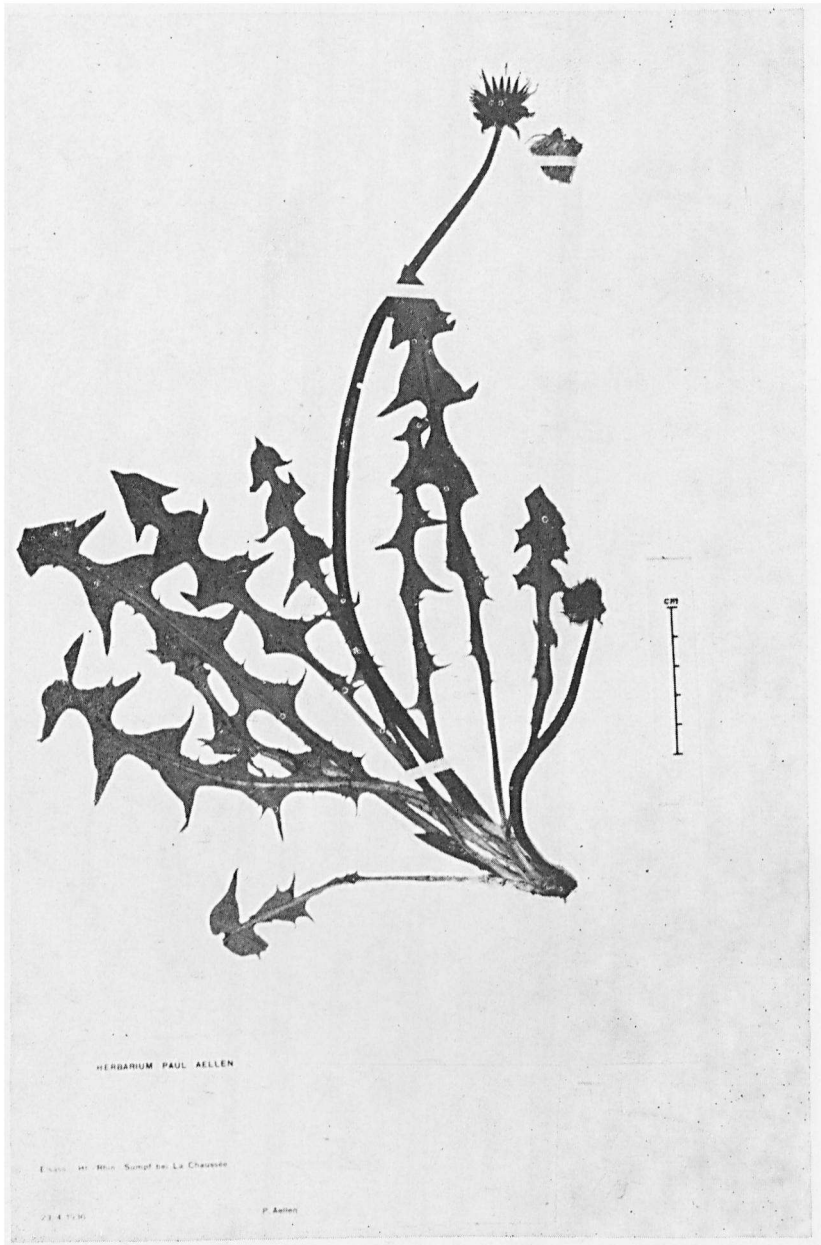


Fig. 6. *T. crassiceps* Hagl. ap. v. S., Ht-Rhin, Haberhäuser-Blotzheim, Aellen.



Fig. 7. *T. DeLanghii* v. S., Belgium: Fagnolle, De Langhe.

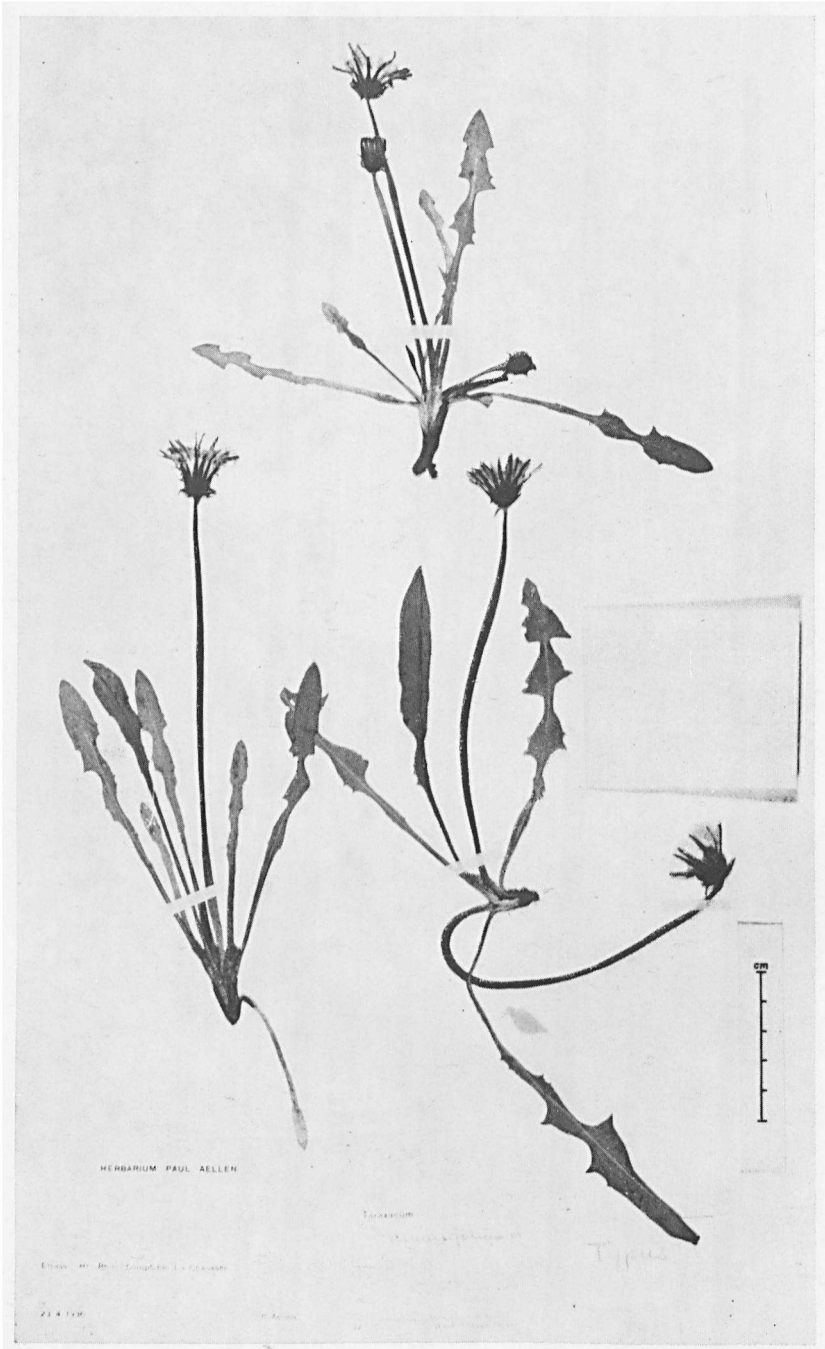


Fig. 8. *T. divulsifolium* v. S., Ht. Rhin: La Chaussée, Allen.



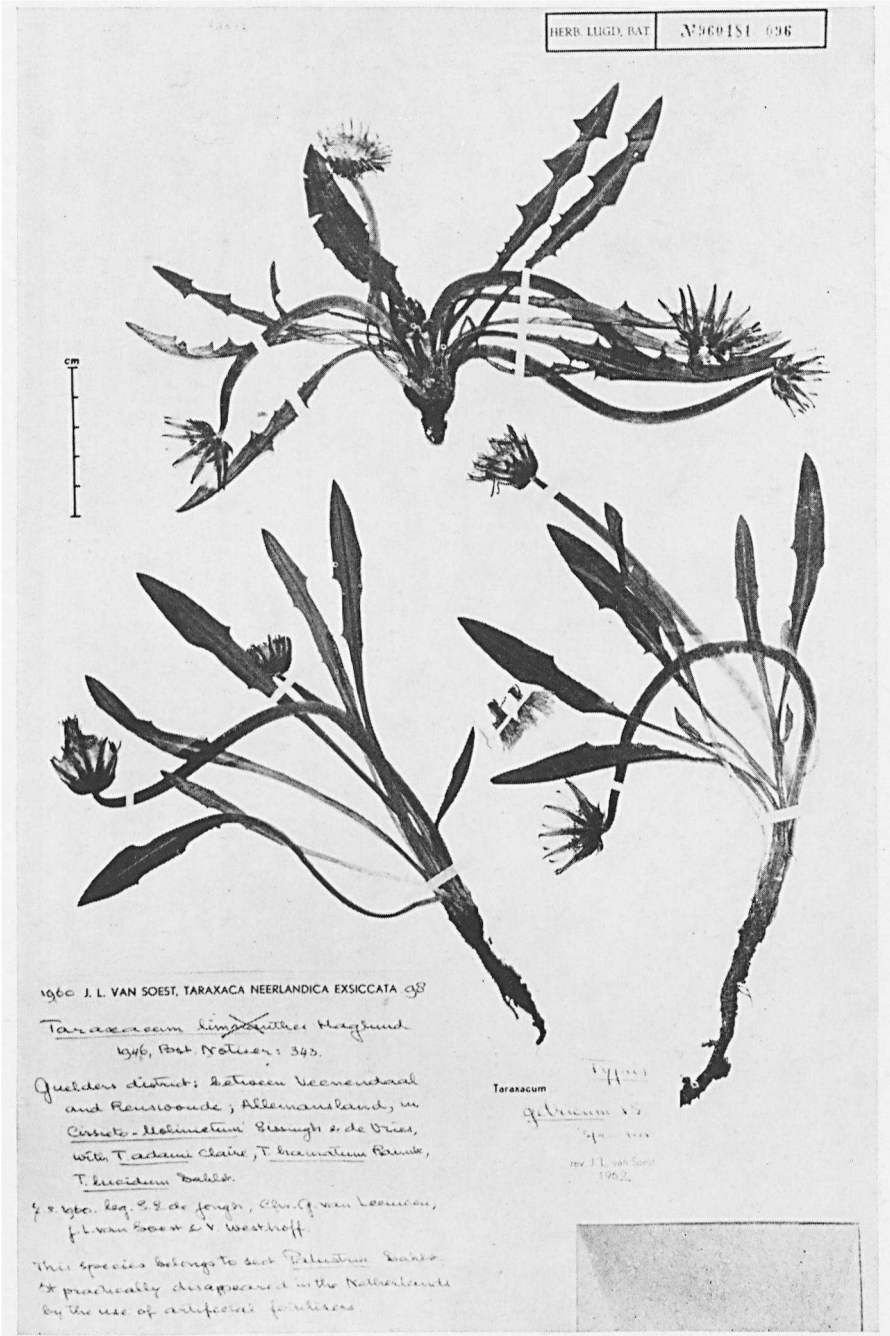


Fig. 9. *T. gelricum* v. S., Netherlands: Veenendaal-Renswoude, de Jongh et al.

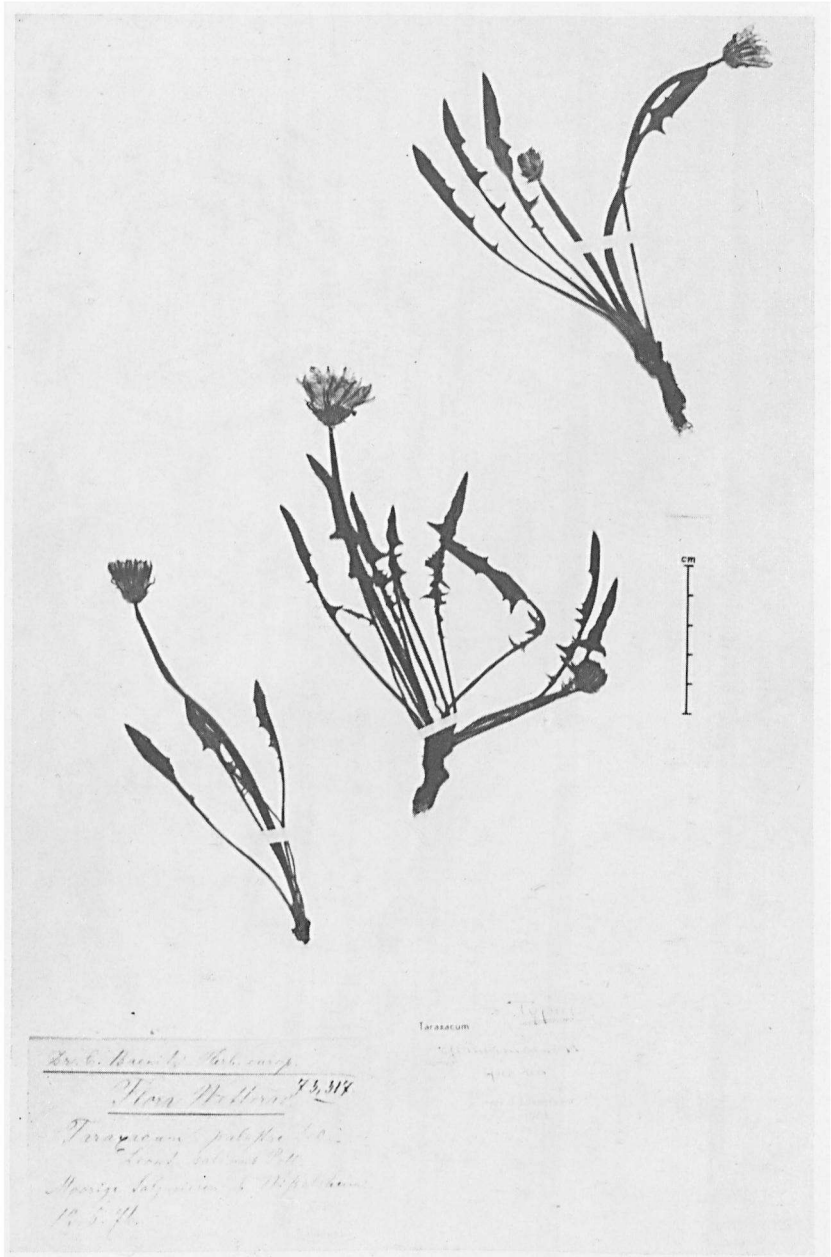


Fig. 10. *T. germanicum* v. S., Hessen: Wetterau, Oertel.

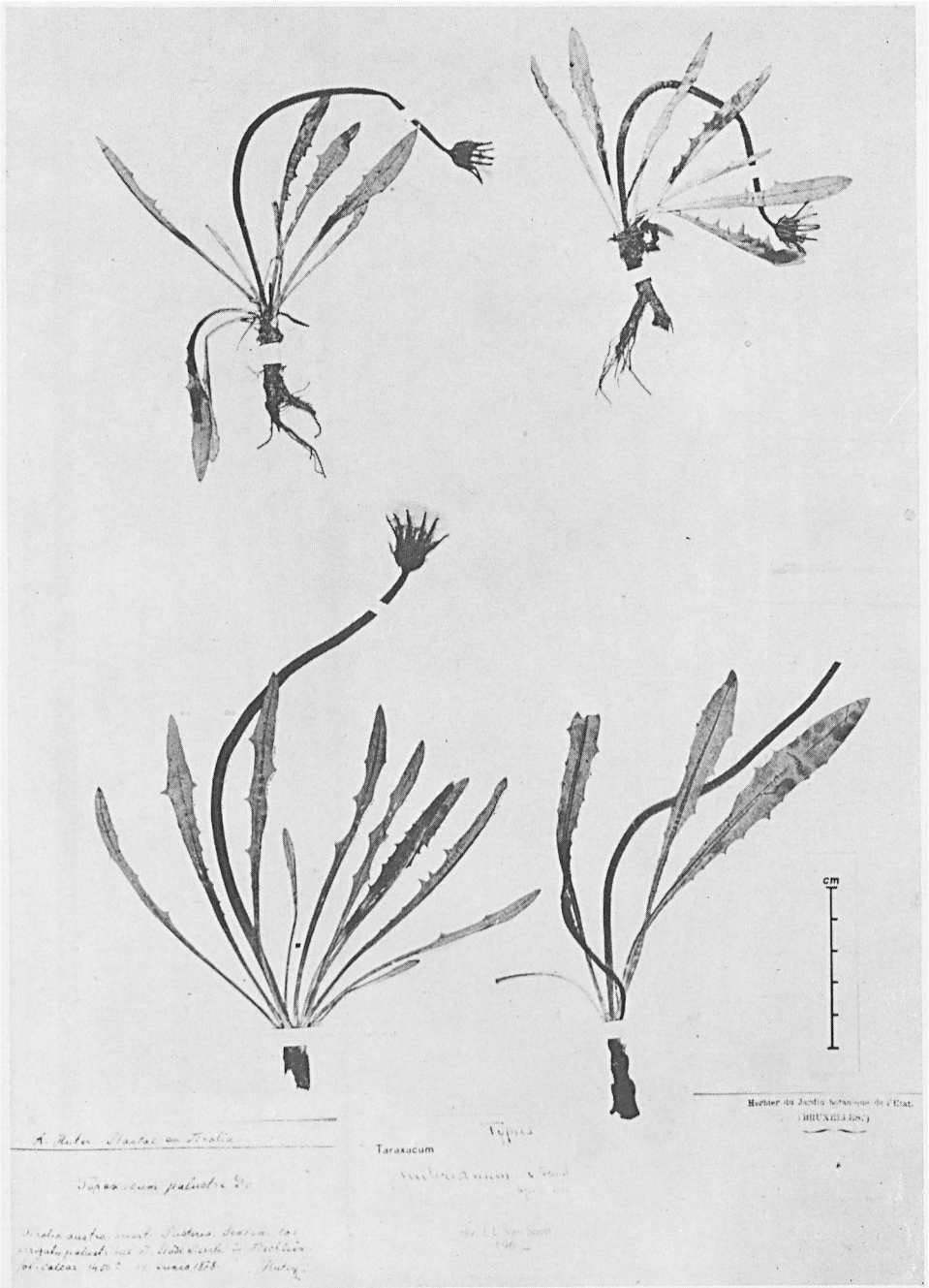


Fig. 11. *T. Huterianum* v. S., S. Tirol: Sexten, Huter.



Fig. 12. *T. illyricum* Dahlst. ap. v. S., Montenegro: Kastar, Lindberg.

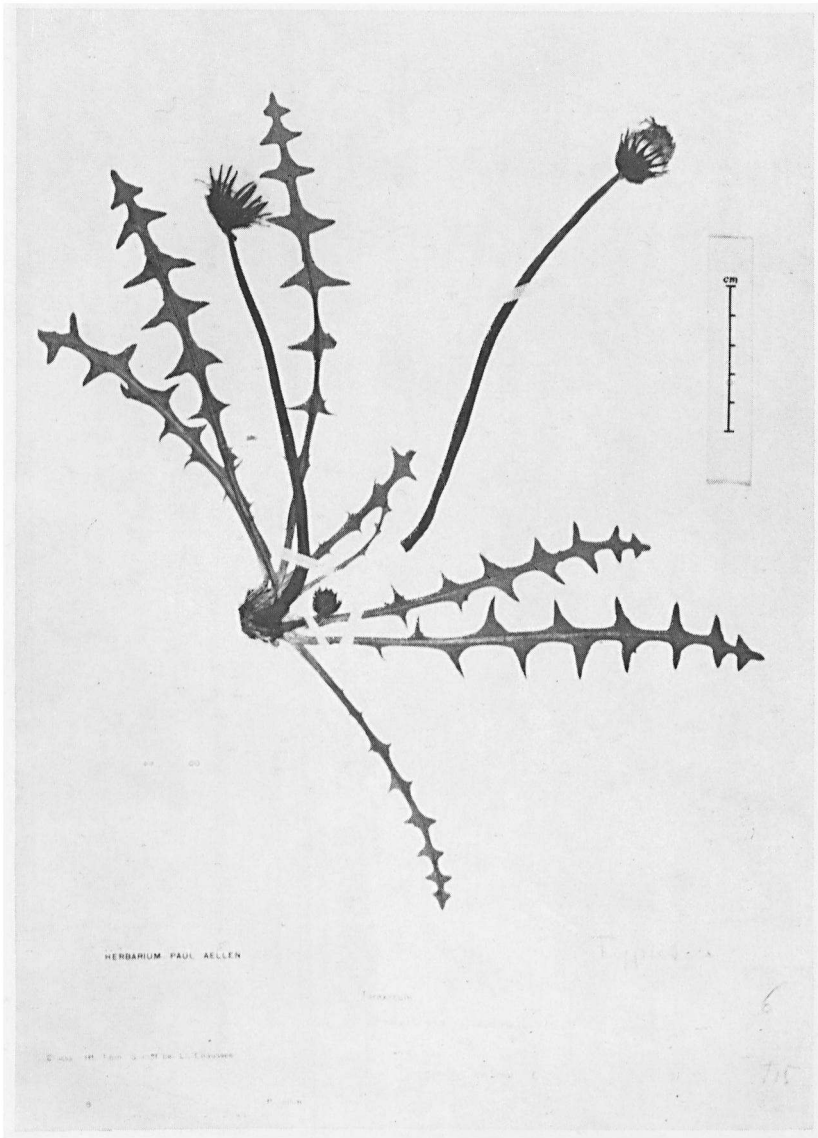


Fig. 13. *T. laeticolorifrons* Hagl. ap. v. S., Ht-Rhin: La Chaussée, Aellen.

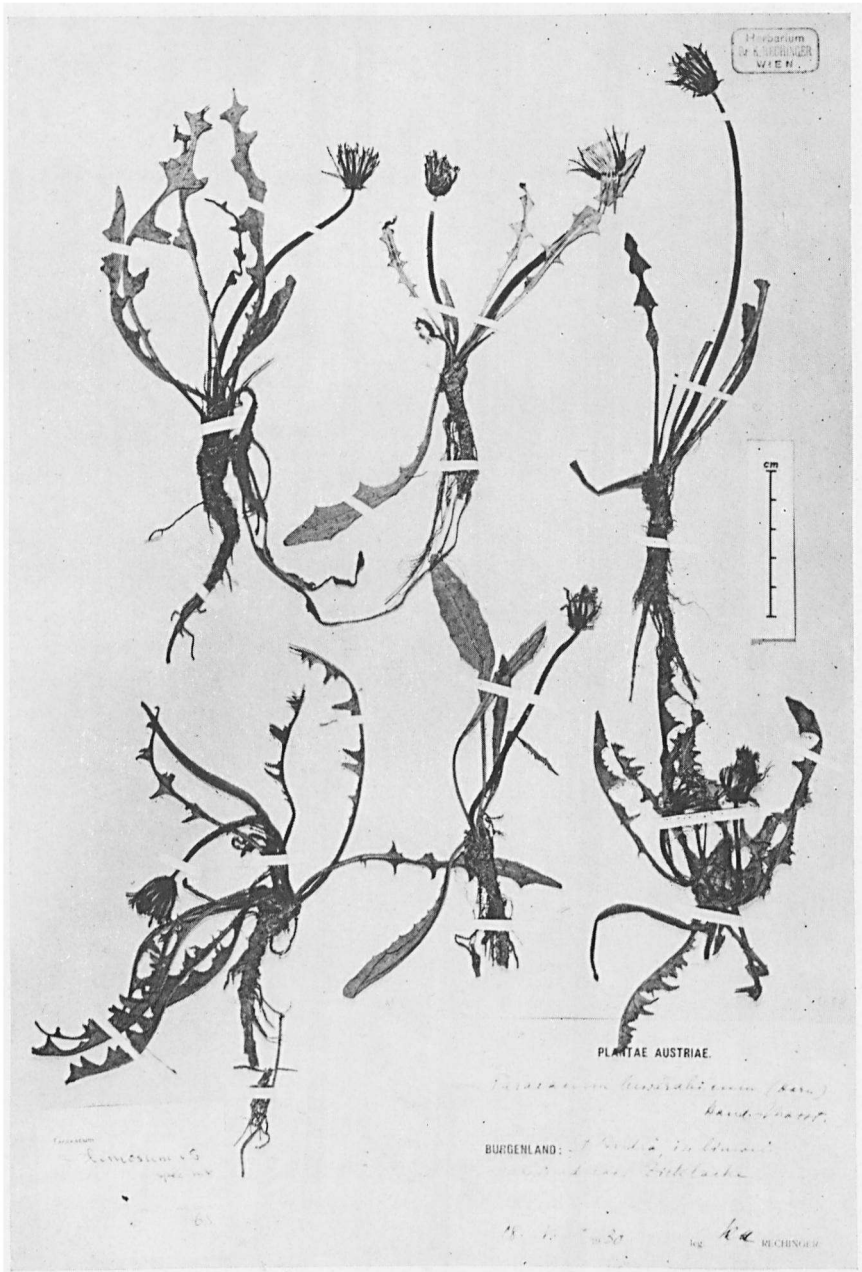


Fig. 14. *T. limosum* v. S., Burgenland: St. Andrä, Rechinger.

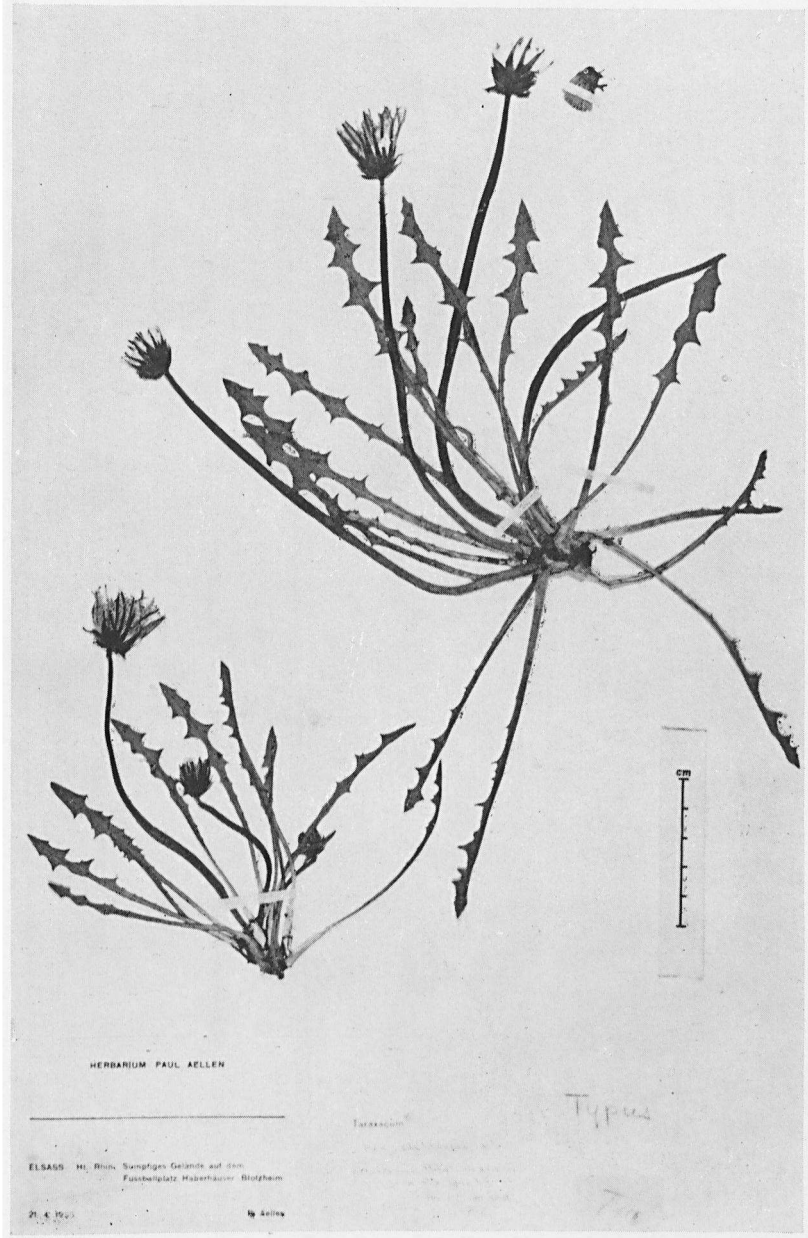


Fig. 15. *T. neo-Aellenii* v. S., Ht-Rhin: Haberhäuser-Blotzheim, Aellen.

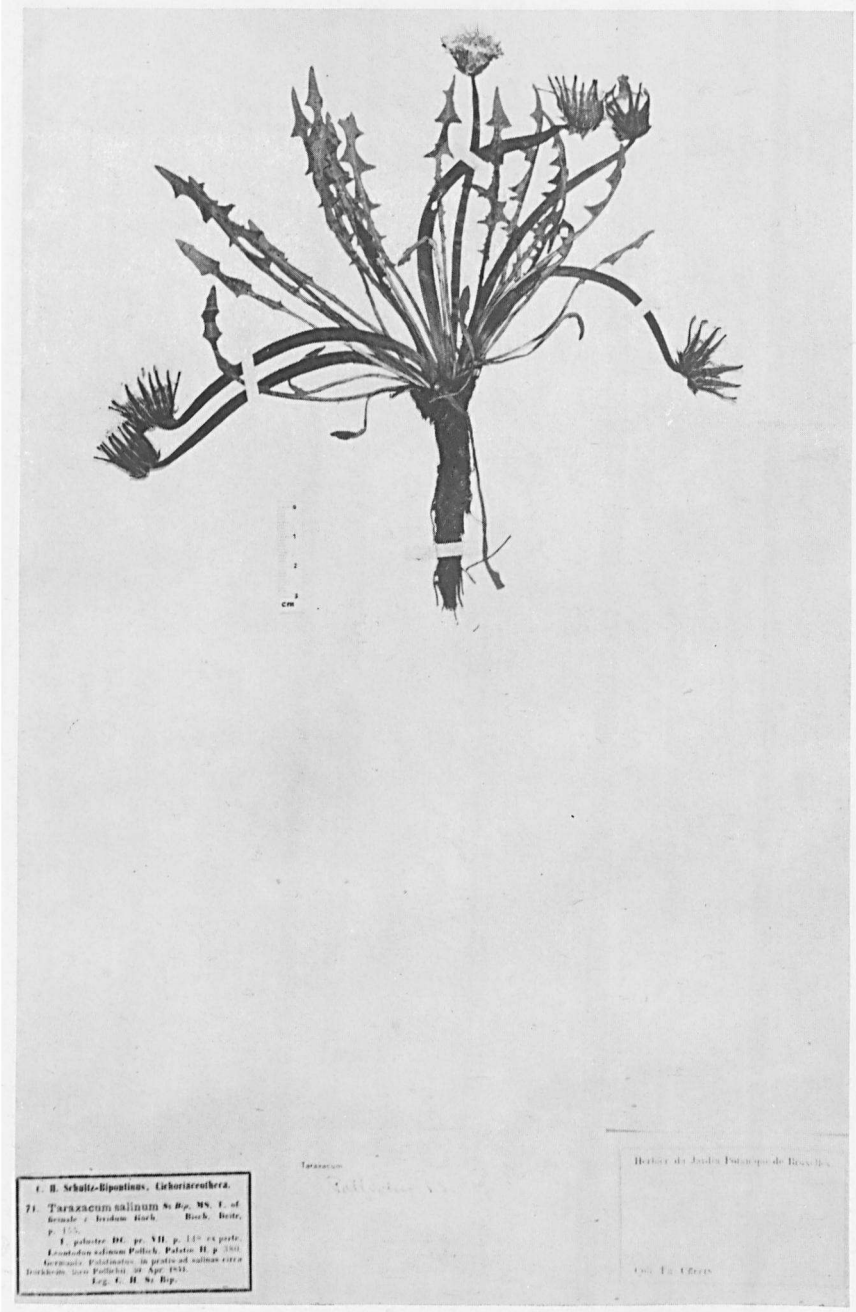
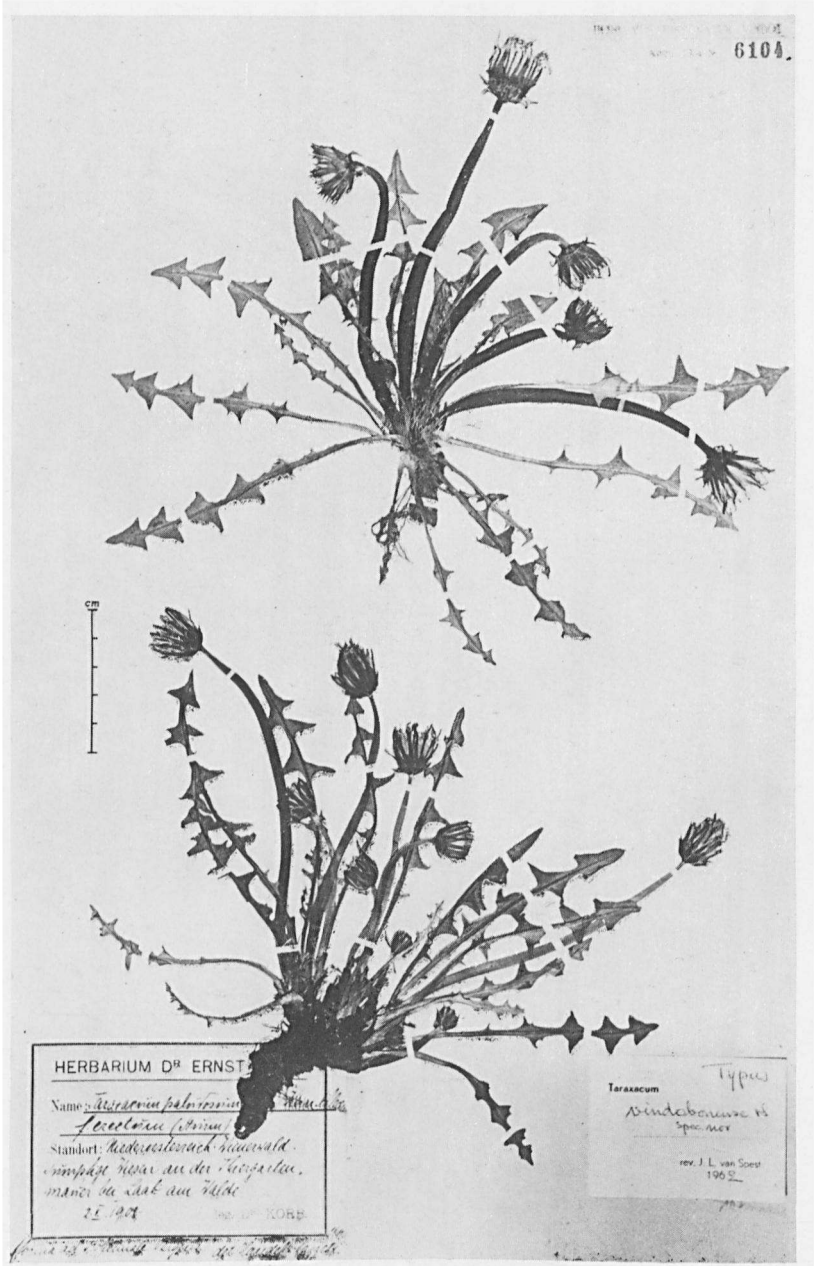


Fig. 16. *T. Pollichii* v. S., Pfalz: Dürkheim, Schultz-Bip.





Fig. 17. *T. udum* Jord., France: Lyon, Jordan.



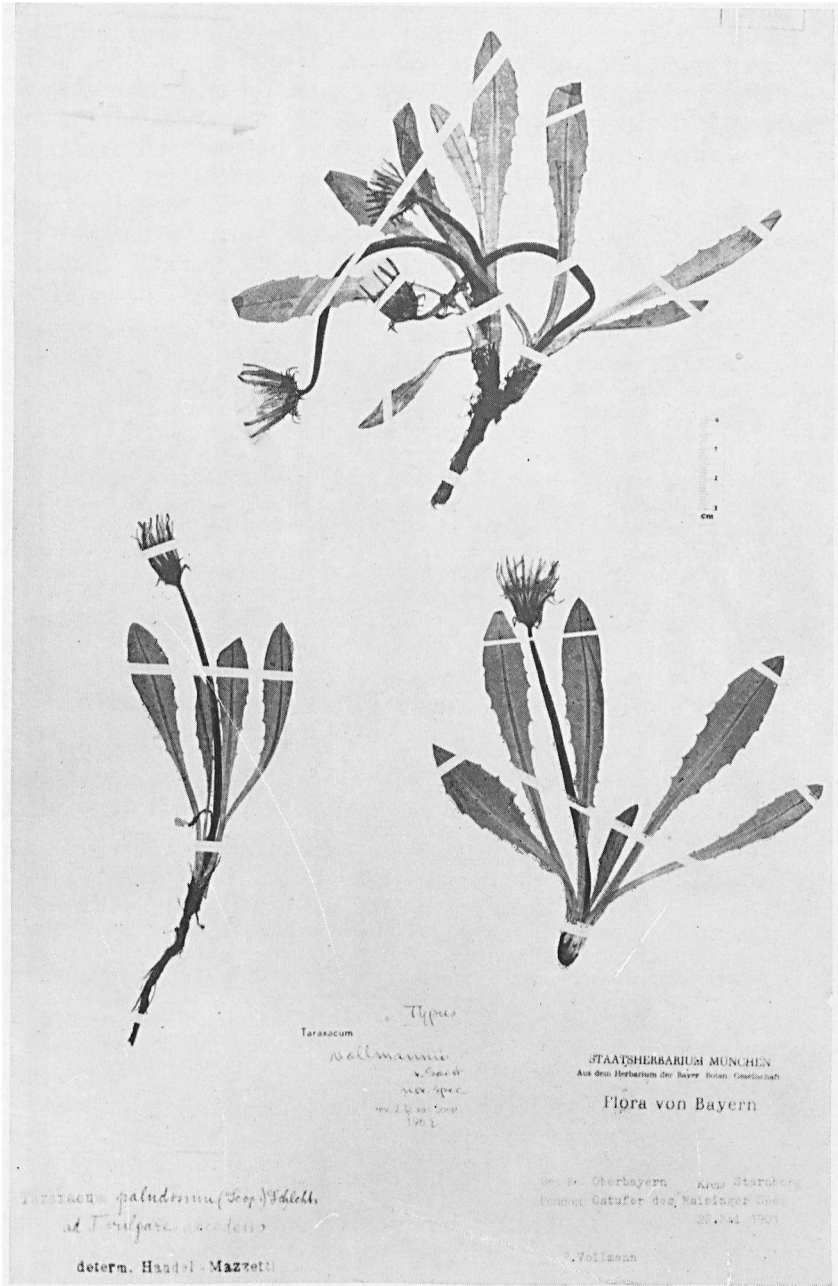


Fig. 19. *T. Vollmannii* v. S., Bavaria: Starnberg, Vollmann.

in which the leaves of the fore-going year are not destroyed during the winter time, these old leaves are often still present in the flowering period. This is the case in *T. udum* as well as in *T. albanicum* v. S. The leaves of *T. udum* always have side lobes, and these often are dentate; the lobes are short and obtuse in the older leaves, longer and rather narrow and triangular in the younger ones.

Figure 18 represents a plant from the type locality. The description given by Jordan is rather complete in "modern" eyes; however, I should prefer to write: "stylis sordide luteis", instead of "laete luteis".

France: Rhône: Lyon, à la Tête d'Or, IV.1849, A. Jordan (h BR, Z); Lyon, Jordan (h BR).

Furthermore:

France: "Marais" de Saône, 1869, Pellat (h GE); La Saône, IV.1898, Gandoger (h W); Arnas, 1898, Gandoger (h GE); Hte-Saône: Confracourt, Magny-Robert, Bertrand, V.1895 (h ZT) pp; Hérault: Montpellier, Lathes, 1948, Braun-Blanquet, cultivated in Delft Bot. Garden 1951/1952 (h v. S.), earlier considered by me to be *T. hollandicum* v. S.; Hte-Savoie: Gruige, 14.5.1859, Jordan (h Z) pp; Chambéry, 1859, Songeon; Le Bourget, Chabert, Coth (h FI). Switzerland: Neuchâtel: Bords du lac, de Clairville (h Z) verisim.; Genève: bois de la Balie, 23.5.1876 & 29.4.1877, Schnudely (h GE); Fribourg: Les Chésaux sous Morlon 720 m, V.1914, Jaquet (h Z); Broc, prairie humide 770 m, V.1909, Jaquet (h M); Vaud: Marais d'Entreroches, 13.5.1883, Favrat (h ZT); près Echallens, IV.1882, Favrat (h ZT); Aubonne, Vetter (h Z); "marais" d'Orbe, 13.4.1884, Vetter (h Z); Aigle, "prés humides", IV.1893, Jaccard (h RUEB). Italy: Modena, A. Mori, Baenitz Herb. Europ. (h BR, Z); the same IV. 1892 (h GE).

46. ***Taraxacum vestrogothicum*** Dahlstedt 1910; 1928, fig. 7, tab. 4, map 4; Saarsoo & Haglund (†) 1962.

*Lectotypus*, according to Haglund 1939: Sweden: Västergötland: Mosseberg, 10.6.1907, Nordstedt (h S!), also in h BM.

*Area of distribution* (map 5.4):

Sweden: Upland (h S!), the involucre slightly darker green than in the type material see Dahlst. 1928; Jämtland: det. Hagl. in h S!; Dalarne (h S!), especially here the involucre are darker green; the material (Hedemora, 1902, Ringselle) originally was identified by Dahlst. as "cfr. *T. lissocarpum*" and mentioned as that species in Dahlst. 1928; Hagl. identified the plants as *T. vestrogothicum*; to my view the plants certainly do not belong to *T. lissocarpum*, but their identification as *T. vestrogothicum* seems to be dubious. Furthermore for Sweden: Västergötland (h S!), see Dahlst. 1910, 1928; Gotland, according to Lundevall 1963; Oeland: h S!, see Dahlst. 1928.

This species has been mentioned by Dahlst. 1928 for Germany, but most of the specimens may belong to *T. apiculatum* v. S., to which it is allied (see that species). Only plants from Germany: Bavaria: Lamsdorfer Moor, 11.5.1902, Vollmann (h M) pp, together with *T. turfosum* (SB) v. S. and *T. xanthostigma* Lindb.f., are similar to *T. vestrogothicum*; however, the outer involucre bracts are only loosely appressed and araneous hairs are present on the scape below the flower head; the achenes necessary for identification are lacking. Plants reported by Lindberg 1935 from Esthonia belong to *T. egregium* Markl.

The achenes of *T. vestrogothicum* are spinulose, have a short pyramid and an extremely long rostrum (more than 10 mm); the involucre

are pale-green, the stigmas, in dried condition, rather dark grey-green. Pollen is present; the leaves often have long side lobes which are recurved backward.

The shape of the outer bracts is similar to that of *T. vindobonense* v. S. and of *T. illyricum* Dahlst.; the involucre is in those two species much darker green and their leaf form is quite different.

47. ***Taraxacum vindobonense* v. Soest spec. nov.** (Fig. 18).

Planta mediocriter alta.

Folia lobata,  $\pm$  10 cm longa, cano-viridia, subtus parce, in nervo dorsali densiuscule araneosa, petiolis nervique mediani parte inferiore purpureo- vel roseo-coloratis; lobi laterales utrinque ca. 4, ad 10 mm longi, patentes, breviter triangulares vel deltoidei, subacuti vel subobtusius, dorso pro parte dentato, interlobiis ad 10 mm longis angustis interdum denticulatis; lobus terminalis integer deltoideus vel hastatus 0.8–2 cm longus, lobulis basalibus subobtusius ad 6 mm longis, lobulo apicali subobtusius vel obtusius interdum mucronulato.

Scapi plures, subcrassi, araneosi, sub involucre dense araneosi.

Involucrum 15 mm longum, ad 15 mm latum, crassiusculum, atroviride purpurascens. Squamae exteriores laxe patentes vel subadpressae, ovatae vel ovato-lanceolatae, 4 mm latae, ad 8 mm longae, in apicem longum subsensim attenuatae, zona lata pallida vel purpurea marginatae.

Calathium paulo radians, ca. 2.5 cm diametro, subpallide (?) luteum. Ligulae marginales planae, extus stria atro-violacea notatae. Antherae polliniferae. Stylus et stigmata fusco-virescentia. Floret vere. Achnium ignotum.

*Typus*: Austria infer.: Wienerwald, "sumpfige Wiesen" an der Thiergarten-Mauer pr. Laab am Walde, 2.5.1908, E. Korb (h W 1954/6104), as *T. paludosum* f. *erectum* (Sturm); identified by HM 1910 as "*forma ad T. officinale vergens*". Also h W 1950/1870 pp and 154/9 6105 pp.

Furthermore:

Austria infer.: "nasse Wiesen" östlich Kreutzenstein, 22 & 29.4.1904, Schneider (h W) as *T. spurium* Beck; Moosbrunn, 3.5.1905, Korb (h W) pp; Moosbrunn, "Sumpfwiese", 28.5.1902, Schneider (h W); Wienerwald, "auf nassen Wiesen" in der Paunzen pr. Pinkersdorf, 21.4.1902, Korb (h W), one of the plants being identified by HM 1913 as "*T. paludosum* vers. *T. officinale*"; Wienerwald, "an nassen Stellen" auf einer Wiese zwischen Kaltenleutgeben und der Huberrahm, 31.5.1919, Korb (h W) pp and verisim.; "auf nassen Wiesen" pr. Achau, 19.4.1912, Korb (h W); bei Wien, 1839, Leuthold (h M); Dornbach, "in pratis humidis", Czagl (h Z) pp; Neuwaldegg, "in pratis paludosis silvaticis" 300 m, Pernhoffer, Exsicc. Fl. Austr.-Hung. 3753 (h M, P) pro minima parte; "auf feuchten Wiesen" in der Baunzen pr. Radersdorf, 21.4.1912, Vetter (h W); Prater; Krieau, 17 & 30.4.1922, Rechinger (h) verisim.; Lobau, an der grossen Wiese am Adlerboden nächst dem Stadtler Uferhaus, 5.5.1929, Korb (h W) as *T. officinale paludosum*; Marchfeld, "auf nassen Wiesen" pr. Lasse, 8.5.1921, Korb (h W).

Burgenland: Grammat, Neusiedl, 22.4.1906, ... (h W); "auf moorigen Wiesen" zwischen Weiden und Podersdorf, 1.5.1932, Korb (h W), with *T. limosum*

v. S.; "auf Schilfboden" am Rande des Neusiedlersees nächst Weiden, 1.5.1932, Korb (h W), as *T. paludosum-officinale*, with *T. limosum* v. S.; Illmitz, "pelouse riveraine d'un étang salé," 6.4.1959, Lawalrée (h).  
 Czecho-Slovakia: Moravia: "Sumpfwiesen" pr. Bisenz, 9.5.1909, Korb (h W).  
 Germany: Bavaria: Attaching-Freising (Erdingermoos) 435 m, 1900, Stadler Fl. Exsicc. Bavarica 543 a, pro minima parte (h GE, M) verisim, together with other species of the section; Rauchmoos pr. Wilzhofen, 17.5.1903, Vollmann (h M) verisim.

In the latin description data on the achenes are lacking; even in the above mentioned material ripe achenes are rarely present. The specimens of Huberrahm have to be commented upon here: three plants on one sheet look similar; of one of these, however, the nearly ripe achenes are to a high degree smooth and could be identified with those of *T. lividum* (W. & Kit.) Peterm.; of the two other ones the achenes are distinctly spinulose; though the involuclral bracts are rather short, I think, the latter two plants are identical to *T. vindobonense*. Normally, *T. lividum* is easily recognizable by the brownish and very broad outer involuclral bracts, and *T. vindobonense* by the dark-green, purplish-washed outer bracts of a much greater length. A sheet from Moosbrunn (leg. Schneider) shows also spinulose achenes; these moreover, are gradually elongated into the pyramid.

The locality Kreu(t)zenstein, mentioned above, is the one given by Beck v. Mannagetta 1893 for *T. palustre* f 4 *T. spurium*: "stärker behaarte Stengel mit breiteren, fast schrotsägeförmigen Blättern". This description is very vague; I have not used this name for the species; this, moreover, would have been inadmissible as Saarsoo has used in 1962 the name for a species of sect. *Vulgaria* Dahlst. Beck identifies his form with "*T. palustre x officinale*?".

In its characteristic form with distinctly lobate leaves *T. vindobonense* is very well recognizable. There exist, however, many plants with very shortly lobate or even sinuate-dentate leaves; in that case confusion is possible with *T. lividum* (W. & Kit.) Peterm., see above, and with *T. limosum* v. S. and *T. olivaceum* v. S.; for the points of difference with *T. limosum*, see under that species; *T. olivaceum* has pale green involuclres and lanceolate leaves.

*T. vindobonense* is slightly variable; pollen not always seems to be present; the density of araneous hairs is variable; the outer involuclral bracts are not always strictly appressed; for this reason this species often has been collected or identified as "*palustre x officinale*". The variable leaf form has already been discussed above.

#### 48. *Taraxacum vollmannii* v. Soest **spec. nov.** (Fig. 19).

Planta sat robusta, 10–12 cm alta, subaraneosa.

Folia gramineo-viridia, oblanceolata, subdense sinuato-dentata vel -denticulata (dentibus saepe subretroversis), ad 1.6 cm lata, ad 10 cm longa, subobtusa, petiolis (nervoque mediano) purpureo-coloratis.

Involucrum 15 mm longum, 12 mm latum, basi turbinatum. Squamae exteriores laxe adpressae, apice valde recurvatae, lanceolatae vel anguste ovatae, acutae, 2–3 mm latae, 7–9 mm longae, colore

pallide viridi purpureo mixto, inconspicue sed late marginatae, summo  $\pm$  atro-violaceo.

Calathium ca. 2.5 cm diametro, pallide (?) luteum. Ligulae marginales planae, extus stria cano-violacea notatae. Antherae polliniferae. Stylus luteus, stigmata virescentia.

Achenium (maturum ignotum) superne spinulosum, in pyramidem conico-cylindricam (spinulis saepe praeditam) ca. 1 mm longam subsensim abiens. Rostrum 9 mm longum. Pappus niveus, 5–6 mm longus.

*Typus*: Germany: Bavaria: Starnberg, Ostufer des Maisinger Sees, 22.5.1901, F. Vollmann (h M), as "*T. paludosum ad T. vulgare accedens*", det. v. Handel-Mazzetti.

Furthermore (less characteristic) in the same region: Weilheim, Rauchmoos pr. Wilzhofen, 17.5.1903, Vollmann (h M) pp; Schwarzhof, auf Moosgründen, 9.5.1897, Harz (h M), both look like "magnifications" of *T. turfosum* (SB) v. S., which can not be said of the type material.

#### ACKNOWLEDGEMENTS

I am indebted to Directors of Institutes and to several private persons who have placed herbarium specimens to my disposal. I am, especially, grateful to Mr. P. AELLEN, Basle, for his contribution; his rich collections, at an earlier date partly revised by HAGLUND, who died before he was in a position to publish the results of his work, animated me to study this difficult group of *Taraxacum* species. Professor C. E. B. BREMEKAMP and Dr. F. A. STAFLEU gave me valuable advice in a problem of nomenclature; both professor BREMEKAMP and professor Dr. F. P. JONKER suggested some corrections in the english and latin text. The photographs published in this paper were taken by Mr. C. L. MARKS with the authorization of the Director of the State Herbarium, Leyden.

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## POSTSCRIPT

After preparation of this paper I could study h FI. Main results are: *T. balticiforme* (and *f. fuscosquameum*) not rare in N. Italy; *T. ciliare* in France (Lot, Indre et Loire, Alp. Mar.) and Italy (Liguria, Toscana); rich collection of *T. tenuifolium* from the known area; *T. udum* from Abruzzo: Pescara, Kuntze.