

## ALPINE SPECIES OF TARAXACUM

WITH SPECIAL REFERENCE TO THE CENTRAL AND EASTERN ALPS

J. L. VAN SOEST

(*'s-Gravenhage*)

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### INTRODUCTION

In this study I do not intend to give a more or less complete survey of the *Taraxacum* species, growing in the alpine regions of Europe. Many taxa are not yet well recognized and, partly, they are insufficiently collected for description; in several cases their achenes are not available, often due to the fact that these ripen too late in the season: mostly they are flowering in July or August.

The sections, represented in these alpine regions, are listed below; only a few will be treated here in more detail. Besides material of my own, rather extensive alpine collection, I have used material of the following herbaria, in most cases only for a part; the abbreviations refer to those used in *Index Herbariorum* I, ed. 3, 1956 by Lanjouw and Stafleu: Instituto Botánico de Barcelona (BC); Jardin Botanique de l'Etat, Bruxelles (BR); Bündner Naturhistorisches und Nationalpark-Museum, Chur (CHUR); Instituto Botánico Dr. Júlio Henriques, Coimbra (COI); Conservatoire et Jardin Botaniques, Genève (G); Institut für systematische Botanik, Graz (GZU); Institut Botanique de la Faculté des Sciences, Grenoble (GR); The Herbarium, Kew (K); Musée botanique cantonal, Lausanne (LAU); Rijksherbarium, Leiden (L); Botanisk Museum, Oslo (O); Muséum National d'Histoire Naturelle, Paris (P); Geobotanisches Forschungsinstitut Rübel (RUEB); Naturhistoriska Riksmuseet, Stockholm (S); Botanisch Museum en Herbarium der Rijksuniversiteit, Utrecht (U); Naturhistorisches Museum, Wien (W); Laboratorium voor Plantensystematiek en Plantengeographie, Wageningen (WAG); Botanischer Garten und Museum der Universität, Zürich (Z); Institut für Spezielle Botanik der Eidg. Technische Hochschule, Zürich (ZT).

Furthermore I was able to examine the private collections of P. Aellen, J. Duvigneaud, J. Lambinon, Prof. R. de Litardière †, Prof. H. Melzer, Dr. H. Schaeftlein and Prof. F. T. Widder.

I acknowledge with much gratitude the help of the directors of the above mentioned institutes and of the other gentlemen for the loan of their important material and for their help in some way or another. The photographs, reproduced by courtesy of the Rijksherbarium, Leiden, are made by Mr. C. L. Marks, whom I am grateful for this fine work.

Apart from the abbreviations, given above, a few are added here: h = herbarium; H. M. = von Handel-Mazzetti; v. S. = van Soest.

## SECTIONS

1. **Parvula** von Handel-Mazzetti, 1907. Monogr. *Taraxacum*: 45; van Soest, 1954. *Collectanea Botan.* 4.1: 13. The section is represented in the region, considered here, by only one species: *T. dissectum* Ledebour; for its distribution, see v.S., l.c.

2. **Pachera** van Soest 1954. *Collectanea Botan.* 4.1: 14. The section consists of three species: *T. pacheri* Schultz-Bip.; for its distribution, see Hegi 1928. *Flora Mittel-Europa* 6.2.: 1089; *T. litardieri* v. Soest 1957. *Acta Bot. Neerl.* 6: 416, known from Corse and the Alpes Maritimes; the third one: *T. nevadense* Lb. f. is only known from the Sierra Nevada.

3. **Arctica** Dahlstedt 1921. *Acta Fl. Suec.*: 37 and 1928. *K. Svenska Vet. Ak. Handl.* 3.6: 55, with 2 species in the region: *T. handelii* Murr and *T. reichenbachii* (Huter) Huter, both known from the eastern Alps, see Hegi l.c.: 1086 and v. Handel-Mazzetti 1935. *Verh. Zool.-Bot. Ges. Wien* 85: 26-49.

4. **Ceratophora** Dahlstedt l.c.: 34, common in the boreal and arctic regions and known from few localities in the central and eastern Alps; a new species is described below.

5. **Alpina** Haglund 1950. *Ber. Schweiz. Bot. Ges.* 60: 237; species of this section are treated below in detail.

6. **Fontana** v. Soest is described as a new section; a number of species is treated here in detail.

7. **Cucullata** v. Soest is described as a new section and treated in detail.

8. **Rhodocarpa** v. Soest 1954. *Collectanea Botan.* 4.1: 15 is represented by *T. schroeterianum* v. Handel-Mazzetti, a species more abundant than was mentioned earlier by H.M. l.c.: 104-105 and Hegi l.c.: 1094-1095; additional localities are given below. Under the same heading *T. rufocarpum* is described, though possibly not belonging to this section.

9. **Vulgaria** Dahlstedt (apud Lindm. 1918); Dahlstedt 1921. *Acta Fl. Suec.* Many species of the European plains are introduced in the alpine region; a few, seeming to be native in the subalpine and alpine districts, are treated below.

10. **Eu-Erythrocarpa** Dahlstedt 1921, *Acta Hort. Bergiani* 9.1: 23. Only *T. aquilonare* v. Handel-Mazzetti is known from here; for its distribution, see Hegi l.c.: 1095; other species occur in the extreme West and East of southern Europe and in the Orient.

11. **Erythrosperma** Dahlstedt em. Lindberg f. 1935, *Acta Bot. Fennica*: 17; species of this section are only scarcely introduced into the higher alpine region; amongst these *T. plumbeum* Dahlstedt seems to be the most common one there.

## SECTIO CERATOPHORA DAHLSTEDT

**Taraxacum krättlii** van Soest **nov. spec.**, Fig. 1.

Planta humilis 5–8 cm alta.

Folia ad 7 cm longa (petiolis alatis roseo-violaceis inclusa) laete gramineo-viridia, in nervo dorsali parce araneosa vel glabra. Folia exteriora oblanceolata denticulata vel breve dentata; interiora breve lobata; lobi laterales utrinque ad 4, triangulares ad 4 mm longi dorso denticulati vel breve dentati, interlobiis subnullis latis; lobus terminalis indeterminatus subobtusus paulo denticulatus interdum incisus.

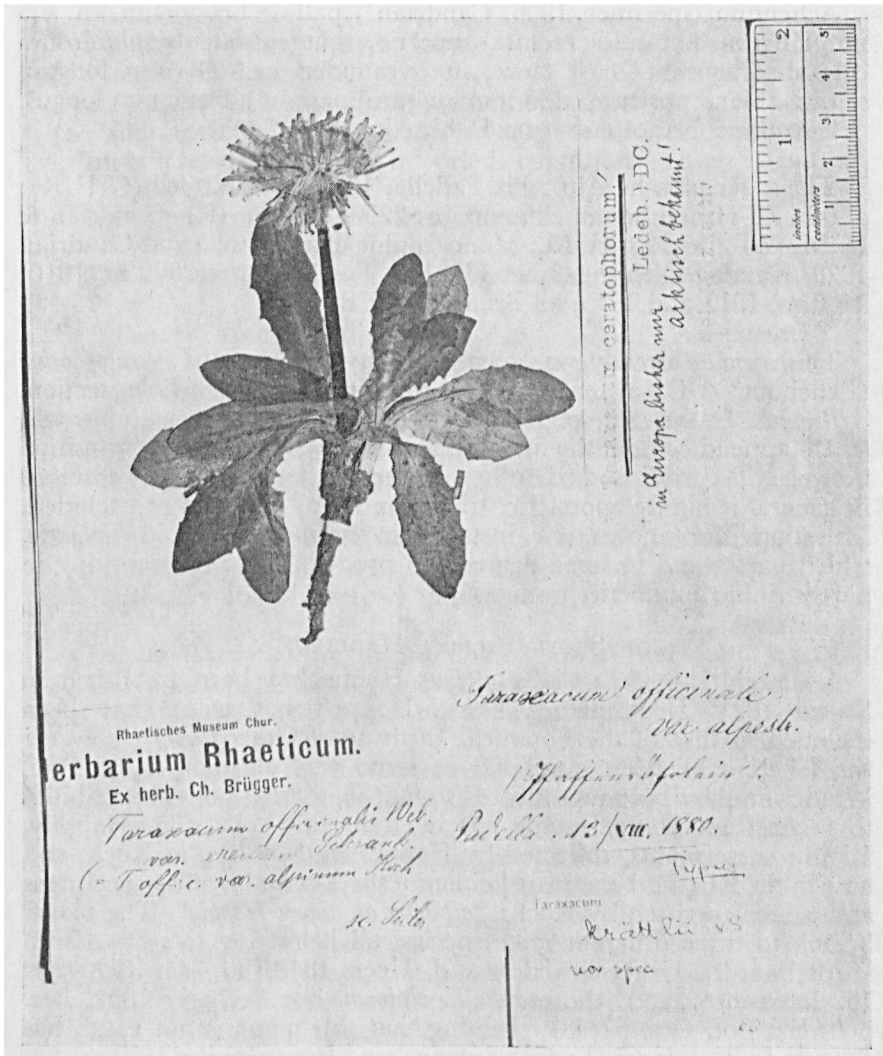


Fig. 1. *T. krättlii* v.S., type specimen.

Scapi ad 3 subcrassi glabrescentes.

Involucrum crassiusculum ca. 13 mm longum, 12 mm latum, obscure viride siccis nigrum. Squamae exteriores  $\pm$  adpressae ovatae ad 7 mm longae, apice pro parte cornutae pro parte corniculatae vel callosae, albo-marginatae; squamae interiores late lineares, membranaceo-marginatae corniculatae vel callosae, apice obtusae saepe erosae.

Calathium paulo radians ad 3 cm diametro pallide luteum. Ligulae marginales planae extus stria pallide cano-purpurea notatae, apice obscure purpureae. Antherae polliniferae; stylus parte superiore et stigmata fusco-virescentia. Floret augusto.

Achenium (specimen 1906, Candrian!) pallide brunneum, ca. 4,5 mm longum (pyramide inclusa) superne argute et patente spinulosum ceterum rugosum—basi laeve, in pyramiden ca. 0,8 mm longam sensim abiens; rostrum ca. 7 mm longum; pappus albus 6 mm longus.

E sectione *Ceratophorum* Dahlstedt.

*Typus*: Rhaetische Alp.: Piz Padella, 13.8. 1880 Krättli (CHUR); also h. ZT; from the same mountain: 2250–2260 m, 1906 Candrian & H. M. (ZT), see also H. M., Monographie Tar., Plate 5 and Candrian 1928, Katalog Oberengadiner Fl.: 157. Furthermore: 2300 m, 1910; 2400 m, 1913 and 1915, all Branger (RUEB, Z).

This species already was recognized by H. M. as *T. ceratophorum* (Ledebour) DC, a macrospecies standing for the whole section.

*Remark.* In the same region a form has been collected with few and small appendices on the involucre bracts, suggesting a transition between *T. krättli* and another alpine species. Though *Taraxacum* in general is highly apomictic, transition forms may not be excluded. Mutations are known, for instance in normally triploid *Vulgaria*, which partly and to some degree can produce crossings, resulting in partly viable apomictic products.

#### SECTIO ALPINA HAGLUND

A description of *Leontodon alpinus* Hoppe has been published in Sturm 1821. Deutschlands Flora. Hoppe's herbarium has been included in that of the Botanical Institute of Graz (GZU); however the labels have been mutilated in some way or another, as Prof. Widder has kindly communicated to me; so, there is no real possibility to reconstruct Hoppe's type specimen in this collection. Happily, I know some plants, collected by Hoppe, send by him to Koch, and now in the Rijksherbarium at Leiden; a sheet contains a few specimens and a label, written by Koch: "*alpinum ab autore Hoppio*". The plants belong to three different microspecies, all belonging to sect. *Alpina*.

Afterwards, Hegetschweiler and Heer 1840. Fl. der Schweiz: 762 have introduced the name *T. alpinum*, but Becherer 1952. Ber. Schweiz. Bot. Ges. 62:581, showing that this name is not valid, has proposed: *T. palustre* (Lyons) Symons ssp. *Hegetschweileri*.

In his monography v. Handel-Mazzetti has treated *T. alpinum*



as the others authors in its broad sense, more or less aequivalent to the whole section *Alpina*, described by Haglund.

## KEY TO THE SPECIES OF SECT. ALPINA

(as far as mentioned in this paper)

- |   |    |
|---|----|
| 1. Pollen absent . . . . .  | 2  |
| Pollen present . . . . .  | 5  |
| 2. Flowers without or with pale grey or clear purple stripes underneath . . . . .   | 3  |
| Flowers with dark brown- or bluish-violet stripes underneath . . . . .  | 12 |
| 3. Flowers lingulate . . . . .  | 4  |
| Flowers tubular; leaves lobate, lobes triangular, acute; terminal lobe acute . . . . . 5 <i>T. oreophilum</i>   |    |
| <i>Remark</i> : few other forms with tubular flowers have been found, partly (?) being aberrations; see also sect. <i>Cucullata</i> .   |    |
| 4. Involucre dark, black in dried condition; flower heads radiate . . . . . 14. <i>T. vetteri</i>   |    |
| Involucre green, flower heads small, non radiate . . . . .  |    |
| . . . . . 4. <i>T. mattmarkense</i>   |    |
| 5. Flowers without or with pale grey or pink stripes underneath . . . . . 7. <i>T. parsennense</i>  |    |
| <i>Remark</i> : compare also . . . . . 2. <i>T. carinthiacum</i>  |    |
| Flowers with dark greyish-violet, -purple, or -blue stripes underneath . . . . .  | 6  |
| 6. Stigmas clear yellow . . . . . 9. <i>T. pseudofontanum</i>   |    |
| Stigmas dirty yellow, even in dried condition . . . . .   | 9  |
| Stigmas (and upper part of styles) dark, in dried condition black . . . . .   | 7  |
| 7. Leaves deeply lobate, lateral lobes narrow, terminal lobe relatively big; flowers tubular or nearly so; outer bracts of the involucre narrow, lanceolate, narrowly margined . . . . . 13. <i>T. vernelense</i> |    |
| Leaves nearly entire or sublobate, flowers lingulate . . . . .  | 8  |
| 8. Outer bracts of the involucre dark green without margine, ovate, appressed; leaves not thin, grass-green . . . . .   |    |
| . . . . . 3. <i>T. helveticum</i>   |    |
| Outer bracts of the involucre pale green, with pale margine, ± recurved, oblanceolate; leaves thin, yellow-green . . . . .  |    |
| . . . . . 10. <i>T. saasense</i>  |    |
| 9. All leaves with distinct and narrow petioles, obovate, not or only scarcely dentate, seldom sublobate . . . . .  |    |
| . . . . . 8. <i>T. petiolulatum</i>   |    |
| Leaves distinctly lobate . . . . .  | 10 |
| 10. Lobes short, lingulate, obtuse or nearly so, mostly entire; outer bracts of the involucre appressed . . . . . 12. <i>T. venustum</i>  |    |
| Lobes triangular, acute, often with recurved apex . . . . .   | 11 |
| 11. Rostrum at least 6 mm . . . . .   | 13 |
| Rostrum at most 6 mm . . . . .  | 12 |

12. Lobes mostly slightly recurved . . . . . 6. *T. panalpinum*  
 Lobes (of the leaves on the same plant) spreading outwards  
 and partly upwards, seldom partly recurved . . . . .  
 . . . . . 2. *T. carinthiacum*
13. Achenes (except cone) nearly 4,5 mm long; involucre nearly  
 14 mm long; bracts partly with appendices; leaves yellow-  
 ish green . . . . . 1. *T. apenninum*  
 Achenes (except cone) nearly 3 mm long, involucre nearly  
 11 mm long, bracts without appendices; leaves grass-  
 green . . . . . 11. *T. vereinense*

1. **Taraxacum apenninum** (Tenore) DC. *emend.* v. Soest;  
*Leontodon apenninum* Tenore 1830; *Taraxacum apenninum* DC. 1838;  
 E. & A. Huet du Pavillon, Pl. Neapol. exsicc. 380, pro *T. apennino*  
 Tenore; non *T. apenninum* Tenore 1845 and v. Handel-Mazzetti  
 1923 et aut.

The descriptions by Tenore and by De Candolle, are insufficient; therefore I have to give a more detailed one, which I have based on the exsiccatum of Huet du Pavillon, very similar to the plant—not very well developed—collected by Tenore and used by De Candolle for the description in his Prodrôme. The exsiccatum, furthermore, seems in full agreement with the icones in Tenore, Fl. Neapolitana 5, tab. 182, Fig. 1.

There has been a confusion with *T. glaciale* E. & A. Huet du Pavillon, exsicc. 377 by several authors, a species without rostrum, even by Tenore himself.

Planta mediocris ca. 8–12 cm alta, parce araneoso-pilosa.

Folia numerosa ad 15 cm longa (petiolo pallido angusto vel subalato vel pro parte conspicue alato inclusa), luteo-viridia, lingulata multilobata; lobi laterales utrinque ad 6, breves deltoidei vel triangulares, saepe obtusi vel subobtusi, inferiores acuti dentati vel denticulati, interdum dorso grosse dentati, margine inferiore integro, in interlobiis ad 6 mm latis abeuntibus; lobus terminalis subobtusus subhastatus vel indeterminato-deltoideus, lobuli basis breves.

Scapi floriferi foliis breviori, sub involucre saepe glabri.

Involucrum mediocre ad 14 mm longum, ad 10 mm latum, basi subtruncatulum, viride. Squamae pro parte callosae, exteriores laxae adpressae oblanceolatae vel ovatae, ad 6 mm longae, ad 4 mm latae, obtusae, albo-, roseolo- vel pallide marginatae; squamae interiores late lineares, membranaceo-marginatae.

Calathium paulo radians. Ligulae marginales angustae, planae, extus stria obscure cano-purpurea notatae. Antherae polliniferae; stigmata sordide lutea. Floret aestate.

Achenium stramineum ca. 4,5 mm longum (pyramide exclusa), superne spinulosum, in pyramidem conicam ca. 0,7 mm longam subsensim abiens. Rostrum 7 mm longum; pappus albus, 5 mm longus.

E sectione Alpinorum Haglund.

*Typus*: in pascuis ad noves montis Corno (25–2800 m), Apruti, 26.8.1856 Huet du Pavillon, Pl. Neapolitani no. 380 (G, K, P, W, WAG); from the same place, 27.8.1856 Huet du Pavillon (G, as *T. officinale* var. *alpinum* Koch).

Furthermore I have seen: Apruc., 1833 Tenore (h.DC); Majella, Valle di Femina Morte, 1924 H.M.(W), in company with *T. glaciale* Huet du Pavillon; they are labelled by H.M. respectively as: *T. alpinum* and *T. apenninum*!

## 2. *Taraxacum carinthiacum* van Soest **nov. spec.**

Planta mediocris glabrescens.

Folia numerosa sublutescentia subglabra, petiolis pro max. parte alatis, pro parte late alatis, nervoque mediano pallido. Folia caedem plantae valde variabilia, lobata; lobi laterales utrinque plerumque 3–4, saepe deltoidei breves vel triangulares sublongi (summo saepe sublingulato), erecto-patentes vel retroversi, integri vel margine inferiore vel superiore 1–2 dentibus muniti; interlobiis interdum indeterminatis integris vel 1–2 dentibus munitis vel sublobatis; lobus terminalis indeterminatus saepe  $\pm$  depresso-rhomboideus, integer vel sublobatus, interdum lobuli basis subovati distincti.

Scapi foliis subaequilongi, glabri vel sub involucro parce araneosi.

Involucrum mediocre ad 13 mm longum ad 15 mm latum, obscure viride saepe subglaucescens. Squamae exteriores erecto-patentes interdum apice recurvatae, lanceolatae vel ovato-lanceolatae ad 6 mm longae, anguste vel angustissime albo- vel viride marginatae; squamae interiores late lineares.

Calathium planum radians ad 3,5 cm diametro obscure luteum. Ligulae marginales planae extus stria cano-purpurea notatae. Antherae parce polliniferae. Stylus parte inferiore aureus, superiore luteo-virescentia, stigmata sordide lutea vel fuscescentia. Floret aestate.

Achenium (speciminis non typici) stramineum 4 mm longum (pyramide inclusa) superne subspinulosum ceterum laeve, in pyramiden conicam ca. 0,5 mm longam subsensim abiens; rostrum 5–6 mm longum, pappus albus 5 mm longus.

E sectione Alpinorum Haglund.

*Typus*: Hohe Tauern: Mallnitzer Tauerntal, slopes of Geiselkopf 1900 m, 18.7.1957 v. Soest (h. 38034; also 38016–7, 38019, 38030).

Furthermore:

Alp. de Savoie: Dent d'Octre 2000–2200 m, 1904; Pas de la Bosse 1700 m, 1899; Lac de Soix 2250–2260 m, 1905, all Briquet (G); Col d'Iséran, 1884 Perrier (G); Col de la Vanois-Tarentaise, 1889 Fauconnet (G).

Berner Alp.: Paneyrossaz, Alp. de Bex, 1835 Muret, also de Charpentier; the same valley 2210 and 2290 m, 1943 Villaret; Outans 1970 m and Vallée de l'Etivaz, Seron 2060 m, both Maillefer, all (LAU).

Walliser Alp.: Betlihorn, 1891 Chenevard (G); St. Bernard, 1843 Reichenbach f. (W).

Glarner Alp.: Graue Hörner, 1857 Alioth (G).

Rhaetische Alp.: Cucal Nair, Val Avers 2500 m, 1895 v. Tavel (ZT); Albula 2300 m, 1892 Meyer (ZT); Albula-Hospiz 2310 m, 1948 v.S. (h); Piz Padella, 1915 Branger (Z); Las Trais Fluors, 1937 la Nicca (CHUR); also 2740 m, 1957 Lüdi (RUEB); Val Curtins, Oberhalbstein, 1914 Schinz (Z); Lunghino

pass 2400 m, v. Tavel (ZT); Rättschenfluh near St. Antonien, 1919 Baumgartner (ZT); Arosa, Rothorn 2400 m, Schröter (ZT); Parsenn 1900–2100 m, 1954 v.S. (h); Calanda, above 1800 m, Salèz (ZT); Sulzfluh, Rätikon 2100 m, 1952 v. Hattum & v. Ooststroom (h).

Oetztaler Alp.: Prossental 21–2400 m, on several spots, 1956 v.S. (h).

Salzburger Kalkalp.: Schneeberg, 1887 Faimann (W); Geisstein, Traunsteiner (W).

Sarntaler Alp.: Sarnerscharte 2400 m, Haussmann (W).

Stubai Alp.: Gschnitztal, Trins, 1873 Churchill (K).

Brenner: Gries, 1865 Huter (K).

Hohe Tauern: Virgen 2400 m, 1866 Gander (K); Steiner Alpe near Windisch Matrei 2400 m, 1880 Mordnetz (W) and 1931 H.M. (W); Glockner region, 1905 Vierhapper (W); Teischnitz, Finsteres Tal 2600 m, 1953 Melzer (h); Gross Glockner, Franz Josephhöhe 2420 m, Mallnitzer Tauerntal, slopes of Feldseekopf and of Geiselkopf 1900–2000 m, Dössenertal nearby the lake 2250–2300 m, all 1957 v.S. (h); Hagener Hütte and Greilkopf 22–2500 m, 1932 H.M. (W).

Totes Gebirge: Tragln, Sigistal, 1952 Schaeftlein (h).

Karawanken: Hochobir near Kappel 1800 m, 1880 Preissmann (W).

Karnische Alp.: Cellonkofel 1600 m, 1957 Melzer (h).

Herzegovina: Trinaue, Pleša pl., Schneider (W).

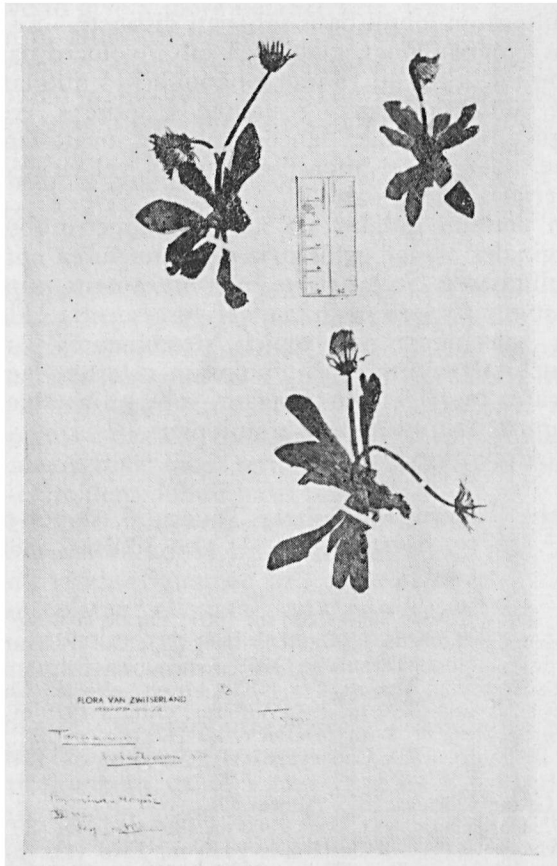


Fig. 2. *T. helveticum* v.S., type specimen.

### 3. *Taraxacum helveticum* van Soest **nov. spec.**, Fig. 2.

Planta 5–12 cm alta sat robusta, glabra vel valde glabrescens, basi fragmentis foliorum vetustorum subincrassata.

Folia numerosa subdecumbentia pallide vel luteo-viridia, lingulata vel subovata obtusa 1–2 cm lata, 3–9 cm longa, petiolis subnullis pallide viridis saepe latissime alatis; folia saepe integra vel retroversodenticulata vel paulo breve triangulariter dentata.

Scapi 1–2(–4) subcrassi, florendi tempore foliis  $\pm$  superantes, purpurascens.

Involucrum mediocre ca. 15 mm longum, 10–15 mm latum, basi rotundatum, obscure viride. Squamae exteriores adpressae vel laxe patentes, parvae, ad 5 mm longae, ad 2,2 mm latae, ovatae acuminatae vel lanceolatae, omnes obtusae, saepe rufescentes, immarginatae laeves; squamae interiores late lineares, late membranaceo-marginatae, laeves.

Calathium subradians ad 2,5 cm diametro, luteum; ligulae marginales planae extus stria cano- vel fusco-violacea notatae, saepe summis subnigrae. Antherae polliniferae; stylus (parte superiore) et stigmata obscura, siccis subnigra. Floret aestate.

Achenium pallide brunneo-stramineum, ca. 4 mm longum superne breve spinulosum ceterum laeve, in pyramidem conicam brevam subabrupte abiens; rostrum breve, ad 4 mm longum; pappus sordide albus, 5 mm longus.

E sectione Alpinorum Haglund.

*Typus*: Bernina-Hospiz, July 1929 v. Soest (h. 1937).

Furthermore:

Alp. Maritimes: Mt. Mounier, Sellavieille 2400 m, 1911 St. Yves (LAU).

Alp. de Savoie: Petit St. Bernard, 1885 Pellat (h); Lac de Taveneuse 1800 m, 1903 Briquet (G).

Walliser Alp.: Distelalp near Saas 2150–2250 m, Plattjen 24–2500 m, Tälliboden 23–2400 m, Almagelltal 2800–2850 m, all 1953 v.S. (h); Ofental 1880 m, Chenevârd (G).

Berner Alp.: Bell Alp near Brieg, 1873 Joad (K); Faulhorn 1800 m, Kützing (L); Alp. de Morcles, La Vire-aux-Boeufs 2000 m, 1906 Wilczek (LAU).

Vierwaldstädter Alp.: Uri, Bamberger (WAG).

Rhaetische Alp.: Val di Rodo, Duana pass 2700 m, 1892 Volkart (Z); Avers, Cucal Nair 2500 m, 1895 v. Tavel (ZT); Val Saluver, 1885 who? (CHUR); Weissenstein 2050 m and Albula pass 21–2300 m, both 1948 v.S. (h); Schlappin near Klosters 1650 m, 1954 v.S. (h); Roggentälli 21–2200 m, 1912 Zoya (RUEB); Gredigsaelpli near Arosa 2300 m, 1938 Maillefer (LAU); Fluella 2250 m, 1917 and Wuosthorn, both Schibler (Z).

Bernina: Hospiz, 1930 W. Koch (ZT); Fuorcla Surlej 2665 m, 1897 Knetsch (Z); Bernina pass 2050–2250 m, 1948 v.S. (h); Lago della Scala 2050 m, 1868 Brügger (ZT); Lago Bianco 2220 m, 1905 Rübel & Schröter (RUEB); Val del Fain, 1899 Hegi (Z); Chalchagn 2900 m, 1907 Rübel (RUEB); Maloja-Fuorcla di Lunghino 23–2400 m, 1895 v. Tavel (ZT); Piz Lagalb 2500 m, 1906 Schröter (ZT).

Silvretta: Vernelatal 2000–2200 m, Fremdvereina 1950 m, Süsertal 2100 m, all 1954 v.S. (h); Hafentälli 21–2200 m, 1912 Zoya (RUEB); Gaschurn, Garneratal, 1912 Vetter (W).

Vorarlberg: Fasultal, Konstanzer Hütte, 1912 Vetter (W).

Ortler: Martelltal, Konzenlacke 2600 m, 1956 Pohl (h. v.S.).

Oetztaler Alp.: Prossental 22–2400 m, 1956 v.S. (h).  
 Brenner: Gossensass and Hühnerspiel, 1910 Vetter (W); Saxalpenwand 2300–2698 m, 1932 H.M. (W).  
 Zillertaler Alp.: between Kalk- und Rollspitze 2300 m, 1957 Melzer (h).  
 Hohe Tauern: Klein Zirknitztal, 1911 Vetter (W); Geiselkopf 1800–1900 m, 1957 v.S. (h); Magdalenental, 1874 Churchill (K).  
 Gurktaler Alp.: Zundernwand near Radenthein 2000 m, 1950 Schaeftlein; Rinseneck 2200 m, 1949 Höpfinger (h. Schaeftlein).  
 Tatra: Fünf Seen, 1917 Schneider (W).

This species has dark stigmas; the typical form has entire leaves, attenuated in a long petiole; it cannot be confused with *T. petiolulatum* (Huter) m, having paler coloured stigmas, narrow petioles and being more tender in all its parts.

Not always the leaves are entire; they can be more or less lobate, the endlobe then being fairly polygonal; generally, this form is found at other localities than the typical one.

**f. lobatum van Soest f. nov.**

Ab *T. helveticum* differt: foliis breve vel elongato-lobatis; lobi laterales integri vel dorso dentati; lobus terminalis saepe polygonius, obtusus vel subobtusus.

*Typus*: Silvretta: Vernelatal 2500 m, 20.7.1954 v. Soest (h. 33891).

Furthermore:

Alp. Maritimes: Mt. Monnier 2400 m, 1911 St. Yves (LAU).  
 Alp. Bergamasques: Val di Scalve 2500 m, 1911 Wilczek (LAU); Val Sérienna 2100 m, 1913 Chenevard (G).  
 Walliser Alp.: Distelalp near Saas 2150–2250 m and Plattjen 24–2500 m, 1953 v.S. (h).  
 Berner Alp.: Novaier Thäli, Lauenzughorn 2220 m, 1913 Noack (RUEB).  
 Churfürsten: Brisigipfel 2280 m, 1914 Vogt (Z); Hinterruck, 1910 E. Müller (Z).  
 Glarner Alp.: Weisstannen, Flysch 2200 m, 1942 W. Koch (ZT); Nüschenalp, 1878 Lehmann (ZT).  
 St. Gotthard: 1849 who? (ZT).  
 Tessiner Alp.: Wandfluhhorn 2600 m, 1903 Bär (Z); Passo Corombe 2320 m, Furri (RUEB); Poschiavo, 1880 Pozzi (ZT).  
 Rhaetische Alp.: Avers, Gletscherhorn 27–2800 m, 1895 v. Tavel (ZT); Albula pass 2300 m, 1878 Kaeser (Z); Klosters, 1905 Laisi (Z); Parsennfurka 22–2400 m, 1954 v.S. (h); Körbshorn 2645 m, 1893 and Wuosthorn, both Schibler (Z).  
 Bernina: Piz Minor 2900 m and Piz Stretta 2820 m, both 1907 Rübel (ERUB); Fuorcla Muragl 2600 m, 1911 Branger (RUEB).  
 Silvretta: Vernelatal 2200 m, 1918 Noach (U); in the same valley on several spots between 2000 and 2250 m and Süsertal 2100 m, both 1954 v.S. (h); Vermonttal, 1912 Vetter (W); Gaschurm, Garneratal, 1912 Vetter (W).  
 Ortler: Martelltal 2350 m, 1956 v.S. (h); Stillfserjoch 2600 m, Dolenz (GZU); St. Gertraud, Sulden 2100 m, 1907 Preissmann (W).  
 Hohe Tauern: Freiwand near Franz Josefs Höhe, 1912 Dolenz (GZU); Geiselkopf 1900 m and Dössenental 2100 m, 1957 v.S. (h).  
 Niedere Tauern: 1910 Schneider (W).

**4. Taraxacum mattmarkense van Soest nov. spec., Fig. 3.**

Planta parva ca. 6–8 cm alta, inferne araneosa.

Folia tenera luteo-viridia, superne glabra, inferne glabrescens, ad 6 cm longa ad 2,5 cm lata, lobata vel interdum grosse obtuse

late dentata; petiolis alatis pallide viridis; lobi laterales utrinque 2-3; deltoidei vel late triangulares obtusi integri, interlobiis saepe subnullis; lobus terminalis deltoideus obtusus vel deltoideo-hastatus, integer, lobuli basis breves obtusi.

Scapi ad 4, parce, sub involucro dense araneosi.



Fig. 3. *T. mattmarkense* v. S., type specimen.

Involucrum mediocre ca. 10 mm longum, ca. 10 mm latum; squamae exteriores laxe adpressae vel erecto-patentes lanceolatae ad 5 mm longae, ad 2 mm latae, late viride- vel roseolo-marginatae, apice obtusae purpureae; interiores late lineares membranaceo-marginatae conspicue ciliolatae, apice purpureae; omnes laeves.

Calathium paulo radians ad 17 mm diametro, clare luteum; ligulae marginales angustae subinvolutae estriatae summo aureo-purpureae. Antherae polline carentes; stylus et stigmata laete lutea; floret aestate.

Achenium maturum ignotum, pappus niveus.

E sectione Alpinorum Haglund.

*Typus*: Walliser Alp.: Saastal, near Mattmark 2100 m, 8.7.1952 v. Soest (h. 31090); furthermore in the immediate neighbourhood: on the same locality at 2150 m altitude; opposite the Allalin glacier, below Nollenhorn 2000–2100 m; Distelalp 2150–2250 m, all 1952 v. S. (h).

Furthermore:

Berner Alp.: Alpes de Bex, Paneyrossaz 2290 m, Villaret (LAU).

5. ***Taraxacum oreophilum*** Haglund, 1950. Ber. Schweiz. Bot. Ges. 60: 238, c. icon.

This species is only mentioned from Piz Padella 2350 m in the Rhaetian Alps, 15.7.1938 W. Koch (S, ZT). It is closely allied to *T. panalpinum*, but the lobes of the leaves are longer, the flower heads larger, the outer involucre bracts acute and not acuminate and, especially, the flowers are tubular, enclosing to a very high degree the anthers, the styles and the stigmas; the marginal flowers, at their outside, are bright purplish.

I have seen several alpine forms of *Taraxacum*, having more or less tubular flowers, no one, however, being identical with *T. oreophilum*. The achenes have a very short cone, showing that it belongs to sect. *Alpina*; apart from the purplish outside, the flowers are dark yellow; confusion with species of sect. *Cucullata* is therefore impossible.

6. ***Taraxacum panalpinum*** van Soest **nov. spec.**, Fig. 4.

Planta mediocris gracilis ca. 6 cm alta, basi fragmentis foliorum vetustorum subincrassata.

Folia ad 8 cm longa numerosa lobata luteo-viridia glabra, nervo mediano pallido raro parum rufescente, petiolis brevis pallide viridis raro parum roseolo-coloratis subalatis. Lobi laterales deltoidei vel saepissime triangulares summo saepe retroverso vel breve falcati dorso conspicue vel sub-convexo, interdum 1 dente parvo rare grosso munito, margine inferiore  $\pm$  crispo-plicatulo. Lobus terminalis deltoideus vel subhastatus integer, acutus vel subacutus.

Scapi floriferi foliis aequilongi vel eis breviori, sub involucre araneosi vel interdum glabrescentes.

Involucrum mediocre 1,5 cm longum, 1,5 cm latum crassiusculum viride subglaucescens; squamae exteriores laxae adpressae apice recurvatae, ovatae vel ovato-lanceolatae saepe acuminatae (extremae angustiores), ultra ad 6 mm longae, 3 mm latae, apice obtusae, in superiore parte inconspicue marginatae vel immarginatae; squamae interiores late membranaceo-marginatae.

Calathium radians ad 2,5 cm diametro, obscure luteum; ligulae marginales planae angustae, extus stria rufo- vel cano-violacea notatae, summis saepe obscurae. Antherae vacuae vel paulo polliniferae; stylus superne sordide luteus, stigmata fusco-virescentia. Floret aestate.

Achenium ca. 4 mm longum (pyramide inclusa) rufo-stramineum, superne breviter spinulosum ceterum laeve, in pyramidem conicam



0,6 mm longam abrupte abiens. Rostrum breve, ad 6 mm longum; pappus albus, 6 mm longus.

E sectione Alpinorum Haglund.

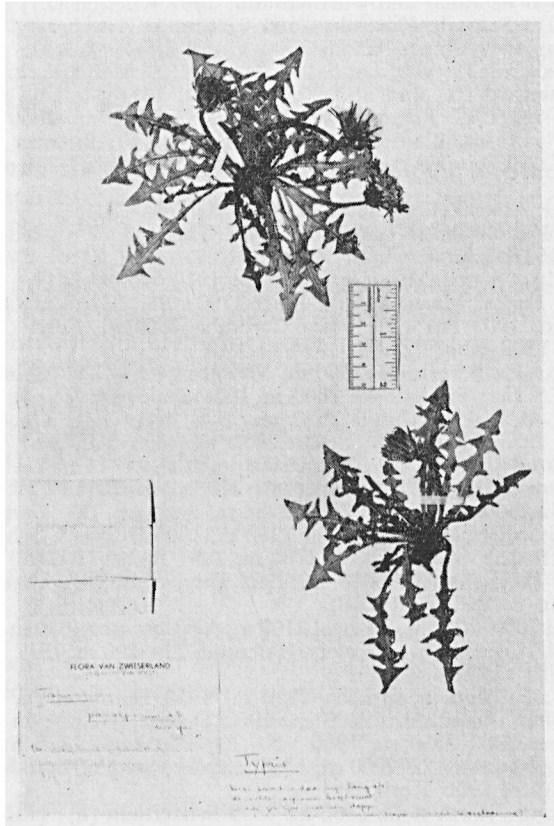


Fig. 4. *T. panalpinum* v.S., type specimen.

Furthermore:

Serra da Estréla: Lagoa Comprida, 1881 Ferreira (COI).

Serra da Lousã: 1883, Henriques (COI), both considered by me as *T. alpinum* s.str. in *Agronomia Lusitana* 1951. 13.1.

Sierra Nevada: Prado de Vedegambra 2600 m, 1923 Font-Quer & Gros (BC, h. v.S.).

Hautes Pyrénées: Lac d'Oredon 1870 m, 1949; Vallée d'Aussone, Gavarnie 1900m, 1952; lac d'Aumar 2193 m, 1952, all J. Aylies (h. de Litardière).

Hautes Alpes: Galibier, 1877 Pellat (h).

Mont Blanc: Mer de Glace 2780–2997 m, Venance Payot (G); Allée Blanche, 1863 Perrier (G); Pointe Ronde, near Martigny 2500 m, 1922 Farquet (ZT).

Alp. de Savoie: Col de Tanneverge 23–2500 m, 1902 Briquet (G); Col de Pelouse 2300 m, 1949 A. H. Palm-Lyesen (U); Hauteluze, 1865 Perrier, exsicc. Billot (GZU); Pic de la Vogéalle 2600 m, 1893 Briquet (G); between Aiguille de Varens and Tête de Colleney, 1902 Briquet (G).

- Walliser Alp.: St. Bernard 2450 m, 1910 and 1921; Hospice 1893 and 1923, all Wilczek (LAU); Alpes de Fulley, 1877 Burdet (LAU); Vallon de la Toula — Col Coudarche 2600 m, 1910 Wilczek (LAU); Zermatt, Riffel 1870 Favrat (LAU); 1879 Hooker (K) and 1922 Thellung (Z); Gornergrat, 1907 Rohrer (Z) and 1910 Western (K); also 3100 m and Hörnli 2850 m, both 1919 Thellung (Z); Schönhorn 2246 m, 1904 Knetsch (Z); Pas de Forcletta, between Val de Zinal and Turtmanntal, 1897 Knetsch (Z); Simplon, Kaldwasser (G); Saastal, Distelalp 2150–2250 m, Gletscheralp near Saas-Fée 23–2400 m and Almagelltal 26–2800 m, all 1952 v.S. (h).
- Berner Alp.: Vallée de l'Étivaz, Laudallaz 1995 m, 1943 Maillefer (LAU); Faulhorn, 1891 Chenevard (G) and also 2618–2683 m, 1841 Martins & Bravais (G); also 2672 m, 1921 Blauer (Z); Paneyrossaz 1800 m, 1866 Thomas (K); Melchsee — Frutt, Blausee; 1938 Wallimann (ZT); Briener Rothorn, 1931 Blauer (Z); Eigergletscher 2340 m, 1918 Michalski (Z); Gemmipass, S. Fries (Z).
- Vierwaldstädter Alp.: Fellital 2600 m, 1915 Schmid (Z).
- Glarner Alp.: Fridolinshütte near Tödi, 1902 Thellung (Z); Maderanental, Alpli 2400 m, 1915 Schmid (Z).
- Appenzeller Alp.: Säntis, Alpsiegel 1640 m, 1918 Koller (Z).
- Tessiner Alp.: Furka, Marschenspitz Bosco, 1903 Bär (Z); Val Onsermone near Comologno, 1905 Bär (Z); Passo Corombe 2320 m, Furri (RUEB).
- St. Gotthard: 1849 who? (ZT).
- Rhaetische Alp.: Piz Beverin 21–2400 m, 1869 Brügger (ZT); Albula pass 21–2300 m, 1948 v.S. (h); Piz Saluver 2800 m, 1904 Candrian (Z); St. Moritzer Alp, Imhoof (LAU); Urdenfurkli 2620 m, 1920 Beger (Z); Oberhalbstein, Val Curtegn, 1918 Schinz (Z); Strela 2653 m, 1893 Schibler (Z); Strela Alp, 1924 Givardet (LAU); Val Nuglia 2600 m, 1920 Wilczek (LAU); Ducanpass, Sertig-Davos 2671 m, 1893 Schibler (Z); Körbshorn 2645 m, 1893 Schibler (Z).
- Bernina: Hospiz 2300 m and pass 2050–2250 m, both v.S. (h); Cambrena 2400 m, 1904 de Litardière (k); Val Minor 2300 m, 1905 Rübel & Schröter (RUEB); Piz Chatscheders — Piz Stretta 2780 m, 1907 Rübel (RUEB); Maloja, 1899 Hegi (Z); Piz Languard 3000 m, 1953 Duvigneau (h); Lagalbsee 2400 m, 1905 Braun & Rübel (RUEB).
- Silvretta: Seetal 2000–2050 m, Süsertal 2100 m, Alp Sardasca 1650 m and Vernelatal 2100 m, all 1954 v.S. (h); Klosters, Hafentälli 21–2200 m, 1917 Zoya (RUEB); Galtür, 1927 Schneider (W).
- Lechtaler Alp.: Rükfopf near Lech 2350 m, 1958 Damblon (h. Lambinon).
- Ortler: Martelltal, Zufallhütte 2200 m, 1900 Dolenz (GZU); in this valley on several spots 2000–2350 m, 1956 v.S. (h); Plattkogel, 1876 Stein (G).
- Oetztaler Alp.: Prossental 22–2600 m, 1956 v.S. (h); Sölden, 1901 Kerner (GZU); Samoar Hütte, 1906 Korb (W).
- Brenner: Rollspitze, north slope 2200 m, 1953 Schaeftlein (h); Hühnerspiel, who? (GZU) and 1886, Evers (GZU).
- N. Tiroler Alp.: Haflekar 2100 m, 1882 Evers (GZU).
- Zillertaler Alp.: Weissenbach 24–2700 m, Treffer (GZU), also 2000–2500 m, 1880 Treffer (Gr.).
- Sanntaler Alp.: Sanntaler Sattel and Kankersattel, both 1931 Korb (W).
- Hohe Tauern: Windtal near Lenkjöchel, Venediger 2400 m, 1906 Dolenz (GZU); Mallnitzer Tauern 2300 m, 1904 Dolenz (GZU).
- Niedere Tauern: Judenburger Alp., Fenzl. (W).
- Totes Geb.: Tragln, Sigital, 1952 Schaeftlein (h).
- Eisenerzer Alp.: Admont, Speckmover (W).
- Tatra: Lomnitzerspitze, Láng (W).
- Transsilvanische Alp.: Pareng, 1883 Barth (W).
- Albania: Kom. Kuçi, Iter Mont. 1886 de Szyszyłowicz (W); Dibala, Iter Alban. Sextum Baldacci 226, 1898 (G, K, W).

From a taxonomical point of view this species occupies the central place in the field of characteristics within the section; it also seems to have the largest area and to be the most common of all species

of this specimen. Still it is impossible to consider it as the true *T. alpinum* as described by Hoppe (as *Leontodon*) or by Hegetschweiler & Heer, as I did in a few earlier studies.

In Sturm 1821, Deutschlands Flora 5, *Leontodon alpinus* Hoppe is pictured; with the exception of two leaves below it seems to represent *T. panalpinum*; three localities are mentioned in this Flora (Heiligenbluth, Salmhöhe, Gamsgrube); these, however, do not appear in the list given above. From Heiligenbluth I know: *T. kalbfussii*, from Salmhöhe: *T. venustum* and *T. petiolulatum*, all collected by Hoppe; from Gamsgrube I know material from *T. vetteri*, collected in 1904 by Vetter.

*T. panalpinum* shows more variability than most other species of the section; splitting up this species in smaller groups does not seem practical to me. Pollen is present, but some times more or less absent; the stigmas are dirty yellow, often greenish yellow; the scapes of the flower heads are hairy at the top, but some times glabrous; the leaves are yellowish green and have mostly recurved triangular lobes. The dark green outer involucral bracts are more or less spreading, often with recurved apex. The achenes are typical for the *Alpina*, having a short cone and a short rostrum.

With ripe achenes no confusion is possible with *T. rhaeticum* m (sect. *Vulgaris* Dahlst.); this one has a long rostrum, nearly twice the length of the achenes; without achenes a decision whether the form in study is *T. panalpinum* or a small specimen of *T. rhaeticum* is more difficult. The leaves of *T. rhaeticum*, however, are greyish to grass-green; the involucre are not so dark and the stigmas are more pure yellow.

*T. carinthiacum* m is allied to *T. panalpinum*, but the difference in shape of the leaves and their lobes makes a decision whether a specimen belongs to the one or the other not difficult.

### 7. *Taraxacum parsennense* van Soest nov. spec., Fig. 5.

Planta mediocris ca. 6–10 cm alta, subglabra.

Folia subnemorosa gramineo-viridia, petiolis subalatis — alatis pallidis vel rufescentis. Folia interiora lobata; lobi laterales utrinque 2–3, triangulares summo acuto saepe retroverso vel recurvo, integri raro 1 dente muniti, interlobiis ca. 5 mm latis interdum paulo denticulatis; lobus terminalis ad 2,5 cm longus hastatus saepe indeterminato-sublobatus vel 1 dente retroverso grosso munitus, subobtusus.

Scapi floriferi foliis aequilongi, sub involucre subaraneosi.

Involucrum mediocre basi ovatum, atroviride. Squamae exteriores laxe patentes apice recurvatae, ovato-lanceolatae ad 7 mm longae immarginatae, saepe purpurascens. Squamae interiores late lineares, 12 mm longae.

Calathium planum radians ca. 3,5 cm diametro, obscure luteum. Ligulae marginales planae, extus estriatae vel inconspicue canostriatae, summo ± nigro. Antherae polliniferae; stylus inferne luteus, sordide luteus; stigmata obscure fusco-lutescentia.

Achenium maturum ignotum stramineum, superne (breve?) spinulosum, ceterum  $\pm$  laeve, in pyramiden conicam sensim abiens; rostrum achenio ad duplo longius?; pappus albus.

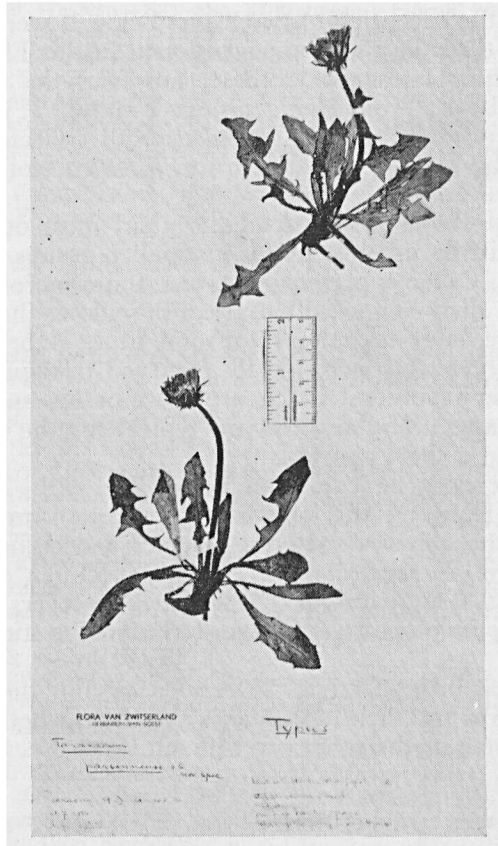


Fig. 5. *T. parsennense* v.S., type specimen.

*Typus*: Rhaetische Alp.: Parsenn near Klosters, between 1900 and 2400 m, 21.7.154 v. Soest (h. 33859).

Furthermore:

Glarner Alp.: Maderanertal, Schwarzstöckli, 1915 Schmid (Z).

Rhaetische Alp.: Dischatal near Davos, 1907 Bär (Z); Schlinigtal 1800 m, 1956, v.S. (h).

This species, though very probably belonging to section *Alpina*, is related to the *Vulgaria* Dahlst.: the rostrum seems to be relatively long and also the habit shows some resemblance to mountaineous species of *Vulgaria*. Often the leaves of *T. parsennense* have brownish petioles, a characteristic not common in *Alpina*. The ligules are more or less lacking coloured stripes.

8. **Taraxacum petiolulatum** (Huter) van Soest **nov. comb.**; *T. officinale* var. *petiolulatum* Huter, in sched. 21.8.1878; *T. alpinum* var. *glabrum* von Handel-Mazetti, 1907. Monogr. Tarax.: 94, c. icon: V. 10d, non *T. glabrum* De Candolle, 1838; *T. officinale* ssp. *alpinum* var. *glabrum* Hegi 1928. Fl. Mitt. Eur. 6.2: 1092.

The description given by Huter is very short: "foliis aperte petiolulatis, ovatis subintegris, floribus croceis"; nevertheless it is, if applied to the section *Alpina* Hagl., a nearly sufficient one. According to modern principles in the description of *Taraxacum* species, a more complete one is needed, following below. In his monography H.M. has published a photographic reproduction of var. *glabrum*, being, according to him, identical with *T. glabrum* DC. and with *T. petiolulatum*. *T. glabrum* DC., however, is a very different species, belonging to sect. *Glabra* Dahlst. and only represented in the arctic region. Though from a descriptive point of view the name "petiolulatum" better had to be changed in "petiolatum", I do not change it for nomenclatorial reason.

Planta gracilis 7–10 cm alta subglabrescens, collum radice araneosum.

Folia supra glabra subrotundata vel elliptica vel obovata, obtusa integra,  $\pm$  dentata vel raro pro parte sublobata, in petiolis pallide viridis 1–3(–4) cm longis breve vel sublonge truncata.

Scapus glabrus.

Involucrum ca. 11 mm longum. Squamae exteriores laxe adpressae parvae sublineares vel pro parte sublatores ad 3 mm longae obtusae immarginatae pallide virides, interiores subobscurae virides late marginatae, omnes laeves.

Calathium subradians ad 2 cm diametro, croceum. Ligulae marginales planae, extus stria cano-purpurea ornatae; antherae polliniferae; stylus et stigmata sordide lutea; floret aestate.

Achenia matura ignota, pappus niveus.

E sectione Alpinorum Haglund.

*Typus Huterianus*: Pusteria, Sexten (Tirol), brevissime graminos. aqua nivali irrigati in Givenglabl, sol. calc., 2300 m, 21.8.1878 Huter (W. 1889/5138 4); also in herb. K.

Furthermore:

- Silvretta: Garneratal, Gaschurn, 1912 Vetter (W).  
 Rhaetische Alp.: Schlinigtal 1800 m, 1956 v.S. (h).  
 Ortler: Martelltal 2350 m, 1956 v.S. (h).  
 Lechtaler Alp.: 2300 m, 1930 Wyatt (K).  
 Oetztales Alp.: Prossental 21–2600 m, 1956 v.S. (h).  
 Stubaier Alp.: Gschnitz, see H.M. l.c. fig. 10 d.  
 Brenner: Tierser Alp — Seiser Alpenhaus, 1912 Vetter (W); Steinalpe near Matrei 2400 m, 1931 H.M. (W); Matrei, A. Kerner (BR).  
 Zillertaler Alp.: Tristental 2000–2500 m, 1880 Treffer (GR); in the same valley 22–2600 m, 1887 and 1888 Treffer (LAU, ZT).  
 Defereggan Alp.: Bahlenke, 1929 Schneider (W).  
 Gailtaler Alp.: Laserzwand, 1929 Gayer (GZU).  
 Hohe Tauern: Feldseekopf 19–2000 m and Geiselkopf 1900 m, 1957 v.S. (h); Glockner, 1905 Vierhapper (W); Salmhöhe, Hoppe (L).

Karnische Alp.: Upper Valentin 2200 m, 1934 Schaeftlein (h); Pustertal, 1878 Huter (K).  
Dolomiten: Passo di Pordoi 2200 m, 1955 Keuchenius (U); Schlern 2450 m, 1954 Melzer (h).

This species has an eastern alpine area; no locality from Switzerland is known, though it reaches the border of this country.

9. **Taraxacum pseudofontanum** van Soest **nov. spec.**, Fig. 6.

Planta mediocris gracilis 5–15 cm alta, basi subglabra.

Folia lingulata luteo-viridia vel gramineo-viridia, parce, in nervo dorsali interdum  $\pm$  rufescente conspicue araneosa; petiolis  $\pm$  alatis pallide viridis. Folia exteriora dentata; interiora lobata vel lobulato-

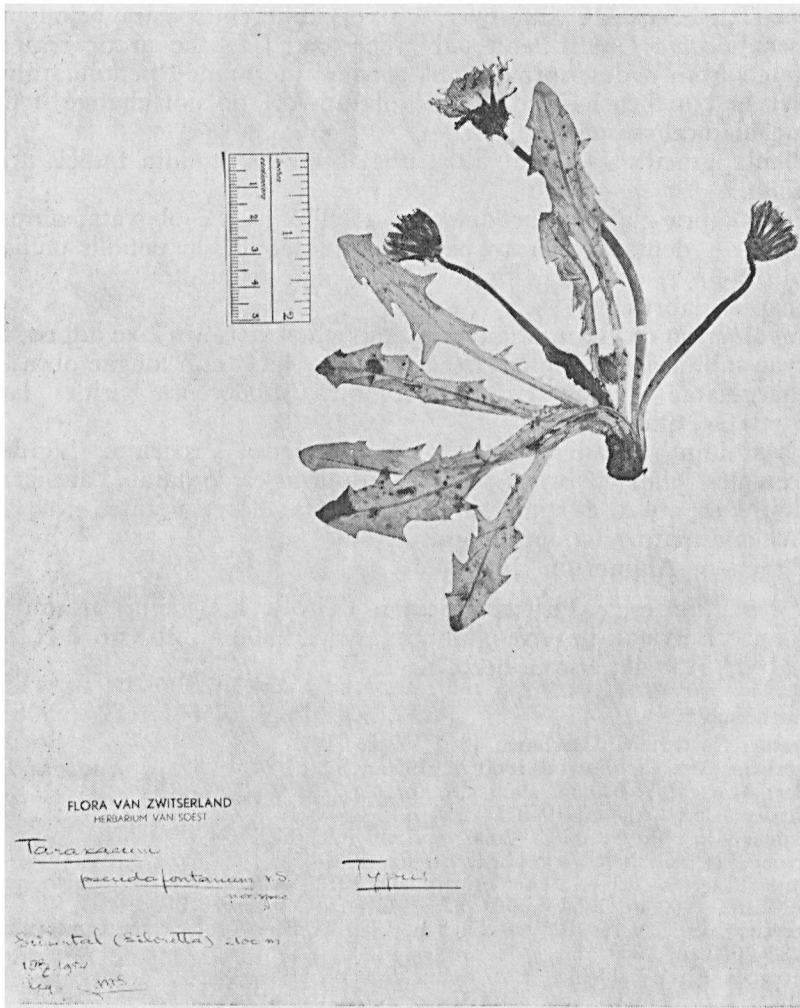


Fig. 6. *T. pseudofontanum* v.S., type specimen.

dentata, ca. 6 cm longa, ad 1,8 cm lata, subobtusata; lobi laterales utrinque ca. 3, breves, triangulares vel lanceolati vel subunguiculati  $\pm$  retroversi denticulati vel dorso 1 dente muniti.

Scapi 1–4, foliis aequilongi vel eis breviter superantes, sub involucri araneosi vel subglabri.

Involucrum mediocre 15 mm longum, 12–14 mm latum, viride. Squamae exteriores apice  $\pm$  recurvatae, lanceolatae ad 8 mm longae 1,5 mm latae apice elongatae, pallide virides,  $\pm$  anguste albo- vel virescenti-marginatae; squamae interiores late lineares apice  $\pm$  purpureae.

Calathium subradians vel radians ad 3 cm diametro, saturate luteum. Ligulae marginales extus stria cano-purpurea notatae apice subnigrae. Antherae polliniferae; stylus et stigmata clare lutea. Floret aestate.

Achenium stramineum 3,5 mm longum (pyramide exclusa) superne brevissime spinulosum ceterum laeve, in pyramidem 0,5 mm longam inconspicue abiens. Rostrum 5–6 mm longum, pappus 5 mm longus. E sectione Alpinorum Haglund.

*Typus*: Oetzaler Alp.: Prossental 21–2200 m, 18.7.1956 v. Soest (h. 36731, 36752); in the same valley this species is collected abundantly up to 2400 m, 1956 v. S. (h).

Furthermore:

Walliser Alp.: Almagelltal 26–2800 m, 1952 v.S. (h).

Glarner Alp.: Widerstein Furkel 18–2000 m, 1910 Roth (Z).

Rhaetische Alp.: Val Bregalga, Avers 2000 m, 1938; Palpuogna, Albula 1900 m, 1948, both v.S. (h); Fideris, Glunersee, Flütsch (CHUR); Schlappin near Klosters 1650 m and Parsenhütte 2200 m, both 1954 v.S. (h).

Bernina: Berninal 2050–2250 m, 1948 v.S.(h); Fuorcla Surlej 23–2700 m, 1905 Rübél (RUEB).

Silvretta: Hafentälli 21–2200 m, 1912 and Vernelatal 2000 m, 1913 Zoya (RUEB); Vernelabach near Vereinahaus 1950 m, Vernelatal 2000–2200 m, Alp Sardasco 1650 m, Süsertal 2100 m, all v.S. (h); Gross Vermunt 2000 m, 1951 Melzer (h).

Oetzaler Alp.: Prossental 2400 m, 1956 v.S. (h).

Ortler: Martelltal 2350 m, 1956 v.S. (h).

Brenner: Gries, 1865 Huter (K).

Dolomiten: Schlern, Schneider (W); Passo di Pordoi 2300 m, 1955 Keuchenius (U).

Hohe Tauern: Mallnitzer Tauerntal, below Geiselkopf 1900 m, Dössenertal 2000 m, and near Dössenersee 2250–2300 m, all 1957 v.S. (h).

This species is closely related to *T. helveticum* m; it can easily be recognized by its clear yellow stigmas, which are dark grey in *T. helveticum*. Furthermore, the pale outer involucral bracts, generally with recurved apex, are remarkable. In leaf form there is a striking resemblance to species of sect. *Fontana* m, such as *T. fontanicolum* m, having a longer rostrum and dentate leaves, with dents not directed backward in general.

#### 10. *Taraxacum saasense* van Soest **nov. spec.**, Fig. 7.

Planta ad 10 cm alta subglabra.

Folia numerosa conspicue tenera luteo-viridia glabra, petiolis subalatis vel alatis pallide viridis; folia exteriora oblanceolata integra

vel sublobata; folia interiora lobata; lobi laterales utrinque ca. 3, breve deltoidei vel triangulares summo acuminato subobtusos, integri, inferne raro  $\pm$  dentati; interlobiis subnullis 3–10 cm latus raro dentatis; lobus terminalis saepe breve deltoideus subobtusus saepe apice mucronatus, interdum indeterminato-sublobatus vel dentatus.



Fig. 7. *T. saasense* v.S., type specimen.

Scapi 1–2, sub involucrio parcissime araneosi vel glabri, basin versus parce araneosi.

Involucrium subparvum ca. 10 mm latum, 12 mm longum. Squamae exteriores laxae adpressae parvae lanceolatae, ad 5 mm longae, pallide virides, apice violaceae; squamae interiores obscure virides, late lineares membranaceo-marginatae, omnes laeves.

Calathium paulo radians ad 2 cm diametro, luteum. Ligulae marginales planae extus stria obscure rubro-violacea notatae, summis subnigrae. Antherae (parce?) polliniferae; stylus parte inferiore clare luteus, superne obscurus; stigmata obscura, siccis subnigra. Floret aestate.



*Achenium dilute brunneum, maturum ignotum, rostrum achenio subaequilongium, pappus albus.*

E sectione Alpinorum Haglund.

*Typus:* Walliser Alp.: Saas-Fée, above the Gletscher Alp 23–2400 m, 23.7.1952 v. Soest (h. 31073–4); furthermore in the neighbourhood: Plattjen 24–2500 m, Mattmark 2100–2150 m, both 1952 v. S. (h); Plattjen, 1919 Arnow (Z).

Furthermore:

Alp. Maritimes: Tenda, near Lacum di Fontanalba, 1911 Bicknell & Pollini, Fl. Ital. exsicc. II. 1996 Fiori & Béguinot (K, LAU, ZT).

Alp. de Savoie: Col de Bix, 1903 Briquet (G).

Walliser Alp.: Simplon, 1865 Bader (G).

Berner Alp.: Alp. de Bex, Vallée de l'Avançon d'Anzeindaz 2085 m, 1943 Villaret (LAU).

This species, belonging to the West-alpine Flora, is easily recognized by its thin and yellowish green leaves with very short deltoid lobes; the outer involucre bracts are small and pale green, the stigmas are dark coloured.

#### 11. *Taraxacum vereinense* van Soest **nov. spec.**, Fig. 8.

Planta gracilis 7–10 cm alta glabrescens.

Folia laete gramineo-viridia ca. 10 cm longa (petiolis angustis vel subangustis pallide viridis inclusa) profunde lobata; lobi laterales utrinque 3–4, angusti, triangulares vel falcati, dorso longe anguste dentati, margine inferiore integro, interlobiis dentatis sublongis 2–3(–5) mm latis; lobus terminalis subacutus, lobuli basis acuti.

Scapi 1–2 graciles, sub involucre saepe araneosi.

Involucrum ca. 11 mm longum, 12 mm latum, atro-viride; squamae exteriores erecto-patentes apice recurvatae, lanceolatae ca. 7 mm longae subacutae vel subobtusae, angustissime albo- vel pallide purpureo-marginatae; squamae interiores membranaceo-marginatae.

Calathium paulo radians ad 17 mm diametro, obscure luteum; ligulae marginales planae extus stria cano-purpurea ornatae; antherae parce polliniferae; stylus inferne luteus, superne virescenti-luteus; stigmata virescenti-lutea; floret aestate.

*Achenium dilute brunneum* 3 mm longum (pyramide exclusa) superne spinulosum ceterum rugosum—basi laeve, in pyramiden conicam 0,5 mm longam subabrupte abiens; rostrum 6–7 mm longum; pappus albus, 5 mm longus.

*Typus:* Silvretta: Vereinahaus 1950 m, 18.7.1954 v. Soest (h. 33810).

Furthermore:

Walliser Alp.: Hannigalp near Saas-Fée 22–2400 m and below Mittaghorn 1800 m, both 1952 v.S. (h).

Rhaetische Alp.: Albula pass 21–2300 m, 1948 v.S. (h); Piz Padella 2200 m, 1910

Branger (RUEB); Oberhalbstein, Piz Curver 2435 m, Schröter (RUEB).

Silvretta: Vernelatal 2100 m, 1954 v.S. (h).

Ortler: Martelltal 2250 m, 1956 v.S. (h).

Oetztaler Alp.: Prossental 21–2200 m, 1956 v.S. (h).

*T. vereinense* has a rather long rostrum, which makes it uncertain if this species belongs to sect. *Alpina*. The habit of the plant, however, is alike those of species of this section. On the other hand it seems to flower a little bit earlier than the others and also the achenes ripen earlier. There is some resemblance to small forms of *T. rhaeticum* m (sect. *Vulgaria* Dahlst.), but this species lacks pollen and has pure yellow stigmas, as well as *T. perfissum* m.



Fig. 8. *T. vereinense* v.S., type specimen.

12. ***Taraxacum venustum*** Dahlstedt 1908. Arkiv f. Bot. 7.1: 5, non Koidzumi 1933 Bot. Mag. Tokyo: 104; *T. officinale* b. *Kalbfussii* Schultz-Bip. 1933. Flora 16.2: 605; von Handel-Mazzetti 1907. Monogr. Tarax.: 94; *T. alpinum* var. *Kalbfussii* Sch.-Bip. in Braun-Blanquet & Rübel 1936. Fl. Graubunden: 1476; *T. officinale* ssp. *alpinum* var. *Kalbfussii* Hegi 1928, Fl. Mittel-Europa 6.2: 1092; *T. alpinum* var. *hyoseridifolia* Baer & Hellweger in Herb. norm. Dörfler

1899 (no. 4063), non *T. hyoseridifolium* Arvet-Touvet & Marcou d'Aymeric 1892.

The descriptions given by Baer and Hellweger, and by Schultz-Bip.—the latter being clear and accurate—needed addition, given by Dahlstedt. The name *T. venustum* and its description are hidden in a short note at the foot of page 5; therefore I used earlier the (older) name *kalbfussii* during the revision in several herbaria. As lectotype we have to choose Dörfners exsiccatum from Hühnerspiel, see below.

This species is only known from the east alpine region, where it is common at an altitude from (1700–)2000–2700 m above sea level.

Alp. Alp.: Nebelhorn, Bornmüller (S).

Rhaetische Alp.: Piz Uertsch 2500 m, Schröter (ZT); Val Maisas 2600 m, 1867 Favrat (LAU) and 1906 Sulger Buel (Z); Samnaun, 1856 Krättli (Z) and 1867 Favrat (LAU); Davos, Grosse Schiahorn 2700 m, v. Tavel (ZT); Ducan pass, Sertig 2671 m, 1893 Schibler (Z); Fimberjoch, Jaeggi (ZT).

Bernina: Piz Alv and Val Minor 2300 m, both Rübel & Schröter (RUEB); Piz Alv, who? (AMD); Piz Canciano, Pozzi (ZT); Piz Lagalb 2500 m, 1906 Schröter (ZT).

Silvretta: Vernelatal 2000–2250 m, on several spots, 1956 v.S. (h).

Lechtaler Alp.: Rükfopf near Lech 2350 m, 1958 Damblon (h. Lambinon).

Ortler: Martelltal 2100–2350 m, on several spots, 1956 v.S. (h); Konzenlacke 2600 m, 1956 Pohl (h. v.S.); Edelweisschütte near Trafoi, 1913 Vetter (W); St. Gertraud, Suldental 2100 and 2700 m, 1906 Preissmann (W).

Brenta Alp.: Cima Val Skura 2000–2200 m, 1918 R. Czegka (GZU).

Stubai Alp.: Trins and Naturfreundehaus, Padaster, both 1930 Korb (W); Padasterjoch, 1910 Schneider (W); Gschnitztal, Churchill (K), for this valley see also H.M., Monogr. fig. 10 b; Muttenjoch 2700 m, 1873 (K).

Brenner: Sterzing, 1912 Glowacki (GZU); Hühnerspiel near Gossensass 2400–2730 m, 1899 Bear & Hellweger, exsicc. Dörfner no. 4063 (G, GZU, LAU, O, P, RUEB, S, W); Hühnerspiel, 1910 Vetter (W) and 1953 Schaeftlein (h); Wolfendorn, 1912 Vetter (W).

Zillertaler Alp.: Tristen 24–2700 m, Treffer (GZU); Rohrbach, St. Johann 2000–2400 m, Treffer (W).

Hohe Tauern: Venedigergruppe, Lenkjöchel 2400 m, 1906 Dolenz (GZU); Umbal, Prägraten, 1913 Schneider (W), with a sketch of the achenes!; Knappenhaus, 1915 Korb (W); Sonnblickgebirge, Würthen, 1929 Schneider (W); Fuscher-  
törl, 1931 Schneider (W); Waschgangalpe, Sagritz, exsicc. Schulz-Bip. 74, Pacher (K, L. O. S); Salmhöhe, Hoppe (L); Heiligenbluth, Hoppe (K); and Hallender 1914 (W); also 2400 m, 1885 Freyn (h. de Litardière); Heiligenbluth-Sagritz, Lagger (LAU); Franz Josefshöhe, Pasterze 2330 m, 1880 Preissmann (W); Ködnitztal 2750 m, 1953 Melzer (h); Goldberggruppe, Stellkopf, 1935 Widder (h), Leitertal, 1905 Vierhapper (W); Gross Glockner, Kokeil (K); Böseck, Mallnitzer Tauerntal 1700 m and Dössensee 2250–2300 m, 1957 v.S. (h); Hagener Hütte and Greilkopf, 1932 H.M. (W).

Karnische Alp.: Pustertal 18–2400 m, 1867 Ausserdorffer (K).

Dachsteingebirge: Adamekhütte, 1924 Korb (W); Edelgrieshöhe 2200 m, 1941 Schaeftlein (h).

Eisenerzer Alp.: Admont, Speckmover (W); Kalbling 1800 m, Kock (L, P).

Probably I saw this species also from Transsilvania, C. Getz (L). Braun-Blanquet & Rübel l.c. have mentioned five localities from the Bernina region and one from the other Rhaetian Alps.

### 13. *Taraxacum vernelense* van Soest **nov. spec.**, Fig. 9.

Planta mediocris 8–9 cm alta subglabra, basi fragmentis foliorum vetustorum incrassata.

Folia subdecumbentia luteo-viridia vel gramineo-viridia glabra, petiolis angustis nerveoque mediano pallide viridis, exteriora obovata in inferiore parte dentata vel sublobata. Folia interiora 5–6 cm longa, lobata; lobi laterales utrinque 2–3 parvi breves triangulares vel deltoidei, integri obtusi vel subacuti vel inferiores acuti, interlobiis



Fig. 9. *T. vernelense* v.S., type specimen.

subangustis vel latiusculis integris; lobus terminalis sat magnus saepe  $\frac{1}{2}$ – $\frac{1}{3}$  totae foliae longus, ad 2–3 cm longus  $\pm$  hastatus obtusus integer vel raro minute dentatus vel subincisus, lobuli basis paulo evoluti.

Scapi 1–2, sub involucrio parce araneosi vel glabrescentes.

Involucrium mediocre, obscure viride; squamae exteriores laxe adpressae apice recurvatae, lineari-lanceolatae 4–6 mm longae, inferne 1,5 mm, superne 0,5 mm latae, obtusae inconspicue sublatae pallido-marginatae, brunnescentes laeves. Squamae interiores lineares, membranaceo-marginatae laeves.

Calathium radians ad 3 cm diametro luteum; ligulae marginales  $\pm$  involutae vel angustae extus stria atro-violacea notatae, summis

subnigrae. Antherae polliniferae; stylus et stigmata subobscura; floret aestate.

Achenium ochraceum 3,5 mm longum (pyramide inclusa) superne minute spinulosum vel tuberculatum ceterum laeve, in pyramiden conicam 0,3 mm longam subsensim abiens; rostrum ad 3 mm longum, pappus albus 5 mm longus.

E sectione Alpinorum Haglund.

*Typus*: Silvretta: Vernelatal 2050 m, 18.7.1954 v. Soest (h. 33878–80).

Furthermore:

Rhaetische Alp.: Parsennhütte near Klosters 2200 m, 1954 v.S. (h).

Tessiner Alp.: Alpe Motto — Pizzo Scaglie, Val Verzasca 1900 m, 1903 Jaggli (G).

Bergamasker Alp.: Monte Legnone — Lagho Delegnaccio 2190 m, 1911 I. Braun (G).

Brenner: Vennatal, 1926 Vetter (W).

Hohe Tauern: Dössenersee 2250–2300 m, 1957, v.S. (h).

In its leaf form this species is alike *T. cucullatum* Dahlst., but the whole plant is smaller and the flower heads are deep yellow; *T. cucullatum* often grows in mowing fields in the alpine region, *T. vernelense* on the other hand prefers humid, short grassy slopes. The achenes of *T. vernelense* are characteristic for the section *Alpina*.

#### 14. *Taraxacum vetteri* van Soest **nov. spec.**, Fig. 10.

Planta mediocris ad 12 cm alta subglabra.

Folia luteo-viridia, ad 9 cm longa, petiolis pallide viridis vel subroseolis anguste alatis inclusa; lobi laterales utrinque 3–4, breves deltoidei vel lingulati vel triangulares,  $\pm$  breve dentati vel denticulati, summis saepe retroversi interdum erecto-patentes, interlobiis saepe grosse dentatis; lobus terminalis deltoideus vel deltoideo-hastatus subacutus, lobuli basis acuminati acuti.

Scapi sub involucre paulo araneosi.

Involucrum basi ovatum obscurum, siccis nigrum. Squamae exteriores laxe patentes ovato-lanceolatae ad 7 mm longae, 3 mm latae, angustissime marginatae, interdum ciliolatae; interiores 13–14 mm longae.

Calathium 1,5–2 cm diametro, paulo radians. Ligulae luteae, marginales involutae, extus roseolo- vel purpureo- vel pro parte e-striatae; styli lutei, stigmata  $\pm$  sordide lutea, antherae vacuae. Floret aestate (augusto).

Achenium maturum ignotum stramineum superne sub(?)spinulosum; rostrum breve, pappus albus.

E sectione Alpinorum Haglund.

*Typus*: Gailtaler Alp.: Laserztörl, Lienzer Unholden, 14.8.1922 Vetter (W. 1950/1867); also in the neighbourhood: Kerschbaumer Törl, 1922 Vetter (W).

## Furthermore:

Alp. de Savoie: Col de Salvadon 2200 m, 1898; Dent du Midi 25–2700 m, 1918; Val d'Illiez 2500 m, 1905; Grenairon — Col du Genivrier, 1898, all Briquet (G).  
 Mont Blanc: Buet, Col de l'Echaud, 1886 Jaccard (LAU).  
 Walliser Alp.: Col de Torrens 28–2900 m, 1919 Gandoger (RUEB).  
 Berner Alp.: Grand Muveran 28–2900 m, 1879 Burdet (LAU); Vallée de l'Etivaz, Thoumaley 2000 m, 1942 Maillefer (LAU); Dent de Morcles, 1907 Wilczek (LAU); Vallée de l'Avançon d'Anzeindaz, on several spots; Lagriaz 2060 m, Tête de Filasses 2130 m and 2145 m, Tortay 2300 m and 2340 m, all 1942 and 1943 Villaret (LAU); La Vire-aux-Boeufs 2350 m, 1947 Villaret (LAU); Gemmi, 1882 Chenevard (G); Lavaraz sur Bex, Thomas (W).

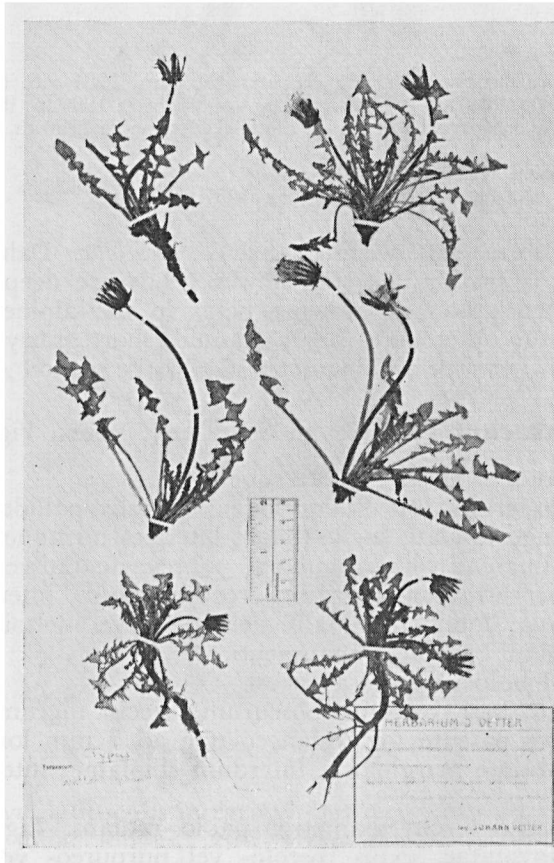


Fig. 10. *T. vetteri* v.S., type specimen.

Tessiner Alp.: Mt. Arera 2500 m, 1911 Chenevard (G); Passo Corombe 2460 m, 1951 Furrer (RUEB).  
 Glarner Alp.: Calanda 2150 m and 2550 m, 1941 and 1943 Büel (ZT).  
 Rhaetische Alp.: Piz Padella 2300 m, 1910 Branger (Z); Avers, Gletscherhorn 27–2800 m, 1895 v. Tavel (ZT); Albula pass 21–2300 m, 1948 v.S. (h); Val Tavrü towards Val Foraz, 1918 Schröter (ZT); Calanda 2700 m, 1917 Braun-Blanquet & Schröter, exsicc. Fl. Rhaet. 97 (G, LAU, RUEB, Z, ZT); Kupferfluh near Davos 2500 m, 1900 and Schiahorn 24–5002 m, 1910 both Schibler (Z); Mindersscharte near Pfunds, 1931 H.M. (W).

Bernina: Piz Languard 3000 m, 1953 Duvigneaud (h); Genistobel, Salzfluh 2600 m; Val Agoni (verisim.) and Piz Alv 27–2800 m, all Schröter (ZT).  
 Arlberg: 1908 Schneider (W).  
 Lechtaler Alp.: Valluga 1500 m, 1955 Melzer (h).  
 Amadello Gruppe: Campiglii, Valle Rendena 2560 m, 1874 Churchill (K).  
 Brenner: Wolfendorn, 1912 Vetter (W).  
 Zillertaler Alp.: Rohrbach, St. Johann 2000–2400 m, Treffer (W).  
 Salzburger Kalkalp.: Porsäule, Hochkönig, 1915 Vetter (W).  
 Hohe Tauern: Gamsgrube, 1904 Vetter (W); Gauskarl, Leitertal, 1937 Franz (W).  
 Gailtaler Alp.: Hochstadel, 1929 Schneider (W).  
 Totes Geb.: Hinterstoder, Priel, 1884 Kerner (GZU); Grosser Priel 1900 m and 2000–2100 m, 1923 Baumgartner (W).  
 Julische Alp.: Rogica near Kriz 2300 m, 1893 Dolenz (GZU).

This species is characterized by its yellowish stigmas and, especially, by its conspicuous dark involucre; pollen is absent; the lobes of the leaves are short, broad and dentate. It is very characteristic in the East Alps, but towards the West the sharp characteristics seem to fade away; some times the involucre are less dark, the outer involucre bracts some times narrower and more or less spreading; often pollen is present there, though mostly (or always?) sterile; the lobes of the leaves are less crispate and a little bit more hairy.

Most of the material that I have seen lack ripe achenes; this makes it difficult to decide if all these fluctuations really refer to *T. vetteri*. In western Switzerland the whole question becomes still more difficult, because also *T. carinthiacum*—so characteristic in the eastern Alps—there occurs in smaller forms, resembling to *T. vetteri*. In this region a further study is needed in which especially achenes are necessary.

#### SECTIO FONTANA VAN SOEST

Plantae sat magnae et robustae raro graciles. Folia elongata integra vel sublobata vel interdum conspicue lobata; lobi laterales saepe retroversi; petiolis saepe late vel latissime alatis, purpureis vel saepe pallidis. Involucra viridia interdum glaucescentia; squamae exteriores vulgo adpressae, ovatae vel ovato-lanceolatae, saepe late marginatae, omnes laeves. Ligulae crocae vel saturate luteae. Floret aestate. Achenia straminea vel pallide brunnea, 3,5–5 mm longa (pyramide subbreve inclusa); rostra ca. 8 mm longa, pappus albus.

On humid and marshy spots and near wells in the upper subalpine and in the alpine region of high mountains: (1600–)1800–2400 m in Europe; from Corse through the Alpine chain into the mountains of south-eastern Europe.

The characteristic species of the section show nearly entire leaves with alate petioles, appressed, ovate and marginated outer involucre bracts and a long rostrum. *T. fontanum* H.M., in its broad sense, is more or less identical to the whole section; in its restricted sense, as used below, it represents the typical species for the section.

Some species show a remarkable resemblance to species of northern Europe, belonging to the sections *Spectabilia* Dahlst. and *Boreigena* Dahlst. The *Spectabilia*, however, are perfectly characterized by

large achenes; the *Boreigena*, closely allied to the *Vulgaria* Dahlst., may have only a superficial resemblance to the *Fontana*.

KEY TO THE SPECIES OF SECT. FONTANA

- |  |                               |
|--|-------------------------------|
| 1. Stigmas pure yellow . . . . .   | 2                             |
| Stigmas dirty yellow, greenish or blackish . . . . .   | 4                             |
| 2. Leaves grass-green with reddish petioles; pollen absent . . . . .   | 9. <i>T. silvicolum</i>       |
| Leaves yellow- or grass-green with green, pale or brownish petioles; pollen present or not . . . . .   | 3                             |
| 3. Leaves grass-green; outer bracts of the involucre ovate, dark, appressed or erect; pollen absent . . . . .  | 8. <i>T. pseudoboreigenum</i> |
| Leaves yellow-green; outer bracts of the involucre more or less lanceolate; pollen present . . . . .   | 11. <i>T. crocellum</i>       |
| <i>Remark: compare also T. pseudofontanum in sect. Alpina.</i>   |                               |
| 4. Petioles of the leaves purple, seldom palish; outer bracts of the involucre with indistinct broad margine or only in <i>T. corsicum</i> with narrow margine . . . . . | 5                             |
| Petioles pale or brownish, median nerve sometimes brownish; outer bracts of the involucre ovate to lanceolate, without or with narrow but distinct margine . . . . .     | 6                             |
| 5. Pollen absent; outer bracts of the involucre with narrow but distinct margine . . . . .   | 3. <i>T. corsicum</i>         |
| Pollen present; outer bracts of the involucre with broad but indistinct margine . . . . .  | 1. <i>T. fontanum</i>         |
| 6. Marginal flowers lacking stripes or with weak and partly indistinct stripes, or with clear purple stripes . . . . .   | 7                             |
| Marginal flowers with distinct grey-violet stripes . . . . .   | 9                             |
| 7. Flowers nearly orange-coloured, without or with indistinct or purple stripes; leaves lobate, lobes 1.5–2 cm long; young leaves $\pm$ hairy . . . . .                  | 2. <i>T. aurantellum</i>      |
| Flowers dark yellow, without or with weak greyish stripes; young leaves nearly glabrous . . . . .  | 8                             |
| 8. Leaves entire or to coarse dentate; dents to 7 mm long . . . . .  | 6. <i>T. peralatum</i>        |
| Leaves lobate, lobes 1–2 cm long . . . . .   | 5. <i>T. fontanosquameum</i>  |
| 9. Leaves to coarse and long dentate with broad middle field . . . . .   | 4. <i>T. fontanicolum</i>     |
| Leaves distinctly lobate . . . . .   | 10                            |
| 10. Outer bracts of the involucre more or less appressed; petioles and median nerves pale . . . . .  | 10. <i>T. aestivum</i>        |
| Outer bracts of the involucre distinctly recurved to reflexed; petioles and median nerves brownish, in dried condition to purplish brown . . . . .                       | 7. <i>T. pohlii</i>           |

1. **Taraxacum fontanum** von Handel-Mazzetti 1907. Monogr. Taraxacum: 100, c. icon.; emend. v. Soest.

The description, given by H.M., is broader and looser than it seems useful for a homogeneous species within *Taraxacum*; as far as



I know, no type specimen has been indicated by him; I will use the name "fontanum" with limitations in leaf form and completing the description with a few other data:

Folia lingulata denticulata vel anguste unguiculato-et retroversodentata, raro sublobata; lobi laterales angusti acuti; petiolis subalatis purpureis interdum subpallidis.

Scapus sub involucro glabrus vel parce araneoso-pilosus; squamae involucris exteriores  $\pm$  adpressae ovatae, late inconspicue pallide marginatae; ligulae marginales extus parce vel e-striatae; antherae polliniferae; stylus et stigmata virescenti-lutea.

*T. silvicolum* m, likewise with purple petioles, has pure yellow stigmas. *T. corsicum* as well as *T. silvicolum* lack pollen and the leaves have a different shape. All the other species of this section have pale, whitish or brownish petioles; often the outer involucral bracts of these species are narrower and have no margin or only a narrow (but often distinct) one.

*T. fontanum* is indigeneous in the central and eastern Alps; H. M. has mentioned *T. fontanum* (sens. lat.!) from the Apennines, the Balcan Peninsula, the Caucasus and the Near East, regions, which I believe do not belong to the area of *T. fontanum* sens. str., even partly not to that of the section.

## 2. **Taraxacum aurantellum** van Soest **nov. spec.**, Fig. 11.

Planta robusta ad 20 cm alta.

Folia suberecta gramineo-viridia, juniores subdense araneoso-pilosa denique glabrescens, nervo mediano pallido vel roseolo-colorato, petiolis subnullis vel late alatis pallide viridis vel  $\pm$  roseolis; folia 3-4 cm lata, lingulata ad 20 cm longa, acute et anguste retroverso-vel recurvo-vel patento-dentata, interiora saepe pro parte vel omnia lobata; lobi laterales utrinque ca. 3, triangulares saepe valde retroversi dorso saepe dentato, in interlobiis (ad 2 cm) latis dentatis abeuntes; lobus terminalis hastato-sagittatus acutus, interdum grosse dentatus vel sublobatus.

Scapi sub involucro subaraneosi.

Involucrum crassiusculum ca. 16 mm longum, ad 2 cm latum, obscure viride. Squamae exteriores laxe adpressae—erecto-patentes, apice recurvatae (denique reflexae) ovatae vel ovato-lanceolatae superne acuminatae summo obtuso purpureo, anguste marginatae apice minute ciliolatae; squamae interiores late lineares, inferne ad 5 mm latae, late membranaceo-marginatae, apice purpurascens.

Calathium subradians ad 3 cm diametro, croceum; ligulae marginales angustae extus stria rubro-purpurea vel cano-purpurea  $\pm$  notatae, apice obscurae; antherae parce polliniferae; stylus et stigmata virescenti-lutea; floret aestate.

Achenium rufo-vel obscure stramineum 4 mm longum pyramide inclusa) superne acute spinulosum ceterum rugosum—basi sublaeve, in pyramidem conicam 0,3 mm longam abrupte abiens; rostrum ca. 8 mm longum; pappus albus, 6 mm longus.

E sectione Fontanorum v. Soest.

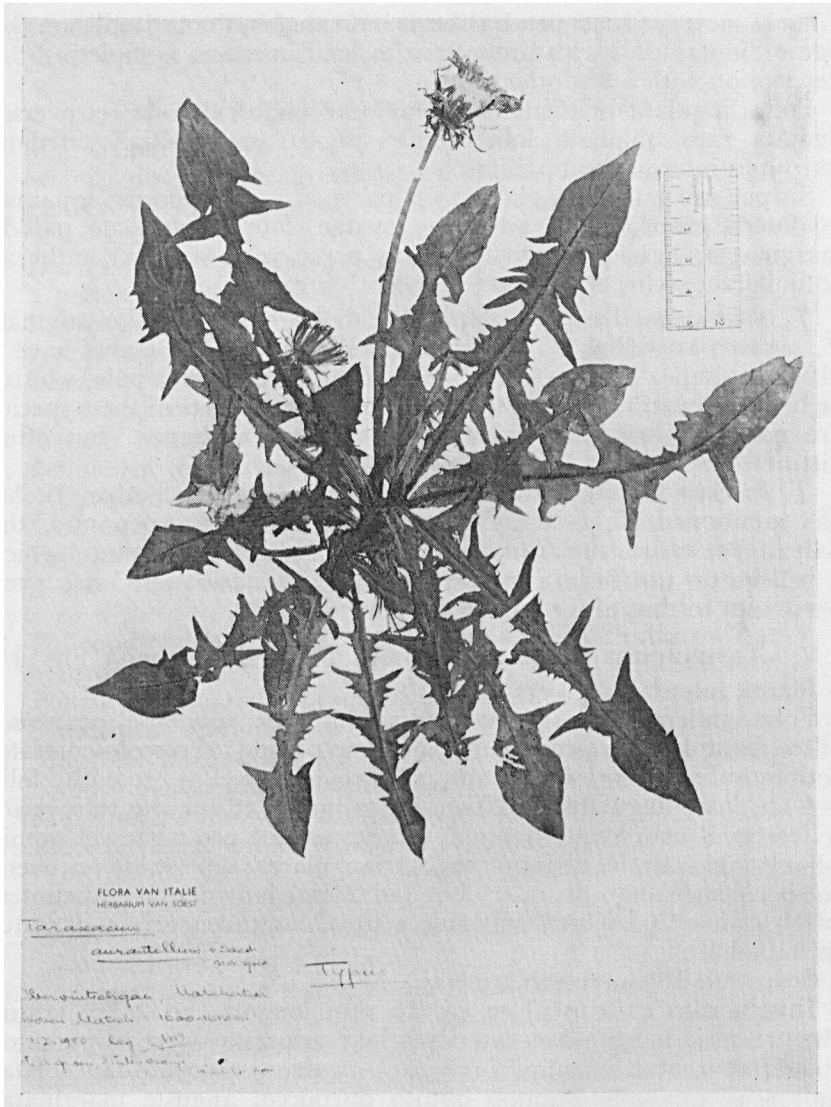


Fig. 11. *T. aurantellum* v.S., type specimen.

*Typus*: Oetztales Alp.: Matschertal 1600–1650 m, 9.7.1956 v. Soest (h 36693–4, 36697, 36702, 36705, 36712, 36722–4).

Furthermore:

Hohe Tauern: Mallnitzer Tauerntal 1800 m, below Ebeneck, 1957 v.S. (h).

This species seems to be closely allied to *T. fontanosquameum* m, the latter having, in stead of orange-coloured, saturated yellow flowers and much shorter endlobes of the leaves.

*f. stylosa* v. Soest *f. nov.*: Ligulae marginales breves, stylosae: Oetztaler Alp.: Matschertal, 9.7.1956 v. Soest (h. 36866).

3. **Taraxacum corsicum** van Soest **nov. spec.**, Fig. 12.

Planta robusta ca. 20 cm alta.

Folia numerosa ad 10 cm longa terrae adpressa, laete gramineo-viridia subglabra, nervo mediano pallido, petiolis  $\pm$  roseolis alatis vel pro parte anguste vel sub-alatis; folia exteriora obovata  $\pm$  acute patento-vel retroverso-dentata, interiora incisa vel lobata; lobi



Fig. 12. *T. corsicum* v.S., type specimen.

laterales utrinque ad 3, triangulares subbreves, dorso interdum dentatis, margine inferiore integro, interlobiis inconspicuis vel latis; lobus terminalis magnus indeterminatus obtusus, subincisus vel  $\pm$  deltoideo-dentatus vel integer; lobuli basis breves acuti.

Scapi ad 3, foliis subaequilongi vel eis superantes, sub involucri paulo arancosi.

Involucrum crassiusculum 16 mm longum, 14 mm latum, obscure viride. Squamae exteriores laxe adpressae ovatae ad 4 mm latae, ad 10 mm longae,  $\pm$  acuminatae, anguste albo- vel roseolo-marginatae, laeves; squamae interiores late lineares membranaceo-marginatae.

Calathium planum radians ad 4 cm diametro, luteum; ligulae marginales planae, extus stria cano-violacea notatae, summis subnigrae; antherae vacuae; stylus sordide luteus; stigmata obscura siccis nigra; floret aestate.

Achenium 5 mm longum (pyramide inclusa), ochraceum, superne spinulosum ceterum rugosum—basi laeve, in pyramiden conicam 0,8 mm longam subsensim abiens; rostrum 7 mm longum; pappus albus, 5 mm longus.

E sectione Fontanorum v. Soest.

*Typus*: Corsica: Monte Niello, couloirs a l'Ubac, silice 2000 m, 16.7.1913 Wilczek (LAU); furthermore on the same mountain: Bergeries de Porciollelli 1950 m, 1913 Wilczek (LAU).

#### 4. **Taraxacum fontanicolum** van Soest **nov. spec.**, Fig. 13.

Planta mediocris 5–16 cm alta, glabra vel parcellissime araneosa. Folia subdecumbentia luteo-viridia, exteriora lanceolata dentata, interiora et media lanceolata pro max. parte acute  $\pm$  retroversodentata vel denticulata vel inconspicue lobata, lobis subintegris acutis summo retroverso, petiolis anguste vel saepe sublatae alatis  $\pm$  viridis vel nervoque mediano praesertim parte inferiore  $\pm$  rufo-colorato.

Scapi 1–2, foliis breviter superantes vel aequilongi.

Involucrum 17 mm longum ovatum obscurum glaucescens. Squamae exteriores laxe patentes, apice recurvatae, lanceolatae vel ovato-lanceolatae 7–8 mm longae, 2–2,5 mm latae, inconspicue vel immarginatae, interiores lineares.

Calathium saturate luteum ad 3 cm diametro, radians; ligulae marginales extus stria  $\pm$  atro-violacea ornatae; antherae polliniferae vel polline carentes; stylus et stigmata virescentia; floret aestate.

Achenium (speciminis non typici!) brunneum 3,7 mm longum (pyramide inclusa) ad 0,8 latum superne spinulosum ceterum rugosum, in pyramiden conicam 0,4 mm longam spinulis saepe praeditam subsensim abiens; rostrum 7 mm longum; pappus albus 5 mm longus.

E sectione Fontanorum v. Soest.

*Typus*: Rhaetische Alp.: Albula, Palpuogna, locus paludosus 1900 m, 31.7.1948 v. Soest (h. 19172, 19178, 19180–1, 19185, 19190). In the neighbourhood: Albula pass 21–2300 m, Val Mulix near Naz 1780 m, Val Tisch near Bergün above the Alp 1850–2100 m, all 1948 v. S. (h).

Furthermore:

Bernina: pass 2050–2250 m, 1948 v.S. (h); Lago Nero 2220 m, 1905 Braun & Rübél (RUEB).

Rhaetische Alp.: Corviglia 2400 m, 1957 Melzer (h); Buffalora-Ofenberg, 1901 Brunies (Z); Val Cluozza, 1909 Schröter (ZT).

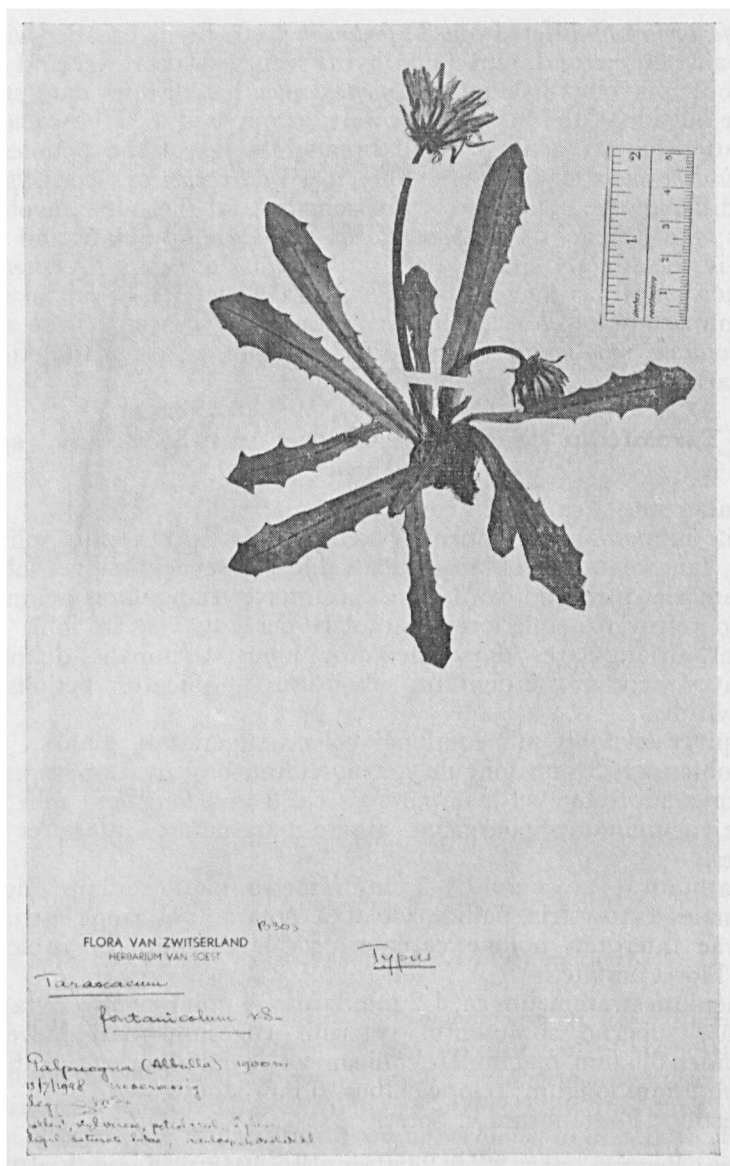


Fig. 13. *T. fontanicolum* v.S., type specimen.

Vorarlberg: Rautz 1650 m, 1903 Preissmann (W).

Ortler: Martelltal 21–2300 m, 1956 v.S. (h).

Brenner: Vennatal, 1926 Vetter (W).

Hohe Tauern: Prägraten, 1923 Vetter (W); Geiselkopf 1900 m and Hochalmblick near Mallnitz 2000 m, 1957 v.S. (h); Katschtal, Stern 2300 m and Franz Josefshöhe, Pasterze, 1934 Widder (h).

Dolomiten: Passo di Pordoi 2200 m, 1955 Keuchenius (U).

Karnische Alp.: Leitental 16–1800 m, 1955 Schaeftlein (h).

Tatra: Gr. Köhnbachtal, 1917 Schneider (W).

*T. fontanicolum* differs from *T. fontanum* s. str. by its broader-winged and pale petioles and, especially, by its recurved, narrower and often dark outer involucre bracts. *T. fontanicolum* has distinct dark stripes on the outside of the marginal flowers, as opposed to *T. peralatum* m, the latter having generally still broader wings of the petioles. *T. fontanicolum* has a slight resemblance to *T. helveticum* m (sect. *Alpina*); they differ in the character of the achenes and the outer involucre bracts; the achenes of *T. fontanicolum* are more spinulate and their beak is indistinctly delimited, as contrasted with *T. helveticum*. *T. fontanicolum* has longer outer involucre bracts: 7–8 mm in stead of 5 mm; those of *T. helveticum* are acuminate with an obtuse apex; *T. helveticum*, smaller in size, has darker coloured styles and stigmas and darker, not greyish coloured involucre.

5. ***Taraxacum fontanosquameum*** van Soest **nov. spec.**,  
Fig. 14.

Planta robusta ca. 10–25 cm alta, subglabra.

Folia numerosa decumbentia laete viridia subtus pilis solitariis obsita, lanceolata vel oblanceolata valde grosse dentata vel lobata; lobi laterales utrinque ca. 3, pro max. parte triangulares acuminati summo retroverso, inferiores lanceolati peracuti vel, in foliis interioribus, triangulares dorso dentato; lobus terminalis deltoideo-sagittatus saepe grosse dentatus subobtusus  $\pm$  plicatus; petiolis late alatis viridis.

Scapi crassi foliis subaequilongi vel eis superantes, glabri.

Involucrum 15 mm longum crassiusculum basi ovatum; squamae exteriores adpressae vel laxe patentes ca. 9 mm longae, 4 mm latae ovatae acuminatae conspicue albido-marginatae, interiores late lineares.

Calathium  $\pm$  croceum 2,5–3 cm diametro, paulo radians. Ligulae marginales extus stria pallide violacea notatae vel saepe estriatae; antherae interdum polline carentes; stylus et stigmata virescenti-lutea. Floret aestate.

Achenium stramineum ca. 1,2 mm latum, 4 mm longum (pyramide inclusa), superne spinulosum ceterum rugosum—basi laeve, in pyramiden 0,6 mm longam late conicam apice pallidam sensim abiens; rostrum 9 mm longum; pappus albus, 6 mm longus.

E sectione Fontanorum v. Soest.

*Typus*: Bernina, pass 2050–2250 m, 18.7.1948 v. Soest (h. 19359).

Furthermore:

Rhaetische Alp.: Albula, Palpuogna 1900 m, Albula pass 21–2300 m and Weissenstein 2000–2100 m, all 1948 v.S. (h); St. Antonien, Partnun 2000 m, 1893 Schröter (ZT); Gotschnagrat near Klosters 2300 m and Stutzbachtal near Laret 1800 m, both 1954 v.S. (h).

Silvretta: Vernelatal 2000 m, Fremdvereina 1950 m, Seetal 2000–2050 m, all 1954 v.S. (h); Vermunttal, 1912 Vetter (W).

Hohe Tauern: Mallnitzer Tauerntal 1800 m, 1957 v.S. (h).

This species is allied to *T. peralatum* m, differing from it especially

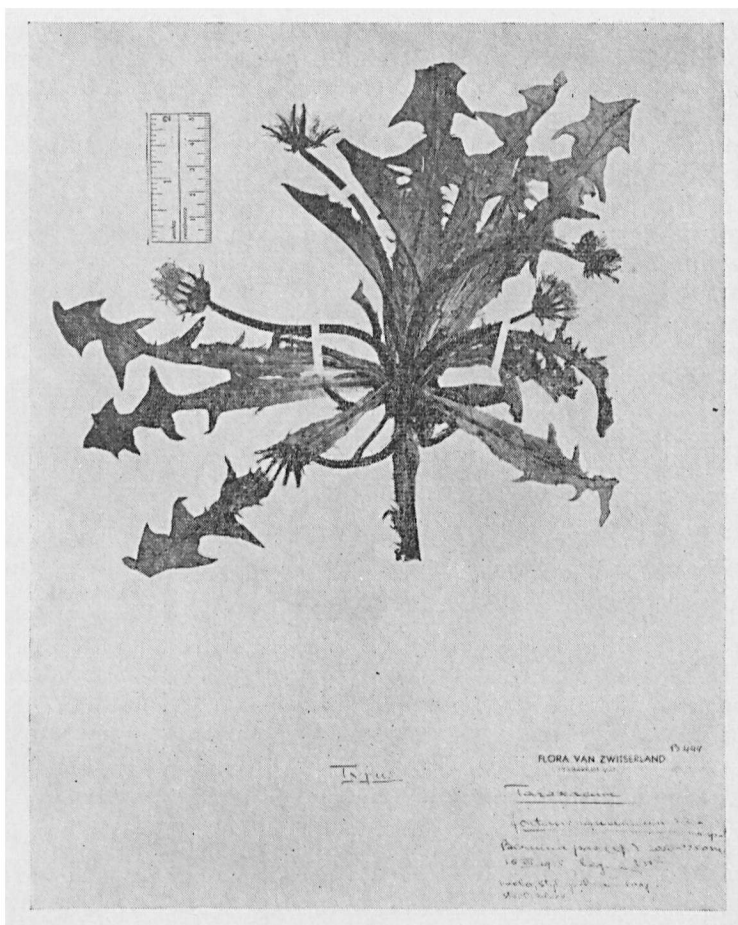


Fig. 14. *T. fontanosquameum* v.S., type specimen.

by its leaf form. Together with *T. peralatum* and *T. aurantellum*, it is characterized by the absence (or nearby absence) of stripes at the outside of the marginal flowers. Whilst *T. aurantellum* is more or less purplish-pink coloured here, giving, together with the dark yellow of the flowers, an impression of orange colour to the flowerheads, the flowers of *T. fontanosquameum* are only more or less saturated yellow. The leaves of *T. aurantellum* often are more divided, the endlobes are longer and, in the youth, they are more hairy.

6. ***Taraxacum peralatum*** van Soest **nov. spec.**, Fig. 15.

Planta mediocris 12–25 cm alta,  $\pm$  epilosa.

Folia 10–20 cm longa gramineo-viridia, exteriora oblanceolata vel obovata ad 3 cm lata obtusa vel subacuta integra vel denticulata, petiolis subnullis; folia media et interiora oblanceolata ad 4 cm lata obtusa vel subacuta retroverso-dentata, saepius etiam denticulata vel





purpurascente; squamae exteriores  $\pm$  adpressae vel patentes apice recurvatae, ovatae longe acuminatae, conspicue anguste albido-vel purpureo-marginatae, interiores ad medium attingentes, extremae pro parte lanceolatae; squamae interiores lineari-lanceolatae.

Calathium paulo radians 2,5–3 cm diametro; ligulae marginales extus stria parce colorata notatae vel estriatae; antherae polline carentes vel repletae; stylus et stigmata obscura; floret aestate.

Achenium (speciminis non typici!) brunneo-stramineum subcylindricum 5 mm longum (pyramide inclusa) ad 0,8 mm latum, superne breviter spinulosum ceterum sublaeve, in pyramiden conico-cylindricam 1 mm longam abrupte abiens. Rostrum 8 mm longum; pappus albus, 6 mm longus.

E sectione Fontanorum v. Soest, habitum speciorum sectionis Boreigeniae Dahlstedt imitans.

*Typus*: Rhaetische Alp.: Cuolm da Latsch, near Bergün 2100 m, 12.7.1948 J. C. van Soest (h. v. S. 19165).

Furthermore:

Rhaetische Alp.: Preda, Albula 1850 m and Palpuogna, in damp places, both 1948 v.S. (h).

Bernina: pass, 2050–2250 m, 1948 v.S. (h).

In the eastern Carpathians: Howerla Czorns Hora, 1888 Woloszczak (W), plants have been collected similar to *T. peralatum*, however with normal radiate flower heads and with yellowish green stigmas.

## 7. *Taraxacum pohlii*<sup>1)</sup> van Soest **nov. spec.**, Fig. 16.

Planta robusta 10–13 cm alta.

Folia gramineo-viridia ca. 10 cm longa, petiolo late alato inclusa, parce, sed in nervo mediano sordide rubescente densiuscule araneosa, sublobata vel lobata; lobi laterales utrinque 2–3, deltoidei vel triangulares breves acuti dorso interdum 1 dente muniti vel paulo denticulati, in interlobiis ca. 1 cm latis abeuntibus; lobus terminalis indeterminatus subdentatus subacutus.

Scapi saepe singuli, arancosi, sub involucro dense araneosi.

Involucrum 13 mm longum ad 2,5 cm latum crassum; squamae exteriores reflexo-patentes vel reflexae lanceolatae ad 10 mm longae pallide virides saepe purpurascentes laeves, interiores late lineares apice obscure virides.

Calathium planum radians ad 4 cm diametro, saturate luteum; ligulae marginales planae extus stria cano-violacea notatae; antherae polliniferae; stylus et stigmata subobscura. Floret aestate. Achenium maturum ignotum.

E sectione Fontanorum v. Soest.

<sup>1)</sup> In remembrance of Dr. L. M. POHL, Schlanders, excellent connoisseur of the Obervinschgau region; with greatest hospitality he guided and advised an excursion of the staff of the State Herbarium (Leiden) with students of the Leiden University to South Tirol (1956); a few days later he died during an alpine trip.



Fig. 16. *T. pohlii* v.S., type specimen.

*Typus*: Ortler: Martelltal 2350 m, 21.7.1956 v. Soest (h. 36804, 36884); in the same valley at 2300 m altitude, 1956 v. S. (h).

With regard to the flower heads this species is reminiscent of the *Vulgaria* Dahlst.; other characteristics, such as the leaf form, show a close relationship to the *Fontana* m. The median nerve of the leaves is brown; after disappearance of the chlorophyll in some way or



Fig. 17. *T. pseudoboreigenum* v.S., type specimen.

another, a deep purple is left. *T. pohlii* reminds one somewhat to northern species, belonging to sect. *Boreigena* Dahlst.

8. ***Taraxacum pseudoboreigenum* van Soest nov. spec.,**  
 Fig. 17.

Planta magna robusta 40 cm alta, araneosa-hirsutula.

Folia luteo-viridia ad 20 cm longa ad 4 cm lata late lingulata integra minute retroverso-dentata vel saepe denticulata, subtus conspicue reticulato-venosa, nervo mediano lato araneoso basin versus rufo-purpureo, petiolis nullis vel latissime alatis.

Scapi crassi foliis superantes, sub involucri araneoso-pilosi.

Involucrum 20 mm longum crassiusculum basi ovatum subatratum; squamae exteriores ovatae 4 mm latae, 11 mm longae, anguste albo-marginatae erecto-patentes denique apice recurvatae.

Calathium obscure luteum radians, ad 4 cm diametro; ligulae marginales extus stria fusco-violacea ornatae; antherae polline carentes; stigmata et stylus aurea; floret aestate.

Achenium maturum ignotum, pappus albus.

E sectione Fontanorum v. Soest, habitum speciorum sectionis Boreigeniae Dahlstedt imitans.

*Typus*: Rhaetische Alp.: Albula, between Palpuogna and Preda, in silvis 1800–1900 m, 13.7.1948 v. Soest (h. 19168).

*T. pseudoboreigenum* is allied to *T. silvicolum* m, the latter being more slender and having purple petioles.

### 9. *Taraxacum silvicolum* van Soest **nov. spec.**, Fig. 18.

Planta robusta 13–18 cm alta, basi subglabra.

Folia erecta obscure viridia subaraneoso-pilosa, exteriora anguste spathulata saepe  $\pm$  dentata, interiora oblanceolata retroverso-dentata vel lobata; lobi laterales utrinque ca. 2, triangulares acuminati dorso integro vel 1 dente munito; lobus terminalis ovatus subinteger obtusus vel subacutus vel subhastatus vel replete hastato-sagittatus; petiolis alatis nervoque mediano rubro-colorato.

Scapi erecti, foliis aequilongi, sub involucri dense araneosi, ceterum subaraneosi.

Involucrum 15–16 mm longum subobscurum viride saepe purpurascens; squamae exteriores patentes apice recurvatae, 8 mm longae ovato-lanceolatae, acuminatae, late albo-vel roseolo-marginatae.

Calathium subradians ad 2,5 cm diametro; ligulae saturate luteae vel subcroceae, marginales extus stria fusco-violacea ornatae; antherae polline carentes; stylus et stigmata laete lutea; floret aestate.

Achenium olivaceo-stramineum ca. 6 mm longum (pyramide inclusa) ad 1 mm latum, superne acute spinulosum ceterum rugosum —basi laeve, in pyramidem conicam 0,8 mm longam subsensim abiens; rostrum 8 mm longum; pappus albus, 8 mm longus.

E sectione Fontanorum v. Soest.

*Typus*: Rhaetische Alp.: Val Tisch near Bergün 1800 m, 8.7.1948 v. Soest (h. 19164).

Furthermore:

Berner Alp.: Tour d'Anzeindaz, 1943 Villaret (LAU).

Rhaetische Alp.: Sagliaz. towards Val Tisch near Bergün 1800 m, Preda-Palpuogna, Albula and Albula pass 21–2300 m, all 1948 v.S. (h); Schlingital 1800 m, 1956 v.S. (h).



Fig. 18. *T. silvicolum* v.S., type specimen.

The purple petioles are an easy characteristic in order to distinguish this species from most others of sect. *Fontana*; the difference with *T. fontanum*, with the same characteristic, is mentioned above. *T. silvicolum*, furthermore, is characterized by pure yellow stigmas as in *T. pseudoboreigenum*, the latter having green or slightly brownish petioles.

10. ***Taraxacum aestivum* van Soest nov. spec.**, Fig. 19.

Planta gracilis ad 20 cm alta inferne glabra, basi fragmentis foliorum vetustorum subincrassata.

Folia numerosa luteo- vel gramineo-viridia, glabra, nervo mediano pallido petiolis subalatis pallide viridis. Folia exteriora lingulata



Fig. 19. *T. aestivum* v.S., type specimen.

saepe grosse dentata, interiora lobata; lobi laterales triangulares ca. 1 cm longi dorso denticulato, interlobiis ca. 7 mm latis denticulatis vel minute dentatis, lobus terminalis deltoideus vel hastatus vel hastato-sagittatus saepe integer, lobulo apicali subacuti vel subobtusius, lobuli basis acuti.

Scapi foliis aequilongi vel breviter superantes, sub involucro subaraneosi.

Involucrum mediocre 12 mm longum, 14 mm latum, viride pruinatum; squamae exteriores laxe adpressae vel subpatentes, ovato-lanceolatae immarginatae apice pallidae.

Calathium planum radians ad 2,5 cm diametro; ligulae luteae, marginales extus stria fusco-violacea notatae; antherae parce polliniferae; stylus et stigmata virescenti-lutea; floret aestate.

Achenium maturum ignotum, luteo-brunneum, superne minute(?) spinulosum; pappus albus.

*Typus*: Bernina: Alp Languard, in silvis 1950 m, 25.7.1933 v. Soest (h. 4603).

Furthermore:

Bernina: Piz Languard 2400 m, 1933; Chaputschöll, 1929 and Bernina pass 2050-2250 m, 1948, all v.S. (h); Lago Bianco, 1930 W. Koch (ZT).

Rhaetische Alp.: Albula, near Weissenstein 2050 m, 1948 v.S. (h); Dischmatal near Davos, 1899 Hegi (Z).

Stubai Alp.: Gschnitztal, Alpe Laponas 18-1900 m, 1903 H.M. (W).

Ortler: Martelltal 21-2300 m, 1956 v.S. (h).

### 11. *Taraxacum crocellum* van Soest **nov. spec.**, Fig. 20.

Planta gracilis 10-20 cm alta glabra.

Folia luteo-viridia tenera lanceolata vel oblanceolata dentata vel lobata; lobi laterales utrinque ca. 2, breves saepe anguste deltoidei vel anguste triangulares summo retroverso acuti dorso interdum dentato, interlobiis latis; lobus terminalis indeterminatus vel hastato-sagittatus integer apice subobtusus vel subacutus; petiolis pallide viridis interdum paulo subalatis.

Scapi foliis superantes.

Involucrum mediocre 12 mm longum 12 mm latum, basi subtruncatum viride subpruinatum purpurascens; squamae exteriores laxe adpressae lanceolatae vel ovato-lanceolatae 7 mm longae ca. 2,5 mm latae, pallide inconspicue marginatae, interiores lineares membranaceo-marginatae.

Calathium planum radians ad 2,5 cm diametro  $\pm$  croceum; ligulae marginales extus stria cano-violacea notatae; antherae polliniferae; stylus et stigmata laete lutea; floret aestate.

Achenium stramineum, maturum ignotum; pappus albus.

*Typus*: Silvretta: Vernelatal 2150 m, 18.7.1954 v. Soest (h. 33698, 33799, 33800, 33802).

Furthermore:

Silvretta: Vernelatal 2050 and 2250 m, Süssertal 2100 m, Vereinahaus 1950 m and Seetal 2000 m, all 1954 v.S. (h).

Oetztales Alp.: Matschertal 1650 m, 1956 v.S. (h).

*T. crocellum* probably belongs to the *Fontana*; it seems closely allied to *T. aestivum* m, the latter having more yellow flowers, no pure yellow stigmas and a greyish involucre. *T. crocellum* is reminiscent of the *Alpina*; as soon as ripe achenes are to my disposal I better shall be able to decide whether it belongs to *Fontana* or *Alpina*. There is



Fig. 20. *T. crocellum* v.S., type specimen.

some resemblance to *T. petiolulatum* Huter (sect. *Alpina*), but the involucre are different; furthermore, *T. crocellum* has more dentate leaves, a narrower apex of the leaves and pure yellow stigmas.

#### SECTIO CUCULLATA VAN SOEST

Plantae subglabrae vel paulo araneosae. Petioli foliarum pallidi vel leviter colorati. Involucre obscure virescentes, squamae exteriores  $\pm$  adpressae, erecto-patentes vel  $\pm$  recurvatae. Ligulae pallide ochraceo-luteae, marginales  $\pm$  involutae, tubulosae vel stylosae, extus stria roseo-purpurea notatae vel  $\pm$  decoloratae. Achenia olivacea ca. 4 mm longa (pyramide inclusa) superne tenuiter spinulosa, rostrum longum, ca. 7–8 mm; pappus albus.

Plants of the whole chain of the Alps at 1700–2400 m altitude, also in Corse.



This section is allied to both the *Alpina* Hagl. and the *Fontana* m; the involucre shows relationship to the first section, the achenes to the second one. This section, however, is no intermediate group between both; the pale ochraceous colour and the peculiar form of the ligulas are remarkable. In the genus *Taraxacum* the colour of the flowers has a rather wide amplitude: white (for instance in *T. leucanthemum* Ledebour), pale yellow (for instance in sect. *Erythrosperma* Dahlst. em. Lb. f in majority), saturate yellow (sect. *Vulgaria* Dahlst. for instance) to orange-red or "croceus" (certain *Fontana*) or "aurantiacus" (*T. aurantiacum* Dahlst.); even pink and purplish in central Asian forms (*T. roseum* H. M., *T. porphyranthum* Boissier). The ochraceous colour, nearly the colour of straw, is only characteristic in sect. *Cucullata*, of which *T. cucullatum* Dahlst. represents the type species.

1. ***Taraxacum cucullatum*** Dahlstedt 1907. Acta Horti Bergiani 4.2: 25, c. icon.; *T. stramineum* Beauverd 1929. Bull. Soc. Bot. Genève: 138, pro parte?. I have seen the type specimen in h. S.: cultivated in Bergianske Trädgården, Stockholm, 3.8.1901 from achenes collected in Salzburg.

This species is not rare in the Alps. I refer to Bonnier 1930/1933, Flore de France: 6; Hegi 1928, Flora Mitt. Europa 6.2: 1093; von Handel-Mazzetti 1923. Oesterr. Bot. Zt. 72: 269; Becherer 1956. Ber. Schweiz. Bot. Ges. 66: 192 and 1958. 68: 238. Certainly it is not only a species of the western region, as suggested by Hegi; from the central and eastern region I have seen:

Churfürsten: Breitenalp — Selamatt 16–1700 m, 1914 Vogt (Z).  
 Vierwaldstätter Alp.: Gletsch 2000 m, 1920 Christ (ZT).  
 Rhaetische Alp.: Avers-Cresta 1960 m and Thäli, both 1938 v.S. (h); Val Tisch near Bergün 1850–2100 m, 1948 v.S. (h); Alp Casanna, Ober-Säss 2030 m, 1913 Noack (RUEB).  
 Oetztales Alp.: Vent-Ramoljoch 2500 m, who? (AMD).  
 Sarntaler Alp.: Jauffen, 1910 Schneider (W).  
 Hohe Tauern: Waschgangalpe, Leiter, Radenalpe near Sagritz, 1851 Pacher, exsicc. Schultz-Bip. Cichor., pro parte (W); Mallnitz, 1929 Schneider (W); Mallnitzer Tauerental 1850 m, 1957 v.S. (h).  
 Niedere Tauern: Radstädter Tauern, 1897 Kann (GZU); Radeckalpe, Ankogl 1700 m, 1913 Fritsch (GZU); Lungau, Zaunersee 2050 m, 1926 H.M. (W).  
 Schneeberg (Nied. Oesterr.): Damböckhaus 1800 m, 1957 Melzer (h).

2. ***Taraxacum tirolense*** Dahlstedt 1907, Acta Horti Bergiani 4.2: 23, c. icon.; *T. alpinum* var. *ochroleuca-tubulosa* Hellweger in sched. 1891 and in Dörfners Katalog 1902: 180.

This species only is known from the eastern Alpine region: I saw:  
 Bernina: Piz Lagalb 2550 m, 1933 v.S. (h).  
 Rhaetische Alp.: Lünensee near Bludenz, 1911 Vetter (W).  
 Oetztales Alp.: Vent, Neurauner (GZU); Tösens 2500 m, 1926 H.M. (W).  
 Sonnenwend Geb.: Sonnenwendjoch 2226 m, 1891 Hellweger (S, W), Hellweger's type material; also near Ienbach 2100 m, 1903 Hellweger (RUEB).  
 Zillertaler Alp.: Varnatal, 1926 Vetter (W); Weissenbach 2000–2400 m, 1890 and 1897 Treffer (GZU, LAU, O, S), mentioned by Dahlstedt; Luttach

2000–2400 m, 1897 and 1898 Treffer (G, GZU, LAU); the type specimen in h.S.! is a cultivated plant in Bergianske Trädgården, Stockholm 1906 Dahls., from achenes from Luttach; Voldertal 1850 and 2000–2100 m, H.M. (W). Gailtaler Alp.: Laserzwand, 1928 Gáyer (GZU). Deferegger Alp.: 26–2700 m, 1934 H.M. (W); Lienz, Kühbodental 1770 m, 1932 H.M. (W).  
Hohe Tauern: Böseck, Tauerntal 1600 m, 1957 *Viola* v. Soest (h. v.S.).  
Karnische Alp.: Obstansersee near Kartitsch 2330 m and Leitental, Fillmoor 16–1800 m, both Schaefflein (h).

3. ***Taraxacum fontaniforme* van Soest nov. spec.**, Fig. 21.

Planta mediocris 12 cm alta, tota glabra.

Folia 6 cm longa (petiolis subnullis alatis inclusa) luteo-viridia lanceolata vel ovato-lanceolata acuta, retroverso-denticulata.

Involucrum viride, obscure punctatum. Squamae exteriores laxe patentés apice  $\pm$  recurvatae, ovato-lanceolatae acuminatae ad 7 mm longae, late albido- vel purpureo-marginatae apice roseolae; squamae interiores late membranaceo-marginatae, 14 mm longae apice rubro-violaceae.

Calathium mediocre flavum; ligulae marginales pro max. parte involutae, extus vinoso-coloratae, apice obscure purpureae. Styli

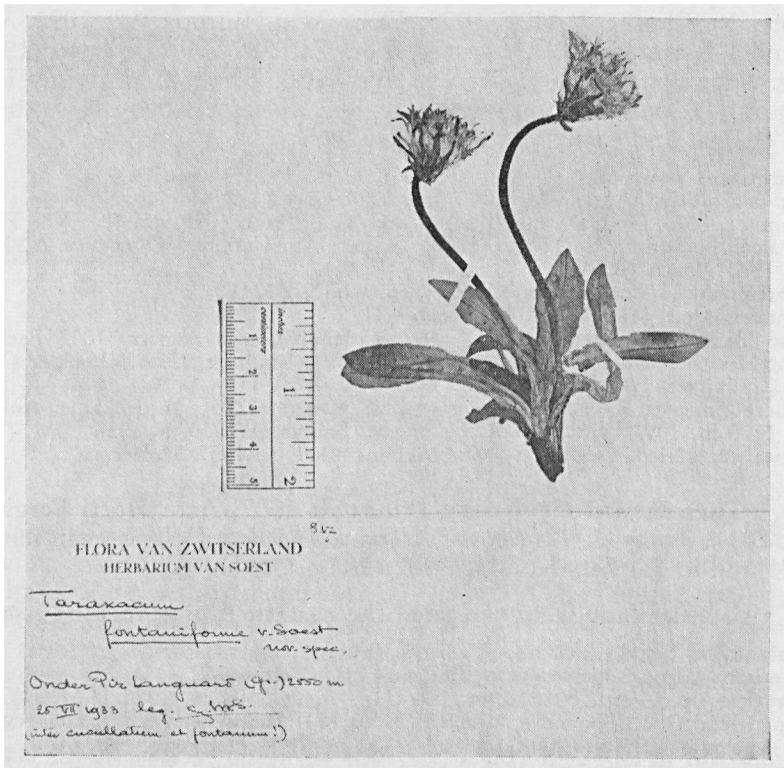


Fig. 21. *T. fontaniforme* v.S., type specimen.

inferne lutei, superne purpurei; stigmata obscure purpurea, siccis subnigra; antherae vacuae. Floret aestate. Achenium maturum ignotum.

E sectione Cucullatorum v. Soest.

*Typus*: Bernina: Piz Languard 2550 m, 25.7.1933 v. Soest (h. 4601).

The leaves of this species are reminiscent of those of *T. fontanum* H.M., but *T. fontaniforme* can be recognized by the pale yellow, not straw-coloured flowers. It has beautiful purple stigmas and even the upper part of the styles is light reddish purple; I never saw this colour of stigmas and styles elsewhere in this genus.

4. **Taraxacum cucullatiforme** v. Soest 1957. Acta Botan. Neerl. 6: 417, c. icon.

This species, only known from Corse: Monte Renoso and Monte Rotundo, is also collected: Monte d'Oro 18–2100 m, herb. Salis-Mraschlins (ZT).

#### SECTIO RHODOCARPA VAN SOEST

1. **Taraxacum schroeterianum** v. Handel-Mazzetti 1905. Oesterr. Bot. Zt. 55: 461; Monogr. Tarax. 1907: 104, c. icon.; Oest. Bot. Zt. 1922. 71: 270; Braun-Blanquet & Rübél, Fl. Graubunden, 1936: 1417; v. Soest 1954. Collectanea Bot. 4.1: 16; and 1954. Vegetatio 5/6: 527.

*T. rhodocarpum* Dahlst. 1907, Acta Horti Bergiani 4.2: 21.

*T. officinale* ssp. *Schroeterianum* Schinz & Keller, Fl. der Schweiz.

*T. laevigatum* ssp. *Schroeterianum* Hegi 1928. Fl. Mitteleur. 6.2: 1094.

The area of this species is: Spain (Sierra de Guadarrama) and the alpine chain from the Alpes Maritimes to eastern Switzerland; *T. schroeterianum* is not known from the Pyrenees. Localities, not mentioned in the literature, are listed below.

Walliser Alp.: Grand St. Bernard 2450 m, 1921 Wilczek (LAU); Alpe Breuillet 2300 m, 1910 Wilczek (LAU); Mattmark, Saastal 2100–2350 m, 1937 Maillefer (LAU); Saas-Fée — Saas Almagell 1800 m, Almagelltal 21–2200 m, Distelalp 2150–2250 m, Tälliboden 23–2400 m, all 1952 v.S. (h); Col de la Gueula 1960 m, 1917 Moreillon (LAU).

Vierwaldstädter Alp.: Göschenen 1100 m, 1906 A. S. Peax (Gray herb.); Surenenpass 15–1800 m, 1866 Brügger (ZT).

Tessiner Alp.: Valle Mesocco, Valle Leggia, 1917 Guralser (RUEB).

Rhaetische Alp.: Albula pass 21–2300 m, Weissenstein 2050 m, Palpuogna 1900 m, all 1948 v.S. (h); Lampertschalp and Zervreila, Vals, Wüller (CHUR); Parsenn Hütte 2200 m, slope of Lauenenzughorn 1320 m, Schlappintal near Klosters 1650 m, Landquart valley below Alp Pardenn 1320 m, all 1954 v.S. (h).

Bernina: Hospiz 2300 m, pass 2050–2250 m, both v.S. (h); Flatz valley near Pontresina 1850 m, 1933 v.S. (h); south slope of Piz Lagalb, 1944 W. Koch (ZT).

Silvretta: Alp Sardasca 1640–1650 m, Alp Fremdvereina, Jörital 1950 m, both 1954 v.S. (h).

## 2. *Taraxacum rufocarpum* van Soest **nov. spec.**

Planta mediocris vel robusta, ca. 10–15 cm alta, subglabra (scapi sub involucrio interdum et folia subtus paulo araneosi), basi fragmentis foliorum vetustorum subincrassata.

Folia numerosa suberecta ad 13 cm longa, ad 3 cm lata, gramineo-viridia, lobata; lobi laterales utrinque ad 4, hamati vel deltoidei vel triangulares, subacuti  $\pm$  crispatis, dorso integro vel saepe magis dentato, margine inferiore saepe valde concavo integro, summo saepe retroverso, in interlobiis brevis vel subnullis ad 5 mm latis interdum magis dentatis  $\pm$  abeuntibus; lobus terminalis hastatus vel  $\pm$  deltoideus, ad 2 cm longus, ad 3 cm latus, vel interdum elongatus subobtusus, integer vel utrinque 1 dente grosso munitus, lobuli basis retroversi subacuti; petiolis alatis (5–10 mm latis) nervoque mediano pallido vel subrufescente. Folia exteriora saepe  $\pm$  lingulata sublobata vel grosse dentata.

Scapi 1–3, floriferi foliis aequilongi vel eis breviter superantes.

Involucrum crassiusculum ca. 15(–18) mm longum, ad 14 mm latum, saepe obscure viride. Squamae exteriores apice recurvatae oblanceolatae ad 7 mm longae 3 mm latae obtusae parum roseo-violaceae, inconspicue marginatae, laeves; interiores apice violaceae, late membranaceo-marginatae, laeves.

Calathium 2,5–4 cm diametro, luteum. Ligulae marginales planae, extus stria purpurea notatae. Antherae saepe parce polliniferae; stylus luteus, stigmata fusco-lutea. Floret aestate.

Achenium 4 mm longum (pyramide inclusa) rufum vel aurantiacum, superne spinulosum (spinulis erectis) ceterum rugosum—basi laeve, in pyramidem conicam ca. 0,5 mm longam spinulis interdum praeditam subsensim abiens. Rostrum 5 mm longum; pappus niveus, 4–5 mm longus.

*Typus*: Hohe Tauern: Hochalmblick below Schönbretterspitze 2000 m, 25.7.1957 v. Soest (h. 37978–80, 37982).

Furthermore:

Alp. Maritimes: 1887 Favrat (ZT); possibly: Mt. Mounier 2750 m, 1904 St. Yves (LAU).

Alp. de Savoie: Pointe de Finive 24–2500 m, 1917; Mt. Buet, Fer-à-Cheval 2300 m, 1904; Col de Barbérine 2400 m, 1904, all Briquet (G).

Walliser Alp.: Rappental 2300 m, 1915 Burnat & al. (LAU).

Berner Alp.: Col du Rawil, Iffigenalp, 1906 Wilczek (LAU).

Churfürsten: Käseruck 2150 m, 1941 W. Koch (ZT).

Rhaetische Alp.: Oberengadin, Laret 2080 m, 1930 W. Koch (ZT); Parsennhütte near Klosters 2200 m, 1954 and Schlinigtal 1800 m, 1956 v.S. (h).

Bernina: Forno, 1898 Schinz & Hegi (Z); Cacciabella pass, Bergell 2700 m, Rikli (ZT).

Stubai Alp.: Magdalenerthal, Muttenjoch 2700 m, 1872 Churchill (K).

Eisenerzer Alp.: Hochschwab 2000 m, 1953 Rechingner (W).

Hohe Tauern: Mallnitzer Tauerntal, below Geiselkopf 1900–2000 m, below Ebeneck and below Mallnitzer Tauern 1900 m, Dössenersee 2250–2300 m, Franz Josefshöhe 2420 m, all 1957 v.S. (h); Kals 1900 m, 1931 H.M. (W); Waschgangalpe, Pacher in Schultz Bip. exs. 74, pro min. parte (K).

Dolomiten: Durmalp, Fassatal or St. Pellegrino in Fiemme, Facchini, exs. Rchb. 1958 (L. W); the same exsicc. contains *T. panalpinum* m.; it is difficult to

decide which of both localities belongs to *T. rufocarpum*; both species extend their area as far as the western Balkans.  
Hercegovina: Trinaue, Pleša pl., 1911 Schneider (W).

It is still uncertain to which section *T. rufocarpum* belongs. The rostrum is too short to consider it as one of the *Fontana*; the outer involucre bracts show little relation with those of species of the *Alpina*; in other characters *T. rufocarpum* shows affinity to the latter section. It differs from *T. schroeterianum* in colour of the achenes, the shape of the outer involucre bracts, the green, slightly winged petioles.

#### SECTIO VULGARIA DAHLSTEDT

In the subalpine region a few species of sect. *Vulgaria* seem to be really native; some of these are described below. They constitute more or less a transition between the characteristic *Vulgaria* of the European plains and the *Fontana* and *Alpina*.

Though, from a morphological point of view, it is not easy to make a distinct difference between this subalpine group and the characteristic *Vulgaria*, their behaviour seems to be different. The last ones are mostly introduced in the higher regions along roads, even up to high altitude. Both groups do not bloom until June or July. The introduced forms, however, show an excessive or abnormal growth ("status aestivalis"); the native, subalpine forms behave completely normal. In cultivation (in my garden, Delft) the latter bloom nearly a month later than the *Vulgaria* of the European plains.

#### 1. *Taraxacum aequilobiforme* van Soest **nov. spec.**, Fig. 22.

Planta sat robusta ca. 15 cm alta.

Folia numerosa multilobata luteo-viridia, parce, in nervo dorsali densiuscule araneosa, petiolis subalatis pallidis. Lobi laterales utrinque 5–8, falcati vel anguste triangulares acuti, dorso saepe valde convexo integro vel raro dentato, margine inferiore integer, angulis loborum plicatis; interlobiis longiusculis (ad 10 mm longis), ad 5 mm latis, saepe dentatis vel per grosse dentatis; lobus terminalis sagittatus, lobuli basis acuti integri, lobulo apicali elongato subacuto.

Scapi foliis aequilongi vel eis breviter superantes, sub involucre araneosi.

Involucre ca. 15 mm longum, ca. 18 mm latum, basi rotundatum. Squamae exteriores ovatae vel ovato-lanceolatae ca. 10 mm longae obscure virides subglaucescentes, laxe adpressae apice recurvatae, subconspicue vel pro parte inconspicue marginatae, ciliolatae; squamae interiores late lineares membranaceo-marginatae.

Calathium paulo radians 2,5–3 cm diametro, obscure luteum. ligulae marginales angustae evittatae vel paulo roscolae. Antherae (saepe parce) polliniferae; stylus et stigmata laete lutea. Floret aestate (in regione alpina!).

Achenium stramineum 4 mm longum (pyramide inclusa) superne spinulosum ceterum rugosum—basi laeve, in pyramiden conico-

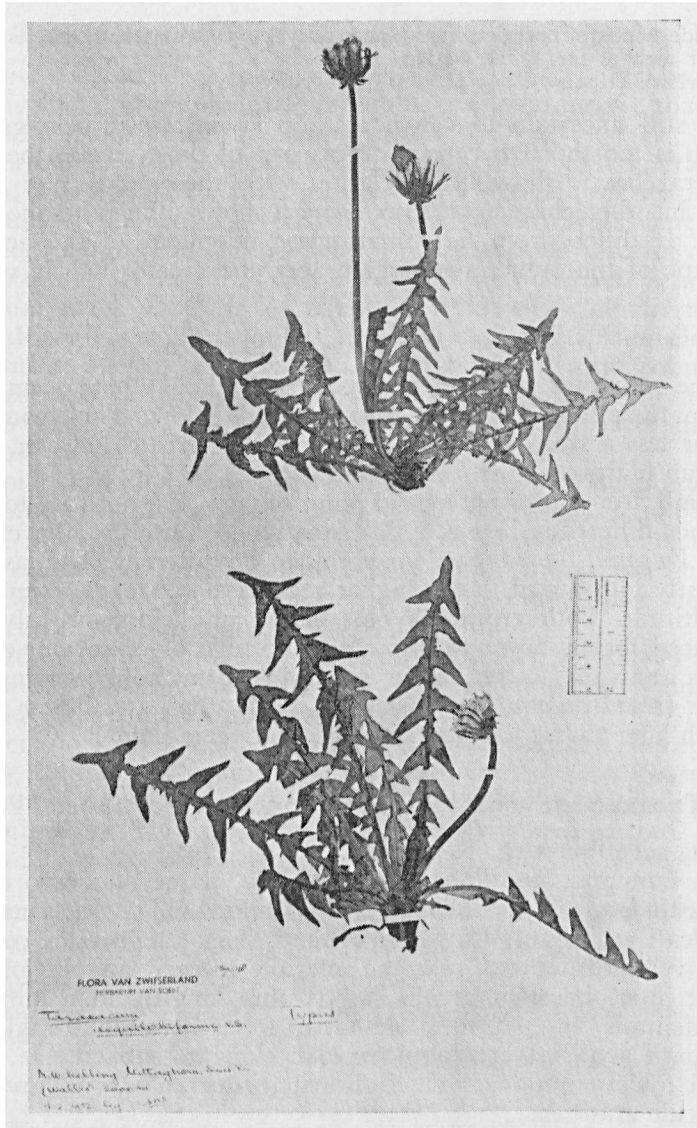


Fig. 22. *T. aequilobiforme* v.S., type specimen.

cylindricam ad 0,7 mm longam (spinulis saepe praeditam) abrupte abiens. Rostrum ca. 8 mm longum; pappus albus ca. 5 mm longus. E sectione Vulgariorum Dahlstedt.

*Typus*: Walliser Alp.: Saas-Fée, northwest slope of Mittaghorn 2000 m, 16.7.1952 v. Soest (h. 31113-8); furthermore in the same region: Kalbermatten 1900 m, Fée-kessel 18-2000 m and towards Almagelltal 1800 m, all 1952 v. S. (h).

2. **Taraxacum callosum** van Soest **nov. spec.**, Fig. 23.

Planta sat hamilis 4–11 cm alta, basi fragmentis foliorum sub-  
incrassata.

Folia decumbentia gramineo-viridia ad 10 cm longa, parce araneosa;  
lobi laterales utrinque 3–4, triangulares retroversi vel  $\pm$  deltoidei  
vel saepe breve et late unguiculati subacuti, dorso denticulato vel



Fig. 23. *T. callosum* v.S., type specimen.

integrò raro subgrosse dentato, interlobiis sublatusculis ca. 2–3 mm latis saepe curvato- vel recto-dentatis vel denticulatis, interdum grosse, rarissime sublobato-dentatis; lobus terminalis subhastatus vel  $\pm$  deltoideus vel subsagittatus, raro 1 dente munitus, lobuli basis acuti retroversi; petiolis brevis, 1–3 cm longis, subangustis vel subalatis, pallidis.

Scapi breves, sub involucro parce araneosi.

Involucrum mediocre ca. 1 cm latum, 1 cm longum, glauco-viride. Squamae exteriores laxè adpressae lanceolatae ad 5 mm longae, immarginatae; squamae interiores late lineares membranaceo-marginatae apice conspicue callosae.

Calathium planum radians, ad 3 cm diametro, dilute luteum. Ligulae marginales planae extus stria subpallide cano-purpurea notatae, apice interdum nigrescentes. Antherae polliniferae; styli lutei, stigmata sordide lutea. Floret aestate.

Achenium fulvo-stramineum parvum 3 mm longum (pyramide inclusa) superne spinulosum ceterum rugosum—basi laeve, in pyramiden brevam conicam 0,25 mm longam (spinulis saepe praeditam) inconspicue abiens. Rostrum ca. 5 mm longum; pappus albus, 4 mm longus.

E sectione Vulgariorum Dahlstedt.

*Typus*: Walliser Alp.: Saas-Fée, Fée-kessel 1800–2000 m, 7.7.1952 v. Soest (h. 31025–8); furthermore in the same valley: below Plattjen 22–2300 m, the achenes from this locality being used for the description; West slope of Mittaghorn 2100 m, 1952 v. S. (h).

### 3. *Taraxacum complicatum* van Soest **nov. spec.**

Planta sat humilis ad 10 cm alta, subgrosse araneoso-pilosa.

Folia numerosa  $\pm$  decumbentia gramineo-viridia lobata petiolis nervoque mediano pallido; lobi laterales breves parvi falcati vel anguste triangulares saepe grosse dentati, acuti vel subacuti, interlobiis magis dentatis et denticulatis, angulis loborum saepe plicatulis interdum fusco-marginatis; lobus terminalis brevis sagittatus vel deltoideus subacutus, lobuli basis evoluti saepe dorso 1 dente munito.

Scapi pauci, foliis subaequilongi.

Involucrum (in formis alpinis minor) mediocre 12 mm longum, ad 14 mm latum crassiusculum, obscure viride. Squamae laeves, exteriores laxè adpressae ovatae 7 mm longae 4,5 mm latae pallide vel viride-marginatae ciliolatae; squamae interiores late lineares membranaceo-marginatae.

Calathium planum radians ad 3 cm diametro luteum, ligulae marginales planae extus stria cano-violacea notatae; antherae polliniferae, stylus luteus, stigmata livescentia; floret aestate.

Achenium (speciminis non typici) stramineum 4 mm longum (pyramide exclusa) superne spinulosum ceterum laeve, in pyramiden subcylindricam 0,7 mm longam abrupte abiens. Rostrum 6–7 mm longum, pappus albus 5 mm longus.



*Typus*: Rhaetische Alp.: Schlinigtal, near the Alp 1800 m, 12.7.1956 v. Soest (h. 36862; also 36861).

Furthermore:

Alp. de Savoie: Rochers d'Entre, 1920 Briquet (G).

Berner Alp.: Alpes de Bex, vallée de l'Avançon d'Anzeindaz, Le Dru 1895 m and Tortay 2340 m, 1943 Villaret (LAU).

Walliser Alp.: Almagelltal 24-2600 m, 1952 v.S. (h).

Bernina: Fextal, Marmorè 2100 m, 1923 Schibler (Z).

*T. complicatum*, especially in smaller forms growing at high altitudes, resembles species of sect. *Alpina* Hagl.; the outer bracts of the rather dark involucre are short indeed, but the achenes and their long rostrum show that this species belongs to sect. *Vulgaria* Dahlst.

#### 4. *Taraxacum perfissum* van Soest **nov. spec.**, Fig. 24.

Planta mediocris 5-12 (-30) cm alta.

Folia numerosa decumbentia gramineo-viridia, inferne parce, in nervo dorsali densiuscule araneosa, petiolis angustis nervoque mediano pallido vel sordide rufescente. Folia exteriora oblanceolata  $\pm$  lobata obtusa vel subobtusa; folia interiora ad 20 cm longa (petiolo inclusa) lingulata fissa; lobi laterales (ad 3 cm longi) lineares vel anguste triangulares erecto-vel  $\pm$  reflexo-patentes vel falcati, acutissimi, paulo et saepe longe dentati, in interlobiis 1-1,5 cm longis valde longe subulato-dentatis (denti ad 1 cm longi) inconspicue abeuntibus; lobus terminalis sagittatus vel hastatus vel subtrilobatus acutus 1,5-2 cm longus, inferne ca. 2,5 cm latus, lobuli basis saepe lineares integri, lobulo apicali interdum dentato.

Scapi breves araneoso-pilosi.

Involucrum ad 15 mm longum, ad 20 mm latum. Squamae exteriores reflexo- vel erecto-patentes lanceolatae saepe elongatae ad 9 mm longae, subobscure virides, parum pruinosae apice  $\pm$  purpurascetes, interdum inconspicue purpureo-marginatae, ciliolatae. Squamae interiores late lineares, inferne late membranaceo-marginatae.

Calathium ad 3 cm diametro, obscure luteum. Ligulae marginales planae extus stria cano-purpurea notatae. Antherae  $\pm$  vacuae; stylus luteus, stigmata sordide lutea. Floret aestate.

Achenium 4 mm longum (pyramide inclusa) stramineum, superne squamuloso-spinulosum ceterum rugosum—basi laeve, in pyramiden conicam 0,6 mm longam abrupte abiens. Rostrum 9 mm longum; pappus  $\pm$  sordide albus, 6 mm longus.

E sectione *Vulgariorum* Dahlstedt.

*Typus*: Silvretta: Alp Sardasca 1650 m, 22.7.1954 v. Soest (h. 33658); in the immediate neighbourhood furthermore: Vernelatal 2000-2200 m, Süssertal 2100 m, Vereinahaus 1950 m, Fremdvereina 1950 m, below Alp Sardasca 1550 m, all 1954 v. S. (h).

Furthermore:

Rhaetische Alp.: Dischmatal near Davos, 1899 Hegi (Z); Laret near Davos 1750 m, and Gotschnaboden 17-1800 m, both 1954 v.S. (h); Schlinigtal 1700-1750 m, 1956 v.S. (h).

Oertler: Martelltal 21-2300 m, 1956 v.S. (h).



Fig. 24. *T. perfissum* v.S., type specimen.

5. ***Taraxacum praeticum*** van Soest **nov. spec.**, Fig. 25.

Planta 25 cm alta inferne glabra.

Folia suberecta gramineo-viridia nervo mediano subaraneosa, petiolis roseo-purpureis dentibus filiformis munitis, pro parte subalatis. Folia interiora ad 20 cm longa (petiolo inclusa), lobata; lobi laterales utrinque 3-4, falcati acutissimi e basi lati, patentes vel erecto-patentes, dorso saepe longe dentati vel denticulati,  $\pm$  abeuntes in interlobiis latiusculis (5-10 mm) et longis; lobus terminalis magnus



Fig. 25. *T. praeticum* v.S., type specimen.

ad 4 cm longus, 1,5–2,5 cm latus subacutus saepe sublobatus vel paulo patente dentatus, longe hastatus vel  $\pm$  ovatus vel ovato-triangularis vel subsagittatus; lobuli basis falcati dorso saepe magis dentati vel pseudo-fissi. Folia exteriores oblongo-lanceolata subintegra, dentata vel sublobata.

Scapi colorati sub involucrio subdense araneosi.

Involucrum mediocre 17 mm longum, angustum (ca. 12 mm latum)

obscure viride. Squamae exteriores reflexo-patentes denique retroflexae, lanceolatae ca. 9 mm longae, immarginatae vel pro parte inconspicue purpureo-marginatae; squamae interiores late lineares membranaceo-marginatae, omnes  $\pm$  purpureae.

Calathium planum radians ad 3 cm diametro  $\pm$  croceum. Ligulae marginales extus stria obscure purpurea ornatae. Antherae polliniferae; stylus et stigmata sordide lutea siccis subnigra. Floret aestate.

Achenium parvum 2,7 mm longum (pyramide exclusa) superne spinulosum ceterum rugosum—basi laeve, in pyramiden 0,4 mm longam subabrupte abiens. Rostrum 9 mm longum; pappus niveus 5 mm longus.

E sectione *Vulgariorum* Dahlstedt.

*Typus*: Rhaetische Alp.: Klosters, below Pardenn 1320 m, 14.7.1954 v. Soest (h. 33636-7).

Furthermore:

Berner Alp.: Alpes de Bex, La Varraz 1800 m, 1942 Maillefer (LAU).

Rhaetische Alp.: Klosters 1300 m, Mönchalptal 1450 m, Rüti 1450 m and below Gotschna 1750 m, all 1954 v.S. (h).

Silvretta: between Monbiel and Vereina 1300 m, Sardascatal 1300 m and Vereinahaus 1950 m, all 1954 v.S. (h).

Hohe Tauern: Granatspitzgruppe, Muntanitz 2450 m, 1952 Wendelberger (h. Melzer).

## 6. *Taraxacum reophilum* van Soest **nov. spec.**, Fig. 26.

Planta gracilis ca. 15-30 cm alta, valde glabrescens.

Folia suberecta luteo-viridia vel paulo canescentia, petiolis pallidis anguste alatis; folia interiora ca. 20 cm longa, lobata; lobi laterales utrinque 4-5 lanceolati vel anguste triangulares acuti erecto-vel reflexo-patentes integri vel dorso rarissime denticulati vel dentati, angulis loborum superiorum plicatis; interlobiis longis (ad 3 cm) latiusculis (0,5-1 cm) raro integris interdum denticulatis, saepe longe patento-dentatis vel lobulis lanceolatis ad 8 mm longis munitis; lobus terminalis  $\pm$  sagittatus, lobuli basis retroflexi vel saepissime patentes, acuti, lobulo apicali elongato saepe subobtusio, omnes integri vel parce denticulati.

Scapi floriferi foliis aequilongi vel eis breviter superantes, sub involucri araneosi vel glabrescentes.

Involucrum 1,5 cm longum, 1,5 cm latum, basi rotundatum, subobscurum viride glaucescens. Squamae exteriores laxae adpressae ovatae vel ovato-lanceolatae, ad 6 mm longae, ad 3 mm latae, acuminatae summo obtuso, apice parum marginatae; squamae interiores late lineares membranaceo-marginatae.

Calathium planum radians ad 3 cm diametro,  $\pm$  croceum. Ligulae marginales planae extus stria pallide cano-purpurea notatae. Antherae polliniferae; stylus luteus; stigmata sordide lutea, denique subobscura. Floret aestate.

Achenium 5 mm longum (pyramide inclusa) stramineum superne tuberculatum vel brevissime spinulosum, ceterum laeve, in pyramiden

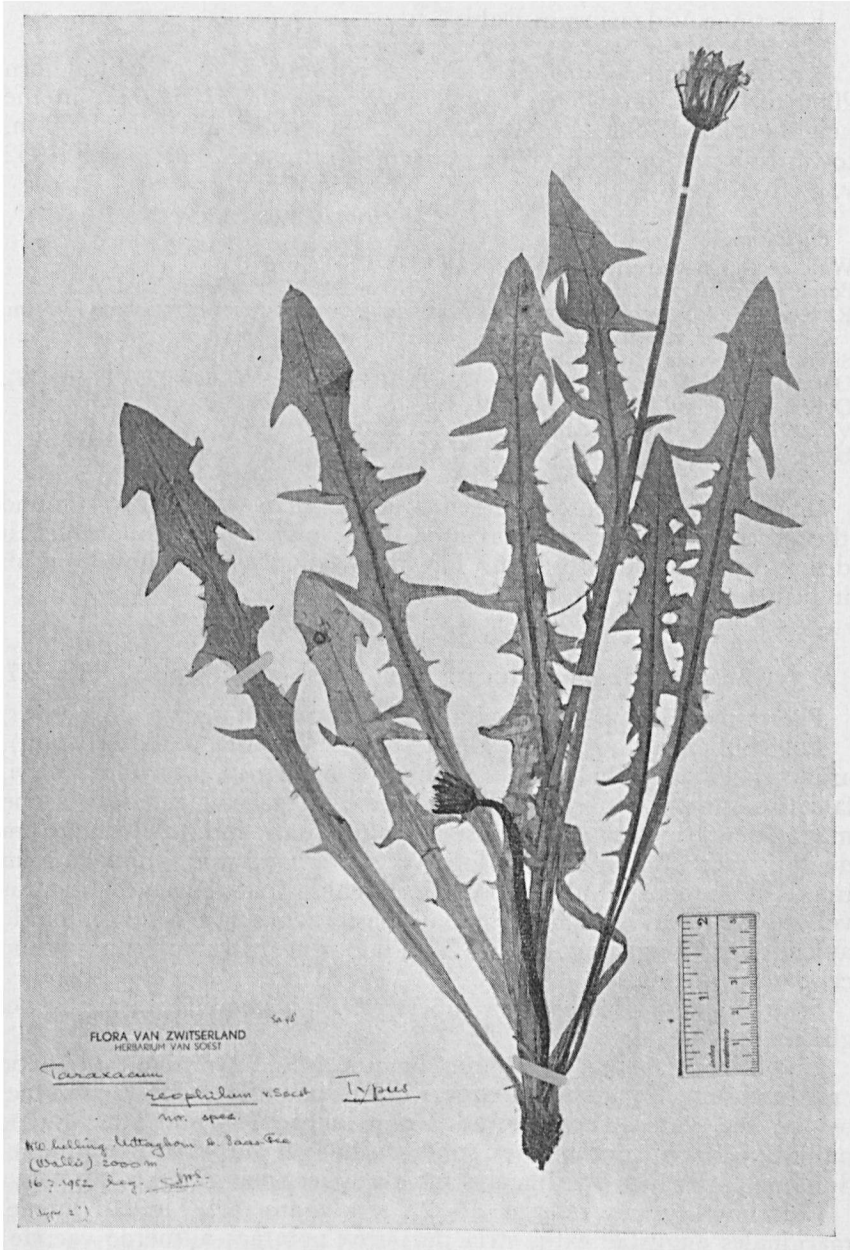


Fig. 26. *T. reophilum* v.S., type specimen.

conicam sublongam (0,7 mm) subsensim abiens. Rostrum breve, 5–6 mm longum; pappus albus 5 mm longus.

E sectione *Vulgariorum* Dahlstedt.

*Typus*: Walliser Alp.: Saas-Fée, northwest slope of Mittaghorn 2000 m, along brooklets, 16.7.1952 v. Soest (h. 31064–71); in the neighbourhood: Saas-Fée 18–2000 m, below Mittaghorn at 1800 m, towards Saas-Almagell 1800 m, near Mattmark 2000 m, all 1952 v. S. (h).

Furthermore:

Walliser Alp.: Steinental near Bérusal, 1893 Chenevard (G).

Berner Alp.: Alpes de Bex, Les Ayers 1870 m, 1946 Maillefer (LAU).

Rhaetische Alp.: Schlappintal near Klosters 1600 and below Gotschna 1300 m, both 1954 v.S. (h).

Silvretta: Vernelatal 2100 m, 1954 v.S. (h).

Oetztaletal: Radurscheltal near Pfunds, 1926 Vetter (W) and 1936 Plank (W).

Ortler: Martelltal 21–2300 m, 1956 v.S. (h).

Vorarlberg: Solarneljoch, Scesaplana, 1912 Vetter (W).

Hohe Tauern: Kals 1900 m, 1931 H.M. (W).

This species can be considered as a link between the *Vulgaria* and the *Fontana*; it seems to be related to *T. aestivum* m, from which it differs by a shorter rostrum. The dark colour of the flower heads indicates the affinity to the *Fontana*.

## 7. *Taraxacum rhaeticum* van Soest **nov. spec.**, Fig. 27.

Planta mediocris 5–15 cm alta.

Folia suberecta ad 17 cm longa (petiolo angusto pallido inclusa), araneosa, lobata; lobi laterales utrinque 4–6, angusti acuti unguiculosi, falcati summo retroverso vel retroflexo, integri vel inferiora saepe magne dentati vel interdum fissi et multidentati; interlobiis interdum dentatis saepe 3 mm latis, in folia exteriora 5–15 mm longis, in folia interiora saepe subnullis; lobus terminalis deltoideus vel hastatus vel subsagittatus subacutus, lobuli basis acuminati integri, lobulo apicali saepe longe lingulato ad 2 cm lato, integro vel interdum paulo crispato-denticulato.

Scapi floriferi foliis breviter superantes, sub involucro araneosi vel glabrescentes.

Involucrum mediocre 12 mm longum, ca. 12 mm latum saepe crassiusculum. Squamae exteriores erecto-patentes apice recurvatae, ovatae vel ovato-lanceolatae ad 7 mm longae 2–3 mm latae, saepe pallide virides purpurascens, sublatae albo- vel purpureo-marginatae. Squamae interiores late lineares membranaceo-marginatae.

Calathium paulo radians ad 2,5 cm diametro. Ligulae luteae, marginales angustae extus stria purpurea notatae; antherae vacuae; stylus et stigmata lutea; floret in regionis alpinis aestate, in regionis subalpinus interdum vere.

Achenium stramineum 4 mm longum (pyramide inclusa) superne breve spinulosum (spinulis  $\pm$  rufescentis), ceterum sublaeve, in

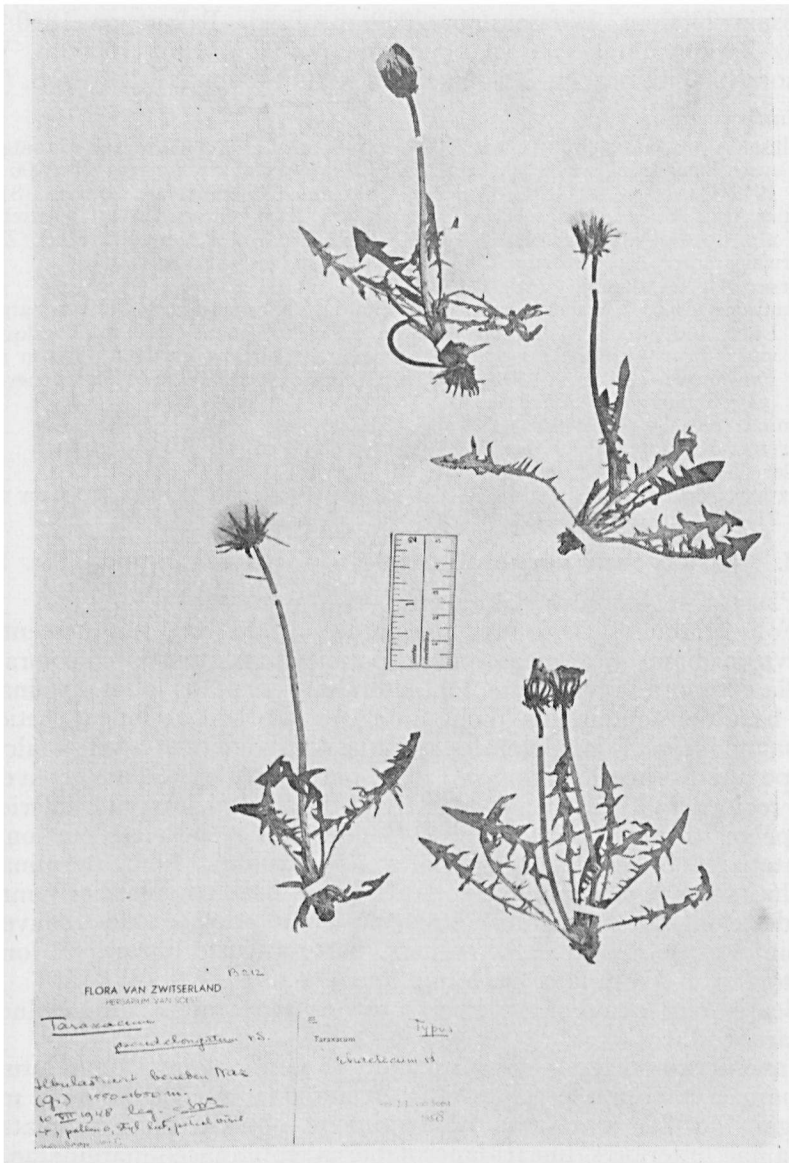


Fig. 27. *T. rhaeticum* v.S., type specimen.

pyramiden conicam 0,5 mm longam spinulis saepe praeditam sensim  
 abiens; rostrum 7 mm longum; pappus albus 6 mm longus.

E sectione Vulgariorum Dahlstedt.

*Typus:* Rhaetische Alp.: Albula road below Naz 1550–1650 m,  
 10.7.1948 v. Soest (h. 19285, 19287); furthermore very common in  
 the neighbourhood: Albula pass, abundant 21–2300 m, Albula

Hospiz 2300 m, Weissenstein 2050 m, Preda-Palpuogna 1850 m, Naz-Bergün 1400–1630 m abundant, Val da Munz 1600 m, Val Tuors 1600 m, Bergün-Bergünerstein 1350–1400 m, all 1948 v. S. (h).

Furthermore:

Walliser Alp.: Saastal, Mattmark 2100–2150 m; im Lerch 1900 m and Hannigalp near Saas-Fée 22–2400 m, all 1952 v.S. (h); Col de Torrens 28–2900 m, 1919 Gandoger (RUEB); Riffelalp 2200 m, 1947 Horn af Rantzien (S).

Berner Alp.: Alpes de Bex, Col des Essets 2000 m, 1905 Wilczek (LAU); Gletscheralp, Loetschental, 1939 Weibel (G); Sigreswiler Grat 1820 m, 1933 Lüdi (ZT).

Vierwaldstädter Alp.: Kartigel, Meiental 1350 m, 1914 E. Schmid (Z).

Glarner Alp.: Calanda, Ziegler (LAU).

Rhaetische Alp.: Klosters, forest 1250–1300 m, Klosters-Laret 1400 m, above Laret 1600 m, Mönchalp 1300 m, Klosters-Serneus 1200 m, Landquart valley near Alp Pardenn 1320 m, Stutzbachtal below Pardenn 1900 m and Parsenn 22–2400 m, all 1954 v.S. (h); Aelpli, Arosa 2100 m, 1898 Chenevard (G); Schlinigal, 1956 v.S. (h).

Bernina: pass 2050–2250 m, 1948 v.S. (h).

Silvretta: Schlappintal 1400 m, 1500 m and 1600 m, all 1954 v.S. (h).

Ortler: Martelltal 2350 m, 1956 v.S. (h).

Oetztaier Alp.: Matschertal 1600–1650 m and Prossental 1900 m, 2000 m and 21–2200 m, all 1956 v.S. (h).

## 8. *Taraxacum serpentinum* van Soest **nov. spec.**, Fig. 28.

Planta 7–15 cm alta glabrescens.

Folia numerosa suberecta gramineo-viridia vel sublutescentia, nervo mediano  $\pm$  araneoso-pilosa, petiolo pallide purpureo-colorato. Folia exteriora breve lobata, lobi laterales  $\pm$  dentati; lobus terminalis  $\pm$  hastatus acuminatus. Folia interiora ad 18 cm longa (petiolo subalato inclusa); lobi laterales utrinque 4–5, triangulares vel  $\pm$  falcati saepe angusti acuti summo pro max. parte retroverso, dorso convexo vel recto dentati vel inciso-dentati vel denticulati, margine inferiore saepe recto integro; interlobiis 2–3 mm latis saepe ad 1 cm longis dentatis; lobi laterales superiores approximati; lobus terminalis  $\pm$  hastatus vel plerumque trilobatus, lobuli basis triangulares summo valde elongato saepissime retroverso acuto, dorso valde convexo subintegro, lobulo apicali pro max. parte anguste lineare vel longe deltoideo, 1–3 mm lato, ca. 5 mm longo, acuto.

Scapi foliis aequilongi vel eis breviter superantes, sub involucro  $\pm$  araneosi.

Involucrum viride  $\pm$  crassiusculum 13 mm longum 16 mm latum. Squamae exteriores patentes apice recurvatae lanceolatae ad 7 mm longae, ad 2,5 mm latae immarginatae obtusae apice ciliolatae; squamae interiores lineari-lanceolatae membranaceo-marginatae.

Calathium valde radians ad 3,5 cm diametro. Ligulae saturate luteae marginales planae vel subplanae, extus stria purpurea paulo notatae, apice saepe obscure purpureae. Antherae vacuae vel parce polliniferae; styli et stigmata sordide lutea. Floret aestate.

Achenium stramineum 4 mm longum (pyramide exclusa) superne spinulosum ceterum tuberculatum—basi laeve, in pyramiden conico-cylindricam 0,8 mm longam subsensim abiens; rostrum 5–6 mm; pappus albus 5–6 mm longus.

E sectione *Vulgariorum* Dahlstedt.





Fig. 28. *T. serpentinum* v.S., type specimen.

*Typus*: Rhaetische Alp.: Parsenn, Stutzbachtal 1800 m on serpentine, 21.7.1954 v. Soest (h. 33659), also no. 33655.

Furthermore:

Rhaetische Alp.: Albula, Val Tisch 1850–2100 m, 1948 v.S. (h).

## SUMMARY

In sect. *Ceratophora* Dahlst. *T. krätlii* (Piz Padella) is described.

In sect. *Alpina* Hagl. a number of new sp. are described, a few only restricted to the western<sup>+</sup> or to the eastern<sup>++</sup> Alps: *T. carinthiacum* (also western Balcans), *T. helveticum* (also Tatra) with f. *lobatum*, *T. mattmarkense*<sup>+</sup>, *T. panalpinum* (also high mountains in Spain, Tatra and Transsilvanian Alps, western Balcans), *T. parsennense*<sup>++</sup>, *T. pseudofontanum*, *T. saasense*<sup>+</sup>, *T. vereinense*, *T. vernelense*<sup>++</sup>, *T. vetteri*. The latin description of 2 already known sp. is enlarged: *T. apenninum* (Tenore) DC. em v.S. (Apennines) and *T. petiolulatum*<sup>++</sup> (Huter) v.S. nov. comb.; furthermore *T. oreophilum* Hagl. and *T. venustum* Dahlst.<sup>++</sup> are treated.

In sect. *Fontana* nov. sect., next to *T. fontanum* H.M. sens. str., a number of new species are described: *T. aurantellum*<sup>++</sup>, *T. corsicum* (Corse), *T. fontanicolum*<sup>++</sup> (also Tatra), *T. fontanosquameum*<sup>++</sup>, *T. peralatum*<sup>++</sup>, *T. pohlii*<sup>++</sup>, *T. pseudoboreigenum* (Central Alps). In connection with this section *T. aestivum*<sup>++</sup> and *T. crocellum*<sup>++</sup> are described.

In sect. *Cucullata* nov. sect., besides *T. cucullatum* Dahlst. and *T. tirolense* Dahlst., *T. fontaniforme* (Bernina) is described.

In connection with sect. *Rhodocarpa* v.S. (*T. schroeterianum* H.M.), *T. rufocarpum* is described (Alps, W. Balcans).

In sect. *Vulgaria* Dahlst. the following sp. are described: *T. aequilobiforme*<sup>+</sup>, *T. callosum*<sup>+</sup>, *T. complicatum*<sup>+</sup> (also Bernina), *T. perfissum*<sup>++</sup>, *T. praeticum*, *T. reophilum*, *T. rhaeticum*, *T. serpentinum* (central Alps).

Photographs of the type specimens of most of the new sp. are published.