AN ACCOUNT OF SOME NEOTROPICAL TARAXACUM SPECIES

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The genus *Taraxacum* (Lactuceae-Compositae) is a highly successful group of perennial herbs which, although centered in Eurasia, are native in five continents. The major of the 2000-odd species are polyploid seed-apomicts, and, being genetically invariable, can be regarded as 'microspecies.' Although the species are rightly regarded as taxonomically 'critical,' this is largely due to the considerable phenotypic plasticity displayed, so characteristic of genetically invariable units. A careful examination of well-grown material during the main flowering period at temperate latitudes will rarely lead to taxonomic difficulty (Richards, 1972). However, abnormal phenotypes are adopted at other times of year, and this phenomenon creates particular difficulties in tropical regions where *Taraxacum* apparently displays no marked flowering period and thus exhibits even more plasticity than is usual.

Whereas the native *Taraxacum* species of North America are relatively well-known, those of neotropical regions, south of the United States, have been largely ignored. Up till now, only eight species have been described: *T. magellanicum* Comm., *T. melanocarpum* Dahlst., *T. gillesii* Hooker & Arnott, *T. ibari* Phil., and *T. rhusiocarpum* Dahlst., all from Tierra del Fuego, and *T. andinum* Dahlst., from the southern Andes, belong to the section *Arctica* Dahlst. em. Richards, a circum-arctic section with a number of North American species; *Taraxacum mexicanum* DC, from Mexico above 2000 m, and *T. fernandezianum* Dahlst., from the island of Juan Fernandez, are closely related and have heretofore not been classified. It is noteworthy that no species in the circum-arctic section *Ceratophora* Dahlst., of which about 50 species have been described from North America, mostly in the Arctic, have been recorded from Central and South America.

In the present paper, nine additional native species are reported from the neotropical regions. These are placed with *Taraxacum mexicanum* and *T. fernandezianum* in a new section *Mexicana*.

It has been recognised for some time that some species in the European sections *Vulgaria* Dahlst. (*Taraxacum officinale* Wigg. s.l.) and *Erythrosperma* (H. Lindb. f.) Dahlst. (*T. levigatum* (Willd.) DC or *T. erythrospermum* Andrz. s.l.) are adventive in many regions of the world, including the American continent. American taxonomists have invariably used these aggregate species names, and the only account of the microspecies adventive in America concerns the *Erythrosperma* in North America (van Soest, 1958). During the present study, I have examined specimens of a number of European species adventive in Central and South America, and these are also enumerated.

MATERIAL STUDIED

During the course of this study, I have seen some 300 herbarium sheets of *Taraxacum* from neotropical regions. These include the collections of the United States National Museum, Smithsonian Institute, Washington (US); the New York Botanic Garden (NY); the University of Michigan Herbarium, Ann Arbor (MICH); the Nacional Herbario, Universidad Nacional de Mexico (MEXU); the Rijksherbarium, Leiden (L); the Reading University Herbarium (RU); the Herbarium of the Royal Botanic Gardens, Kew (K); the Botaniska Riksmuseet, Stockholm (S); Escuela Nacional de Ciencias Biologicas, Mexico (IPN); and the Herbarium of the Royal Botanic Gardens, Edinburgh (E). I should like to thank the respective authorities for allowing access to this material.

In addition, I have cultivated *Taraxacum fernandezianum* from two gatherings of seed, by Dr. S. R. J. Woodell from the Castle Hotel, Bermuda; and by Professor J. L. van Soest from Arrayan, Chile.

SYSTEMATIC ACCOUNT

Taraxacum sectio Mexicana A. J. Richards, sect. nov.

Plantae mediocres vel parvae pilosae. *Folia* lanceolata vel spathulata, lobata vel subintegra, griseo vel obscuro-viridia. *Scapi* subtenues erecti, interdum valde lanati et breves. *Squamae exteriores* parvae, ad 7-10 mm longae, saepe 4-5 mm, lanceolatae vel ovato-lanceolatae, in parte vel toto scariosae, virides vel griseo-brunneae, ecorniculatae, erectae usque recurvatae. *Capitulum* subparvum, ad 35 mm diametro, flavum usque citrinum, polliniferum vel epolliniferum. *Achenium* stramineum usque griseo-brunneum, parvum, ad 3.0 mm longum (pyramide exclusa), in pyramidem 0.5-1.2 mm cylindricam subabrupte abiens; rostrum tenue, 5-7 mm longum. *Pappus* sordide albus usque pallide stramineus. Semper? agamospermae. Plantae neotropicae inter 2000-4000 m altitudinis. Type species: *T. mexicanum* DC.

The section *Mexicana* includes 11 closely related species of *Taraxacum*, only two of which (*T. mexicanum* and *T. fernandezianum*) have been described previously. All are apparently confined to Central and South America, the West Indies and Bermuda. Three species seem to be restricted to Mexico, and a further three to Central America. These six species occur in rather natural associations between 2000 and 4000 metres. A further two species are found in discrete areas of South America, one in Venezuela and the other on the borders of Chile and Peru. Both are plants of high altitude. In addition, one species is widespread in South America, including some lowland stations in which it may be adventive, while *T. fernandezianum* is mostly known from low altitude localities and is very widespread, being recorded from Juan Fernandez, Chile, Peru, Brasil, Argentina, the West Indies, Central America and Bermuda. It may be adventive in some or most of these areas, and it is not clear where it is native. One species seems to be endemic to Jamaica.

The section is characterised by small, often scarious exterior bracts (in some cases among the smallest known in the genus) that characteristically contrast with the darker involucre of interior bracts, and by small achenes with a cylindrical cone, a rather short but fine beak, and a distinctly discoloured pappus that in many cases may be yellowish. No other neotropical *Taraxaca* have a discoloured pappus. Those with small exterior bracts either have bracts that are not scarious and are usually corniculate (section *Erythrosperma*), or are dark and adpressed to the involucre (section *Arctica*). Cylindrical cones to the achenes are otherwise found in the section *Erythrosperma*, in which the achenes are, however, usually reddish. The section *Vulgaria* are relatively gross plants with exterior bracts exceeding 7 mm, and with a short conical cone to the achene.

The relationships of the section *Mexicana* are of great interest. Superficially, they resemble most small members of the section *Vulgaria*, but the small bracts and the shape of the achene is more reminiscent of the section *Erythrosperma*. These are both largely apomictic groups from Europe of an 'advanced' type (Richards, 1973). However, the section *Mexicana* is more primitive, both in the scarious exterior bracts and especially in the discoloured pappus, which is rarely found in *Taraxacum* and is almost confined otherwise to primitive sexual species from western Asia. There is no conceivable link with the other two native groups of *Taraxaca* in America, the *Arctica* and *Ceratophora*. If one was to imagine a hybrid between these sections (some *Arctica*, including *T. magellanicum* are sexual), it might resemble the *Mexicana* in some ways, but the discoloured pappus and cylindrical cone to the achene would be difficult to explain, as these do not occur in either section. However, any alternative explanation would invoke either a direct link with South-West Europe, or widespread extinction of *Mexicana* types from large areas of Asia and North America. In short, the origin of the *Mexicana*, and its relationships are a mystery.

A KEY TO SECTIONS AND SPECIES OF NEOTROPICAL TARAXACA

1. Plant robust; exterior bracts exceeding 8 mm, spreading to recurved, neither scarious nor corniculate; rostrum exceeding 8 mm; pappus white. ..... section *Vulgaria.*

1. Plant smaller, more delicate, occasionally robust; exterior bracts rarely exceeding 8 mm, adpressed to recurved, often scarious or corniculate; rostrum 5-13 mm; pappus white or discoloured. ..... 2.

2. Plant small and delicate with dissected leaves; exterior bracts not mostly scarious or membranous, usually corniculate; achenes usually reddish with a cylindrical cone; rostrum exceeding 7 mm; pappus white. ..... section *Erythrosperma.*

2. Plant small to robust; exterior bracts often mostly scarious, never corniculate; achenes rarely reddish, cone cylindrical or poorly differentiated; rostrum 5-13 mm; pappus white or discoloured. ..... 3.

3. Plant delicate and usually rather short with glabrous leaves; exterior bracts not membranous, although often with a scarious border, erect to adpressed; achenes fusiform, cone scarcely differentiated; rostrum not exceeding 6 mm; pappus white (section *Arctica*). ..... 4.

3. Plant less delicate, leaves usually with some indumentum; exterior bracts thin, often scarious or membranous, paler than interior bracts, erect to recurved; achenes abruptly narrowed above to form a cylindrical cone; rostrum 5-13 mm; pappus usually discoloured, sometimes yellowish (section *Mexicana.* .... 7.

4. Pollen absent; achenes reddish. ..... 15. *T. rhusiocarpum.*

4. Pollen present; achenes lacking reddish hue. .. 5.

5. Leaves narrow, subentire to lobate; exterior bracts rarely exceeding 3 mm in width, with a broad scarious border. .... 12. *T. magellanicum.*

5. Leaves wider, even ovate, deeply dissected; exterior bracts commonly exceeding 3 mm in width, with a narrow border, or concolorous. ..... 6.

6. Scapes shorter than leaves at flowering; exterior bracts concolorous. . . . . 14. *T. gillesii.*
6. Scapes usually exceeding leaves at flowering; exterior bracts with a narrow white or rose-coloured border. . . . . 13. *T. andinum.*
7. Exterior bracts exceeding 8 mm; achenes 3.5 mm; rostrum 10-13 mm. (C. America). . . . . 11. *T. tenejapense.*
7. Exterior bracts less than 7 mm; achenes less than 3.2 mm; rostrum less than 9 mm. . . . . 8.
8. Petioles narrow, unwinged, rose; involucres narrow (to 10 mm), blackish. (Chile, Peru). . . . . 8. *T. cuzcense.*
8. Petioles variable; involucres usually more than 10 mm wide, never blackish. . . . 9.
9. Leaves lacking clearly defined lobes; exterior bracts 1 mm in width. . . . . 10.
9. Leaves lobate; exterior bracts usually 1.5-2 mm in width. . . . . 11.
10. Leaves spathulate, green, not very dentate; exterior bracts with a narrow white border. (C. America, Haiti). . . . . 5. *T. spathulatum.*
10. Leaves narrowly lanceolate, grey-green, dentate throughout; exterior bracts scarious throughout. (widespread). . . . . 2. *T. fernandezianum.*
11. Scape not exceeding 50 mm at flowering, often almost absent, woolly. (C. America). . 1. *T. mexicanum.*
11. Scape usually longer at flowering, sometimes pilose but never woolly. . . . . 12.
12. Leaf-lobes strongly recurved with a convex distal margin. . . 13.
12. Leaf-lobes patent or slightly recurved; distal margin not markedly convex. . . . . 14.

13. Leaf-lobes dentate; exterior bracts erect, 4 mm, submembranous. (Jamaica). . . . . 4. *T. unguilobifrons.*

13. Leaf-lobes mostly entire; exterior bracts spreading, 5 mm, not membranous. (Venezuela). . . . . 9. *T. craspedotoides.*

14. Exterior bracts erect, 4 mm, submembranous; leaves pale green with dentate triangular lobes. (Mexico). . . . . 10. *T. disseminatoides.*

14. Exterior bracts patent or recurved, 4-6 mm, not membranous; leaves darker. . 15.

15. Plant robust; exterior bracts recurved, 6 × 2 mm; involucre dark green. (S. America). . . . . 3. *T. subspathulatum.*

15. Plant less robust; exterior bracts patent, 4-5 × 1.5 mm; involucre not dark. . . . . 16.

16. Leaf-lobes deltoid; exterior bracts with a clear white border; achenes 3.0 mm. (Mexico). . . . . 7. *T. calocephaloides.*

16. Leaf lobes triangular, acute; exterior bracts with an indistinct border; achenes 2.5 mm. (C. America, Haiti). . . . . 6. *T. argutifrons.*

1. **Taraxacum mexicanum** De Candolle. Prod. Suppt. Not. 7:146 (1838).

Plant small to medium-sized, glabrous except at the base and on the scapes. Leaves 30-150 mm, decumbent to ascending, broadly lanceolate or subspathulate, lobate. Lateral leaf-lobes usually three, short, acute, triangular, entire or acuminate-dentate; terminal leaf-lobe poorly demarcated, short, obtuse; petiole short, winged, dull rose-pink. Scapes few, erect, usually very short (to *50 mm* and often *almost sessile*) at flowering, elongating to 200 mm in fruit, at first *densely lanate*, later glabrescent. Exterior bracts *erect, 5 × 1.5 mm*, olive-green with a *pale margin*. Capitulum 20-25 mm in diameter, deep yellow; ligules bearing purple stripes; style and stigma dirty green, with or without pollen. Achene straw-brown, 2.6 mm (excluding the cone), tuberculate at apex, with *a short* (*0.5 mm*) subcylindrical cone. Rostrum *7 mm, thin*. Pappus discoloured.

Taraxacum mexicanum is a widespread and apparently locally common species above 2000 m in Mexico. It is immediately known by the very short and woolly scapes at flowering. In addition, the short cone and rather long rostrum to the achenes and the short, broad, erect bracts with pale margins are distinctive.

The original description in De Candolle is minimal, but the phrase "scapis folio brevioribus, sparse subvillosis," although an understatement, is diagnostic. I have seen a photograph of the specimen from De Candolle's herbarium at Geneva, which undoubtedly refers to this taxon (mountains around Mexico City, Berlandier). The description in Handel-Mazzetti (1907:75-76) is much more complete and forms a satisfactory diagnosis. Handel-Mazzetti gives five localities, all in Mexico. In addition I can add:

REPRESENTATIVE SPECIMENS: **Mexico:** CHIAPAS: San Cristobal las Casas, 7100′, 14.2.1966, *R. M. Laughlin* (NY). COAHUILA: Parras de la Fuente, Rincon del Monteso, *D. B. Ward* 5748 (MICH). DISTRITO FEDERAL: Canada de Contreras, 3100 m, *C. Vazquez* 20 (MEXU); Canada de Contreras, Cuarto Dinamo, 3100 m, 21.3.1965, *H. Hernan-*

dez (MEXU); Barranca de Solis Grande, Lomas Atlas, 2400 m, *L. Huerta* M. 18 (MEXU). DURANGO: 5 miles north of railway at Coyotes, 2400-2500 m, *J. H. Maysilles* 8282 (MICH); El Carazon, *P. G. Russell, M. J. Souviron* 107 (US). HIDALGO: Puente de Tasquillo, *L. Gonzalez Quintero* 2020 (MEXU); Ixmiquilipan, 9 km north of Orizabita, 2500 m, *L. Gonzalez Quintero* 2593 (MEXU); Los Pescados, Cofre de Perote, 10,700′ *E. K. Balls* 4585 (US). MEXICO: 4 km north of Atizapan, 2350 m, 11.6.1967, *A. Vargas* (N. MEXU); Texcoco, Ahuehuete, 2250 m, 25.11.1951, *E. Matuda* (NY); Nevada de Toluca, 4.8.1962, *L. Huerta* (M. MEXU); Chimalhuacan, 2300 m, 28.7.1964, *A. Castro* (MEXU); Nevada de Toluca, Ojos de Aqua, 12,800′, *E. K. Balls* 4105 (US); Llano grande, 3000 m, 10.7.1951, *E. Matuda* (NY). TAMAULIPAS: reservoir of Miquihuana, 10.7.1949, *Stanford, Taylor and Lauber* (MICH); 5 km north of Atizapan, 2400 m, 6.9.1964, *A. Villamar* (C. MEXU); Chemalhuacan, 2250 m, 7.6.1964, *A. Mendoza* (MEXU); Penas Cuates, north-west of Ixtaccihuatl, 3500 m, *Rzedowski* 21809 (MEXU); Santa Cruz Cuahtenco, La Vereda, 2900 m, *L. Hilario* A. 13 (MEXU); Chalco, Camacho, 2750 m, 11.9.1966, *Fagoaga* (MEXU). PARAJE PROVINCIAL: Popocatepetl, 11,500′, *E. K. Balls* 4183 (US). PUEBLA: on route 150, 17 m east of Puebla, *R. M. King* 2271 (MICH); San Juan Citlaltepec, Lago de Zanpango, 5.6.1966, *V. Velaquez* (MEXU). TEMASCALTEPEC: Cumbre-Gavia, 1936, *G. B. Hinton* (NY, US). VERACRUZ: Boca del Monte, *E. W. Nelson* 226 (US); Orizaba, Lomogrande, 9200′, 27.4.1938, *E. K. Balls* (K).

2. **Taraxacum fernandezianum** Dahlstedt apud C. Skottsberg. Nat. Hist. Juan Fern. and Easter I. 2:226 (1922).

Plant small to medium-sized, subglabrous, or pilose on the mid-ribs. Leaves 70-150 mm, decumbent to ascending, *grey-green,* lobate, usually *indistinctly* so, or frequently *without lobes but deeply and irregularly dentate;* leaf-lobes 2-4, short, recurved; terminal leaf-lobe obtuse or ± acute, entire; petiole unwinged, dull purple or occasionally green. Scapes ascending or erect, exceeding leaves at flowering, pilose, but scarcely lanate at first, becoming glabrescent. Exterior bracts patent, or somewhat recurved, narrowly lanceolate, 5 × 1, pale, olive-green, or sometimes brownish-red, and ± scarious. Capitulum 25-35 mm in diameter, yellow; ligules bearing dark or grey-violet stripes; style yellow, stigma yellow at first, becoming dark in a dried condition; pollen usually present (Dahlstedt says it can be

absent). Achenes straw-brown to light warm brown, 3.0-3.2 mm (excluding cone), spinulose above; cone cylindrical, 0.8 mm. Rostrum slender, 7-8 mm; pappus off-white. 2n = 24. Agamospermous.

Taraxacum fernandezianum was first described by Dahlstedt from the islands of Masafuera and Masatierra, Juan Fernandez (S). Since then it has been found from sea-level to 3000′ throughout much of Central and South America, the West Indies and Bermuda. It is by far the most widespread member of the group, and the most catholic in habitat requirement, although most stations seem to be on disturbed ground near the coast. Only in this species, which seems to have been the only one in cultivation (at Leiden and Newcastle) do we have evidence of chromosome number and apomictic behaviour. However, all other species show characters of apomictic behaviour (good seed-set, irregular pollen, or lack of pollen), and it is probable that all members of the section are polyploid (most probably triploid) apomicts.

Taraxacum fernandezianum is best diagnosed by its leaf shape, which is narrowly oblong-spathulate, with many indistinct short lobes and is consistently dentate from apex to petiole; the leaves are a characteristic grey-green. The exterior bracts are typical for the section, being small, narrow and largely scarious. The achene has the small size and cylindrical cone of the section.

In addition to the type localities on Juan Fernandez, I can add:

REPRESENTATIVE SPECIMENS: **Bermuda:** Agaris, *F. S. Collins* 314 (US); The Castle Harbour Hotel, 12.1969, *S. R. J. Woodell*, as seed (OXF), 2*n* = 24; Flatts, *F. S. Collins* 314 (US). **Haiti:** Don, Citadel top, 400 m, *E. C. Leonard* 8626 (US); Funds Varettes, Mission, *E. C. Leonard* 3634 (US); Mean Rabel, 2.3.1929, *E. C. and G. M. Leonard* (US); Massif de la Pelle, Petionville, M. Tranchard, 1640 m, 2.8. 1924, *E. L. Ekman* (US); Morues des Commissaires, 1600 m, *L. R. Holdridge* 899 (US). **Honduras:** MORAZA'N: Montana La Tigra, San Juancito, 200 m, *A. Molina* 10117 (US). **Dominican Republic:** Constanza, 17.5.1959, *J. J. Jiminez* (US). **Guatemala:** Tabz, 1905, *W. A.*

Kellerman (US). **Costa Rica:** San Jose, San Pedro de Mantes de Oca to Curnidibat, 1200 m, *P. Standley* 32820 (US). **Mexico:** DISTRITO FEDERAL: Deserto de Leon, 2400 m, *E. Matuda* 18803 (US); Monelia, 11.1889, *A. Duges* (US); Querotoro, *G. Arsène* 10535 (US). **Brasil:** CURITIBA: Rua Cel Dulcidio, 820 m, *J. C. Lindemen and J. H. de Haas* 487 (US). SANTA CATARINA: Porto Uniao, Rio Liguaco, 750 m, *L. B. Smith and R. R. Reitz* 8794 (US). **Argentina:** EL CARMEN: prope Salta, 9.10.1901, *R. E. Fries* (US); Neuquem, Quebrada de Tiu-Tiu, *R. Maldorato* 67 (L). **Chile:** Arrayan, 29.3.1967, *J. L. van Soest* (L and OXF), $2n = 24$; Santiago, El Golf, 1.4.1967, *J. L. van Soest* (L). **Peru:** HUANUCO: Carpish Pass, Tingo Maria to Lima, 2750 m, *H. A. Allard* 21012 (US); Oroya, 10,000-13,000′, s.n., no date, *A. S. Kalenborn* (US).

3. **Taraxacum subspathulatum** A. J. Richards, sp. nov. Holotype: Argentina: Tucumán: Villa Vougues, 1000 m, *S. Venturi* 1470 (US).

Planta mediocris. *Folia* olivaceo-viridia, ascendentes 70-130 mm, lobata, spathulata. Lobi laterales 1-3, recurvati, angusti, in margine superiore sat convexi, dentati; lobus terminalis paulo distinctus, obtusus, dentatus. *Petiolus* sordide roseus, exalatus vel, in petiolis brevibus, alatus. *Scapi* breves per anthesin, deinde elongati, crassi, pilosi saepe dense. *Squamae exteriores* recurvatae, 5-6 × 2 mm, obscuro-virides, vel purpurascentes, emarginatae, ecorniculatae. Involucrum crassum, subnigrum. *Capitulum* c. 35 mm diametro, flavum; ligulae stria extus grisea notatae; stylus stigmaque siccum subnigrum, valde polliniferum. Achenium stramineo-brunneum, 2.5 mm, tuberculatum, in pyramidem subconicam 0.5 mm subabrupte abiens. *Rostrum* 7 mm. *Pappus* sordide albus. E. sectione *Mexicana*.

REPRESENTATIVE SPECIMENS: **Argentina:** TUCUMAN: Tafi, Siambou, 1200 m, *S. Venturi* 3936 (US); Chile cito, 1000-1200 m, 4.1960, *L. L. W. van Soest* (L). **Chile:** SANTIAGO: 21.4.1967, *J. L. van Soest* (L); Valparaiso, Gargen Suizo, Las Zonas, *J. W. Harshberger* 1050 (US). **Peru:** Oroya, 10,000-16,000′, *A. S. and H. Kalenborn* 1918 (NY). **Bolivia:** Cercado. Valle de Cochabamba, 2570 m, 5.4.1966, *R. F. Steinbach* (NY); Valle de Cochabamba, 2600 m, 24.11.1928, *J. Steinbach* (NY, K). **Juan Fernandez:** Masatierra, Cumberland Bay, 23. 12. 1954, *C. Skottsberg* (L).

Taraxacum subspathulatum is a distinctive species with dark broad involucres and broad spathulate leaves with recurved leaf-lobes. It can only be confused with *T. unguilobifrons* among the *Mexicana,* from which it is readily distinguished by having spathulate leaves and larger darker involucres. It occurs in a different region from most other *Mexicana* species, being apparently restricted to Central South America, Bolivia and Juan Fernandez. Also, it is not typical for the section Mexicana, being rather robust in floral features for that section.

4. **Taraxacum unguilobifrons** A. J. Richards, sp. nov. Holotype: Jamaica: Farm Hill, *C. R. Orcutt* 3280 (US).

Planta mediocris-subalta. *Folia* olivaceo-viridia, ascendentia usque suberecta, 100-150 mm, angusta, lobata. Lobi laterales (2)-3-(4), breves, recurvati, hamati, in margine superiore valde convexi, dentati; lobus terminalis brevis, hamatus; petiolus angustus exalatus, purpureus. *Scapi* folia excedentes, purpurei, araneoso-pilosi sub involucro. *Squamae* exteriores patentes vel subrecurvatae, submembranaceae, 4 × 1.4 mm, pallide virides, vel rubescentes, emarginatae, ecorniculatae. *Capitulum* 15-20 mm diametro, citrinum; ligulae stria cano-violacea extus notatae; stylus stigmaque obscurum, polliniferum. Achenium ignotum. E sectione *Mexicana.*

REPRESENTATIVE SPECIMENS: **Jamaica:** Cuichona. 4900 ft, *W. Harris* 10926 (US, K).

Taraxacum unguilobifrons has characteristically recurved, "hamate" leaf lobes, recalling the European species *T. unguilobum* Dahlst. The only species which can be confused are *T. argutifrons,* with longer, more acute, less hamate lobes, and *T. craspedotoides,* which has entire leaf-lobes, without teeth. Moreover, both these species have green exterior bracts; those of *T. unguilobifrons* are membranaceous, as is the case in *T. disseminatoides* and *T. fernandezianum. Taraxacum unguilobifrons* is at present known only from two sites in Jamaica.

5. **Taraxacum spathulatum** A. J. Richards, sp. nov. Holotype: Mexico: Oaxaca: Distrito del Centro, Acueducto de Xochimilco, 1570 m, *C. Conzatti* 5259 (US).

Planta mediocris, subtenella. *Folia* prasino-viridia, erecta, 80-150 mm longa, spathulata, integra vel sublobata, obtusa; petiolus exalatus, roseus; nervus medianus albus. *Scapi* folia aequantes, virides vel rosei, araneoso-pilosi sub involucro. *Squamae exteriores* olivaceo-virides, interdum purpurascentes, 5 × 1 mm. patentes vel subrecurvatae, anguste albo-marginatae, ecorniculatae. *Capitulum* 20-25 mm diametro, citrinum; ligulae extus stria cano-violacea notatae; stylus stigmaque obscurum, polliniferum. *Achenium* ignotum. E sectione *Mexicana*.

REPRESENTATIVE SPECIMENS: **Mexico:** DISTRITO FEDERAL: Llanos de capilco, Contreras, 3000 m, 19.6.1966, *R. Cruz* (MEXU); MEXICO: Presa de la Concepcion, Tepetzotlan, 2350 m, 5.3.1968, *L. Hilirio* (MEXU); Cerro Gordo, San Juan Teotihuacan, 2700 m, 24.4.1966, *F. A. Villanuera* (MEXU). VERACRUZ: Cofre de Perote, Las Pescados, 10,700′, 24.5.1938, *E. K. Balls* (K). **Colombia:** PUTUMAYO: Valle de Sibundoy, 3 km south Sibundoy, 2000 m, *M. L. Bristol* 601 (US). **Haiti:** Mission, Fonds Varettes, 1000 m, *E. C. Leonard* 3917 (US). **Costa Rica:** Fiacade volcán de Turrialba, 2000 m, *P. C. Standley* (US).

Taraxacum spathulatum is best known by its soft, dull pale green, obtusely spathulate leaves, which are without clear lobes. The involucre resembles that of *T. argutifrons*. It is apparently restricted to mountains in Central America and Haiti.

6. **Taraxacum argutifrons** A. J. Richards, sp. nov. Holotype: Mexico: Charcas, San Luis Potosi Alvarez, *E. Palmer* 180 (US).

Planta mediocris usque subalta. *Folia* ascendentia, 80-180 mm longa, obscure prasino-viridia, lobata. Lobi laterales 3-5, paulo recurvati, acuti, dentati, interdum subhamati; lobus terminalis acutus, triangularis vel deltoideus, vel etiam tripartitus, saepe apiculatus; petiolus exalatus, rubro-violaceus. *Scapi* pauci, ascendentes, araneoso-pilosi. *Squamae* exteriores patentes, 5 × 1.5 mm, olivaceo-virides,

sensim pallide marginatae, ecorniculatae. *Capitulum* 30 mm diametro, citrinum; ligulae sublongae, extus stria cano-violacea notatae; stylus stigmaque obscurum, epol-liniferum. *Achenium* brunneo-stramineum (vel subcanum), 2.5 mm longum (pyramide exclusa), tuberculatum ad apicem, in pyramidem subconicam 0.5 mm longum sub-abrupte abiens. *Rostrum* tenue, 6 mm. *Pappus* subalbus. E sectione *Mexicana*.

REPRESENTATIVE SPECIMENS: **Mexico:** SAN LUIS POTOSI: *A. F. Whiting* 993 (MICH). COAHUILA: Saltillo, *E. Palmer* 769 (US). DISTRITO FEDERAL: Ajusco, 3000 m, *I. Castorena* 66 (MEXU); La Cima, 3000 m, (MEXU). DURANGO: South on road from El Salto to Pueblo Nuevo, 2500-2650 m, *J. H. Maysilles* 7813 (MICH, US). HIDALGO: Sierra de Pachuca, Real del Monte, 2770 m, *J. H. Beaman* 2757 (US); 6 km north of Pachuca, 2900 m, *N. Garcia* R.60 (MEXU); 4 miles south of Jacala, on road to Zimapan, *C. Feddema* 1525 (MICH). MEXICO: Nicholas Romero, 1 km north-west of Cahuacan, 2600 m, *F. Brizuela* V.349 (MEXU); 20 km north-east of Texcoco, 2850 m, 9.6.1968, *J. Vargas* V (MEXU); Fraccionamiento "La Herradura," muncipio de Huixquilucan, 2350 m, *M. A. Hernandez* G.123 (MEXU); Los Pescados, Cofre de Perote, 10,700′, *E. K. Balls* 4585 (US). OAXACA: 12 km north of Ixtlan de Juarez on road to Valle Nacional, 2500 m, *R. M. King* 2015 (MICH); Popocatapetl, *J. N. Rose and R. Hoy* 6067 (US). PUEBLA: Neaskio otlati, 8700′, *J. Weaver* 960 (US); Sierra Madre Oriental, Nuevo Leon, 165 m, *F. G. Meyer and D. J. Rogers* 3803 (US). TAMAULIPAS: Miquihuana, *L. R. Stanford, L. A. Taylor and S. M. Lauber* 2373 (US); 6 km west of Miquihuana, 2940 m, *Stanford, Retherford and Northcraft* 726 (NY); Temascaltepec, Las Cruces, 2250 m, *G. B. Hinton* 1046 (US, NY). **Colombia:** PUTUMAYO: Valle de Sibundoy, 3 k north of San Pedro, 2600 m, *P. J. Chindoy* 192 (US). **Haiti:** Bombardopolis, 610 m, *E. C. Leonard* 13392 (US).

Taraxacum argutifrons is closely related to *T. calocephaloides*, from which it can be distinguished by the spreading exterior bracts with pale, not white margins, and the darker, smaller achenes with a shorter, less distinct cone. The leaves of the two species are similar, but *Taraxacum argutifrons* can never be said to possess deltoid side lobes, a distinctive feature of *T. calocephaloides*.

It is widespread, and probably common in Mexico; there are single records from Colombia and Haiti.

7. **Taraxacum calocephaloides** A. J. Richards, sp. nov
Holotype: Mexico: Distrito Federal: Del Coyoacan
Pedregal de San Angel, *A. Sharp and C. L. Gilly* 11
(MICH).

Planta mediocris ad grandis. *Folia* erecta, 100-300 mm
longa, prasino-viridia, lobata. Lobi laterales (2)-3-(4)
patentes vel subrecurvati, integri vel dentati, deltoidei
Lobus terminalis brevis, obtusus vel subrotundatus, in
terdum apiculatus. *Petiolus* exalatus viridis vel roseo
purpureus ad basin. *Scapi* folia excedentes, glabri ve
araneoso-pilosi sub involucro. *Squamae exteriores* multae
parvae, recurvatae, 4 × 1.4 mm, olivaceo-virides vel ruf
escentes, albo-marginatae, ecorniculatae. *Capitulum* 25-3
mm diametro, citrinum; ligulae stria brunneo-purpurea
extus notae; stylus stigmaque obscuro-viride, pollin
ferum (interdum parce). *Achenium* stramineum 3.0 mm
longum (pyramide exclusa), apice patenter spinulosum
ceterum rugosum, in pyramidem cylindricam 0.8 mm
abrupte abiens. *Rostrum* 7 mm longum, tenue. *Pappu*
subalbus. E sectione *Mexicana*.

REPRESENTATIVE SPECIMENS: **Mexico:** DISTRITO FEDERAL: Sierra d
Guadalupe, Chiquihuite y Ticoman, *M. Bopp* O. 316 (MEXU); Cu
huacan. 21.5.1913. *F. Salazar* (US); Edo. Texcoco, Ahuehuet
2250 m, *E. Matuda* 25861 (US); Luebla Rancha Losada, 2194 m
J. Nicolas 65 (US). PUEBLA: Arzobispado, 2165 m, *G. Arsène* 197
(US); Santa Rita Ranch, 1500 m, *R. Runyon* 874 (US). VERA CRUZ
Boca del Monte, *E. W. Nelson* 226 (US).

Taraxacum calocephaloides is a tall species with pal
involucres and white-margined exterior bracts. Th
achenes are large for the section, with a long cylindrica
cone, recalling those of *Erythrosperma* or *Erythrocarp*
species, and the leaf-shape strongly resembles that of *T*
calocephalum H. M. em. Dahlst., in the latter section. Th
characteristic involucre bears no resemblance to those o
these taxa however. It is apparently restricted to moder
ate and high altitudes in Mexico.

8. **Taraxacum cuzcense** A. J. Richards, sp. nov. Holotype: Chile: Puenta Alto, near Santiago, 3.10.1919, *E. W. D. and M. M. Holway* (US).

Planta mediocris usque subhumilis. *Folia* erecta (usque ascendentia), 50-100 mm longa, prasino-viridia, anguste subspathulata, lobata. Lobi laterales 2-3, breves, recurvati, anguste triangulares usque subdeltoidei, acuti, in apicem attenuatum abientes; interlobi curvati integri; lobus terminalis subacutus vel obtusus integer; petiolus brevis roseus exalatus. *Scapi* erecti, folia aequantes, araneoso-pilosi. *Squamae exteriores* recurvatae, 5 × 1.5 mm, pallidae pagina superiore, nigrescentes pagina inferiore, emarginatae, ecorniculatae. *Capitulum* 15-20 mm diametro, citrinum; ligulae extus stria cano-violacea notatae; stylus stigmaque obscurum, polliniferum. *Achenium* stramineum, 2.5 mm longum (pyramide excluso), apice erecto-spinulosum, ceterum laeve, in pyramidem conico-cylindricam 0.5 mm subabrupte abiens. *Rostrum* tenue, 5 mm longum. *Pappus* albus. E sectione *Mexicana*.

REPRESENTATIVE SPECIMENS: **Peru:** CUZCO: 3500-3700 m, 3.1925, *F. L. Herrera* (US); 3500-3700 mm, *V. N. Rose* 19038 (US); 11,000 ft, 10.1933, *D. Stafford* (K); AREQUIPA: Pichu Pichu, 13,500 ft, *D. Stafford* 696 (K).

This species is best known by its numerous, small, blackish involucres, and narrow, rose-coloured petioles. It seems to be a species of high altitude in the Andean Chain, from which it is at present only known from two widely separated areas.

9. **Taraxacum craspedotoides** A. J. Richards, sp. nov. Holotype: Venezuela: Huacha, La Venta-Laguna, 3450-3650 m, *Harriet G. Barclay and Pedro Juajibioy* 9862 (US).

Planta mediocris, subtenella. *Folia* olivaceo-viridia, ascendentia, 80-150 mm longa, lobata, anguste lanceolata. Lobi laterales 2-3, breves, recurvati, integri vel paulo

dentati, margine superiore sat convexi; lobus terminalis brevis, subacutus, integer; petiolus longus (ad dimidum longitudinis folii toti), angustus, exalatus, roseus. *Scapi* folia aequantes, araneosi, deinde glabrescentes. *Squamae exteriores* patentes, 5 × 1.5 mm, emarginatae, vel leviter pallide marginatae, ecorniculatae. *Capitulum* ca. 30 mm diametro, flavum; ligulae stria obscuro-cano-purpurea extus notatae; stylus stigmaque sordide viride, parce polliniferum. *Achenium* ignotum. E sectione *Mexicana*.

REPRESENTATIVE SPECIMENS: **Venezuela:** MERIDA: Paramo de la Sal, 3400 m, *A. Jahn* 518 (US); Timotes-Pico del Aquila, 3000 m, *L. Aristeguiela* 2126 (NY); Paramo de Mucuchies, 3000 m, *A. Jahn* 803 (US); Sierra Nevada de Merida, 10,000′, *E. P. de Bellard* 221 (US).

Taraxacum craspedotoides is best known by its narrow leaves with short recurved lobes with convex distal margins. The involucre resembles that of *T. argutifrons*. The plant bears a strong superficial resemblance to *T. craspedotum* Dahlst. (section *Spectabilia* Dahlst.). However, the involucre is quite different, being quite characteristic for the section *Mexicana*. It is known only from high altitude in a restricted area of Venezuela.

10. **Taraxacum disseminatoides** A. J. Richards, sp. nov. Holotype: Mexico: Distrito Federal: Canada de Contreras, *H. Farias* R38 (MEXU).

Planta mediocris, tenella. *Folia* laete viridia, erecta, c 100 m longa, lobata, spathulata. Lobi laterales 2-3, triangulares, dentati, acuti; lobus terminalis deltoideus, obtusus, vel tripartitus et apiculatus; petiolus angustus, exalatus, roseus. *Scapus* singularis vel scapi pauci, araneoso-pilosi, folia excedentes. *Squamae exteriores* erectae, 4 × 1 mm, pallide olivaceo-virides, submembranaceae, pallide marginatae, ecorniculatae. *Capitulum* 15-20 mm diametro, citrinum; ligulae extus stria canopurpurea notatae; stylus stigmaque sordide viride, epolliniferum. *Achenium* brunneo-stramineum, 2.8 mm (pyramide exclusa)

tuberculatum ad apicem, ceterum laeve, in pyramidem cylindrico-conicam 0.5 mm subabrupte abiens. *Rostrum* 5 mm. *Pappus* sordide albus. E sectione *Mexicana*.

REPRESENTATIVE SPECIMENS: **Mexico:** DISTRITO FEDERAL: Tlalpam, Valley of Mexico, 16.8.1902, *C. G. Pringle s.n.* (US).

Taraxacum disseminatoides has leaves of a characteristic pale green. The large dentate, strictly triangular, somewhat distant leaf-lobes are distinctive, and reminiscent of some forms of the *Erythrosperma*-species *T. disseminatum* Hagl. The involucre, with very small, erect, submembranaceous, pale olive bracts, is highly characteristic. The achenes recall those of *T. argutifrons*. It is recorded from two stations in Mexico.

11. **Taraxacum tenejapense** A. J. Richards, sp. nov. Holotype: Mexico: Distrito Federal: Nevada de Toluca, Ojas de Agua, 12,800 ft., 1.4.1938, *E. K. Balls* (K).

Planta mediocris. *Folia* olivaceo-viridia, ascendentia, 80-150 mm, lanceolata, lobata. Lobi laterales 2-4, recurvati, subhamati, margine superiore sat convexi, integri vel 1-dentati (interdum multi-dentati margine inferiore); lobus terminalis subacutus vel rotundatus mucronatus, subhamatus, integer; petiolus nervusque medianus pallide virides, petiolo brevi angusto exalato. *Scapi* folia subaequantes per anthesin, deinde elongati, subtenues glabrescentes vel sparsim pilosi cupreo-virides. Squamae exteriores recurvatae, pallide virides, tenues vel sat membranaceae, 8-10 × 1-2 mm, vix marginatae, ecorniculatae; squamae interiores obscuriores. *Capitulum* 35-40 mm diametro, pallide flavum; ligulae stria obscura colore incerto extus notatae; stylus stigmaque siccum obscurum vel subnigrum polliniferum. *Achenium* stramineo-brunneum vel pallide brunneum, 3.5 mm, tuberculatum et spinulosum ad apicem, in pyramide cylindra 0.7 mm abrupte abiens. *Rostrum* 10-13 mm. *Pappus* sordide albus. E sectione *Mexicana*.

REPRESENTATIVE SPECIMENS: **Mexico:** CHIAPAS: Tenejapa, steep slope with *Quercus* and *Magnolia* in the Paraje Matsab, 8900′,

Alush Shilom Ton 675 (IPN); Tenejapa, slope with *Quercus* and *Liquidambar* at Paraje Shohle, 8200′, *Alush Shilom Ton* 765 (IPN, NY); San Cristobal Las Casas, cornfield, 6900′, *D. Breedlove* 6775 (MICH); Seltepec, Ventana, 2100 m, *E. Matuda* 4544 (NY). MEXICO: Valley of Mexico, *E. Matuda* 2231 (MICH). **Guatemala:** Chimaltenango, Santa Elena, 2400-2700 m, *A. F. Skutch* 104 (MICH). **Costa Rica:** Cartago, Volcán Irazu, 3200 m, *R. J. Taylor* 4434 (NY).

Taraxacum tenejapense has a leaf form between *T. mexicanum* and *T. unguilobifrons* or *T. craspedotoides,* with rather short, scarcely dentate, recurved subhamate leaf-lobes. However, it is readily known from these and all other species in section *Mexicana* by the long achenes and exterior bracts. The form of the achenes, with the rather short, cylindrical cone; the discoloured pappus; and the thin, almost membranous exterior bracts, which contrast palely with the darker interior bracts, are all characteristic of this section.

This seems to be a species of moderate altitude in south Central America.

Section Arctica Dahlst., Acta Fl. Sueciae, **1**:37 (1921) emend. Richards, Bot. J. Linn. Soc. **65**:39 (1972).

This is the only bipolar section of *Taraxacum.* It occurs circumboreally at very high latitudes, and in various mountain systems of the Northern Hemisphere, including the North American Rockies, where *T. rupestre* Greene and *T. scopulorum* A. Gray reach south to Colorado, Idaho and Montana (two little known Californian species, *T. ammophilum* Nels., and *T. californicum* Mz. and Ttn. may also belong to this section). Four species are known from South America, mostly around the southern tip, although *T. andinum* extends to Aconcaqua, Argentina (near Santiago, Chile). There is thus a gap of some 8000 km between the North and South American stations. *T. magellanicum,* which is the most widespread of the species in Tierra del Fuego, is also common in New Zealand and has been recorded from Chatham Island. Two related species (*T. cygnorum* H. M. and *T. aristum* Hagl. and Markl.) are found

in Australia, completing the picture for a remarkably widespread, disjunct, and presumably ancient section (Richards, 1973). The South American species are as follows (all known stations are given) :

12. **Taraxacum magellanicum** Commers. ex C. H. Schultz-Bipont, Flora: p. 122 (1855) ; Dahlstedt H., Ark. Bot., 6(12) : 5 (1907) (fig.).

T. ibari Philippi, Anal. Univ. Chile, 87:324 (1894).

T. melanocarpum H. M., Monogr. Gatt. Taraxacum: 54 (1907).

Type locality: **Chile.** Magellan, Purta Arenas. 1852. *W. Leckler* pl. magellanicae 1103 (S).

ADDITIONAL LOCALITIES ARE: **Argentina:** TIERRA DEL FUEGO: Estancia Harberton, Campo Afuera, 54°48′S, 67°27′W, 450 m, *D. M. Moore* 1390 (K); Campo Rancho Tombo, 54°52′S, 67°16′W, *D. M. Moore* 1367 (K); Estancia Moat, Rio Chico, 54°53′S, 66°53′W, 700 m, *D. M. Moore* 1634 (K); Isla Navarvno, *C. Skottsberg* (US); Orange Harbour, 1919, *Capt. Wilkes* (US); Rio Garde, *T. Mexia* 7929 (K, US); Rioblanco Cordillera de los Bagnales, 5.1879. *H. Ibar* (K) (type of *T. ibari*); Sierra Almanza, Gerro Almanza, 54°50′S, 67°29′W, 900-1100 m, *D. M. Moore* 1419 (K). **St. Cruz:** 12.11.1928, *A. Donat* (K) (as *melanocarpum*); Estancia Las Vegas, Los Vascos, 51°19′S, 70°20′W, *D. M. Moore* 1315 (K); Guar Aiken, road, 25 km south Puerto Oyle, 2.1.1939, *W. J. Ryerdam et al.* (K); Lago Argentina, Brazo Rico, 17.12.1950, *H. Sleumer* (US); Estancia Fitzroy, Rio de las Vueltos, 450 m, *H. Sleumer* 1265 (US). **Chile:** Cordilieres de Neaute, 1855, *P. Germain* (K) (type of *T. melanocarpum*); Magellan, Loredo Bay, 22.1.1888 *L. A. Lee* (US); Gregory Bay, 18.1.1888, *L. A. Lee* (US); 23.11.1886, *W. E. Safford* (US); Puerto Williams, Navarino Islands, 7.1.1959, *E. J. Godley* (K).

Taraxacum magellanicum shares with other South American members of sect. *Arctica* a fusiform achene with scarcely differentiated cone, a short (to 6 mm) rostrum to the achene, a white pappus, short, wide erect exterior bracts, and smooth, rather small leaves. It is distinguished from other members of the group by wide scarious margins to the bracts, and narrow, scarcely lobate leaves. It

is remarkably variable, and may usually be sexual: a chromosome count of $2n = 16$ (diploid) has been recorded by D. M. Moore (pers. comm.).

13. **Taraxacum andinum** Dahlstedt, Ark. Bot., **6**(12):13 (1907) (fig.).

Type locality: **Argentina:** Las Cuevas, Horcon, Aconcagua, 3000-3100 m, *G. O. Malme* 2865 (S).

ADDITIONAL LOCALITIES ARE: **Argentina:** Terra del Chubut, Valle de la Laguna Blanca, 45°52′S, 71°15′W, 15.11.1902, *J. Koslowsky* (K). **St. Cruz:** Estancia Guer Aike, *H. Steumer* 877 (US); Puerto San Julian, 1.12.1927, *M. E. Blake* (K); Rio de las Vueltas, *H. Steumer* 1362 (US); Rio Gallegos, *H. Steumer* 779 (US). **Chile:** Magellan, 78 km north-west of Punta Arenas, *W. J. Eyerdam et al.* 24145 (K).

Taraxacum andinum is characteristically a more dwarf and stockier plant than *T. magellanicum*, with a broader and much more dissected leaf. It also differs in the exterior bracts, which usually exceed 3 mm in width, and have narrow white or rose margins. It is dubiously distinct from *T. gillesii* (see below).

14. **Taraxacum gillesii** W. J. Hooker and G. A. W. Arnott in Hooker, Companion Bot. Mag., **1**:31 (1835).

Type locality: **Chile.** Las Guindas, Andes of Mendoza. *Dr. Gilles* (? date) (K).

ADDITIONAL LOCALITIES ARE: **Argentina:** TIERRA DEL FUEGO: Cabo San Vincente, 23.11.1969, *R. N. P. Goodall* (RU); Estancia moat, Rio Chico, 54°53′S, 66°53′W, 700′, *D. M. Moore* 1634 (RU).

This species is dubiously distinct from *Taraxacum andinum*, but has even shorter, wider and more dissected leaves, scapes shorter than the leaves, and concolorous bracts; it may prove to be an extreme form of *T. andinum*, but at present I am continuing to regard it as a separate species.

15. **Taraxacum rhusiocarpum** Dahlstedt, Ark. Bot., 6(12): 15 (1907) (fig.).

Type locality: **Argentina:** PATAGONIA: Between Kark and Eberhardt, in woods, 31.3.1899, *O. Borge* 354 (S).

This species has never been recollected, but it seems to be distinctive: the narrowly lobed leaves approach some forms of *Taraxacum magellanicum*, but it has rather broad, narrowly margined exterior bracts (similar to *T. andinum*), chestnut or reddish achenes, and lacks pollen. It requires rediscovery.

Section Vulgaria Dahlst., Acta Fl. Suec., 1:37 (1921).

This section is apparently restricted in the native state to Europe; two species in Asia may be introductions which have not yet been found in their native localities. They are common and invasive weeds of open ground, grasslands, etc. and have become adventive in many parts of the world, including North America, South Africa, Australia, New Zealand and South-East Asia. Although they have been recorded in South and Central America under the aggregate species name *Taraxacum officinale* Weber, there exist no records of the individual microspecies (the section is almost entirely agamospermous and contains some 400 agamospecies). The species in this section are frequently very plastic, and in Europe are difficult to identify outside the main flowering season. Perhaps because of different day-lengths, etc., members of this section from the Southern Hemisphere tend to be particularly difficult to identify with certainty, and the majority of identifications listed here are tentative, the material being atypical. Species in sect. *Vulgaria* occurring in neotropical regions will be known by their robust stature and long exterior bracts (exceeding 8 mm). The achenes lack a distinctive cone, the rostrum exceeds 8 mm, and the pappus is white.

16. **Taraxacum bracteatum** Dahlst., Ark. Bot., **19**(18):11 (1925).

Mexico: Erongaricuro, seed collected 30.4.1968, *Lindenbergh.* Cultivated *van Soest* (L).

17. **Taraxacum angustisquameum** Dahlst. ex H. Lindberg f., Medd. Soc. F. Fl. Fenn., 35: 13. (1908).

Chile: Cerra San Christobel, 800 m, 2.4.1967, *J. L. van Soest* (L); El Golf, 1.5.1967, *J. L. van Soest* (L); Santiago, Park by Mapocho River, 6.4.1967, *J. L. van Soest* (L).

18. **Taraxacum copidophyllum** Dahlst., Ark. Bot., **9**(10):25 (1910).

Chile: Santiago, 21.4.1967, *J. L. van Soest* (L).

19. **Taraxacum cordatum** Palmgr., Acta Soc. F. Fl. Fenn., 34(1):12 (1910).

Colombia: CUNDINAMARCA: Macizode Bogota, Quebrada del Rosal, 3000 m, 29.6.1939, *J. Cuatrecasas* (US). **Guatemala:** Quezaltenango, Volcan St. Maria, 3770 m, *J. H. Beaman* 4101 (US).

20. **Taraxacum marklundii** Palmgr., Acta Soc. F. Fl. Fenn., 34(1):20 (1910).

Chile: Santiago, 21.4.1967, *J. L. van Soest* (L).

21. **Taraxacum raunkiaerii** Wiinst., Dansk Ekskurs. Fl., 5th Ed., 303 (1934).

Argentina: TIERRA DEL FUEGO: Varela Peninsula, Estancia Harberton, 2.11.1968, *N. P. Goodall* 1835 (MICH).

22. **Taraxacum vastisectum** Makl., Act. Bot. Fenn., **23**: 120 (1938).

Chile: Santiago, 21.4.1967, *J. L. van Soest* (L).

Section Erythrosperma (H. Lindberg f.) Dahlstedt,

Act. Fl. Suec., **1**:41 (1921)

emend. H. Lindb. f., Acta Bot. Fenn., **17**:8 (1935).

The *Erythrosperma* are small delicate plants, native to dry areas of Europe and western Asia; there are about 130 agamospecies, a number of which have been found adventive in other areas, including North America (van Soest, 1958). They are diagnosed by fruits bearing long (ca. 1 mm) cylindrical cones (similar to sect. *Mexicana*), but which are more usually reddish or purple in hue, and short exterior bracts which are most commonly corniculate (i.e., with an appendage just below the apex).

Erythrosperma species cannot be confused with section *Arctica*, which have smooth, glabrous leaves, and a fusiform achene without a marked cone, and with a short rostrum; nor with section *Vulgaria* which are grosser plants with long exterior bracts and achenes which lack a markedly cylindrical cone. They do, however, resemble some members of section *Mexicana*, although they are less gross and with more dissected leaves, rarely have membranous or scarious exterior bracts, usually have corniculate exterior bracts and reddish achenes, and always have a white pappus.

23. **Taraxacum fulvum** Raunkiaer, Dansk Ekskurs. Fl., 2nd Ed., 258 (1906).

Haiti: Nord, Marmelade, 800 m, *E. C. Leonard* 8354 (US).

24. **Taraxacum plumbeum** Dahlstedt, Ark. Bot., **10**:6 (1911).

Chile: SANTIAGO: El Golf, 1.4.1967, J. L. van Soest (L).

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