

Reevaluation of the species of *Hieracium* sect. *Hieracium* that were described by Hylander from introduced populations in Scandinavian parks

Torbjörn Tyler

Department of Ecology, Plant Ecology and Systematics, Ecology building, Sölvegatan 37, SE-223 62 Lund, Sweden (e-mail: torbjorn.tyler@ekol.lu.se)

Received 2 May 2002, revised version received 15 Aug. 2002, accepted 21 Aug. 2002

Tyler, T. 2004: Reevaluation of the species of *Hieracium* sect. *Hieracium* that were described by Hylander from introduced populations in Scandinavian parks. — *Ann. Bot. Fennici* 41: 103–131.

Hylander treated 144 species of *Hieracium* sect. *Hieracium* found in Scandinavian parks, 132 of which were described for the first time. However, he did not supply any determination key, only a few species were illustrated and hints about the differences between species were few. In addition, the species concept of Hylander was obviously much narrower than what has been agreed upon by those working with native Scandinavian species of this group. The species treated have all been introduced to northern Europe, presumably from southern Germany or France, during the latter half of the 19th century as contamination of commercial grass-seed, but the majority of the species is still not known from any native occurrences. In the present paper, all these “park-*Hieracia*” are described in a standardized manner, and illustrations as well as a determination key to all species are provided. The types are indicated for all species and six taxa are lectotypified. The number of species have been reduced to 95 by merging those species that were found to be identical or unacceptably closely similar. A way of constructing a numerical description taking into consideration 33 different characters is described. The numerical description was used to calculate an overall similarity index for all pairs of species and thereby identify synonymous names. In addition, the numerical description was found to be of great help when constructing the determination key.

Introduction

Hylander (1943) treated 143 introduced species of *Hieracium* sect. *Hieracium* and in a later addendum (Hylander 1949) one more species was described. Of these, 132 species were described anew based on presumably unintentionally introduced material growing in Scandinavian parks. However, subsequently very few Nordic botanists have tried to determine any of these so called “park-*Hieracia*”, and those who

have tried have soon found the task impossible. There is even a rumour that Hylander himself later in life rejected determining any additional material of these species. It is obvious that Hylander applied a much narrower species concept on the park-*Hieracia* than what has generally been agreed upon for the indigenous Scandinavian material. One may further suspect that Hylander, overwhelmed by the unexpected variability of the park-*Hieracia*, rather than leaving a large proportion of the material aside, tended to

make a new species for every collection that he for various reasons was unable to group with any other collection. Thus, the majority of the species described by Hylander are still today known from a single park only. Only a few species are known from some indigenous sites. However, based mainly on the distribution of associated species, Hylander (1943) concluded that most of the park-*Hieracia* originate from southern Germany, possibly excluding a small group of ca. ten species morphologically similar to *H. praecox* Jord. that may originate from eastern France.

Hylander concentrated on park-lawns established during the latter half of the 19th century, which contained particular non-indigenous species (e.g. *Poa chaixii*, *Luzula luzuloides*, *Trisetum flavescens*). There is a large number of such parks, both in Sweden and in other North-European countries including Norway and Russia (T. Berg & A. Sennikov pers. comm.). Hylander (1943) treated 248 localities, and many more sites with this particular floristic composition have been found since then. Apart from the above mentioned graminoids, a very large number of non-indigenous plant taxa have been found in these parks and some of the taxa have become widely naturalised, or do still grow in the same parks, some 150 years after their introduction. Apparently, they were introduced as contaminations in a widely available commercial grass-seed product at that time, but no written documents about this trade have been found (Hylander 1943).

One major aim of Hylander was to try to locate the geographic and temporal origin(s) of the imported grass-seed used in these parks. The only method available to him was to compare the taxonomic composition of the lawns, which altogether contained more than 250 plant taxa, with the distribution of taxa and plant sociology in possible source-areas. Taxa with very restricted natural distributions would then be most useful.

Species of *Hieracium* sect. *Hieracium* are a major, and often even dominating, component of the vegetation in the parks concerned, and since these agamic microspecies are generally known to often have relatively narrow distributions, they were at once identified by Hylander as pos-

sibly very important tools in his work. However, although being an unusually sharp-eyed taxonomist, Hylander had very limited experience of *Hieracium*-taxonomy and, maybe even more fatal for his purpose, he was unable to obtain any herbarium material from abroad during these years of warfare.

Beyond doubt, the task to treat these plants taxonomically was, and still is, a very difficult one. To identify and delimit closely-related species known only from single localities is in many cases impossible without the help of extensive cultivation-experiments and genetic markers. Species of apomictic *Hieracium* (in the sense of all Scandinavian authors) comprise members of a single clone that is morphologically distinct from all other clones by several independent characters. However, all species change in appearance according to their environment. Members of the same clone growing in geographically remote sites may thus appear quite different. As long as no material from intermediate habitats is available, the correct identification of such species may be almost impossible. For indigenous species such intermediate material is nearly always available but this is not the case for a clone that is only known from e.g. a lawn on a dry earth-wall in southern Denmark and the edge of a pond under coniferous trees in northern Sweden. In addition, it appears to me as if the park-*Hieracia* are more taxonomically critical than most indigenous Swedish species. The latter are in most cases clearly different in many characters and, with few exceptions, there are no large groups of morpho-types that differ mutually in single characters only. On the contrary, among the park-*Hieracia* there are several groups in which each species differ from some other in a single character only so that series of morphotypes are formed, in which the "ends" are very well separated but all types are connected to the next one by minor differences only.

The original descriptions by Hylander (1943, 1949) are very clear and thorough, but only a few species are illustrated and in most cases there are no discussions about how to distinguish between the various species, nor are there any determination keys. Thus, to identify any unknown material with any of Hylander's species, the only possibility has been to carefully

read all the 144-page-long Latin descriptions. To my knowledge, no serious attempts have been made by any author on the European continent to identify Hylander's species with any indigenous material. Thus, the original intention and aim of Hylander, to use the *Hieracia* as tools to find the exact origin of the 19th century grass-seed, remains unattained.

Since many of the species concerned have proven to be very successful in their new habitat — there are still many parks with lots of park-*Hieracia* in Sweden and some species have become naturalized in natural woodlands — there is a need to be able to name these species correctly. In addition, the question of the exact origin of the widely used commercial grass-seed that first introduced a considerable number of today naturalized plant taxa to northern Europe remains highly interesting. To facilitate the possibility to solve both these problems in the future, simple and readily comparable descriptions and determination keys in a modern international language are urgently needed.

The aims of this study are (1) to give standardized English descriptions, illustrations and determination keys to all park-*Hieracia* treated by Hylander (1943, 1949), and (2) to synonymize those names that refer to taxa that are identical or too closely similar, thereby approaching a species-concept for the park-*Hieracia* congruent with the species concept used for indigenous Scandinavian species. If successfully achieved, this should facilitate future studies of these plants in Scandinavia and make it possible for a researcher with good knowledge of the central European *Hieracia* to identify their origin and native distribution. Most probably, most species described by Hylander have as well been described under different names (and ranks) in their native range. A future synonymization of Hylander's species with central European taxa is thus likely to necessitate multiple nomenclatural rearrangements.

Methods

I have studied parts of the original material (holotypes and/or isotypes) from the Swedish herbaria LD, S and UPS for almost every species treated

by Hylander (1943, 1949). In a few cases, when no original material could be located, other material from the type locality, or material from other localities identified by the author and cited in the protologue (syntypes or paratypes) were used as the primary source of information. Based on this material, all characters generally given taxonomic importance in this group were described using standardized and clearly defined terms (*see* Appendix 1). In addition, each recognized character-state was coded numerically to produce a handy and mathematically comparable numeric description of each species (*see* Appendix 2).

A numeric description like this is very useful when trying to write determination keys for groups with large numbers of taxa but has not been used in *Hieracium* before. Without such a code, some taxa are very easily “lost” when writing long determination keys, and in particular when taxa are variable for some of the characters used in the key couplets. By handling a numeric description of each taxon in a database, or a spreadsheet in a calculation software, the risk of losing any taxon, or overlooking any taxon-character combination, is much reduced. Numeric descriptions may also be used to automatically generate determination keys with suitable computer software. However, the key presented was prepared manually using the numeric description as a means to keep track of all taxa and characters only. In addition, the numeric description can be used to calculate an index of overall similarity between all pairs of taxa and thereby identify possibly identical taxa even when not all taxa treated are recognized by heart by the researcher. The overall similarity index (OSI) used here (Appendix 2) has previously been applied to indigenous Scandinavian *Hieracium* species (T. Tyler unpubl. data). Among these latter, species accepted by me or by earlier authors nearly always differ by more than ten, and usually by more than 15 OSI units. However, it must be stressed that an index like this must not in any case be used uncritically to dismiss or accept taxa. The value and rank of taxa can only be evaluated by critically comparing characters and ranges of variation, keeping in mind the different importance of the characters and the taxonomic tradition of the group concerned. The OSI can also be used as an

aid to identify unknown material by comparing a numerical description of it with the descriptions of all known species in a database. However, to my experience, such comparisons in most cases do not give the single correct determination, but they may still be very useful in identifying a range of species among which the correct determination is to be found.

Using the numeric description, the OSI difference between all pairs of taxa were calculated using PAUP 4.0b8 (Swofford 2001) and those pairs of taxa that differed by less than 10–15 OSI units were identified. The original descriptions and, whenever available, additional herbarium material were used to carefully evaluate the distinctness of the species in these pairs. Those species that turned out to differ in single characters only, or which were otherwise vaguely defined, were synonymized. The aim was to apply a comparable species concept to the park-*Hieracia* as for the indigenous Swedish species, but for various reasons this was not always possible or suitable. First, for some species the available herbarium material is so scarce or so modified that it is hardly possible to establish its affinities. Second, there are some variable series of morphotypes, in which I consider it impossible to delimit species without knowledge of their full range of variation in their natural distribution area. Third, I have chosen to provisionally accept some species that differ in a single but very conspicuous character only. In those cases I think that no taxonomic changes should be made until the full range of variation of the group in its natural range is known.

Using the OSI index, all park-*Hieracia* were also compared with a large subset of species native in southern Sweden. However, although some park-*Hieracia* are fairly similar to native species, none of the former could be identified with any of the latter.

In this treatment I reduce the number of species of park-*Hieracia* from the 144 accepted by Hylander (1943, 1949) to 95. However, there is still quite a number of species so closely similar that I would not have accepted them as separate species if they had been indigenous to Sweden. However, for reasons discussed above, I have found it reasonable to provisionally accept some

closely similar species awaiting complimentary information from their native distribution. I evaluate that the true number of species amongst the park-*Hieracia* is ca. 75, but this cannot be confirmed as long as the variation of these species in their native range remains unknown.

Typification

Hylander (1943, 1949) did not select holotypes according to modern standards. However, in Hylander (1943: pp. 271–274) there is a list of type localities (“*Typlokalit t*”) for all species treated (including those described by earlier authors). In addition, for almost all new species known from more than one gathering, a holotype is indicated in the protologue as “coll. org., typus in S”. However, there are a few cases where Hylander failed to indicate a holotype; in these cases I designate lectotypes here. When only one gathering was known and is cited in the protologue, Hylander did not explicitly designate any types. However, since all types explicitly indicated by Hylander were deposited in S, I consider it reasonable to accept the material found in S as the holotype when the original material consists of a single gathering. For a few species, I have been unable to locate the holotypes in S, but they may still be there somehow misplaced, and as long as they have not been sought for throughout the herbarium I consider it premature to select any lectotypes. Apart from the holotypes preserved in the *Hieracium* and type collections in S, for most species there are multiple isotypes in at least LD and UPS, as well as in boxes with unsorted material in S and UPS. As far as the species described by earlier authors are concerned, it is debatable whether the designation of “type localities” by Hylander should be accepted as designation of lectotypes. Concerning the species described by Wiinstedt, Schou (2001) has selected lectotypes in agreement with the “Type localities” designated by Hylander. Four species of park-*Hieracia* described by authors before Hylander were lectotyped by Sennikov (2003).

In the descriptions below, if not otherwise stated, all types are holotypes, deposited in S and collected in Sweden.

About the key and descriptions

The key is intended for well-developed collections of well-preserved herbarium specimens. At least 15× magnification is needed to observe some of the structures described. All colours and shapes described refer to dry herbarium material. The leaf-colour is fairly variable in living material and may be a useful character, but is unfortunately barely observable on herbarium specimens. However, the older leaves of some species tend to develop a violet tinge, which is usually best observed on the lower surface but may spread to the upper surface as well. Some of the terminology used is explained in Appendix 1.

Shapes of leaves and their dentation provide many very important characters, some of which are difficult to describe accurately in words. Therefore it is strongly recommended always to compare the descriptions with the illustrations of each species when using the key.

The numeric descriptions are not shown but may be obtained from the author upon request.

Key

1. Phyllaries with ± abundant hairs and leaves densely dark-spotted, commonly deeply cut 2
1. Phyllaries with 0–few hairs or, if phyllaries with abundant hairs, then leaves not spotted 8
2. Style yellowish 3
2. Style darker 5
3. Ligules conspicuously ciliate; leaves with sagittate base *sparsiguttatum*
3. Ligules glabrous; leaves with truncate–cuneate base .. 4
4. Leaves ovate, distinctly widest below middle, with large basal teeth (Fig. 70) *psittacinum*
4. Leaves elliptic–lanceolate, basal teeth not conspicuously enlarged (Fig. 13) *baliophyllum*
5. Ligules ± ciliate; leaves with regularly dimorphous dentation 6
5. Ligules glabrous; leaves with teeth of ± equal and even size 7
6. Cauline leaf with dense stellate hairs beneath .. *ohsenii*
6. Cauline leaf without dense stellate hairs *zygophorum*
7. Anthela dense with strongly arcuate branches and short (< 1.5 cm) accladium *liljeholmii*
7. Anthela loosely paniculate with ± straight branches and long accladium *scotostictum*
8. Phyllaries with ± abundant stellate tomentum forming conspicuous white bands along margins 9
8. Phyllaries without conspicuous white bands of tomentum along margins, stellate hairs either more sparse or ±

- evenly distributed 10
9. Leaves sagittate (–cordate) at base 11
9. Leaves truncate, rounded or ± cuneate at base 26
10. Leaves sagittate (–cordate) at base 62
10. Leaves truncate, rounded or ± cuneate at base 88
11. Style yellowish; ligules glabrous 12
11. Style darker; ligules glabrous or ciliate 13
12. Leaves deeply cut with ± obtuse or coarse teeth (Fig. 44) *koehleri*
12. Leaves with more shallow and acute dentation (Fig. 19) *comitans*
13. Leaves bidentate or with conspicuously dimorphous dentation; cauline leaf with dense stellate hairs beneath 14
13. Leaves ± evenly dentate; cauline leaf without dense stellate hairs 15
14. Phyllaries ± broadly obtuse *densipellitum*
14. Phyllaries subulate *froederstroemii*
15. Petiole with leaf-like appendages (Fig. 9) *appendiculatum*
15. Petiole without leaf-like appendages 16
16. Ligules conspicuously ciliate 17
16. Ligules ± glabrous 20
17. Leaves green, coarsely and obtusely crenate–dentate; phyllaries ± obtuse 18
17. Leaves often tinged with violet, acutely dentate; phyllaries ± acute 19
18. Capitula of medium-size; phyllaries with solitary hairs *decorans*
18. Capitula small (phyllaries < 10 mm); phyllaries without hairs *seriflorum*
19. Leaves lanceolate, dentate with ± dimorphous teeth, never spotted (Fig. 81); style blackish *spodiocladum*
19. Leaves rounded, ± broadly elliptic, dentate or denticulate, often spotted (Fig. 20); style dotted or ± blackish *contaminatum*
20. Leaves finely denticulate (the teeth < 10% of total width of leaf) 21
20. Leaves (at least at base) with larger denticulations ... 22
21. Leaves rounded triangular–ovate; style dotted *bathymallum*
21. Leaves elliptic; style blackish *maurostylum*
22. Leaf-margin with widely spaced teeth (≥ 2 cm apart) *stengnense*
22. Leaves more densely dentate 23
23. Leaves rounded triangular–ovate 24
23. Leaves elliptic 25
24. Anthela with strongly arcuate branches and short accladium *ptilophorum*
24. Anthela with ± straight branches and ± long (> 2 cm) accladium *asteroloma*
25. Leaves with coarse, ± obtuse dentation (Fig. 24); phyllaries with solitary hairs *decorans*
25. Leaves acutely dentate (Fig. 20); phyllaries hairless or very rarely with solitary hairs *contaminatum*
26. Leaves finely denticulate (teeth < 10% of total width of leaf) 27
26. Leaves (at least at base) with larger denticulations ... 44
27. At least the primary capitulum with ± hairs 28

27. Phyllaries of all capitula hairless 29
28. Phyllaries obtuse and densely hairy *hortense*
28. Phyllaries ± acute and with solitary to few hairs only
..... *scotostylum*
29. Cauline leaf with dense stellate hairs beneath 30
29. Cauline leaf ± without stellate hairs on lower surface
(excluding main veins) 32
30. Leaves elliptic, distinctly serrate (Fig. 45) .. *laxilimbatum*
30. Leaves ovate, dentate 31
31. Style ± densely dotted; anthela with very strongly arcuate
branches *diphyllum*
31. Style yellowish–± sparsely dotted; anthela with moderately
arcuate branches *crebriserratum*
32. Ligules glabrous 33
32. Ligules ciliate 38
33. Leaves ± spotted (at least on specimens in exposed habi-
tats); style yellowish or blackish *contaminatum*
33. Leaves never spotted; style dotted–blackish 34
34. Leaves broadly ovate; style blackish *maurostylum*
34. Leaves elliptic–narrowly ovate; style ± dotted–yellow-
ish 35
35. Leaves narrowly ovate, truncate at base *cyrtocladum*
35. Leaves broadly elliptic, rounded–attenuate at base ... 36
36. Phyllaries with rather sparse stellate hairs forming
narrow lines along margins only; style densely dotted ...
..... *limbifloccum*
36. Phyllaries with abundant stellate tomentum forming
broad greyish band along margins; style sparsely dotted–
yellowish 37
37. Cauline leaf with short tapering apex *severiceps*
37. Cauline leaf with ± longly caudate apex *cyrtocladum*
38. Phyllaries ± broadly obtuse 39
38. Phyllaries narrowly acute 40
39. Phyllaries with rather sparse stellate hairs forming
narrow greyish lines along margins only *grandifoliatum*
39. Phyllaries with very abundant stellate hairs distributed ±
all over the surface *wendelianum*
40. Leaves with conspicuously enlarged basal teeth 41
40. Basal teeth not conspicuously enlarged as compared
with other teeth 42
41. Style ± pure yellow; leaves finely denticulate (Fig. 85) .
..... *strictipes*
41. Style dotted; leaves regularly serrate (Fig. 45)
..... *laxilimbatum*
42. Phyllaries with abundant stellate hairs distributed ± all
over the surface; leaves regularly serrate (Fig. 36)
..... *grandiserratum*
42. Phyllaries with rather sparse stellate hairs forming
narrow greyish lines along margins only; leaves dentate
..... 43
43. Phyllaries subulate; anthela with ± straight branches;
leaves truncate at base *spodirolepis*
43. Phyllaries acute but hardly subulate; anthela with arcuate
branches; leaves often subsagittate at base
..... *hypomallum*
44. At least the primary capitulum with solitary hairs 45
44. Phyllaries of all capitula hairless 46
45. Leaves narrowly elliptic–lanceolate; phyllaries subulate
..... *epipsilum*
45. Leaves broadly oblong–ovate; phyllaries narrowly
obtuse *decorans*
46. Cauline leaf with dense stellate hairs on lower surface ..
..... 47
46. Cauline leaf ± without stellate hairs on lower surface. 51
47. Phyllaries broadly obtuse, ligules glabrous
..... *bembicophorum*
47. Phyllaries narrowly obtuse–acute; ligules ± ciliate 48
48. Leaves deeply dentate (largest teeth ca. 4 mm long) ... 49
48. Leaves more finely serrato-dentate (largest teeth ca. 2
mm long) 50
49. Leaves attenuate at base *crispatum*
49. Leaves truncate–rounded at base *monstrosum*
50. Leaves narrowly elliptic; inner ones commonly very nar-
rowly so *torticeps*
50. Leaves ± broadly ovate *crebriserratum*
51. Phyllaries subulate 52
51. Phyllaries not subulate 55
52. Leaves deeply cut (largest teeth > 25% of width of leaf)
..... 53
52. Leaves not cut 54
53. Ligules glabrous; leaves often contorted and irregularly
cut but not bidentate *intercedens*
53. Ligules densely ciliate; leaves regularly bidentate
..... *hastato-ovatum*
54. Style ± sparsely dotted; leaves narrowly elliptic, cuneate
at base *torticeps*
54. Style densely dotted–blackish; leaves broader, rounded
or sagittate at base *contaminatum*
55. Style ± pure yellow 56
55. Style darker 57
56. Phyllaries with broad greyish bands of stellate tomentum
along margins *luzuleti*
56. Phyllaries with only sparse stellate hairs along margins
..... *pachyodon*
57. Ligules ± glabrous 58
57. Ligules conspicuously ciliate 60
58. Style yellowish–sparsely dotted; leaves subsagittate at
base *pitloporum*
58. Style densely dotted–blackish, leaves truncate–cuneate
at base 59
59. Leaves with regularly dimorphous dentation (Fig. 43);
phyllaries ± obtuse *issenii*
59. Leaves with teeth of even size; phyllaries acute–subu-
late *erontocephalum*
60. Leaves serrate with evenly-sized, ± longly acuminate
teeth (Fig. 28) *durum*
60. Leaves dentate–serrato-dentate, teeth hardly acuminate
but often ± dimorphous 61
61. Phyllaries with ± continuous bands of stellate tomentum
along margins; leaves densely (< 1 cm between teeth)
and sharply serrato-dentate almost to apex (Fig. 53)
..... *monstrosum*
61. Phyllaries with sparse stellate hairs along margins;
leaves more sparsely dentate–denticulate, rarely densely
serrato-dentate and then in lower half only (Fig. 60)
..... *pachyodon*
62. Leaves deeply dentate–cut (largest teeth > 15% of width
of leaf), usually with regularly dimorphous teeth 63
62. Leaves more finely dentate 68
63. Petiole with leaf-like appendages; acladium usually long
(> 4 cm) *guttatifrons*
63. Petiole without leaf-like appendages; acladium shorter ...

- 64
64. Ligules ciliate 65
64. Ligules glabrous 67
65. Phyllaries narrowly obtuse; cauline leaf without dense stellate hairs beneath, style \pm blackish *grandidens*
65. Phyllaries subulate; cauline leaf with \pm stellate hairs on lower surface; style \pm dotted 66
66. Phyllaries narrow, longly acuminate with a conspicuous tuft of \pm stellate hairs or cilia at apex *erioneurum*
66. Phyllaries not particularly narrow, gradually tapering to an acute apex, without stellate hairs in apical part *imberbe*
67. Style blackish; phyllaries \pm without stellate hairs; leaves with ≥ 5 large teeth on each side *baroniae*
67. Style \pm dotted, phyllaries with sparse stellate hairs along margins, leaves with 4 major teeth on each side, basal ones very large (Fig. 73) *quadridentatum*
68. Style yellowish; capitula small with phyllaries commonly < 10 mm long 69
68. Style darker; capitula usually larger 71
69. Ligules ciliate; primary capitulum with at least solitary hairs *basilimbatum*
69. Ligules glabrous; all capitula hairless 70
70. Outer leaves usually tinged with violet; cauline leaf with dense stellate hairs beneath *subhorizontale*
70. All leaves green and \pm without stellate hairs on lower surface *otophorum*
71. Phyllaries narrowly subulate 72
71. Phyllaries not subulate 75
72. Leaves coarsely and obtusely dentate (Fig. 63) *platyanthelum*
72. Leaves acutely dentate or finely denticulate 73
73. At least the primary capitulum with \pm sparse hairs; outer leaves tinged with violet below *spaniotrichum*
73. Phyllaries of all capitula hairless; leaves rarely violet.. 74
74. Ligules glabrous; leaves sharply serrato-dentate *psiloloma*
74. Ligules ciliate; leaves finely denticulate *mimeticum*
75. Ligules ciliate 76
75. Ligules glabrous 79
76. Leaves regularly dentate with acute teeth of \pm even size 77
76. Leaves irregularly dentate with mixed smaller and larger, acute and obtuse teeth 78
77. Style \pm densely dotted; phyllaries with long and slender, black glands *hypomallum*
77. Style yellowish–sparsely dotted; phyllaries with medium-sized, brownish–yellowish glands *subhorizontale*
78. Cauline leaf with short tapering point, without stellate hairs on lower surface; anthela loosely paniculate *araeocladum*
78. Cauline leaf caudate at apex, with \pm stellate hairs on lower surface; anthela subumbellate *aterrimum*
79. Cauline leaf with dense stellate hairs on lower surface.. 80
79. Cauline leaf \pm without stellate hairs beneath (excluding main veins) 84
80. Leaves very broadly ovate–suborbicular, with sparse, \pm obtuse teeth (Fig. 92); phyllaries broadly obtuse *xenophyllum*
80. Leaves less broad, acutely dentate; phyllaries with narrow apex 81
81. Phyllaries \pm completely without stellate hairs; leaves sparsely and finely denticulate (Fig. 5) *ageneium*
81. Phyllaries with sparse but conspicuous stellate hairs along margins; leaves \pm densely dentate 82
82. Leaves elliptic, cuneate–subtruncate at base .. *pachyodon*
82. Leaves ovate, subsagittate at base 83
83. Leaves green; cauline leaf often very large, \pm without stellate hairs on lower surface; phyllaries with long and slender, black glands *otophorum*
83. Leaves commonly tinged with violet; cauline leaf generally small, with dense stellate hairs beneath; phyllaries with medium-sized, brownish–yellowish glands *subhorizontale*
84. Leaves usually tinged with violet and commonly \pm spotted, finely dentate with \pm evenly sized teeth (Fig. 20) *contaminatum*
84. Leaves rarely violet and never spotted; commonly with distinctly dimorphous dentation 85
85. Style blackish; anthela loose with \pm straight branches and long (> 2 cm) acladium, leaves coarsely dentate (Fig. 10) *araeocladum*
85. Style yellowish–dotted; anthela \pm densely paniculate with arcuate branches; leaves acutely dentate 86
86. Phyllaries \pm broadly obtuse *tytopogon*
86. Phyllaries \pm acute 87
87. Phyllaries with narrow, obtuse–acute apex and a narrow but conspicuous stripe of stellate hairs along margins; ligules glabrous or inconspicuously ciliate ... *otophorum*
87. Phyllaries broad at apex, obtuse or with short acuminate point, with very few stellate hairs; ligules densely ciliate *hypomallum*
88. At least the primary capitulum with solitary hairs 89
88. Phyllaries of all capitula hairless 97
89. Ligules glabrous 90
89. Ligules ciliate 92
90. Style yellowish; leaves cuneate– \pm rounded at base, without enlarged basal teeth, usually spotted (Fig. 13) .. *baliophyllum*
90. Style \pm dotted; leaves truncate–subhastate at base, with conspicuously enlarged basal teeth, spotted or not 91
91. Cauline leaf with dense stellate hairs on lower surface; leaves usually tinged with violet and spotted *pseudopediaceum*
91. Cauline leaf \pm without stellate hairs; leaves green *ohlsenii*
92. Leaves very densely and irregularly dentate–cut, often \pm contorted, rounded–cuneate (often \pm asymmetrically) at base (Fig. 90) *unguiferum*
92. Leaves regularly dentate–cut, sometimes with regularly dimorphous teeth, commonly truncate–subsagittate at base 93
93. Leaves deeply cut (to $> 20\%$ of width of leaf); style blackish *ohlsenii*
93. Leaves less deeply dentate; style yellowish–dotted ... 94
94. Leaves elliptic, narrowed towards a narrowly truncate–angustate base *yxnerumense*
94. Leaves ovate, truncate–subhastate or sagittate at base ... 95
95. Petioles with many leaf-like appendages; cauline leaf with dense stellate hairs on lower surface; leaves with \pm

- evenly sized teeth *stenocranoides*
95. Petioles without leaf-like appendages (or with single ones close to leaf-base); cauline leaf with 0–sparse stellate hairs; leaves with ± distinctly dimorphous dentation 96
96. Phyllaries subulate; leaves never spotted *spaniotrichum*
96. Phyllaries narrowly obtuse; leaves commonly spotted *sparsiguttatum*
97. Leaves deeply dentate–cut (largest teeth > 15% of width of leaf) 98
97. Leaves more shallowly dentate–denticulate 106
98. Phyllaries subulate; leaves elliptic 99
98. Phyllaries not subulate; leaves elliptic or ovate 102
99. Leaves coarsely and ± obtusely dentate, subsagittate at base (Fig. 63) *platyanthelum*
99. Leaves with acute teeth and rounded–cuneate base .. 100
100. Leaves deeply cut towards base (Fig. 1); phyllaries with very sparse stellate hairs *accrescens*
100. Leaves ± irregularly dentate throughout; phyllaries with conspicuous stellate hairs along margins 101
101. Cauline leaf with dense stellate hairs on lower surface; glands on phyllaries black *aemulans*
101. Cauline leaf without stellate hairs; glands on phyllaries yellowish *grandidentiforme*
102. Leaves ovate, ± sagittate at base; petiole rarely with leaf-like appendages 103
102. Leaves elliptic, rounded–cuneate or rarely subhastate at base; petiole often with leaf-like appendages ... 104
103. Leaves dentate with mostly evenly sized teeth (sometimes with a few very small ones between major ones, Fig. 40) *hypomallum*
103. Leaves deeply dentate–cut with regularly dimorphous dentation (Fig. 33) *grandidens*
104. Phyllaries ± broadly obtuse, with ± sparse but conspicuous stellate hairs along margins *perexpansum*
104. Phyllaries very narrowly obtuse–acute with 0–few stellate hairs 105
105. Leaves narrowly elliptic–oblong, deeply and irregularly cut; petiole with many leaf-like appendages (Fig. 58) *onychodontum*
105. Leaves shortly elliptic–lanceolate, sharply dentate but hardly cut; petiole ± without leaf-like appendages (Fig. 16) *bembicophorum*
106. Ligules ciliate 107
106. Ligules glabrous 124
107. Phyllaries ± without stellate hairs 108
107. Phyllaries with conspicuous stellate hairs 111
108. Phyllaries subulate 109
108. Phyllaries narrowly obtuse 110
109. Leaves ± narrowly lanceolate, truncate at base and with enlarged basal teeth (Fig. 7) *anisolepis*
109. Leaves broadly ovate–suborbicular, rounded or truncate at base, without enlarged basal teeth (Fig. 52) *mimeticum*
110. Cauline leaves commonly 2, with dense stellate hairs on lower surface; anthela loose with long ± straight branches *microcodon*
110. Cauline leaf 0–2, with or without stellate hairs; anthela dense with arcuate branches *pachyodon*
111. Cauline leaf with ± dense stellate hairs on lower surface 112
111. Cauline leaf ± without stellate hairs..... 113
112. Leaves lanceolate, densely but irregularly serrato-dentate (Fig. 66) *pseudopachyodon*
112. Leaves broadly elliptic–suborbicular (Fig. 52) *mimeticum*
113. Phyllaries with sparse stellate hairs confined to margins 114
113. Phyllaries at least towards base with ± abundant and evenly distributed stellate tomentum 120
114. Leaves narrow (> 2.8 times longer than wide), angustate–cuneate at base 115
114. Leaves broader, truncate–rounded at base 117
115. Phyllaries 12 mm long, longly subulate *dolichophyllum*
115. Phyllaries shorter, rarely subulate 116
116. Style yellowish; anthela densely paniculate with arcuate branches and short (< 2 cm) acladium .. *pachyodon*
116. Style dotted; anthela with ± long and straight branches and longer acladium *microcodon*
117. Ligules conspicuously ciliate; phyllaries subulate .. 118
117. Ligules glabrous–subciliate, phyllaries not subulate ... 119
118. Leaves rounded ovate, ± truncate at base, cauline leaf lanceolate with ± tapering point *mimeticum*
118. Leaves broadly elliptic, rounded at base; cauline leaf ovate–broadly elliptic with longly caudate apex *radiiflorum*
119. At least some leaves ± sagittate at base *parallelisquamum*
119. All leaves rounded–cuneate at base *pachyodon*
120. Leaves densely and sharply serrate or finely denticulate; phyllaries ± acute 121
120. Leaves ± deeply dentate; phyllaries ± obtuse 123
121. Leaves broadly elliptic–suborbicular, finely denticulate *obtusius*
121. Leaves narrowly elliptic–lanceolate, serrato-dentate .. 122
122. Leaves sharply but shallowly serrato-dentate (Fig. 36, largest teeth ca. 3 mm or 6% of width of leaf) *grandiserratum*
122. Leaves more deeply serrate with forward-curving teeth (Fig. 65, largest teeth 4–5 mm or ca. 10% of width of leaf) *protractifrons*
123. Style conspicuously dotted; leaves denticulate (largest teeth < 10% of leaf width) *grandifoliatum*
123. Style ± purely yellow; leaves more deeply dentate *wendelianum*
124. Leaves ± narrowly elliptic, cuneate at base; leaves denticulate (largest teeth < 10% of leaf width) 125
124. Leaves truncate– ± rounded at base; leaves commonly more deeply dentate 127
125. Phyllaries 12 mm long, ± broadly obtuse; acladium usually long (> 4 cm) *pulchriceps*
125. Phyllaries shorter; ± acute; acladium shorter 126
126. Style blackish *pachyodon*
126. Style ± sparsely dotted *microcodon*
127. Style blackish 128
127. Style yellowish– ± dotted 131
128. Phyllaries broadly obtuse *aethalodes*

128. Phyllaries ± acute 129
129. Leaves with ± sparse, incurved teeth, sometimes spotted; petiole sometimes with leaf-like appendages
..... *porphyrostictum* 129
129. Leaves densely dentate with ± evenly sized teeth, never spotted; petiole without leaf-like appendages
..... 130
130. Leaves ovate, denticulate (largest teeth < 10% of width of leaf) *anthracostylum*
130. Leaves elliptic, more deeply dentate *pachyodon*
131. Cauline leaf with dense stellate hairs on lower surface 132
131. Cauline leaf ± without stellate hairs 135
132. Leaves with coarse, ± obtuse teeth (Fig. 6)
..... *amblyodontum* 132
132. Leaves with acute teeth 133
133. Leaves very finely denticulate–subentire (Fig. 69)
..... *psilurum* 133
133. Leaves more deeply dentate 134
134. Leaves with low, broadly triangular teeth, basal ones pointing ± backwards (Fig. 5); phyllaries ± without stellate hairs *ageneium*
134. Leaves ± serrato-dentate, basal teeth pointing forwards to outwards (Fig. 60); phyllaries usually with sparse stellate hairs along margins *pachyodon*
135. Style yellowish 136
135. Style darker pigmented 138
136. Phyllaries ± without stellate hairs; leaves broadly elliptic, truncate at base, deeply dentate (Fig. 49)
..... *macrurum* 136
136. Phyllaries with conspicuous stellate hairs along margins 137
137. Leaves densely serrate (Fig. 89) *unguiculatum*
137. Leaves dentate (Fig. 60) *pachyodon*
138. Leaves sparsely and obtusely dentate (Fig. 6)
..... *amblyodontum* 138
138. Leaves ± densely and acutely dentate–serrate 139
139. Phyllaries broadly obtuse; largest teeth well above leaf-base 140
139. Phyllaries narrowly obtuse–acute; leaves with largest teeth close to leaf-base 141
140. Phyllaries 11–12 mm long, with conspicuous, although narrow and interrupted, lines of stellate tomentum along margins *nigrisquameum*
140. Phyllaries 8–9 mm long, with only sparse stellate hairs along margins *pulchriceps*
141. Phyllaries with abundant, ± evenly distributed, stellate tomentum *severiceps*
141. Phyllaries without or with sparse stellate hairs confined to margins 142
142. Leaves denticulate to finely serrato-dentate (largest teeth < 10% of width of leaf) 143
142. Leaves more deeply dentate 145
143. Phyllaries subulate, ± completely without stellate hairs; cauline leaves commonly 2–3 *psiloloma*
143. Phyllaries (apart from innermost ones) not subulate, with sparse but conspicuous stellate hairs along margins; cauline leaf usually single 144
144. Leaves densely but ± finely serrato-dentate (< 1 cm between teeth); phyllaries ± obtuse *nigrisquameum*

144. Leaves ± sparsely denticulate; at least innermost phyllaries ± subulate *psilurum*
145. Leaves ovate; phyllaries subulate *mucroniferum*
145. Leaves elliptic; phyllaries narrowly obtuse–shortly acute 146
146. Leaves irregularly dentate, cuneate–angustate at base, flat (Fig. 3); style densely dotted; ligules glabrous
..... *aequialtum* 146
146. Leaves regularly finely serrate, rounded at base, often undulate–contorted; style ± sparsely dotted; ligules often shortly ciliate 147
147. Leaves rounded–cuneate at base *pachyodon*
147. At least some leaves ± sagittate at base
..... *parallelsquameum* 147

Descriptions

H. accrescens Hyl. (1943)

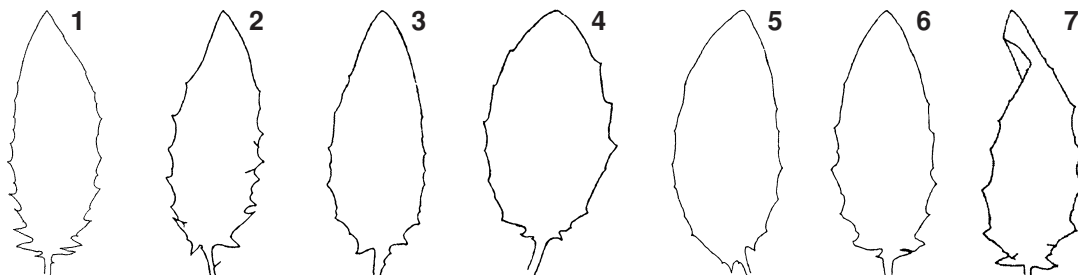
LEAF (Fig. 1): green. CAULINE LEAF: 0–1, estellate. PHYLLARIES: 11–12 mm, subulate. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: very sparse–sparse along margins. PEDUNCLES: dense glands. STYLE: dotted. LIGULES: ciliate. ANTHELA: paniculate with arcuate branches and short acladium. TYPE: Uppl., Djursholm, Villa Mittag-Leffler, G. Samuelsson & N. Hylander 22.VI.1938.

H. aemulans Hyl. (1943)

LEAF (Fig. 2): green or sometimes violet. CAULINE LEAF: 1, with dense stellate hairs. PHYLLARIES: 12 mm, longly acuminate with threadlike subulate apex. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: sparse and conspicuous in basal part only. PEDUNCLES: dense glands. STYLE: dotted. LIGULES: densely and longly ciliate. ANTHELA: densely paniculate with arcuate branches and short acladium. TYPE: Srm, Överselö, Tynnelö G. Samuelsson & N. Hylander 15.VI.1939.

H. aequialtum Hyl. (1943)

LEAF (Fig. 3): green. CAULINE LEAF: 1, lanceolate with ± tapering apex, ± estellate. PHYLLARIES: 10 mm, narrowly obtuse–shortly acute. GLANDS ON PHYLLARIES: very dense, long, brownish-black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: sparse along margins. PEDUNCLES: very dense glands. STYLE: densely dotted. LIGULES: glabrous–subciliate. ANTHELA: densely paniculate with arcuate branches and short acladium. COMMENTS: very similar to *H. amblyodontum* but with significantly longer glands on phyllaries and darker style. TYPE: Gbg, Askim, Villa Anneberg, N. Hylander 1.VII.1941.



H. aethalodes Hyl. (1943)

LEAF (Fig. 4): green. CAULINE LEAF: 1–2, \pm estellate. PHYLLARIES: 9 mm, broad and mostly broadly obtuse, the outer ones short and loose. GLANDS ON PHYLLARIES: very dense, medium sized–long, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: sparse along margins. PEDUNCLES: \pm dense glands. STYLE: densely dotted–blackish. LIGULES: glabrous or shortly ciliate. ANTHELA: densely paniculate with arcuate branches and short acladium. TYPE: Gbg, Mölndal, Lagklarebäck, *N. Hylander* 30.VI.1941.

H. ageneium Hyl. (1943)

LEAF (Fig. 5): green. CAULINE LEAF: 0–1, with dense stellate hairs. PHYLLARIES: 10 mm, with broad but shortly acute apex. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: \pm 0. PEDUNCLES: dense glands. STYLE: dotted. LIGULES: glabrous. ANTHELA: paniculate with arcuate branches and medium-long acladium. TYPE: Vg, Lerum, Jonsereds station, *N. Hylander* VII.1941.

H. amblyodontum Hyl. (1943)

LEAF (Fig. 6): green. CAULINE LEAF: 1–2, with sparse stellate hairs. PHYLLARIES: 10 mm, shortly acute. GLANDS ON PHYLLARIES: very dense, short, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: sparse along margins. PEDUNCLES: dense glands. STYLE: sparsely dotted. LIGULES: glabrous. ANTHELA: paniculate with arcuate branches and short–medium-long acladium. TYPE: Gbg, Råda, Wendelsberg, *N. Hylander* 3.VII.1941.

H. anisolepis Hyl. (1943)

LEAF (Fig. 7): dark green, sometimes violet. CAULINE LEAF: 1, lanceolate, with \pm stellate hairs. PHYLLARIES: 10 mm, at least the inner ones narrowly acuminate with threadlike subulate apex. GLANDS ON PHYLLARIES: very dense, rather short, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: very sparse along margins. PEDUNCLES: dense glands. STYLE:

sparsely dotted. LIGULES: ciliate. ANTHELA: paniculate with arcuate branches and short acladium. TYPE: Vg, Alingsås, Nohaga, *R. Ohlsén* 8.VI.1939.

H. anthracostylum Hyl. (1943)

LEAF (Fig. 8): green. CAULINE LEAF: 1, with sparse stellate hairs. PHYLLARIES: 9 mm, shortly acute. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: very sparse along margins. PEDUNCLES: dense glands. STYLE: blackish. LIGULES: glabrous. ANTHELA: paniculate with arcuate branches and short acladium. TYPE: Bl, Augerum slott, *N. Hylander* 21.VI.1941.

H. appendiculatum Hyl. (1943)

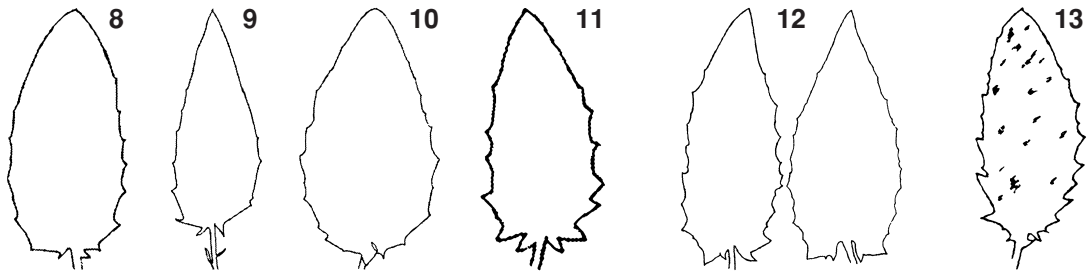
LEAF (Fig. 9): green. CAULINE LEAF: 1–2, often with leaf-like appendages on the petiole, estellate. PHYLLARIES: 9 mm, narrowly obtuse. GLANDS ON PHYLLARIES: very dense, medium sized, yellowish-brown. HAIRS ON PHYLLARIES: 0 (or rarely solitary). STELLATE HAIRS ON PHYLLARIES: rather sparse but conspicuous along margins. PEDUNCLES: dense glands. STYLE: densely dotted. LIGULES: densely and longly ciliate. ANTHELA: paniculate with arcuate branches and short acladium. TYPE: Srm, Saltsjöbaden, Grand Pensionat Barnekow, *N. Hylander* 20.VI.1939.

H. araeocladum Hyl. (1943)

LEAF (Fig. 10): green. CAULINE LEAF: 1, estellate. PHYLLARIES: 9–10 mm, narrowly obtuse. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: very sparse along margins. PEDUNCLES: dense glands. STYLE: densely dotted–blackish. LIGULES: subciliate. ANTHELA: loosely paniculate with long, \pm arcuate branches and long acladium. TYPE: Boh, Marstrand, Koön, Rosenlund, *N. Hylander* 2.VII.1941.

H. asteroloma Hyl. (1943)

LEAF (Fig. 11): dark green, sometimes violet, often plicate.



CAULINE LEAF: 1, estellate. PHYLLARIES: 11 mm, narrowly obtuse. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: rather abundant along margins. PEDUNCLES: dense glands. STYLE: dotted. LIGULES: glabrous. ANTHELA: paniculate with \pm straight branches and medium-long accladium. COMMENTS: This species is very closely similar to *H. bathymallum* and *H. ptilophorum* but differs by the branching-pattern of the inflorescence and relatively sparser stellate hairs on phyllaries. Based on the presently available sparse material of all three species I cannot decide whether they should be treated as separate or not. TYPE: Vg, Alingsås, Nolhaga, R. Ohlsén 16.VI.1936.

H. aterrimum Hyl. (1943)

Syn: *H. abundans* Hyl. (1943)

LEAF (Fig. 12): green or sometimes violet. CAULINE LEAF: 1–2, deeply serrato-dentate, caudate at apex and with \pm dense stellate hairs. PHYLLARIES: 10–11 mm, narrowly obtuse. GLANDS ON PHYLLARIES: extremely dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: \pm 0—sparse along margins and at apex. PEDUNCLES: dense glands. STYLE: dotted. LIGULES: \pm ciliate. ANTHELA: subumbellate—densely paniculate with arcuate branches and medium-long accladium. COMMENTS: *H. abundans* appears to me as absolutely identical with *H. aterrimum*. TYPE: Bl, Karlskrona, Kungsholmen, H. Hylander 9.VI.1939. (*H. abundans*: Srm, Ytterselö Målsåker, G. Samuelsson & N. Hylander 21.VI.1938).

H. baliophyllum Dahlst. ex Hyl. (1943)

Syn: *H. dicranocladum* Hyl. (1943)

LEAF (Fig. 13): green or sparsely spotted, the outer ones usually violet. CAULINE LEAF: 0–1, with sparse stellate hairs. PHYLLARIES: 10 mm, shortly acute. GLANDS ON PHYLLARIES: very dense, medium sized, brownish—black. HAIRS ON PHYLLARIES: few—sparse, with translucent apex. STELLATE HAIRS ON PHYLLARIES: sparse along margins. PEDUNCLES: dense glands. STYLE: yellowish. LIGULES: glabrous. ANTHELA: loosely paniculate with almost straight branches and short—medium-long accladium. TYPE: Srm, Ytterselö, Målsåker, G. Samuelsson & N. Hylander 21.VI.1938. (*H. dicranocladum*: Boh, Ljung, Lyckorna, H. Fries 18.VI.1934).

H. baroniae Hyl. (1943)

LEAF (Fig. 14): dark green, often violet. CAULINE LEAF: 1, \pm estellate. PHYLLARIES: 10 mm, shortly acute. GLANDS ON PHYLLARIES: very dense, long, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: \pm 0. PEDUNCLES: very dense glands. STYLE: blackish. LIGULES: glabrous. ANTHELA: paniculate with arcuate branches and medium-long accladium. TYPE: Ög, Åtvid, Adelsnäs, N. Hylander 29.VI.1942.

H. basilimbatum Hyl. (1943)

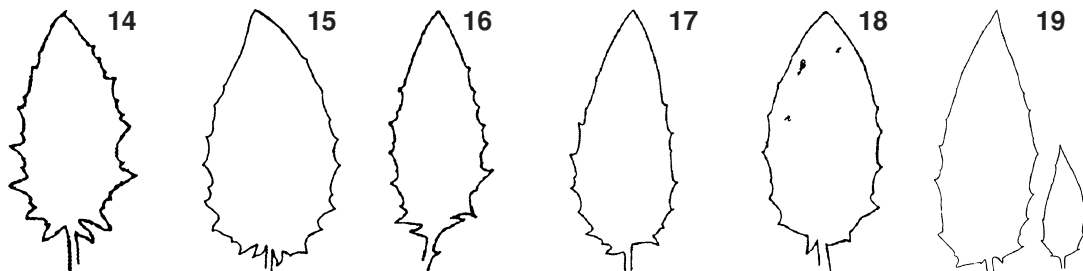
LEAF: green. CAULINE LEAF: 1, narrowly ovate, estellate. PHYLLARIES: 9 mm, narrowly obtuse—shortly acute. GLANDS ON PHYLLARIES: very dense, long, yellowish—brown. HAIRS ON PHYLLARIES: solitary. STELLATE HAIRS ON PHYLLARIES: sparse along margins. PEDUNCLES: dense glands. STYLE: yellowish—sparsely spotted. LIGULES: longly and densely ciliate. ANTHELA: paniculate with arcuate branches and medium-long accladium. TYPE: Vg, Skallsjö, Nääs, R. Ohlsén 13.VI.1939.

H. bathymallum Hyl. (1943)

LEAF (Fig. 15): dark green, sometimes violet. CAULINE LEAF: 1, \pm estellate, ovate with caudate apex. PHYLLARIES: 9–10 mm, narrowly obtuse—shortly acute. GLANDS ON PHYLLARIES: very dense, of medium length but slender, yellowish—brown—blackish. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: very abundant, forming dense and broad lines of tomentum along margins. PEDUNCLES: very dense glands. STYLE: \pm sparsely dotted. LIGULES: glabrous—subciliate. ANTHELA: paniculate with arcuate branches and short—medium-long accladium. COMMENTS: This species is very closely similar to *H. asteroloma* and *H. ptilophorum* but differs by the branching-pattern of the inflorescence and extremely abundant stellate tomentum on phyllaries. Based on the presently available sparse material of all three species I cannot decide whether they should be treated as separate or not. TYPE: Vg, Siene, Vårgårda säteri, R. Ohlsén 23.VI.1940.

H. bembicophorum Hyl. (1943)

Syn: *H. brachycentrum* Hyl. (1943)



LEAF (Fig. 16): green or sometimes violet. CAULINE LEAF: 1–2, with narrow but tapering apex, estellate. PHYLLARIES: 11 mm, shortly acute. GLANDS ON PHYLLARIES: very dense, long, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: \pm 0—sparse along margins. PEDUNCLES: dense glands. STYLE: sparsely dotted. LIGULES: glabrous—shortly ciliate. ANTHELA: paniculate with almost straight branches and medium-long acladium. TYPE: Gbg, Askim, Billdals slott, *N. Hylander* 26.VI.1941. (*H. brachycentrum*: Gbg, Mölndal, Lagklarebäck, *N. Hylander* 1.VII.1938).

H. brachycodon Hyl. (1943)

LEAF (Fig. 17): sometimes violet. CAULINE LEAF: 0. PHYLLARIES: 11–12 mm, \pm subulate. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: rather abundant at apex and along basal margins. PEDUNCLES: dense glands. STYLE: yellowish—sparsely dotted. LIGULES: subciliate. ANTHELA: subumbellate with arcuate branches and medium-long acladium. TYPE: Srm, Överselö, Tynnelsö, *G. Samuelsson* & *N. Hylander* 1662, 15.VI.1939.

H. brachythysanum Hyl. (1943)

LEAF (Fig. 18): often violet and sometimes sparsely spotted. CAULINE LEAF: 1, with \pm dense stellate hairs. PHYLLARIES: 11 mm, \pm broadly obtuse. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: rather abundant along margins. PEDUNCLES: dense glands. STYLE: sparsely dotted. LIGULES: glabrous. ANTHELA: paniculate with arcuate branches and short acladium. TYPE: Sk, Lund, The botanical garden, *N. Hylander* 8.VI.1936.

H. comitans Hyl. (1943)

Syn: *H. microphyllum* Hyl. (1943)

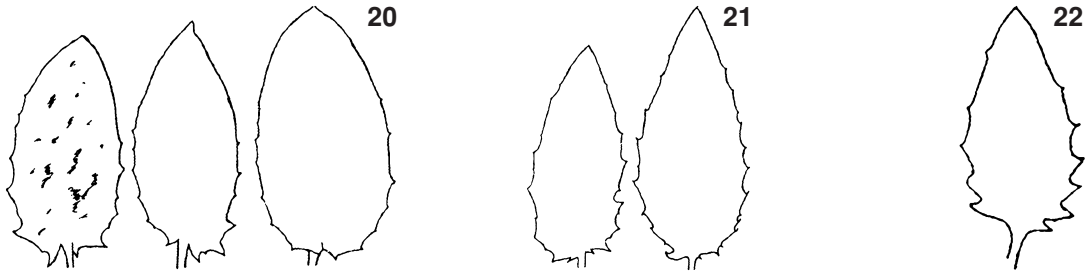
LEAF (Fig. 19): green or sometimes violet. CAULINE LEAF: 1–2, ovate with \pm caudate apex, estellate. PHYLLARIES: 9–11 mm, narrowly obtuse—shortly acute. GLANDS ON PHYLLARIES: very dense, rather long but slender, yellowish—brownish. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: abun-

dant, forming dense tomentum along margins. PEDUNCLES: dense glands. STYLE: pure yellow—sparsely dotted. LIGULES: glabrous. ANTHELA: loosely paniculate with arcuate branches and medium-long to long acladium. COMMENTS: The two species of *Hylander* treated as synonymous here are very closely similar and cannot be separated with certainty based on normally developed specimens. *Hieracium comitans* may also be closely similar to *H. bathymallum* and related species, see comment at the former. TYPE: Srm, Strängnäs, Klostergatan 22, *N. Hylander* 9.VII.1942.

H. contaminatum Wiinst. (1922)

Syn: *H. spaniodontum* Hyl. (1943), *H. variisquameum* Hyl. (1943), *H. ischnocladum* Hyl. (1943), *H. isodontum* Hyl. (1943) & *H. dysharmostum* Hyl. (1943)

LEAF (Fig. 20): green, or more often violet and often densely spotted. CAULINE LEAF: 1, ovate with short cuspidate—caudate apex, estellate. PHYLLARIES: 9–11 mm, narrowly obtuse—shortly acute. GLANDS ON PHYLLARIES: very dense, medium sized—long, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: rather sparse or \pm abundant but always conspicuous along margins. PEDUNCLES: dense glands. STYLE: sparsely dotted—blackish. LIGULES: glabrous or densely ciliate. ANTHELA: paniculate with \pm arcuate branches and short-medium-long acladium. COMMENTS: *Hieracium spaniodontum* differs from *H. contaminatum s. stricto* and sparsely dotted in *H. spaniodontum*) but this is not enough to justify recognition at the species level. *H. variisquameum* is hardly separable from *H. contaminatum* and I cannot see any possibility to separate *H. ischnocladum* from the type of *H. variisquameum*. *H. isodontum* and *H. dysharmostum* differs from *H. contaminatum s. stricto* by having densely ciliate ligules but the leaves and all other characters are very similar. The type material of *H. variisquameum s. stricto* and *H. contaminatum s. stricto* differs from all other species mentioned here by having \pm spotted leaves but in general this character often varies with degree of exposure. TYPE: Denmark, Jylland, Rosenvold hestehave, *K. Wiinstedt* 13.VI.1920 (lectotype in C, Schou 2001). (*H. spaniodontum*: Vg, Alingsås, Nohaga, *R. Ohlsén* 16.VI.1938; *H. variisquameum*: Upl, Uppsala, the Botanic Garden, *N. Hylander* 14.VII.1942; *H. ischnocladum*: Srm, Hölö, Tullgarn, *N. Hylander* 1.VII.1939; *H. isodontum*: Gbg, Mölndal, Lagklarebäck, *N. Hylander* 1.VII.1938; *H. dysharmostum*: Vg, Alingsås, Nohaga, *R. Ohlsén* 13.VI.1938).



H. crebriserratum Hyl. (1943)

Syn: *H. plumosolimbatum* Hyl. (1943)

LEAF (Fig. 21): green, sometimes violet. CAULINE LEAF: 1, lanceolate with tapering apex and dense stellate hairs. PHYLLARIES: 10 mm, narrowly obtuse. GLANDS ON PHYLLARIES: very dense, medium sized, brownish. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: rather abundant along margins. PEDUNCLES: dense glands. STYLE: yellowish–sparsely dotted. LIGULES: ± ciliate. ANTHELA: densely paniculate with moderately arcuate branches and short–medium-long acladium. COMMENTS: Although maybe not absolutely identical, *H. plumosolimbatum* is very similar to the as seed-alien widely distributed *H. crebriserratum* and I cannot see any reason to treat them as separate species. This species has managed to spread and become established also outside the parks in a few places in Sweden. TYPE: Upl, Lidingö, Kappsta, *N. Hylander* 19.VI.1939. (*H. plumosolimbatum*: Upl, Lidingö, Hustegaholm, *F. Sundstedt* 17.VI.1939).

H. crispatum Hyl. (1943)

LEAF (Fig. 22): green, sometimes sparsely spotted. CAULINE LEAF: 0–1, with dense stellate hairs. PHYLLARIES: 10 mm, shortly pointed. GLANDS ON PHYLLARIES: very dense, medium sized, yellowish-brown. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: rather abundant along margins and towards the base. PEDUNCLES: dense glands. STYLE: sparsely dotted. LIGULES: subciliate. ANTHELA: paniculate with arcuate branches and short acladium. TYPE: Srm, Ytterselö, Mälsåker, *G. Samuelsson & N. Hylander* 932, 21.VI.1938.

H. cyrtocladum Hyl. (1943)

Syn: *H. accumulatum* Hyl. (1943), *H. pogonolepis* Hyl. (1943), *H. densilimbatum* Hyl. (1943), *H. ischnolepis* Hyl. (1943), *H. anthracecephalum* Hyl. (1943) & *H. dasycodon* Hyl. (1943)

LEAF (Fig. 23): green. CAULINE LEAF: 1–2, ovate–lanceolate with caudate apex, estellate. PHYLLARIES: 8–10 mm, shortly acute–subulate. GLANDS ON PHYLLARIES: very dense, medium-sized–long, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: abundant along margins and towards the base, sometimes distributed ± all over the outer surface

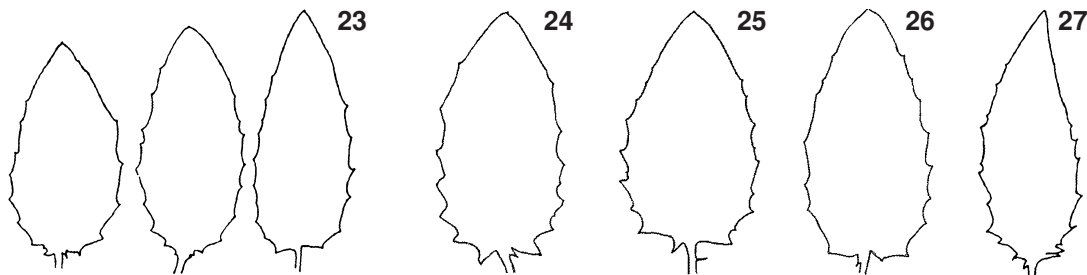
but usually forming dense tomentum along margins only. PEDUNCLES: dense glands. STYLE: dotted. LIGULES: glabrous–subciliate. ANTHELA: paniculate with ± arcuate branches and commonly very short acladium. COMMENTS: As pointed out by the author in the protologue, the original material of *H. accumulatum* is not ideally developed but clearly belongs to a group of species containing a. o. *H. cyrtocladum*. Contrary to Hylander, I do not think that the peculiarities of *H. accumulatum* justify specific recognition. *Hieracium pogonolepis* is also very similar and hardly distinguishable. The four last synonyms refer to taxa that differ in minor characters only (as in part also pointed out by their author) and they are all very similar to *H. cyrtocladum* s. stricto. TYPE: Sm, Åby, Björnö, *H.G. Bruun* 23.VI.1938. (*H. accumulatum*: Upl, Lidingö, Kappsta, *N. Hylander* 20.VI.1938; *H. pogonolepis*: Ög, Åtvid, Adelsnäs, *N. Hylander* 19.VI.1942; *H. densilimbatum*: Gbg, Partille, Bokedalen, *R. Ohlsén* 19.VI.1939; *H. ischnolepis*: Srm, Ytterselö, Mälsåker, *G. Samuelsson & N. Hylander* 930, 21.VI.1938; *H. anthracecephalum*: Gbg, Partille, Bokedalen, *R. Ohlsén* 19.VI.1939; *H. dasycodon*: Upl, Uppsala, the Botanic Garden, *N. Hylander* 7.VII.1942).

H. decorans Hyl. (1943)

LEAF (Fig. 24): green. CAULINE LEAF: 1, ovate, shortly acuminate, estellate. PHYLLARIES: 11 mm, narrowly obtuse. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: sparse–numerous, with long translucent apices. STELLATE HAIRS ON PHYLLARIES: rather abundant along margins. PEDUNCLES: dense glands and few hairs. STYLE: sparsely dotted. LIGULES: subciliate. ANTHELA: paniculate with arcuate branches and medium-long acladium. TYPE: Upl, Lidingö, Hustegaholm, *N. Hylander* 17.VI.1939.

H. densipellitum Hyl. (1943)

LEAF (Fig. 25): green. CAULINE LEAF: 1, with dense stellate hairs. PHYLLARIES: 11 mm, broad, ± broadly obtuse. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: very abundant all over the outer surface, although most dense along margins. PEDUNCLES: ± sparse glands. STYLE: densely dotted. LIGULES: shortly and sparsely ciliate. ANTHELA: paniculate with strongly arcuate branches and short acladium. TYPE: Sk, Helsingborg, Sofiero, *N. Hylander* 23.VI.1941.



H. diphyllum Hyl. (1943)

LEAF (Fig. 26): green or sometimes violet. CAULINE LEAF: 1–2, with dense stellate hairs. PHYLLARIES: 9–10 mm, shortly acute–subulate. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: rather sparse at apex and along margins. PEDUNCLES: dense glands. STYLE: ± densely dotted. LIGULES: densely and longly ciliate. ANTHELA: paniculate with extremely arcuate branches and medium-long acladium. COMMENTS: In most characters very close to *H. crebriserratum* but differs from that species by darker style and, in particular, by the strikingly arcuate peduncles. However, the material determined as *H. diphyllum* by its author appears to be heterogeneous and may well represent more than one taxon. TYPE: Upl, Lid- ingö, Villa Solbacken, *N. Hylander* 21.VI.1938.

H. dolichophyllum Hyl. (1943)

LEAF (Fig. 27): yellowish green. CAULINE LEAF: 1, narrowly ovate, estellate. PHYLLARIES: 12 mm, narrowly subulate. GLANDS ON PHYLLARIES: very dense, medium sized, brownish. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: sparse along margins. PEDUNCLES: dense glands. STYLE: densely dotted. LIGULES: shortly ciliate. ANTHELA: paniculate with arcuate branches and ± short acladium. TYPE: Upl, Tegels- mora, ad templum, *G. Samuelsson* 18.VI.1934.

H. durum Hyl. (1943)

Syn: *H. tolypophorum* Hyl. (1943)

LEAF (Fig. 28): green. CAULINE LEAF: 0–1, estellate. PHYLLARIES: 10–11 mm, shortly acute. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: rather abundant along margins. PEDUNCLES: dense glands. STYLE: dotted. LIGULES: shortly ciliate. ANTHELA: paniculate with arcuate branches and medium-long acladium. COMMENTS: As far as I understand, *H. tolypophorum* is completely identical to *H. durum*. TYPE: Vg, Lerum, Jonsereds station, *N. Hylander* 4.VII.1941 (*H. tolypophorum*: Gbg, Råda, Wendelsberg, *N. Hylander* 3.VII.1941).

H. epipsilum Hyl. (1943)

LEAF (Fig. 29): green. CAULINE LEAF: 1, lanceolate, longly acuminate, estellate. PHYLLARIES: 10 mm, subulate. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: few, blackish almost throughout. STELLATE HAIRS ON PHYLLARIES: rather abundant along margins. PEDUNCLES: ± dense glands. STYLE: pure yellow. LIGULES: glabrous. ANTHELA: paniculate with arcuate branches and medium-long acladium. TYPE: Upl, Uppsala, the Botanic Garden, *N. Hylander* 12.VI.1939.

H. erioneurum Hyl. (1943)

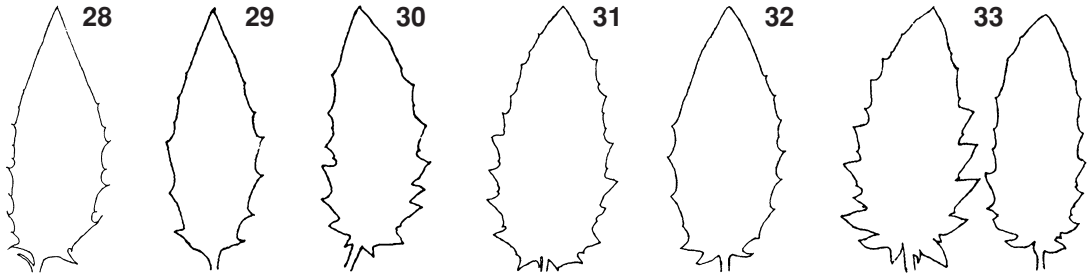
LEAF (Fig. 30): sometimes violet. CAULINE LEAF: 1, with sparse stellate hairs. PHYLLARIES: 11 mm, narrowly acuminate, with subulate apex. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: sparse at apex and along margins. PEDUNCLES: dense glands. STYLE: dotted. LIGULES: ciliate. ANTHELA: densely paniculate with arcuate branches and short acladium. TYPE: Upl, Lidingö, Kappsta, *N. Hylander* 19.VI.1939.

H. froederstroemii Hyl. (1943)

LEAF (Fig. 31): sometimes violet. CAULINE LEAF: 1, with dense stellate hairs. PHYLLARIES: 10 mm, ± subulate. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: rather abundant along margins. PEDUNCLES: dense glands. STYLE: blackish. LIGULES: glabrous. ANTHELA: paniculate with arcuate branches and short acladium. TYPE: Sk, Helsingborg, Sofiero, *H. Fröderstöm* & *N. Hylander* 23.VI.1941.

H. gerontocephalum Hyl. (1943)

LEAF (Fig. 32): green. CAULINE LEAF: usually 0, or 1 and then broadly ovate with shortly caudate apex, estellate. PHYLLARIES: 9–11 mm, shortly acute–subulate. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0



(rarely solitary). STELLATE HAIRS ON PHYLLARIES: rather sparse along margins. PEDUNCLES: dense glands. STYLE: densely dotted—blackish. LIGULES: glabrous. ANTHELA: loosely paniculate with arcuate branches and medium-long accladium. TYPE: Gbg, Partille, Villa Skogsly, *N. Hylander* 25.VI.1941.

H. grandidens Dahlst. (1893)

Syn: *H. chrysomaureum* Hyl. (1943)

LEAF (Fig. 33): dark green. CAULINE LEAF: 1–2, ± estellate. PHYLLARIES: 10–12 mm, narrowly obtuse. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: sparse but conspicuous along margins. PEDUNCLES: dense glands. STYLE: blackish. LIGULES: ± conspicuously ciliate. ANTHELA: paniculate with strongly arcuate branches and medium-long accladium. COMMENTS: As far as I understand, *H. chrysomaureum* is only a modification of *H. grandidens*. This species is the most common and widespread of all park-*Hieracia* and it has in many places spread far beyond the original parks. It appears to have an unusual ability to become established in sunny sites as well as in ephemeral rural habitats. TYPE: Ög, Trädgårdsföreningen ad Linköping in pratis graminosis, 20 VI. 1886, *H. Dahlstedt* in S (lectotype designated by Senikov 2003). (*H. chrysomaureum*: Ög, Ö. Eneby, Marieborg, *N. Hylander* 26.VI.1942).

H. grandidentiforme Hyl. (1943)

LEAF (Fig. 34): often violet. CAULINE LEAF: 1, estellate. PHYLLARIES: 9–10 mm, subulate. GLANDS ON PHYLLARIES: very dense, mixed long and short, yellowish. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: rather sparse along margins. PEDUNCLES: dense glands. STYLE: dotted. LIGULES: ciliate. ANTHELA: paniculate with ± arcuate branches and short accladium. TYPE: Hls, Söderala, Älvvik, *T. Folin* VII.1937.

H. grandifolium Dahlst. (1922)

LEAF (Fig. 35): green. CAULINE LEAF: (1)–2, estellate. PHYLLARIES: 9 mm, ± broadly obtuse. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0.

STELLATE HAIRS ON PHYLLARIES: rather sparse along margins. PEDUNCLES: very dense glands. STYLE: dotted. LIGULES: sub-ciliate. ANTHELA: paniculate with ± straight branches and medium-long accladium. TYPE: not designated, but ought to be lectotypified with material from Srm, Strängnäs, Klostergatan 22 (“Marströms garden”).

H. grandiserratum Hyl. (1943)

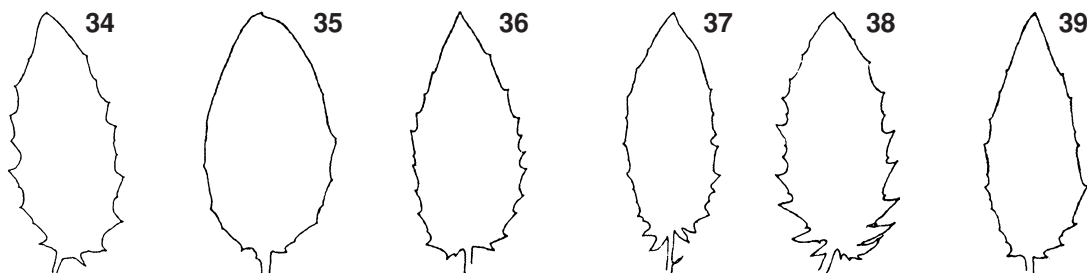
LEAF (Fig. 36): green. CAULINE LEAF: 0–1, broadly ovate with narrowly caudate apex, estellate. PHYLLARIES: 10 mm, shortly acute. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: abundant ± all over outer surface although forming dense tomentum only along margins. PEDUNCLES: dense glands. STYLE: dotted. LIGULES: densely and longly ciliate. ANTHELA: paniculate with arcuate branches and short accladium. TYPE: Srm, Yttersele, Mälsäker, *G. Samuelsson & N. Hylander* 929, 21.VI.1938.

H. guttatifrons Hyl. (1943)

LEAF (Fig. 37) sometimes violet. CAULINE LEAF: (1)–2, estellate. PHYLLARIES: 11–12 mm, shortly acute. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: sparse at apex and along margins. PEDUNCLES: dense glands. STYLE: ± densely dotted. LIGULES: densely ciliate. ANTHELA: paniculate with arcuate branches and medium-long–long accladium. TYPE: Srm, Överselö, Tynnelsö, *G. Samuelsson & N. Hylander* 1659, 15.VI.1939.

H. hastato-ovatum Hyl. (1943)

LEAF (Fig. 38): often violet. CAULINE LEAF: 1, estellate. PHYLLARIES: 11 mm, ± subulate. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: abundant along margins, forming dense tomentum. PEDUNCLES: dense glands. STYLE: ± densely dotted. LIGULES: ciliate. ANTHELA: paniculate with arcuate branches and short accladium. TYPE: Upl, Lidingö, Hustegaholm, *N. Hylander* 17.VI.1939.



H. hortense Hyl. (1943)

LEAF (Fig. 39): green. CAULINE LEAF: 0–1, estellate. PHYLLARIES: 9–10 mm, narrowly obtuse. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: abundant–dense, with translucent apices. STELLATE HAIRS ON PHYLLARIES: rather sparse along margins. PEDUNCLES: dense glands. STYLE: sparsely dotted. LIGULES: subglabrous. ANTHELA: paniculate with arcuate branches and medium-long acladium. TYPE: Gbg, Göteborg, Övra Fogelbergsgatan 3, N. Hylander 21.VI.1938.

H. hypomallum Hyl. (1943)

Syn: *H. porrectidens* Hyl. (1943).

LEAF (Fig. 40): green or sometimes violet. CAULINE LEAF: 0–1, ovate with \pm tapering point, estellate or with sparse stellate hairs. PHYLLARIES: 9–11 mm, with broad, shortly acute–apiculate apex. GLANDS ON PHYLLARIES: very dense, long but slender, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: sparse at apex and along margins. PEDUNCLES: dense glands. STYLE: \pm densely dotted. LIGULES: shortly but densely ciliate. ANTHELA: paniculate with arcuate branches and short acladium. COMMENTS: The two species of Hylander treated as synonymous here differ by minor characters only and they do belong to a very critical group involving many species (e.g. *H. pachyodon* & *H. otophorum*) that differ by few characters only and the limits of which are very difficult to determine. TYPE: Vg, Skallsjö, Nääs, R. Ohlsén 13.VI.1939. (*H. porrectidens*: Vg, Skallsjö, Oskarshöjd, N. Hylander 6.VII.1938).

H. imberbe Hyl. (1943)

LEAF (Fig. 41): green. CAULINE LEAF: 0–1, with dense stellate hairs. PHYLLARIES: 10 mm, \pm subulate. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: \pm 0. PEDUNCLES: dense glands. STYLE: densely dotted. LIGULES: shortly ciliate. ANTHELA: paniculate with arcuate branches and short acladium. TYPE: Bl, Karlskrona, Villa Vik, H. Hylander 19.VI.1939.

H. intercedens Hyl. (1943)

LEAF (Fig. 42): sometimes violet. CAULINE LEAF: 1, estellate. PHYLLARIES: 10 mm, narrow with shortly acute–subulate apex. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: rather abundant along margins. PEDUNCLES: dense glands. STYLE: dotted. LIGULES: \pm glabrous. ANTHELA: densely paniculate with arcuate branches and short acladium. TYPE: Srm, Överselö, Tynnelsö, G. Samuelsson & N. Hylander 15.VI.1939.

H. issenii Hyl. (1943)

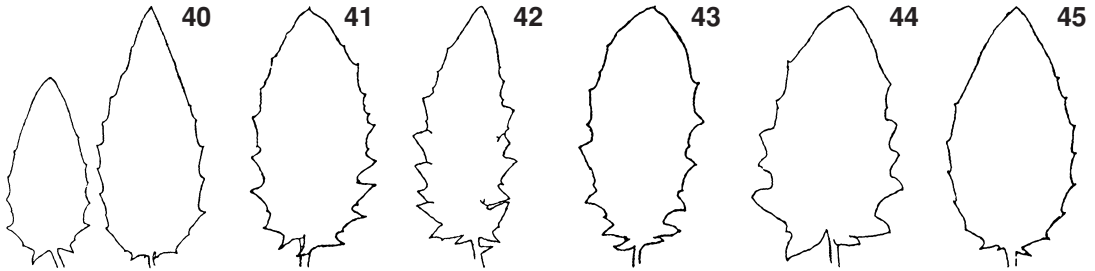
LEAF (Fig. 43): green. CAULINE LEAF: 1–2, \pm estellate. PHYLLARIES: 9 mm, obtuse. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: rather abundant along margins. PEDUNCLES: dense glands. STYLE: densely dotted–blackish. LIGULES: glabrous. ANTHELA: paniculate with \pm straight branches and medium-long acladium. TYPE: not clearly designated by Hylander; lectotype designated here: Ög, Lilla Skärby, P. A. Issén 25.VI.1904, det. N. Hylander, in S.

H. koehlerii Dahlst. (1921)

LEAF (Fig. 44): sometimes violet. CAULINE LEAF: 1–2, with \pm stellate hairs. PHYLLARIES: 10–11 mm, shortly acute. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: rather sparse along margins. PEDUNCLES: dense glands. STYLE: yellowish. LIGULES: glabrous or subciliate. ANTHELA: densely paniculate with arcuate branches and short acladium. TYPE: (If Hylander’s (1943) designation of “Typcollecte” is accepted as a designation of lectotype, or as designated by Sennikov 2003) Srm, Strängnäs, in horto, E. Köhler 23.VI.1897 (distributed by Dahlsted in *Herbarium Hieraciorum Scandinavicae* XII: 20).

H. laxilimbatum Hyl. (1943)

LEAF (Fig. 45): sometimes violet. CAULINE LEAF: 0–1, with



sparse stellate hairs. PHYLLARIES: 10 mm, narrow with shortly acute–subulate apex. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: rather abundant along margins. PEDUNCLES: dense glands. STYLE: dotted. LIGULES: longly and densely ciliate. ANTHELA: paniculate with arcuate branches and short acladium. TYPE: Srm, Yttersejö, Målsåker, G. Samuelsson & N. Hylander 925, 21.VI.1938.

H. liljeholmii Dahlst. (1921)

LEAF (Fig. 46): always densely spotted, sometimes violet, sometimes with leaf-like appendages on the petiole. CAULINE LEAF: 1, with sparse stellate hairs. PHYLLARIES: 12–13 mm, longly subulate. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: dense, with short translucent apex. STELLATE HAIRS ON PHYLLARIES: sparse at apex only. PEDUNCLES: dense glands and \pm abundant hairs. STYLE: dotted. LIGULES: glabrous. ANTHELA: densely paniculate with arcuate branches and short acladium. TYPE: not designated, ought to be lectotypified with material collected by A.F. Liljeholm in Gbg, Göteborg, Slottskogen.

H. limbifloccum Hyl. (1943)

LEAF (Fig. 47): green. CAULINE LEAF: 0–1. PHYLLARIES: 11 mm, shortly acute. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: rather sparse at apex and along margins. PEDUNCLES: dense glands. STYLE: sparsely dotted. LIGULES: glabrous. ANTHELA: paniculate with arcuate branches and medium-long acladium. TYPE: Gbg, Askim, Villa Anneberg, N. Hylander 1.VII.1941.

H. luzuleti Hyl. (1943)

Syn: *H. microphylloides* Hyl. (1949)

LEAF (Fig. 48): green. CAULINE LEAF: 1, estellate or with \pm stellate hairs. PHYLLARIES: 10 mm, shortly acute–subulate. GLANDS ON PHYLLARIES: very dense, medium sized, brownish.

HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: abundant along margins, forming dense tomentum. PEDUNCLES: \pm dense glands. STYLE: pure yellow–yellowish. LIGULES: subciliate. ANTHELA: paniculate with arcuate branches and medium-long acladium. COMMENTS: *Hieracium microphylloides* differs only in minor details from *H. luzuleti* and I cannot justify their recognition as different species. TYPE: Gbg, Rödbo, Ellesbo, N. Hylander 7.VII.1941 (*H. microphylloides*: Gbg, Arendal, N. Hylander 1946).

H. macrurum Hyl. (1943)

LEAF (Fig. 49): green. CAULINE LEAF: 1, estellate. PHYLLARIES: 10 mm, narrowly obtuse. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: \pm 0. PEDUNCLES: dense glands. STYLE: yellowish. LIGULES: glabrous. ANTHELA: paniculate with arcuate branches and short acladium. TYPE: not clearly designated by Hylander; lectotype designated here: Gtl, Västerhejde, Vibble på strandvall, E. Fries 23.VI.1914, in S.

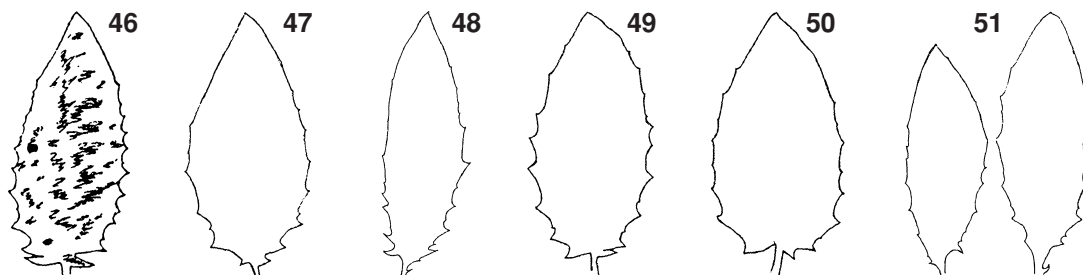
H. maurostylum Hyl. (1943)

LEAF (Fig. 50): green. CAULINE LEAF: 1, estellate. PHYLLARIES: 9 mm, narrowly obtuse–shortly acute. GLANDS ON PHYLLARIES: very dense, short and weak, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: rather sparse along margins. PEDUNCLES: dense glands. STYLE: black. LIGULES: glabrous. ANTHELA: paniculate with arcuate branches and \pm short acladium. TYPE: Gbg, Askim, Billdals slott, N. Hylander 26.VI.1941.

H. microcodon Hyl. (1943)

Syn: *H. isohypses* Hyl. (1943) & *H. elimbatum* Hyl. (1943).

LEAF (Fig. 51): green. CAULINE LEAF: 0–2, estellate or with dense stellate hairs. PHYLLARIES: 9–10 mm, narrowly obtuse–shortly acute. GLANDS ON PHYLLARIES: very dense, medium sized–long, brownish–black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: \pm 0 or sparse along



margins. PEDUNCLES: \pm dense glands. STYLE: \pm sparsely dotted. LIGULES: glabrous or ciliate. ANTHELA: paniculate with \pm straight branches and medium-long acladium. COMMENTS: The type material of *H. isohypsus* consists of poorly developed and conserved specimens making it difficult to ascertain the affinities of this species. However, there appear to be no good characters separating *H. isohypsus* from *H. microcodon*. *H. elimbatum* differs in minor characters only and does not deserve specific recognition. TYPE: Vg, Skallsjö, Oskarshöjd, N. Hylander 7.VII.1941 (*H. isohypsus*: Stockholm, Södermalm, Tanto, N. Hylander 30.VI.1935; *H. elimbatum*: Vg, Gärdhem, NW of Velanda slott, H.E. Johansson 15.VI.1930).

H. mimeticum Hyl. (1943)

Syn: *H. jugiferum* Hyl. (1943) & *H. polypodium* Hyl. (1943)

LEAF (Fig. 52): green or sometimes violet. CAULINE LEAF: 1, ovate-lanceolate with long and narrow \pm gradually tapering apex, estellate or with \pm dense stellate hairs. PHYLLARIES: 10–12 mm, shortly acute–subulate. GLANDS ON PHYLLARIES: very dense, long, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: very sparse along margins. PEDUNCLES: dense glands. STYLE: dotted. LIGULES: ciliate. ANTHELA: paniculate with arcuate branches and short–medium-long acladium. COMMENTS: The three species of Hylander treated as synonymous here differ by minor characters only but they do all belong to a very critical group involving many species that differ by few characters only and the limits of which are very difficult to determine. Contrary to the statement in the protologue, the type of *H. jugiferum* could not be located in S, and when asked for in other Swedish herbaria, only very limited, unmounted material of this species from its only known locality were located (in Hylanders posthumous and unsorted herbarium in UPS). However, the only difference between this material of *H. jugiferum* and the type of *H. mimeticum* appears to be the presence of dense stellate hairs on the lower side of the cauline leaf on the former and in my opinion this does not justify recognition of two species. TYPE: Vg, Skallsjö, Nääs, R. Ohlsén 13.VI.1939 (*H. jugiferum*: Hls, Söderala, Borgvik, T. Folin VII.1937; *H. polypodium*: Upl, Uppsala, the Botanic Garden, N. Hylander 7. 1942).

H. monstrosus Hyl. (1943)

Syn: *H. densiglandulum* Hyl. (1943)

LEAF (Fig. 53): green. CAULINE LEAF: 0–2, acutely lacinate, with 0–sparse stellate hairs. PHYLLARIES: 8–9 mm, narrowly obtuse–shortly acute. GLANDS ON PHYLLARIES: very dense, rather short, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: rather abundant along margins. PEDUNCLES: dense glands. STYLE: densely dotted. LIGULES: ciliate. ANTHELA: paniculate with arcuate branches and short acladium. TYPE: Srm, Yttersele, Målsåker, G. Samuelsson & N. Hylander 15.VI.1939 (*H. densiglandulum*: Srm, Överselö, Tynnelsö, G. Samuelsson & N. Hylander 1661, 15.VI.1939).

H. mucroniferum Hyl. (1943)

LEAF (Fig. 54): green. CAULINE LEAF: 1, estellate. PHYLLARIES: 11 mm, subulate. GLANDS ON PHYLLARIES: very dense, long, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: sparse at apex and along margins. PEDUNCLES: dense glands. STYLE: dotted. LIGULES: glabrous. ANTHELA: loosely paniculate with long, arcuate branches and medium-long acladium. TYPE: Boh, Marstrand, Koön, Rosenlund, N. Hylander 2.VII.1941.

H. nigrisquameum Hyl. (1943)

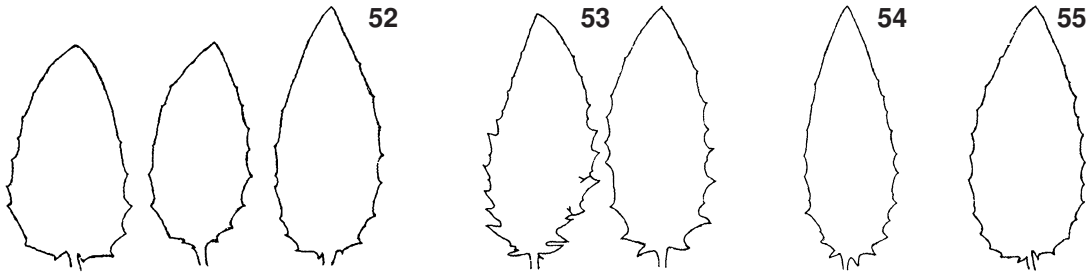
Syn: *H. gotoburgense* Hyl. (1943)

LEAF (Fig. 55): sometimes violet. CAULINE LEAF: 1–2, ovate with short tapering point, estellate. PHYLLARIES: 10–11 mm, narrowly obtuse. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: rather sparse along margins. PEDUNCLES: dense glands. STYLE: densely dotted. LIGULES: glabrous. ANTHELA: paniculate with strongly arcuate branches and short acladium. TYPE: Gbg, Råda, Wendelsberg, N. Hylander 3.VII.1938 (*H. gotoburgense*: Gbg, Göteborg, Överås, H. C. Kindberg 17.VI.1917).

H. obtusius Hyl. (1943)

Syn: *H. torticeps* f. *viplense* Johanss. p.p. (1927)

LEAF (Fig. 56): sometimes violet. CAULINE LEAF: 0–1, with sparse stellate hairs. PHYLLARIES: 11 mm, shortly acute–subulate. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: in



basal half abundant and evenly distributed. PEDUNCLES: dense glands. STYLE: densely dotted. LIGULES: ciliate. ANTHELA: densely paniculate–subumbellate with arcuate branches and short acladium. COMMENTS: I have some doubt concerning the geographic origin of this species. It has been found at at least three nearby localities on the island of Gotland. These localities are close to, but according to herbarium labels, not inside parks and as far as I know there are no other grass-seed aliens growing nearby. In addition, these localities were not described further by Hylander (1943). TYPE: Gtl, Follingbo, Jakobsberg, *E.T. Fries*.VI.1914.

H. ohlsenii Hyl. (1943)

LEAF (Fig. 57): sometimes sparsely spotted, often violet. CAULINE LEAF: 1, with dense stellate hairs. PHYLLARIES: 10 mm, subulate. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: abundant, blackish almost throughout. STELLATE HAIRS ON PHYLLARIES: sparse at apex and along margins. PEDUNCLES: dense glands and sparse hairs. STYLE: ± blackish. LIGULES: subciliate. ANTHELA: paniculate with arcuate branches and short–medium-long acladium. TYPE: Vg, Alingsås, Nolhaga, *R. Ohlsén* 16.VI.1936.

H. onychodontum Hyl. (1943)

LEAF (Fig. 58): sometimes violet. CAULINE LEAF: 1, narrowly lanceolate, estellate. PHYLLARIES: 11 mm, narrow, narrowly obtuse. GLANDS ON PHYLLARIES: dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: ± 0. PEDUNCLES: dense glands. STYLE: dotted. LIGULES: glabrous. ANTHELA: paniculate with arcuate branches and medium-long acladium. TYPE: Gbg, Askim, Villa Anneberg, *N. Hylander* 1.VII.1941.

H. otophorum Hyl. (1943)

Syn: *H. horizontale* Hyl. (1943) *H. platycodon* Hyl. (1943) & *H. latisinuosum* Hyl. (1943)

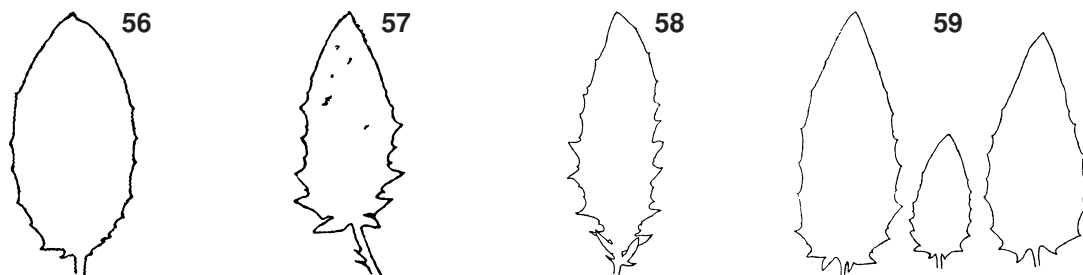
LEAF (Fig. 59): green. CAULINE LEAF: 1–2, often very large, triangular–lanceolate and in shape similar to the basal leaves, estellate or with sparse stellate hairs. PHYLLARIES: 9–11 mm, narrowly obtuse–shortly acute. GLANDS ON PHYLLAR-

IES: very dense, medium sized, brownish–blackish. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: rather sparse but conspicuous along margins. PEDUNCLES: dense glands. STYLE: yellowish–sparsely dotted. LIGULES: glabrous–subciliate. ANTHELA: paniculate with ± arcuate branches and commonly very short acladium. COMMENTS: The difference between *H. horizontale* and the type of *H. otophorum* is, as already pointed out by Hylander (1943), minute and I have not found any justification for treating them as separate species. The original material of *H. platycodon* consists of poorly developed specimens but as far as I can understand they belong to the same species as those referred to *H. otophorum*. *H. latisinuosum* is also very similar. *H. otophorum* (*s. lato*) belong to a large group of Hylanderian species that are very closely similar and the limits of which are hard to determine; *H. pachyodon* (*s. lato*) differs from the species treated here mainly by its more elliptic leaves that are rounded at base and *H. hypomallum* (*s. lato*) differs by having less conspicuous stellate hairs on phyllaries and densely ciliate ligules. However, some of the material determined as *H. otophorum* by Hylander differs considerably from the type and most probably belong to some other species. Hylander (1943) further mentions several other species as very closely related to *H. otophorum* (e.g. *H. subhorizontale*) and although I have thus far found it possible to keep these species apart, further studies including native material may well lead to their synonymization. TYPE: Gbg, Råda, Wendelsberg, *N. Hylander* 3.VII.1938 (*H. horizontale*: Stockholm, Experimentalfältet, *N. Hylander* 29.VI.1939; *H. platycodon*: Upl, Djursholm, Banérvägen 4, *N. Hylander* 16.VI.1939; *H. latisinuosum*: Boh, Marstrand, Koön, Rosenlund, *H. Fries* 6.VI.1938.)

H. pachyodon Dahlst. (1922)

Syn: *H. sterrocladum* Hyl. (1943), *H. subaequaltum* Hyl. (1943), *H. firmirimum* Hyl. (1943), *H. malloneuron* Hyl. (1943), *H. ochrostylum* Hyl. (1943), *H. stenocodon* Hyl. (1943), *H. asteromallum* Hyl. (1943), *H. macropodium* Hyl. (1943), *H. tridymocephalum* Hyl. (1943), *H. melanocorethrum* Hyl. (1943), *H. paucisquamum* Hyl. (1943), *H. psilolepis* Hyl. (1943), *H. pulchelliceps* Hyl. (1943) & *H. sernanderianum* Hyl. (1943)

LEAF (Fig. 60): green or sometimes violet. CAULINE LEAF: 1–2, broadly elliptic–ovate with short ± tapering or shortly caudate apex, estellate or with ± stellate hairs. PHYLLARIES: 9–11 mm, narrowly obtuse–shortly acute. GLANDS ON



PHYLLARIES: very dense, medium-sized-long, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: sparse at apex and along margins. PEDUNCLES: dense glands. STYLE: yellowish-± densely dotted. LIGULES: glabrous or ciliate. ANTHELA: densely paniculate with strongly arcuate branches and short accladium. COMMENTS: Hylander (1943) treated *H. pachyodon* in a very narrow sense transferring most of the material of this group to his *H. sterrocladum*. However, the only important difference between the two appears to be the pigmentation of the style (yellowish in *H. pachyodon* s. Hyl., ± densely dotted in *H. sterrocladum*). Schou (2001), who has studied Danish material of both taxa in detail, considers them as conspecific and I have decided to follow him here. However, there is a large number of species described by Hylander that are very close to the type of *H. pachyodon/sterrocladum*. Some of these are treated as synonyms here since I have not been able to find any reliable separating character, or since they appear to differ by a single character only. But there still remains a number of species that I have chosen to treat separately since their types appear to differ more significantly from *H. pachyodon*, but which are still very similar to this species. Further studies involving more material of these taxa may show that they are also better treated as synonyms. Nevertheless, I admit that *H. pachyodon* as treated here is a fairly variable species and whenever more material of the complete morpho-series becomes available other taxonomic conclusions will perhaps be made. TYPE: not formally designated, however, since Hylander accepted only one collection as belonging to this species I have decided here to designate it as lectotype; Denmark, København, Gamle Carlsberg Have, O. Gelert 27.VI.1893, in S. (*H. sterrocladum*: Vg, Skallsjö, Nääs, R. Ohlsén 13.VI.1939; *H. subaequialtum*: Vg, Alingsås, Nohhaga, R. Ohlsén 8.VI.1939; *H. firmiratum*: Upl, Uppsala, vid slottet, E. Almqvist 7.VII.1942; *H. malloneuron*: Stockholm, Blockhusudden, N. Hylander 16.VI.1939; *H. ochrostylum*: Vg, Alingsås, Nohhaga, R. Ohlsén 8.VI.1939, *H. stenocodon*: Gbg, Mölndal, Lagklarebäck, N. Hylander 3.VII.1938; *H. asteromallum*: Gbg, Mölndal, Gunnebo, N. Hylander 30.VI.1941; *H. macropodum*: Boh, Marstrand, Koön, Rosenlund, N. Hylander 2.VII.1941; *H. tridymocephalum*: Gbg, Mölndal, Lagklarebäck, N. Hylander 30.VI.1941; *H. melanocorethrum*: Gbg, Partille, Bokedalén, R. Ohlsén 19.VI.1939; *H. paucisquamum*: Upl, Lidingö, Hustegaholm, N. Hylander 17.VI.1939; *H. psilolepis*: Vg, Alingsås, Nohhaga, R. Ohlsén 8.VI.1939; *H. pulchelliceps*: Upl, Djursholm, Banérvägen 4, N. Hylander 29.VI.1939; *H. sernaderianum*: Nrk, Lerbäck, Klockarehyttan, K. Johansson 7.VI.1921).

H. parallelisquamum Hyl. (1943)

LEAF (Fig. 61): green. CAULINE LEAF: 1–2, lanceolate, estellate. PHYLLARIES: 12 mm, narrow, shortly acute. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: sparse along margins. PEDUNCLES: dense glands. STYLE: sparsely dotted. LIGULES: ± glabrous-subciliate. ANTHELA: paniculate with arcuate branches and short accladium. TYPE: not clearly designated by Hylander (1943); lectotype designated here: Boh, Marstrand, Koön, Rosenlund, N. Hylander 2.VII.1941, in S.

H. perexpansum Hyl. (1943)

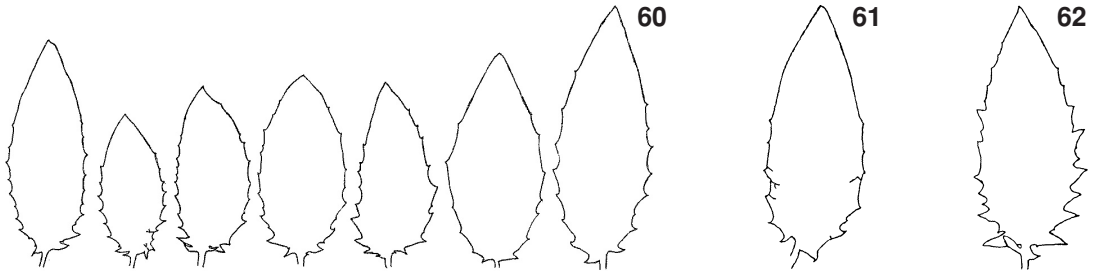
LEAF (Fig. 62): sometimes violet and/or sparsely spotted. CAULINE LEAF: 1–2, with long but ± gradually tapering apex and with ± stellate hairs beneath. PHYLLARIES: 10 mm, narrowly obtuse. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0–solitary. STELLATE HAIRS ON PHYLLARIES: sparse but conspicuous along margins and towards the base. PEDUNCLES: dense glands. STYLE: dotted. LIGULES: glabrous. ANTHELA: paniculate with arcuate branches and short accladium. TYPE: Upl, Älvkarleby, Skutskär, E. Almqvist & N. Hylander 10.VII.1939.

H. platyanthelum Hyl. (1943)

LEAF (Fig. 63): green. CAULINE LEAF: 1, with sparse stellate hairs. PHYLLARIES: 12–13 mm, subulate. GLANDS ON PHYLLARIES: very dense, ± short, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: sparse at apex and along margins. PEDUNCLES: dense glands. STYLE: densely dotted-blackish. LIGULES: subciliate. ANTHELA: paniculate with unusually stout, arcuate branches and short accladium. TYPE: Gbg, Råda, Wendelsberg, H. Fries 24.VI.1923.

H. porphyrostictum Hyl. (1943)

LEAF (Fig. 64): ± sparsely spotted and often violet. CAULINE LEAF: 1, estellate. PHYLLARIES: 10 mm, subulate. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: sparse along



margins. PEDUNCLES: dense glands. STYLE: black. LIGULES: glabrous. ANTHELA: paniculate with arcuate branches and medium-long acladium. TYPE: Ög, Kullerstad, Skärblacka disponentvilla, *N. Hylander* 27.VI.1942.

H. protractifrons Hyl. (1943)

LEAF (Fig. 65): green. CAULINE LEAF: 1, longly caudate, estellate. PHYLLARIES: 11–12 mm, shortly acute. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: rather abundant, at least towards base ± throughout the outer surface. PEDUNCLES: dense glands. STYLE: sparsely dotted. LIGULES: ciliate. ANTHELA: paniculate with arcuate branches and short-medium-long acladium. TYPE: BI, Karlskrona, Kungsholmen, *H. Hylander* 9.VI.1939.

H. pseudopachyodon Hyl. (1943)

LEAF (Fig. 66): green. CAULINE LEAF: 1, narrowly lanceolate, with dense stellate hairs. PHYLLARIES: 11–12 mm, shortly acute. GLANDS ON PHYLLARIES: very dense, long, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: sparse along margins. PEDUNCLES: dense glands. STYLE: dotted. LIGULES: ciliate. ANTHELA: paniculate with arcuate branches and short acladium. TYPE: Upl, Lidingö, Tykö, *N. Hylander* 20.VI.1938.

H. pseudopediaceum Wiinst. (1926)

LEAF (Fig. 67): green. CAULINE LEAF: 1–2. PHYLLARIES: 8 mm, subulate. GLANDS ON PHYLLARIES: dense, medium sized, black. HAIRS ON PHYLLARIES: few, with translucent apex. STELLATE HAIRS ON PHYLLARIES: sparse along margins. PEDUNCLES: dense glands. STYLE: dotted. LIGULES: glabrous. ANTHELA: paniculate with arcuate branches and medium-long acladium. TYPE: Denmark, Sjælland, Jernbaneskrænt ved Springforbi, *K. Wiinstedt* 31.V.1922 (lectotype in C, Schou 2001).

H. psiloloma Hyl. (1943)

LEAF (Fig. 68): green. CAULINE LEAF: 2, narrowly ovate, estellate. PHYLLARIES: 11–12 mm, narrow, subulate. GLANDS ON

PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: 0. PEDUNCLES: dense glands. STYLE: dotted. LIGULES: glabrous. ANTHELA: paniculate with arcuate branches and short-medium-long acladium. TYPE: Gbg, Askim, Villa Anneberg, *N. Hylander* 1.VII.1941.

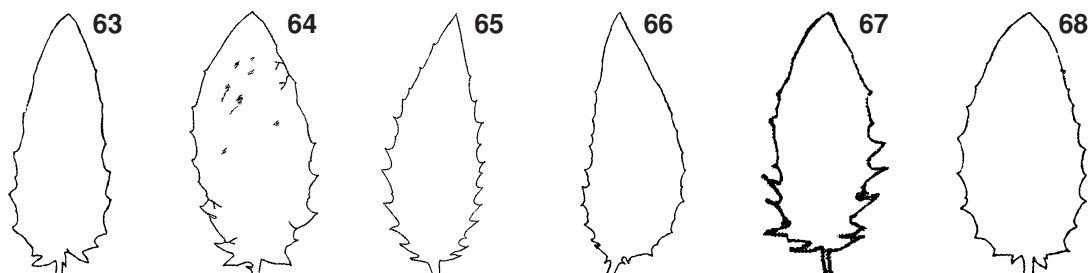
H. psilurum Hyl. (1943)

Syn: *H. brastadense* Hyl. (1943); *H. stenstroemii* var. *propatulum* Johanss. & Sam. (1924)

LEAF (Fig. 69): green. CAULINE LEAF: 1, with ± sparse stellate hairs. PHYLLARIES: 9–11 mm, shortly acute-subulate. GLANDS ON PHYLLARIES: very dense, long, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: sparse along margins. PEDUNCLES: dense glands. STYLE: ± sparsely dotted. LIGULES: glabrous or ciliate. ANTHELA: paniculate with arcuate branches and short acladium. COMMENTS: The material mentioned as belonging to *H. psilurum* by Hylander in the protologue is fairly variable in several characters and since *H. brastadense* clearly belong to the same group of morphotypes I cannot justify its recognition. The original material of *H. stenstroemii* var. *propatulum* was not considered by Hylander (1943) but according to the protologue this plant was collected in the park at Bjärka-Säby and the type-material, distributed in *Hieracia Scandinavica exsiccata* 213 (Johansson & Samuelsson 1923–26) clearly belong to *H. psilurum*. TYPE: Upl, Uppsala, the Botanic Garden, *N. Hylander* 5.VII.1942; (*H. brastadense*: Boh, Brastad, Holma, *J. E. Palmér* VI.1912; *H. stenstroemii* var. *propatulum*: lectotype (designated here): *Hieracia Scandinavica exsiccata* No. 213 (Johansson & Samuelsson 1923–26), in S.

H. psittacinum Hyl. (1943)

LEAF (Fig. 70): densely spotted. CAULINE LEAF: 1, deeply pinnatisect towards base, estellate. PHYLLARIES: 10 mm, shortly acute. GLANDS ON PHYLLARIES: very dense, medium sized, yellowish-brown. HAIRS ON PHYLLARIES: few, blackish almost throughout. STELLATE HAIRS ON PHYLLARIES: rather abundant, ± evenly distributed all over the outer surface. PEDUNCLES: dense glands and solitary hairs. STYLE: ± pure yellow. LIGULES: glabrous. ANTHELA: loosely paniculate with long and straight branches and long acladium. TYPE: Sk, Lund, the Botanic Garden, *F. E. Ahlfvengren* 8.VI.1936.



H. ptilophorum Hyl. (1943)

LEAF (Fig. 71): dark green, sometimes violet. CAULINE LEAF: 1, ± estellate, ovate with caudate apex. PHYLLARIES: 9–10 mm, narrowly obtuse–shortly acute. GLANDS ON PHYLLARIES: very dense, of medium length but slender, yellowish-brown–blackish. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: abundant, forming dense tomentum along margins. PEDUNCLES: very dense glands. STYLE: ± sparsely dotted. LIGULES: glabrous–subciliate. ANTHELA: paniculate with strongly arcuate branches and short–medium-long acladium. COMMENTS: This species is very closely similar to *H. bathymallum* and *H. asteroloma* but differs by the branching-pattern of the inflorescence with strongly arcuate peduncles and relatively sparser stellate hairs on phyllaries, based on the presently available sparse material of all three species I cannot decide whether they should be treated as separate or not. TYPE: Ög, Ö. Eneby, Marieborg, *N. Hylander* 26.VI.1938.

H. pulchriceps Hyl. (1943)

Syn: *H. sandbergianum* Hyl. (1943)

LEAF (Fig. 72): green. CAULINE LEAF: 1, lanceolate with short tapering apex, estellate. PHYLLARIES: 11–12 mm, narrowly–broadly obtuse. GLANDS ON PHYLLARIES: very dense, long, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: rather sparse at apex and along margins. PEDUNCLES: dense glands. STYLE: dotted. LIGULES: glabrous. ANTHELA: loosely paniculate with ± arcuate branches and medium-long–long acladium. COMMENTS: As far as I understand, *H. sandbergianum* is completely identical with *H. pulchriceps* and according to Hylander (1943) the latter species has been found at the type-locality of the former. TYPE: Gbg, Askim, Billdals slott, *N. Hylander* 26.VI.1941; (*H. sandbergianum*: Sk, Ystad, Sandskogen, *C. Sandberg* 10.VII.1942).

H. quadridentatum Hyl. (1943)

LEAF (Fig. 73): sometimes violet. CAULINE LEAF: 1, deeply pinnatifid with longly caudate apex, with sparse stellate hairs. PHYLLARIES: 8–9 mm, shortly acute. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: sparse along margins. PEDUNCLES: dense glands. STYLE: ± densely dotted–blackish. LIGULES: ± glabrous. ANTHELA: densely paniculate with short branches and short acladium. COMMENTS: *Hieracium kolthoffianum*

LARIES: 0. STELLATE HAIRS ON PHYLLARIES: sparse along margins. PEDUNCLES: dense glands. STYLE: dotted. LIGULES: glabrous. ANTHELA: paniculate with arcuate branches and short acladium. TYPE: Srm, Frustuna, Södertuna, *N. Hylander* 25.VI.1939.

H. radiiflorum Hyl. (1943)

LEAF (Fig. 74): green. CAULINE LEAF: 1, ovate with longly caudate apex, estellate. PHYLLARIES: 11 mm, longly subulate. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: sparse along margins. PEDUNCLES: dense glands. STYLE: dotted. LIGULES: ciliate. ANTHELA: paniculate with arcuate branches and very short acladium. TYPE: Gbg, Partille, Bokedal, *N. Hylander* 4.VII.1938.

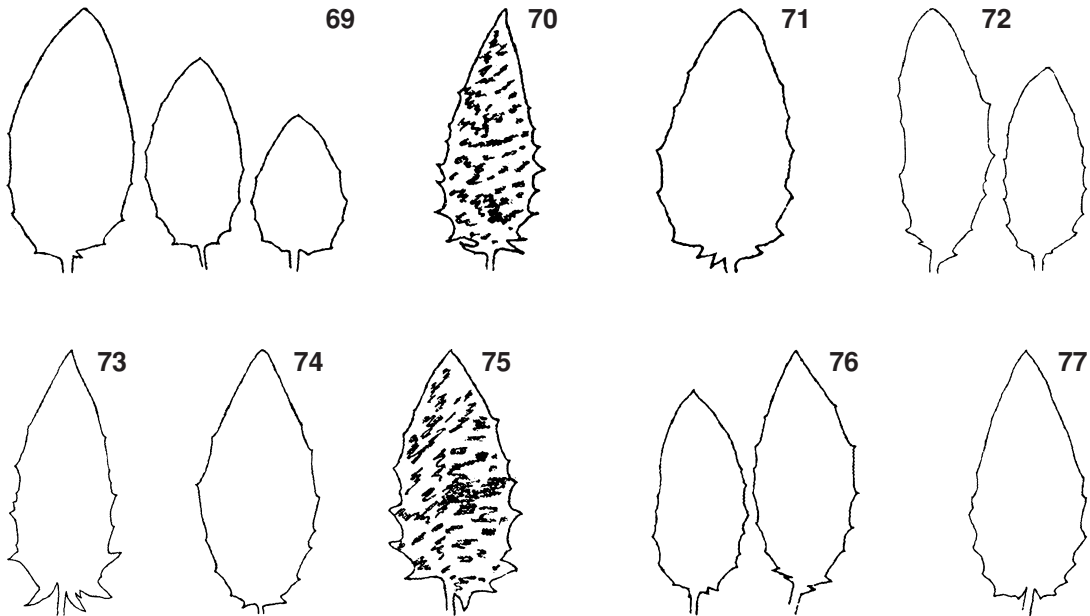
H. scotostictum Hyl. (1943)

LEAF (Fig. 75): densely spotted, often violet. CAULINE LEAF: 1, estellate. PHYLLARIES: 11 mm, longly and narrowly subulate. GLANDS ON PHYLLARIES: dense, short, black. HAIRS ON PHYLLARIES: dense, blackish almost throughout. STELLATE HAIRS ON PHYLLARIES: sparse along margins. PEDUNCLES: dense glands and numerous hairs. STYLE: densely dotted. LIGULES: ± glabrous. ANTHELA: loosely and irregularly subpaniculate with long ± straight branches and long acladium. TYPE: Vg, Gärdhem, NW of Veland, *H. E. Johansson* 15.VI.1930.

H. scotostylum Hyl. (1943)

Syn: *H. kolthoffianum* Hyl. (1943)

LEAF (Fig. 76): often violet. CAULINE LEAF: 1, ovate, shortly cuspidate, with ± sparse stellate hairs. PHYLLARIES: 10 mm, narrow, narrowly obtuse–subulate. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0–solitary, with short translucent apex. STELLATE HAIRS ON PHYLLARIES: rather sparse along margins. PEDUNCLES: dense glands. STYLE: ± densely dotted–blackish. LIGULES: ± glabrous. ANTHELA: densely paniculate with short branches and short acladium. COMMENTS: *Hieracium kolthoffianum*



differs from the type of *H. scotostylum* by a less pigmented style and maybe more dense hairs and stellate hairs on the leaves but I think these differences are due to modification only. TYPE: Sk, Lund, the Botanic Garden, *N. Hylander* 22.VI.1941; (*H. kalthoffianum*: Upl, Lidingö, Kappsta, *I. Kalthoff* 19.VII.1939).

H. seriflorum Hyl. (1943)

LEAF (Fig. 77): green. CAULINE LEAF: 1–2, estellate. PHYLLARIES: 9–10 mm, narrowly obtuse. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: rather sparse along margins. PEDUNCLES: dense glands. STYLE: dotted. LIGULES: shortly ciliate. ANTHELA: densely paniculate with arcuate branches and short acladium. TYPE: not clearly designated by Hylander (1943); lectotype (designated here): Srm, Frustuna, Södertuna, *N. Hylander* 17.VII.1936.

H. severiceps Wiinst. (1939)

LEAF (Fig. 78): green. CAULINE LEAF: 1–2, broadly ovate with short tapering point. PHYLLARIES: 9, shortly acute. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: abundant, forming dense tomentum along margins. PEDUNCLES: dense glands. STYLE: densely dotted. LIGULES: glabrous. ANTHELA: paniculate with arcuate branches and short acladium. TYPE: Denmark, Sjælland, Cultiv i Botanisk have fra Nysø park, *K. Wiinstedt* 4.VI.1937 (holotype in C, cf. Schou 2001).

H. spaniotrichum Hyl. (1943)

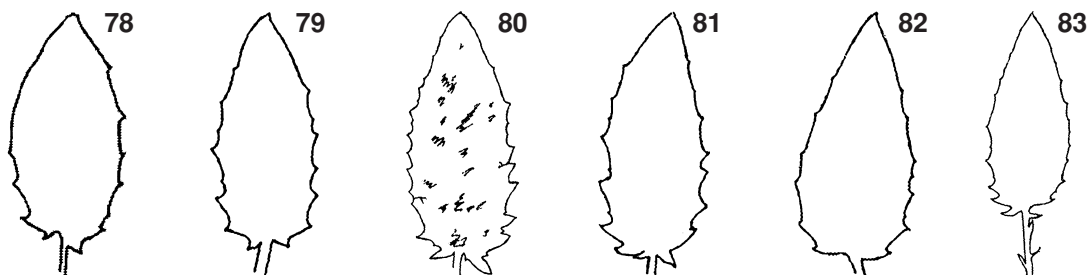
LEAF (Fig. 79): the outer ones always violet. CAULINE LEAF: 1, with sparse stellate hairs. PHYLLARIES: 10 mm, ± subulate. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: few, blackish ± throughout. STELLATE HAIRS ON PHYLLARIES: sparse along margins. PEDUNCLES: dense glands. STYLE: dotted. LIGULES: densely ciliate. ANTHELA: paniculate with arcuate branches and short acladium. TYPE: Upl, Djursholm, Banérvägen 4, *N. Hylander* 16.VI.1939.

H. sparsiguttatum Hyl. (1943)

LEAF (Fig. 80): usually sparsely spotted, sometimes violet. CAULINE LEAF: 1, narrowly lanceolate, with sparse stellate hairs. PHYLLARIES: 11, with long and narrow but ± obtuse apex. GLANDS ON PHYLLARIES: very dense, medium sized, yellowish-brown. HAIRS ON PHYLLARIES: few, with ± long translucent apex. STELLATE HAIRS ON PHYLLARIES: very sparse at apex and along margins. PEDUNCLES: dense glands. STYLE: yellowish. LIGULES: ciliate. ANTHELA: densely paniculate with arcuate branches and short acladium. TYPE: BI, Karlskrona, Villa Vik, *H. Hylander* 8.VI.1939.

H. spodiocladum Hyl. (1943)

LEAF (Fig. 81): often violet. CAULINE LEAF: 0–1. PHYLLARIES: 10–11 mm, shortly acute. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: rather sparse along margins and towards



the base. PEDUNCLES: dense glands. STYLE: black. LIGULES: densely and longly ciliate. ANTHELA: densely paniculate with \pm straight branches and short accladium. TYPE: Upl, Lidingö, Björnbo, *N. Hylander* 17.VI.1939.

H. spodiolepis Hyl. (1943)

LEAF (Fig. 82): green. CAULINE LEAF: 1, estellate. PHYLLARIES: 10 mm, at least the inner ones subulate. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: rather sparse along margins and towards the base. PEDUNCLES: dense glands. STYLE: densely dotted. LIGULES: densely and longly ciliate. ANTHELA: paniculate with \pm straight branches and short accladium. TYPE: Gbg, Mölndal, Gunnebo, *N. Hylander* 3.VII.1941.

H. stenocranoides Wiinst. (1939)

LEAF (Fig. 83): usually violet. CAULINE LEAF: 1, caudate, with dense stellate hairs. PHYLLARIES: 10 mm, subulate. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: abundant, with long translucent apices. STELLATE HAIRS ON PHYLLARIES: sparse along margins. PEDUNCLES: dense glands and few hairs. STYLE: dotted. LIGULES: \pm ciliate. ANTHELA: loosely paniculate with arcuate branches and medium-long accladium. TYPE: Denmark, Sjælland, Botanisk Have i København, *K. Wiinstedt* 27.V.1922 (holotype in C, cf. Schou 2001).

H. strengnense Sam. ex Johanss. (1927)

LEAF (Fig. 84): green. CAULINE LEAF: 1, deeply and acutely dentate. PHYLLARIES: 10 mm, shortly acute. GLANDS ON PHYLLARIES: very dense, medium sized, brownish. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: rather abundant along margins and towards apex. PEDUNCLES: dense glands. STYLE: dotted. LIGULES: glabrous. ANTHELA: loosely paniculate with \pm arcuate branches and medium-long accladium. TYPE: lectotype designated by Hylander (1943, as "coll. orig.") and confirmed by Sennikov (2003): Srm, Strängnäs, Liljhagens trädgård, *G. Samuelsson* 15.VII.1924 (*Hierac. Scand. Exsiccata* 459), in S.

H. strictipes Hyl. (1943)

LEAF (Fig. 85): green. CAULINE LEAF: 1, estellate. PHYLLARIES: 11 mm, at least the inner ones subulate. GLANDS ON PHYLLARIES: very dense, long, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: rather sparse along margins. PEDUNCLES: dense glands. STYLE: yellowish. LIGULES: ciliate. ANTHELA: paniculate with arcuate branches and medium-long accladium. TYPE: Gbg, Askim, N Billdals slott, *N. Hylander* 1.VII.1941.

H. subhorizontale Hyl. (1943)

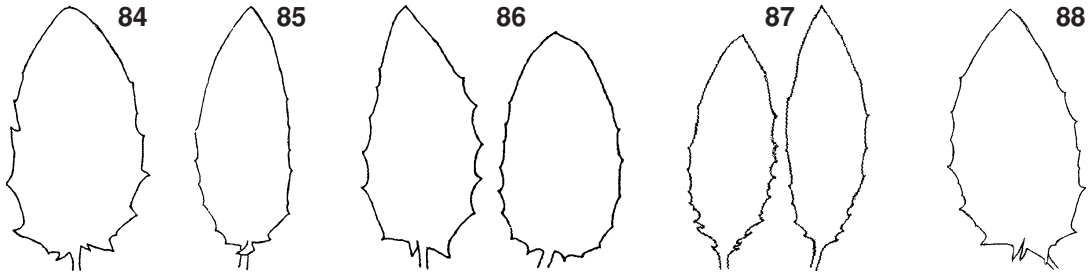
Syn: *H. holoxanthum* Hyl. (1943)

LEAF (Fig. 86): the outer ones usually violet. CAULINE LEAF: 1, with dense stellate hairs. PHYLLARIES: 10 mm, narrowly obtuse. GLANDS ON PHYLLARIES: very dense, medium sized, yellowish-brownish. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: sparse—rather abundant along margins. PEDUNCLES: dense glands. STYLE: yellowish—sparsely dotted. LIGULES: subciliate. ANTHELA: paniculate with \pm arcuate branches and short accladium. COMMENTS: I have not been able to find any important characters separating *H. holoxanthum* from the type of *H. subhorizontale*. TYPE: Upl, Djurholm, Strandvägen 13, *N. Hylander* 16.VI.1939. (*H. holoxanthum*: Srm, Överselö, Tynnelsö, *G. Samuelsson* & *N. Hylander* 1670, 15.VI.1939).

H. torticeps (Dahlst.) Dahlst. (1903)

Syn: *H. tortisquamum* Hyl. (1943)

LEAF (Fig. 87): often violet, the inner ones commonly very narrowly elliptic. CAULINE LEAF: 1–3, with \pm stellate hairs. PHYLLARIES: 11–12 mm, shortly acute—subulate. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: sparse—rather abundant along margins. PEDUNCLES: dense glands. STYLE: \pm sparsely dotted. LIGULES: \pm ciliate. ANTHELA: densely paniculate with arcuate branches and commonly very short accladium. COMMENTS: *Hieracium tortisquamum* is very closely similar to *H. torticeps* and I cannot see any reason to treat them separately; in addition, both species were reported from the type-locality of *H. tortisquamum* by Hylander (1943). TYPE: lectotype designated by Sennikov



(2003): Ög, ad Sturefors in nemorosis lapidosis, 20.VI.1883, *H. Dahlstedt*. (*H. tortisquamum*: Ög, Åtvid, Adelsnäs, *N. Hylander* 29.VI.1942).

H. tythtopogon Hyl. (1943)

LEAF (Fig. 88): green. CAULINE LEAF: 0–1, estellate. PHYLLARIES: 11–12 mm, ± broadly obtuse. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: sparse at apex and along margins. PEDUNCLES: dense glands. STYLE: dotted. LIGULES: glabrous. ANTHELA: loosely paniculate with arcuate branches and medium-long acladium. TYPE: Vg, Skallsjö, Oskarshöjd, *N. Hylander* 7.VII.1941.

H. unguiculatum Hyl. (1943)

LEAF (Fig. 89): green. CAULINE LEAF: 0–1, estellate. PHYLLARIES: 10–11 mm, shortly acute–subulate. GLANDS ON PHYLLARIES: very dense, long, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: sparse along margins. PEDUNCLES: dense glands. STYLE: sparsely dotted–yellowish. LIGULES: glabrous. ANTHELA: paniculate with arcuate branches and short acladium. TYPE: B1, Karlskrona, Kungsholmen, *H. Hylander* 23.VI.1937.

H. unguiferum Hyl. (1943)

LEAF (Fig. 90): green. CAULINE LEAF: 1, with dense stellate hairs. PHYLLARIES: 11, shortly acute. GLANDS ON PHYLLARIES: extremely dense, medium sized, yellowish. HAIRS ON PHYLLARIES: solitary, with translucent apices. STELLATE HAIRS ON PHYLLARIES: rather sparse along margins. PEDUNCLES: very dense glands. STYLE: sparsely dotted. LIGULES: shortly ciliate. ANTHELA: paniculate with arcuate branches and short acladium. COMMENTS: The type collection consists mainly of very vigorous and modified plants with asymmetric leaves (Fig. 90, left) whereas later collections from the same locality and most probably belonging to the same species are less modified and differ considerably in leaf shape (Fig. 90, right). TYPE: Boh, Herrestad, Smärtungen, *H. Fries* 14.VI.1941.

H. wendelianum Hyl. (1943)

LEAF (Fig. 91): green. CAULINE LEAF: 0–1, estellate. PHYLLARIES: 11 mm, ± obtuse. GLANDS ON PHYLLARIES: very dense, long, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: abundant, ± evenly distributed all over the outer surface. PEDUNCLES: dense glands. STYLE: yellowish. LIGULES: densely ciliate. ANTHELA: paniculate with ± arcuate branches and short acladium. TYPE: Gbg, Råda, Wendelsberg, *N. Hylander* 3.VII.1941.

H. xenophytum Hyl. (1943)

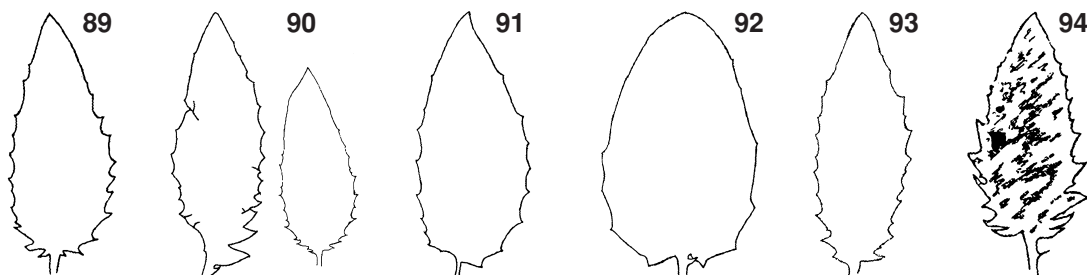
LEAF (Fig. 92): green. CAULINE LEAF: 1, with dense stellate hairs. PHYLLARIES: 10 mm, ± broadly obtuse. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: 0. STELLATE HAIRS ON PHYLLARIES: very sparse at apex and along margins. PEDUNCLES: dense glands. STYLE: densely dotted. LIGULES: glabrous. ANTHELA: paniculate with arcuate branches and medium-long acladium. TYPE: Srm, Frustuna, Södertuna, *N. Hylander* 25.VI.1939.

H. yxnerumense Hyl. (1943)

LEAF (Fig. 93): sometimes violet. CAULINE LEAF: 1, ± estellate. PHYLLARIES: 10 mm, narrow, ± subulate. GLANDS ON PHYLLARIES: very dense, medium sized, black. HAIRS ON PHYLLARIES: few, blackish almost throughout. STELLATE HAIRS ON PHYLLARIES: sparse along margins. PEDUNCLES: very dense glands and solitary hairs. STYLE: dotted. LIGULES: ± ciliate. ANTHELA: paniculate with arcuate branches and short–medium-long acladium. TYPE: Ög, Yxnerum, Borkhult, *N. Hylander* 29.VI.1942.

H. zygophorum Hyl. (1943)

LEAF (Fig. 94): densely spotted. CAULINE LEAF: 0–1, estellate. PHYLLARIES: 11–12 mm, subulate. GLANDS ON PHYLLARIES: dense, short, black. HAIRS ON PHYLLARIES: dense, blackish almost throughout. STELLATE HAIRS ON PHYLLARIES: sparse in basal part. PEDUNCLES: dense glands and few hairs. STYLE:



sparsely dotted. LIGULES: ciliate. ANTHELA: paniculate with arcuate branches and short–medium-long acladium. TYPE: BI, Karlskrona, Villa Vik, H. Hylander 8.VI.1939.

List of synonyms

abundans = *aterrimum*
accumulatum = *cyrtocladum*
anthracocephalum = *cyrtocladum*
asteromallum = *pachyodon*
brachycentrum = *bembiocophorum*
brastadense = *psilurum*
chrysomaurum = *grandidens*
dasycodon = *cyrtocladum*
densiglandulum = *monstrosum*
densilimbatum = *cyrtocladum*
dicranocladum = *baliophyllum*
dyscharmorum = *contaminatum*
elimbatum = *microcodon*
firmiramum = *pachyodon*
gotoburgense = *nigrisquameum*
ishnocladum = *contaminatum*
ischnolepis = *cyrtocladum*
isodontum = *contaminatum*
isohypses = *microcodon*
kolthoffianum = *pulchriceps*
holoxanthum = *subhorizontale*
horizontale = *otophorum*
jugiferum = *mimeticum*
latisinuosum = *otophorum*
macropodium = *pachyodon*
malloneuron = *pachyodon*
melanocorethrum = *pachyodon*
microphyllodes = *luzuleti*
microphyllum = *comitans*
ochrostylum = *pachyodon*
paucisquameum = *pachyodon*
platycodon = *otophorum*
plumosolimbatum = *crebriserratum*
pogonolepis = *cyrtocladum*
polypodium = *mimeticum*
porrectidens = *hypomallum*
propatulum = *psilurum*
psilolepis = *pachyodon*
pulchelleiceps = *pachyodon*
sandbergianum = *pulchriceps*
sernanderianum = *pachyodon*

spaniodontum = *contaminatum*
stenocodon = *pachyodon*
stenstroemii var. *propatulum* = *psilurum*
sterrocladum = *pachyodon*
subaequialtum = *pachyodon*
tolyphorum = *durum*
torticeps f. *viblense* = *obtusius*
tortisquameum = *torticeps*
tridymocephalum = *pachyodon*
variisquameum = *contaminatum*
viblense = *obtusius*

References

- Dahlstedt, H. 1893: Bidrag till sydöstra Sveriges *Hieracium*-flora II — *Sv. Vet.-Ak. Handl.* 25(3): 1–201.
- Dahlstedt, H. 1903: *Herbarium Hieraciorum Scandinaviae* XV–XVI. — Stockholm (exsiccata).
- Dahlstedt, H. 1921: Nya syd- och mellansvenska *Hieracia silvaticiformia*. — *Arkiv Bot.* 17(2): 1–19.
- Dahlstedt, H. 1922: Nya *Hieracium*-Arter fra Danmark. — *Bot. Tidskr.* 37: 241–252.
- Hylander, N. 1943: Die Grassameneinkömmlinge Schwedischer Parke. — *Symb. Bot. Ups.* VII (1): 1–432.
- Hylander, N. 1949: Nya fynd av adventiva *Hieracia silvaticiformia* samt några nyupptäckta samforekomster av gammaldags gräsfröinkomlingar. — *Sv. Bot. Tidskr.* 43: 407–419.
- Johansson, K. 1927: *Enumerantur Hieracia vulgata Suecicae*. — *Arkiv Bot.* 21A(15): 1–98.
- Johansson, K. & Samuelsson, G. 1923–26: *Hieracia scandinavica exsiccata*. — Uppsala & Stockholm. (exsiccata).
- Johansson, K. & Samuelsson, G. 1924: Nya svenska *Archieracier*. — *Bot. Notiser* (1924): 135–160.
- Schou, J. C. 2001: Danmarks Høgeurter — *AAU Reports* 41: 1–246. (Århus).
- Sennikov, A. N. 2003: Typification of some *Hieracium* (Asteraceae) names published by Swedish authors. — *Ann. Bot. Fennici* 40: 219–231.
- Swofford, D. L. 2001: *PAUP**, *Phylogenetic analysis using parsimony (*and other methods)*, version 4. — Sunderland, Mass.
- Wiinstedt, K. 1922: Indledning og Anmærkninger. — In: Dahlstedt, H. (ed.), *Nya Hieracium-Arter fra Danmark*. — *Bot. Tidskr.* 37: 241–252.
- Wiinstedt, K. 1939: Nogle nye *Hieracium*-arter i Danmark — *Dansk Bot. Ark.* 9(10): 1–13.

Appendix 1. Explanations to the structure of the standardised descriptions and to characters and terminology used in the keys and descriptions.

- Leaf:** This refers to the shape and colour of the middle basal leaves. In some species the outer (older) leaves are commonly tinged with violet pigments at flowering. This is usually best observed on the lower surface. Some species have leaves that are densely spotted with dark purple blotches on the upper side. The illustrations show the most typical leaf-shape(s) of each species. Apart from the standard terminology of plant descriptions that is found in any standard flora the following is used in the keys. Dimorphous dentation is when every second tooth is regularly much smaller than the intervening ones. Appendiculate petioles are those with free leaf-segments attached well below the main leaf.
- Cauline leaf:** The number, and sometimes the shape, of any leaf on the stem, as well as the amount of stellate hairs on their lower surface is here described.
- Phyllaries:** The shape and length of the inner long bracts that cover the outer surface of the capitulum is here described. The apex of the phyllaries may be broadly obtuse, narrowly obtuse (i.e. with very narrow but still obtuse apex), shortly acute (i.e. with \pm broadly triangular point) or subulate.
- Glands on phyllaries and hairs on phyllaries:** The indument of secondary and tertiary capitula is here described. The amount of simple hairs and glands (i.e. glandular hairs) is given as: solitary (i.e. singly on some phyllaries only), few (i.e. 1–5 per phyllary), numerable (10–many, but still a countable number, per phyllary), dense (i.e. dominating and hardly countable), very dense (i.e. crowded). The glands may be short (< 0.5 mm), medium sized, or long (> 0.8 mm), and their heads may be black or brownish-yellowish on carefully dried material. The simple hairs may have short or long white (translucent) apices.
- Stellates on phyllaries:** Most species have minute stellate hairs on the phyllaries. Solitary stellates are hardly visible but when numerous they tend to form a greyish shading as observed through a lens. This stellate tomentum is commonly unevenly distributed on the phyllaries, it may be concentrated to the margins or to the basal part. The amount of stellates on the long inner bracts is given as: very sparse (i.e. few and hardly observable), sparse (i.e. numerable stellates but not many enough to contribute to the colour of the bract), rather abundant (i.e. producing a conspicuous greyish shading on some parts of the bracts but not covering large continuous areas) and very abundant (i.e. large areas with dense greyish tomentum). Apart from the stellates there is commonly a tuft of flexuose short cilia at the apex of the phyllaries. These are generally mixed with, and confluent with the true stellates but may sometimes be very conspicuous.
- Peduncles:** The indument of glands and simple hairs on the peduncles of the secondary capitula is here described. The amount is given on the same scale as described for “Glands on phyllaries” above, given that one phyllary is equivalent to ca. 1 cm of a peduncle.
- Style:** The inner tissue of carefully dried styles is yellow. However, most species have \pm abundant blackish papilla on the outer surface of the styles. The colour of the styles is thus described as yellowish (i.e. without conspicuous blackish papilla), sparsely dotted (i.e. with \pm widely spaced black papilla covering < 50 % of the surface), densely dotted (i.e. with abundant black papilla covering > 50 % of the surface) or blackish (i.e. almost no yellow surface visible).
- Ligules:** The apex of the ligules may bear minute cilia. These are best observed on the inner flowers of recently opened capitula.
- Anthela:** The branches and peduncles of the anthela (i.e. the “false inflorescence”) may be longer or shorter and may bear one or several capitula. The anthela is thus described as dense or loose or as simple or compound. These branches may further be straight or arcuate. The acladium is the peduncle of the primary (i.e. first flowering) capitulum and it may be short (< 2 cm), medium-long (2–4 cm) or long (> 4 cm).
- Comments:** Under this heading the distinctness of closely similar species is discussed.
-

Appendix 2. The 33 characters (capital letters) and their states (numbers) that were included in the numeric description of the species and used to calculate the overall similarity index (OSI). This was calculated by adding the arithmetic difference between character-states as given below over all characters for each pair of species compared. All intervening figures were used to denote intermediate character-states but some are here omitted for simplicity. All statements about leaves refer to the middle basal leaves, all statements about phyllaries to the long bracts covering the outer surface of the capitulum and all statements about the indument of capitula and peduncles refer to secondary capitula.

-
- | | |
|--|--|
| <p>A Leaf colour
 0 all green
 2 the outer ones always tinged with violet</p> <p>B Leaves spotted
 0 never
 2 always</p> <p>C Leaf length/width ratio (excluding teeth)
 0 < 1.8
 1 1.8–2.3
 2 2.3–2.8
 3 2.8–3.3
 4 3.3–4.0
 5 > 4.0</p> <p>D Shape of leaf-base
 0 sagittate
 1 cordate
 2 truncate–rounded
 3 attenuate
 4 cuneate</p> <p>E Ratio of length of largest teeth/width of leaf (excluding teeth)
 0 leaves entire or minutely denticulate
 1 < 0.1
 2 0.10–0.15
 3 0.15–0.25
 4 > 0.25</p> <p>F Position of largest teeth (incisions) on leaf
 0 at the leaf-base
 2 at the middle of the leaf</p> <p>G Outline of leaf-teeth (or incisions)
 0 with concave margins
 1 with straight margins or claw-shaped or very minute
 2 with convex margins</p> <p>H Direction of leaf dentation
 0 at right angles to the leaf-margin
 2 strongly forward directed</p> <p>I Distance (along the leaf-margin) between major dentations
 0 ca. 1 cm
 1 ca. 1.5 cm
 2 ca. 2 cm</p> <p>J Relative size of every second leaf-tooth
 0 all of the same size
 2 every second teeth much smaller (i.e. dimorphous dentation)
 4 distinctly bidentate</p> <p>K Leaf surface
 0 ± plane
 2 strongly undulate or plicate</p> | <p>L Largest width of leaf
 0 well below the middle (leaves ± ovate)
 1 close to the middle (leaves elliptic)
 3 well above the middle (leaves ± obovate)</p> <p>M Petiole
 0 not appendiculate
 2 usually appendiculate (i.e. with free leaf-segments attached well below the leaf-base)</p> <p>N Number of cauline leaves
 0 1
 1 2–3</p> <p>O Stellate hairs on the lower surface of the cauline leaves
 0 0–few
 2 abundant</p> <p>P Length of longest phyllaries
 0 < 10 mm
 1 ca. 10 mm
 2 ca. 11 mm
 3 ca. 12 mm
 4 ≥ 13 mm</p> <p>Q Shape of apex of phyllaries
 0 broad
 1 gradually tapering
 2 suddenly acuminate</p> <p>R Apex of phyllaries
 0 truncate–broadly rounded
 1 broadly obtuse
 2 narrowly obtuse
 3 shortly acute
 4 subulate</p> <p>S Glands on phyllaries
 0 0–solitary
 1 few–sparse
 2 numerable
 3 dense
 4 very dense (crowded)</p> <p>T Length of glands on phyllaries
 0 < 0.5 mm
 2 > 0.8 mm</p> <p>U Colour of glands on phyllaries
 0 black
 1 brownish
 2 yellowish</p> <p>V Simple hairs on phyllaries
 0 0–solitary
 1 few–sparse
 2 numerable
 3 dense</p> |
|--|--|

continues

Appendix 1. Continued.

W Colour of hairs on phyllaries	AC Glands on peduncles
0 dark \pm throughout (or 0)	0 0–solitary
1 with ca. 25%–50% translucent apex	1 sparse–numerous
2 dark in basal part only	2 \pm dense
X Amount of stellate tomentum on phyllaries	AD Black pigmentation of styles on dried material
0 very sparse	0 \pm absent (i.e. styles purely yellow)
1 sparse but conspicuous	1 as sparse–dense dots
2 abundant	2 abundant (styles \pm blackish)
3 very abundant forming dense tomentum	AE Ciliation of the apices of ligules
Y Apical cilia on phyllaries	0 glabrous
0 not conspicuous	2 conspicuously ciliate
1 conspicuous	AF Anthela
Z Stellate hairs (tomentum) on phyllaries	0 densely compound with short arcuate branches
0 \pm evenly distributed throughout the length	1 compound with \pm erect branches
1 distinctly concentrated at the base	3 simple and deeply bifid with \pm erect and long branches
AA Concentration of stellate tomentum along the margins of the phyllaries	AG Acladium (i.e. the peduncle of the primary capitulum)
0 lacking (stellates evenly distributed or 0)	0 0–2 cm long
2 conspicuous	2 > 4 cm long
AB Simple hairs on peduncles	
0 0–solitary	
1 sparse–numerous	
2 \pm dense	
