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SIEGFRIED BRÄUTIGAM & WERNER GREUTER

A new treatment of *Pilosella* for the Euro-Mediterranean flora**Abstract**

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Recognising *Pilosella* as a genus distinct from *Hieracium* is justified both from a phylogenetic point of view (a more broadly defined *Hieracium*, to be monophyletic, would have to include at least two further genera along with *Pilosella*: *Andryala* and *Hispidella*) and for practical considerations. In *Hieracium*, almost all taxa are apomicts that rarely hybridise, and whenever they do, give rise to new, stable apomictic lines that are customarily given taxonomic recognition as species or subspecies. In *Pilosella* hybridisation is frequent, gene flow between populations (however defined) is considerable, and the recognition of microtaxa as if they were apomictic lines is unpractical. The classification here proposed rests on a framework of twenty accepted “basic” species (some with subspecies) or species aggregates. Hybrid progenies in which 2-3(-4) of these species or aggregates are believed to have participated are treated as 122 “collective species”, one per known or postulated parental combination. Each of these comprises one recognised species, or sometimes more than one when an included morphotype is stable over a significant, coherent area, or when the offspring of a particular subspecies or microspecies combination deserves recognition. A synopsis of the proposed classification is presented, and required new names and combinations are validated.

Keywords: *Hieracium*, Europe, Mediterranean, classification, nomenclature, collective species.

Introduction

Up to the present day, *Pilosella* Vaill. is considered by many authors as a subgenus of *Hieracium* L. Schultz & Schultz (1862) are among the first to accept it as a genus of its own (as did 19th century *Hieracium* specialists Fries, Arvet-Touvet and Norrlin at some stage of their life – but not permanently). During the last decades generic recognition of *Pilosella* has gained increased but not universal support. Several authors (including the present ones) have so far hesitated to follow suit, the unassessed nomenclatural consequences of a change being a major reason for their reluctance. Also, the question of how to deal with the American *Hieracium* subg. *Chionoracium* Sch. Bip. (or as a genus, *Stenotheca* Monnier) under a narrow generic concept had not yet been definitely answered.

On morphological grounds *Pilosella* is clearly distinct by cypselae features from *Hieracium* sensu stricto. A number of further characteristics, when combined, support separation but are not expressed in all species (e.g., the presence of stolons or of red veins on the abaxial ligule surface). Past workers have experienced no difficulty in defining both groups and sharing the species among them. In spite of abundant hybridisation within either group, no hybrids between representatives of *Pilosella* and *Hieracium* are known. Nuclear DNA content (1C value) is about twice as high in *Hieracium* as in *Pilosella* (Bräutigam & Bräutigam 1999, Vladimirov & Greilhuber 2003).

The sequence analysis of both nuclear (ITS) and chloroplast DNA (*trnT-trnL* intergenic spacer; *matK* gene) added considerably to our understanding of phylogenetic relationships (Fehrer & al. 2007a). The results consistently support the monophyly of a clade comprising *Hieracium* sensu lato, *Andryala* L. and *Hispidella* Lam. The chloroplast DNA data, especially within *Pilosella*, show no evident correlation with morphology. The observed patterns point to basal and/or intergroup hybridisation events resulting in chloroplast “capture” followed by differential line sorting. Chloroplast DNA data are thus indicative of the complex evolutionary mechanisms and reticulate connections prevailing in the group since its very origin, rather than of morphologically expressed phylogenetic affinities. The nuclear (ITS) data, however, yield a neat classification well compatible with morphological data. Apart from the single, isolated species *Hieracium intybaceum* Jacq., which appears in a basal position with respect to the whole complex, it shows a subdivision into three main clades: *Hieracium* (incl. subg. *Chionoracium*), *Pilosella* with its sister *Hispidella*, and *Andryala*.

Phylogenetically it would be possible to define a natural genus *Hieracium* in a broad sense, to include *Pilosella*, *Andryala*, and *Hispidella*. However, from a practical point of view a narrower genus concept, with those four as distinct genera, is much preferable.

While apomixis is frequent or predominant in Old World *Hieracium* and *Pilosella* alike, it is of a different nature: diplospory in the former, apospory in the latter. Concomitantly the patterns of diversification differ. Whereas *Hieracium*, except for some sexual diploids, consists of phenetically invariable apomictic lines, most *Pilosella* populations retain a varying but significant degree of sexuality. The study of natural populations, the observed patterns of variation and experimental crosses concur to demonstrate that hybridisation, involving all species, is a frequent, recurrent phenomenon in *Pilosella*. There are all kinds of taxa in the latter genus, ranging from fully sexual, both diploid and polyploid species, to almost totally apomictic ones occurring as widespread, morphologically stable clones (Fehrer & al. 2007b). As a consequence, classification in *Pilosella* must follow different criteria than those currently applied in *Hieracium*, where the trend is toward recognition of very narrowly defined but constant, hybridogenous agamospecies.

Classification in [*Hieracium* subg.] *Pilosella* underwent extreme fluctuation over time. In his seminal revision Fries (1862) recognised 42 species in all, to which Schultz & Schultz (1862) added a dozen of their own plus an equal number of interspecific hybrids. When Nägeli & Peter (1885) introduced their new taxonomic concept to hieraciology it resulted in a fourfold number of species (164) plus countless subspecies. The next monographer, Zahn (1923), recognised 182 species – a relatively slight increase – but (to accommodate the countless microtaxa that had meanwhile been described and named, especially by Nordic botanists) inflated subspecies numbers. As an example, in that work there are 624 numbered subspecies in *Hieracium pilosella* L. (*Pilosella officinarum*) alone. Yet Zahn himself was critical of the meaning of such extreme pulverisation: Touton (1921: 71) quotes him as follows [our translation]: “The study of the species *pilosella* in detail leads to nothing, because not a single fixed subspecies exists, but everything flows together”; to which Touton added: “The species *pilosella* shares this fate with many other *Hieracium* species”.

At the opposite extreme, a synthetic approach has been proposed recently by Tyler (2001). Dealing only with the Nordic taxa, he reduced their species number to 8, of which only 3 were further subdivided, plus 12 biparental nothospecies. He justified his new, “unprejudiced” classi-

fication by stating “that all existing systems are inappropriate in the light of the complicated, and largely unknown, reproductive biology of these taxa”. While his approach has undoubted merit, it is not useful in the context of our Euro-Mediterranean inventory, for at least two obvious reasons. First, extending it southward to cover other areas has yet to be attempted and would predictably result in conflicts of classification, as what is well defined and stable in one area need not be so elsewhere; and second, adopting broadly defined units for organising and storing information inevitably results in loss of valuable chorological and morphological data.

The system we have chosen for our broad, Euro-Mediterranean context is neither novel nor unique. It builds upon good, modern precedent that has been successfully applied on a more restricted geographical scale (see, in particular, Šljakov 1989 for European Russia and Mateo Sanz 2006 for Spain). In the first place, we recognise a relatively small number (20) of “basic” species, or in some cases, small groups of species (termed “aggregates”). This part of our classification follows the usual standards adopted for the Euro+Med database, as explained and implemented in Med-Checklist (Greuter & al. 1984-89), meaning that “basic” species and their segregates may be further subdivided into subspecies, or may include insufficiently known taxa of doubtful taxonomic value (introduced by the word “also”, in the following Synopsis). We have, however, made spare use of subspecies, defining them broadly – often in the sense of the *greges* of Zahn (1923).

Plants that do not fit into one of the basic species or aggregates are interpreted as hybrid offspring, and binomials are used to designate each postulated “parental” combination. These hybridogenous taxa (or taxon swarms) we do not treat as nothospecies (as which they would not be covered by either Euro+Med or Med-Checklist, but simply ignored) but term them “collective species” (as which they can be included). Thus, to each different combination of postulated parental basic species (or aggregates) corresponds one collective species, provided that (a) it occurs in nature and (b) it can be distinguished with some confidence from other possible combinations. (The latter is not always the case: for example, crosses of *Pilosella officinarum* often cannot be distinguished from the corresponding crosses of *P. peleteriana*.) Our 122 collective species are of very unequal nature and value: they may comprise newly formed, primary hybrids only, or correspond to stable hybridogenous species, or often they include both (Schuhwerk & Fischer 2003, Fehrer & al. 2005). As a rule, each collective species consists of a single taxonomic unit treated at species rank and designated by a binomial. However, on occasions we found it practical to recognise more than one specific unit within a collective species. Such segregates are useful when a particular morphotype is stable over a significant, coherent area, or when the offspring of different subspecies or segregates of the same basic species differ recognisably among themselves. The number of such segregates we kept deliberately low; more can be added easily if and when the need is felt. In no case did we recognise subspecies within collective species.

Synopsis of Euro-Mediterranean *Pilosella* taxa

A. Basic species and aggregates (with subordinate species and subspecies)

1. *Pilosella alpicola* (Steud. & Hochst.) F. W. Schultz & Sch. Bip.; also:
Pilosella bonaquae (Buttler & W. Lippert) S. Bräut. & Greuter;
2. *Pilosella argyrocoma* (Fr.) F. W. Schultz & Sch. Bip.;
3. *Pilosella aurantiaca* (L.) F. W. Schultz & Sch. Bip.:
subsp. *aurantiaca*,
subsp. *auropurpurea* (Nägeli & Peter) S. Bräut. & Greuter,
subsp. *decolorans* (Fr.) T. Tyler;
4. *Pilosella breviscapa* (DC.) Soják;
5. *Pilosella caespitosa* aggr.:
Pilosella caespitosa (Dumort.) P. D. Sell & C. West; also:
subsp. *colliniformis* (Peter) P. D. Sell & C. West,
Pilosella onegensis Norrl.;

6. *Pilosella castellana* (Boiss. & Reut.) F. W. Schultz & Sch. Bip.;
7. *Pilosella cymosa* (L.) F. W. Schultz & Sch. Bip.:
 subsp. *cymosa*,
 subsp. *sabina* (Sebast. & Mauri) H. P. Fuchs,
 subsp. *vaillantii* (Tausch) S. Bräut. & Greuter;
8. *Pilosella echioides* aggr.:
 Pilosella brzovecensis (Horvat & Pawł.) S. Bräut. & Greuter,
 Pilosella caucasica (Nägeli & Peter) Sennikov,
 Pilosella echioides (Lumn.) F. W. Schultz & Sch. Bip.:
 subsp. *echioides*,
 subsp. *proceriformis* (Nägeli & Peter) S. Bräut. & Greuter,
 Pilosella procera (Fr.) F. W. Schultz & Sch. Bip.;
9. *Pilosella galiciana* (Pau) M. Laínz;
10. *Pilosella glacialis* (Reyn.) F. W. Schultz & Sch. Bip.;
11. *Pilosella hoppeana* (Schult.) F. W. Schultz & Sch. Bip.:
 subsp. *cilicica* (Nägeli & Peter) P. D. Sell & C. West,
 subsp. *hoppeana*,
 subsp. *macrantha* (Ten.) S. Bräut. & Greuter;
12. *Pilosella lactucella* (Wallr.) P. D. Sell & C. West:
 subsp. *lactucella*,
 subsp. *nana* (Scheele) M. Laínz;
13. *Pilosella macrotricha* (Boiss.) F. W. Schultz & Sch. Bip.;
14. *Pilosella officinarum* Vaill.; also:
 subsp. *velutina* (Hegetschw.) H. P. Fuchs
15. *Pilosella peleteriana* (Mérat) F. W. Schultz & Sch. Bip.:
 subsp. *peleteriana*,
 subsp. *subpeleteriana* (Nägeli & Peter) P. D. Sell;
16. *Pilosella piloselloides* aggr.:
 Pilosella pavichii (Heuff.) Arv.-Touv.,
 Pilosella piloselloides (Vill.) Soják:
 subsp. *bauhinii* (Schult.) S. Bräut. & Greuter,
 subsp. *floccosa* (Nägeli & Peter) S. Bräut. & Greuter,
 subsp. *magyarica* (Peter) S. Bräut. & Greuter,
 subsp. *piloselloides*,
 subsp. *praealta* (Gochnat) S. Bräut. & Greuter,
 subsp. *rubrobauhinii* (Schelk. & Zahn) S. Bräut. & Greuter;
17. *Pilosella pseudopilosella* (Ten.) Soják;
18. *Pilosella saussureoides* Arv.-Touv.;
19. *Pilosella vahlüi* (Froel.) F. W. Schultz & Sch. Bip.;
20. *Pilosella verruculata* (Link) Soják:
 subsp. *akinfiwii* (Woronow & Zahn) S. Bräut. & Greuter,
 subsp. *verruculata*.

B. Intermediate, “collective” species (with their constituent species)

1. *Pilosella alpicola* <> *cymosa*: *Pilosella petraea* coll.:
 Pilosella petraea F. W. Schultz & Sch. Bip.;
2. *Pilosella alpicola* <> *hoppeana*: *Pilosella merxmulleriana* coll.:
 Pilosella merxmulleriana (S. Bräut.) S. Bräut. & Greuter;
3. *Pilosella alpicola* <> *officinarum*: *Pilosella annae-vetterae* coll.:
 Pilosella annae-vetterae (Zahn) Soják
4. *Pilosella argyrocoma* <> *pseudopilosella*: *Pilosella subulatissima* coll.:
 Pilosella subulatissima (Zahn) Mateo;

5. *Pilosella argyrocoma* <> *saussureoides*: ***Pilosella nevadensis*** coll.:
Pilosella nevadensis (Arv.-Touv.) Mateo & Greuter;
6. *Pilosella argyrocoma* <> *vahlilii*: ***Pilosella aranii*** coll.:
Pilosella aranii Mateo;
7. *Pilosella aurantiaca* <> *caespitosa*: ***Pilosella fuscoatra*** coll.:
Pilosella fuscoatra (Nägeli & Peter) Soják;
8. *Pilosella aurantiaca* <> *caespitosa* <> *cymosa*: ***Pilosella norrliniiiformis*** coll.:
Pilosella norrliniiiformis (Pohle & Zahn) Soják;
9. *Pilosella aurantiaca* <> *caespitosa* <> *cymosa* <> *lactucella*: ***Pilosella dimorphoides*** coll.:
Pilosella dimorphoides Norrl.;
10. *Pilosella aurantiaca* <> *caespitosa* <> *lactucella*: ***Pilosella subdecolorans*** coll.:
Pilosella subdecolorans (Norrl.) S. Bräut. & Greuter;
11. *Pilosella aurantiaca* <> *cymosa*: ***Pilosella guthnickiana*** coll.:
Pilosella guthnickiana (Hegetschw.) Soják;
12. *Pilosella aurantiaca* <> *cymosa* <> *lactucella*: ***Pilosella plaicensis*** coll.:
Pilosella plaicensis (Wol.) Soják;
13. *Pilosella aurantiaca* <> *cymosa* <> *officinarum*: ***Pilosella biflora*** coll.:
Pilosella biflora (Arv.-Touv.) Arv.-Touv.;
14. *Pilosella aurantiaca* <> *cymosa* <> *piloselloides*: ***Pilosella macutensis*** coll.:
Pilosella macutensis (K. Malý & Zahn) Soják;
15. *Pilosella aurantiaca* <> *echioides* <> *piloselloides*: ***Pilosella muscelii*** coll.:
Pilosella muscelii (Prodán) S. Bräut. & Greuter;
16. *Pilosella aurantiaca* <> *glacialis*: ***Pilosella aurantella*** coll.:
Pilosella aurantella (Nägeli & Peter) Soják;
17. *Pilosella aurantiaca* <> *glacialis* <> *hoppeana*: ***Pilosella notha*** coll.:
Pilosella notha (Huter) S. Bräut. & Greuter;
18. *Pilosella aurantiaca* <> *glacialis* <> *hoppeana* <> *lactucella*: ***Pilosella amaurocephala*** coll.:
Pilosella amaurocephala (Peter) Soják;
19. *Pilosella aurantiaca* <> *hoppeana*: ***Pilosella substoloniflora*** coll.:
Pilosella substoloniflora (Peter) Soják;
20. *Pilosella aurantiaca* <> *hoppeana* <> *lactucella*: ***Pilosella eminens*** coll.:
Pilosella eminens (Peter) Soják;
21. *Pilosella aurantiaca* <> *lactucella*: ***Pilosella fusca*** coll.:
Pilosella blyttiana (Fr.) F. W. Schultz & Sch. Bip.,
Pilosella fusca (Vill.) Arv.-Touv.;
22. *Pilosella aurantiaca* <> *lactucella* <> *officinarum*: ***Pilosella peteriana*** coll.:
Pilosella peteriana (Käser) Holub;
23. *Pilosella aurantiaca* <> *lactucella* <> *officinarum* <> *piloselloides*: ***Pilosella moechiadia*** coll.:
Pilosella moechiadia (Peter) S. Bräut. & Greuter;
24. *Pilosella aurantiaca* <> *lactucella* <> *piloselloides*: ***Pilosella hyperborea*** coll.:
Pilosella hyperborea (Fr.) F. W. Schultz & Sch. Bip.;
25. *Pilosella aurantiaca* <> *officinarum*: ***Pilosella stoloniflora*** coll.:
Pilosella rubra (Peter) Soják,
Pilosella stoloniflora (Waldst. & Kit.) F. W. Schultz & Sch. Bip.;
26. *Pilosella aurantiaca* <> *officinarum* <> *piloselloides*: ***Pilosella trigenes*** coll.:
Pilosella trigenes (Peter) Soják;
27. *Pilosella aurantiaca* <> *peleteriana*: ***Pilosella bryhnii*** coll.:
Pilosella bryhnii (Omang) Soják;
28. *Pilosella aurantiaca* <> *piloselloides*: ***Pilosella calomastix*** coll.:
Pilosella calomastix (Peter) Soják,
Pilosella derubella (Gottschl. & Schuhw.) S. Bräut. & Greuter;
29. *Pilosella breviscapa* <> *lactucella*: ***Pilosella alturgelliana*** coll.:
Pilosella alturgelliana Mateo;

30. *Pilosella caespitosa* <> *cymosa*: ***Pilosella glomerata*** coll.:
Pilosella glomerata (Froel.) Fr.;
31. *Pilosella caespitosa* <> *cymosa* <> *lactucella*: ***Pilosella dubia*** coll.:
Pilosella dubia (L.) F. W. Schultz & Sch. Bip.,
Pilosella scandinavica (Dahlst.) Schljakov,
Pilosella tubulascens Norrl.;
32. *Pilosella caespitosa* <> *cymosa* *lactucella* <> *officinarum*: ***Pilosella polioderma*** coll.:
Pilosella polioderma (Dahlst.) Soják;
33. *Pilosella caespitosa* <> *cymosa* <> *officinarum*: ***Pilosella macranthela*** coll.:
Pilosella macranthela (Nägeli & Peter) Soják;
34. *Pilosella caespitosa* <> *echioides* <> *lactucella* <> *piloselloides*: ***Pilosella wolgensis*** coll.:
Pilosella wolgensis (Zahn) Soják;
35. *Pilosella caespitosa* <> *echioides*: ***Pilosella solacolui*** coll.:
Pilosella solacolui S. Bräut. & Greuter;
36. *Pilosella caespitosa* <> *hoppeana*: ***Pilosella levieri*** coll.:
Pilosella levieri (Peter) Soják [*hoppeana* <> *onegensis*];
37. *Pilosella caespitosa* <> *hoppeana* <> *officinarum*: ***Pilosella abakurae*** coll.:
Pilosella abakurae (Schelk. & Zahn) Soják;
38. *Pilosella caespitosa* <> *hoppeana* <> *officinarum* <> *piloselloides*: ***Pilosella aneimensis*** coll.:
Pilosella aneimensis (Nägeli & Peter) Soják;
39. *Pilosella caespitosa* <> *lactucella*: ***Pilosella floribunda*** coll.:
Pilosella cochlearis Norrl.,
Pilosella floribunda (Wimm. & Grab.) Fr.;
40. *Pilosella caespitosa* <> *lactucella* <> *officinarum*: ***Pilosella iserana*** coll.:
Pilosella iserana (R. Uechtr.) Soják,
Pilosella piloselliflora (Nägeli & Peter) Soják;
41. *Pilosella caespitosa* <> *officinarum*: ***Pilosella flagellaris*** coll.:
Pilosella flagellaris (Willd.) Arv.-Touv.,
Pilosella macrostolona (Gus. Schneid.) Soják,
Pilosella prussica (Nägeli & Peter) Soják;
42. *Pilosella caespitosa* <> *officinarum* <> *piloselloides*: ***Pilosella melinomeles*** coll.:
Pilosella leptoclados (Peter) Soják,
Pilosella melinomeles (Peter) Holub;
43. *Pilosella caespitosa* <> *peleteriana*: ***Pilosella chaetocephala*** coll.:
Pilosella chaetocephala (H. Hofm.) J. Holub;
44. *Pilosella caespitosa* <> *peleteriana* <> *piloselloides*: ***Pilosella dichotoma*** coll.:
Pilosella dichotoma (Lindeb.) Soják;
45. *Pilosella caespitosa* <> *piloselloides*: ***Pilosella polymastix*** coll.:
Pilosella erythrochrista (Nägeli & Peter) S. Bräut. & Greuter,
Pilosella polymastix (Peter) Holub;
46. *Pilosella caespitosa* <> *pseudopilosella*: ***Pilosella pawlowskiella*** coll.:
Pilosella pawlowskiella (Merxm.) Holub;
47. *Pilosella cymosa* <> *echioides*: ***Pilosella setigera*** coll.:
Pilosella setigera Fr.;
48. *Pilosella cymosa* <> *echioides* <> *officinarum*: ***Pilosella crassiseta*** coll.:
Pilosella crassiseta (Peter) Soják;
Pilosella cinereiformis (R. Meissn. & Zahn) S. Bräut. & Greuter
49. *Pilosella cymosa* <> *echioides* <> *officinarum* <> *piloselloides*: ***Pilosella setifolia*** coll.:
Pilosella setifolia (Touton) S. Bräut. & Greuter;
50. *Pilosella cymosa* <> *echioides* <> *piloselloides*: ***Pilosella megatracha*** coll.:
Pilosella megatracha (Borbás) Soják,
Pilosella schneidii (Schack & Zahn) S. Bräut. & Greuter;

51. *Pilosella cymosa* <> *glacialis*: ***Pilosella laggeri*** coll.:
Pilosella laggeri (Rchb. f.) F. W. Schultz & Sch. Bip.;
52. *Pilosella cymosa* <> *glacialis* <> *lactucella*: ***Pilosella tendina*** coll.:
Pilosella tendina (Nägeli & Peter) Soják;
53. *Pilosella cymosa* <> *glacialis* <> *lactucella* <> *officinarum*: ***Pilosella tinctilingua*** coll.:
Pilosella tinctilingua (Zahn) Soják;
54. *Pilosella cymosa* <> *glacialis* <> *officinarum*: ***Pilosella pseudotrichodes*** coll.:
Pilosella pseudotrichodes (Zahn) Soják;
55. *Pilosella cymosa* <> *hoppeana*: ***Pilosella halacsyi*** coll.:
Pilosella halacsyi (Halácsy) Soják;
56. *Pilosella cymosa* <> *lactucella*: ***Pilosella corymbulifera*** coll.:
Pilosella corymbulifera (Arv.-Touv.) Arv.-Touv.;
57. *Pilosella cymosa* <> *lactucella* <> *officinarum*: ***Pilosella stenosoma*** coll.:
Pilosella stenosoma (Nägeli & Peter) Soják;
58. *Pilosella cymosa* <> *lactucella* <> *piloselloides*: ***Pilosella pseudosulphurea*** coll.:
Pilosella pseudosulphurea (Touton) Soják;
59. *Pilosella cymosa* <> *officinarum*: ***Pilosella kalksburgensis*** coll.:
Pilosella cymiflora (Nägeli & Peter) S. Bräut. & Greuter,
Pilosella kalksburgensis (Wiesb.) Soják;
60. *Pilosella cymosa* <> *officinarum* <> *peleteriana*: ***Pilosella fuernrohrii*** coll.:
Pilosella fuernrohrii (Vollm.) S. Bräut. & Greuter;
61. *Pilosella cymosa* <> *officinarum* <> *piloselloides*: ***Pilosella fallacina*** coll.:
Pilosella anchusoides Arv.-Touv.,
Pilosella fallacina (F. W. Schultz) F. W. Schultz,
Pilosella pilosellina (F. W. Schultz) Soják;
62. *Pilosella cymosa* <> *peleteriana*: ***Pilosella hybrida*** coll.:
Pilosella hybrida (Vill.) F. W. Schultz & Sch. Bip.;
63. *Pilosella cymosa* <> *piloselloides*: ***Pilosella ziziana*** coll.:
Pilosella bodewigiana (Zahn) Soják [*cymosa* <> *pavichii*],
Pilosella densiflora (Tausch) Soják,
Pilosella ziziana (Tausch) F. W. Schultz & Sch. Bip.
64. *Pilosella cymosa* <> *piloselloides* <> *pseudopilosella*: ***Pilosella litardiereana*** coll.:
Pilosella litardiereana (Zahn) Soják;
65. *Pilosella echioides* <> *hoppeana*: ***Pilosella balansae*** coll.:
Pilosella balansae (Boiss.) S. Bräut. & Greuter [*hoppeana* <> *procera*],
Pilosella erythrodonta (Zahn) S. Bräut. & Greuter,
Pilosella sterrochaetia (Nägeli & Peter) S. Bräut. & Greuter;
66. *Pilosella echioides* <> *hoppeana* <> *officinarum*: ***Pilosella grossheimii*** coll.:
Pilosella grossheimii (Zahn) Coşkunç. & Beyazoğlu;
67. *Pilosella echioides* <> *hoppeana* <> *officinarum* <> *piloselloides*: ***Pilosella chaetophyton*** coll.:
Pilosella chaetophyton (Zahn) S. Bräut. & Greuter;
68. *Pilosella echioides* <> *hoppeana* <> *piloselloides*: ***Pilosella budensis*** coll.:
Pilosella budensis (Borbás) Soják;
69. *Pilosella echioides* <> *lactucella*: ***Pilosella tephroglauca*** coll.:
Pilosella tephroglauca (Nägeli & Peter) Soják;
70. *Pilosella echioides* <> *lactucella* <> *officinarum*: ***Pilosella tephrophyton*** coll.:
Pilosella tephrophyton (Oborný & Zahn) Soják;
71. *Pilosella echioides* <> *lactucella* <> *piloselloides*: ***Pilosella occidentalis*** coll.:
Pilosella occidentalis (Nyár.) Soják;
72. *Pilosella echioides* <> *officinarum*: ***Pilosella bifurca*** coll.:
Pilosella bifurca (M. Bieb.) F. W. Schultz & Sch. Bip.,
Pilosella rothiana (Wallr.) F. W. Schultz & Sch. Bip.,
Pilosella schelkownikowii (Zahn) Soják [*caucasica* <> *officinarum*];

73. *Pilosella echioides* <> *officinarum* <> *piloselloides*: ***Pilosella heterodoxa*** coll.:
Pilosella euchaetia (Nägeli & Peter) Soják,
Pilosella heterodoxa (Tausch) Soják,
Pilosella heterodoxiformis (Zahn) S. Bräut. & Greuter;
74. *Pilosella echioides* <> *piloselloides*: ***Pilosella auriculoides*** coll.:
Pilosella auriculoides (Láng) Arv.-Touv.,
Pilosella calodon (Peter) Soják,
Pilosella procerigena (Litv. & Zahn) Sennikov [*piloselloides* <> *procera*],
Pilosella samokovensis (T. Georgiev & Zahn) S. Bräut. & Greuter [*echioides* <> *pavichii*];
75. *Pilosella echioides* <> *piloselloides* <> *verruculata*: ***Pilosella pannoniciformis*** coll.:
Pilosella pannoniciformis (Litv. & Zahn) Soják;
76. *Pilosella echioides* <> *verruculata*: ***Pilosella maschukensis*** coll.:
Pilosella maschukensis (Litv. & Zahn) Soják,
Pilosella woronowiana (Zahn) Soják [*procera* <> *verruculata*];
77. *Pilosella galiciana* <> *pseudopilosella*: ***Pilosella pseudogaliciana*** coll.:
Pilosella pseudogaliciana Mateo;
78. *Pilosella galiciana* <> *vahlilii*: ***Pilosella unamunoi*** coll.:
Pilosella unamunoi (C. Vicioso) Mateo;
79. *Pilosella glacialis* <> *hoppeana* <> *lactucella* <> *piloselloides*: ***Pilosella salernicola*** coll.:
Pilosella salernicola (J. Vetter & Zahn) Soják;
80. *Pilosella glacialis hoppeana*: ***Pilosella acutifolia*** coll.:
Pilosella acutifolia (Vill.) Arv.-Touv.,
Pilosella pachypila (Peter) Soják,
Pilosella permutata (Nägeli & Peter) Soják;
81. *Pilosella glacialis* <> *hoppeana* <> *lactucella*: ***Pilosella lathraea*** coll.:
Pilosella brachycoma (Nägeli & Peter) H. P. Fuchs,
Pilosella lathraea (Peter) Soják;
82. *Pilosella glacialis* <> *hoppeana* <> *officinarum*: ***Pilosella basifurca*** coll.:
Pilosella basifurca (Peter) Soják;
83. *Pilosella glacialis* <> *lactucella*: ***Pilosella smithii*** coll.:
Pilosella smithii Arv.-Touv.;
84. *Pilosella glacialis* <> *lactucella* <> *peleteriana*: ***Pilosella aletschensis*** coll.:
Pilosella aletschensis (Zahn) Soják
85. *Pilosella glacialis* <> *lactucella* <> *saussureoides*: ***Pilosella triplex*** coll.:
Pilosella triplex (Peter) Soják;
86. *Pilosella glacialis* <> *officinarum*: ***Pilosella hypoleuca*** coll.:
Pilosella hypoleuca Arv.-Touv.;
87. *Pilosella glacialis* <> *peleteriana*: ***Pilosella subrubens*** coll.:
Pilosella subrubens Arv.-Touv.;
88. *Pilosella glacialis* <> *piloselloides*: ***Pilosella frigidaria*** coll.:
Pilosella frigidaria (Nägeli & Peter) Soják;
89. *Pilosella glacialis* <> *pseudopilosella* <> *saussureoides*: ***Pilosella faurei*** coll.:
Pilosella faurei Arv.-Touv.
90. *Pilosella hoppeana* <> *lactucella*: ***Pilosella viridifolia*** coll.:
Pilosella viridifolia (Peter) Holub;
91. *Pilosella hoppeana* <> *lactucella* <> *vahlilii*: ***Pilosella noguerensis*** coll.:
Pilosella noguerensis Mateo;
92. *Pilosella hoppeana* <> *officinarum*: ***Pilosella hypeurya*** coll.:
Pilosella hypeurya (Peter) Soják;
93. *Pilosella hoppeana* <> *officinarum* <> *piloselloides*: ***Pilosella hypeurygenes*** coll.:
Pilosella hypeurygenes (A. W. Hill) S. Bräut. & Greuter;
94. *Pilosella hoppeana* <> *officinarum* <> *pseudopilosella*: ***Pilosella heteromelana*** coll.:
Pilosella heteromelana (Zahn) Mateo;

95. *Pilosella hoppeana* <> *officinarum* <> *verruculata*: ***Pilosella sedelmeyeriana*** coll.:
Pilosella sedelmeyeriana (Zahn) S. Bräut. & Greuter;
96. *Pilosella hoppeana* <> *peleteriana*: ***Pilosella billyana*** coll.:
Pilosella billyana (de Retz) Mateo;
97. *Pilosella hoppeana* <> *piloselloides*: ***Pilosella ruprechtii*** coll.:
Pilosella arnoserioides (Nägeli & Peter) Soják,
Pilosella biglana (Bornm. & Zahn) S. Bräut. & Greuter [*hoppeana* <> *pavichii*],
Pilosella ruprechtii (Boiss.) Dostál;
98. *Pilosella hoppeana* <> *pseudopilosella*: ***Pilosella byzantina*** coll.:
Pilosella byzantina (Boiss.) P. D. Sell & C. West;
99. *Pilosella hoppeana* <> *saussureoides*: ***Pilosella eglanulosa*** coll.:
Pilosella eglanulosa (Sudre) Mateo;
100. *Pilosella lactucella* <> *officinarum*: ***Pilosella schultesii*** coll.:
Pilosella schultesii (F. W. Schultz) F. W. Schultz & Sch. Bip.,
Pilosella soleiroliana (Arv.-Touv. & Briq.) S. Bräut. & Greuter;
101. *Pilosella lactucella* <> *officinarum* <> *piloselloides*: ***Pilosella paragoga*** coll.:
Pilosella paragoga (Nägeli & Peter) Soják;
102. *Pilosella lactucella* <> *peleteriana*: ***Pilosella auriculiformis*** coll.:
Pilosella auriculiformis (Fr.) F. W. Schultz & Sch. Bip.;
103. *Pilosella lactucella* <> *peleteriana* <> *piloselloides*: ***Pilosella paragogiformis*** coll.:
Pilosella paragogiformis (Käser) Soják;
104. *Pilosella lactucella* <> *piloselloides*: ***Pilosella sulphurea*** coll.:
Pilosella koernickeana (Nägeli & Peter) Soják,
Pilosella sulphurea (Döll) F. W. Schultz & Sch. Bip.;
105. *Pilosella lactucella* <> *pseudopilosella*: ***Pilosella panticosae*** coll.:
Pilosella panticosae Mateo;
106. *Pilosella lactucella* <> *pseudopilosella* <> *vahlilii*: ***Pilosella gudarica*** coll.:
Pilosella gudarica Mateo;
107. *Pilosella lactucella* <> *saussureoides*: ***Pilosella tardiuscula*** coll.:
Pilosella tardiuscula (Peter) Soják;
108. *Pilosella lactucella* <> *saussureoides* <> *vahlilii*: ***Pilosella tremedalis*** coll.:
Pilosella tremedalis Mateo;
109. *Pilosella lactucella* <> *vahlilii*: ***Pilosella pseudovahlilii*** coll.:
Pilosella pseudovahlilii (de Retz) Mateo;
110. *Pilosella officinarum* <> *peleteriana*: ***Pilosella longisquama*** coll.:
Pilosella longisquama (Peter) Holub;
111. *Pilosella officinarum* <> *piloselloides*: ***Pilosella brachiata*** coll.:
Pilosella arida (Freyn) Soják,
Pilosella brachiata (DC.) F. W. Schultz & Sch. Bip.,
Pilosella florentoides (Arv.-Touv.) P. D. Sell & C. West,
Pilosella leptophyton (Nägeli & Peter) S. Bräut. & Greuter,
Pilosella pavichiodes S. Bräut. & Greuter [*officinarum* <> *pavichii*],
Pilosella visianii F. W. Schultz & Sch. Bip.;
112. *Pilosella officinarum* <> *pseudopilosella*: ***Pilosella pintodasilvae*** coll.:
Pilosella pintodasilvae (de Retz) Mateo;
113. *Pilosella officinarum* <> *saussureoides*: ***Pilosella subtardans*** coll.:
Pilosella subtardans (Nägeli & Peter) Soják;
114. *Pilosella officinarum* <> *verruculata*: ***Pilosella kozlowskyana*** coll.:
Pilosella kozlowskyana (Zahn) Soják;
115. *Pilosella peleteriana* <> *piloselloides*: ***Pilosella promeces*** coll.:
Pilosella anobrachia (Arv.-Touv. & Gaut.) S. Bräut. & Greuter,
Pilosella mayeri (Vollm.) Soják,
Pilosella promeces (Peter) Holub;

116. *Pilosella peleteriana* <> *pseudopilosella*: ***Pilosella vansoestii*** coll.:
Pilosella vansoestii (de Retz) Mateo;
117. *Pilosella peleteriana* <> *saussureoides*: ***Pilosella portae*** coll.:
Pilosella portae (T. Durand & B. D. Jackson) Mateo & Greuter;
118. *Pilosella piloselloides* <> *pseudopilosella*: ***Pilosella fulviseta*** coll.:
Pilosella fulviseta (Bertol.) Soják;
119. *Pilosella piloselloides* <> *pseudopilosella* <> *saussureoides*: ***Pilosella tephrodes*** coll.:
Pilosella tephrodes (Nägeli & Peter) S. Bräut. & Greuter;
120. *Pilosella piloselloides* <> *verruculata*: ***Pilosella sintenisii*** coll.:
Pilosella sintenisii (Freyn) Soják;
121. *Pilosella pseudopilosella* <> *saussureoides*: ***Pilosella tardans*** coll.:
Pilosella tardans (Peter) Soják;
122. *Pilosella saussureoides* <> *vahlilii*: ***Pilosella caballeroi*** coll.:
Pilosella caballeroi (Mateo) Mateo;

Appendix: Nomenclatural validations and comments

Pilosella anobrachia (Arv.-Touv. & Gaut.) S. Bräut. & Greuter, **comb. nov.** ≡ *Hieracium anobrachion* Arv.-Touv. & Gaut., Hieracith. 10: [in schedis] Gall. No. 547. 1900.

Pilosella aurantiaca subsp. ***auropurpurea*** (Nägeli & Peter) S. Bräut. & Greuter, **comb. nov.** ≡ *Hieracium aurantiacum* subsp. *auropurpureum* Nägeli & Peter, Hierac. Mitt.-Eur. 1: 295. 1885.

Pilosella balansae (Boiss.) S. Bräut. & Greuter, **comb. nov.** ≡ *Hieracium balansae* Boiss., Diagn. Pl. Orient., ser. 2, 6: 119. 1859.

Pilosella biglana (Bornm. & Zahn) S. Bräut. & Greuter, **comb. nov.** ≡ *Hieracium biglanum* Bornm. & Zahn in Repert. Spec. Nov. Regni Veg. 16: 181. 1919.

Pilosella bonaquae (Buttler & W. Lippert) S. Bräut. & Greuter, **comb. nov.** ≡ *Hieracium bonaquae* Buttler & W. Lippert in Strid, Mount. Fl. Greece 2: 608. 1991.

Pilosella brzovecensis (Horvat & Pawł.) S. Bräut. & Greuter, **comb. nov.** ≡ *Hieracium brzovecense* Horvat & Pawł. in Acta Soc. Bot. Poloniae 32: 486. 1963.

Pilosella chaetophyton (Zahn) S. Bräut. & Greuter, **comb. nov.** ≡ *Hieracium chaetophyton* Zahn in Věstn. Tiflissk. Bot. Sada, ser. 2, 3-4: 32. 1927.

Pilosella cinereiformis (R. Meissn. & Zahn) S. Bräut. & Greuter, **comb. nov.** ≡ *Hieracium cinereiforme* R. Meissn. & Zahn in Engler, Pflanzenr. 82: 1390. 1923.

The name *Hieracium cinereiforme* first appeared in a letter that Zahn addressed to Touton and was published by the latter (in Jahrb. Nassauischen Vereins Naturk. 73: 72, 1921). However, conditions for valid publication were not met there, as no descriptive elements referring to the species itself are included (see also comments under *Pilosella hypeurygenes*, below). Zahn's co-author "Meißner" could be identified as Richard Meißner, of Bernburg (c. 1855-1915), of whom an obituary notice can be found in Zobel (Verz. Anhalt Phan. 4: III-IV. 1920).

Pilosella collina (Gochnat) Soják in Preslia 43: 185. 1971 ≡ *Hieracium collinum* Gochnat, Tent. Med.-Bot. Cichorac.: 17. 1808. – Lectotype (designated here): The illustration of *Hieracium Collinum* in Gochnat, Tent. Med.-Bot. Cichorac.: t. I. 1808. – Epitype (designated here): "*Hieracium collinum* Gochn. [manu Copin de Miribel]"; "*Hieracium angustifolium* Mt. Cenis" [manu Bonjean?]; "*hier. angustifol.* M. Cenis est *h. collinum* Gochn." [manu Villars], [Bonjean?] in herb. Villars (GRM 1837.27543, photo!) [= ***Pilosella cymosa*** (L.) F. W. Schultz & Sch. Bip.].

Gochnat's *Hieracium collinum* is a long standing source of confusion and debate. Nägeli & Peter (Hierac. Mitt.-Eur. 1: 298. 1885) used it for the species that previous

authors, and again Zahn (in Engler, Pflanzenr. 82: 1268. 1923), knew al *H. pratense* Tausch 1828 and is now generally designated as *H. caespitosum* Dumort. 1827. Zahn (l.c.: 1388, and elsewhere in his writings) included it in *H. fallax* Willd. 1809, a name that for priority reasons it should have displaced. The name *H. collinum* is not currently used in any sense. Gochnat's original illustration shows fair similarity with *H. caespitosum*, *H. fallax* and *H. cymosum* L. 1753 but does not coincide completely with any of them, so that it cannot be interpreted with full certainty.

The question of possible type material is still open (pers. comm. by Günter Gottschlich, Tübingen). There are no specimens of either Gochnat or his mentor Villars at Strasbourg (STR). One specimen labelled *Hieracium collinum* Gochnat is present in Villars' herbarium in Grenoble, of which Vincent Poncet kindly sent us a photograph and which, as was confirmed by Gottschlich, belongs to *H. cymosum*. However, it originates from Mt Cenis, so it can hardly be original material for *H. collinum*, said to have been found near Marlenheim, Alsatia.

In order to obviate the need to either take up the name *Pilosella collina* (Gochnat) Soják in an unfamiliar sense or propose its formal rejection, we designate the original illustration (being the single secure original element available) as the lectotype of *Hieracium collinum* and, in the same time, designate an epitype that belongs to *H. cymosum*, a name much older than *H. collinum*.

Pilosella cymiflora (Nägeli & Peter) S. Bräut. & Greuter, **comb. nov.** ≡ *Hieracium cymiflorum* Nägeli & Peter, Hierac. Mitt.-Eur. 1: 424. 1885.

Pilosella cymosa subsp. ***vaiillantii*** (Tausch) S. Bräut. & Greuter, **comb. nov.** ≡ *Hieracium vaiillantii* Tausch in Flora 11, Ergänzungsbl. 1: 57. 1828 ≡ *Hieracium cymosum* subsp. ***vaiillantii*** (Tausch) Nyman, Consp. Fl. Eur.: 452. 1879 ≡ *Pilosella vaiillantii* (Tausch) Soják in Preslia 43: 184. 1971.

Pilosella derubella (Gottschl. & Schuhw.) S. Bräut. & Greuter, **comb. nov.** ≡ *Hieracium derubellum* Gottschl. & Schuhw. in Ber. Bayer. Bot. Ges. 69-70: 148. 2000.

Pilosella echioides subsp. ***proceriformis*** (Nägeli & Peter) S. Bräut. & Greuter, **comb. nov.** ≡ *Hieracium echioides* subsp. ***proceriforme*** Nägeli & Peter, Hierac. Mitt.-Eur. 1: 487. 1885 ≡ *Hieracium proceriforme* (Nägeli & Peter) Zahn in Engler, Pflanzenr. 82: 1369. 1923 ≡ *Pilosella proceriformis* (Nägeli & Peter) Soják in Folia Geobot. Phytotax. 6: 218. 1971.

Pilosella erythrochrista (Nägeli & Peter) S. Bräut. & Greuter, **comb. nov.** ≡ *Hieracium erythrochristum* (Nägeli & Peter) Üksip in Komarov, Fl. SSSR 30: 520. 1960 ≡ *Hieracium arvicola* subsp. ***erythrochristum*** Nägeli & Peter, Hierac. Mitt.-Eur. 1: 668. 1885.

This name must be used for the species currently known as *Hieracium arvicola* Nägeli & Peter (Hierac. Mitt.-Eur. 1: 666. 1885) or *Pilosella arvicola* Soják (in Preslia 43: 186. 1971), two illegitimate names: both were applied, upon publication, to a species that included the type of the earlier and legitimate *H. assimilatum* (Norrl.) Norrl. (in Mela, Lyhyk. Kasvioppi Kasvio, ed. 2: 2: 212, after Aug. 1884) = *Pilosella septentrionalis* subsp. ***assimilata*** Norrl. (in Acta Soc. Fauna Fl. Fenn. 2(4): 147, Feb.-June 1884).

Nägeli & Peter (l.c.: 672) treated *Hieracium assimilatum* as a subspecies of *H. arvicola*. Thanks to the kindness of Alexander Sennikov, Helsinki, we could study excellent digital images of original specimens of, or *H. assimilatum*, which we found to be indistinguishable from *Pilosella floribunda*. This leaves the name *H. arvicola* (typified by the type of Nägeli & Peter's subsp. ***arvicola*** – see ICBN Art. 7.5) as the oldest binomial that belongs to the present species. Nevertheless, being illegitimate, it is unavailable for use, same as the homotypic *P. arvicola*.

The next possible candidate for naming the present species appeared to be *Hieracium curvulum* Norrl. (in Mela, Suomen Kouluksvio, ed. 4: 526. 1899), treated

by Zahn (1923: 1476) as a subspecies of *H. arvicola*. Sennikov again kindly provided type photographs, which show a plant that we consider to belong to *Pilosella piloselloides* subsp. *praealta*.

Pilosella erythrodonta (Zahn) S. Bräut. & Greuter, **comb. nov.** ≡ *Hieracium erythrodontum* Zahn in Vandas, Reliq. Formán.: 347. 1909 [et in Engler, Pflanzenr. 82: 1376. 1923].

We were at first disinclined to accept the basionym as validly published in 1909, for exactly the same reasons as mentioned below under *Pilosella hypeurygenes*. When proposing the new species *Hieracium erythrodontum*, Zahn described in detail the equally new *H. erythrodontum* subsp. *philippopolitanum* and also provided descriptive matter for subsp. *erythrodontum*, but apparently none for the species as such. On second thoughts, we accept that the short paragraph intercalated between the subspecies descriptions, while not explicitly referring to the species as a whole, can be considered as an implicit species diagnosis. As Zahn mentions differences from two other *Hieracium* species, he must logically have had the whole new species in mind.

Pilosella fuernrohrrii (Vollm.) S. Bräut. & Greuter, **comb. nov.** ≡ *Hieracium fuernrohrrii* Vollm. in Denkschr. Königl. Bot. Ges. Regensburg 9: 72. 1905.

Pilosella heterodoxiformis (Zahn) S. Bräut. & Greuter, **comb. nov.** ≡ *Hieracium heterodoxiforme* Zahn in Engler, Pflanzenr. 82: 1514. 1923.

The name *Hieracium heterodoxiforme* Zahn first appears in a paper by Touton (in Jahrb. Nassauischen Vereins Naturk. 74: 38. 1922), where it is not, however, validly published for lack of a description of the species. Only the three constituent subspecies are described, but their names are not validly published either (ICBN, Art. 43.1). The situation is thus the same as for *H. hypeurygenes*, mentioned below. Subsequently, when he validly published *H. heterodoxiforme*, Zahn (l.c. 1923) adopted a different circumscription for the species, restricting it to one of the three original subspecies, for which he maintained the former designation subsp. *nassovicum*. As that subspecies is coextensive with the species, it included the type of the species name. This contravenes the present nomenclatural rules (ICBN, Art. 26.1), and yet again, *H. hypeurygenes* subsp. *nassovicum* fell short of valid publication. It shares this fate with the binomial *H. nassovicum*, proposed by Gottschlich (in Feddes Repert. 108: 105. 1997) as a new combination but for which there is no basionym.

Pilosella hoppeana subsp. *macrantha* (Ten.) S. Bräut. & Greuter, **comb. nov.** ≡ *Hieracium pilosella* var. *macranthum* Ten., Fl. Napol. 4: 114. 1830 ≡ *Hieracium macranthum* (Ten.) Ten., Fl. Napol. 5: 190. 1836 ≡ *Pilosella macrantha* (Ten.) F. W. Schultz & Sch. Bip. in Flora 45: 422. 1862 ≡ *Hieracium pilosella* subsp. *macranthum* (Ten.) Arcang., Comp. Fl. Ital.: 435. 1882 ≡ *Hieracium hoppeanum* subsp. *macranthum* (Ten.) Nägeli & Peter, Hierac. Mitt.-Eur. 1: 125. 1885.

Pilosella hypeurygenes (A. W. Hill) [Coşkunç. & Beyazoğlu in Edinburgh J. Bot. 59: 320. 2002, **comb. inval., ex**] S. Bräut. & Greuter, **comb. nov.** ≡ *Hieracium hypeurygenes* [Zahn in Věstn. Tiflissk. Bot. Sada, ser. 2, 3-4: 32. 1927, **nom. inval., ex**] A. W. Hill, Index Kew., Suppl. 8: 114. 1933.

One of the tricky nomenclatural messes alas typical for Zahn's *Hieracium* work. When he proposed the new species *H. hypeurygenes*, Zahn did not describe it, but instead he described the three new subspecies he recognized in it. As he did not describe the taxon as Art. 41.3(a) of the ICBN mandates (none of the subspecies is, of course, co-extensive with the species), neither the species name nor (ICBN, Art. 43.1) any of the subspecies names were validly published. When in 1933 the species name was listed as accepted in the Index Kewensis the situation was different, in so far as Art. 41.3(b) permits validation by reference to a previously published description of a taxon. The difference between *the* and *a* is subtle but logically justified, and no doubt intentional. One must thus accept *Hieracium hypeurygenes* A. W. Hill as be-

ing validated by reference to Zahn's 1927 description of *H. hypeurygenes* subsp. *hypeurygenes*. Coşkunçelebi & Beyazoğlu, when proposing the combination *Pilosella hypeurygenes* with reference to Zahn, did essentially the same as Hill had done – but they were publishing in 2002. Reference to a Latin description was not then sufficient to validate the name of a new taxon: indication of a type specimen by use of the word “type” or an equivalent, and of the herbarium of deposit, would have been necessary to obtain the benefit of Art. 33.7(d) and validate the intended combination.

Pilosella leptophyton (Nägeli & Peter) S. Bräut. & Greuter, **comb. nov.** ≡ *Hieracium leptophyton* Nägeli & Peter, Hierac. Mitt.-Eur. 1: 642, 827. 1885.

Pilosella merxmuelieriana (S. Bräut.) S. Bräut. & Greuter, **comb. nov.** ≡ *Hieracium merxmuelierianum* S. Bräut. in Bot. Jahrb. Syst. 107: 5. 1985.

Pilosella moechiadia (Peter) S. Bräut. & Greuter, **comb. nov.** ≡ *Hieracium moechiadium* Peter in Bot. Jahrb. Syst. 5: 491. 1884 ≡ *Hieracium cineraria* subsp. *moechiadium* (Peter) Nägeli & Peter, Hierac. Mitt.-Eur. 1: 665. 1885

Pilosella muscelii (Prodán) S. Bräut. & Greuter, **comb. nov.** ≡ *Hieracium muscelii* Prodán in Bul. Şti. Acad. Republ. Populare Romîne, Sect. Biol. Şti. Agric., Ser. Bot. 9: 311. 1957.

Pilosella nevadensis (Arv.-Touv.) Mateo & Greuter, **comb. nov.** ≡ *Hieracium pilosella* var. *nevadense* Arv.-Touv., Hier. Gall. Hisp. Cat.: 7. 1913 ≡ *Hieracium nevadense* (Arv.-Touv.) Prain, Index Kew., Suppl. 5: 130. 1921.

Pilosella notha (Huter) [Soják in Čas. Nár. Muz., Odd. Přír. 150: 139. 1982, comb. inval., ex] S. Bräut. & Greuter, **comb. nov.** ≡ *Hieracium nothum* Huter, Fl. Gefäss-Pfl. Höhlenstein: 30. 1872.

Soják, in 1982, proposed the same combination but gave an earlier reference (Huter in Österr. Bot. Z. 20: 338. 1870) for the intended basionym. In that place, *Hieracium nothum* appears as a nomen nudum, merely with an indication of the locality and supposed parentage.

Pilosella pavichiodes S. Bräut. & Greuter, **sp. nov.** – Type: Romania, reg. Hunedoara, in quercetis penes vicum Petreşti ad Sebeş, Borza (CL). – Latin description: see Borza in Feddes Repert. Spec. Nov. Regni Veg. 61: 92-92. 1958, sub *Hieracium pavichiodes*, nom. inval. [sine design. typi].

Pilosella piloselloides subsp. *bauhinii* (Schult.) S. Bräut. & Greuter, **comb. nov.** ≡ *Hieracium bauhinii* Schult. in Besser, Prim. Fl. Galiciae Austriac. 2: 149. 1809 (post 16 Mar.); et Schult., Observ. Bot.: 164. 1809 (sero) ≡ *Pilosella bauhinii* (Schult.) Arv.-Touv. in Bull. Soc. Dauphin. Echange Pl.: 280. 1880 ≡ *Hieracium magyaticum* subsp. *bauhinii* (Schult.) Nägeli & Peter, Hierac. Mitt.-Eur. 1: 592. 1885.

Pilosella piloselloides subsp. *floccosa* (Nägeli & Peter) S. Bräut. & Greuter, **comb. nov.** ≡ *Hieracium florentinum* subsp. *floccosum* Nägeli & Peter, Hierac. Mitt.-Eur. 1: 550. 1885.

Pilosella piloselloides subsp. *magyarica* (Peter) S. Bräut. & Greuter, **comb. nov.** ≡ *Hieracium magyaticum* Peter in Bot. Jahrb. Syst. 5: 217. 1884 ≡ *Hieracium bauhinii* subsp. *magyaticum* (Peter) Zahn in Neue Denkschr. Allg. Schweiz. Ges. Gesamnten Naturwiss. 40: 703. 1906.

Pilosella piloselloides subsp. *praealta* (Gochnat) S. Bräut. & Greuter, **comb. nov.** ≡ *Hieracium praealtum* Gochnat, Tent. Med.-Bot. Cichorac.: 17. 1808 ≡ *Pilosella praealta* (Gochnat) F. W. Schultz & Sch. Bip. in Flora 45: 429. 1862 ≡ *Hieracium florentinum* subsp. *praealtum* (Gochnat) Nägeli & Peter, Hierac. Mitt.-Eur. 1: 539. 1885 ≡ *Hieracium piloselloides* subsp. *praealtum* (Gochnat) Zahn in Hegi, Ill. Fl. Mitt.-Eur. 6: 1230. 1929.

Pilosella piloselloides subsp. *rubrobauhinii* (Schelk. & Zahn) S. Bräut. & Greuter, **comb. nov.** ≡ *Hieracium bauhinii* subsp. *rubrobauhinii* Schelk. & Zahn in Věstn. Tiflissk. Bot. Sada 29: 4. 1913 ≡ *Hieracium rubrobauhinii* (Schelk. & Zahn) Üksip in Komarov, Fl. SSSR 30: 460. 1960 ≡ *Pilosella rubrobauhinii* (Schelk. & Zahn) Sennikov in Bot. Žurn. 83(3): 69. 1998.

Pilosella portae (T. Durand & B. D. Jackson) Mateo & Greuter, **comb. nov.** ≡ *Hieracium silvaticum* Porta, Veg. Itin. Iber.: 45. 1892; et in Atti Imp. Regia Accad. Agiati Rovereto, ser. 2, 9: 45?. 1892 [non *Hieracium sylvaticum* (L.) Gouan 1773] ≡ *Hieracium portae* [Willk., Suppl. Prodr. Fl. Hispan.: 118. 1893, nom. prov., ex] T. Durand & B. D. Jackson, Index Kew., Suppl. 1: 210. 1902.

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Pilosella sedelmeyeriana (Zahn) S. Bräut. & Greuter, **comb. nov.** ≡ *Hieracium sedelmeyerianum* Zahn in Věstn. Tiflissk. Bot. Sada, ser. 2, 3-4: 28. 1927.

Pilosella setifolia (Touton) S. Bräut. & Greuter, **comb. nov.** ≡ *Hieracium setifolium* Touton in Jahrb. Nassauischen Vereins Naturk. 74: 41. 1922.

Pilosella solacolui [Holub in Folia Geobot. Phytotax. 12: 306. 1977, basion. inval., ex] S. Bräut. & Greuter, **sp. nov.** – Type: Romania, “(Crangu M.) R.S. [Râmnicu-Sărat]”, 1911, *Brândză* (CL 07071). – Latin Description: see Nyárády in Săvulescu, Fl. Rep. Pop. Române 10: 723. 1965, sub *Hieracium solacolui* Prodán (Fl. Român., ed. 2: 1144. 1939, nom. inval. [sine diagn. lat.] ex Nyár., l.c., nom. inval. [sine design. typi]).

We are indebted to Irina Goia, Cluj, for providing us with a whole series of detailed digital images of the type specimen.

Pilosella soleiroliana (Arv.-Touv. & Briq.) S. Bräut. & Greuter, **comb. nov.** ≡ *Hieracium soleirolianum* Arv.-Touv. & Briq. in Annuaire Conserv. Jard. Bot. Genève 5: 108. 1901 ≡ *Hieracium schultesii* subsp. *soleirolianum* (Arv.-Touv. & Briq.) Zahn in Engler, Pflanzenz. 82: 1217. 1923.

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Pilosella subdecolorans (Norrl.) S. Bräut. & Greuter, **comb. nov.** ≡ *Hieracium subdecolorans* Norrl. in Acta Soc. Fauna Fl. Fenn. 3(4): 69. 1888.

Pilosella tephrodes (Nägeli & Peter) S. Bräut. & Greuter, **comb. nov.** ≡ *Hieracium tephrodes* Nägeli & Peter, Hierac. Mitt.-Eur. 1: 641, 827. 1885.

Pilosella verruculata subsp. *akinfiwii* (Woronow & Zahn) S. Bräut. & Greuter, **comb. nov.** ≡ *Hieracium incanum* subsp. *akinfiwii* Woronow & Zahn in Věstn. Tiflissk. Bot. Sada 12: 13. 1908 ≡ *Pilosella akinfiwii* (Woronow & Zahn) Sennikov in Bot. Žurn. 83(3): 62. 1998.

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