

## Lectotypification of some names in *Jovibarba* and *Sempervivum* (Crassulaceae)

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### Summary

Letz, R. & Marhold, K.: Lectotypification of some names in *Jovibarba* and *Sempervivum* (Crassulaceae). – Taxon 45: 111-116. 1996. – ISSN 0040-0262.

Lectotypes are designated for four Linnaean names for taxa belonging at present to the genera *Jovibarba* and *Sempervivum*: *S. globiferum* ( $\equiv$  *J. globifera*), *S. hirtum* ( $\equiv$  *J. globifera* subsp. *hirta*), *S. arachnoideum*, and *S. montanum*. In addition, epitypes are designated for *S. arachnoideum* and *S. montanum* as well as a lectotype for *S. soboliferum* Sims, a synonym of *J. globifera*.

During work by the first author on the genera *Jovibarba* and *Sempervivum* in the Carpathians and E. Alps it was necessary to consider the typification of four Linnaean names for taxa belonging at present to these genera. The name *S. tectorum* L., providing the type of *Sempervivum*, had already been lectotypified (Jarvis & al., 1993: 87).

***Sempervivum globiferum* L.**, Sp. Pl.: 464. 1753  $\equiv$  *Jovibarba globifera* (L.) J. Parn. in Bot. J. Linn. Soc. 103: 219. 1990. – Lectotype (designated here): Herb. Linn. No. 632.1 (LINN).

= *Sempervivum soboliferum* Sims in Bot. Mag.: ad t. 1457. 1812. – Lectotype (designated here): [icon in] Bot. Mag.: t. 1457. 1812.

The protologue (Linnaeus, 1753: 464) reads:

4. *Sempervivum (globiferum)* foliis ciliatis, propaginibus globosis.  
*Sempervivum* foliis radicalibus in globum congestis ciliatis, propaginibus globosis. *Hort. cliff.* 180. *Roy. lugdb.* 457.  
*Sedum majus vulgari simile, globulis decidentibus. Moris. hist.* 3. p. 472. s. 12. t. 7. f. 18.  
*Sedum vulgari magno simile. Bauh. hist.* 3. p. 688.  
*Habitat in Rutheno D. Gmelin.* 2]

The final line refers to a specimen Linnaeus received from J. G. Gmelin, collected in Ruthenia [southern European Russia]. There is a specimen in Linnaeus's own herbarium (No. 632.1, LINN; see Savage, 1945: 87) bearing the symbol for the western edge of Asia (cf. Savage, 1945: vii; Stearn, 1957: 106), the species number in *Species plantarum* ("4"), the specific epithet "*globuliferum*" at the bottom of the sheet, and an annotation "*Sempervivum hexagynum. Sempervivum 2dum Hort. Etiss.*" (cf. Savage, 1945: 87) on the verso of the sheet in Linnaeus's handwriting. There is a slight difference in the spelling of the epithet, but no species with an epithet "*globuliferum*" appears to have been published by Linnaeus. The specimen seems to be original material, collected by Gmelin. As pointed out by Tjaden (1969: 168), it appears from Linnaeus's letter to Gmelin of 1744 that the latter had sent a specimen to Linnaeus as "*Sempervivum hexagynum*" which Linnaeus had identified

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as the species he had described in *Hortus cliffortianus*. The symbol for the western edge of Asia could indicate that the specimen had been collected in the European part of Russia, as there are no localities of this species in Asia and the easternmost known occurrence is approximately at 43°E (for a distribution map, see Meusel & al., 1965: 199, as *S. soboliferum*). The specimen fully agrees with the diagnosis and is undoubtedly in accordance with *Jovibarba globifera* subsp. *globifera* as recently used by, e.g., Parnell & Favarger (1993a). There were different opinions on the interpretation of the name *S. globiferum* (for details see Muirhead, 1965; Leute, 1966; Parnell & Favarger, 1990; and for a very detailed history of the misapplication of this name, Tjaden, 1969).

Since a specimen is referred to in the protologue, and it is possible to document that all other original material are illustrations (moreover not corresponding to the genus *Jovibarba*), we designate that specimen as lectotype of *Sempervivum globiferum*.

The name *Sempervivum soboliferum* Sims (in Bot. Mag.: ad t. 1457. 1812; for the history of this name see Tjaden, 1969) is currently considered to be a synonym of the name *Jovibarba globifera* subsp. *globifera*. As there is no original material in the Kew herbarium, where Sims's herbarium is deposited (Stafleu & Cowan, 1985: 612), the obvious lectotype is the illustration accompanying Sims's description. This illustration corresponds well with the current concept of *J. globifera* subsp. *globifera*. In order to avoid any confusion in the future, and to maintain the present interpretation of the name *S. soboliferum*, we here effect the corresponding lectotype designation.

***Sempervivum hirtum* L.**, Cent. Pl. I: 12. 1755 ≡ *Jovibarba globifera* subsp. *hirta* (L.) J. Parn. in Bot. J. Linn. Soc. 103: 219. 1990. – Lectotype (designated here): Herb. Burser XVI(1): 54 (UPS).

The protologue (Linnaeus, 1755: 12) reads (Linnaeus's handwritten additions in his own copy of the *Centuria*, in the library of the Linnean Society of London, are added in square brackets):

33. *Sempervivum (hirtum)* foliis caule petalorumque apicibus hirtis.  
*Sedum majus montanum*, foliis dentatis. *Bauh. pin.* 283.  
*Cotyledon altera montana*. *Clus. II. hist. 2. p.* 63.  
*Habitat in Tau[re]ro Rastadiensi*. [Burserus 2]  
*Descr. Folia* radicalia acuminata, ciliata. *Caulis* subhirsutus, foliis ciliatis villosis. *Petala* valde longa, apice & margine subtus hirta.

There is a specimen of *Sempervivum hirtum* (the basionym of the now widely accepted name, *Jovibarba globifera* subsp. *hirta*) in Linnaeus's own herbarium (No. 632.2, LINN). However, this specimen was sent to Linnaeus by Jacquin in 1768 (Savage, 1945: 87) and thus is not an original element.

The first cited synonym, from Bauhin (1623), can be connected with a specimen in the Burser's herbarium (UPS), vol. XVI(1): 54. This specimen is labelled as "*Sedum majus montanum dentatis foliis* Bauh. *Cotyledon altera montana* Clus. Ad radium Taureri Rastadiensi [Radstädter Tauern, Austria]" (cf. Savage, 1937: 52). From the locality mentioned in the protologue and from Linnaeus's handwritten reference to Burser it is apparent that he based the description of *Sempervivum hirtum* on exactly this specimen. The above-mentioned area of origin of Burser's specimen is in the

supposed contact zone of *Jovibarba globifera* subsp. *hirta* and *J. globifera* subsp. *arenaria* (Koch) J. Parn., where intermediates can occur (Salisburgia, Carinthia; cf. Melzer, 1966). Such an intermediate from S. Tirolia was described by Leute (1966) as *Diopogon arenarius* subsp. *pseudohirtus* Leute. Burser's specimen, however, having cauline leaves wider than the rosette leaves and with a hairy abaxial surface (Moberg & Thulin, pers. comm.), corresponds with the current concept of *J. globifera* subsp. *hirta* (e.g., Parnell & Favarger, 1993a). On the other hand, since there are no other records of the occurrence of either *J. globifera* subsp. *hirta* or the above mentioned intermediate type in the Radstädter Tauern (Wittmann & al., 1987: 369), Burser's indication of provenance should be interpreted to apply in a very wide sense.

Since no other potential type element is mentioned in the protologue, the specimen from Burser's herbarium may well be the holotype. To be on the safe side, we here designate it as the lectotype of *Sempervivum hirtum*.

***Sempervivum arachnoideum* L., Sp. Pl.: 465. 1753.** – Lectotype (designated here): Herb. Clifford: 180, *Sempervivum* No. 5 (BM). – Epitype (designated here): Nord-Tirol, An Felsen vor Vaz Niederleger im Wattenthal, ca. 1700 m, 18 Aug 1902, Handel-Mazzetti (WU) [as *S. doellianum* Lehm.].

The protologue (Linnaeus, 1753: 465) reads:

5. *Sempervivum (arachnoideum)* foliis pilis intertextis, propaginibus globosis.
- Sempervivum* foliis radicalibus in globum congestis: villis reticulatim connexis. *Hort cliff.* 180. \* *Roy. lugdb.* 457.
- Sempervivum rubrum montanum* gnaphaloides. *Col. ecphr.* I. p. 292 t. 291.
- Sedum montanum tomentosum.* *Bauh. pin.* 284.
- Habitat in Alpibus Italiae, Helvetiae.* 2]

The typification of *Sempervivum arachnoideum* is complicated by the fact that two subspecies are reported in recent literature (Huber, 1961; Favarger & Zésiger, 1964; Ricci, 1982; Parnell & Favarger, 1993b; Lippert, 1995). Apart from the typical subspecies there is *S. arachnoideum* subsp. *tomentosum* (C. B. Lehm. & Schnittsp.) Schinz & Thell., based on *S. tomentosum* C. B. Lehm. & Schnittsp., which was described from a cultivated plant of unknown origin. Lehmann & Schnittspahn (1856) stressed among the most important differential characters of the latter taxon the densely arachnoid-hairy, flattened rosettes forming dense cushions. As far as we are aware the only specimen representing original material for this name, and thus the obvious choice of lectotype, is deposited at W, labelled "*Sempervivum tomentosum* L & Sch, cult, C. B. Lehmann in Offenbach a. M." Neither of the two fragments on the sheet, however, possesses a rosette, which is important for proper identification.

There are two chromosomal races, diploid and tetraploid, reported for *Sempervivum arachnoideum*. However, according to Welter (1979), there are no reliable morphological characters to distinguish between diploids and tetraploids, and she suggested polytopism as a likely explanation of this cytological variation. Welter did not comment on the afore-mentioned subspecies. Parnell & Favarger (1993b) are of the opinion that both subspecies contain diploids and tetraploids. Although admitting

some geographical basis for the two taxa, they stress the presence of considerable overlap and the occurrence of intermediates, and consider the subspecies as to be rather ill defined. Lippert (1995: 82-83) interpreted *S. arachnoideum* subsp. *arachnoideum* as diploid taxon distributed in the Alps and Pyrenees (but absent from the southeastern Alps and eastern Pyrenees); and subsp. *tomentosum* as tetraploid taxon distributed in the eastern Pyrenees, southern Alps, and Apennines.

The oldest synonym cited by Linnaeus is Columna's "*Sempervivum rubrum montanum* γναφαλοδες". Columna (1606: 291-293) provided an illustration of a plant that undoubtedly belongs to *Sempervivum arachnoideum*, a very detailed description, and cited the locality of its occurrence as "In Aequico'orum, montibus, & iugis altissimis nudis saxosis meridiei oppositis supra montem Flaminiani, *lo Serrone*, vulgò dictum, supercilium scilicet appellatum". We have identified this locality as Monte Tra le Serre (1590 m) in the Appennino Abruzzese above the town of Fiamignano, province of Rieti, Italy. From the distribution of the chromosome races of *S. arachnoideum*, mapped by Welter (1979), it seems that only tetraploid plants occur in this area. Moreover, herbarium specimens originating from this area (RO, WU) correspond to what is currently called *S. arachnoideum* subsp. *tomentosum*.

Bauhin (1623) provided the phrase name "*Sedum montanum tomentosum*" with reference only to Columna's afore-mentioned polynomial. There is no specimen in Burser's herbarium in UPS which can be connected with this name. Linnaeus (1738) and Royen (1740) used the phrase name "*Sempervivum foliis radicalibus in globum congestis: villis reticulatim connexis*. Hort cliff. 180. \* Roy. lugdb. 457." Linnaeus (1753) considered it as particularly appropriate since he marked the *Hortus Cliffortianus* reference with an asterisk (Stearn, 1957: 162): it refers to a complete plant, and it could be inferred from this that he had seen material in cultivation. There is a specimen in the Clifford herbarium (BM) which can be linked to the synonym in *Hortus cliffortianus* and appears indeed to belong to *Sempervivum arachnoideum*. However, it lacks a rosette and is, therefore, difficult to identify to subspecific level.

As far as we are aware, there are no specimens which are original material in either the herbarium of Royen in Leiden (L) or Linnaeus's herbarium in Stockholm (S).

As the selection of the Columna's illustration, connected with the locality in the Apennines, would conflict with the current concept of *Sempervivum arachnoideum* subsp. *arachnoideum*, we designate the specimen from the Clifford herbarium as the lectotype. However, as it is inadequate for the identification at the subspecific level, we further designate an epitype under Art. 9.7 of the *Code*. The epitype specimen was collected in an area where only the diploid populations occur (according to Welter, 1979).

***Sempervivum montanum* L., Sp. Pl. 465. 1753. – Lectotype (designated here):** Herb. Burser XVI(1): 55 (UPS), three rosette fragments in the lower right corner of the sheet. – Epitype (designated here): Schweiz: Engadin: Piz Padella bei Samaden, am S.-O. Hange des Schafberges, ca. 2300 m, 8 Aug 1906, *Handel-Mazzetti* (WU).

The protologue (Linnaeus, 1753: 465) reads:

5. *Sempervivum (montanum)* foliis integerrimis, propaginibus patulis.  
Sedum rosulis liberis, foliis laevibus. *Hall. helv.* 393.  
Sedum alpinum, rubro magno flore. *Bauh. pin.* 284.

*Sedum majus montanum*, foliis non dentatis, floribus rubentibus.

*Bauh. pin.* 283.

*Sedum minus*, flore rubente. *Besl. eyst. vern.* 6. t. 8. f. 2.

*Habitat in rupibus Helvetiae.* 21

The first cited synonym, “*Sedum rosulis liberis, foliis laevibus*” from Haller (1742), caused a discussion about the identity of *Sempervivum montanum*. Rouy & Camus (1901) argued that this name is based on plants with glabrous leaves (“foliis laevibus”), whereas *S. montanum* has leaves with glandular hairs. However, Burnat (1906) suggested that Haller, in writing “foliis laevibus”, was most probably stressing the difference between *S. montanum* and *S. arachnoideum*, which has arachnoid hairs. Haller’s description corresponds to *S. montanum* except in the number of petals.

There are two cited synonyms from Bauhin (1623). The specimen bearing the polynomial “*Sedum majus montanum foliis non dentatis, floribus rubentibus*”, in Burser’s herbarium (vol. XVI(1): 55, UPS), is identified with *Sempervivum montanum* by Linnaeus in his manuscript *Determinationes in hortum siccum Joachimi Burseri* (Savage, 1937: 53). This specimen also bears Burser’s annotation “In montibus Helveticis”. As Linnaeus interpreted Bauhin’s polynomials according to the Burser herbarium (Savage, 1937; Stearn, 1957: 116-117) this specimen undoubtedly represents original material. However, according to the number of petals, their shape and dark mid-vein, the flowering plants on that sheet belong to *S. arachnoideum* not *S. montanum*. Only three small fragments of rosettes in the lower right corner of the sheet agree with *S. montanum* instead, but because of their fragmentary nature and the absence of flowers it is impossible to be completely sure of this identification. There is no other specimen in the Burser herbarium which might be referable to Bauhin’s polynomials cited in the protologue of *S. montanum*.

The last cited synonym is a polynomial from Besler (1613). The plant depicted there certainly belongs to *Sempervivum montanum*.

After consideration of the above elements from the protologue we here designate the three rosette fragments of the specimen in Burser’s herbarium as the lectotype. In order to fix the application of the name in its traditional sense, we further propose an appropriate epitype, under Art. 9.7 of the *Code*.

#### Acknowledgements

The authors are very grateful to Gina Douglas, librarian of the Linnean Society of London, for the invaluable help with the old literature, to C. E. Jarvis and N. Turland, Linnean Plant Name Typification Project, London, for patient and helpful discussion of the drafts of the manuscript and for the correction of the language of the article. Special thanks go to R. Moberg and M. Thulin, Uppsala, for detailed information on the specimens in Burser’s herbarium as well as to the curators of the herbaria RO, W and WU for their kind help. This work was supported by the Ministry for Science and Research, Vienna, Austria, through the East-West Programme of the Austrian Academy of Sciences (Project No. OWP 58), and the Grant Agency for Science, Bratislava, Slovakia (Grant No. 2/2032/95), which is gratefully acknowledged.

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