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Infrageneric placement of the Southern Hemisphere taxa of *Anemonastrum* and *Knowltonia* earlier included in *Anemone* sensu lato (*Ranunculaceae*)

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Abstract. The genera *Anemonastrum* and *Knowltonia* earlier usually included in *Anemone* sensu lato (*Ranunculaceae: Anemoneae*) were recently proposed to be recognized in expanded circumscriptions, based on molecular phylogenetic findings and partly also morphological and biogeographical evidence. Both these genera contain some representatives that are noteworthy from morphological and biogeographical viewpoints, and the general ranges of these genera (combining the ranges of their included species) demonstrate remarkable continent-scale disjunctions. In particular, *Knowltonia* in its new circumscription (corresponding to *Anemone* sect. *Pulsatilloides* sensu Hoot et al., 2012) contains southern African and some American taxa (mostly South American ones, including *Oreithales*, *Barneoudia*, etc.), and *K. crassifolia* from Tasmania. *Anemonastrum* (corresponding to *Anemone* subg. *Anemonidium* sensu Hoot et al., excluding *Hepatica*) is mainly Eurasian, but it also includes several North American species, as well as *A. antucense* from southern South America and *A. tenuicaule* from New Zealand. Species of the newly outlined *Anemonastrum* and *Knowltonia* were placed in various infrageneric taxa of *Anemone* sensu lato. Following the re-circumscription of genera, it is now timely to nomenclaturally update and partly re-circumscribe the relevant infrageneric taxa earlier treated in *Anemone* sensu lato. Here we propose the following new combinations at the section and subsection ranks: *Knowltonia* sect. *Mexicanae* (Starod.) Mosyakin & de Lange, comb. nov. (incl. *K. mexicana*); sect. *Crassifoliae* (Ulbr.) Mosyakin & de Lange, comb. nov. (incl. *K. crassifolia*); sect. *Rigidae* (Ulbr.) Mosyakin & de Lange, comb. nov. (incl. *Knowltonia hootae* = *Anemone rigida*, *K. hepaticifolia*, *K. moorei*); sect. *Meridium* (Starod.) Mosyakin & de Lange, comb. nov. (incl. *K. helleborifolia* and *K. peruviana*), sect. *Sellowiae* (Hoot) Mosyakin & de Lange, comb. nov. (incl. *K. sellowii* and *K. assisbrasiliensis*); sect. *Oreithales* (Schltdl.) Mosyakin & de Lange, comb. nov. (incl. *K. integrifolia*); sect. *Barneoudia* (Gay) Mosyakin & de Lange, comb. nov. (incl. *K. balliana*, *K. chilensis*, *K. major*); sect. *Pulsatilloides* (DC.) Mosyakin & de Lange, comb. nov.; [sect. *Pulsatilloides*] subsect. *Alchemillifoliae* (Ulbr.) Mosyakin & de Lange, comb. nov. (incl. *K. caffra* and *K. fanninii*), and [sect. *Pulsatilloides*] subsect. *Pinnatifoliae* (Ulbr.) Mosyakin & de Lange, comb. nov. (incl. *K. tenuifolia*). The new species-rank combination *Knowltonia caffra* (Eckl. & Zeyh.) Christenh. & Byng ex Mosyakin & de Lange, comb. nov. is validated. The new subsectional name *Anemonastrum* sect. *Anemonidium* subsect. *Makariri* de Lange & Mosyakin, subsect. nov. is proposed; this new subsection houses *Anemonastrum antucense* from South America and *A. tenuicaule* from New Zealand.

Keywords: *Anemonastrum*, *Anemone*, infrageneric classification, *Knowltonia*, nomenclature, *Ranunculaceae*, Southern Hemisphere, taxonomy

Introduction

In our earlier articles (Mosyakin, 2016, 2018a, b; Mosyakin, de Lange, 2018, and references therein) we discussed extensively the problem of a rational circumscription of genera in the group of *Anemone* L. sensu lato (*Ranunculaceae: Anemoneae*). In general, in these articles we favored a rather narrow circumscription

of genus-rank entities, with recognition of the following genera: (1) *Hepatica* Mill., (2) *Anemonastrum* Holub (including *Anemonidium* (Spach) Holub, *Arsenjevia* Starod., *Jurtsevia* Á. Löve & D. Löve, and *Tamuria* Starod.; corresponding mainly to *Anemone* subgen. *Anemonidium* sensu Hoot et al., 2012, but excluding *Hepatica*), (3) *Knowltonia* (corresponding to *Anemone* subg. *Anemone* sect. *Pulsatilloides* sensu Hoot et al., 2012), (4) *Pulsatilla* Mill., and (5) *Anemone* sensu stricto.

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These genera correspond to the main phylogenetic lineages (clades) outlined in recent molecular phylogenetic studies (e.g., Ehrendorfer, Samuel, 2000, 2001; Schuettpelz et al., 2002; Wang et al., 2009; Meyer et al., 2010; Pfosser et al., 2011; Hoot et al., 2012; Lehtonen et al., 2016; Jiang et al., 2017, and references therein). As reported by Lehtonen et al. (2016), Jiang et al. (2017), Liu et al. (2018b) and some other authors, the clade containing the genus *Clematis* L. (incl. *Archiclematis* (Tamura) Tamura and *Naravelia* Adans.: see Liu et al., 2018a, b) and its sister genus *Anemoclema* (Franch.) W.T.Wang (Wang et al., 2009; Jiang et al., 2017, 2018; Liu et al., 2018a, b) is phylogenetically rooted in *Anemone* sensu lato. Recent comparative analysis of complete chloroplast genomes of taxa of *Anemoclema*, *Anemone*, *Pulsatilla*, and *Hepatica* (Liu et al., 2018b) also indicated the placement of the *Anemoclema* + *Clematis* clade as sister to the *Hepatica* + *Anemonastrum* clade, well within the larger clade of *Anemone* sensu latissimo.

Consequently, if we follow the principles of phylogeny-based taxonomy not recognizing polyphyletic and paraphyletic taxa, we should either (1) unite *Anemone* sensu lato with *Clematis* sensu lato, with numerous new combinations needed and rather confusing nomenclatural and taxonomic outcomes, or (2) recognize several generic segregates from *Anemone* sensu lato, such as *Anemonastrum*, *Hepatica*, *Knowltonia*, *Pulsatilla*, *Anemone* sensu stricto (Mosyakin, 2016, 2018a, b; Mosyakin, de Lange, 2018; Christenhusz et al., 2018, and references therein), and probably also *Eriocapitella* Nakai (as recognized by Christenhusz and Byng in Christenhusz et al., 2018). The second option is preferred here and in our earlier publications (Mosyakin, 2016, 2018a, b; Mosyakin, de Lange, 2018), and is further justified and nomenclaturally implemented by Christenhusz and Byng (Christenhusz et al., 2018).

As suggested by Mosyakin (2016, 2018a) and explicitly proposed by Christenhusz and Byng (in Christenhusz et al., 2018), who validated most of the required species-level combinations and names in *Knowltonia*, this genus in its new much expanded circumscription includes both dry-fruited and fleshy-fruited southern African species, plus some American taxa (mainly from South America), and the geographically isolated Tasmanian *K. crassifolia* (Hook.) Christenh. & Byng. The resulting wider genus, as compared to its traditional rather narrow circumscription (as recognized by Rasmussen, 1979; see also comments in Manning et al.,

2009; Mosyakin, 2018a), is morphologically rather diverse and, in our opinion, is in need of recognition of several morphologically and phylogenetically distinct infrageneric taxa. The corresponding infrageneric taxa have been considered, and some of them validated, by Hoot et al. (2012), mainly as subsections and series of *Anemone* (sensu lato) subg. *Anemone* sect. *Pulsatilloides* DC. Here these infrageneric entities are transferred to *Knowltonia*, in most cases with the change of their rank (the subsections recognized by Hoot et al. (2012) are mainly treated here as sections, etc.). Updated morphological descriptions and/or diagnoses for most of the infrageneric taxa considered below are provided in Hoot et al. (2012); additional taxonomic, nomenclatural, and morphological data on some taxa (species and/or species groups) are available from several other publications (e.g., Ulbrich, 1905, 1906; Starodubtsev, 1989, 1991; Tamura, 1991, 1993, 1995; Ziman et al., 2006, 2008, and references therein).

Validation of new infrageneric combinations in *Knowltonia*

Knowltonia Salisb. sect. *Mexicanae* (Starod.) Mosyakin & de Lange, comb. nov.

Basionym: *Anemonidium* (Spach) Holub sect. *Mexicana* Starod., Bot. Zhurn. (Moscow & Leningrad) 74(9): 1345. 1989. ≡ *Anemone* L. [sect. *Rivularidium* Jancz.] ser. *Mexicanae* (Starod.) Ziman, Bulakh & Kadota, J. Jap. Bot. 81(4): 196. 2006. ≡ *Anemone* L. [subg. *Anemone* sect. *Pulsatilloides* DC.] subsect. *Mexicanae* (Starod.) Hoot, in Hoot & al., Syst. Bot. 37(1): 148. 2012.

Type: *Anemonidium mexicanum* (Kunth.) Starod. (Starodubtsev, 1989), accepted here as ***Knowltonia mexicana*** (Kunth.) Christenh. & Byng.

Species included: *Knowltonia mexicana* (Kunth.) Christenh. & Byng (≡ *Anemone mexicana* Kunth).

Knowltonia Salisb. sect. *Crassifoliae* (Ulbr.) Mosyakin & de Lange, comb. nov.

Basionym: *Anemone* L. [sect. *Rivularidium* Jancz.] ser. *Crassifoliae* Ulbr., Bot. Jahrb. Syst. 37(2): 199. 1905 (as "*Crassifolia*"). ≡ *Anemone* L. [subg. *Rivularidium* (Jancz.) Juz.] sect. *Crassifoliae* (Ulbr.) Tamura, Acta Phytotax. Geobot. 42: 178. 1991, comb. inval. (as "sect. *Crassifolia* Ulbr.", without direct reference to the basionym; see Art. 41.5 of the ICN: Turland et al., 2018). ≡ *Anemone* L. [subg. *Anemone* sect. *Pulsatilloides* DC.] subsect. *Crassifoliae* (Ulbr.) Hoot, in Hoot & al., Syst. Bot. 37(1): 148. 2012.

Type: *Anemone crassifolia* Hook. (the only species included in the protologue; see also Art. 10.8 of the ICN: Turland et al., 2018), now accepted as *Knowltonia crassifolia* (Hook.) Christenh. & Byng.

Species included: *Knowltonia crassifolia* (Hook.) Christenh. & Byng (≡ *Anemone crassifolia* Hook.).

Knowltonia Salisb. sect. *Rigidae* (Ulbr.) Mosyakin & de Lange, comb. nov.

Basionym: *Anemone* L. [sect. *Rivularidium* Jancz.] ser. *Rigidae* Ulbr., Bot. Jahrb. Syst. 37(2): 199. 1905 (as "*Rigida*"). ≡ *Anemone* L. sect. *Rigidae* (Ulbr.) Tamura, Sci. Rep. Coll. Gen. Educ. Osaka Univ. 16: 28. 1967. ≡ *Anemone* L. subgen. *Rigida* (Ulbr.) Tamura, Acta Phytotax. Geobot. 42(2): 178. 1991. ≡ *Anemonidium* (Spach) Starod. [subg. *Meridium* Starod. sect. *Meridium* Starod.] subsect. *Rigida* (Ulbr.) Starod., Veterenitsy: sist. evol. [Ветреницы: систематика и эволюция]: 118. 1991. ≡ *Anemone* L. [subg. *Anemone* sect. *Pulsatilloides* DC.] subsect. *Rigidae* (Ulbr.) Hoot, in Hoot & al., Syst. Bot. 37(1): 149. 2012.

Type: *Anemone rigida* Gay (Art. 10.8 of the ICN: Turland et al., 2018), accepted here as *Knowltonia hootae* Christenh. & Byng.

Species included: *Knowltonia hepaticifolia* (Hook. f.) Christenh. & Byng (≡ *Anemone hepaticifolia* Hook. f.), *K. hootae* Christenh. & Byng (≡ *Anemone rigida* Gay, non *Knowltonia rigida* Salisb., nom. illeg.), *K. moorei* (Espinosa) Christenh. & Byng (≡ *Anemone moorei* Espinosa).

Knowltonia Salisb. sect. *Meridium* (Starod.) Mosyakin & de Lange, comb. nov.

Basionym: *Anemonidium* (Spach) Holub sect. *Meridium* Starod., Bot. Zhurn. (Moscow & Leningrad) 74(9): 1345. 1989.

= *Anemonidium* (Spach) Holub [sect. *Meridium* Starod.] subsect. *Helleborifolia* Starod., Bot. Zhurn. (Moscow & Leningrad) 74(9): 1345. 1989. ≡ *Anemone* L. [subg. *Rivularidium* (Jacz.) Juz. sect. *Rivularidium* Jacz.] ser. *Helleborifoliae* Tamura, Acta Phytotax. Geobot. 42(2): 178. 1991 (published as "ser. nov.", with a brief Latin diagnosis). ≡ *Anemone* L. [subg. *Anemone* sect. *Pulsatilloides* DC.] subsect. *Helleborifoliae* (Starod.) Hoot, in Hoot & al., Syst. Bot. 37(1): 148. 2012.

Type: *Anemonidium helleborifolium* (DC.) Starod. (Starodubtsev, 1989), accepted here as *Knowltonia helleborifolia* (DC.) Christenh. & Byng.

Species included: *Knowltonia helleborifolia* (DC.) Christenh. & Byng (≡ *Anemone helleborifolia* DC.), *K. peruviana* (Britton) Christenh. & Byng (≡ *A. peruviana* Britton).

Note: The infrageneric epithet *Meridium* has priority over *Helleborifolia* (*Helleborifoliae* if placed in *Knowltonia* or *Anemone*) if this infrageneric entity is recognized as a section (Art. 11.2 of the ICN: Turland et al., 2018).

Knowltonia Salisb. sect. *Sellowiae* (Hoot) Mosyakin & de Lange, comb. nov.

Basionym: *Anemone* L. [subg. *Anemone* sect. *Pulsatilloides* DC.] subsect. *Sellowiae* Hoot, in Hoot & al., Syst. Bot. 37(1): 148. 2012 (as "*Sellowii*").

Type: *Anemone sellowii* Pritz. (Hoot et al., 2018), accepted here as *Knowltonia sellowii* (Pritz.) Christenh. & Byng.

Species included: *Knowltonia sellowii* (Pritz.) Christenh. & Byng (≡ *Anemone sellowii* Pritz.), *K. assisbrasiliiana* (Kuhlmann & Porto) Christenh. & Byng (≡ *A. assisbrasiliiana* Kuhlmann & Porto).

Knowltonia Salisb. sect. *Oreithales* (Schltdl.) Mosyakin & de Lange, comb. nov.

Basionym: *Oreithales* Schltdl., Linnaea 27: 559. 1856. ≡ *Anemone* L. [subg. *Anemone* sect. *Pulsatilloides* DC.] subsect. *Oreithales* (Schltdl.) Hoot, in Hoot & al., Syst. Bot. 37(1): 149. 2012. ≡ *Capethia* Britton, Ann. New York Acad. Sci. 6: 235. 1891, nom. illeg.

Type: *Oreithales integrifolia* (DC.) Schltdl. (the only species included in the genus *Oreithales* in the protologue), accepted here as *Knowltonia integrifolia* (DC.) Christenh. & Byng.

Species included: *Knowltonia integrifolia* (DC.) Christenh. & Byng. (≡ *Hepatica integrifolia* DC. ≡ *Anemone integrifolia* (DC.) Spreng. ≡ *Oreithales integrifolia* (DC.) Schltdl. ≡ *Capethia integrifolia* (DC.) Britton).

Knowltonia Salisb. sect. *Barneoudia* (Gay) Mosyakin & de Lange, comb. nov.

Basionym: *Barneoudia* Gay, Fl. Chil. 1: 29, t. 1. 1845. ≡ *Anemone* L. sect. *Barneoudia* (Gay) Prantl, in Engler & Prantl, Nat. Pflanzenfam. 3(2): 62. 1891. ≡ *Anemone* L. [subg. *Anemone* sect. *Pulsatilloides* DC.] subsect. *Barneoudia* (Gay) Hoot, in Hoot & al., Syst. Bot. 37(1): 149. 2012.

Type: *Barneoudia chilensis* Gay (the only species included in the genus *Barneoudia* in the protologue), accepted here as *Knowltonia chilensis* (Gay) Christenh. & Byng.

Species included: *Knowltonia balliana* (Britton) Christenh. & Byng (≡ *Barneoudia balliana* Britton ≡ *Anemone balliana* (Britton) Hoot), *K. chilensis* (Gay)

Christenh. & Byng (≡ *Barneoudia chilensis* Gay ≡ *Anemone chilensis* (Gay) Kurtz), *K. major* (Phil.) Christenh. & Byng (≡ *Barneoudia major* Phil. ≡ *Anemone major* (Phil.) F. Meigen).

Knowltonia Salisb. sect. ***Knowltonia***

≡ *Anemone* L. sect. *Knowltonia* (Salisb.) Prantl, in Engler & Prantl, Nat. Pflanzenfam. 3(2): 62. 1891. ≡ *Anemone* L. ser. *Knowltonia* (Salisb.) J.C. Manning & Goldblatt, Bothalia 39(2): 218. 2009.

Type (typus generi): *Knowltonia rigida* Salisb. (the only species included in *Knowltonia* by Salisbury, 1796), nom. illeg. (*Adonis capensis* L. cited in synonymy; Art. 52.1 and 52.2 of the ICN: Turland et al., 2018), now accepted as ***Knowltonia capensis*** (L.) Huth.

Species included: *Knowltonia anemonoides* H. Rasmussen (≡ *Anemone anemonoides* (H. Rasmussen) J.C. Manning & Goldblatt), *K. bracteata* Harv. ex J. Zahlbr. (≡ *A. bracteata* (Harv. ex J. Zahlbr.) J.C. Manning & Goldblatt), *K. brevistylis* Szyszyl. (≡ *A. brevistylis* (Szyszyl.) J.C. Manning & Goldblatt), *K. cordata* H. Rasmussen (≡ *A. cordata* (H. Rasmussen) J.C. Manning & Goldblatt), *K. filia* (L. f.) T. Dur. & Schinz (≡ *A. filia* (L. f.) J.C. Manning & Goldblatt), *K. capensis* (L.) Huth (≡ *A. knowltonia* Burt Davy), *K. vesicatoria* (L. f.) Sims (≡ *A. vesicatoria* (L. f.) Prantl), *K. transvaalensis* Szyszyl. (≡ *A. transvaalensis* (Szyszyl.) Burt Davy). See further taxonomic and morphological information in Rasmussen (1979) and Manning et al. (2009; taxa treated as species of *Anemone* sensu lato). Intraspecific taxa recognized by Rasmussen (1979) and Manning et al. (2009) are not considered here.

Knowltonia Salisb. sect. ***Pulsatilloides*** (DC.) Mosyakin & de Lange, comb. nov.

Basionym: *Anemone* sect. *Pulsatilloides* DC., Syst. Nat. 1: 195. 1817. ≡ *Anemone* L. subgen. *Pulsatilloides* (DC.) Juz., Flora URSS [Флора СССР] 7: 256. 1937, pro parte. ≡ *Pulsatilloides* (DC.) Starod., Veterenitsy: sist. evol. [Ветреницы: систематика и эволюция]: 124. 1991, pro min. parte.

Type: *Anemone capensis* (L.) Lam. (lectotype, designated by Starodubtsev, 1991: 124) (≡ *Knowltonia pulsatilloides* Christenh. & Byng, non *K. capensis* (L.) Huth).

Note: Mosyakin (2018b: 6) already commented that the concept of the genus *Pulsatilloides* as outlined by Starodubtsev (1991), who included in that genus the members of *Anemonastrum* sect. *Anemonastrum* subsect. *Himalayicae* (Ulbr.) Mosyakin together with *Pulsatilloides capensis* (L.) Starod. (now recognized

as *Knowltonia tenuifolia* (L. f.) Mosyakin, incl. *K. pulsatilloides*), *P. glaucifolia* (Franch.) Starod. (now properly accepted as *Anemoclema glaucifolium* (Franch.) W.T. Wang), and *P. begoniifolia* (H. Lév. & Vaniot) Starod. (which is *Anemone begoniifolia* H. Lév. & Vaniot, a member of *Anemone* sensu stricto), is "very unnatural phylogenetically and has not been confirmed by molecular, morphological, and karyological evidence". *Anemone* sect. *Pulsatilloides* as understood and circumscribed by Hoot et al. (2012) appears to be phylogenetically natural, but it was applied in a very wide sense to all taxa placed here and in Christenhusz et al. (2018) in the genus *Knowltonia*. Here the name *Knowltonia* sect. *Pulsatilloides* is restricted only to dry-fruited southern African taxa, which we place in two subsections (see below).

Knowltonia Salisb. sect. ***Pulsatilloides*** subsect. ***Pinnatifoliae*** (Ulbr.) Mosyakin & de Lange, comb. nov.

Basionym: *Anemone* [sect. *Pulsatilloides* DC.] ser. *Pinnatifoliae* Ulbr., Bot. Jahrb. Syst. 37(2): 200 (diag.), 239. 1905.

Type: *Anemone capensis* (L.) Lam. (the only species included in the series in the protologue, cited with the authorship "(L.) DC.") (≡ *Knowltonia pulsatilloides* Christenh. & Byng, non *K. capensis* (L.) Huth).

Species included: *Knowltonia tenuifolia* (L. f.) Mosyakin (incl. *K. pulsatilloides* Christenh. & Byng; see nomenclatural comments and synonymy in Mosyakin, 2018).

Note: If the second species (corresponding to *Atragene capensis* L. ≡ *Anemone capensis* (L.) Lam. sensu stricto) is recognized in this subsection, its correct species-rank name in *Knowltonia* will be *K. pulsatilloides* Christenh. & Byng (see, however, taxonomic and nomenclatural comments in Manning and Goldblatt, 2013, and Mosyakin, 2018a).

Knowltonia Salisb. sect. ***Pulsatilloides*** subsect. ***Alchemillifoliae*** (Ulbr.) Mosyakin & de Lange, comb. nov.

Basionym: *Anemone* L. [sect. *Pulsatilloides* DC.] ser. *Alchemillifoliae* Ulbr., Bot. Jahrb. Syst. 37(2): 201. 1905 (as "*Alchimillifoliae*"). ≡ *Anemone* L. sect. *Alchemillifoliae* (Ulbr.) Tamura, Acta Phytotax. Geobot. 42(2): 179. 1991 (as "*Archimillifolia*", sphalm.). ≡ *Anemone* L. [subg. *Anemone* sect. *Pulsatilloides* DC.] subsect. *Alchemillifoliae* (Ulbr.) Hoot, in Hoot et al., Syst. Bot. 37(1): 149. 2012, pro parte (excl. *Anemone tenuifolia*).

Type: *Anemone alchemillifolia* E. Mey. ex Pritz. (Art. 10.8 of the ICN: Turland et al., 2018), a homotypic

synonym of *Knowltonia caffra* (Eckl. & Zeyh.) Christenh. & Byng ex Mosyakin & de Lange, see below.

Species included: *Knowltonia caffra* (≡ *Anemone caffra* (Eckl. & Zeyh.) Harv.), *K. fanninii* (Harv. & Hook. f.) Christenh. & Byng (≡ *A. fanninii* Harv. & Hook. f.); for further taxonomic and morphological information see Manning and Goldblatt (2013; taxa treated in *Anemone* sensu lato).

Note 1: Hoot et al. (2012: 149–150) reported the type of *Anemone* ser. *Alchemillifoliae* Ulbr. as "LECTOTYPE: designated by Tamura (1995): *Anemone caffra* Harv. Gen. S. Afr. Pl. 9. 1838" and commented that "The source of the name "*alchemillifolia*" appears to be *A. alchemillifolia* E. Mey. ex Pritz. (Linnaea 15: 758 [erroneous page citation—S.M. & P.dL.] 1842), synonymous with *Pulsatilla (Anemone) caffra* Eckl. & Zeyh. (Enum. Pl. Afric. Austral. [Ecklon & Zeyher] 1: 1. 1934–35)". However, according to Art. 10.8 of the ICN (Turland et al., 2018), "When the epithet in the name of a subdivision of a genus is identical with or derived from the epithet in one of the originally included species names, the type of the higher-ranking name is the same as that of the species name, unless the original author of the higher-ranking name designated another type". Ulbrich (1905) rather confusingly listed two accepted species of this series as "*A. caffra* (Eckl. et Zeyh.) Harvey" and "*A. fanninii* Harvey" on page 201 (where the name "*alchemillifolia* E. Mey. in Pritzel, Revisio Gen. Anem. 1841" was also mentioned in a footnote), but on pages 188 and 240 of the same publication accepted *A. alchemillifolia* (including "var. *caffra* (Eckl. et Zeyh.) Huth" on page 240) and *A. fanninii*. Consequently, the name *Anemone alchemillifolia* E. Mey. ex Pritz. (an illegitimate and superfluous name because Pritzel (1842: 614) cited *Pulsatilla caffra* Eckl. & Zeyh. in synonymy) is the type of the series and the lectotypification by Tamura (1995) was unnecessary.

Note 2: The name *Anemone caffra* was sometimes cited with the authorship of only Harvey (1838). However, this name is a nomenclatural combination based on *Pulsatilla caffra* Eckl. & Zeyh. (Ecklon, Zeyher, 1834: 1). Christenhusz and Byng (in Christenhusz et al., 2018: 75) cited the name "*Anemone caffra* Harv. Gen. S. Afr. P.: 9. 1838" as the basionym of their new nomenclatural combination *Knowltonia caffra*. Since they failed to cite the correct basionym and the actual place of its valid publication, their new combination is invalid (Art. 41.5 of the ICN: Turland et al., 2018). This combination is validated below with the proper

reference to its basionym. It should be also noted that the combination *Anemone caffra* was validated by Harvey in 1838 by his reference to "*Pulsatilla caffra*. Eck. and Zeyh.", not in 1859 as indicated by Manning and Goldblatt (2013: 6).

Knowltonia caffra (Eckl. & Zeyh.) Christenh. & Byng ex Mosyakin & de Lange, comb. nov.

Basionym: *Pulsatilla caffra* Eckl. & Zeyh., Enum. Pl. Afric. Austral. 1: 1. 1834 [Dec 1834 – Mar 1835]. ≡ *Anemone caffra* (Eckl. & Zeyh.) Harv., Gen. S. Afr. Pl.: 9. 1838. ≡ *Anemone alchemillifolia* E. Mey. ex Pritz., Linnaea 15(6): 614. 1842 (as "*alchemillaefolia*"), nom. illeg. superfl. (*Pulsatilla caffra* cited in synonymy; Art. 52.1 and 52.2 of the ICN: Turland et al., 2018). ≡ *A. alchemillifolia* E. Mey. ex Pritz. var. *caffra* (Eckl. & Zeyh.) Huth, Bull. Herb. Boissier 4: 423. 1896. ≡ *Knowltonia caffra* "(Harv.)" Christenh. & Byng, Global Fl. 4: 75. 2018, nom. inval. (Art. 41.5 of the ICN: Turland et al., 2018).

Validation of a new subsection in *Anemonastrum*

Anemonastrum Holub sect. ***Anemonidium*** (Spach) Mosyakin subsect. ***Makariri*** de Lange & Mosyakin, subsect. nov.

Type: *Anemonastrum tenuicaule* (Cheeseman) de Lange & Mosyakin (≡ *Ranunculus tenuicaulis* Cheeseman ≡ *Anemone tenuicaulis* (Cheeseman) Parkin & Sledge ≡ *Anemonidium tenuicaule* (Cheeseman) Christenh. & Byng).

Species included: *Anemonastrum antucense* (Poepp.) Mosyakin & de Lange (southern South America: Chile) and *A. tenuicaule* (Cheeseman) de Lange & Mosyakin (New Zealand).

Description: Perennial rhizomatous herbaceous plants. Basal leaf blades 3–8(–10) cm long, sparsely pubescent. Inflorescences 2–3-flowered or flowers solitary. Tepals (4–)5–15 mm long, without anastomosing veins, subglabrous, white to pinkish-white (*A. antucense*) or pink to red or reddish-brown (*A. tenuicaule*). Carpels and achenes compressed, glabrous or subglabrous, shortly stalked (*A. antucense*), sessile or subsessile (*A. tenuicaule*), with hooked or spirally coiled styles.

Etymology: The name of the subsection is from the Te Reo Maori (Maori language) word for "cold" (also "winter") because the New Zealand species, the nomenclatural type of this subsection, is confined to cold and shady habitats, and it flowers in winter (astronomical summer in the Southern Hemisphere).

Note: Two species of this subsection were included by various authors in several infrageneric taxa of *Anemone* sensu lato. For example, Ulbrich (1905) placed *Anemonastrum antucense* (as *Anemone antucensis*) in *Anemone* sect. *Rivularidium* Jancz. ser. *Rivulares* Ulbr. Ziman et al. (2006, 2008) included *Anemone antucensis* and *A. tenuicaulis* in *Anemone* sect. *Rivularidium* Jancz. ser. *Jamesoniae* Ziman, Bulakh & Kadota (as "*Jamesonii*"), together with *A. jamesonii* Hook. f., *A. sellowii*, *A. assibrasiliana*, and *A. moorei*. Hoot et al. (2012) placed our two species in *Anemone* subgen. *Anemonidium* (Spach) Juz. sect. *Anemonidium* Spach together with *A. canadensis* L., *A. dichotoma* L., and *A. richardsonii* Hook. f., which are now recognized as *Anemonastrum canadense* (L.) Mosyakin, *A. dichotomum* (L.) Mosyakin, and *A. richardsonii* (Hook. f.) Mosyakin (see Mosyakin, 2016).

Trans-Pacific biogeographical links and phylogenetic relationships of *A. antucense* and *A. tenuicaule* were discussed by Ehrendorfer and Samuel (2000, 2001), Schuettpelz et al. (2002), Ziman et al. (2006, 2008), Meyer et al. (2010), Hoot et al. (2012), and some other authors. Information on taxonomy, nomenclature, morphology, and biogeography of *A. tenuicaule* and *A. antucense* was summarized in our earlier article (Mosyakin, de Lange, 2018).

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Внутрішньородові таксони для видів *Anemonastrum* та *Knowltonia* з Південної Півкулі, які раніше включалися до *Anemone sensu lato* (*Ranunculaceae*). Укр. бот. журн., 2018, 75(6): 509–516.

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На основі молекулярно-філогенетичних і частково також морфологічних та біогеографічних даних нещодавно було запропоновано визнати у значно розширеному розумінні роди *Anemonastrum* та *Knowltonia*, які раніше здебільшого включали до *Anemone sensu lato* (*Ranunculaceae*). Обидва ці роди включають представників, які є цікавими з морфологічної та біогеографічної точок зору, а загальні ареали цих родів (тобто, сума ареалів їхніх видів) демонструють явні міжконтинентальні диз'юнкції. Зокрема, *Knowltonia* в новому розумінні (що відповідає *Anemone* sect. *Pulsatilloides sensu* Hoot et al., 2012) включає південноафриканські та деякі американські (переважно південноамериканські) таксони, а також *K. crassifolia* з о-ва Тасманія. Рід *Anemonastrum* (що відповідає *Anemone* subg. *Anemonidium sensu* Hoot et al., за виключенням роду *Hepatica*) є переважно євразійським, але також містить декілька північноамериканських видів та південноамериканський *A. antucense* і новозеландський *A. tenuicaule*. Види, що зараз включені до *Anemonastrum* та *Knowltonia*, раніше розміщували в різних внутрішньородових таксонах роду *Anemone sensu lato*. Тепер ці внутрішньородові таксони мають бути дещо переглянуті та перенесені до відповідних родів. Ми пропонуємо в статті такі нові комбінації рангів секції та підсекції: *Knowltonia* sect. *Mexicanae* (Starod.) Mosyakin & de Lange, comb. nov. (incl. *K. mexicana*); sect. *Crassifoliae* (Ulbr.) Mosyakin & de Lange, comb. nov. (incl. *K. crassifolia*); sect. *Rigidae* (Ulbr.) Mosyakin & de Lange, comb. nov. (incl. *Knowltonia hootae* ≡ *Anemone rigida*, *K. hepaticifolia*, *K. moorei*); sect. *Meridium* (Starod.) Mosyakin & de Lange, comb. nov. (incl. *K. helleborifolia* та *K. peruviana*), sect. *Sellowiae* (Hoot) Mosyakin & de Lange, comb. nov. (incl. *K. sellowii* та *K. assisbrasiliiana*); sect. *Oreithales* (Schltdl.) Mosyakin & de Lange, comb. nov. (incl. *K. integrifolia*); sect. *Barneoudia* (Gay) Mosyakin & de Lange, comb. nov. (incl. *K. balliana*, *K. chilensis*, *K. major*); sect. *Pulsatilloides* (DC.) Mosyakin & de Lange, comb. nov., [sect. *Pulsatilloides*] subsect. *Alchemillifoliae* (Ulbr.) Mosyakin & de Lange, comb. nov. (incl. *K. caffra* та *K. fanninii*), [sect. *Pulsatilloides*] subsect. *Pinnatifoliae* (Ulbr.) Mosyakin & de Lange, comb. nov. (incl. *K. tenuifolia*). Валідизована нова комбінація у ранзі виду, *Knowltonia caffra* (Eckl. & Zeyh.) Christenh. & Byng ex Mosyakin & de Lange, comb. nov. Описана нова підсекція *Anemonastrum* sect. *Anemonidium* subsect. *Makariri* de Lange & Mosyakin, subsect. nov.; ця підсекція містить *Anemonastrum antucense* з Південної Америки та *A. tenuicaule* з Нової Зеландії.

Ключові слова: *Anemone*, *Knowltonia*, *Ranunculaceae*, внутрішньородова класифікація, номенклатура, Південна півкуля, систематика

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Внутриродовые таксоны для видов *Anemonastrum* и *Knowltonia* из Южного полушария, которые ранее включались в *Anemone sensu lato* (*Ranunculaceae*). Укр. бот. журн., 2018, 75(6): 509–516.

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На основе молекулярно-филогенетических и частично также морфологических и биogeографических данных недавно было предложено признать в значительно расширенном понимании роды *Anemonastrum* и *Knowltonia*, которые ранее преимущественно включали в род *Anemone sensu lato* (*Ranunculaceae*). Оба эти рода включают представителей, которые интересны с морфологической и биogeографической точек зрения, а ареалы этих родов (то есть, сумма ареалов их видов) демонстрируют явные межконтинентальные диз'юнкции. В частности, *Knowltonia* в новом понимании (соответствующем *Anemone* sect. *Pulsatilloides sensu* Hoot et al., 2012) включает южноафриканские и некоторые американские (преимущественно южноамериканские) таксоны, а также *K. crassifolia* из о-ва Тасмания. Род *Anemonastrum* (соответствующий *Anemone* subg. *Anemonidium sensu* Hoot et al., за исключением рода *Hepatica*) преимущественно евразийский, но он также включает несколько североамериканских видов, южноамериканский *A. antucense* и новозеландский *A. tenuicaule*. Виды, которые сейчас включены в *Anemonastrum* и *Knowltonia*, ранее размещали в различных внутриродовых таксонах рода *Anemone sensu lato*. Теперь эти внутриродовые таксоны должны быть несколько пересмотрены и перенесены в соответствующие роды. Мы предлагаем здесь следующие новые номенклатурные комбинации рангов секции и подсекции: *Knowltonia* sect. *Mexicanae* (Starod.) Mosyakin & de Lange, comb. nov. (incl. *K. mexicana*); sect. *Crassifoliae* (Ulbr.) Mosyakin & de Lange, comb. nov. (incl. *K. crassifolia*); sect. *Rigidae* (Ulbr.) Mosyakin & de Lange, comb. nov. (incl. *Knowltonia hootae* ≡ *Anemone rigida*, *K. hepaticifolia*, *K. moorei*); sect. *Meridium* (Starod.) Mosyakin & de Lange, comb. nov. (incl. *K. helleborifolia* и *K. peruviana*), sect. *Sellowiae* (Hoot) Mosyakin & de Lange, comb. nov. (incl. *K. sellowii* и *K. assisbrasiliiana*); sect. *Oreithales* (Schltdl.) Mosyakin & de Lange, comb. nov. (incl. *K. integrifolia*); sect. *Barneoudia* (Gay) Mosyakin & de Lange, comb. nov. (incl. *K. balliana*, *K. chilensis*, *K. major*); sect. *Pulsatilloides* (DC.) Mosyakin & de Lange, comb. nov., [sect. *Pulsatilloides*] subsect. *Alchemillifoliae* (Ulbr.) Mosyakin & de Lange, comb. nov. (incl. *K. caffra* и *K. fanninii*), [sect. *Pulsatilloides*] subsect. *Pinnatifoliae* (Ulbr.) Mosyakin & de Lange, comb. nov. (incl. *K. tenuifolia*). Действительно обнаружена новая комбинация в ранге вида, *Knowltonia caffra* (Eckl. & Zeyh.) Christenh. & Byng ex Mosyakin & de Lange, comb. nov. Описана новая подсекция *Anemonastrum* sect. *Anemonidium* subsect. *Makariri* de Lange & Mosyakin, subsect. nov.; эта подсекция включает *Anemonastrum antucense* из Южной Америки и *A. tenuicaule* из Новой Зеландии.

Ключевые слова: *Anemone*, *Knowltonia*, *Ranunculaceae*, внутриродовая классификация, номенклатура, систематика, Южное полушарие