

A Taxonomic Revision of *Anemone* L. Subgenus *Anemonanthea* (DC.) Juz. sensu lato (Ranunculaceae) II

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Genus *Anemone* subgen. *Anemonanthea* sensu lato (Ranunculaceae) is taxonomically studied. In this Part II the species from No. 14 to No. 28 are revised: 14. *A. nikoensis* Maxim., 15. *A. reflexa* Stephan ex Willd., 16. *A. quinquefolia* L., 17. *A. lancifolia* Pursh, 18. *A. piperi* Britton ex Rydb., 19. *A. grayi* Behr & Kellogg, 20. *A. oregana* A. Gray, 21. *A. stolonifera* Maxim., 22. *A. davidii* Franch.

Key words: *Anemone*, morphology, subgenus *Anemonanthea*, taxonomy.

Ser. 3. **Nikoenses** Ziman, Kadota & Bulakh in J. Jpn. Bot. **79**: 47 (2004).

14. *Anemone nikoensis* Maxim. in Bull. Acad. Sci. St.-Petersb. **18**: 275 (1873). TYPE: JAPAN: "Circa Nikkoo alpem, flor." 1864, Tschonoski (lectotype-LE !, isolectotype-BM !, K !, GH !).

Anemonoides nikoensis (Maxim.) Holub in Folia Geobot. Phytotax. Praha **8**: 166 (1973).

Rhizomes long horizontal or ascending, 2–3 mm in diameter, and short vertical nodulose, 4–6 mm in diameter. Basal leaves 2–3, scale-like, and solitary, with distinct blades; petioles 5–10(–20) cm long, glabrous; blades ternate to biternate, pentagonal, 3–5(–10) × 3–6 cm, adaxially glabrous or sparsely pilose along veins; petiolules 5–15 mm long; central leaflets deeply pinnate-lobate, broadly ovate; base truncate or cuneate; margin incised and serrate; apex acuminate or obtuse; lateral leaflets similar

to central ones, but a little smaller. Scapes 15–30(–50) cm long, glabrous; cymes 1–2-flowered. Involucral leaf petioles 1–3(–5) cm × 3–5 mm, basally vaginate, hirsute or subglabrous; blades ternate, similar to those in basal leaves, but larger, 3–7 × 4–6 cm, glabrous or sparsely pilose along veins; petiolules 3–10 mm long (Fig. 1M). Pedicels 3–15 cm long, pilose. Tepals 5(–6), broadly elliptic to obovate, with narrow base and apex, white and tinged pink, 15–30 × 10–20 mm, sparsely pubescent basally; basal veins 5–9, anastomosing veins 5–9. Stamens 3–8 mm long; filaments filiform; anthers oblong-ellipsoid, connectives wide. Ovaries ovoid, 1–2 mm long, densely covered with hairs 0.1–0.2 mm long; style straight, ca. 1 mm long; stigma linear (Fig. 2N). Achene bodies ovoid, ca. 3–4 × 1.5–2 mm, densely puberulent (hairs ca. 0.2 mm long); styles hooked or slightly curved, 0.5–1 mm long, glabrous; stigmas linear.

Chromosome number: $n = 8$ (Kurita 1957, Baumberger 1970), 7 (Okada and Tamura 1979).

Distribution: NE. Asia: Japan (Honshu, Shikoku, Kyushu); occurring in forests or open sites, alt. 100–900 m.

Specimens examined: **JAPAN**; Yamanashi Pref., Mt. Kushigata, Nakakoma-gun, no date, no collector's name (K); Tokyo Pref., Shibuya, 27.4.1891, Makino (LE); Tokyo Pref., Takao-cho, Minamitama-gun, 29.4.1913, Makino (LE); Ômi (Shiga Pref.), Ôkawamura, 1889, Tchonoki (LE); Kyoto Pref., Ashibi-dani, Kei hoku-cho, Kitakuwada-gun, 18.4.1977, Mimoro & Tsugaru 3081 (MHA); Kochi Pref., Mt. Torigata, Niyodo-mura, Takaoka-gun, 22.5.1889, Makino 33961 (LE).

This species was described at the basis of its biternate basal leaves and solitary flowers with 5 white tepals. Later Ohwi (1984) noted its two types of rhizomes, distinct petiolules of basal leaf blades, and densely short-pilose carpels. According to Ohwi, *A. nikoensis* differs from the allied *A. pseudoaltaica* mainly by the lower number of wider tepals.

Anemone nikoensis is indeed close to the *A. altaica*-subgroup, but it has several essential characteristics, mainly in its floral characters [e.g., few-flowered cymes, 5 (–6) sparsely pubescent tepals 15–30 mm long each with narrow bases and apices having 5–9 vein anastomoses]. We believe these distinctions are sufficient to recognize not only a distinct species, but also a distinct series.

Ser. 4. **Reflexae** Ulbr. in Bot. Jahrb. 37: 228 (1906).

15. **Anemone reflexa** Stephan ex Willd., Sp. Pl. 2: 1282 (1797). TYPE: "In Sibiria regionibus Baicalensibus, Irkutsk," Stephan & Laxmann (lectotype–LE !); "Ad Lenam, Redowski, montes Sajanenses," Lessing, "In Sibiria: ad dl. Toms, Gmelin (paratype–LE !).

Anemonoides reflexa (Stephan ex Willd.) Holub in Folia Geobot. Phytotax. Praha 8: 166 (1973).

Rhizomes long horizontal or ascending, 1–

2 mm in diameter, and short nodulose, 4–5 mm in diameter. Basal leaves 2–3, scale-like, and solitary, with distinct blades; petioles 10–25 cm long; blades ternate, 2–5 × 3–6 cm, glabrous or sparsely pilose; petiolules 3–5 mm long; central leaflets almost entire, elliptic to ovate; base cuneate; margin serrate; apex acuminate to acute; lateral leaflets similar to central ones, but often deeply bilobed, hence, the leaves seem 5-parted. Scapes 15–25 (–30) cm long, glabrous; cymes 1–3-flowered. Involucral leaf petioles 10–20 × 1–2 mm; blades ternate, similar to but larger than the basal leaf blades, 4–8 × 4–7 cm, sparsely puberulent; petiolules 1–2 mm long; central leaflets undivided; lateral leaflets unequally 2-cleft (Fig. 1N). Bracteoles 1–2, small (1.5–2.5 cm long, 3-parted) present or absent. Pedicels 1.5–4 cm long, densely puberulent. Tepals 5–6 (–7), linear-lanceolate, with wide bases and apices, bent or reflexed, white, 5–7 × 1–3 mm, abaxially puberulent; basal veins 3, anastomosing veins absent. Stamens 2–5 mm long; filaments dilated apically, mainly ovate-lanceolate or mace-like; anthers ellipsoid or broadly ovoid, connectives narrow. Ovaries oblong-ovoid, basally narrowed, 0.8–1 mm long, densely or sparsely covered with hairs ca. 0.2 mm long; styles straight, 0.8–1 mm long; stigmas slightly dilated (Fig. 2O). Achene bodies ovoid-ellipsoid, slightly compressed, with narrow ribs, 3–4 × 1.5–2 mm, sparsely puberulent (hairs less than 0.1 mm long); styles curved to recurved, 0.5–1.5 mm long, glabrous; stigmas linear (Fig. 3H).

Chromosome number: $n = 8$ (Baumberger 1970, Starodubtsev 1991).

Distribution: Russia (Europe, Siberia, Far East), China (Henan, Jilin, Shaanxi), N. Korea, Mongolia; occurring in open forest, bushes, and in valleys.

Specimens examined: **RUSSIA**; Irkutsk Reg., near Baikal, 3.6.1902, Borodin (KW); near Irkutsk, 31.5.1903, Jurinski (KW); st. Baikal, 13.6.1908,

Ganeshin (KW); Kuznetskiy Alatau, near Telbesa River, 2.6.1903, Krylov (KW); Krasnoyarsk Reg., near Enisei River, Simonovka, 26.5.1914, Iljin (KW); Sikhote-Alinj, Kit, 21.5.1945, Zhudova (MHA); Primorski Reg., Suchanski Distr., Tigrovaja Balka, 21.5.1964, Gorovoi 5079 (MHA); Khasanski Distr., Kedrovaja Padj, 9.5.1980, Starodubtsev (MHA); Chuguevski Distr., Sokolovka, 19.5.1980, Starodubtsev (MHA); Shkotovski Distr., Tigrovyy, 29.4.1980, Starodubtsev (MHA). **MONGOLIA**; Noin-Ula, 1925, Glagolev (LE); Kentey Mts., upper part of River Tola, Menzoi Iro, 10.7.1929, Ikonnikov-Galitski (LE).

This species was described as a taxon close to *A. ranunculoides*, but having lateral bipartite leaf segments, glabrous stems and in particular 5 recurved tepals. Ulbrich (1906) separated *A. reflexa* in the monotypic series Reflexae because of its unique tepal shape (bent or reflexed), but Juzepchuk (1937) raised the taxonomic status of this taxon to subsect. Reflexa, and he noted its creeping rhizomes, 1–2-flowered stems, 5–6 small white pubescent tepals, and irregularly dilated filaments.

Anemone reflexa is distinctive, but it is closer to *A. raddeana* (not to *A. ranunculoides*), differing from the latter by fewer smaller and narrower bent pubescent tepals, having rhizomes of two types and the presence of few small bracteoles. Its distinctions correspond to a series level.

Ser. 5. **Quinquefoliae** Ziman, Kadota & Bulakh in J. Jpn. Bot. **79**: 47 (2004).

16. **Anemone quinquefolia** L., Sp. Pl. 541 (1753). TYPE: U. S. A., “Ranunculus nemorum, fragariae foliis, virginianus” Pluk. alm. 310. t.16. f. 3. Habitat in Virginia, Canada. Kalm”. N.710. 25. [(lectotype designated here–LINN !)]; “Hepatica trilobata. Virginia, Clayton (paratype–BM !); U. S. A. Moist woods near Billeville, 18.5.1862, Macoun; Hudson Bay, Moore Factory, 10.8.1881, Haudin (paratype–K !).

var. **quinquefolia**

Anemone pedata Raf., Med. Repos. **2**: 361

(1808).

Anemone nemorosa L. var. *quinquefolia* (L.) Pursh, Fl. Amer. Sept. **2**: 386 (1813).

Anemone nemorosa L. var. *quinquefolia* (L.) A. Gray, Man., ed. 5, **38** (1867).

Anemone nemorosa L. subsp. *americana* Ulbr. in Bot. Jahrb. **37**: 226 (1906).

Anemone quinquefolia L. var. *bifolia* Farw. in Pap. Michigan Acad. Sci. **1**: 94 (1923).

Anemone nemorosa L. var. *bifolia* (Farw.) B.Boivin in Phytologia **16**: 239 (1968). TYPE: “Under shrubs near Rochester,” Farwell 5431 (BLN).

Anemone quinquefolia L. var. *interior* Fernald f. *rubra* J. W. Moore in Rhodora **52**: 57 (1950). TYPE: U. S. A.: Ottertail Co., Effington Township J. W. Moore & Phinney 12775 (holotype–MIN !).

Anemonanthea quinquefolia (L.) Nieuwl in Amer. Midl. Natur. **3**: 174 (1914).

Anemonoides quinquefolia (L.) Holub in Folia Geobot. Phytotax. Praha **8**: 166 (1973). var. **minima** (DC.) Frodin in Phytologia **77**: 86 (1994).

Anemone minima DC., Syst. Nat. **1**: 206 (1817). TYPE: U. S. A.: “Sur les Allemani en Virginie,” Pursh (lectotype–G !).

Anemonoides minima (DC.) Holub in Folia Geobot. Phytotax. Praha **8**: 166 (1973).

Rhizomes long horizontal or ascending, 2–3 mm in diameter, and short nodulose, 3–5 mm in diameter. Basal leaves 2–3, scale-like (2–4 mm long), and solitary, with distinct blades; petioles 5–20 (–25) cm long, glabrous; blades 3-sected, pentagonal-rhombic, 2–5 × 3–6 cm, sparsely puberulent to glabrous; petiolules 1–2 mm long; central segments oblanceolate to rhombic; base narrowly cuneate; margin crenate to serrate or incised; apex acuminate to obtuse; lateral segments bipartite (sometimes bilobed or unlobed), rhombic-ovate. Scapes 5–30 cm long, glabrous or sometimes sparsely puberulent; cymes 1-flowered. Involucral leaf petioles 1–2 cm × 1–2 mm; blades 3-sected, similar to

those in basal leaves, pentagonal-rhombic, 2–5 × 2–5 cm, glabrous to pilose; petiolules 1–2 mm long; central segments undivided, lateral segments 2-parted or bilobed (sometimes unlobed) (Fig. 1O). Pedicels 2–6 cm long, pilose to subglabrous. Tepals 5 (–6), oblong-elliptic, with wide base and apex, white, pink or bluish, 10–20 (–25) × 4–8 mm, glabrous; basal veins 3–5, anastomosing veins absent (rarely solitary). Stamens 3–5 mm long; filaments basally dilated; anthers ellipsoid, connectives wide. Ovaries oblong-ovoid, 0.8–1.5 mm long, densely covered with hairs ca. 0.5 mm long; styles straight or slightly curved, 1–1.5 mm long; stigmas linear (Fig. 2P). Achene bodies ovoid-ellipsoid, slightly compressed, with narrow ribs, 2.5–4.5 × 1.5–2 mm, densely puberulent (hairs 0.5–1 mm long); styles straight to slightly curved, 1–2 mm long, basally slightly puberulent or glabrous; stigmas linear (Fig. 3I).

Chromosome number: $n = 16$ (Heimburger 1970).

Distribution: E. North America: Canada, U. S. A. (more than 20 States); occurring in forests, thickets, in moist soil, alt. 30–1900 m.

Specimens examined: U. S. A.; Virginia, Craig Co., Barbours Creek, 5.5 mi NE of Newcastle, 20.5.1972, Keener 2727 (PAC); Pine-oak woods 0.3 mi E of Barbours Creek, 22.5.1974, Rothpick (PAC); Pennsylvania, Cambria Co., 1 mi S of Dysart, 14.5.1972, Keener 2714 (PAC); Idaho, Nez Perces Co., Craig Mts., Lake Waha, 900 m, 20.5.1892, Sandberg 194 (K); Oceur D'Allene Mts., 11.7.1895, Leiberg 1259 (K); Massachusetts, Hampshire Co., Handley off Rt., Dept. Store, 5.7.1979, Ahles 86523 (MHA); Wisconsin, Vilas Co., Blueberry, Lake NF of Woodruff, 27.0.1978, Marysha 318 (MHA); Ashland Co., S of Mellen, 30.6.1978, Iltis et al. 470 (MHA). **CANADA**; Ontario, Hearst, Cochrane Distr., 4 mi N of Casgrain Township, 2.6.1954, Baldwin 5629 (LE); Long Rapids, Mattagami River, Hudson Bay, 20.6.1956, Baldwin 6188 (LE); Quebec, St.-Romuald, Co. Levis, river Chaudiere, 29.5.1969, Gravel & Tessier 69-22 (MHA); Sillery, St.-Patrick, 17.5.1977, Roy NC-2-77 (K); Lennoxville, Sherbrooke, Boise, 15.5.1979, Capano 20 (MHA); Fleurimont, d'Asco,

Sherbrooke, 25.4.1982, Shaffer 36 (MHA).

According to Britton (1892), *A. quinquefolia* is characterized mainly by its long horizontal rhizomes, subglabrous stems, 3-foliolate basal leaves with bipartite lateral leaflets, and 4–9 tepals, and that *A. quinquefolia* differs from the European *A. nemorosa* by “its slender habit, less lobed divisions of the involucreal leaves, and smaller flowers” (Britton 1892: 225).

After an examination of ample herbarium collections, Fernald (1928) noted the narrow rhizomes (1–4 mm in diameter) covered with tooth-like scales, solitary basal leaves with 3–5 divisions, 5 tepals and densely short-hirsute achenes with curved styles.

Anemone quinquefolia and other N American species of sect. *Anemonanthea* have many critical characters in common: narrow involucreal leaf petioles, sessile segments of basal and involucreal leaves, solitary flowers having 5 (rarely 6) glabrous tepals without vein anastomoses, and achenes mainly with narrow ribs covered with hairs 0.2–1 mm long, and styles 1–2 mm long. Therefore, this group of taxa merits a separate series *Quinquefoliae*.

Anemone quinquefolia is widely distributed in the eastern part of the United States, and it is one of the most variable taxa of sect. *Anemonanthea*. Although several inter-specific taxa of *A. quinquefolia* have been recognized (vars. *interior* Fernald and *bifolia* Farw., etc.), the authors of a recent monographic treatment of *Anemone* (Dutton et al. 1997) accepted two varieties (*quinquefolia* and *minima*). We agree with this taxonomic conclusion.

16a. var. *quinquefolia*

Plants are characterized by 1 (–2) sinuses on outer margins of basal and involucreal lateral leaflets, and achene bodies 3–4.5 mm long, styles 1–2 mm long.

16b. var. *minima* (DC.) Frodin

Plants differ from those of var. *quinquefolia* by unlobed lateral leaflets,

achene bodies 2.5–3 mm long, and styles 0.5–1 mm long.

17. **Anemone lancifolia** Pursh, Fl. Amer. Sept. 2: 386 (1814). TYPE: U. S. A.: Virginia, Greenbrier Co., Kates Mt., 17.3.1893, Heller 801 (neotype–NY!).

Anemone nemorosa Torr. & A. Gray, Fl. N. Amer. 1: 12 (1838).

Anemone trifolia Britton in Ann. N. Y. Acad. Sci. 6: 226 (1891).

Anemone quinquefolia L. var. *lancifolia* (Pursh) Fosberg in Virgin. J. Sci. 2: 108 (1941).

Anemone trifolia L. subsp. *lancifolia* (Pursh) Hiitonen in Mem. Soc. Fauna Fl. Fenn. 47: 13 (1971).

Anemonoides lancifolia (Pursh) Holub in Folia Geobot. Phytotax. Praha 11: 81 (1976).

Rhizomes long horizontal, 2–3 mm in diameter, and short nodulose, 3–5 mm in diameter. Basal leaves 2–3, scale-like, and solitary, with distinct blades; petioles 5–15 (–25) cm long, glabrous; blades 3-sected, rhombic, 4–8 × 3–7 cm, strigose to subglabrous; leaflets subsessile; central segments undivided, oblanceolate to ovate; base narrowly cuneate; margin serrate; apex acute to acuminate; lateral segments similar to central ones. Scapes 10–30 cm long, glabrous; cymes 1-flowered. Involucral leaf petioles 1.5–2 cm × 1–2 mm; blades 3-sected, similar to those in basal leaves, rhombic-lanceolate, 3–9 × 3–7 cm, sparsely puberulent or subglabrous; segments subsessile (Fig. 1P). Pedicels 2–4 (–10) cm long, sparsely puberulent or subglabrous. Tepals 5 (–6), elliptic, with wide bases and apices, white, 10–20 × 5–10 mm, glabrous; basal veins 3–5, anastomosing veins absent. Stamens 4–6 mm long; filaments filiform; anthers ellipsoid, connectives wide. Ovaries oblong-ovoid, ca. 2 mm long, densely covered with hairs ca. 0.2 mm long; styles straight or slightly curved, ca. 1 mm long; stigmas linear. Achene bodies ovoid, slightly compressed,

with narrow ribs, 4–5 × 1.5–2 mm, densely puberulent (hairs 0.1–0.2 mm long); styles straight or slightly curved, 1–1.5 mm long, basally puberulent, stigmas linear (Fig. 3J).

Chromosome number: unknown.

Distribution: E. North America. U. S. A. (N. Carolina, S. Carolina, W. Virginia); occurring in woods, alt. 800–1500 m.

Specimens examined: U. S. A.; Virginia, Rocky wood sites, 1000 m, 23.5.1933, Killip 30932 (US); Roanoke Co., N of Cat Hill, Salem, 21.4.1940, Wood (PENN); Augusta Co., along St. Marys River, 26.4.1965, Freer (VPI); W Virginia, Pocahontas Co., Allegheny Mt., W of N Carolina, Stanley Co., Falls of Yadkin River, 20.4.1896, Small (NY); Davidson Co., 2 mi W of Randolph Co. line, 21.4.1956, Radford 10176 (UNCC); N Carolina, Lee Co., 4 mi W of Moncure, 4.4.1967, Logne 951 (BM).

In Pursh's (1813) description of this species, *A. lancifolia* was demarked by its lanceolate shape of the leaflets and their incise-dentate margins. Later Fernald (1928) noted the confusion with respect to *A. lancifolia* and stated that this species differed from *A. quinquefolia* mainly by its involucral leaf shape, and thus he proposed to include it in *A. quinquefolia*. However, according to Keener (1975) and Dutton et al. (1997), *A. lancifolia* differed from *A. quinquefolia* by its longer stems, basal mainly glabrous leaf blades, deeply parted central involucral leaflets, and larger tepals.

These two species differ from others also by having tepals with solitary vein anastomoses and shorter involucral leaf petioles (0.5–2 cm long). According to our data, *A. lancifolia* differs from other N American species of sect. *Anemonanthea* by its glabrous leaves and stems.

18. **Anemone piperi** Britton ex Rydb. in Bull. Torrey Bot. Club 29: 153 (1902). TYPE: U. S. A.: Idaho, Latah Co., 16.6.1893, Piper 1469 (holotype–NY!, isotype–GH!).

Anemonoides piperi (Britton ex Rydb.) Holub in Folia Geobot. Phytotax. Praha 8:

166 (1973).

Rhizomes long horizontal or ascending, 1–2 mm in diameter, and short vertical nodulose, 3–5 mm in diameter. Basal leaves 2–3, scale-like (3–4 mm long), and solitary, with distinct blades; petioles 10–20 cm long, glabrous; blades 3-sected, wide-rhombic or pentagonal, 2–6 × 3–7 cm; pilose to subglabrous; segments sessile, undivided; central segments oblanceolate to narrow-rhombic; base narrowly cuneate; margin serrate to dentate; apex acuminate to acute; lateral segments similar to central ones, but often bilobed and asymmetrical. Scapes 5–20 (–35) cm long, pilose; cymes 1-flowered. Involucral leaf petioles 1–3 cm × 1–2 mm, glabrous; blades similar to those in basal leaves, 3-sected, wide-rhombic, 2–7 × 3–6 cm, puberulent to subglabrous (Fig. 1Q). Pedicels 1.5–5 cm long, pilose. Tepals 5 (–7), elliptic, with wide base and apex, white or rarely pinkish, 10–20 × 6–8 mm, glabrous; basal veins 3–5, anastomosing veins absent. Stamens 4–6 mm long, filaments filiform, anthers ellipsoid, connectives wide. Ovaries ovoid, 2–3 mm long, densely covered with hairs 1–2 mm long; styles straight or slightly curved, 0.5–1 mm long; stigmas sublinear. Achene bodies ovoid to ellipsoid, 3–4 × 1.5–2 mm, densely puberulent (hairs 1–2 mm long); styles straight to slightly curved, 0.5–1 mm long, glabrous; stigmas sublinear (Fig. 3K).

Chromosome number: unknown.

Distribution: W. North America: Canada (British Columbia), U. S. A. (Idaho, Montana, Oregon, Utah, Washington); occurring in shaded woods, alt. 400–3000 m.

Specimens examined: U. S. A.; Idaho, Ceur D'Alene Mts., 1610 m, 11.7.1895, Leiberg 1259 (GH); Clearwater Co., ca. 9 mi E of Bovillon, 7.6.1987, Dutton & Gladu 4546 (BBG).

According to Britton (1892), *A. piperi* differs from *A. quinquefolia* by its basal leaf shape, straight pedicels and short achene styles, but Britton also noted its larger stems,

ternate basal leaves which are initially pubescent but later glabrous, similar involucral and basal leaves, and white glabrous tepals.

Meanwhile, Fernald (1928) noted its "oblique or ascending rhizomes, 1–6 stems from a rootstock, and basal leaves commonly present at flowering time" (1928: 187). According to Fernald, the flowers were characterized by white, elliptic-ovate to oblong tepals without anastomoses.

Based on these essential distinctions, Dutton et al. (1997) regarded *A. piperi* as the most distinct taxon within the *A. quinquefolia* complex, and although we agree with this judgment, we also note the necessity of future critical population studies. We also note its non-solitary pubescent stems, and white or red tepals.

19. **Anemone grayi** Behr & Kellogg in Bull. Calif. Acad. Sci. 1: 5 (1884). TYPE: U. S. A.: California, Tamalpais 3.1882, 113 (holotype–CAS !).

Anemone nemorosa L. var. *grayi* (Behr & Kellogg) Greene, Fl. Francisc. 295 (1892).

Anemone quinquefolia L. var. *grayi* (Behr & Kellogg) Jeps., Fl. W. Calif. 198 (1901).

Anemone quinquefolia L. var. *minor* (Eastw.) Munz in Aliso 4: 90 (1958). TYPE: U. S. A.: California, Del Norte Co., on Gasquet Mt. Rd. 22.4.1907, Eastwood 153 88199 (holotype–CAS !).

Anemone quinquefolia L. subsp. *grayi* (Behr & Kellogg) E. Murray in Kalmia 12: 18 (1982).

Anemone lyallii Britton in Ann. N. Y. Acad. Sci. 6: 227 (1891). TYPE: CANADA: British Columbia, Salmon River, 24.6.1876, Dawson 910 (lectotype–NY !); U. S. A. Oregon, Fort Colville, near Pend Oreille River, 5.1861, Lyall; Washington, Clallam Co., Mt. Angeles, 5500 ft., 17.7.1931, Thomson 7431 (paratype–K !).

Anemone grayi Behr & Kellogg subsp. *lyallii* (Britton) Dutton & al., Fl. N. Am. 2: 155 (1987).

Anemone quinquefolia L. var. *lyallii* (Britton) B. L. Rob., Syn. Fl. N Amer. 1: 13 (1895).

Anemone nemorosa L. var. *lyallii* (Britton) Ulbr. in Bot. Jahrb. 37: 226 (1906).

Anemone oligantha Eastw. in Proc. Calif. Acad. Sci. Ser.4. 20: 142 (1931). TYPE: U. S. A.: California: Del Norte Co., Waldo-Crescent City Rd., Shelby Creek, 30.4.1907, Eastwood 158 (holotype-CAS 88197 !).

Anemonoides lyallii (Britton) Holub in Folia Geobot. Phytotax. Praha 11: 81 (1973).

Rhizomes long horizontal or ascending, 1.5–2 mm in diameter, and short nodulose, 4–6 mm in diameter. Basal leaves 2–3, scale-like (3–5 mm long), and solitary, with distinct blades; petioles 5–25 cm long, glabrous; blades 3-sected, rhombic to pentagonal, 2–6 × 3–8 cm, pilose or puberulent; petiolules ca. 1 mm long; central segments ovate to rhombic; base cuneate; margin crenate to serrate; apex acute; lateral segments similar to central ones, but sometimes bilobed. Scapes 5–30 (–40) cm long, glabrous or sparsely pilose; cymes 1-flowered. Involucral leaf petioles 1–3 cm × 1–2 mm; blades 3-sected, similar to those in basal leaves, but smaller, 2–5 × 3–5 cm, rhombic to pentagonal, sparsely puberulent; petiolules 1–2 mm long (Fig. 1R). Pedicels 1–5 (–10) cm long, glabrous or pilose. Tepals 5 (–6), elliptic to obovate, with wide base and apex, white, blue or reddish, 7–10 (–15) × 4–6 (–8) mm, glabrous; basal veins 3–5, anastomosing veins absent. Stamens 3–5 mm long; filaments filiform; anthers oblong-ellipsoid, connectives wide. Ovaries oblong-ovoid, ca. 2 mm long, densely covered with hairs ca. 0.2 mm long; styles curved, ca. 0.5 mm long; stigmas linear. Achene bodies basally narrowed, ovoid to ellipsoid, slightly compressed, with narrow ribs, 3–5 × 1.5–2 mm, sparsely puberulent (hairs 0.1–0.2 mm long); styles straight to curved, 0.5–1.5 mm long, glabrous; stigmas linear (Fig. 3L).

Chromosome number: $n = 8$ (Lamprecht

1962, Dutton 1996).

Distribution: W. North America: Canada (British Columbia), U. S. A. (Oregon, California, Washington); occurring in shady woods or sometimes on grassy slopes, alt. 100–1900 m.

Specimens examined: U. S. A.; California. San Mateo Co., King's Mts., 18.3.1902, Greene 323 (K, LE); Del Norte Co., Low Divide, Gasquer Trail, 17.4.1938, Van Deventer 35 (JEPS); Trinity Co., Scott Mt., road from Carrville to Callahan, 20.5.1980, Howell & al. 53537 (CAS); Washington, Clallam Co., Mt. Angeles, 5500 ft., 17.6.1931, Thompson 7431 (K); Oregon, Crook Co., Tumalo Ranger Station, Deschutes National Forest, 25.6.1919, Ferris & Duthie 473 (DS); Benton Co., Mary's Park, W of Corvallis, 11.6.1951, Detling 6920 (ORE); MacDonald Forest, 26.4.1960, Braswell (GH); Grant Co., head of Dugout Cr., E of the S Fork John Day and Big Baldy, 21.5.1980, Wright 1292 (OSC). CANADA; Vancouver, 30.4.1908, Macoun (NY); British Columbia, Near Sproat River Falls N of Alberni, 1.5.1961, Calder & Mackay 28592 (DAO).

Anemone grayi was described as a species allied to both *A. nemorosa* and *A. quinquefolia*, and therefore, it was included into the above species variously in these taxa chiefly as variety. In examining this group, Fernald (1928) treated *A. grayi* as differing from *A. quinquefolia* by its nodulose rhizomes with pronounced constrictions, and scarcely cleft leaflets. Fernald accepted *A. grayi* as close to *A. lyallii* but differing by its short slender rhizomes and more numerous stamens.

We also note that the tepals of *A. grayi* are 7–15 mm long, and the involucral leaf petioles 2–4 cm long. Thus we agree with Dutton (1986) in dividing this species into two subspecies, viz., subsp. *grayi* and *lyallii*. The latter one differs from the former mainly by its smaller tepals and achenes.

20. *Anemone oregana* A. Gray in Proc. Amer. Acad. Arts 22: 308 (1887). TYPE: U. S. A.: Oregon, Hood River, 1878, Barrett (lectotype-GH !).

Anemone quinquefolia L. var. *oregana* (A.

Gray) B. L. Robinson, Syn. Fl. N. Aner. 1: 13 (1895). TYPE: U. S. A.: Oregon, Cascade Mts., Howell (lectotype-GH).

Anemone nemorosa L. var. *oregana* (A. Gray) Ulbr. in Bot. Jahrb. 37: 227 (1906).

Anemone adamsiana Eastw. in Proc. Calif. Acad. Sci. ser. 4. 20: 142 (1931). TYPE: U. S. A.: California: Del Norte Co., Waldo-Crescent Road, French Hill, 24.3.1907, Eastwood 70 (holotype-CAS 88154 !).

Anemone felix M. Peck in Torreyia 32: 149 (1932). TYPE: U. S. A.: Oregon; Lincoln Co., near De Lake, 27.3.1931, Peck16325 (holotype-WILLU; isotype-GH !).

Anemonoides felix (M. Peck) Holub in Folia Geobot. Phytotax. Praha 11: 81 (1973).

Anemonoides oregana (A. Gray) Holub in Folia Geobot. Phytotax. Praha 11: 81 (1973).

Rhizomes long horizontal or ascending, 2–3 mm in diameter, and short nodulose, 4–6 mm in diameter. Basal leaves 2–3, scale-like, and solitary, with distinct blades; petioles 5–20 cm long, glabrous; blades 3-sected, pentagonal, 3–6 × 5–9 cm, adaxially strigose along veins, abaxially glabrous or strigose; petiolules 1–2 mm long; central segments oblong to rhombic; base cuneate; margin serrate; apex acuminate to acute; lateral segments often deeply bilobed or serrate and wider than central ones. Scapes 5–30(–35) cm long, glabrous or pilose; cymes 1-flowered. Involucral leaf petioles 1–3 cm × 1–2 mm; blades 3-sected, similar to those in basal leaves, pentagonal, 3–7 × 5–8 cm, glabrous or strigose; segments sessile (Fig. 1S). Pedicels 1–7 cm long, glabrous or pilose. Tepals 5–7(–8), obovate, with wide bases and apices, blue to purple, but sometimes nearly white, 10–20 × 5–10 mm, glabrous; basal veins 3–5, anastomosing veins absent. Stamens 4–6 mm long; filaments filiform; anthers ellipsoid, connectives wide. Ovaries oblong-ovoid, 2–3 mm long, sparsely covered with hairs ca. 0.2 mm long or subglabrous; styles straight, ca. 1 mm

long; stigmas linear. Achene bodies basally narrowed, ovoid, 4–5 × 1.5–2 mm, subglabrous or sparsely puberulent (hairs 0.1–0.2 mm long); styles straight, 1–1.5 mm long, glabrous; stigmas linear (Fig. 3M).

Chromosome number: $n = 8$ (Dutton 1986).

Distribution: W. North America. U. S. A. (California, Oregon, Washington); occurring in woods and open slopes, alt. 100–1800 m.

Specimens examined: U. S. A.; Oregon, Mt. Hood, Elk meadows, 5000 ft., 31.7.1927, Thompson 3289 (K); Douglas Co., 15 mi N of Wolf Crater, 8.4.1938, Meyer 1415 (MO); Tillamook Co., Hebo Mt., Coast Range, 21.5.1940, Constance & Beetle 2659 (K, PAC); Hood River Co., Gordon Cr. Trail, Mt. Hood National Forest, 22.5.1952, Ireland 3145a (ORE); Washington, Grays Harbor Co., Col. Bob, 2000 ft., 3.5.1931, Thompson 6247 (K); Kittitas Co., N side of Lake Keechelus, 27.5.1939, Hitchcock & Martin 4674 (GH).

This species was regarded as close to *A. quinquefolia*. According to Fernald (1928), it differed from the former by its nearly entire involucral leaflets, and blue tepals, longer stamens, and straight styles of mature achenes.

Dutton et al. (1997) included *A. oregana* in *A. grayi* as a subspecies because of the presence of many essential common characters. After a comparative examination of ample herbarium material, we are treating *A. oregana* as a species distinct from *A. quinquefolia* on the basis of its larger tepals (10–20 × 5–10 mm), red to blue, and longer achene styles.

Sect. II. **Rosulantes** Ziman & Kadota in J. Jpn. Bot. 79: 48 (2004).

Ser. 6. **Rosulantes**

21. *Anemone stolonifera* Maxim. in Bull. Acad. Sci. St.-Petersb. 22: 225 (1876). TYPE: JAPAN: Nambu, 1865, Tchonoski (holotype-LE !); CHINA: Prov. Se-tchuen, district de Tchen-keou, Heou-pin, 11.5.1892, R. P. Farges 946 (paratype-K !).

Anemone siuzevi Kom. in Acta Hort. Petropol. 22: 262 (1903).

Anemone stolonifera Maxim. var. *quelpaertensis* Nakai & Kitag. in Bot. Mag. Tokyo **50**: 78 (1936).

Anemonoides stolonifera (Maxim.) Holub in Folia Geobot. Phytotax. Praha **8**: 156 (1973).

Rhizomes long stolon-like horizontal, 1–2 mm in diameter, and short ascending, 3–5 mm in diameter. Basal leaves 2–5(–8), developing before flowering; petioles basally vaginate (6–9 mm wide), surrounded by fibrous remnants, 8–20(–25) cm long, puberulent above; blades distinct, ternate, reniform-pentagonal, 2–5 × 4–8 cm, sparsely to densely puberulent; petiolules 2–6 mm long; central leaflets 3-parted to 3-lobed, rhombic to broadly ovate, 2–6 × 1–4 cm; base cuneate; margin lobulate to dentate and ciliate; apex acute or obtuse; petiolules 2–6 mm long; lobes and lobules ovate; lateral leaflets unequally 2-parted. Scapes 1–3, 15–20(–25) cm long, scarcely pubescent above; cymes 1–3-flowered. Involucral leaves more than 3; petioles 0.5–2 cm × 1–2 mm; blades 3-sected or 3-parted, rhombic-ovate, similar to those in basal leaves, 2–5 × 3–6 cm, puberulent; segments sessile rhombic. Small involucral leaves of the inner circle (bracteoles) 1–2 cm long, entire, lanceolate. Pedicels 3–7(–10) cm long, puberulent. Tepals 5(–6), elliptic or elliptic-obovate, with narrow base and rounded apex, white or pinkish, 5–10 × 3–7 mm, sparsely or densely puberulent; basal veins 3–5, anastomosing veins absent. Stamens 2–5 mm long; filaments filiform; anthers narrowly ellipsoid, connectives wide. Staminodes (between perianth and stamens) present, 1.8–3 × ca. 2 mm. Ovaries ovoid, 1.5–2 mm long, sparsely covered with hairs ca. 0.1 mm long or subglabrous; styles apically curved, conic, 0.5–1 mm long; stigmas linear (Fig. 2Q). Achene bodies ovoid, 3–4 × 1.5–2 mm, sparsely puberulent (hairs ca. 0.1 mm long) or subglabrous; styles curved, ca. 0.5 mm long, glabrous; stigmas linear.

Chromosome number: $n = 8$ (Kurita 1955).

Distribution: Japan (Hokkaido, Honshu), China (E. Heilongjiang, Taowan), Korea; occurring in broad-leaved and coniferous forests, sometimes in open slopes, alt. 700–2600 m in mountain regions.

Specimens examined: JAPAN; Honshu: Tochigi Pref., Nikko, Senjo Plane, 1916, Makino 33366 (E); Tochigi Pref., Mt. Shiranesan, 1922, Makino 33629 (E); Tochigi Pref., 1925, Makino 33969 (E); Tochigi Pref., Kirifuri, 27.5.1962, Kanai (LE); Tochigi Pref., Nikko, Yumoto, Karikomiko Lake, 17.6.1979, Ohashi & al. (MHA); Nagano Pref., Kamiina-gun, Miwamura, Oguro, 19.6.1965, Kanai & al. (LE).

Anemone stolonifera differs from the all above taxa of sect. *Anemonanthea* by having several basal leaves (rosulate shoots) which develop before flowering, vaginate petiole bases, fibrous remnants surrounded stems, and presence of staminodes.

22. *Anemone davidii* Franch. in Nouv. Arch. Mus. Hist. Nat. Paris, Ser. 2, **8**: 366 (1886). TYPE: CHINA: “Se-tchuan occid., Prov. de Moupin”, 4.1869, David (holotype-P!).

Anemone stolonifera Maxim. var. *davidii* (Franch.) Finet & Gagnep. in Bull. Soc. Bot. Fr. **53**: 125 (1906).

Anemone petiolulata S. J. Pei in Contr. Biol. Lab. Sci. Soc. Chin., Bot. Ser. **9**: 2 (1933). TYPE: CHINA: “Szechuan: Nanchuan, 5.7.1930, Chang 273” (holotype-P!).

Anemonoides davidii (Franch.) Starod., Vetrenytsy 123 (1991).

Rhizomes long horizontal, stolon-like, 1–2 mm in diameter, and short vertical, branched, 6–15 mm in diameter. Basal leaves 2–5(–9), with distinct blades developing before flowering; petioles basally vaginate (5–10 mm wide), surrounded by fibrous remnants, 10–20(–35) cm long, subglabrous or puberulent above; blades ternate, cordate-pentagonal, 5–10(–12) × 5–15 cm, sparsely puberulent; petiolules 3–7 mm long; central leaflets 3-lobed, rhombic; base

cuneate; margin lobulate or coarsely dentate; apex acuminate; lateral leaflets smaller, unequally 2-parted; ultimate lobules obtuse. Scapes 1–3, 20–40(–60) cm long, subglabrous; cymes 1–3-flowered. Involucral leaves 3–5; petioles 1.5–3 cm × 1–2 mm, puberulent; blades ternate, similar to those in basal leaves, 5–8 × 6–9 cm, sparsely puberulent; petiolules 2–5 mm long; central leaflets 3-lobed; lateral leaflets 2-parted. Bracteoles 1–2, 2–3 cm long, wide-lanceolate, 3-lobed or 3-dentate. Pedicels 5–15 cm long, puberulent. Tepals 5 (–6), elliptic or obovate, with narrow base and rounded apex, white, 15–20(–30) × 10–20 mm, sparsely puberulent along central vein or subglabrous; basal veins 5–7, anastomosing veins 5–15. Stamens 4–8 mm long; filaments filiform; anthers narrow-ellipsoid; connectives narrow. Staminodes present between stamens and carpels, 2–3 mm × 2 mm. Ovaries ovoid, slightly compressed, 2–3 mm long, with lateral ribs 0.2–0.3 mm wide, subglabrous; styles straight, 0.5–0.7 mm long, stigmas subcapitate (Fig. 2R). Achene bodies ovoid, slightly compressed, with narrow ribs, 3–5 × 2–3 mm, glabrous or sparsely puberulent (hairs ca. 0.1 mm long); styles curved, ca. 1 mm long, glabrous; stigmas slightly dilated (Fig. 3N).

Chromosome number: unknown.

Distribution: China (Hubei, Sichuan, Yunnan, etc.); occurring in mixed forests and shady places by streams, alt. 1500–3500 m.

Specimens examined: CHINA; Sichuan: Tchenkeou-tin, 11.5.1882, Farges (LE); 1889, Henry 5581 (P, LE); Nanchuan-hsien, 8000–9000 ft., 18.5.1928, W. P. Fang (P); 31.5.1928, W. T. Wang (K); Tienchuan-hsien, 2450 m, 24.4.1936 K. L. Chu (K); Ma-pien Hsien, 2700 m, 27.5.1931, W. T. Wang; 24.5.1930, W. P. Fang 451 (BM); Yunnan, Mi Li-uping, Mekong-Yangtzi divide, 6.1921, Forrest 19951 (K); 7.1935, C. W. Wang (PE); W of Huadinba Farm, N end of Cangshan forest, 2900 m, 19.5.1981, Sino-Brit. Exp. 0810 (K); Kweichou, Lao Shan, 1.10.1931, Steward & al. 490 (LE); Qianxi Co., Jin-bo, 1350 m, 7.6.1988, Chen Qianhai & al. 946 (PE); W Hupeh, 5.1.1903, Wilson 1853 (P, LE); 5.4.1903, Wilson 3041

(P).

Anemone davidii was initially described as a variety of *A. stolonifera*. Both taxa have in common certain features of their shoot structure and seasonal development (i.e., rosulate basal leaves developing before flowering and fibrous remnants of basal parts of their petioles). In view of the results of our examination of herbaria of the both taxa (including their types), we have found the distinctions between them in the size of leaves, scapes and flowers (these much larger in *A. davidii*), sepal venation (vein anastomoses are lacking in *A. stolonifera*, but numerous in *A. davidii*), origin of staminodes (in *A. stolonifera* from stamens; *A. davidii* from carpels), and in the carpels and achenes (narrow ribs and subcapitate stigmas occur only in *A. davidii*). However, the basic characters of *A. petiolulata* (described from China, Sichuan as close to both *A. stolonifera* and *A. davidii*) are within limits of *A. davidii* as describe herein, and thus this species is not recognized in our treatment.

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本稿はキンポウゲ科イチリンソウ属のうちで広義の *Anemonanthea* 亜属の分類学的再検討の第2部である。パート II では次の9種について、解析の結果を報告した; 14. *Anemone nikoensis* Maxim. イチリンソウ, 15. *A. reflexa* Stephan ex Willd., 16. *A. quinquefolia* L., 17. *A. lancifolia* Pursh, 18. *A.*

piperi Britton ex Rydb., 19. *A. grayi* Behr & Kellogg, 20. *A. oregana* A. Gray, 21. *A. stolonifera* Maxim. サンリンソウ, 22. *A. davidii* Franch.

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