

**A NEW *DRYMOCALLIS* (ROSACEAE)  
FROM NORTHEASTERN CALIFORNIA AND SOUTH-CENTRAL OREGON**

**BARBARA ERTTER**

University and Jepson Herbaria  
University of California  
Berkeley, California  
bjertter@gmail.com

Snake River Plains Herbarium  
Boise State University  
Boise, Idaho

Harold M. Tucker Herbarium  
&

Orma J. Smith Museum of Natural History  
The College of Idaho  
Caldwell, Idaho

**ABSTRACT**

***Drymocallis modocana*** Ertter, **sp. nov.**, is described for plants with the unique combination of primarily solitary stems, narrow inflorescences, pedicel vestiture consisting of septate glandular hairs, broadly oblanceolate-elliptic to narrowly obovate pale yellow petals that are shorter than the obtuse sepals, and obliquely ovoid reddish-brown achenes. Although the species is currently known primarily from the Warner Mountains of northeastern California and adjacent Oregon, the presence of morphologically identical populations as far to the north as Grant Co., Oregon, suggests that the range of the species might actually prove to be the mountains bordering the northwestern lobe of the Great Basin. Conservation attention is warranted at least in California.

The current circumscription of *Drymocallis* Fourn. ex Rydb. (Potentilleae: Rosaceae) encompasses about 30 species in temperate North America and Eurasia (Ertter 2015), plus additional varieties. The genus was initially established by Rydberg (1898), who eventually recognized 28 species in North America (1908). These were collapsed to a mere three species and transferred back into *Potentilla* L. by Keck (in Clausen et al. 1940): *P. arguta* Pursh with two subspecies, *P. fissa* Nutt., and *P. glandulosa* Lindl. with eleven subspecies. Keck's taxonomy was adopted in subsequent floras, until a convergence of morphological (Soják 1989) and molecular (Eriksson et al. 1998) evidence established that the species in question were in a lineage separate from *Potentilla* s.s., along with *Fragaria* and several other erstwhile *Potentilla* species that Rydberg had treated as separate genera.

Although Soják (2006) subsequently provided the new combinations needed to maintain Keck's taxonomic structure within *Drymocallis*, I had already decided a more wide-sweeping overhaul was in order (Ertter 2007). I accordingly chose to recognize the majority of Keck's subspecies as full species in the treatment of the genus for *Flora of North America North of Mexico* (Ertter 2015), on the grounds that Keck's subspecies did not clearly group into the three recognized species, nor did additional undescribed variation in the genus. Furthermore, corresponding diversity in Eurasian *Drymocallis* has been treated at species rank, so it made sense for North American species to have equivalent recognition. The overwhelming tendency for collections to be identified only to species rank was also concerning, in that it obscures the possible conservation status of valid components of biodiversity.

My revised treatment of *Drymocallis* accordingly recognized 15 species in North America, plus an additional seven varieties, concentrated in the western states. Admittedly “unabashedly provisional,” this overhaul was nevertheless intended to provide the framework needed to

accommodate the additional taxa that were likely to be teased out of an abundance of unresolved variation with further research, especially in the Pacific Northwest and southeastern Intermountain Region (Ertter 2015). Regrettably (at least in my view), the overlapping preparation of *Drymocallis* for a revised *Flora of the Pacific Northwest* (Hitchcock et al. 2018) opted instead to collapse the variation within its coverage into only three species: *D. arguta*, *D. campanulata* (C. L. Hitchc.) Ertter, and *D. glandulosa*. The last included three subspecies, but three others of Keck's subspecies were submerged in synonymy, including some recognized in the original edition (Hitchcock & Cronquist 1973). The confusion wrought by significantly diverging contemporaneous taxonomic treatments covering the same geographic area has not been conducive to improving our understanding of an intriguing, understudied genus that appears to contain an abundance of undescribed variation.

At the same time, I acknowledge the challenge of drafting a functional floristic treatment for *Drymocallis* in the Pacific Northwest when so much of the regional variation defies ready placement in currently recognized taxonomic options. This difficulty is compounded by the dearth of recent annotations on *Drymocallis* in the major regional herbarium, coupled with the high percentage of herbarium specimens lacking key diagnostic characters; i.e., indication of petal color, flower shape at anthesis, stem number, and architecture of mature inflorescences. I have been gradually doing the essential fieldwork needed to underpin further revisionary work on the genus, coupled with providing material for phylogenetic analysis by Eurasian collaborator. However, this has been intertwined with simultaneous work on other problematic *Potentilleae* and unrelated projects, and the critical step of annotating *Drymocallis* at major regional herbaria remains a daunting challenge.

The current publication gives formal taxonomic status to one of the previously undescribed elements of variation within *Drymocallis*, so that the species can be included in an upcoming revision of the Jepson eFlora (<https://ucjeps.berkeley.edu/eflora/>). This is the entity referenced in the discussion of *D. convallaria* in *Flora of North America* (Ertter 2015) with the comment that “Excluded here are comparably [to *D. micropetala*] small-petaled plants from the Warner Mountains of California and Oregon that have the aspect of *D. convallaria* but the blunter, redder achenes of *D. glandulosa*.” The same entity is addressed under *D. hansenii* (Greene) Rydb. in the second edition of *The Jepson Manual* (Ertter 2012): “Coarser pls from Wrn probably undescribed taxon.” Subsequent fieldwork in 2012, 2016, and 2017 has confirmed that this entity is a relatively uniform representative of the genus in the Warner Mountains of northeastern California and adjacent Oregon that is sufficiently distinct to merit taxonomic recognition. Morphologically identical populations are also confirmed from the nearby Gearhart Mountains and far to the north in Grant County, Oregon, indicating that the species is probably also present in intervening portions of Oregon.

**DRYMOCALLIS MODOCANA** Ertter, *sp. nov.* (Figs. 1–6). **TYPE: USA. California.** Modoc Co.: Pine Creek Basin W of Warren Peak, Warner Mountains ca 17 airmiles ESE of Alturas, upper dry margin at W end of wet meadow, with sagebrush, 41.362°N 120.244°W, 2255 m elev., 28 Jul 2017, Ertter, DiNicola, & Woodruff 22928 (holotype: UC; isotypes: NY, OSC).

Differs from other *Drymocallis* in the combination of primarily solitary stems (Fig. 2); narrow inflorescences (branch angle 8–30°; Figs. 2–4); pedicel vestiture consisting of abundant to dense septate glandular hairs; small (4–6 mm), broadly oblanceolate-elliptic to narrowly obovate, pale yellow petals that are shorter than the obtuse sepals (Fig. 5); and ± obliquely ovoid, reddish-brown achenes (Fig. 6).

**Plants** herbaceous perennial, usually single-stemmed, occasionally tufted from a short-branched caudex. **Stems** erect, 2.5–6(–8) dm, the base 2–5(–6) mm diam., with abundant septate glandular hairs to 2 mm long, inconspicuous short eglandular hairs sparse or absent. **Basal leaves** 10–25 cm long; sheathing leaf-bases ciliate, otherwise glabrous, rarely sparsely strigose; lateral leaflets 2–3 per side; terminal leaflet petiolulate, the blade broadly obovate with an obtuse to rounded apex, (1.5–)2.5–6 cm long, (1.3–)2–4 cm wide, both surfaces with sparse to common simple hairs ± 0.5–1 mm

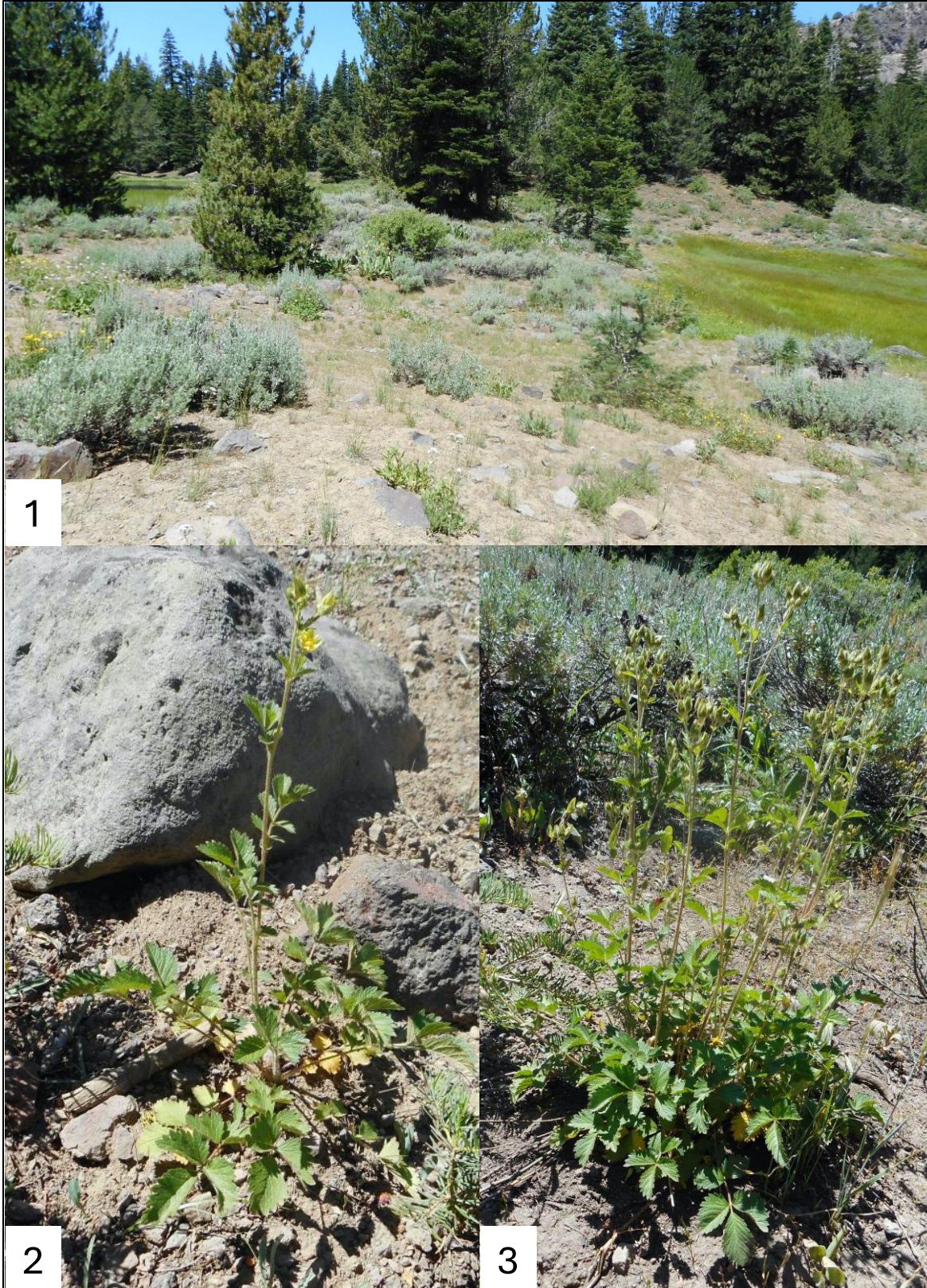
long and inconspicuous short glandular trichomes, the margins single- to double-toothed with 8–15 teeth per side. **Cauline leaves** 2(3) per side, progressively reduced distally, (5–)7–20(–25) cm long; lateral leaflets 2–3 per side. **Inflorescences** compact to narrowly elongate, usually comprising  $\frac{1}{5}$ – $\frac{1}{3}$  of plant height, not particularly leafy; branches diverging at 8–30°; pedicels 2–10 (proximal to 20) mm long, septate glandular hairs abundant to dense, short eglandular hairs absent or obscured. **Flowers** (5–)9–35(–45), opening  $\pm$  widely; hypanthium shallowly bowl-shaped, 4–5 mm diam. (pressed), with abundant glandular trichomes and sparse short simple hairs; epicalyx bractlets linear to narrowly elliptic-oblongate, 3–6 mm long,  $\pm$  1–1.5 mm wide, occasionally lobed; sepals  $\pm$  spreading at anthesis, 7–9 mm long, with a mixture of straight simple hairs to 1 mm and glandular trichomes, apex obtuse, often mucronate; petals not overlapping,  $\pm$  spreading at anthesis, pale yellow (cream), broadly oblanceolate-elliptic to narrowly obovate, 4–6 mm long, 2–3 mm wide, much shorter than sepals; filaments 1–2 mm long; anthers  $\pm$  0.6–0.9 mm long; styles thickly fusiform,  $\pm$  1 mm long, usually golden-brown. **Achenes** usually reddish brown,  $\pm$  obliquely ovoid,  $\pm$  1.2 mm long.

Flowering from June to July. Dry edges of meadows (Fig. 1) and seepage areas, roadcuts and openings in conifer forest, partial shade of aspens; 1240–2300 m elevation (low elevation extreme in Grant Co., Oregon).

**Etymology.** The name alludes to the Modoc biogeographic area (in the broad sense) where the new variety is best known; it is also intended to acknowledge and honor the Modoc tribe whose traditional territory this area represents. “Modoc Woodbeauty” is an appropriate English vernacular name.

**Other collections examined.** **CALIFORNIA.** Modoc Co.: Parker Creek Rd (Modoc NF Rte 31) 2.0 mi E of lower junction to Jess Valley, Warner Mts, steep N-facing roadcut in open (and well-grazed) ponderosa pine/fir forest, 41.449°N 120.310°W, 1670 m, 18 Jul 2012, *Ertter 21119* (MO, RSA, SRP, UC); top of Parker Creek Rd (Modoc NF Rt. 31) at junction of Granger Creek Rd, crest of Warner Mts, steep N-facing open ponderosa pine/fir forest with *Artemisia*, *Symphoricarpos*, *Lupinus*, 41.459°N 120.240°W, 2030 m, 18 Jul 2012, *Ertter 21121* (CHSC, CIC, NY, RENO, WIS, UC); Soup Springs campground in Warner Mts, S edge of heavily grazed meadow, between *Veratrum* and conifers, 41.310°N 120.279°W, ca. 2060 m, 27 Jul 2017, *Ertter et al. 22926* (SRP, UC); Parker Creek, Warner Mts., 5200 ft, 18 Jun 1931, *Payne 190* (JEPS); E exposure at base of cliffs on ridge W of Dry Creek, trib. of Parker Creek, 6500 ft, 21 Jun 1931, *Payne 221* (JEPS). **OREGON.** Grant Co.: Little Indian Creek Rd (Rte 55) 1.2 mi S of bend in Indian Creek Rd, ca 6 airmiles SW of Prairie City, partial shade at edge of wet meadow on grassy basalt flat, 44.384°N 118.768°W, 1242 m, 27 Jun 2018, *Ertter & DiNicola 23166* (CIC, OSC, UC, WTU). Lake Co.: Gearhart Mtn, ca. halfway between The Dome and Palisades, seepage on uphill side of path, full sun, 42.47°N 120.82°W, ca 2000 m, 12 Aug 1996, *Ertter & Garrett 15182* (CIC, OSC, UC, tbd); Willow Creek campground in N Warner Mts, shade of aspen & conifers, 42.094°N 120.202°W, 1850 m, 17 Aug 2016, *Ertter & DiNicola 22760* (OSC).

*Drymocallis modocana* shares the most morphological features with three currently recognized species of *Drymocallis*: *D. convallaria*, *D. glandulosa*, and *D. hansenii* (Greene) Rydb. The predominantly single-stemmed habit (Figs. 2, 4) and narrow inflorescence (Fig. 2–4) are characteristic of *D. convallaria*, a widespread species west of the Rocky Mountains whose range lies north and east of *D. modocana*. However, the obtuse sepals, small broadly oblanceolate-elliptic to narrowly obovate petals (Fig. 5), and ovoid reddish-brown achenes (Fig. 6) suggest a stronger affinity to *D. glandulosa*, also widespread in western North America and overlapping the range of *D. modocana*. In *D. convallaria*, the sepals are usually acute and achenes are usually narrower and lighter brown; petals vary in size and color, but are typically more broadly obovate, to nearly round. At the same time, most subspecies of *D. glandulosa* commonly have multiple stems with leafier, more widely branched inflorescences (branch angle 20–55°). The exception is *D. glandulosa* subsp. *viscida* (Parish) Ertter from the mountains of southern California, which also has a narrow inflorescence and petal size and



**Figure 1.** Habitat of type collection of *Drymocallis modocana* (Ertter et al. 22928) at edge of Pine Creek Basin in Warner Mountains. **Figure 2.** Solitary-stemmed plant at type locality. **Figure 3.** Tufted plant with multiple stems at type locality.



Figure 4. Specimen showing the narrowness of a fully developed inflorescence (Ertter & Garrett 15182, CIC).



**Figure 5.** Flower from type location of *Drymocallis modocana* (Ertter et al. 22928), showing the orientation and relative sizes of the small, broadly oblanceolate-elliptic to narrowly obovate, pale yellow petals and the larger obtuse sepals. **Figure 6.** Obliquely ovoid reddish-brown achenes and a few thickly fusiform golden-brown styles, from Ertter & Garrett 15182; scale bar shows millimeters.

shape comparable to *D. modocana*; however, subsp. *viscida* differs in other aspects of habit, leaflets, sepal size, and petal color. The other most comparable species is *D. hansenii* (Greene) Rydb. from the Sierra Nevada and Cascades Mountains of California, which has the general habit, relatively large petals, and achenes more comparable to *D. convallaria*.

*Drymocallis modocana* is primarily known from the Warner Mountains of northeastern California (Modoc Co.) and adjacent Oregon (Lake Co.). However, the presence of morphologically identical populations on Gearhart Mountain (also in Lake Co., Oregon) and the John Day Valley (Grant Co., Oregon) suggest that the range of species might actually be described as the mountains bordering the northwestern lobe of the Great Basin. The formal taxonomic recognition of *D. modocana* will hopefully encourage more targeted field studies that will cast light on the actual distribution of this species and also generate quality material needed to clarify other elements of unresolved variation in *Drymocallis* in central Oregon.

Additional specimens of *D. modocana* probably already exist in regional herbaria, in particular OSC/ORE/WILLU and WTU. However, the resources and effort required to spend sufficient time at these institutions to locate possible candidates currently filed as various species of *Drymocallis* was beyond the scope of the current paper, which is instead based primarily on my own collections, supplemented with specimens at CIC, SRP, and UC/JEPS. CIC has particularly good coverage for eastern Oregon, while SRP includes many specimens from Oregon that were considered superfluous when the collections of OSC and ORE were combined.

**Conservation status.** *Drymocallis modocana* presumably qualifies for some level of conservation status in California, where it is known only from scattered populations in the Warner Mountains of Modoc County. Grazing pressure was observed to be relatively intense at most collecting

localities, with few plants developing inflorescences. Conservation status in Oregon is more problematic, in that the current documentation of two confirmed populations is unlikely to represent the actual distribution in the state.

**Insect interactions.** A couple of petiole galls were preserved on one collection from the Warner Mountains (Ertter 21121; Fig. 7). These were probably produced by gall wasps in the genus *Diastrophus* (family Cynipidae), whose interactions with *Drymocallis* and other Rosaceae are currently under investigation by Charles Davis, a doctoral student at the Pennsylvania State University.



Figure 7. Petiole gall on specimen of *Drymocallis modocana* (Ertter 21121, CIC).

#### ACKNOWLEDGEMENTS

A fine selection of field companions throughout this study is acknowledged, in particular Stu Garrett, Alexa DiNicola, and Lindsay Woodruff; gall-chasing with Charles Davis has been an extra bonus. On-going access to the resources and staff of the University and Jepson Herbaria (UC/JEPS: University of California at Berkeley), the Snake River Plains Herbarium (SRP: Boise State University), and the Harold M. Tucker Herbarium (CIC: The College of Idaho) has been critical to my ongoing research on *Potentilleae*, as have the convenient accommodations in Berkeley made available by the generous hospitality of Joanne Kerbavaz, James Wood, and Walter Wood. Special curatorial assistance from Nina House is also gratefully acknowledged. The Mary L. Bowerman, Lawrence R. Heckard, Louise Kellogg, Clara Ball Pearson, and Harriet A. Walker endowment funds of the University and Jepson Herbaria are gratefully acknowledged for partial support at various stages of this research. Access to on-line resources has been invaluable, in particular the Consortium of Pacific Northwest Herbaria ([www.pnwherbaria.org/index.php](http://www.pnwherbaria.org/index.php)), the on-line Flora of North America ([http://floranorthamerica.org/Main\\_Page](http://floranorthamerica.org/Main_Page)), the Jepson eFlora (<https://ucjeps.berkeley.edu/eflora/>), and International Plant Names Index ([www.ipni.org/](http://www.ipni.org/)).

#### LITERATURE CITED

- Clausen, J., D.D. Keck, and W.M. Hiesey. 1940. Experimental studies on the nature of species. I. Effect of varied environments on western North American plants. Carnegie Inst. Washington Publ. 520: 1–452.
- Eriksson, T., M.J. Donoghue, and M.S. Hibbs. 1998. Phylogenetic analysis of *Potentilla* using DNA sequences of nuclear ribosomal internal transcribed spacers (ITS), and implications for the classification of Rosoideae (Rosaceae). *Pl. Syst. Evol.* 211: 155–179.

- Ertter, B. 2007. Generic realignments in tribe *Potentilleae* and revision of *Drymocallis* (Rosaceae) in North America. *J. Bot. Res. Inst. Texas* 1: 31–46.
- Ertter, B. 2012. *Drymocallis*. Pp. 1175–1178, 1185, in B.G. Baldwin, D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken (eds.). *The Jepson Manual: Vascular Plants of California* (ed. 2). Univ. of California Press, Berkeley.
- Ertter, B. 2015 [2014]. *Drymocallis* (Rosaceae). Pp. 280-295, in *Flora of North America North of Mexico*, Vol. 9. Oxford Univ. Press, New York and Oxford.
- Hitchcock, C.L. and A. Cronquist. 1973. *Flora of the Pacific Northwest: An Illustrated Manual*. Univ. of Washington Press, Seattle.
- Hitchcock, C.L. and A. Cronquist; D.E. Giblin, B.S. Legler, P.F. Zika, and R.G. Olmstead (eds.). 2018. *Flora of the Pacific Northwest: An Illustrated Manual*. Univ. of Washington Press, Seattle.
- Rydberg, P.A. 1898. A monograph of the North American *Potentilleae*. *Mem. Dept. Bot. Columbia Coll.* 2: 1–223 + 112 plates.
- Rydberg, P.A. 1908. Rosaceae. Tribe 7. *Potentilleae*. *N. Amer. Fl.* 22(3–4): 268–377.
- Soják, J. 1989 [1985]. Generická problematika *Potentilla* s.l. *Čas Nár. Muz., Rada Pří.* 154: 117–118.
- Soják, J. 2006. New infraspecific nomenclatural combinations in twelve American species of *Drymocallis* and *Potentilla* (Rosaceae). (Notes on *Potentilla* XVII.). *Thaiszia* 16: 47–50.