
New Combinations in the *Heterotheca villosa* (Pursh) Shinnery Complex (Compositae: Astereae)

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ABSTRACT. New combinations in the *Heterotheca villosa* complex were deemed necessary for a pending revision of *Heterotheca* sect. *Phyllothea*. Based on extensive fieldwork and examination of a large number of herbarium collections, the following new combinations are proposed: *Heterotheca stenophylla* var. *angustifolia*, *H. villosa* var. *ballardii*, *H. villosa* var. *depressa*, *H. villosa* var. *horrida*, *H. villosa* var. *minor*, and *H. villosa* var. *nana*.

During investigations leading to a revision of *Heterotheca* sect. *Phyllothea* Nuttall and systematics papers on various aspects of the biology of members of the section, the following new combinations were determined to be required. Nomenclatural decisions were reached after examining more than 8,700 herbarium specimens of *H.* sect. *Phyllothea*. Semple (1990) presented a possible conservative synonymy for *H. villosa* (Pursh) Shinnery, noting that several additional varieties might warrant recognition based on additional data. Multivariate morphometric analyses completed since 1990 indicate that upper stem leaf shape and the numbers of hairs and glands per unit area of leaf surface are useful in delimiting taxa within the highly variable *H. villosa* complex. The details of these analyses will be published elsewhere.

Heterotheca stenophylla (A. Gray) Shinnery var. ***angustifolia*** (Rydborg) Semple, comb. nov. Basionym: *Chrysopsis angustifolia* Rydborg, Bull. Torrey Bot. Club 37: 128. 1910. *Chrysopsis villosa* (Pursh) Nuttall var. *angustifolia* (Rydborg) Cronquist, Bull. Torrey Bot. Club 74: 150. 1947. *Heterotheca villosa* (Pursh) Shinnery var. *angustifolia* (Rydborg) Harms, Wrightia 4: 16. 1968. TYPE: U.S.A. Nebraska: Hooker Co., near Mullen, Middle Loup River, 14 Sep. 1893, Rydborg 1766 (lectotype, selected by Semple (1990), NY; isolecotypes, GH, NY, US).

This is the common, moderately pubescent and eglandular goldenaster on the eastern prairies from Texas north to South Dakota. The type would be identified as a member of *H. stenophylla*, if it was glandular like members of variety *stenophylla*. The

two varieties occur in pure and mixed populations throughout the range of the species. Most individuals in *H. stenophylla* have narrow oblanceolate leaves that are usually crowded and ascending and have distinctly larger hairs along much of the leaf margin than on the surfaces. Leaf surface hairs in both varieties of *H. stenophylla* often have a broader base than normal in section *Phyllothea*. In the southern part of its range, variety *angustifolia* can be quite similar to *H. canescens* (DC.) Shinnery. In the northern part of its range, variety *angustifolia* can be similar to *H. villosa* var. *villosa*. Plants from Nebraska, Oklahoma, and Texas treated as *H. villosa* var. *foliosa* in floras belong in *H. stenophylla* var. *angustifolia*. In the Black Hills area of South Dakota, which is at the limits of distribution for both taxa, *H. stenophylla* var. *angustifolia* and *H. villosa* var. *foliosa* can be difficult to distinguish. Local hybridization between *H. villosa* and *H. stenophylla* undoubtedly occurs in the northern part of the range of the latter species.

Heterotheca villosa (Pursh) Shinnery var. ***ballardii*** (Rydborg) Semple, comb. et stat. nov. Basionym: *Chrysopsis ballardii* Rydborg, Brittonia 1: 100. 1931. TYPE: U.S.A. Minnesota: Chaska, July 1891, Ballard 640 (holotype, MIN).

This is the generally robust, larger-headed, many-rayed, eglandular, oblong-leaved race of the species occurring on the northeastern prairies of Canada and the United States. Typical variety *villosa* has oblanceolate leaves and smaller heads with fewer rays.

Heterotheca villosa (Pursh) Shinnery var. ***depressa*** (Rydborg) Semple, comb. et stat. nov. Basionym: *Chrysopsis depressa* Rydborg, Mem. New York Bot. Gard. 1: 381. 1900. *Heterotheca depressa* (Rydborg) Dorn, Vasc. Pl. Wyoming. 295. 1988. TYPE: U.S.A. Wyoming: Yellowstone National Park, Lower Geyser Basin, 4 Aug. 1897, Rydborg & Bessey 5067 (holotype, NY; isotypes, CAN, US).

This is the generally small-statured, smaller-headed, few-rayed, densely pubescent and very sparsely glandular race of the species that occurs in typical form in the vicinity of hot springs and geysers in Yellowstone National Park in Wyoming. Less typical plants also have been collected in the nearby Teton National Park. Members of variety *minor* and plants intermediate between variety *depressa* and variety *minor* occur in both parks. Field observations indicate that typical variety *depressa* is common near the type locale and other hot springs and geysers in Upper Geyser Basin, while variety *minor* is common in other areas of Yellowstone National Park. Dorn (1988) treated variety *depressa* as a separate species. Our numerical analyses indicate that too many plants intermediate between variety *depressa* and variety *minor* occur to justify species status. Both varieties are tetraploid in the area of sympatry.

Heterotheca villosa* (Pursh) Shinnars var. *minor (Hooker) Semple, comb. nov. Basionym: *Chrysopsis villosa* (Pursh) Nuttall [var.] β *minor* Hooker, London J. Bot. 6: 244. 1847. TYPE: U.S.A. [Wyoming: Sweetwater Co.,] "Oregon [Territory], on the granite masses of the Sweet Water River, only fringing the fissures," July 1843, Geyer 7 (holotype, K; isotypes, GH, K ex Bentham, NY).

Diplopappus hispida Hooker, Fl. Bor. Amer. 27: 22. 1834. *Chrysopsis hispida* (Hooker) DC., Prod. 7: 279. 1836. *Chrysopsis villosa* (Pursh) Nuttall var. *hispida* (Hooker) A. Gray, Synop. Fl. N. Amer. 1, 2: 123. 1884. *Heterotheca villosa* (Pursh) Shinnars var. *hispida* (Hooker) Harms, Brittonia 26: 61. 1974. TYPE: Canada. Saskatchewan: Carlton House [Fort], 1827, Richardson s.n. (lectotype, selected by Semple (1990), BM, shoot No. 2).

This variety has long been recognized as variety *hispida*, a name that does not have priority at the varietal rank. The holotype of variety *minor* is a small-headed individual with oblanceolate leaves that are about average in hair density for the variety and considerably, but not significantly, above average in gland density. The type of *Diplopappus hispida* has leaves with indument density very low for variety *minor*. If variety *hispida* were to be recognized as a separate taxon, then many other local and rare morphs occurring in the Rocky Mountains would also need to be recognized to be consistent. However, there are numerous individuals with intermediate traits.

Heterotheca villosa* (Pursh) Shinnars var. *horrida (Hooker) Semple, comb. et stat. nov. Basionym: *Chrysopsis horrida* Rydberg, Bull. Torrey Bot. Club 31: 648. 1904. *Heterotheca horrida* (Rydberg) Harms, Wrightia 4: 17. 1968. TYPE: U.S.A. Colorado: New Windsor, 8 Aug. 1900, Osterhout 2326 (holotype, NY; isotypes, RM(2), WIS).

This is the common foothills and prairie race of the species occurring from southeastern Wyoming to central New Mexico and west to northeastern Arizona. It is similar to variety *minor* in indument and differs in having oblong versus oblanceolate upper stem leaves. The capitulescence is generally compact and rather umbelliform. This variety has been recognized as a species in some floras (e.g., Harms, in Correll & Johnston, 1970; Great Plains Flora Association, 1986; Dorn, 1988). Semple (1990) placed it in synonymy under *H. villosa* var. *hispida* (= var. *minor*) on the basis of similarity in indument features.

Heterotheca villosa* (Pursh) Shinnars var. *nana (A. Gray) Semple, comb. nov. Basionym: *Chrysopsis canescens* (DC.) Torrey & Gray var. *nana* A. Gray, Mem. Amer. Acad. Arts 4: 78. 1849. TYPE: U.S.A. New Mexico: [possibly Mora Co.:] "elevated rocky region 2 mi. E of the Mora River," Aug 1847, Fendler [391c] (holotype, GH).

This is a dwarf, rare form of the species that is similar to variety *horrida*, but differs in having smaller heads and much smaller leaves that have many more glands. If variety *horrida* and variety *nana* are treated as convarietal, then the name variety *nana* has priority.

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