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NAMES AND TYPES IN PERENNIAL *ATRIPLEX* LINNAEUS (CHENOPODIACEAE) IN NORTH AMERICA SELECTIVELY EXCLUSIVE OF MEXICO

Stanley L. Welsh¹ and Clifford Crompton²

**Abstract:** Cited are names and combinations within the woody species of *Atriplex* as they occur in North America. Types and their repositories are included for all taxa except those for which that information could not be located. New nomenclatural proposals include *Atriplex gardneri* var. *aptera* (A. Nelson) Welsh & Crompton, comb. nov.; *A. garrettii* var. *navajoensis* (C. A. Hanson) Welsh & Crompton, comb. nov.; *Atriplex acanthocarpa* var. *coahuilensis* (Henrickson) Welsh & Crompton, comb. nov. A lectotype is designated for *A. breweri* S. Watson.

**Key words:** Chenopodiaceae, Atriplex types, North America.

This list of names and synonyms of perennial and woody *Atriplex* taxa is preliminary to the preparation of a taxonomic treatment for the woody species of *Atriplex* as they occur in North America, both indigenous and introduced species. All names, whether treated as taxa recognized by me or as mere synonyms, are included. The taxonomic treatment that will appear subsequently in the publication of the Flora North America Project will distinguish between the names of taxa per se and their included synonyms. The relatively large number of names and synonyms for this small group of plants is indicative of the changes in generic concepts, the ever-changing interpretation of the status of a taxon, and the general phenotypic plasticity of this amazing group of shrubs, subshrubs, and perennial herbs, which hybridize freely among themselves and sometimes with other taxa not apparently closely allied. They grow on a surprising array of substrates in the American West, from the cold temperate of northern Alberta to the much warmer climates of Mexico. Often they are among the most important shrub species on saline, fine-textured substrates, and sometimes they are the only shrubby inhabitants. Their ability to survive and even thrive in saline sites has placed them in a position of importance for browsing animals where other browse is scarce or lacking. They cover huge areas where geomorphological processes have exposed raw, saline strata in vast expanses.

Niobrara Shale, Mancos Shale, Morrison Formation, and numerous other geological formations support these plants. Saline pans and other poorly drained lowlands are occupied by these species. Despite the affinity for saline areas, where they have little competition (except from other halophytes), some of the species thrive where total soluble salts are low. The four-wing saltbush, *Atriplex canescens* (Pursh) Nuttall, is such a plant. It grows from the edge of saline areas up gradient into far less saline substrates, often in grasslands or in shrublands dominated by sagebrush and other shrubby species.

Hybridization is an important factor contributing to the diversity of woody *Atriplex* species. There are at least two main taxa around which many of the remainder are placed, and with which most form at least occasional hybrids, i.e., *A. canescens* (Pursh) Nuttall and *A. confertifolia* (Torrey & Fremont) S. Watson. Some of the hybrids have received names and formal taxonomic recognition. Most of them are of occasional occurrence, and some of the taxa treated in contemporaneous taxonomic works are apparently of hybrid derivation—now more or less stabilized as populations, mainly on very peculiar substrates.

The following list is thought to be exhaustive for woody and perennial *Atriplex* names in North America, especially for those north of Mexico. A few taxa represented in Mexico are included where they round out the names for

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species complexes largely confined north of that country. Pertinent types have been received on loan by the gracious kindness of curators of the herbaria cited with the specimens. Abbreviations for the herbaria are those standard ones cited in Index Herbariorum, except that the origin of the collection is indicated by use of such designations as NY Torrey for historic specimens. This is thought to be important because it authenticates the antiquity of the specimen and might prove important in certain cases in judging whether a particular author had access to a given specimen.

The type information is presented below in dual format for some taxa, with the type locality or collector information (herein arbitrarily designated "Type locality") as recorded with the protologue cited first and with the label data of the type specimen (herein designated "Type") cited second where there is a substantial difference in the two accounts.


Basionym: Obstrea acanthocarpa Torrey
This is a shrub or subshrub, generally less than 1 m tall, characterized by spongy fruiting bracteoles 8–15 mm long, borne on slender to stout pedicels 4–20 mm long. Leaves are variable, but often sinuate-dentate to undulate-crisped and with hastately lobed base. The species occurs from west Texas and southern New Mexico south through southeastern Arizona and var. coahuilensis in southern Texas.

= A. acanthocarpa var. coahuilensis (Henrickson) Welsh & Crompton (cited below).
Type: Mexico, Coahuila, ca 2 km W of Nadadores in saline pastured flats near El Porvenir along Hwy. 30, with Suaeda, Sporobolus, Distichlis, var. 27°03' N lat, 101°37' W long, 540 m, 6 Dec 1975, J. Henrickson 14784; holotype TEX; isotypes MEXU, NY!, RSA.

This taxon is distinguished by its fruiting bracteoles bearing radiating processes, and stems with at least the medial leaf blades hastate-lanceolate, and with mature fruiting inflorescences very long. Its range is from southern Texas to southeast Coahuila and coastal Tamaulipas.

Atriplex acanthocarpa var. coahuilensis (Henrickson) Welsh & Crompton, comb. nov.

= A. gardneri var. cuneata (A. Nelson) Welsh
Atriplex acanthocarpa var. pringlei (Standley) Henrickson, Southwest. Nat. 33: 461. 1998

Basionym: A. pringlei Standley
The taxon is endemic to Mexico, from northern Zacatecas and southern Nuevo Leon south to San Luis Potosi.

Basionym: A. stewartii I. M. Johnston
The taxon is endemic to Coahuila, Mexico, and is distinguished by its 4-winged fruiting bracteoles, although specimens are transitional to A. acanthocarpa var. acanthocarpa.

Type: "Yalgoo, W. A." [western Australia], 10 Oct. 1945, C. A. Gardner 7751a; holotype PERTH!

= A. canescens (Pursh) Nuttall
Type: New Mexico, Dona Ana Co., Mesilla Park, Cockerell in 1900; holotype US!

The US specimen bears the following label data: "Atriplex rugulosa, var. Distinguished from A. canescens by the very narrow (3 mm broad) leaves. Apparently = A. canescens angustifolia but that name is preoccupied. Sand Hills Mesilla Park, N. M. 1900. T.D. Cockerell."

Hall and Clements (1923) cited this as a new name for A. canescens var. angustifolia, but it seems obvious that while Cockerell recognized the equivalency of the taxa, he was proposing a new taxon, not merely a new name.

= A. gardneri var. aptera (A. Nelson) Welsh & Crompton


Hanson (1962) suggested that his taxon was of hybrid derivation involving A. canescens and A. buxifolia as parental taxa. Distribution of specimens assignable to the concept is sporadic, possibly indicating multiple origins, and it cannot be considered a taxon in the usual sense. The type specimen of A. aptera has definite wings aligned in four rows similar to some A. canescens but agrees in aspect, size, and general features with A. gardneri.

Atriplex berlandieri Moquin-Tandon, Chenop. Enum. 65. 1840.
= A. canescens (Pursh) Nuttall
Type: "In regno Mexican. Berlandier 1828"; holotype ?
Moquin-Tandon enlarges on the type information in his treatment in Prodromus (13[2]: 114. 1849), "In regno Mexicano inter Laverdo et Bejar (Berlandi n. 1450)."

= A. gardneri var. bonnevillensis (C. A. Hanson) Welsh
Type: Utah, Millard Co., "dry lake bed 1.5 miles northeast of headquarters, Desert Range Experiment Station (dominant plant)," 12 July 1961, C. A. Hanson 354; holotype BRY; isotypes GH, MO!, NY!, UTC.

The sheets at GH and NY have the date printed as 13 July 1961, probably representing typographical errors.
Type locality: “Frémont; 459 Torrey; 75 Brewer” (l.c.).
Since the plant was described by Watson on the basis of at least three collections, and as there are duplicates of the Brewer collection, it is proper to designate the material at GH as lectotype. The sheet at US bears a sketch and notes by John Torrey: “75. Obiome—near the Sea, at Sta Monica. Probably O. lentiformis [large frutification] in an abnormal state. The bracts appear to have been changed by galls.”
Recognition of A. breviori at taxonomic level as either a variety or subspecies of A. lentiformis is without merit. Indeed, the plants have typically larger leaves and fruiting bracteoles that average larger. However, there is a series of intermediates that connect the robust coastal material with the less robust plants in the interior. Plants designated as belonging to A. breviori are considered by me as taxonomically negligible.

= A. gardneri var. aptera (A. Nelson) Welsh
Type locality: Wyoming. Sheridan Co., Dayton, 1220 m altitude, September 1899, Tweedy 2656; holotype NY!

Atriplex canescens var. linearis (Pursh) Nuttall, Genera N. Amer. Pl. 1: 197. 1818.
Basionym: Calligonum canescens Pursh
Putative or actual hybrids are known to A. canescens and A. confertifolia or A. gardneri (various varieties). Such hybrids are only occasional; they do not swamp the characteristics of the taxa nor persist as populations. The two exceptions to the sporadic nature of the hybrids involving A. canescens as one of the parental types are A. gardneri var. borneoellensis and A. gardneri var. aptera. Neither of these overwhelms the parental taxa, but being long-lived, they persist for long periods of time and occupy rather large areas in specific habitats. Bracts with four wings appear to have arisen independently at several places within the woody atriplexes. Such a condition is not necessarily an indication of close genetic affinities. Indeed, the gardneri and acanthocarpa complexes seem to be more distantly removed from A. canescens than from other taxa.

= A. canescens (Pursh) Nuttall
Basionym: Obione occidentale var. angustifolia Torrey
Narrow-leaved shrubs from west Texas are transitional with broader-leaved materials both there and elsewhere. They do not seem to constitute a taxon.

Basionym: A. aptera A. Nelson
= A. gardneri var. aptera (A. Nelson) Welsh

Type: Utah, Juab Co., Lyndondale sand dunes, T35S, R4W, 8 Sept. 1865, S. L. Welsh & C. Moore 5120; holotype BRY!, isotype NY!
The variety is based on its very broad bracts, stems that produce roots by layering, thus accommodating burial in dunes, and diploid chromosome number.

Atriplex canescens var. laciniata Parish, in Jepson, Fl. Calif. 442. 1914.
= A. canescens × A. polyacarpa? as to possible origin.
Type locality: California, Imperial Co., “Caleb, Colorado Desert, Parish 8256” (Jepson l.c.).
Type: California, Imperial Co., “Plants of Southern California, Salton Basin, Caleb. About 200 feet below sea level, No. 8256. Coll. S. B. Parish, Oct. 11. 1911”; holotype UC [JEPS]; isotype GH!
This variety has been suggested as based on specimens intermediate between A. canescens and A. linearis (C. A. Hanson l.c.), although Stutz (personal communication 1984) posed another possibility, i.e., that a chromosomal race of A. polyacarpa forming hybrids with A. canescens has resulted in at least partially stabilized populations of var. laciniata within the Salton Basin. The type is characterized by deeply lacinate, 4-lobed bracteoles within the size range of A. canescens. It has slender branchlets and narrow leaves approaching those of both A. linearis and A. canescens var. macilenta, which had a similar origin from a separate chromosomal race of A. polyacarpa forming hybrids with A. canescens.

Basionym: A. linearis S. Watson
= A. linearis S. Watson

Basionym: A. linearis S. Watson
= A. linearis S. Watson

Basionym: A. macropoda Rose & Standley
This taxon is known from Baja California.

Atriplex canescens var. macilenta Jepson, Fl. Calif. 1: 442. 1914.
Type locality: California, Imperial Co., “Holtville, Colorado Desert, Parish 8258” (l.c.).
Type: California, Imperial Co., "Plants of Southern California, Salton Basin. Bluffs of Alamo River, Halbatillo. About 15 feet below Sea Level, S. B. Parish 8258, Oct. 18, 1912"; holotype UC JEPS; isotypes DS ("Calexico"), GH!, POM!

The type has leaves to 4 mm wide, narrowly oblanceolate and obtuse apically. Bracts are small, as in A. linearis, and toothed along the margin of the wings. The toothed margin of the wings hints at the laciniate nature of bracts on plants from the nearby Salton Basin and named var. laciniata Parish. Plants called var. macilenta approach but do not exactly match the more characteristic specimens of A. linearis from southern Arizona and northern Mexico. According to Stutz (personal communication 1994), the var. macilenta is a high polyploid, while A. linearis is a diploid. The relatively broader, thicker leaves of var. macilenta are apparently diagnostic.

The specimen at DS, Parish 8258, Oct. 1912, is labeled as having been taken on "Bluffs of the Alamo, Calexico." It is one of three localities cited under Parish's number 8253, and the specimens other than the one taken at Holtville are probably better considered as paratypes.

Parish made a series of collections from the Salton Basin in October 1912. His numbers 8252 and 8256 were collected on October 11, 1892; 8253 is a small-bracteole, narrow-leaved plant assignable to var. macilenta, the type of which (8258) was taken on October 18. Parish's number 8256, the type of var. laciniata, is evidently closely placed geographically within the Salton Basin, which also supports A. polycarpa, which is potentially a taxon of both var. macilenta and laciniata through hybridization with different chromosomal races of A. polycarpa through hybridization with A. canescens. Number 8255 approaches A. linearis in size of bracts and width of leaves, and possibly that species is also involved in the derivation of both var. laciniata and macilenta.

Type: California, Imperial Co., "Plants of Southern California, Salton Basin. Bluffs of Alamo River, Halbatillo. About 15 feet below Sea Level, S. B. Parish 8258, Oct. 18, 1912"; holotype UC JEPS; isotypes DS ("Calexico"), GH!, POM!

The type consists of two fertile branches, one pistillate and the other staminate. Both have the small, narrow leaves characteristic of the taxon throughout its range. The species is only exceptionally restricted to saline substrates of such fine-textured strata as the members of the Cretaceous Mancos Shale and Jurassic Morrison Formation, inter alia, where it often occurs as a monotypic. It forms occasional hybrids with A. confertifolia and A. gardneri var. canescens, with whom its ecology is sporadic. The taxon is probably most closely allied to the latter, with which it shares large land areas, but from which its autecology is restricted. It is regarded herein at species rank because of the maintenance of morphological integrity despite occasional contact with the other taxa over much of its area. Additionally, there are hints in its morphology of close ties in still another direction, i.e., with A. obovata.

Type locality: California, "Near San Diego; Dr. E. Palmer, 1875 (n. 234)" (Watson 1877).

Type locality: "Carrizo Mountains," P. C. Standley 7481, 31 July 1911; holotype US!


Type locality: "Nearly allied to A. notattitii. Discovered by Miss Alice Eastwood at Grand Junction, Colorado, in well formed fruit on 20th May, 1891. Miss Eastwood notes it as the earliest in fruit of several perennial species of the genus growing in the same locality" (i.e.).

Type locality: "Dry hills near the north end of the Carrizo Mountains," P. C. Standley 7481, 31 July 1911; holotype US!

Type locality: California, "Near San Diego; Dr. E. Palmer, 1875 (n. 234)" (Watson 1877).

Type locality: California, "Dry hills near the north end of the Carrizo Mountains," P. C. Standley 7481, 31 July 1911; holotype US!


Type locality: California, "near San Diego; Dr. E. Palmer, 1875 (n. 234)" (Watson 1877).

Type locality: California, "Dry hills near the north end of the Carrizo Mountains," P. C. Standley 7481, 31 July 1911; holotype US!


Type locality: California, "near San Diego; Dr. E. Palmer, 1875 (n. 234)" (Watson 1877).

Type locality: California, "Dry hills near the north end of the Carrizo Mountains," P. C. Standley 7481, 31 July 1911; holotype US!


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Atriplex falcata (M. E. Jones) Standley, N. Amer. Fl. 21: 68. 1916.
= A. gardneri var. falcata (M. E. Jones) Welsh

Atriplex fruticosa Nuttall ex Moquin-Tandon, in de Candolle, Prodr. 13(2): 112. 1849. pro syn.
= A. gardneri var. gardneri
Type: "Atriplex fruticosa. A. Halimium affinis. R. Mts." Nuttall; holotype BM!
The type of A. fruticosa is mounted with collections with the notation "British North America. Dr. Richardson 1819–28," and designated as A. canescens. In Index Kewensis the name fruticosa is noted as a synonym of A. canescens, a supposition possibly based on the identity of the Richardson material, but more probably on the publication of the name as a synonym of A. canescens by Moquin-Tandon. The epithets fruticosa and heterophylla, both herbarium names of Nuttall, were published as synonyms and are not to be regarded in considerations of priority.

Atriplex fruticulosa Jepson, Pittonia 2: 306. 1892.
Type: California, "Little Oak, Solano Co., Aug. 16, 1892. Willis L. Jepson"; holotype UC; isotype MO!
This plant functions mostly as an annual but is apparently capable of a longer life span, extending to become a short-lived perennial. The name has priority over the later homonym, A. fruticulosa Osterhout (1898).

Basionym for: A. crenulicola Osterhout
= A. gardneri (Moquin-Tandon) Dietrich var. gardneri
Type locality: Wyoming, Albany Co., Steamboat Lake, "The type was collected near a small alkaline lake in Southern Wyoming," C. Osterhout s.n. 2 July 1896; holotype (no. 1324) RM!; isotype NY!, RM! (this second sheet, presumably an isotype, lacks the collector’s number). A collector’s number was not cited with the protologue, but the holotype sheet at RM bears the number 1324. Material on which this entity was based differs in no particular way from A. gardneri var. gardneri.

Atriplex gardneri (Moquin-Tandon) Dietrich, Syn. Pl. 5: 537. 1892.
Basionym: Obione gardneri Moquin-Tandon
There is a sheet, possibly identifiable as belonging to this species and not bearing on the nomenclature of the species, in the Lewis and Clark herbarium at PH: “A half shrub from the high plains of Missouri. July 20th 1806.” It is cited here to demonstrate that the species was known from the earliest collections into the western plains.

Atriplex gardneri var. aperta (A. Nelson) Welsh & Crompton, comb. nov.
This entity was treated by Hanson (1962) as a probable derivative of hybridization between A. canescens and A. buxifolia (A. gardneri sens. lat.). It is a low shrub most similar to the latter, but with bracteoles winged as in A. canescens or with tuberces aligned in four rows, and with yellow stamine flowers. It is likely that the condition of 4-winged fruits has arisen independently on many occasions and that the resulting populations are not associated genetically as in a typical taxon. Regardless of origin, however, the resultant plants are readily recognizable and are widely distributed from southern Canada south along the plains to Nebraska and Wyoming. A. canescens also forms hybrids with other phases of the gardneri complex (sec below).

Basionym: A. bomecellensis C. A. Hanson
This variety is more or less intermediate between A. gardneri var. falcata and A. canescens, but it most nearly resembles the former in habit. The bracteoles are 5–8 mm long and 3–9 mm wide, ovoid, with four lateral wings or rows of flattened tubercules to 3 mm wide, or the wings rarely absent. The plants are confined to playas and saline pans in the valleys of western Utah and across Nevada.

Basionym: A. canadensis A. Nelson

Basionym: A. nuttallii var. falcata M. E. Jones

= A. gardneri var. utahensis (M. E. Jones) Dorn
Basionym: A. tridentata Kuntze

Basionym: A. welshii C. A. Hanson

Basionym: A. nuttallii var. utahensis M. E. Jones

Despite earlier treatments in which this taxon was regarded at infraspecific status within A. canescens, the nearest allies appear to be in the gardneri complex. Apparent hybrids are known between A. garrettii and A. confertifolia (C. A. Hanson 1962), but not with A. canescens.

Atriplex garrettii var. navajoensis (C. A. Hanson) Welsh & Crompton, comb. nov.
This variety differs from the type material in plant size, length of stamine inflorescences, color of stamine flowers, and other intangibles. Generally the plants are very similar. The few known localities, from the vicinity of Lee's Ferry to Navajo Bridge in Coconino County, AZ, are only disjunct by about 100 km from the nearest populations of var. garrettii.

Atriplex gordonii Hooker, J. Bot. 5: 261. 1853. nom. nov. pro A. gardneri Moquin-Tandon
= A. gardneri (Moquin-Tandon) Dietrich var. gardneri

Atriplex lentiformis Moquin-Tandon

Type locality: "New Mexico to Sonora. Collectors: 1346 Berlandier; 462 Gregg; Emory; Thurber; Bigelow; 572, 1137, 1138 Wright" (Watson). Paratypes: "No. 462. Atriplex obovata Moq. Perros Bravos, Coahuila, Mexico, Dr. J. Gregg, leg. 1848-49" (GII Lowell); "Berlandier, No. 1346. Bae de del Salado, San Luis Potosi, 1827" (GII).


Atriplex griffithsii Standley, N. Amer. Fl. 21: 63. 1916.

= A. lentiformis var. griffithsii (Standley) L. Benson

Type: Arizona, Cochise Co.: "Wilcox," Griffiths sn. 1895, Oct. 12, 1900; holotype NY; isolectotype US!

This is a distinctive taxon with silvery, thick leaves. It is disjunct from the remainder of the species.


= A. gardneri (Moquin-Tandon) Dietrich var. gardneri

Type: "Atriplex * heterophylla. R. Ms. Nuttall; intended type BM!"

This is yet another herbarium name by Nuttall cited as a synonym of A. canaescens by Moquin-Tandon in de Candolle's Prodrumus. It again demonstrates that the species was well represented in collections prior to the collection of the type material of A. gardneri.


Basionym: Obione hysmenelytra Torrey


= A. nanmaderia Lindl.

Type: California, Los Angeles County, Coastal cliffs, Playa del Rey. C. B. Wolf 1821, 23 Dec. 1939; isotypes CAS!, GII!, NY!

The isolate at GII consists of four woody, leafy branches, two of them with fruiting bracts. Leaves are short-petiolate, with blades 1.2-3.5 cm long and 1.3 cm wide.

Atriplex jonesii Standley, N. Amer. Fl. 21: 65. 1916. nom. nov. pro A. sabulosa M. E. Jones.

= A. obovata Moquin-Tandon


Basionym: Obione lentiformis Torrey, in Sigreaves

This is a warm-desert species, important in saline pans along drainages at low elevations in the valleys of the Colorado and Gila rivers and Salton Sink. The species is distributed from western and southern Arizona, through southern Nevada and California, and also in Mexico. Hanson (1962) notes that A. lentiformis sens. lat. forms hybrids with A. leucophylla (Moquin-Tandon) Dietrich, a perennial not especially woody species, and possibly even with an annual species. Such hybridizations might indicate that A. lentiformis and its near relative A. torreyi have alliances elsewhere than with the other woody species treated herein.


Basionym: A. breueri S. Watson

=A. lentiformis sens lat?


Basionym: A. breueri S. Watson

=A. lentiformis sens lat?


Basionym: A. griffithsii Standley

=A. lentiformis sens lat?

Atriplex lentiformis var. griffithsii (Standley) Benson, Amer. J. Bot. 30: 236. 1943.

Basionym: A. griffithsii Standley

=A. lentiformis sens lat?


Basionym: Obione torreyi S. Watson


Type locality: Mexico, Sonora, alkaline soil about Guaymas, Palmer 120, 121, 235; syntypes GII.


Paratypes 120 and 121 are immature, the former pistillate, the latter staminate. The lectotype sheet #235 has at least four branches with more or less mature fruiting bracteoles. The bracteoles are 4-winged, rather deeply lanatiately lobed to merely toothed along the wings, and are 3-6 mm wide.

Hanson (1962) regarded A. linearis as the most substantial variant within the canaescens complex but recognized that it forms hybrids with A. canaescens. The plants are certainly morphologically distinct from most phases of that entity. The slender, short to elongate leaves (seldom more than 4 mm wide and to 3.8 cm long), fruiting bracteoles seldom over 6 or 7 mm wide, and very slender branchlets are apparently diagnostic in most instances.

Atriplex macropodica Rose & Standley, N. Amer. Fl. 21: 72. 1916.

= A. linearis S. Watson (sens lat.), but the fruiting bracteoles are long pedicellate, unlike A. canaescens

Type locality: "Type collected on Pinchinilloque Island, Lower California, March 27, 1911, J. N. Rose 16518 (U.S. Nat. Herb. no. 63867)."

Type: Lower California, Pinchinilloque Island, Gulf of California, J. N. Rose 16518, March 27, 1911; holotype US!


= A. garrettii var. navajoensis (C. A. Hanson) Welsh & Crompton

Type: "Arizona: Coconino Co., east side of the Navajo Bridge, July 21, 1961," C. A. Hanson 388; holotype BRY!; isotype CH!


= A. gardneri var. cuneata × A. confertifolia

Type locality: "Type collected on dry hills near Farmington, New Mexico, altitude 1580-1650 m, July 19, 1911, Paul C. Standley 7066 (U.S. Nat. Herb. no. 686089)."

Type: New Mexico, "Dry hills near Farmington," San Juan Co., New Mexico, July 19, 1911, P. C. Standley 7066; holotype US!

The name is evidently based on plants intermediate between A. gardneri var. cuneata and A. confertifolia.


Type: Australia, "Cultivated in Italy, seed from South Australia." Holotype not seen.


= A. canescens (Pursh) Nuttall sens. str.

It is unfortunate that one must at this late date attempt to analyze Watson's use of the name nuttallii for a portion of the woody atriplexes in the American West. From its publication in 1874 the name has been the source of much confusion, serving to clutter Atriplex nomenclature for all subsequent time. It seems certain from a study of Watson's proposal, justification for which can only be inferred, that he was merely presenting a new name for material that he thought to be misinterpreted by contemporary botanists. The evolution of botanical thought with regard to the perennial atriplex species parallels that for other newly discovered taxa in the American West and was initiated when the first of the woody specimens arrived from western botanical explorers. Few names were available, specimens were few and often fragmentary, literature was difficult to obtain, and it was easy to misapply concepts and mix names, a symptomology not of that era alone.

Supposed sensu names cited by Watson (1874) within the synonymy of A. nuttallii include Atriplex canescens as used by Nuttall and an assortment of other historical authors, Obione canescens of Moquin-Tandon and other authors, and still another synonymy, i.e., "A. gordonii Hook.," with the citation "Pl. Geyer in Lond. Jour. Bot. 5: 2619," and by implication the type of A. gordonii (i.e., A. gardneri).

Watson first cited the name A. canescens as published by Nuttall (1818), the implication being that Calligonum canescens Pursh, basionym of A. canescens, could not apply. Nuttall is indeed author of the combination Atriplex canescens, and the place of citation is his 1819 publication, wherein he cites C. canescens as the basionym of his combination; furthermore, Nuttall's description is clearly C. canescens Pursh, sensu stricto. It is Watson's understanding of Nuttall's use of the epithet that is in error. Thus, A. canescens of Nuttall is certainly not a mere sensu name, however one might wish to interpret the application of the epithet. Both the name and the concept as supplied by Nuttall are A. canescens, including its basionym. A. nuttallii of Watson thus includes the type of Calligonum canescens, and the epithet nuttallii is illegitimate under stipulations of the International Code. Hence, from a nomenclatural viewpoint there is no problem. Nuttall based his Atriplex canescens squarely on Calligonum canescens Pursh, and Watson quoted A. canescens Nuttall as the name-bringing synonym of A. nuttallii, which was stillborn. The lectotype of Calligonum canescens Pursh is at PII and is therefore the lectotype of both Obione canescens and A. nuttallii, which cannot be transferred to a different species or brought to life by sophisticated arguments. Hence, the proposal for lectotypification by McNeill et al. (1983) is illegitimate.


= A. gardneri var. falcata (M. E. Jones) Welsh

Type locality: "Type is my specimens from Dolly Varden Smelter, E. Nevada, July 1894 (1891)."

Type: Nevada, Elko Co., "Marcus E. Jones Herbarium. Atriplex nuttallii var. anomalii (sic) Jones n. var. Dolly Varden at the Smelter, VII-24-91. N.W. of Ibapah, Utah." M. E. Jones sn; holotype POM!; isotype UC (£rag.)!

Jones was clearly in error in citing the date of the collection as 1894. His itinerary cited in Leaflets of Western Botany (10: 189-236) places him at the Dolly Varden Smelter on 24 July 1891, not 1894.

Atriplex nuttallii sp. falcata (Rydberg) Hall & Clements, Phyllog. Meth. Taxon. 325. 1923.

Basionym: A. buxifolia Rydberg

= A. gardneri (Moquin-Tandon) Dietrich var. gardneri


= A. corrugata S. Watson


Basionym: A. cuneata A. Nelson

= A. gardneri var. falcata (A. Nelson) Welsh


Basionym: A. nuttallii var. falcata M. E. Jones

= A. gardneri var. falcata (M. E. Jones) Welsh


= A. gardneri var. falcata (M. E. Jones) Welsh


= A. gardneri (Moquin-Tandon) Dietrich var. gardneri

Basionym: Obione gardneri Moquin-Tandon


= A. gardneri var. utahensis (M. E. Jones) Dorn

Basionym: A. tridentata Kuntze

Atriplex nutillii var. tridentata (Kuntze) R. J. Davis, Fl. Idaho 261. 1952.
= A. gardneri var. utahensis (M. E. Jones) Dorn
Basionym: A. tridentata Kuntze

= A. gardneri var. cuneata (A. Nelson) Welsh
Type locality: Colorado, Delta Co., Delta, Cowen 4071 (Rydberg 1904).

Atriplex obovata Moquin-Tandon, Chenop. Enum. 61. 1840.
Type locality: "In Peruvia. (v.s. in herb. Mus. Paris)" (l.c.).

= A. obovata Moquin-Tandon
Type locality: Texas, El Paso Co., Fornillo Creek, Harbert 103.
Type: "No. 103 (see specimen of male), 1-2 [feet] high - Folage & specially fruit different from that of A. acanthocarpa. Fornillo Creek, W Texas. Aug. [18]83. V. Havard, U.S.A."; holotype GH!; isotype US!

The sheet at GH consists of three leafy branches, now lacking fruiting bracteoles or staminate flowers. The material is certainly a match for what has traditionally passed under the name obovata; hence, there is no problem with its interpretation.

Basionym: Pierocociton occidentale Torrey & Frémont
= A. canescens (Pursh) Nuttall

= A. canescens × A. gardneri var. gardneri

This is a coarse specimen, very woody and obviously intermediate between A. canescens and A. gardneri var. gardneri.

= A. matamorensis A. Nelson; Obione oppositifolia (S. Watson) Ulbrich, in Engler & Prantl
Type locality: "In the Rio Grande Valley on the Mexican side, collected only by Berlandier (No. 3201, 'Matamoros to San Fernando')" (Watson l.c.).

= A. lentiformis (Torrey) S. Watson (the A. breucrii S. Watson phase)
Type locality: "At Santa Monica, California, on the seashore at the base of the bluffs; S. B. & W. F. Parish, October, 1881" (Watson 1882).

= A. matamorensis A. Nelson; Obione oppositifolia (S. Watson) Ulbrich, in Engler & Prantl
Type locality: "Near Colton [actually at Lancaster according to Parish in Zoe 5: 113, 1901], California; Dr. C. C. Parry 1881"; holotype (Parry 221) GH!; isotypes NY!, UC (frag.)

The type consists of a branched stem, with lateral spinose sterna to 4 cm long. The leaves are ovate-orbicular. The plant is obviously allied to A. confertifolia, but distinct.

Basionym: Obione polyacarpus Torrey

Type: "A. acanthocarpa ssp. pringlei" (Standley) Henrickson

Type locality: "Type collected on alkaline plains, Hacienda de Angostura, San Luis Potosi, Mexico, July 15, 1891. C. G. Pringle 3775 (U.S. Nat. Herb. no. 48298)."

Type: "Mexico, San Luis Potosi, alkaline plain, Hacienda de Angostura, 15 Jul 1891," C. G. Pringle 3775; holotype US; isotype GHI!


Basionym of: A. jonesii Standley

= A. sabinosa Rous., 1890.

Type locality: Arizona, Navajo Co., "No. 4109 Jones, Winslow, Ariz., Sept., 1884, distributed as A. Greggii" (Jones 1903).

Type: "Flora of Arizona. 4109. Atriplex Greggii, Watson. Winslow, M. E. Jones, September 1, 1884"; holotype US; isotypes GHI, NY, POM!.

The name at GHI consists of three branches, two stamine and one pistillate.


Type locality: California, Kern Co., Maricopa Hills, May 15, 1913, Eastwood 3269 (Machbride 1918).


The holotype at GHI consists of a branched stem bearing lateral spineless branches to 4.2 cm long; that at US consists of spined branchlets and two packets of fruiting bracteoles.

Atriplex spinosa (Machbride) D. Dietrich, Syn. Pl. 5: 536. 1852.

Basionym: Obione spinosa Machbride, in de Candolle

= A. canescens (Pursh) Nuttall


= A. acanthocarpa ssp. stewartii (I. M. Johnston) Henrickson

Type locality: Mexico.


The plant is obviously allied to A. acanthocarpa, the varibly 4-winged fruiting bracteoles having been derived independently or possibly through introgression from A. canescens. Henrickson (1988) does not suggest the latter possibility but does note that the 4-winged condition is not consistent, that there is a transition from that condition to those where the wings are replaced by radiating processes.

Atriplex subconferta Rydberg, Fl. Rocky Mts. 248. 1917 [1918].

= A. confertifoilia (Torrey & Fremont) S. Watson

Type locality: Idaho, between Twin and Shoshone Falls, Nelson & Macbride 1379; holotype NY; isotypes POM, UC.


This appears to be a small-leaved phase of A. confertifoilia of little or no taxonomic significance.


Basionym: Obione tetraperta Bentham

= A. canescens (Pursh) Nuttall


Basionym: Obione torreyi S. Watson


Basionym: A. griffithii Standley

= A. lentiformis (Torrey) S. Watson


= A. gardneri var. utahensis (M. E. Jones) Doran.

Type locality: Utah, Box Elder Co., Corrine, Kuntze 3084, 1874.

Type: O. Kuntze 3084, "Bei Corinne am Salzsee, 7000 [much too high] ft, [Box Elder Co.], Utah, September 1874"; holotype NY; isotype? K!


Basionym: A. decumbens S. Watson


= A. gardneri var. welshii (C. A. Hanson) Webb.

Type: "Utah: Grand Co., 4 mi south of Cisco along state highway 128, July 5, 1961"; C. A. Hanson 322; holotype BYU; isotypes GHI, ISC!


= A. canescens (Pursh) Nuttall

Type locality: Lyman or Buffalo counties, South Dakota, M. Lewis in 1804.


The original description of Calligonum canescens Pursh is "C. dioicus, pulverulento-fruticosum; folis lanceolatis, floribus asperilibis glomeratis in apice ramulo subspiratis, fructibus alatis, alis venosis crassito-dentatis. In the plains of the Missouri, near the Big bend. 11. July, Aug. v.s. in Herb. Lewis. Flowers exceeding small. Goats delight to feed upon this shrub."

The sheet at PIH contains three branches, the left one with immature fruit, the middle one sterile, and the one at right with mature fruiting bracteoles. This latter specimen was designated specifically as the lectotype by McNiel et al. (1983); it clearly fits the concept of the species as interpreted by contemporary authors, except for Stutz and Sanderson (1979), who claim that the type belongs to what was subsequently named A. aptera A. Nelson, based on the
assumption that the Lyman County, South Dakota, type locality is not within the current range of *A. canescens* as presently accepted but is within the range of *A. ater*. Examination of a great many specimens from throughout the western plains has failed to yield a plant of *A. ater* with flowering bracteoles identical to the lectotype, which is matched many times among the specimens traditionally passing as *A. canescens*.

The type sheet bears the designation "Sept. 21, 1804," and the site of the Lewis and Clark camp on that date is adjacent to present Lower Brule, Lyman or Buffalo counties, a short distance above the confluence of the White River. That portion of the Missouri River has been inundated by waters behind the Fort Randall Dam, far downstream. Nuttall had traversed the river corridor in 1811, going upriver as far as Fort Mandan. The description and discussion by Nuttall (1818) of the species is pertinent to the interpretation of the Lewis type material. He describes the plant as about 3 or 4 feet high, with the "calyx (i.e., fruiting bracteoles) 2-lobed, becoming indurated, acute, with 4 unequal cristate or dentate angles"; the habitat was designated: "On the denuded saline hills of the Missouri [possibly a reference to the lower-growing, variable, *gardneri*-like *A. ater*]; commencing about 15 miles below the confluence of the White River, and continuing to the mountains [i.e., to the Mandan, as near as he went toward the mountains]." Much of the habitat where plants typical of *A. canescens*, as traditionally interpreted, could have grown is beneath the waters of Fort Randall Dam, and a valid assumption that typical *A. canescens* did not occur there cannot be made. Some plants from areas of South Dakota adjacent to Lower Brule clearly approach typical *A. canescens*. There is no justification for interpretation of the name differently from that used in the historic past.


= *A. acanthocarpa* (Torrey) S. Watson

Type locality: "Plains between the Burro mountains; September, Bigelow, (in fruit) On the Rio Grande, below Presidio del Norte; Parry. Near the Filoncella, Sonora, September"; Thurbert. (No. 1733; Wright. His No. 1737 seems to be a slender form of the same.)

Type: "Rio Grande below Presidio del Norte (El Paso), Aug." Parry s.n.; lectotype NY! (Henrickson Southwest. Nat. 33: 454. 1988); isotype NY!


Basionym: *A. berlandieri* Moquin-Tandon

= *A. canescens* (Pursh) Nuttall


Basionym: *Calligonum canescens* Pursh

= *A. canescens* (Pursh) Nuttall


= *Atriplex confertifolia* (Torrey & Fremont) S. Watson

Type locality: "On the borders of the Great Salt Lake" (l.c.).


This species is noted by Frémont (1845) in his journal entry for 10 September 1843, on his return trip from Disappointment (Frémont) Island. The plant was probably collected on the trip from the water's edge to the camp on the lower Weber River, in Weber Co., Utah. The holotype consists of a single branch in young fruit. The sheet bears the notation in Torrey's handwriting, "Obione rigid var. confertifolia n.sp. (crossed out) T. & F." Below the notation is a drawing of a fruiting bract, with one side folded back, and an ovary. This is clearly the specimen on which the species was based. There is a second sheet at NY!: "Frémont's 2nd Exped."

**Obione coriacea** (Forssk.) Moquin-Tandon, Chev. Enum. 71. 1849.

This Egyptian species was compared by Torrey and Frémont (Frémont 1845) with *Obione confertifolia* (see above). It does not occur in North America.


= *A. gardneri* (Moquin-Tandon) Dietrich var. *gardneri* Type locality: SE Wyoming or W Nebraska, "Ad La Platte, Gard. n. 250" (Moquin-Tandon in de Candolle l.c.).

Type: "Gordon. 250. La Platte. Obione Garderni Moq. A low female plant, lax spike in fruit," possibly 1843; holotype K?; isotype GH!

The fragments at GH consist of a leaf and two immature fruiting bracteoles, probably taken from the type at K (Hooker herbarium), which we have not seen. Writing on the fragment envelope is in ink, but partly illegible. The name of the collector is subject to interpretation, but is presumed to be "Gordon." Moquin-Tandon interpreted it as "Gardner," and named the species after the person assumed by him to be the collector. The epithet was spelled gardneri on purpose and is not an orthographic variant. It is legitimate under stipulations of the International Code.


= *Atriplex hymenelytra* (Torrey) S. Watson

Type locality: "Hills and gravelly places on the William's River [Bigelow]. This species was found by Dr. Parry and by Colonel Frémont on the Gila" (l.c.).

Type: "Frémont's Expedition to California, 1849. Obione hymenelytra, n. sp. (lectotype NY!, Brown, Amer. Midl. Nat. 55: 203. 1936;). "Frémont's Expedition to California, Gila" (1849) (presumed isotype specimens NY! Crooke!, GHI). A third sheet, "Frémont's 2nd Expedition," is at NY! Except for the sheet designated as lectotype, the Frémont materials from 1849 are scanty, consisting mainly of fruiting bracts (presumed isotypes specimens NY!, GHI) and a branchlet of ejoywood source (GHI). The lectotype at NY! bears all of the accoutrements of a Torrey type specimen, except for lack of illustrations, but includes a descriptive label in Torrey's handwriting and the name Obione hymenelytra, n. sp., on the label.


= *Atriplex lentiformis* (Torrey) S. Watson

Type locality: California, along the Colorado River, S. W. Woodhouse s.n. 6 November 1851 (Sitgreaves Expedition, November 1851) (l.c.).


*Type: Arizona, NY?*

I have been unable to locate material at NY with this designation nor make a determination as to its disposition taxonomically.


= *Atriplex leucophylla* (Moquin-Tandon) D. Dietrich

Typo locality: "In California (Chamisso!), San-Francisco (Barclay?)" (l.c.).

*Type: San Francisco, Barclay"; holotype K!

**Obione obovata** (Moquin-Tandon) Ulbrich, Natur. Pl. ed. 2. 16(c): 508. 1934.

= *A. obovata* Moquin-Tandon


Basionym: *Pterochiton occidentalis* Torrey & Frémont = *A. canescens* (Pursh) Nuttall

**Obione occidentalis** var. angustifolia Torrey, in Emory, Bot. Mex. Bound. 2(1): 189. 1848.

= *A. canescens* (Pursh) Nuttall

*Type locality: Texas, Valley of the Rio Grande, Wright in 1852.*


All three sheets at GH bear the number 1742 on the label. One of them also has the number 394, which was evidently the field collection number. The number 1742 was subsequently applied. The specimens all have very narrow leaves to ca 4 mm wide and immature fruiting bracteoles. The sheet at GH with the number 394 is doubly mounted with a second Wright collection (1741 = No. 24), which has 4-winged fruiting bracteoles to 7 mm wide. Notes appear above both labels on the sheet. That above 394 reads: "24, Chenop. hills near Frontera, 3–4 ft tall, branching widely, July 19, 1851, El Paso Co., Texas"; above 324 is, "324, Obione, sandy ridges on Rio Grande, 3–5 feet tall, much branching, June 17, 1852, Rio Grande below El Paso, Texas." The latter is an isotype. All of the specimens appear to be *A. canescaens*, sens. lat.

Specimens with narrow leaves occur here and there throughout the range of the species. Those from western Texas that fit within the concept of var. angustifolia seem not to represent a taxon worthy of consideration.


Basionym: *Atriplex oppositifolia* S. Watson


= *A. polycarpa* (Torrey) S. Watson

*Type: Arizona, Graham Co., "With the preceding," i.e., "Hills and gravelly places, on William’s River valley of the Gila River [near base of Mt. Graham, ca 13 mi SW of Stafford]." October 28, 1846, Emory s.n.; holotype NY!*


= *Atriplex confertifolia* (Torrey & Frémont) S. Watson

Authentic specimen: *Obione rigida* T. & F. On an island [Frémont Island] in Great Salt Lake. [Weber Co., Utah]; Frémont 767, 1843"; Frémont s.n., 9 September 1843 (NY! Torrey!).

The name was published without a description and is a nomen nudum. The specimen was taken on 9 September 1843 when Frémont and his boating party were on the Disappointment [Frémont] Island in the Great Salt Lake. It seems clear from the notation that Torrey intended, at least initially, to name the species *O. rigida*, with the specimen taken later on "borders of the Great Salt Lake" as var. confertifolia of that species. Reasons for change of mind are not apparent, but Torrey abandoned the epithet rigida in favor of confertifolia. The application of the same number, in this case 767, to two sheets of the same taxa is in keeping with the practice of Frémont, at least occasionally, of using the number to indicate a species and not a collection. The sheet bears drawings of bracts, fruit, seed, and embryo, roughly sketched by Dr. Torrey.


= *A. canescens* (Pursh) Nuttall

*Type locality: In Columbia (Nutt.)! Phyllocarpa spinosa Nutt! in herb. Hook." (l.c.).

= *Lophocarya * (Pterocarya (crossed out)) *spinosa*. R. Mts. of the Columbia. Pr. canescens; Atriplex canescens?*, Nuttall s.n.; holotype BM!*

This name has consistently been treated as a synonym of *A. confertifolia*, but the Nuttall specimen at BM is *A. canescens.*


= *A. canescens* (Pursh) Nuttall

*Type locality: California, San Diego.*


All the specimens at GH and K each consist of a large branch with few leaves and fruiting bracteoles still attached. The leaves are up to 4 mm wide and the bracts somewhat laciniate. Specimens approach the "laciniatum" phase of *A. canescens* and possibly represent intergradation of *A. linearis* with *A. canescens*. The specimen at K bears the label information, "Obione tetraptera. California. Barkley. Hooker 1844."


= *A. torreyi* (S. Watson) S. Watson

*Type locality: Nevada, Humboldt Co., dry valleys bordering the Truckee and Carson rivers, Torrey 463 (Watson 1871).*

The holotype at GH is doubly mounted with Parry 280, 1881. It is stamineate, with glomerules ca 2 mm thick arranged on short lateral spikes (to ca 1.5 cm long) on lateral branches of a much larger paniculate cluster to 28 cm long. Branches are longitudinally striate and ridged with low, acute ridges.


Type: *Petrochiton occidentale* Torr. & Frém. Frémont, probably 10 September 1843 [locality data are missing from the type specimen] (holotype NY; microfiche BRY!).

The herbarium sheet bears a folded sheet of paper with the usual careful and detailed drawings of bracts, embryo, and seed, and the designation “Petrochiton.” In the lower right corner of the sheet is written “Frémont, N. Gen. Petrocalys,” and at the bottom center the words “Petrochiton occidentale, Torr. & Frém.” The sheet contains three branches, with the bracts mainly fallen away. This sheet was designated as lectotype by G. D. Brown, Amer. Midl. Nat. 55: 209. 1956, but no other specimens are cited with the protologue and the designation should be holotype.

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