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CONTRIBUTIONS TOWARD A
FLORA OF NEVADA. NO. 8.

- - -

CHENOPODIACEAE OF NEVADA
(in part)
by

F. R. FOSBERG

November 1, 1940.

Issued by

The Division of Plant Exploration and Introduction,
Bureau of Plant Industry,
U. S. Department of Agriculture,
Washington, D. C.

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Work Projects Administration of Nevada,
Projects, O. P. 65-2-04-13, W. P. 658;
O. P. 165-2-04-21, W. P. 752.

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Collaborator

University of Nevada.

Address all queries concerning this publication to the Division
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CHENOPODIACEAE OF NEVADA^{1/}
(in part)

By F. R. Fosberg

Herbs or shrubs, often scurfy or lepidote; flowers much reduced, small, usually greenish or gray, basically 5-merous, but often less, bisexual or unisexual, arrangement various, perianth of one whorl or absent, stamens opposite the perianth parts, usually the same number, gynoecium of a single one-celled ovary usually superior with one ovule, styles and stigmas 2-3; fruit a utricle or an achene-like nut; seed with or without endosperm, embryo curved to spirally coiled.

Most frequently found in dry, or more often saline or alkaline habitats, and exhibiting many striking modifications and adaptations to such habitats. Several cultivated plants such as the beet (Beta vulgaris) and spinach (Spinacia oleracea) are members of this family.

KEY TO GENERA

1. Leaves reduced to scales, stems thickened, fleshy, jointed.
2. Scales and branches opposite, low herbs - - 15. Salicornia.

^{1/}Treatments on the remaining genera, Chenopodium, Suaeda, Kochia, Corispermum, Salicornia, and Atriplex will be prepared for later publication.



- 2. Scales and branches alternate, shrubs - - - 2. Allenrolfea.
- 1. Leaves functional, stems not particularly fleshy, not jointed.
- 3. Leaves opposite, linear, fleshy, flowers perfect, with imbricate sepals - - - - - 1. Nitrophila.
- 3. Leaves scattered, alternate, rarely subopposite or opposite, if opposite not linear and fleshy, flowers various, sepals not imbricate.
- 4. Leaves linear, terete or scarcely flattened, or if flattened, pungent.
- 5. Leaves pungent or strongly mucronate at apex.
- 6. Shrubs with leaves thick and fleshy, finger-shaped, with a very slender abrupt mucro at apex - - - - - 6. Halogeton.
- 6. Herbs with slender gradually tapering leaves which are pungent at least when mature.
- 7. Flowers in axils of reduced leaves, subtended by 2 pungent bractlets, plant puberulent to hispid, rarely glabrous, leaves usually less than 1 mm. wide, fruit included in horizontally winged calyx - - - - - 3. Salsola.
- 7. Flowers in axils of single bracts without bractlets, plant glabrous, leaves 1-2 mm. wide, fruit exserted.
- 14. Corispermum.

5. Leaves obtuse or acute at apex.

8. Rigid, intricately branched, usually spinose shrubs, leaves tending to be larger toward apices, flowers unisexual, usually dioecious, fruit winged - - - 4. Sarcobatus.

8. Plant an herb, or if woody branched chiefly near base, not spinose, herbaceous in upper parts, leaves narrower toward apices, flowers mostly perfect.

9. Flowers white- (rarely brownish-) woolly, calyx becoming winged in fruit.

13. Kochia.

9. Flowers not woolly, calyx not winged in fruit - - - - - 12. Suaeda.

4. Leaves broad, or if linear, then strongly flattened or revolute and not pungent.

10. Plants noticeably pilose or tomentose at least about the flowers, not glandular.

11. Leaves dentate, plant glabrate in age, fruiting calyx horizontally winged.

9. Cycloloma.

11. Leaves entire, plant not glabrate, calyx not horizontally winged.

12. Leaves densely tomentose, revolute, plant tomentose, fruiting bracts conspicuously white-hairy, making inflores-

cence cottony in appearance.

8. Eurotia.

12. Leaves green, plane or nearly so, plant
pilose, fruiting bracts none,
fruiting calyx with hooked spines em-
bedded in white hair - - - - 5. Bassia.

10. Plants mealy, glandular, scurfy, lepidote, glabrous,
rarely slightly pilose or stellate-pubescent.

13. Plants woody, even in upper parts.

14. Plants with staminate flowers.

15. Leaves terete or almost so, spatulate or
clavate, staminate flowers in spikes,
without calyx - - - - 4. Sarcobatus.

15. Leaves flattened, not especially fleshy,
staminate flowers with calyx, usually
glomerate.

16. Leaves green, slightly mealy only
when young - - - - - 7. Grayia.

16. Leaves gray, mealy, scurfy, or
lepidote - - - - - 16. Atriplex.

14. Plants with pistillate flowers or fruits,
often with paired fruiting bracts.

17. Pistillate flowers with calyx, axillary,
not between bracts, fruit strongly
horizontally winged, leaves terete
or almost so - - - - - 4. Sarcobatus.

17. Pistillate flowers without calyx, usually in terminal inflorescences, enclosed between two, often connate and sac-like bracts which enlarge in fruit, leaves flat.

18. Leaves green, somewhat mealy only when young, fruiting bracts united to form a membranous sac - - - - - 7. Grayia.

18. Leaves gray, mealy or scurfy, bracts herbaceous to coriaceous or woody, usually not entirely united - - - - - 16. Atriplex.

13. Plants herbaceous or somewhat woody at base.

19. Flowers unisexual, pistillate flowers and fruits without calyx, enclosed between two vertical bracts - - - - 16. Atriplex.

19. Flowers ebracteate, polygamous.

20. Sepal 1 - - - - - 10. Monolepis.

20. Sepals 3-5 - - - - - 11. Chenopodium.

1. NITROPHILA S. Wats.

NITROPHILA S. Wats. Bot. King's Expl. 297. 1871.

Perennial herb from horizontal rootstock, stems branched; leaves opposite, linear, semi-terete; flowers perfect, axillary, solitary or in threes, perianth 5-parted, segments chartaceous-membranous, strongly imbricate, white or pinkish to straw-colored, stamens included, style filiform, stigmas 2, subulate; utricle included in perianth, pericarp membranous, free from seed; seed 1 mm, across, black, shining, margin rounded.

One species.

1. NITROPHILA OCCIDENTALIS (Nutt. ex Moq.) S. Wats. Bot. King's Expl. 297. 1871.

Glabrous herbs, stems erect or decumbent; leaves fleshy, mucronate, sessile; flowers sessile or short pedicelled; fruit brown.

Found in alkaline places.

Nevada: Washoe, Humboldt, Lander, Nye, Elko, Lincoln and Clark Counties.

2. ALLENROLFEA O. Ktze.

ALLENROLFEA O. Ktze. Rev. Gen. 545. 1891.

Spirostachys S. Wats. Proc. Am. Acad. 9: 125. 1874. (not



Sonder, 1850).

Shrubs or at least woody at base, branchlets fleshy, green, leaves alternate, reduced to scales; flowers sessile with fleshy peltate bracts in dense cylindrical spikes, perianth much reduced, obpyramidal, fleshy, angled, usually 4-5 lobed; stamens usually 2, exserted; styles 2-3; utricle enclosed in spongy fruiting calyx, pericarp membranous, free.

1. ALLENROLFEA OCCIDENTALIS (S. Wats.) O. Ktze. Rev. Gen. 546.

1891.

Halostachys occidentalis S. Wats. Bot. King's Expl. 293.

1871.

Spirostachys occidentalis S. Wats. Proc. Am. Acad. 9:

125. 1874.

Salicornia occidentalis Greene, Fl. Fran. 173. 1891.

Much branched, branchlets very fleshy, cylindric, slightly glaucous; leaf-scales triangular, early deciduous; spikes up to 2.5 cm. long, 2.5-4 mm. thick; seed brown, about 0.6 mm. long.

In alkaline places.

Nevada: Lyon, Humboldt, Lander, Churchill, Lincoln and Clark Counties.

3. SALSOLA L.

SALSOLA L. Sp. Pl. 222. 1753.

Ours an annual, usually hispidulous, densely branched herb, leaves linear, pungent, alternate; flowers perfect, small, axillary, subtended by two bractlets in addition to the leaf, perianth 5-parted, becoming strongly horizontally winged in fruit, stamens 5, stigmas 2, subulate; utricle included in fruiting perianth, pericarp free from seed; seed black, shining.

One species introduced in Nevada.

1. SALSOLA KALI L. VAR. TENUIFOLIA Tausch, Flora 11: 326. 1828.

Salsola pestifer A. Nels. Coult. & Nels. Man. 169. 1909.

Rounded herb, detaching at base when mature, making a "tumble weed", stems conspicuously green and purple striped; leaves almost terete, up to 6 cm. long, usually less, leaves and bracts unpleasantly prickly.

The Russian Thistle, a serious introduced weed. Very variable in most of its parts.

Common along roadsides and in cultivated fields.

Nevada: Washoe, Ormsby, Pershing, Lander, Churchill, Mineral, Nye, Eureka, White Pine, Lincoln, and Clark Counties.

4. SARCOBATUS Nees

SARCOBATUS Nees, in Neuwied, Reise Nord-Am. 1: 510. 1839.

Fremontia Torr. in Frem. Rep. 91. 1843. (Not Torr. 1854.)

Rigidly branched, often spinose shrubs; leaves linear to clavate, very fleshy; usually dioecious; staminate flowers in terminal, conelike spikes, pistillate flowers axillary, calyx winged, strongly accrescent and conspicuously winged in fruit.

Supposedly two species, not very well separated, but usually distinguishable by the following combinations of characters. Final decision as to their validity as species must depend on field study.

KEY TO SPECIES

Leaves glabrous, usually over 15 mm. long, staminate spike usually over 1 cm. long when mature, fruiting calyx usually less than 1 cm. across - - - - - S. vermiculatus.

Leaves stellate pubescent, usually 1 cm. or less long, staminate spikes usually less than 1 cm. long, fruiting calyx usually well over 1 cm. across - - - - - S. baileyi.

1. SARCOBATUS BAILEYI Cov. Proc. Biol. Soc. Wash. 7: 77. 1892.

Sarcobatus vermiculatus var. baileyi (Cov.) Jeps. Fl.

Calif. 446. 1914.

It is quite probable that Jepson's disposition of this form will prove to be the correct one when observations on the distribution and variability of the two have been recorded

more fully.

Nevada: Washoe, Lyon, Humboldt, Churchill, Mineral, Esmeralda, and Nye Counties.

2. *SARCOBATUS VERMICULATUS* (Hook.) Torr. in Emory, Notes Mil. Rec.

150. 1848.

Batis? vermiculatus Hook. Fl. Bor. Am. 2: 128. 1838.

Sarcobatus maximiliani Nees. in Neuwied, Reise N. Am. 1:

510. 1839.

Fremontia vermicularis Torr. in Frem. Rep. 91. 1843.

In dry, alkaline soil.

Nevada: Washoe, Storey, Lyon, Humboldt, Lander, Churchill, Mineral, Nye, Elko, White Pine, and Lincoln Counties.

5. *BASSIA* All.

BASSIA All. Misc. Taur. 3: 177. 1766. 5: 93. 1776.

Echinopsilon Moq. Ann. Sci. Nat. II, 2: 127. 1834.

Ours an herb with alternate narrow entire leaves, woolly bracteate spikes of mostly perfect sessile flowers, perianth 5-toothed, teeth forming hooked spines in age, fruit included in perianth, pericarp free from seed.

30 Old World species, 1 introduced in Nevada.

1. *BASSIA HYSSOPIFOLIA* (Pall.) O. Ktze. Rev. Gen. 1: 547. 1891.

Suaeda hyssopifolia Pallas, Ill. Pl. 44, Pl. 36. 1803.

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that this is crucial for ensuring transparency and accountability in the organization's operations.

2. The second part of the document outlines the various methods and tools used to collect and analyze data. It highlights the need for consistent data collection procedures and the use of advanced analytical techniques to derive meaningful insights from the data.

3. The third part of the document focuses on the implementation of data-driven decision-making processes. It provides a detailed overview of the steps involved in identifying key performance indicators (KPIs) and using data to inform strategic decisions.

4. The fourth part of the document discusses the challenges and risks associated with data management and analysis. It addresses issues such as data quality, security, and privacy, and offers strategies to mitigate these risks.

5. The fifth part of the document provides a summary of the key findings and recommendations. It emphasizes the importance of ongoing monitoring and evaluation to ensure that the data-driven approach remains effective and relevant over time.

6. The final part of the document includes a list of references and a glossary of key terms. This section is designed to provide additional context and resources for those interested in further exploring the topics discussed in the document.

Erect, more or less virgately branched pilose annual; leaves flat, thin, linear to lanceolate, oblanceolate, or narrowly oblong, obtuse to acute, reduced above, green or grayish green, appressed pilose; flowers with perianth densely woolly, teeth becoming prolonged into red hooked spines in fruit, stamens 5, seed grayish brown, dull.

Weed in waste places, especially if alkaline.

Nevada: Washoe, Storey, Humboldt, Pershing, Lander, Churchill, Mineral, Elko, and Lincoln Counties.

6. HALOGETON C. A. Mey.

HALOGETON C. A. Mey. in Ledeb. Fl. Alt. 1: 378. 1829.

Ours a shrub or suffrutescent herb, erect, glabrous; leaves alternate, fleshy; flowers in terminal panicles, perianth 5-parted, becoming conspicuously horizontally winged in fruit.

Very close to Salsola. One species introduced in Nevada.

1. HALOGETON SOUDA (Loefl.) Macbr. Contr. Gray Herb. (N.S.) 53: 13. 1918.

Salsola souda Loefl. It. 132. 1758.

Salsola sativa L., Sp. Pl. ed. 2, 323. 1762.

Halogeton sativus (L.) Moq. Chen. Mon. Enum. 158. 1840.

Stems white, erect, branching; leaves thick, glaucous, finger-shaped, blunt, but with a slender spinose mucro at apex;

clusters of winged fruiting calyces conspicuous at maturity.

Introduced; native to Mediterranean region.

Nevada: Elko County, (Spreading rapidly. Reports of further extensions would be of interest.)

7. GRAYIA Hook. & Arn.

GRAYIA Hook. & Arn. Bot. Beech. Voy. 387. 1840.

Eremosemium Greene, Pittonia 4: 225. 1900.

Rigidly branched, usually spinose shrub; leaves alternate, entire, oblanceolate to spatulate or oblong, somewhat fleshy, green; dioecious; staminate flowers in terminal or axillary spikes or clusters, stamens 4-5, perianth 4-5 parted; pistillate flowers without perianth, included between two bracts which are connate to form a membranous sac, greatly accrescent in age, in terminal spikes; pericarp free from seed.

Two species, one in Nevada.

1. GRAYIA SPINOSA (Hook.) Moq. in DC. Prodr. 13 (2): 119. 1849.

Chenopodium spinosum Hook. Fl. Bor. Am. 2: 127. 1838.

Grayia polygaloides Hook. & Arn. Bot. Beechey Voy. 388.
1840.

Eremosemium spinosum Greene, Pittonia 4: 225. 1900.

Much branched spinose shrub, branches dark when old, with reticulate whitish fibers over surface, sparsely mealy when

young, glabrate when older; leaves green, usually 1-3 cm. long, rounded at apex; fruiting panicles conspicuous, whitish with a purplish cast, bracts very thin, sac-like.

Common.

Nevada: Washoe, Lyon, Humboldt, Lander, Mineral, Nye, Elko, Eureka, and Clark Counties.

8. EUROTIA Adans.

EUROTIA Adans. Fam. Pl. 2: 260. 1763.

Shrubs or suffrutescent herbs with densely white or brownish stellate-tomentose stems and leaves; leaves linear or narrowly oblong, strongly revolute, alternate, entire; dioecious or incompletely so; staminate flowers with 4-parted perianth, 4 stamens, glomerate, glomerules spicate in staminate plants, occasional on pistillate plants; pistillate flowers in upper axils, forming a somewhat leafy panicle, without perianth, enclosed between two bracts, these obcompressed, conspicuously pilose, connate below, accrescent and enclosing the utricle in fruit, finally dehiscent; pericarp free from seed.

Several species, Mediterranean, western Asiatic, western North American, one in Nevada.

1. EUROTIA LANATA (Pursh) Moq. Chen. Mon. Enum. 81. 1840.

Diotis lanata Pursh, Fl. Am. Sept. 602. 1814.

Eurotia subspinosa Rydb. Bull. Torr. Cl. 39: 312. 1912.

Densely tomentose and often pilose bush, with narrow, revolute, tomentose leaves; fruiting panicles conspicuously pilose, appearing cottony, the indurate apices of bracts noticeable in the hair; seed erect, compressed.

Dry plains and slopes, common.

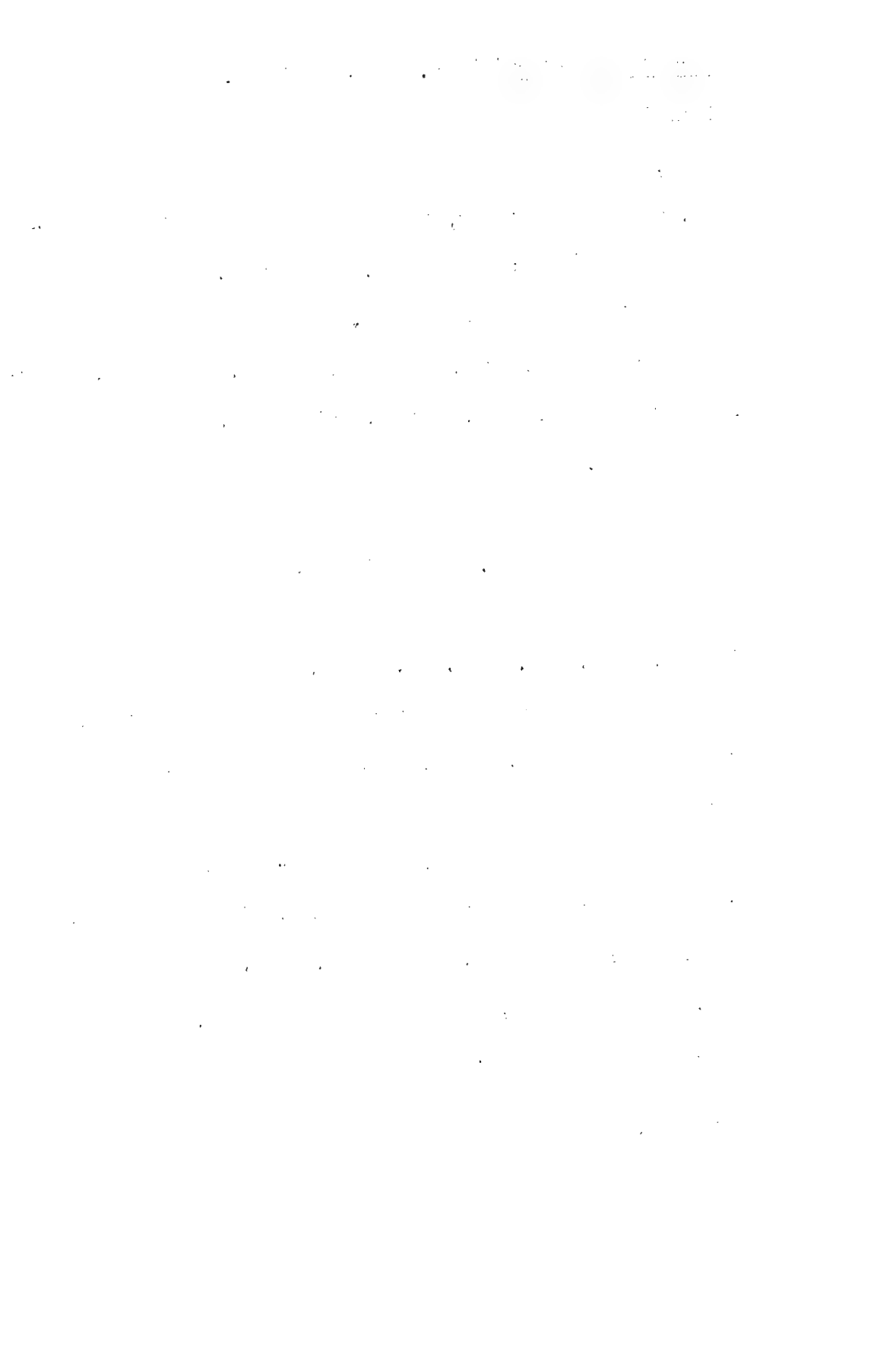
Nevada: Washoe, Lyon, Humboldt, Lander, Churchill, Mineral, Esmeralda, Nye, Elko, Eureka, White Pine, Lincoln, and Clark Counties.

9. CYCLOLOMA Moq.

CYCLOLOMA Moq. Chem. Mon. Enum. 17. 1840.

Diffusely branching annual herbs; leaves alternate, thin, dentate; flowers greenish, small, polygamo-monoecious, sessile and solitary or somewhat glomerate on the branches of loose panicles at the ends of the branches, perianth 5-lobed, the tube developing in age a broad membranous horizontal wing, stamens 5, stigmas 3, linear; fruit flat, horizontal, 2 mm. across, pericarp membranous, free from seed, closely invested by perianth, wing about 1 mm. wide when mature.

One species.



1. CYCLOLOMA ATRIPLICIFOLIUM (Spreng.) Coult. Mem. Torr. Cl. 5:
143. 1894.

Salsola atriplicifolia Spreng. Bot. Gart. Hal. Nachtr. 1:
35. 1801.

Salsola platyphylla Michx. Fl. Bor. Am. 1: 174. 1803.

Plant loosely and thinly woolly, more or less glabrate in age, except around flowers, erect or spreading; wing white-hyaline, margin irregular; seed flat, black.

Weedy, often found in sandy fields.

Nevada: No specimens known from the state, but the plant very likely grows there, as it occurs on both sides and the proper habitats are available.

10. MONOLEPIS Schrad.

MONOLEPIS Schrad. Ind. Sem. Hort. Goetting. (1830): 4. 1830.

Annual herbs with alternate leaves; flowers polygamous, axillary or terminal, glomerate or solitary, with one perianth segment; stamen one, or lacking in pistillate flowers; stigmas 2, subulate; fruiting perianth not accrescent, exceeded by utricle, pericarp adherent; seed erect, compressed, embryo annular.

A genus of three species, widespread in the Western United States. Two of these are found in Nevada. They may be separated as follows:



KEY TO SPECIES

Flowers in dense sessile axillary clusters, leaves hastately

lobed - - - - - M. nuttalliana.

Flowers paniculate, on slender pedicels, leaves entire.

M. pusilla.

1. MONOLEPIS NUTTALLIANA (Schultes) Greene, Fl. Franc. 168.

1891.

Blitum nuttallianum Schultes, in Roem. & Schult., Syst.

Veg. Mant. 1: 65. 1822.

Chenopodium trifidum Trev. Ind. Sem. Vratisl. 1829.

Monolepis chenopodioides Moq. in DC. Prodr. 13 (2): 86.

1849.

Rounded or depressed annual herbs; leaves green, prominently ovate-hastate, but with cuneate base, prolonged acute apex; flowers in dense axillary clusters, apical portions of stems forming interrupted leafy spikes; pericarp adherent, gray when dry, seed vertical, dull-black.

Nevada: Washoe, Lander, Mineral and Elko Counties.

2. MONOLEPIS PUSILLA Torr. apud S. Wats., Bot. King's Expl. 289.

1871.

Very slender annual herb, farinose when young but glabrate and becoming green; leaves early deciduous, entire, oblong, obtuse, short-petiolate; flowers solitary or subsolitary, on slender pedicels in a diffuse panicle involving

almost the whole plant; utricles granulate, pericarp adherent; dull black, circular, about 0.5 mm. across.

Evidently quite rare.

Nevada: Humboldt and Lander Counties.

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