

**ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM**

Plant Abstract

Element Code: PDBRA1N110

Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Physaria ludoviciana*
COMMON NAME: Foothill Bladderpod
SYNONYMS: *Lesquerella ludoviciana*, *Vesicaria ludoviciana*, *Alyssum ludovicianum*, *A. schauerianum*, *Lesquerella argentea*, *Myagrum argenteum*, *Physaria argentea*
FAMILY: Brassicaceae

AUTHOR, PLACE OF PUBLICATION: O’Kane, Steve Lawrence and Ihsan Ali Al-Shehbaz. *Novon* 12(3): 325. 2002.

TYPE LOCALITY: New Mexico.

TYPE SPECIMEN: Academy of Natural Sciences: PH 24775 (type? of *Vesicaria ludoviciana*). Kern, B.H., #s.n. No date.

TAXONOMIC UNIQUENESS: Although there are still some references using the genus *Lesquerella*, *Physaria* is now accepted by most authorities. There are over 30 species of *Physaria* in North America, and another 20 varieties. There are four species of *Physaria* found in Arizona.

DESCRIPTION: **Perennials;** caudex simple or branched; densely pubescent, trichomes (sessile or short-stalked), 4-7-rayed, rays usually furcate, sometimes bifurcate, (rough-tuberculate throughout). **Stems** few from base, erect with outer usually decumbent, 1-3.5(-5) dm. **Basal leaves** (erect); blade narrowly lanceolate to linear or (outer) oblanceolate, (1-)2-6(-9) cm, margins usually entire, rarely shallowly dentate, (inner involute, outer usually flat, base usually with some simple trichomes). **Cauline leaves:** blade narrowly oblanceolate to linear, (1-)2-4(-8) cm, margins flat or involute. **Racemes** compact, (elongated and loose in fruit, densely-flowered). **Fruiting pedicels** (usually recurved), (5-)10-20(-25) mm. **Flowers:** sepals oblong to broadly elliptic, 4-7(-8) mm, (lateral pair subsaccate, median pair cucullate); petals oblanceolate or obovate, (5-)6.5-9.5(-11) mm, (claw undifferentiated from blade, or blade gradually narrowed to claw). **Fruits** subglobose or obovoid, usually inflated, sometimes slightly compressed, (3-)4-6 mm; valves densely pubescent, trichomes spreading, usually pubescent inside, trichomes appressed, sessile; ovules (4-)8-12 (-16) per ovary; style 3-4.5(-6.5) mm. **Seeds** slightly flattened. $2n = 10, 20, 30$. (Flora of North America 2016).

AIDS TO IDENTIFICATION:

ILLUSTRATIONS:

Photos and Herbarium Mounts: <http://eol.org/pages/583834/media>.

Photos: http://www.unomaha.edu/biodiversity/Brassicaceae%20Physaria_ludoviciana.htm.

TOTAL RANGE: From California NE to Minnesota, Michigan and Illinois; Arizona, New Mexico and Oklahoma (not Texas) N to Montana and North Dakota.

RANGE WITHIN ARIZONA: Across extreme northern Arizona from the Paria Arizona Strip (Mohave and Coconino Counties), the Skeletal Mesa locality (Navajo County), and the Chuska Mountains (Apache County). There is one collection reported from southern Arizona in Cochise County.

SPECIES BIOLOGY AND POPULATION TRENDS

GROWTH FORM: Perennial herb.

PHENOLOGY: Flowering: April – July (August), Flora of North America 2016. One Arizona collection noted flowers on September 28th.

BIOLOGY: Cross-pollinated flowers produce fruits; self-pollinated ones did not (Claerbout et al 2007). An Illinois study (Grant et al 2012) determined that seeds do not persist very long in the seed bank.

HABITAT: Sandy or gravelly soils, steep hillsides, prairie pastures, clay slopes, limestone outcrops, sand dunes, open plains, sandy bluffs, rocky flats, white tuff sands (Flora of North America 2016).

ELEVATION: 0 – 6230 feet (0 – 1900m), Flora of North America 2016. Collections in Arizona range from 4900 – 6600 feet (1495-2010m).

EXPOSURE: Not specified.

SUBSTRATE: Variable (see Habitat). Sandstone derived soils and reddish silty soils were noted in two of the Arizona collections.

PLANT COMMUNITY: Great Basin Pinon-Juniper, Ponderosa Pine forest, and Oak-Aspen. Associated species include: *Symphoricarpos*, *Smilacina stellata*, *Vicia*, *Fendlera rupicola*, *Artemisia tridentata*, *Atriplex canescens*, *Spaeralcea*, *Quercus gambelii*, *Ribes cereum*, *Pinus edulis*, *Bouteloua gracilis*, *Heterotheca villosa*, *Allium geyeri*, *Gutierrezia sarothrae*, *Yucca*, *Astragalus calycosus*, *Townsendia incana*, *Erysimum*, *Lesquerella fendleri*, *Hymenoxys acaulis arizonica*, *Erigeron aphanactis congesta*, *Juniperus osteosperma*, *Muhlenbergia pungens*.

POPULATION HISTORY AND TRENDS: Unknown for Arizona. There are 14 known collections. The majority were made since 2000. Two of the collections noted that there were few plants or that it was only occasional. No other abundance or trend data is available. NatureServe (2016) ranks the species as impaired in Arizona. In several other states, notably California and Minnesota, Wisconsin and Illinois (the northeastern most distribution of the species), it is considered critically impaired or even endangered.

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None.
STATE STATUS: None.
OTHER STATUS: None.

MANAGEMENT FACTORS: In Minnesota (Minn. DNR 2016), and perhaps elsewhere, populations are at risk from the encroachment of surrounding woodlands. The mechanical removal of encroaching shrubs followed by a carefully timed regimen of prescribed fire is recommended. *Physaria ludoviciana* plants are extremely vulnerable to fire once they have emerged from the ground, so prescribed burns should be conducted in very early spring before they emerge.

PROTECTIVE MEASURES TAKEN: None specified. Several of the Arizona collections are from lands within the Navajo National Monuments and therefore have some defacto protection.

SUGGESTED PROJECTS: None.

LAND MANAGEMENT/OWNERSHIP: USDI Bureau of Indian Affairs, Navajo Nation; USDI Bureau of Land Management, Arizona Strip Field Office; and Arizona State Trust Land.

SOURCES OF FURTHER INFORMATION

REFERENCES:

- Al-Shehbaz, I. A., and S. L. O'Kane. 2002. *Lesquerella* is united with *Physaria* (Brassicaceae). *Novon* 12:319-329.
- Claerbout, Ann E, J.M. Coons, H.R. Owen, and K.R. Robertson. 2007. Floral Biology of *Physaria ludoviciana* (Brassicaceae), a rare plant to the Midwest. *Castanea* 72(3): 130-137.
- Flora of North America (eFloras.org), accessed 2/22/2016,
http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=250094883.

Grant, Marissa C., A.E. Claerbout, J.M. Coons and H.R. Owen. 2012. Seed biology of *Physaria ludoviciana* (silvery bladderpod; Brassicaceae), an endangered species in sand prairies of the midwest. *Jour. Torrey Botanical Society* 139(1): 63-75.

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<http://plants.jstor.org/stable/10.5555/al.ap.specimen.ph00024775>.

Minnesota Department of Natural Resources, *Physaria ludoviciana*, accessed 2/23/2016,

<http://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&selectedElement=PD BRAIN110>.

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www.natureserve.org.

Tropicos, accessed 2/22/2016, <http://www.tropicos.org/Name/50221337>.

MAJOR KNOWLEDGEABLE INDIVIDUALS:

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ADDITIONAL INFORMATION: Material previously reported as *Physaria ludoviciana* from Canada (Alberta, Manitoba, Saskatchewan) is here included in *P. arenosa* subsp. *arenosa*. *Lesquerella argentea* (Pursh) MacMillan is a later homonym that has been used for *P. ludoviciana* (Flora of North America 2016).

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