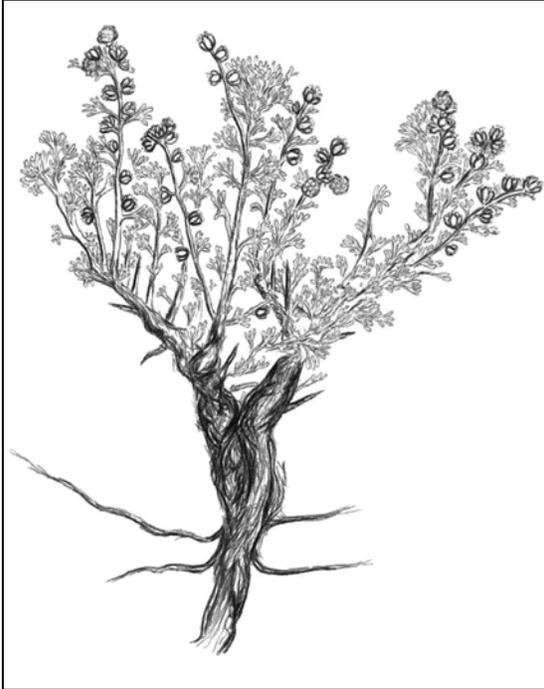


Artemisia spinescens Eaton
ASTERACEAE

budsage

Synonyms: *Picrothamnus desertorum* Nutt.



General Description.—Budsage, also known as spring sage and bud sagebrush, is a low, spinescent, pungently aromatic, rounded shrub 10 to 50 cm high and profusely branched at the base. Young branches and leaves are covered with a white-tomentose pubescence that becomes stiff and gray with age. Leaves are small and normally 2 cm or less in length. Leaves are three- to five-palmately parted, again divided into three linear-spatulate lobes. Leaves are crowded on short stems, with those near the apex being smaller and more entire. Unlike most members of the genus, budsage is deciduous, losing most leaves by midsummer. Flowerheads are small and arranged in glomerate racemes of one to three heads in leaf axils on flower branches. Each head contains two to six fertile, pistillate ray flowers and five to 13 perfect, but sterile, disc flowers. Four to eight rounded involucre bracts subtend each flowerhead (Cronquist 1994, McArthur and others 1979).

Taxonomy.—Budsage is distinct from closely related *Artemisia* species and is sometimes considered a separate monotypic genus although (Cronquist 1994) states that “despite this proposed

segregation, its affinity with *Artemisia* is not in question”. The inclusion or exclusion of segregate genera from *Artemisia* including *Picrothamnus* has not been confirmed by molecular genetic studies as of yet (Vallès and McArthur 2001). Polyploidy within the budsage has been documented; both diploid, $2n = 18$, and tetraploid, $2n = 36$, populations occur (McArthur and Pope 1979).

Range.—The range of budsage extends from Wyoming to western Montana, southern Idaho, and eastern Oregon south to northwestern New Mexico, northern Arizona, and southeastern California (Cronquist 1994, McArthur and others 1979).

Ecology.—Budsage is well adapted to xeric conditions. It is quite common in semiarid valley bottoms, benches, and foothills throughout the Interior Western United States (Hall and Clements 1923, Wood and Brotherson 1986). Mean annual precipitation throughout its habitat varies between 150 and 250 mm. It has an extensive root system that grows primarily within the top 15 to 56 cm of the soil. Interxylary cork is formed over the previous year’s wood that restricts the upward movement of water to the narrow zone of wood formed by the current year’s growth. The corky tissue develops during the early summer and reduces water loss during dormancy (Wood 1966).

Summer dormancy is an adaptation that reduces the effects of drought stress. Early in the spring, when budsage first shows signs of breaking dormancy and prior to bud elongation, the previous season’s bark growth can be removed easily. This condition is known as “slipping” and is used as a sign to tell when the plant is palatable to sheep (Wood and Brotherson 1986). Shrubs subsequently produce new, bright-green leaves as soon as February or March. Terminal and lateral buds generally expand and begin to elongate in late March and early April. Although budsage ordinarily begins to grow in early spring and becomes dormant by midsummer, it occasionally may break summer dormancy after late summer storms.

Reproduction.—Blooming normally begins during the last week in April and continues through

the last week in May. Exceptions, however, have been documented where blooming began as early as late March or has extended as late as mid-June (Wood 1966). Seeds normally mature in early June. There are about 3 million cleaned seeds per kg (Meyer 2003). Freezing temperatures in early spring frequently kill developing embryos. Intact heads regularly fall from the plant without breaking apart to release seeds, although some seeds are usually dispersed independently. Abundant natural reproduction occurs in years when seed production is plentiful and moisture conditions are favorable.

Management.—Budsage is a palatable, nutritious winter forage for upland birds, small game, big game, and domestic sheep. It is particularly preferred just after dormancy. Budsage is high in calcium, magnesium, phosphorous, and protein (Wood and Brotherson 1986). It is usually more palatable in late winter than early winter (Holmgren and Hutchings 1972). Palatability again decreases once twigs have elongated and volatile oil content increases (Cook and others 1954). Budsage is especially important to grazing animals during late winter in areas where there is an abundance of dry grass. Unfortunately, it does not tolerate grazing well, and continual heavy grazing may eliminate it from certain areas (Holmgren and Hutchings 1972). In order to maintain the species in plant communities, periodic rest from grazing is needed. This allows seed and seedlings to develop.

Benefits.—Budsage is an important native shrub because of its forage value to various species of wildlife and domestic livestock. Wildlife species that utilize budsage include mule deer (*Odocoileus hemionus* Rafinesque), pronghorn (*Antilocapra Americana* Ord), mountain sheep (*Ovis canadensis* Shaw), black-tailed jackrabbits (*Lepus californicus* Gray), and chucker partridge (*Alectoris graeca* Meisner) (Wood and Brotherson 1986). In areas of local abundance, budsage can be an important source of protein during late winter months.

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