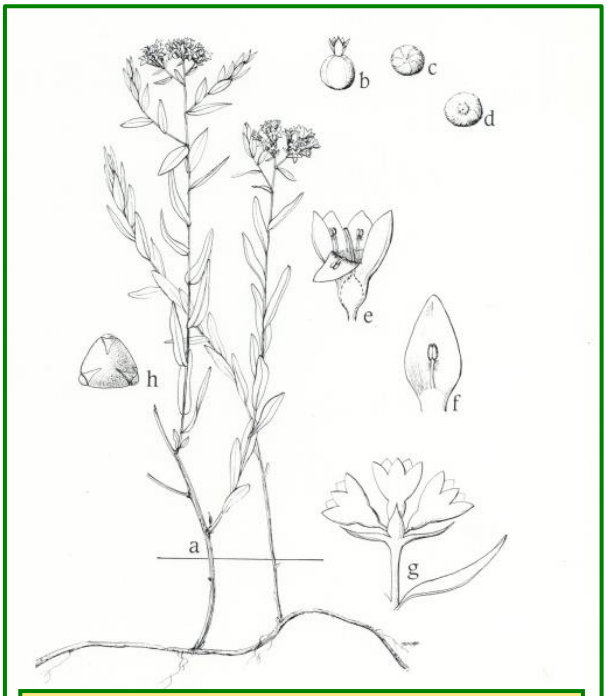
Scientific Name: *Comandra umbellata* L. Nutt **Family:** *Santalaceae*

Common Names: bastard toadflax, pale comandra

Plant Description

Perennial, grows from creeping, white rhizomes; roots are parasitic on neighbouring plants. Stems are hairless, usually branched and grow 15 to 40 cm tall; leaves are numerous, alternate, short- or no-stalked, linear to lance-shaped or narrowly oblong, 1 to 3 cm long, hairless, pale and glaucous; flowers are 4 to 8 mm long, greenish white to purplish, and narrow into a short neck; several to many 3 to 5 flowered clusters form larger ovoid clusters at the tip of stem; flowers have no petals, instead 5 petal-like sepals, each 2 to 5mm long (Johnson et al. 1995, Moss 1983).

Fruit: Green to drab purplish brown, dry to slightly fleshy, egg-shaped to spherical, remains of calyx at tip, 3 to 8 mm in diameter; contains 1 seed (Johnson et al. 1995).



Comandra umbellata illustration a. habit: shows inflorescence, leaves, rhizomes and roots b. fruit c-d. seeds e. flower f. petal and stamen g. inflorescence h. pollen

Seed: 5 to 7 mm long, light brown, glabrous, globose (Currah et al. 1983).

Habitat and Distribution

Occur in prairie grasslands, on gravelly slopes, and in dry open pine woods (Moss 1983). Widely scattered in southern boreal forest and parkland (Johnson et al. 1995). Commonly found on upper slopes with south exposures (Currah et al. 1983).

Seral Stage: Mid seral.

Soil: Moist to dry, generally well drained; can grow in sandy or gravelly areas (Tannas 2004).
Tolerant of high acid soils (Plants for a Future n.d.).

Distribution: All of continental North America excluding Nunavut, Florida and Louisiana (USDA NRCS n.d.).
British Columbia, northern Alberta to central Manitoba, Lake Superior to Newfoundland south to California, Arizona, New Mexico, Texas, Georgia; Hudson Bay (Moss 1983).

Phenology

In Virginia, *C. umbellata* has been observed flowering from April 24 to June 11, and fruiting from May 25 to July 26 (Musselman 1982). In Waterton Lakes National Park, flowering of lower elevation plants starts by the middle of May (Kuijt 1982). Currah et al. (1983) describes *C. pallida* (a ssp. of *C. umbellata*) in the prairies as emerging in late April to May, budding in May, and flowering May to June, with seeds ripening in July.

Pollination

Insect pollinated (USDA NRCS n.d.).

Seed Dispersal

No literature found.

Genetics

2n= 26 (Moss 1983).

Symbiosis

Actively mycorrhizal; semi-parasitic with a wide host range (Currah et al. 1983, ITIS n.d.).
Larval host and/or nectar source for the common buckeye (*Junonia coenia*)(ITIS n.d.).

Seed Processing

Collection: Hand harvest.
Seed Weight: 89.122g/1,000 seeds (Royal Botanic Gardens Kew 2008).
Harvest Dates: July (Currah et al. 1983).
Cleaning: No literature found.
Storage Behaviour: No literature found.
Storage: No literature found.
Longevity: No literature found.

Propagation

Natural Regeneration: Few seeds per plant (Currah et al. 1983)
Germination: Probably room temperature; seeds do not require host stimulus for germination and seedlings can become established without direct contact to a host (Baskin and Baskin 2001). Germination rate poor (Currah et al. 1983).
Pre-treatment: Seeds are most likely in a state of morpho-physiological dormancy; the requirements for embryo growth and dormancy break have not been determined (Baskin and Baskin 2001). Stratify for 3 months at 5°C and then sow in a greenhouse in a pot with a suitable host; plant out near a mature host plant when well established (Plants for a Future n.d.).
Direct Seeding: No literature found.
Planting Density: No literature found.
Seed Rate: No literature found.
Vegetative Propagation: Likely by rhizome division (Currah et al. 1983).
Micro-propagation: No literature found.

Aboriginal/Food Uses

Food: The fruit is edible and was used as a snack by western native peoples, but eating too many may cause nausea. Best eaten when fully grown, but still slightly green, as the fruit becomes less palatable with ripening (Kershaw et al. 1998). Consumption is not recommended, however, since the fruit may accumulate toxic levels of selenium (Marles et al. 2000).
Medicinal: Has been used medicinally by the Cherokee as a dermatological aid applied to cuts/sores and for the kidneys, by the Meskwaki for lung pains and as a cold remedy, and by the Navajo as a foot bath for corns, a mouth wash for canker sores, an eye medicine, and as a narcotic (USDA NRCS n.d.).
Other: Flowers sucked by children for nectar (USDA NRCS n.d.).

Comandra umbellata in bloom

Wildlife/Forage Usage

Wildlife: No literature found.
Livestock: Considered of poor forage value (Tannas 2004).
Grazing Response: Increaser (Tannas 2004).

Reclamation Potential

C. umbellata is frequently found growing on exposed, coarse soils and may, to a limited extent, function as a stabilizer in these conditions (Tannas 2004). It must be planted near other plants that it can parasitize (Johnson et al. 1995).

Notes

C. umbellata is a secondary selenium accumulator (Tannas 2004).

Photo Credits

Photo 1: Darel Hess http://bioimages.vanderbilt.edu
Line Diagram: John Maywood, used by permission of Bruce Peel Special Collections, University of Alberta.

References

Baskin, C.C. and J.M. Baskin, 2001. Seeds – ecology, biogeography, and evolution of dormancy and germination. Academic Press, San Diego, California, USA.

Currah, R., A. Smreciu and M. Van Dyk, 1983. Prairie Wildflowers. An illustrated manual of species suitable for cultivation and grassland restoration. The Friends of the Devonian Botanic Garden, University of Alberta, Edmonton, Alberta. 300 pp.

ITIS (International Taxonomic Information System), n.d. *Comandra umbellata* (L.) Nutt. Bastard toadflax. IN: Integrated taxonomic information system on-line database. http://wildflower.org/plants/result.php?id_plant=COUM [Last accessed October 10, 2013].

Johnson, D., L. Kershaw, A. MacKinnon and J. Pojar, 1995. Plants of the Western Boreal Forest and Aspen Parkland. Lone Pine Publishing and the Canadian Forest Service. Edmonton, Alberta. 392 pp.

Kershaw, L., A. MacKinnon and J. Pojar, 1998. Plants of the Rocky Mountains. Lone Pine Publishing, Edmonton, Alberta. 384 pp.

Kuijt, J., 1982. A Flora of Waterton Lakes National Park. The University of Alberta Press, Edmonton, Alberta. 684 pp.

Marles, R.J., C. Clavelle, L. Monteleone, N. Tays and D. Burns, 2000. Aboriginal Plant Use in Canada's northwest Boreal Forest. Natural Resources Canada and Canadian Forest Service. UBC Press, Vancouver, British Columbia. 368 pp.

Moss, E.H., 1983. *C. umbellata* (L.) Nutt. Bastard toad-flax. IN: Flora of Alberta. A manual of flowering plants, conifers, ferns, and fern allies found growing without cultivation in the province of Alberta, Canada. 2nd edition. University of Toronto Press, Toronto, Ontario. p. 222.

Musselman, L.J., 1982. The Santalaceae of Virginia. Castanea 47(3): 276-283.

Plants for a Future, n.d. *Comandra umbellata* - (L.)Nutt. IN: Plants For A Future, Dawlish, Devon, UK. http://www.pfaf.org/user/Plant.aspx?LatinName=Comandra+umbellata [Last accessed October 8, 2013].

Royal Botanic Gardens Kew, 2008. *Comandra umbellata* Nutt. IN: Seed Information Database. http://data.kew.org/sid/SidServlet?ID=6243&Num=M4b [Last accessed October 7, 2013].

Tannas, K., 2004. Common plants of the western rangelands. Volume 3: Forbs. Olds College, Olds, Alberta and Alberta Agriculture, Food and Rural Development, Edmonton, Alberta. 505 pp.

USDA NRCS, n.d. *Comandra umbellata* (L.) Nutt. bastard toadflax. IN: The PLANTS Database. National Plant Data Center, Baton Rouge, Louisiana. http://plants.usda.gov/core/profile?symbol=COUM [Last accessed October 8, 2013].