Bouffordia dichotoma

Herbaceous to suffrutescent annual or perennial, southern Queensland Australia (CPI 47186)

Prolific seeding (CPI 47186)

Scientific name

Bouffordia dichotoma (Willd.) H. Ohashi & K. Ohashi

Synonyms

Basionym: *Hedysarum dichotomum* Willd.; *Desmodium dichotomum* (Willd.) DC.; *Desmodium diffusum* (Willd.) DC.; *Hedysarum diffusum* Willd.

Seeds

On heavy clay soil (with cotton), southern Queensland Australia (CPI 47186)

Family/tribe

Family: *Fabaceae* (alt. *Leguminosae*) subfamily: *Faboideae* tribe: *Desmodieae.*

Morphological description

Herbaceous to suffrutescent, procumbent to nearly erect (20–80 cm tall), annual or perennial. Stems to 1 m long, branched, 4–5 angled, grooved, moderately to densely hispidly pubescent with long tapering or spreading hooked hairs. Leaves trifoliolate (sometimes unifoliolate near base of stem) with obliquely ovate-acuminate stipules, 5–15 mm long, 3–9 mm wide with lobes almost overlapping; petiole 1–7 cm long, hairy; rachis 0.8–3 cm long; petiolules 2–3 mm long; leaflets ovate to elliptic (sometimes orbicular), obtuse at the base and apex, or base cuneate and apex retuse; appressed pilose above and velutinous on the under surface, with long stout tapering hairs along the midrib and chief lateral veins, more delicate hairs of varying lengths abundant over whole surface, venation raised beneath; terminal leaflet 1.8–10 cm long and 2–7 cm wide, lateral leaflets 1.2–7 cm long and 1.0–4.8 cm wide, stipels very distinct, 5–9 × 1–2.5 mm, lanceolate. Inflorescence axillary or terminal, racemose or racemose-paniculate 5–45 cm long, with densely uncinulate-pubescent rachides, laxly flowered, 2- or 3-flowered at each node. Flowers small, pink or blue, standard 3.3–3.5 mm long, 2.5–3 mm wide, pedicel 2-5 mm long. Fruit 7–18 mm long, sessile to shortly stipitate (stipe 0.5–1.5 mm long), (2–) 4–6 (– 8) articled; articles quadrate at maturity, shallowly and nearly evenly indented along both sutures, 2–3 mm long and 2.5–3 mm wide. Seed yellow or chestnut brown, oval-reniform, 2 mm long and 1.5 mm wide.

Common names

China: □□□□□ er qi shan ma huang; □□□□□

English: dichotomous-stemmed desmodium, tick-trefoil desmodium (generic for *Desmodium*)

Ethiopia: chimero

India: ■■■■■ chikta (Marathi); asud; gander-lapto

Distribution

Native:

Africa: Cameroon; Chad; Ethiopia; Sudan; Uganda

Asia: China (Yunnan); India; Indonesia (Celebes, Java); Myanmar

Uses/applications

Forage

B. dichotoma has shown potential as a forage crop on heavy clay soils in sub-humid, seasonally dry tropical and subtropical environments.

Environment

It has shown potential as a green manure and as an annual ley legume.

Other

Considered to have medicinal properties for treating epizootic lymphangitis (Aari language: tushita) in equines, and stomach ache and fever in humans.

Ecology

Soil requirements

Most of the lines collected originate from slightly acid to alkaline soils, the most acid being pH 5.5. The only accession of this species that has been used in experiments originated from the Sudan and is well adapted to heavy textured alkaline soils.

Moisture

It is well adapted to dry and semi-arid environments on clay soils where it has the capacity to efficiently extract moisture.

Temperature

B. dichotoma is a widely distributed species, originating from around 23° N in Yunnan, China, 12° N in Africa, and 20° N in India to 13° S in Africa and 10° S in Indonesia, and from near sea level to 1700 m asl. This equates to an average annual temperature range from about 22 to 29 °C. In evaluation experiments it has been productive in regions throughout the tropics of northern Queensland and the southern Queensland and northern New South Wales cropping systems which are environments with hot summers, with maximum temperatures frequently in excess of 35 ºC. It is not frost tolerant and the Sudanese accession was burnt by frosts.

Light

Various websites report that this species comes from forests and thickets, as well as grassland, suggesting it has some shade tolerance.

Reproductive development

Flowering data vary with the flora report: India, September–February; China, June–August.

Defoliation

B. dichotoma is extremely palatable and will always be preferentially grazed. Its high palatability can result in it being grazed to ground level so a large degree of grazing management is important if a seed crop is desired.

Fire

No information available.

Agronomy

Guidelines for establishment and management of sown forages.

Establishment

B. dichotoma establishes readily in well prepared seedbeds. It has a relatively small seed so the recommended depth of sowing is about 1 cm and should not exceed 2 cm. The clay soils in which it might be used often have soil crusting characteristics which can reduce establishment significantly if seed is sown too deep and seed is of poor quality (low vigour). *B. dichotoma* can have a large percentage of hard seed and this should be tested. If hard seed is greater than 50%, then seed should be scarified before sowing. The rhizobium requirements for *B. dichotoma* have not been evaluated but it could be expected that the standard strain for *Desmodium* (CB 627 in Australia) should be used. Recommended planting rate when sown for a pure stand is 2 kg/ha.

Fertilizer

As in most legumes, *B. dichotoma* would be expected to respond to applications of P and Mo, and S may also be necessary in some situations.

Compatibility (with other species)

Most potential for *B. dichotoma* is as an annual ley legume or a forage crop. Little is know of its compatibility but it should be compatible with most grass species in their first year of establishment.

Companion species

Grasses: Can be intercropped with *Cenchrus americanus, Sorghum* spp. and *Zea mays* in open rows.

Legumes: No published information. Grows in similar environment to *Desmanthus* spp., *Lablab purpureus* and *Vigna unguiculata*.

Pests and diseases

No pests and diseases have been observed in its early trials.

Ability to spread

It should have low ability to spread due to its very high palatability.

Weed potential

Unlikely to have weed potential because of its palatability .

Feeding value

Nutritive value

Levels of 15% ash, 22% CP, 31% NDF, 26% ADF, 5.8% ADL, 61% IVDMD, 0.6% Ca, 0.2% P, 0.15% K, 0.8% Mg, 0.01% Na, 0.3% S, 4 ppm Cu, 1,600 ppm Fe, 45 ppm Mn and 12 ppm Zn.

Palatability/acceptability

Extremely palatable and selectively grazed by cattle; may be less palatable to small ruminants, equines and camels.

Toxicity

None reported.

Production potential

Dry matter

Dry matter yields in southern Queensland have ranged from 2 to 6 t/ha/year when grown under rainfed conditions of about 750 mm/yr on deep clay soils in a subtropical environment. DM yields ranged from 4.1 to 4.8 t/ha from a single harvest in the elevated tropics of the Amhara region of Ethiopia with 680–1,200 mm mean annual rainfall.

Animal production

No information available.

Genetics/breeding

Self-pollinated; 2*n* = 22.

Seed production

Large scale seed production has not been attempted but seed is held on the plant for some time after maturity which is conducive to both hand and mechanised harvesting.

Herbicide effects

No information available.

Strengths

- Adapted to alkaline clay soils.
- High quality and potential as a ley legume and annual legume crop.
- Extremely palatable.
- Non bloating.

Limitations

- Small seed may result in establishment difficulties on clay soils.
- Palatability will necessitate significant attention to grazing management.

Selected references

Abebe, H. (2020) A survey to assess the value of the legume chimero (*Bouffordia dichotoma* syn. *Desmodium dichotomum*) in mixed farming systems in North and South Wollo Zones, Amhara Region, Ethiopia. Tropical Grasslands-Forrajes Tropicales 8:11–19. doi.org/10.17138/tgft(8)11-19

Clem, R.L. and Hall, T.J. (1994) Persistence and productivity of tropical pasture legumes on three cracking soils (Vertisols) in north-eastern Queensland. Australian Journal of Experimental Agriculture 34:161–171. doi.org/10.1071/EA9940161

Cultivars

None released to date.

Promising accessions

CPI 47186 Selected in Australia. Origin Abu-Naama, Sudan (12°43' N, 450 m asl, rainfall 400 mm) A semi-erect annual, evaluated as a ley species in cropping systems.


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