

Tropical Forages

Stylosanthes fruticosa

Scientific name



Stylosanthes fruticosa (Retz.) Alston

Synonyms

Basionym: *Arachis fruticosa* Retz.; *Stylosanthes bojeri* Vogel; *Stylosanthes mucronata* Willd.

Family/tribe

Family: *Fabaceae* (alt. *Leguminosae*) subfamily: *Faboideae* tribe: *Dalbergieae* subtribe: *Stylosanthinae*.

Morphological description

Woody perennial herb to shrub, 0.1–1 m tall, usually with a thick woody rootstock and many branches. Stems pubescent to densely hairy. Leaves trifoliolate; leaflets oblong-elliptic or linear-lanceolate, acute at base and apex, 5–33 mm long, 1–9 mm wide, usually pubescent and bristly. Flowers cream to yellow, 3–5 borne in dense oblong terminal heads; calyx-lobes 2–4 mm long. Standard 5–7 mm long, 4–5 mm wide. Pod 4–9 mm long with 1 or 2 segments 3.5–4 mm long, 2–2.5 mm wide and a slightly curved beak 1–3 mm long, usually densely pubescent; seeds 1.5–2 mm long. 240,000–360,000 seeds per kg.

Similar species

S. fruticosa is not reliably distinguishable morphologically from *S. scabra*.

Common names

English: African stylo, wild lucerne, shrubby pencilflower

Africa: bâda gotur, bala korama (Senegal); mbono muso, nbono, damel (The Gambia); guirti, kassantouri, dakadake (Zarma/Niger, Nigeria, Benin)

India: sailekampa, sella kampa ■■■■■■■■■■, saali kampa ■■■■■ ■■■■ (Telugu)

Distribution

Native:

Africa: Angola, Botswana, Burkina Faso, Burundi, Cameroon, Chad, Côte d'Ivoire, DRC, Ethiopia, Gambia, Ghana, Guinea-Bissau, Kenya, Malawi, Mali, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Somalia, South Africa (Cape Province, KwaZulu-Natal, Transvaal), Sudan, Swaziland, Tanzania, Togo, Uganda, Zambia, Zimbabwe

Indian Ocean: Madagascar

Asia: India, Saudi Arabia, Sri Lanka, Yemen

Uses/applications

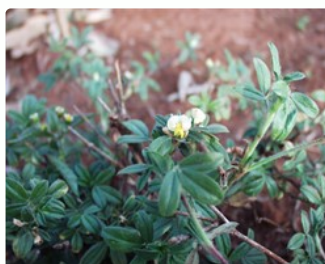
Forage



Similar to *Stylosanthes scabra* (ATF 2931)



3–5 flowers borne in dense oblong terminal heads; viscid bristles (ILRI 558)



Flower (ILRI 2032)



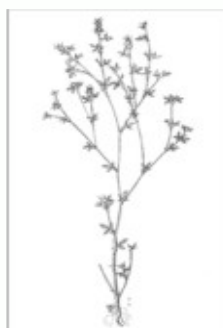
Flower, leaves and bristles



Mature seed heads



Upper pod segments and seeds



Habit.

Scale: between points = 1 cm. (Drawn from N. Sousa Costa 2093 & Quintino 3160.)



A leaf; B

bract; C bracteoles and axis rudiment; D wing; E keel; F standard; G androecium and gynoecium; H unfolded calyx; I pod; J seed. Scale: between points = 2 mm. (Drawn from N. Sousa Costa & Quintino 3160.)



Woody perennial herb with many branches arising from single woody rootstock (CPI 41219A)



Flowers and leaves

S fruticosa has been used in pasture in mixtures with perennial grasses. It is heavily grazed by livestock in native pastures in Africa.

Environment

It is used to improve fertility of fallow areas through leaf drop and nitrogen fixation. Prostrate forms are useful for soil erosion control. It has also been intercropped with millet in dry areas.



With native grasses, semi arid central Queensland, Australia (CPI 41219A)

Other

In India, the powdered plant and leaf are used in traditional medicine.

Ecology

Found in grassland, woodland, scrub and weed of old cultivations.

Soil requirements

While growing well on sandy well-drained alkaline soils, it is tolerant of acid and clay soils. It grows well in soils from pH 4 to 8 and is tolerant of low phosphorus.

Moisture

Rainfall in its natural range varies from 350 to 1,500 mm/year. The species is moderately tolerant of waterlogging and very tolerant of drought. It can behave as an annual in areas with very poor rainfall.

Temperature

Occurs from sea level up to about 2,000 m asl in the tropics. It has no tolerance of heavy frosts, although it can tolerate short cool periods and light frosts better than some other *Stylosanthes* species.

Light

Can tolerate light shade and frequently grows under *Acacia* in the African savannas.

Reproductive development

Plants are day neutral, usually flowering in less than 60 days in the tropics. Temperature is critical for flowering with peak flowering occurring in daytime temperatures from 25 to 30 °C. Temperatures above 30 °C can affect flowering.

Defoliation

Tolerates moderate, but not heavy grazing.

Fire

Like *S. scabra*, it is not tolerant of fire. Plants establish rapidly after fire from the hard seeds remaining in the soil if there is sufficient moisture.

Agronomy

Guidelines for establishment and management of sown forages.

Establishment

Establishment of *S. fruticosa* is similar to that for other *Stylosanthes* species. Establishment is by seed at rates of 3–6 kg/ha. Seeds are hard and require scarification before planting to ensure uniform germination. Seeds are small and seedbeds should be well prepared to a fine, firm tilth. Seeds are best sown just below the surface, lightly covered and rolled. Germination occurs in about 2–5 days and young seedlings emerge about 1 week after planting. It can also be oversown into pastures by broadcasting, followed by a light harrowing. *S. fruticosa* is not reported to have specific rhizobium requirements and in its native habitat it readily nodulates with native rhizobia.

Fertilizer

There is no information available that would allow to draw generalised conclusions on the species.

Compatibility (with other species)

Compatible with perennial grasses that are protected from heavy grazing, including *Andropogon gayanus*, *Heteropogon contortus* and *Hyparrhenia hirta*. Can be inter-cropped with millet in the Sahel.

Companion species

Grasses: *Andropogon gayanus*, *Urochloa humidicola*, *Cenchrus ciliaris*, *Cynodon dactylon*, *Heteropogon contortus*

Legumes: [Chamaecrista rotundifolia](#), *Stylosanthes scabra*

Pests and diseases

Although reported susceptible to anthracnose in Queensland, Australia and in Colombia, several tolerant accessions have been observed in trials in Africa.

Ability to spread

Hard seeds may be dispersed by water and small animals and remain in the soil for several years allowing pastures to regrow annually.

Weed potential

Low weed potential due to high palatability and low tolerance of heavy grazing and fire.

Feeding value

Nutritive value

Although the nutritive value is not as high as that of other more leafy legumes, crude protein levels reported are 7–17% of dry matter. Reported digestibility is 66%.

Palatability/acceptability

Much sought after by livestock and heavily grazed.

Toxicity

No information available.

Feedipedia link

<https://www.feedipedia.org/node/252>

Production potential

Dry matter

DM production from small plots was 6,000 kg/ha, while lower yields of up to 3,000 kg/ha were more commonly obtained in the Sahel.

Animal production

For [S. fruticosa](#) high DM intake of 71 g/kg $W^{0.75}$ has been reported, indicating the species could have reasonable potential for livestock production.

Genetics/breeding

$2n = 40$. This outcrossing species is an allotetraploid closely related to [S. scabra](#) and has been classified with it on morphological grounds, although more recent genetic studies using RAPDs, RFLPs and chloroplast DNA show that they are distinct taxa. It is also related to the other African species, *S. erecta*, and it is reported that it possibly hybridizes naturally with it where the two species overlap, leading to hybrid populations with broad variation.

Seed production

Plants start to flower after only 2 months, towards the end of the rains, and mature seeds are ready for harvest about 4–5 months after planting. The species is reported as a heavy seeder, although due to the small seed size it only yielded about 15–20 kg seeds/ha. The pods are firmly held by bracts and seeds are best harvested by cutting the entire plant when the majority of pods are mature, drying and beating so that the pods fall. The seeds are extracted from the pods by a belt thresher or by hand rubbing. Seeds are hard-seeded and store well.

Herbicide effects

No information available.

Strengths

- Drought tolerant.
- Palatable.
- Extends to moderate altitude subtropics (veld region in South Africa) and there it regenerates after severe frosts.

Limitations

- Cannot withstand heavy grazing.
- Relatively low productivity compared to other species of *Stylosanthes*.
- Most observed genotypes are susceptible to anthracnose.

Selected references

Hakiza, J.J., Lazier J.R. and Sayers, A.R. (1987) Characterization and evaluation of forage legumes in Ethiopia: preliminary examination of variation between accessions of *Stylosanthes fruticosa* (Retz.) Alston. In: Dzwela, B.H. (ed) African forage plant genetic resources, evaluation of forage germplasm and extensive livestock production systems. Proceedings of the 3rd PANESA workshop, Arusha, Tanzania, 27–30 April 1987. p. 174–191. hdl.handle.net/10568/49996

Kouame C.N., Powell, J.M., Renard, C.A. and Quesenberry, K.H. (1993) Plant yields and fodder quality related characteristics of millet-stylo intercropping systems in the Sahel. *Agronomy Journal* 85:601–605. doi.org/10.2134/agronj1993.00021962008500030015x

Liu, C.J., Musial, J.M. and Thomas, B.D. (1999) Genetic relationships among *Stylosanthes* species revealed by RFLP and STS analyses. *Theoretical and Applied Genetics* 99:1179–1186. <https://doi.org/10.1007/s001220051322>

Stace, H.M. and Edye, L.A. (eds) (1984) *The biology and agronomy of Stylosanthes*. Academic Press, Sydney, Australia. doi.org/10.1016/B978-0-12-661680-4.X5001-X

Vander Stappen, J. and Volckaert, G. (1999) Molecular characterization and classification of *Stylosanthes mexicana*, *S. macrocarpa*, *S. seabrana* and *S. fruticosa* by DNA sequence analysis of two chloroplast regions. *DNA Sequence* 10:199–202. doi.org/10.3109/10425179909033948

Cultivars

None

Promising accessions

CPI 41219A This accession was consistently amongst the highest yielding and persistent accessions of the many compared in northern Australia in the 1970s. It, along with all other *S. fruticosa* accessions in those comparisons, was badly affected by anthracnose in about 1974 and further work with the species ceased at that time. In the event that anthracnose can be overcome, this accession should be considered in any future work.

ILRI 13860 In evaluation in Ethiopia, this tall ecotype from Sadoré, Niger was particularly high yielding.

© Copyright 2020. All rights reserved.

