

Tropical Forages

Aeschynomene histrix

Scientific name



Aeschynomene histrix Poir.

Subordinate taxa:

Aeschynomene histrix Poir. var. *densiflora* (Benth.)
Rudd

Aeschynomene histrix Poir. var. *histrix*

Aeschynomene histrix Poir. var. *incana* (Vogel) Benth.

Note: The genus, *Aeschynomene*, is separated into two sections: *Aeschynomene* and *Ochopodium*. The former encompasses predominantly species from humid environments, such as *A. americana*, *A. indica* and *A. villosa*, while the latter includes a number of dryland species, such as *A. brasiliiana*, *A. falcata* and *A. histrix*.

Synonyms

***Aeschynomene histrix*:** *Secula hystrix* (Poir.) Small

var. *densiflora*: Basionym: *Aeschynomene densiflora* Benth.

var. *incana*: Basionym: *Aeschynomene incana* Vogel

Family/tribe

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

Morphological description

Prostrate to semi-erect or erect tap-rooted perennial herb or sub-shrub, 10–80 cm tall, and 75–160 cm diameter; stem moderately pubescent and hispid with yellowish glandular hairs 2–4 mm long. Leaves pinnate, 16–30-foliolate, leaflets oblong-elliptic, rarely obovate, 4–12 mm long, 1.5–4 mm wide, upper surface pubescent to glabrous, lower surface pubescent. Inflorescence racemose, axillary, comprising 4–15 yellow, orange or white flowers, with standard 5–7 mm long. Pod glabrous to moderately pubescent, comprising 2 (rarely 3) fertile segments, each 2–2.5 (rarely 3) mm long, and 2.5 mm wide. Seeds black, 1.5–2 mm long, 1–1.5 mm wide; 420,000–910,000 seeds/kg.

var. *densiflora*: stems suberect; leaflets 7–12 mm long, 2–4 mm wide; stipules 6–15 mm long, (1–) 2–3 mm wide at base; articles of fruit 2–2.5 mm in diameter (or, rarely, 3 mm long); flowers 5–7 mm long.

var. *histrix*: stems usually prostrate; leaflets 4–6 (–8) mm long, 1.5–3 mm wide; stipules 4–5 mm long, about 1 mm wide at base; articles of fruit glabrous to moderately crisp-puberulent; stems and leaves moderately pubescent, often glabrate; bracteoles about as long as calyx; flowers 5–6 mm. long.

var. *incana*: stems usually prostrate; leaflets 4–6 (–8) mm long, 1.5–3 mm wide; stipules 4–5 mm long, about 1 mm wide at base; articles of fruit pubescent, the hairs usually appressed; stems and leaves generally canescent; bracteoles about half as long as calyx; flowers 6–7 mm. long.



Axillary, multi-flowered, usually congested, racemose inflorescence.



Prostrate to semi-erect or erect tap-rooted perennial herb or sub-shrub (CPI 93936)



Leaves pinnate, 16–30 foliolate, leaflets mostly oblong-elliptic (CPI 93936)



Stem pubescent and hispid with yellowish glandular hairs



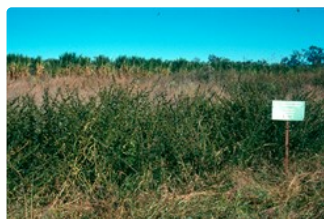
Pod comprising 2 (rarely 3) fertile segments (CPI 93936)



Seeds



Prostrate, canescent stems (CIAT 7265)



Dry season North Qld Australia (CPI 93938)

Description based on Rudd (1955).

Common names

English: porcupine jointvetch

Distribution

Native:

Northern America: Mexico (Colima, Jalisco, Mexico, Sinaloa)

Central America: Belize, Costa Rica, Guatemala, Honduras, Nicaragua

South America: Argentina, Brazil, Bolivia, Colombia, French Guiana, Guyana, Paraguay, Peru, Suriname, Uruguay, Venezuela

Naturalized:

Northern America: USA (Florida)

Cultivated:

Africa: Benin, Nigeria

Uses/applications

Forage

Although not extensively evaluated, [A. histrix](#) appears to have potential to contribute to both livestock-forage and improved fallow systems in the tropics. May have potential in permanent pastures, but needs further evaluation of persistence.

Environment

Can act as a fast-decomposing green manure, although establishment may be slow, and may produce insufficient bulk for this purpose. Can act as a trap crop for the parasitic plant, *Striga hermonthica* in cropping systems although there is genetic variation in the ability to initiate suicidal germination. In West Africa, innovative farmers are using *A. histrix* or *Mucuna pruriens* intercropped with maize or yam in rotation.

Ecology

Occurs in savannah, grassland, pine woods, rocky hillsides and waste places.

Soil requirements

Collected mainly in sandy, acid and low-fertility soils, although also in sandy loams and clays. Adapted to acid to neutral, well drained, low-fertility soils such as ultisols and oxisols.

Moisture

Occurs naturally in areas with annual rainfall mostly between 1,000 and 1,500 mm, the extremes being about 800 mm in Argentina and 2,760 mm in Panama. Moderate drought tolerance. No record of tolerance of flooding or waterlogging.

Temperature

Germplasm collections are from about 15° N in Guatemala to about 23° S in Paraguay, at altitudes to about 1,400 m asl. [A. histrix](#) var. *incana* extends to about 34° S in Uruguay and 31° S in Argentina, and to 31° N in Florida. This represents a range in average annual temperatures from about 17 to 26 °C.

Light

No information available.

Reproductive development

[A. histrix](#) is primarily a short day plant. There is considerable variation in critical photoperiod within the species.

Defoliation

Plants are sensitive to frequent cutting. It can be expected that the more prostrate types are better adapted to grazing than erect types.

Fire

No information available but in their native savannah habitat, tap-rooted populations are able to withstand fires.

Agronomy

Guidelines for establishment and management of sown forages.

Establishment

Mechanical scarification of hand-harvested seed may be necessary to overcome high levels of hardseededness. Machine harvested seed is scarified by the threshing process. [A. histrix](#) appears to be somewhat promiscuous, but may nodulate more effectively with *Aeschynomene* inoculum CB 2312.

Fertilizer

No information available.

Compatibility (with other species)

Competes successfully with weeds in a seasonally dry environment. Has not been successful in more humid environments, possibly due to higher grass competition.

Companion species

Grasses: [Bothriochloa pertusa](#), [Urochloa mosambicensis](#).

Legumes: [Chamaecrista rotundifolia](#), *Stylosanthes guianensis* var. *guianensis*, [S. hamata](#), [S. scabra](#).

Pests and diseases

Anthraxnose, caused by the fungus *Colletotrichum gloeosporioides*, is the most important disease in [A. histrix](#). Isolates of the pathogen from *Aeschynomene* spp. can infect other legumes. More prostrate ecotypes are generally more affected by *Rhizoctonia* foliar blight, and semi-erect to erect ecotypes by *Fusarium* wilt. Some ecotypes appear susceptible to legume little-leaf phytoplasma. Flowers and developing pods may be attacked by heliothis (*Helicoverpa armigera*) larvae.

Ability to spread

[A. histrix](#) spreads by seed. However, many accessions are very late flowering and seed set may be interrupted by dry season or frost.

Weed potential

Vigorous growth, high seed production, high levels of hard seed, and relative ease of establishment suggest some weediness potential in certain environments.

Feeding value

Nutritive value

Average leaf:stem ratios vary from 0.5:1 to 1.1:1, with individual ecotype extremes ranging from 0.3:1 to 1.9:1 depending on age of growth. CP levels vary from 13 to 28% in leaf, and from 9 to 15% in stem. IVDMD of leaf averages 53–66% (extremes 32–82%) and of stem, 30–40% (extremes 23–45%). P and Ca levels in 4-wk-old [plants](#): 0.66% and 0.74%, respectively.

Palatability/acceptability

As with many tropical legumes, stock acceptance of [A. histrix](#) improves with exposure to the species, to the point where it is readily eaten.

Toxicity

No information available.

Production potential

Dry matter

In a set of more tropical selections, 5 growth habit groups were identified: (1) semi-erect, low growing; (2) prostrate, open; (3) decumbent, dense; (4) decumbent or semi-erect, few branches, thick stems, open; (5) semi-erect to erect, many branches, dense. Annual DM yields vary markedly with ecotype from <2 to 17 t/ha, but are mostly 2–8 t/ha.

Animal production

No information available.

Genetics/breeding

2n = 20. *Aeschynomene* species are mostly self-fertile.

Seed production

Hand harvested seed yields average about 90 kg/ha, and more than 200 kg/ha in some accessions.

Herbicide effects

No information available.

Strengths

- Good DM yields.
- Adaptation to acid and low-fertility soils.
- Potential as a *Striga* trap crop.

Limitations

- Susceptibility to anthracnose.
- Sensitivity to frequent cutting.

Selected references

Bielig, L.M. (1997) Chromosome numbers in the forage legume genus, *Aeschynomene* L. *Sabrao Journal of Breeding and Genetics* **29**:33–39.

Maliki, R., Sinsin, B., Floquet, A., Cornet, D. and Lançon, J. (2017) Sedentary yam-based cropping systems in West Africa: Benefits of the use of herbaceous cover-crop legumes and rotation—lessons and challenges. *Agroecology and Sustainable Food Systems* **41**(5):450–486. doi.org/10.1080/21683565.2017.1279252

Merkel, U., Peters, M., Tarawali, S.A., Schultze-Kraft, R. and Berner, D.K. (2000) Characterization of a collection of *Aeschynomene histrix* in subhumid Nigeria. *The Journal of Agricultural Science* **134**:293–304. doi.org/10.1017/S0021859699007546

Rudd, V.E. (1955) The American species of *Aeschynomene*. *Contributions from the United States National Herbarium* **32**:1–172. hdl.handle.net/10088/27083

Cultivars

None released.

Promising accessions

The following three elite accessions have been selected in studies in south-west Nigeria based on agronomic performance, forage quality, seed production and ability to suppress *Striga hermonthica*.

CIAT 9690 (ILRI 12463, IRFL-2891, CPI 93599, ILCA-00149, UF-312) Origin Mato Grosso, Brazil (11.6° S, 200 m asl, c. 1,500 mm/yr). This accession was also amongst the best in limited testing in northern Australia.

CIAT 18539 (BRA 003948) Origin Mato Grosso, Brazil (15.1° S, 160 m asl, c. 1,700 mm/yr).

CIAT 18974 Origin Bolívar, Venezuela (7.4° N, 190 m asl, 1,270 mm/yr).

The following seven accessions were identified as being comparable to those above in the same Nigerian study but did not have the capacity to induce suicidal germination of striga seed to the same degree. These accessions are worthy of further evaluation where striga does not occur.

CIAT 7884, **CIAT 8262** (BRA 001741), **CIAT 8581** (ILCA 12135), **CIAT 8904** (BRA 002691), **CIAT 8907** (BRA 002739), **CIAT 8911** (BRA 002801), **CIAT 8943** (BRA 003123).

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