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Vigna aconitifolia (Jacq.) Marechal. (Papilionaceae): A review of medicinal uses, Phytochemistry and Pharmacology

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Abstract
Vigna aconitifolia (Jacq.) Marechal. (Papilionaceae) is a medicinally important plant and is used for the treatment of different diseases specially in dermatological disorders. Alkaloids, phenols, flavonoids and phytic acid have been reported from this plant. Antioxidant, antidiabetic and hypocholesterolemic activities are also shown by *Vigna aconitifolia.* The present review is an attempt to compile all the previous data on the basis of its medicinal uses, phytochemistry and pharmacology reported in the previous articles.

Keywords: *Vigna aconitifolia*, medicinal uses, phytochemistry, pharmacology.

Introduction
Vigna aconitifolia L (Jacq) Marechal is a draught resistant legume, belonging to the family Fabaceae, commonly grown in arid and semiarid regions of India. *Vigna aconitifolia* (Jacq) Marechal is a minor legume crop. *Vigna* bean is native to India and Pakistan, grown for food production and as a forage and cover crop [1, 2].

Fig 1: *Vigna aconitifolia* seeds

Table 1: Names of *Vigna aconitifolia* in different languages [3, 4].

Languages	Names
English	Moth bean, Mat bean, Turkish gram, Moth gram, Dew bean, Dew gram
French	Haricot papillon, Haricot mat
Hindi	Moth daal
Japanese	Mosu biin
Malyalam	Mitti kelu
Sanskrit	Makushta, Makushtaka, Vanamudga
Tamil	Narippayir
Thai	Matpe
Urdu	Matki Daal

Table 2: Taxonomy [5, 6].

Kingdom	Plantae	Sub tribe	Phaseolinae
Family	Papilionaceae	Genus	*Vigna*
Subfamily	Faboideae	Species	*aconitifolia*
Tribe	Phaseoleae	Synonyms	*Dolichos dissectus* Lam. *Phaseolus aconitifolius* Jacq. *Phaseolus palmatus* Forssk.
Plant	Annual, slender, prostrate creeping, hairy herb.		
Leaves	Alternate, 3-foliolate.		
Inflorescence	Axillary, head-like, dense false raceme.		
Flower	Bisexual, papilionaceous; calyx campanulate, c. 2.5 mm long; corolla yellow, standard orbicular, up to 8 mm long, wings c. 6 mm long, keel sickle-shaped, c. 7 mm long; stamens 10, 9 united and 1 free; ovary superior, sessile, c. 4 mm long, style incurved.		
Fruit	A cylindrical pod 2.5–5 cm × 0.5 cm, brown, covered with short stiff hairs, 4–9-seeded.		
Seeds	Rectangular to cylindrical, 3–5 mm × 1.5–2.5 mm, whitish green, yellow to brown, often mottled with black.		

Macroscopy of seeds

The seed is small, very light yellow and oblong shaped. Hilum is sub-apical. Surface of seed have heavily reticulate patterns of rugue with waxy drops here and there. The boundary of hilum has net of interwoven string like structure. The hilum is oval with broader posterior and narrower anterior end. The boundary of hilum is clearly defined and slightly protruded out. There is a rod like very narrow slit which joins the micropyle with the anterior end of the seed [7]. Hilum at (or almost at) the level of seed coat white, linear; Macrosclereids, Height 37±2 µm, Hour-glass shaped lumen; Aril very short; Funicle present [8].

Table 4: Nutritional value of seeds [9].

Essential minerals (mg / 100g)		Amino acid (g / 100 g)	
Macro-minerals		Alanine	3.68
Calcium	244.10	Arginine	6.14
Magnesium	214.04	Aspartic acid	10.64
Phosphorus	174.26	Cystine	0.64
Potassium	2256.68	Glutamic acid	16.12
Sodium	34.06	Glycine	3.08
Micro-minerals		Histidine	2.76
Copper	0.76	Isoleucine	4.16
Iron	7.46	Leucine	7.42
Manganese	1.61	Lysine	6.34
Zinc	1.41	Methionine	1.62
Fatty acids (%)		Phenylalanine	5.48
Eicosenoic acid	4.18	Proline	3.33
Linoleic acid	22.06	Serine	4.36
Linolenic acid	20.14	Threonine	3.96
Myristic acid	2.24	Tryptophan	1.24
Oleic acid	18.04	Tyrosine	3.14
Palmitic acid	16.46	Valine	5.16
Palmitoleic acid	9.21	Vitamins (mg/100g)	
Stearic acid	7.04	Ascorbic acid (C)	59.10
------	------	Niacin (B_3)	28.08

Traditional and medicinal uses

The ripe whole or split seeds of moth bean are eaten cooked or fried. Sprouted and cooked seeds are preferred as breakfast items in India whereas fried splits are consumed in the form of a ready to eat product. The seeds are sometimes ground into flour, which is mixed with other flours to make unleavened bread. The immature pods are sometimes eaten boiled as a vegetable. In India the pod walls and residues left after the preparation of dhal are fed to animals. Moth bean is also grown for green manure, forage and hay and as a cover crop. Seeds are used medicinally in diets to treat fevers while roots are said to be narcotic [6].

Pharmacological activities

Table 3: Different extracts of *Vigna aconitifolia* have shown

Part	Extract	Pharmacological activity
Seed	Acetone	Trypsin inhibitor, antioxidant activity [2, 10]
	Hydro alcoholic	Antidiabetic activity [11]
	n-butanol	Nootropic activity [12]
	Methanol	Hepatotoxicity, nephrotoxicity [13]
	Protein concentrate	Hypocholesterolemic activity [14]

Phytochemistry

The phytochemical literature survey of *V. aconitifolia* revealed the presence of albumin, globulin [2, 10], condensed tannins [2, 10] flavonoids, phenolic acids [2], phytic acid [2, 10] and trypsin and chymotrypsin inhibitor [2, 15, 16].

Conclusion

The traditional uses, pharmacology and phytochemistry of *V. aconitifolia* presented in this review could be helpful for future studies and research. The plant has good future prospective for discovery of new molecules and pharmacological activities.

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