## **REVIEW ARTICLE**

# A SCIENTIFIC REVIEW ON PHARMOCOLOGICAL ACTIONS OF *MACROTYLOMA UNIFLORUM* ON VARIOUS DISEASES

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Author affiliation:	ABSTRACT:				
<sup>1</sup> Department of	Macrotyloma uniflorum plant comes under the family				
Pharmacognosy and	Fabaceae (Leguminosae), which common name is famous in Andhra				
Phytochemistry,	Pradesh India as Ulavalu. It distributes to all over the world mainly				
<sup>2</sup> Department of	in Africa, Australia and Asia. Mostly it is available as feed for animals				
<sup>3</sup> Department of	(horse gram). This plant contains some disease controlling				
Pharmaceutical	properties mainly for asthma, liver problems, urinary problems, skin				
Chemistry Pharmacy	diseases, diabetes, obesity and ulcers. This documentation work may				
Practice,	be beneficial for the persons who are suffering from above diseases				
Nimra College of	and at the same time or the plant researchers for its cultivation				
Pharmacy, Vijayawada	process [1].				
521456 AP INDIA	KEYWORDS: Macrotyloma uniflorum, Leguminosae, Pharmacology				
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#### **INTRODUCTION:**

*Macrotyloma uniflorum* is the plant one of the lesser known beans, commonly called Horse gram. The horse gram is normally used to feed horses, though it is also commonly used in cooking and it is useful as an ayurvedic medicine as it having a food with medicinal qualities. The plant parts of *Macrotyloma uniflorum* roots, leaves, seeds, and in some cases whole plant is used as a medicine and it is belonging to the family Fabaceae or Leguminosae of genus Macrotyloma [2].

#### **TAXONOMICAL CLASSIFICATION [3]:**

### Table 1: Taxonomical classification of M. uniflorum

Kingdom	Plantae
Clade	Angiosperms
Clade	Eudicots
Order	Fabales
Family	Fabaceae
Genus	Macrotyloma
Species	M. uniflorum

# VERNACULAR NAMES [3]:

Some common names of *M. uniflorum* are represented as in their available areas as follows:

#### Table 2: Vernacular names of M. uniflorum

Name of the State/ Language	Vernacular Name
Punjab	Chana/ Chholey
Telangana, Andhra Pradesh	Ulavalu
Darjeeling, Sikkim (Nepali)	Gahat
Kerala	Muthira/Kuthira
Tamil Nadu	Kaanam/Kollu
Maharashtra	Kulith
Karnataka	Hurali
South Canara (Karnataka)	Kudu
Odisha	Kolatha
Northern India	Gahat/Kulath
Himachal Pradesh	Kulath
Myanmar	Bazat
Hindi	Monga

# TAXONOMICAL CHARACTERIZATION [4]:



Figure 1: M. uniflorum plant, seeds and flower

Horse gram is a short day, twining, succulent, annual climbing herb which has trifoliate leaves, white colored flowers, long linear pubescent pods with curved beak, flattened small seeds with light red, brown, grey, black or mottled test with photo and thermo-sensitive nature. It matures in 4 to 6 months. Horse gram germ in a reasonably well in drought- areas with very poor soils.

## **CULTIVATION REQUIREMENTS [5]**:

It is native to the old-world tropics and indigenous to India. Archaeological investigations have revealed the use of horse gram as food especially in India as origin around 2000 BC. Horse gram belongs to the genus Macrotyloma and contains 25 species indigenous to Africa and Asia. Presence of wild or naturalized horse gram is recorded in Africa (Central, East and Southern Africa) and India.

The primary center of origin and use of horse gram as a cultivated plant is in the plain sand hills of low altitude extending south wards in the Western Ghats in South West India. During the Neolithic period, through counter-migration of human beings, its cultivation was diffused to the northern and western parts of the Indian subcontinent. It is generally grown insub- humid to semi-arid climates with annual rainfall 300–600mm, and also with less than 30 cm rainfall as a dry-land crop up to an elevation of 1800 m from mean sea level. The optimum temperature range for it grow this 25°C t o32°C; it can tolerate temperatures upto 40°C, butthe growth rate declines markedly below 20 °C.

## FOLKLORE USE [6]:

It is used by the rural people in day-to-day life as a diet, it has been recognized as potential source of protein and other nutrients. It has high nutritional value equivalent to other commonly grown pulse crops in all aspects and also an excellent source of iron, molybdenum and calcium. Horse gram seed contains carbohydrate (57.2% w/w), protein (22% w/w), dietary fiber (5.3% w/w), fat (0.50% w/w), calcium (287 mg), phosphorus (311 mg), iron (6.77 mg) and calories (321kcal) as well as vitamins like thiamine (0.4mg), riboflavin (0.2 mg) and niacin (1.5 mg) per 100 grams of dry matter.

However, several factors like the genotype, soil, fertilizer application, cultural practices, weather and climatic factors, post-harvest handling and storage can directly or indirectly affect the nutritional quality. Horse gram seed is low in fat and is excellent sources of protein, dietary fiber, a variety of micro- nutrients and phytochemicals still it has remained an underutilized food legume, consumed only by the farming communities of inaccessible areas and low-income groups.

# PHYTOCHEMICAL REVIEW [7]:

The *M. uniflorum* plant contains some type of constituents. These can be extracted by using some entrants. Which are listed as below table:

S. No.	Type of Constituent Extracted	Type of	Part of the	Ref.
		Extrant	Plant Used	
1	Benzeneacetaldehyde	Ethanol	seed	1
2	Benzeneetanamine	Ethanol	seed	2
3	L-phenylalanine, ethylester	Ethanol	seed	3
4	2-(1-methyl-2-propenyl)bicyclo[2.2.1]heptane	Ethanol	seed	2
5	1H-pyrrole,2-(2,4,6-cycloheptatrienyl)	Ethanol	seed	2
6	Ethyl. Alphadglucopyranoside	Ethanol	seed	4
7	Mome ionositol	Ethanol	seed	4
8	n-Hexadecanoicacid	Ethanol	seed	4
9	Heptadecanoicacid, ethyl ester	Ethanol	seed	5
10	9,12-octadecadienoicacid(Z,Z)	Ethanol	seed	7
11	Ethyl(9Z,12Z)-9,12-octadecadienoate	Ethanol	seed	8
12	Heptadecane,3-methyl	Ethanol	seed	9
13	Octanamide,N-(2-hydroxyethyl)(Z,Z)	Ethanol	seed	10
14	3-cyclopentylpropionicacid,	Ethanol	seed	11
	2- dimethylaminoetyl ester			
15	(R)14-methyl-8-hexadecn-1-0l	Ethanol	seed	4
16	Hexadecanoicacid,2-hydroxy-1-(hydroxyl methyl)	Ethanol	seed	5
	ethyl ester			
17	1-cyclohexyldimethylsilyloxybutane	Ethanol	seed	6
18	Eicosane	Ethanol	seed	7
19	9,12-Octadecadienoicacid (Z,Z)-,2,3-	Ethanol	seed	8
	dihydroxypropyl ester			
20	Heneicosane	Ethanol	seed	6
21	9-Methyk-10,12-hexadecaduen-1-olacetate	Ethanol	seed	7
22	Hexatriacontane	Ethanol	seed	8
23	i-propyl,9,12-octadecenadienoate	Ethanol	seed	9
24	Vitamin E	Ethanol	seed	9
25	Tricycle[20.8.0.0(7,16)]triacontane,1(22),7(16)-	Ethanol	seed	8
	diepoxy			
26	Stigmasterol	Ethanol	seed	9
27	Stigmast-5-en-3-ol	Ethanol	seed	11
28	(-)-lsolongifolol, acetate	Ethanol	seed	11

Table 3: Phytochemical classification of M. uniflorum

#### PHARMACOLOGICAL REVIEW:

*M. uniflorum* plant exhibits different types of pharmacological activities. They may be isolated from different plant parts upon treated with some entrants. These can be described in below table.

 Table 4: Pharmacological View of M. uniflorum

S.No.	Pharmacological	Model	Species Used	Plant Parts	Extract	Ref.
	Action			Used		
1	Antimicrobial	Inhibition of microbial growth	Gram-positive	Powdered	Ethanolic extract	8
	potency	by the disc diffusion method	and gram-	plant		
			negative bacteria			
2	Hemolytic	Spectroscopic methods	Mice	Aerialparts	Methyl ester of hexadecanoic and	9
	activity		erythrocytes.		ethyl ester of hexadecanoic acid	
					mixture (i) and n- exadecanoicacid	
3.	Cytotoxicity	Brine shrimp lethality bioassay	Brine shrimp	Aerialparts	Fractionated crude extracts	10
		technique	nauplii		dichloromethane, ethyl acetate, 1-	
					butanol	
4	Antioxidant	Nitric-oxide radical scavenging	Invitro	Dryseeds	Ethanolic seed extracts	11
	activity	assay, hydroxyl radical method				
		and phosphomolybdenum				
		reduction assay				
-	Diumati coffe at	Lingshitzmenthed	Albinovete	Dimino o dio	Ethonolic good outworks	10
5	Diureticenect	Lipschitzmethod	Albinorats	Dryseeds	Ethanolic seed extracts	12
6	Lithogenesis	Autoanalyzer,	Wistaralbino	Seed	Methanolic,acetone	13
		Anovafollowedby tukey-kramer	mice			

7	Antidiabetic	Kinetic studies (streptozotocin-	Swissalbino	Seedmeal	Physiological saline (0.145 m	14
	effect	nicotinamide-induced	male mice		NaCl) and Ammonium sulfate	
		diabetic mice)				
8	Hepato	Paracetamol and d-	Albinorats	Seeds	Methanol	15
	protective	galactosamine				
	activity	inducedlivertoxicity				
9	Anti hyper	High-fatdiet-induced	Sprague-dawley	Seeds	Thanol and water extract	16
	cholesterolemic	hypercholesterolemia	rats			
	effect					

### **ANALYTICAL REVIEWS:**

The *M. uniflorum* plant contains some analytes, these can be extracted by doing different methods. These can be listed below.

#### Table 5: Analytical review of M. uniflorum Effects

S. No	Analyte	alyte Compounds of Analyte Method Used		Extract Name	Ref.
	Name				
1	Phenolic	3, 4-dihydroxy benzoic, <i>p</i> -hydroxy	Reversed phase high performance	Acetonitrile or methanol).	17
	acids	benzoic, vanillic, caffeic,p-coumeric,	liquid chromatography (rp- hplc)		
		ferulic, syringic and sinapic acids	with UV detection		
2	Linoleic	Mome inositol, ethyl alpha-d-	Gc-msspectroscopy	Ethanolextract	18
	acid	glucopyranoside, n- hexadecanoic acid			
3	Quercetin	Rutinand Gallicacid	HPTLC	Toluene: Ethyl Acetate:Formic	19
				Acid:Methanol (3:6:1.6:0.4)	
				solution	

#### **CONCLUSION:**

*Macrotyloma uniflorum* plant which is commonly famous used as horse gram. Which contains fibre and protein contents. It is used as horse feed and some ayurvedic preparations for treating the various diseases in humans. It contains different types of analytical constituents, by using this constituents scientists formed the ayurvedic preparations. Mainly this review useful for the knowing the scientific and pharmacological actions of the *Macrotyloma uniflorum* to the researchers who continued their research works upon this plant.

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