



Review Article

HYPOLIPIDEMIC EFFECT OF KULATTHA (*DOLICHOS BIFLORUS*): AN AYURVEDIC REVIEW

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ABSTRACT

Kulattha, also known as horse gram, is a legume with significant Ayurvedic applications, particularly for urinary stones, respiratory issues, and metabolic disorders. Modern research supports its use, showing it has anti-urolithiatic, anti-inflammatory, and hypolipidemic effects due to compounds like flavonoids and phenolic acids. This study was aimed to explore the efficacy of *Kulattha* on dyslipidemia. Now a days unhealthy food habits like processed food, junk food and sedentary lifestyle are the main causative factors for dyslipidemia. The prevalence of dyslipidemia is very high in India, which requires urgent intervention strategies to prevent and manage its important cardiovascular risk factors. Many pharmacological interventions are available for hyperlipidaemia but long-term use of synthetic drugs may cause side effects and may not address the root cause of the disorder. In this regard an attempt has been made to address the hypolipidemic activity of *kulattha*, because *Kulattha* can be an economical alternative without any adverse effect.

INTRODUCTION

Hyperlipidaemia refers to the elevated levels of lipids (fats) in the bloodstream, including cholesterol, cholesterol esters, phospholipids, and triglycerides. This condition, known as hyperlipidaemia, is significant due to its role in causing atherosclerosis in arterial walls, leading to vascular complications. Elevated lipoprotein levels in many patients are often a result of a sedentary lifestyle, excessive body weight, and diets rich in total and saturated fats, compounded by genetic predisposition to high circulating lipid levels.

Kulattha (horse gram) is a highly nutritious and resilient legume, widely recognised for its therapeutic significance in Ayurveda. Belonging to the *Fabaceae* family and botanically classified as *Dolichos biflorus* or *Macrotyloma uniflorum*. Due to its ability to grow in dry conditions, *Kulattha* is often referred to as the "poor man's pulse crop" and serves as a staple in rural diets.

Traditionally, it is consumed in various forms such as soup, dal, and sprouted preparations, offering both nourishment and medicinal benefits. Although several pharmacological interventions are available for hyperlipidaemia but long-term use of modern drugs may cause side effects. Ayurveda emphasises preventive and curative measures that restore metabolic balance by improving *Agni* (digestive and metabolic fire), reducing excessive *Meda Dhatu*, and correcting lifestyle and dietary habits. *Kulattha* (*Dolichos biflorus* Linn.) is a traditionally used medicinal plant with both nutritional and therapeutic potential, known for its *Medohara* (anti-obesity/hypolipidemic) properties.

In this study, an attempt is made to elaborate on the *Karma*, *Rasa*, *Guna*, *Virya*, and *Vipaka* of *Kulattha* to study its hypolipidemic activity.

METHODS AND MATERIAL

- Data on *Kulattha* (*Dolichos biflorus*) was collected from Ayurvedic Samhitas, Nighantus, present-day Ayurvedic literature, research journals, and reliable online sources.
- Literature related to hyperlipidaemia was collected from available modern medical sources (textbooks, journals, research articles).

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Hyperlipidaemia

Hyperlipidaemia is a metabolic disorder characterized by abnormally elevated levels of lipids (fats) in the blood, including cholesterol, triglycerides, and various lipoproteins. It is considered a major risk factor for cardiovascular diseases such as atherosclerosis, coronary artery disease, stroke, and peripheral vascular disease. Depending on which lipid fraction is elevated, hyperlipidaemia can be classified as hypercholesterolemia (high total cholesterol, particularly LDL cholesterol), hypertriglyceridemia (high triglycerides), mixed hyperlipidaemia (elevation of both cholesterol and triglycerides), or familial hyperlipidaemia (genetic disorders causing high lipid levels from birth).

In today's modern era, lifestyle changes, unhealthy dietary habits, physical inactivity, stress, and increased consumption of processed foods have led to a marked rise in lipid disorders.

Various causes of Hyperlipidaemia include

1. Smoking
2. Drinking excessive alcohol
3. Eating foods high in saturated fats or trans fats.
4. Sedentary lifestyle (lack of physical activity).
5. Stress
6. Genetic factors that predispose to unhealthy cholesterol levels.

Hypercholesterolemia or hyperlipidaemia usually does not present with any symptoms. The only way to detect the condition is by performing a lipid profile test. In hypercholesterolemia, the patient might have:

- Increased total cholesterol: more than 200mg/dl
- Low-density lipoprotein (LDL) cholesterol: more than 100 mg/dl (commonly known as "bad cholesterol")/7triglycerides: more than 150mg/dl
- VLDL: more than 30mg/dl

From an Ayurvedic perspective, *Medovridhhi* is characterised by the excessive accumulation of *Meda Dhatu* (adipose tissue), which corresponds to obesity and lipid metabolism disorders in modern medicine. *Medovridhhi* can lead to serious complications such as *Hridroga* (heart disease), *Prameha* (diabetes), and *Raktapitta* (bleeding disorders). Hyperlipidaemia, the modern counterpart of *Medovridhhi*, is often asymptomatic but significantly increases the risk of cardiovascular diseases, stroke, and metabolic syndrome.

Kulattha (*Dolichos biflorus* linn.)

In this study, an attempt is made to elaborate on the *Karma*, *Rasa*, *Guna*, *Virya*, and *Vipaka* of *Kulattha* to study its hypolipidemic activity.

Different species identified as *Kulattha* are:

1. *Dolichos biflorus* Linn.
2. *Dolichos uniflorum*
3. *Dolichos unguiculata*
4. *Macrotyma uniflorum* (Lamk.) Verdc.
5. *Vigna unguiculata* (Linn.) Walp.
6. *Vigna sinensis*

In the current research work, *Dolichos biflorus* is considered synonymous with *Macrotyma uniflorum*. According to certain *Nighantus*, *Kulattha* is of two types:

1. *Kulattha* (*Dolichos biflorus*)
2. *Vana Kulattha* / *Aranya Kulattha* (*Cassia absus*)

Botanical Identity

- Botanical Name: *Dolichos biflorus* Linn./ *Macrotyma uniflorum* (Lamk.) Verdc.
- Family: Fabaceae (Leguminosae)
- Common Name: Horse Gram
- Sanskrit Name: *Kulattha* / *Kulatthika*
- Distribution: Widely found in Asia and Africa; cultivated in various parts of India.

Ras-panchak of *Kulattha*

कुलत्थिका कुलत्थश्च कथ्यन्ते तद्गुणा अथ ॥६०॥

कुलत्थः कटुकः पाके कषायः पित्तरक्तकृत् ।

लघुर्विदाही वीर्योष्णः श्वासकासकफानिलान् ॥६१॥

हन्ति हिक्काऽश्मरीशुक्रदाहानाहान्सपीनसान् ।

स्वेदसंग्राहको मेदोज्वरक्रिमिहरःपरः॥६२॥ (भावप्रकाश निघण्टु)

Property	Description
<i>Rasa</i>	<i>Kashaya, Madhura</i>
<i>Guna</i>	<i>Laghu, Ushna, Tikshna</i>
<i>Virya</i>	<i>Ushna</i>
<i>Vipaka</i>	<i>Katu</i>
<i>Prabhava</i>	<i>Bhedana</i>
<i>Doshakarma</i>	<i>Kapha-Vata Shamak</i>

Kulattha possesses *Katu*, *Tikta*, *Kashaya Rasa*, *Laghu*, *Tikshna*, *Ruksha*, *Ushna Guna*, *Katu vipaka*, and *Ushna Virya*. *Tikta*, *Katu Rasa*^[1,2], and *Ushna Virya* have *Agni* and *Vayu Mahabhoot* predominance which made this drug *Vatakaphahar*, *Strotoshodhaka*, and *Vatanuloman*. *Lekhana*, *Rukshana* and *Shoshana* properties of *Kulattha* are due to its *Kashaya Rasa* and *Ushna*, *Tikshna*, *Ruksha Guna* that help in reducing excessive *Meda*, *Kapha*, and *Kleda*.

Phytochemical Constituents of *Kulattha*

The lipid-lowering effect of *Kulattha* may be due to the presence of phytoconstituents (flavonoids, polyphenols, beta-sitosterol, aminoacids-glycine, isoflavones, isoferririn, cumesterol. Phytochemical

screening studies reveal the existence of flavonoids, urease, glycosides, lenoleic acid, polyphenols, beta sitosterol, amino acids- glycine, alanine, cysteine, serine, isoflavones, genistein, isoferirin, cumesterol, psoralidin, galactosidase, glucosides and streptogenin^[3]. The seeds of *M. uniflorum* contain extractable total phenolics and tannins^[4]. Dry heated samples were found to have considerable amounts of phenolic acids and tannins than in raw samples. There were eight phenolic acids components and the most abundant was p-coumaric acid and p-hydroxy benzoic acid^[5]. The successive extracts of root, seeds of *M. uniflorum* have showed the presence of alkaloids, flavonoids, glucosides, lignins, phenols, saponins, tannins and sterols. Alkaloids are the chief molecules of therapeutic importance from this species.

Hypolipidemic Effect of *Kulattha*

Kumar and team demonstrated that *M. uniflorum* extracts have strong activities against hypercholesterolemia and obesity. Hypolipidemic effect of *M. uniflorum* extract is evaluated in rats by analysing its effects on diet, weight gain, serum lipid profile, serum glutamate oxaloacetate transaminase (SGOT), serum glutamate pyruvate transaminase (SGPT) and body fat. Researches showed that the intake of ethanol and water extract of the plant for 5 weeks resulted a significant decrease ($p < 0.01$) of total cholesterol (TC), triglycerides, low-density lipoprotein (LDL), very low-density lipoprotein (VLDL) SGOT and SGPT levels. There was a significant increase in high-density lipoprotein (HDL) ($p < 0.01$). They also discovered ethanol extract-treated group has shown a significantly higher fecal excretion of cholesterol level than those treated with water extract^[6]. Body weight of rats in the water extract-treated group was significantly lower than that in the ethanol extract-treated group.

RESULT AND DISCUSSION

Various research studies on phytochemicals indicate the presence of active ingredients having anti-hyperlipidemia and antiobesity actions in *Kulattha*^[7]. In an animal study conducted by Muthu AK *et. al.* it was found that a higher dose of the methanolic extract of *Dolichos biflorus* (400mg/kg body weight) showed comparable results with the standard drug Atorvastatin. Therefore, it can be concluded that the *Dolichos biflorus* possesses hypolipidemic activity in high-fat diet rats^[8]. The lipid-lowering effect of *Kulattha* may be due to the presence of phytoconstituents (flavonoids, polyphenols, beta-sitosterol aminoacids-glycine, isoflavones, isoferririn, cumesterol^[9]).

Due to its ability to eliminate free radicals, chelate metal catalysts, activate antioxidant enzymes,

reduce tocopherol radicals, and inhibit oxidase or phospholipase. *Kulattha* reduced the quantity of free fatty acids. *Kulattha* decreased the level of triglycerides by reducing activity of lipoprotein lipase in adipose tissue. Increased plasma triglyceride uptake by skeletal muscle and adipose tissue may be caused by enhancing the actions of adipose tissue hormone-sensitive lipase and skeletal muscle lipoprotein. Thus, all these activities help in breaking the pathogenesis of Dyslipidemia and showed improvement in serum lipid levels.^[10]

CONCLUSION

Therapeutic properties of medicinal plants may possibly be due to existence of various phytochemical components and when it administered to patients it shows significant improvement in hyperlipidaemia. These properties indicate that *Kulattha* stimulates digestion (*Deepana-Pachana Karma*), reduces excessive *Meda* (fat), pacifies *Kapha* accumulation, and breaks down pathological obstruction (*Bhedana* action). This makes it suitable for conditions like *Medoroga*, *Sthaulya* (obesity), and hyperlipidaemia. Horse gram or *Kulattha* is easily available in the market and can be used as a wholesome food and therapeutic drug for dyslipidemia, making it economical and practical for medicinal use.

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