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## Review Article

### A review on *dioscorea pentaphylla* plant

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#### Abstract

*Dioscorea pentaphylla* L. a common plant of Dioscorea family commonly called five leaves in Bangladesh. The plant contains the alkaloid, carbohydrate, tannin, gum protein, steroid, glycoside, flavonoids. It is used as an analgesic, anti-inflammatory, and Powder of plant extract given orally in abdominal pain after delivery. It is a wild tuber is used both as food and medicines. Tubers are used against skin infections. The in vitro examinations of concentrating from *Dioscorea pentaphylla* exhibited antigenotoxic potential, antibacterial activity, antioxidant, Antinociceptive, antifungal activity. It contains a chemical constituent like alkaloids, saponin, flavonoids, tannins and phenols.

**Keywords:** *Dioscorea pentaphylla* L, Dioscorea family, Bangladesh, chemical constituent.



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#### Introduction

Plants have been utilized as a wellspring of medication since old time [1]. The depiction of the utilization of an assortment of plant derived prescriptions was written in various old writing of India (Veda, Purana and Upanishad) and China [2]. Now a days, in expanding populace individuals utilize home grown cures which have gotten progressively well known in the treatment of minor afflictions and are likewise much productive than others

#### *Dioscorea pentaphylla* [4]



**Fig: 01: *dioscorea pentaphylla* L..**

**Taxonomy [4]**

Family: Dioscoreaceae

Synonyms: Botryosicyos pentaphyllus (L.) Hochst., Dioscorea changiangensis, Dioscorea codonopsidifolia Kamik., Dioscorea digitata Mill., Dioscorea globifera R.Knuth, Dioscorea jacquemontii Hook.f., Dioscorea kleiniana Kunth, Dioscorea pentaphylla var. cardonii Prain & Burkill, Dioscorea pentaphylla var. communis Prain & Burkill.(fig.1)

**Common name**

Fiveleaf Yam,

Sanskrit: ककलक Kantakaluka

Tamil: நடுநுurai, கவளள Kaattuvalli, வள (க)

Telugu: అడవ గనసతగAdavi Genasu Tiga,

Kannada: ಕಗಲ Kaadu Gumbala

Khasi: phan kysiew

**Description**

Tuberous climbers; stem terete, twining to left, usually armed with prickles. Leaves 3-5-foliolate, with bulbils in the axils; leaflets 3.5-8 x 2.5-5 cm, elliptic-ovate, base acute or attenuate, apex acute, glabrous or pubescent below; upper leaves much smaller; petiole to 8 cm long. Male flowers on slender spikes on axillary or terminal panicles, tomentose. Perianth lobes 6, greyish; outer c. 1.5 mm long, ovate, tomentose, inner c. 1 mm long, lanceolate, glabrous. Stamens 3, staminodes 3. Female spike solitary, tomentose. Perianth lobes 6, biseriate, c. 1 mm long, ovate. Ovary c. 3 mm long, oblong, ribbed; stigma capitate. Capsule c. 2 cm long, oblong, 3-winged, glabrescent.

**Parts used [5]**

Used in Ayurveda and Sidha. Tubers, if eaten, produce sterility in males. Tubers for healing swellings, boils, rheumatism and as a tonic. Root powder taken by women to enhance milk during lactation. Leaves decoction drunk as contraceptive. Veterinary medicine. Root extract given for cough; root bark along with stem bark of Albizia lebeck crushed and applied locally for rheumatism.

**Synthetic constituents [6]**

Dioscorea pentaphylla contain a chemical constituents like alkaloids, saponin, flavonoids, tannins and phenols, glycosides,steroids.

**Pharmacological Effects****Antimutagenic effect [7]**

*D. pentaphylla* is one of such important medicinal edible food. The antimutagenicity potential of different extracts (petroleum ether, chloroform, and ethyl alcohol) of *D. pentaphylla* against MMS was assessed using *Drosophila*, an organism that is extensively used and suited for *in vivo* testing of simple or complex compounds. When the genotoxic activity of MMS was tested at 0.02, 0.05, and 0.1 mM concentration, it was found that MMS at a concentration of 0.1 mM had significantly increased the number of small, large, twin, and total spots. Therefore, 0.1 mM concentration of MMS was used as positive control; to test the antigenotoxic potential of different extracts of *D. pentaphylla* for 48 ± 4 and 72 ± 4 h larvae. When different extracts of *D. pentaphylla* was administered in combined treatment, it was found that all the three extracts inhibited the genotoxic effect of MMS significantly. It is notable that the treatment in both 48 ± 4 and 72 ± 4 h had significantly decreased by three folds the number of twin spots, total spots and frequency of clones per 105 cells when compared to control (distilled water) group. However, it is to be noted that among the three extracts, the ethanol extract significantly inhibited the genotoxic effects of MMS.

**Antibacterial activity [8]**

As the methanol extract of *D. pentaphylla* (tuber) showed highest zone of inhibition, therefore it was taken with eight different mobile phases for TLC and column chromatography analysis. TLC analysis showed that the methanol extract showed significant number of visible bands. The column chromatography of *D. pentaphylla* revealed that there are six fractions were collected. The antibacterial activity of fractions showed that only F6 exhibited the zone of inhibition against all tested bacterial strains also documented the antibacterial activity of methanol extract and fractions from the bulbils of *D. bulbifera* to be active against *E. coli*, *M. tuberculosis*, *E. aerogenes*, *K. pneumoniae* and *P. aeruginosa*. The experiment was further subjected to get the active spot / band using F6 on TLC. It was observed that same spot appeared 23 times out of 25 times of experiments at Rf: 0.82 with respective mobile phase with F6 The spot having Rf: 0.82 was named as DP-1 (present study) and results confirmed the spot (DP-1) at the said Rf. The present antibacterial analysis of DP-1 using Agar well Diffusion and Disc Diffusion assay was done and results revealed that it showed significant inhibitory activity against *S. pyogenes* followed by *S. flexneri*, *S.*

*mutans*, *V. cholerae* and *S. typhi* at used concentrations.

### Antimicrobial activity [5]

The results of antimicrobial investigation revealed that the MIC of the petroleum ether, chloroform and ethanol extracts was 100 µl/100 µl for each. The petroleum ether extract demonstrated antibacterial activity against all the clinical strains of bacteria. It showed maximum activity against *S. aureus* (16.13 mm) followed by *P. aeruginosa* (12.30 mm), and *K. pneumoniae* (12.23 mm), and among fungal strains, it showed maximum activity against *M. audouini* (14.42 mm) when compared to standard. Chloroform extract showed least inhibition activity against all the strains of bacteria and fungi. It was 19.40 mm against *S. aureus*, 16.00 mm against *P. aeruginosa*, 14.33 mm against *K. pneumoniae* and 16.23 mm against the fungal strain *T. tonsurans*. Whereas the ethanol extract showed significant inhibition zone similar to standard. Ethanol extract illustrated inhibition zone against *S. aureus* (20.63 mm), *P. aeruginosa* (20.50 mm), *K. pneumoniae* (19.26 mm), and among the fungal strains against *M. gypseum* (20.37 mm) and *C. albicans* (18.13 mm).

### Antinociceptive effects [9]

Thereby, flavonoids and alkaloids are possible candidates for the antinociceptive agent. In this entire experimental observation convinced us to assume that the antinociceptive effects of methanolic extracts of *Dioscorea pentaphylla* (MEDP) due to its high flavonoid contents. Additionally, flavonoids able to inhibit eicosanoid biosynthesis (such as prostaglandins) which has the involvements in various immunological responses and the end product of cyclooxygenase (COX) and lipoxygenase (LOX) pathway. Hence, the COX inhibitory of EETP may reduce the production of the chemical compounds (phospholipids) which is responsible for the prostaglandins synthesis and ultimately relieve the pain sensation.

### Conclusion

This survey of writing features one of the significance of certain plants of variety *DIOSCOREA* having a place with the family *Dioscoreaceae*. The most common *Dioscorea* species are *D. bulbifera* L. (Pita aalu), *D. pentaphylla* L. (Panja Sanga), *D. hispida* Dennst. (Banya aalu), *D. alata* L. (Khamba aalu), *D. oppositifolia* L. (Paani aalu), *D. pubera* Blume (Kukai Sanga) etc. A few reports

alluding to their utilization in ailments like antigenotoxic potential, antibacterial activity, antioxidant, Antinociceptive, and antifungal activity. It contain a chemical constituents like alkaloids, saponin, flavonoids, tannins and phenols. An activity is important to efficiently assess these plants for unexplored exercises and phytoconstituents, so they can be industrially misused.

### Author Contribution

All authors Contributed equally.

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