

DIPLOCYCLOS PALMATUS: A PHYTOPHARMACOLOGICAL REVIEW

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ABSTRACT

Herbal medicines are in great demand in the developed as well as developing countries for primary healthcare because of their wide biological and medicinal activities, higher safety margins and lesser costs. Shivalingi (*Diplocyclos palmatus* Linn.) is a lesser heard medicinal plant of Ayurveda with the fruits having important use in the area of reproductive medicine (female infertility, aphrodisiac, tonic, leucorrhoea). The plant especially the fruits have immense folklore usage even today. It has been described in Ayurvedic classical texts like *Rajanighantu* and *Nighantu ratnakara*. So far no study reports are available on chemical analysis on the dried fruits of *shivalingi*. Hence, the present attempt was undertaken with an objective to investigate the Phytochemical and Pharmacotherapeutics studies. The results of the analyses showed the presence of organic constituents like alkaloids, triterpenoids, flavonoids, saponins, steroids and proteins in the dried fruit. This provides impetus to conduct advanced research on this fruit to uncover its vast medicinal potential.

Keywords: *Diplocyclos palmatus*, Phytochemistry, Pharmacotherapeutics.

INTRODUCTION

The medicinal plants are widely used by the traditional medicinal practitioners for curing various diseases in their day to day practice. In traditional system of medicine, different parts (Leaves, stem, flower, seeds and even whole plant) of *Diplocyclos palmatus* (figure 1) have been used to treat various diseases. It has considerable reputation as a potent adjunct in the treatment of various ailments such as jaundice, inflammation and fever. Shivalingi (*Diplocyclos palmatus* Linn.) is a lesser heard medicinal plant of Ayurveda with the fruits having important use in the area of reproductive medicine (female infertility, aphrodisiac, tonic, leucorrhoea etc.).¹ The plant especially the fruits have immense folklore usage even today. It has been described in Ayurvedic classical texts like *Rajanighantu* and *Nighantu ratnakara*. So far no study reports are available on chemical analysis on the dried fruits of *shivalingi*. Advanced research on this fruit to uncover its vast medicinal potential. Lollipop Climber is a

perennial climber with hairless stem, becoming thickened and white dotted on the ridges when older. Leaves are broadly ovate, 3.5-14 x 4-14.5 cm, palmately lobed. Lobes are linear-lance shaped to elliptic, hairless. Leaf stalk 1.5-9.0 cm long. Flowers are small, white or yellowish, male in stalkless clusters of 2-8, along with 5 female flowers in the same axil. Sepal cup is 3-4 mm long in male, 1.5-2.5 mm long in female, sepals smaller than tube. Flower of male larger than female. Fruit is solitary, or in clusters of 2-5. It is ovoid-round, 1.5-2.5 cm. When ripe, it is red with longitudinal white stripes, and reminds one of lollipop, hence the common name. It is found including the Himalayas, at altitudes of 200-1500 m. flowering: August-October. The small flowers of Lingini or Shivalingi are of greenish-yellow in colour. The female flowers of the plant are borne in fascicles and the male ones are solitary. The plant's corolla is about 3-4 mm, with ovate-oblong, acute, pubescent lobes. The fruit or berry of the plant is rounded, with a diameter of 2-3 cm and the bluish-green

coloured fruit has eight vertical white streaks. They ripe red and bear a few brown, obovate seeds. The compressed seeds have a length of 4 mm and width of 3 mm and they are usually encircled by a prominent raised band. The plant generally flowers between the months of August and September and fruits in September and October in central India. Lingini or Shivalingi is commonly found throughout India and it is most common and typically found in village hedges.^{15, 16, 17}

PHYTOCHEMISTRY

Phytochemical studies of *Diplocyclos palmatus* shows the presence of alkaloids, flavonoids, triterpenoids saponins, steroids and proteins, resins with, Sugars, starch. The seeds have been reported to contain 12% oil, protein also contains goniotalamin, bryonin, punicicacid and lipids.^{8, 9}

PHARMACOLOGY

Gynaecological activity

Seed of Shivlingi, Sonth, Kalimirch, Putrajivi and Root bark of Vat is made in powder. 2-5 gms. Powder is taken with water or milk at night once daily for 21 days, after completion or beginning of menstrual cycle.^{2, 3}

Antiasthmatic activity

The antiasthmatic activity of 70% alcoholic extract of *Diplocyclos palmatus* was done by mesenteric mast cell count by Atopic allergy method in rats. The number of intact and disrupted mast cells, in ten randomly selected fields for each tissue was counted. Three slides per each animal were studied.⁴

Analgesic Activity

The analgesic activity of the 70% alcoholic extract of dried aerial parts of the plant *Diplocyclos palmatus* was carried out in mice using Eddy's hot plate analgesio meter. After administration of test and standard drug, the test for analgesia was carried out by placing the mice on electrically heated plate at 55degreeC +/- 0.5 degree C and noting the signs of discomfort, i.e., it may lick its fore paws or jump out of the plate. The time was noted in seconds. Test was carried out similarly for animals of control group. The observations were made at 30' and 60' It was found that *Diplocyclos palmatus* showed fairly good analgesic activity at 30 and 60 minutes when compared with standard drug.⁴

Anticonvulsant Activity

For inducing convulsion by electro shock, a rectangular pulse current of high voltage (150 mA) is employed. The electro shock was given

to each rat for 0.2 seconds with the help of convulsion meter through pinna electrodes. Drugs likely to be effective in Grandmal epilepsy usually confer protection against electrically induced convulsion in animals. Group I received carbamazepine (40mg/kg body weight) and Group II received 0.2ml of 1% Tween 80 solution and served as standard and control respectively. Similarly Group III received 500mg/kg body weight of 70% alcoholic extract of *Diplocyclos palmatus*. The electro shock was given to each rat for 0.2 seconds with the help of convulsion meter through pinna electrode and the effects were observed.⁴

Antimicrobial activity

Ethanol extracts of different parts of *Diplocyclos palmatus* through well diffusion method. There fine responses of the organisms to the leaf and stem extracts compared with standard antibiotics, while organisms did not show any susceptibilities to fruit and seed extracts. *S. aureus*, *M. luteus*, *B. cereus* and *P. aeruginosa* were susceptible to leaf and stem extract at all concentrations except *P. aeruginosa* for 10 mg/ml. *E. coli* and *S. typhimurium* were resistant to all extracts. Judging by the diameter of the zone of inhibition *B. cereus* and *S. aureus* were identified as the most susceptible organisms the stem and leaf extracts of *Diplocyclos palmatus*. In general antibacterial activity increases with increase in concentration of extract as evident by the zone of inhibition.⁶⁻⁸

Antivenom and Antidote activity

50g of leaves ground to paste. 1-2 spoonfuls of paste are administered with betel leaves immediately after bite. It is given thrice a day until the patient gets relief. Avoid sleep and head bath till the patient gets relieved from bite.¹⁰

Anti-inflammatory Activity

The dried powdered plant material was extracted with chloroform in a Soxhlet extraction apparatus. The solvent was removed under reduced pressure and semi-solid mass was obtained (yield 14.25%). The extract showed positive test for steroids, triterpenoids and lipids. The extract at the different doses of 50, 100 and 200 mg/kg was suspended in aqueous Tween 80 solution (2%) and indomethacin (10 mg/kg) in saline used for the present study.^{9, 10, 12}

Classical uses

Lingini or Shivalingi has a number of useful medicinal properties and usages. It is

considered bitter, aperient and tonic and it is commonly used for relieving bilious attack. The leaves of the plant are applied topically for getting relief from inflammations. The Indian women sometimes take the seeds in combination with other plant drugs for helping conception and prevent miscarriage. The practitioners of Ayurvedic medicine use the plant's fruit as an aphrodisiac and tonic, while in Siddha; the entire plant is used for getting relief from constipation. Seeds are use in sterility due to blocked tubes in women Snake bite Root Fever Stomach ache External abscess Fruits are used for Diarrhoea.^{14, 17}



Fig. 1: *Diplocyclos palmatus* leaves

REFERENCES

1. Abraham Z (1981). "Glimpses of Indian Ethnobotany": Oxford and Publishing Co., New Delhi: pp. 308-320.
2. Khan AV, Khan AA (2006). "Ethnomedicinal uses of *Achyranthes asperal*. (Amaranthaceae) in management of Gynecological Disorders in Western Uttar Pradesh (India)". *The Journal of Reproductive and Fertility*, 43(1): 127-129.
3. Khanna KK, Kumar A, Jha AK (2005). "Floristic Diversity of Chhattisgarh (Angiosperms)". Bishen Singh Mahendra Pal Singh, 23- A, New Connaught Place, Dehraun.
4. *International Journal of Drug Discovery*, ISSN: 0975-4423, Volume 2, Issue 2, 2010.
5. Ahmad I, Mehmood Z, Mohammad F (1998). Screening of some Indian medicinal plants for their antimicrobial properties. *J. Ethnopharmacol.* 62: 183-193.
6. Clark A M, Hufford CD (1993). Discco and development of novel prototype antibiotics for opportunistic infections related to the acquired immunodeficiency syndrome. In *Human Medical Agents from Plants*, American Chemical Society (ACS Symposium series 534), Washington, D.C. (no. 534) pp. 228-241
7. Cohen ML (1992). Epidemiology of drug resistance: implications for a post-antimicrobialera. *Sci.* 257: 1050-1055. Cowan MM (1999). *Plant Products as Antimicrobial Agents*. *Clin. Microbiol. Rev.* 12: 564 -582.
8. De Paiva SR, Figueiredo MR, Aragao TV, Kaplan MA (2003). Antimicrobial activity in vitro of plumbagin isolated from *Plumbago* species. *Mem. Inst. Oswaldo. Cruz.* 98: 959-61.
9. Gupta M, Sivakumar T, Mazumdar UK, Vamsi ML, Karki SS, Sambathkumar R, Manikandan L (2003). Evaluation of antiinflammatory
10. Activity of chloroform extract of *Bryonia laciniosa* in experimental animal models. *Biol. Pharm. Bull.* 26(9): 1342-1344
11. Kirtikar K. R., Basu B. D., "Indian Medicinal Plants," 2nd ed., ed. By Basu L. M., The Indian Press, Allahabad, 1988, pp. 1158—1159
12. Mosaddik M. A., Haque M. E., *Pharm. Phramacol. Commun.*, 56, 411—413 (1999).
13. Mosaddik M. A., Haque M. E., Rashid M. A., *Biochem. Syst. Ecol.*, 28, 1039—1040 (2000).
14. Anonymous (1948-76): *The Wealth of India (Raw Materials)*. Vol. 1-11. CSIR, New Delhi, India.
15. Bharath Kumar, R. (2000): *Ethnobotanical Studies of Sriharikota Island, Andhra Pradesh*. Ph.D. Thesis. S.V.University, Tirupati.
16. http://database.prota.org/PROTAhtml/Diplocyclos%20palmatus_En.html. Accessed 22 June 2011
17. Germplasm Resources Information Network. *Diplocyclos palmatus* (L.) C. Jeffrey. Available on line Accessed 22 June 2011
18. Invasive species in South Africa. 2010. Available on line: