



A REVIEW ON PHARMACOLOGICAL ACTIVITIES OF THE GENUS *PYRENACANTHA*

***Vimalavathini R. and Anjali P.**

Department of Pharmacology, College of Pharmacy, MTPG & RIHS, Pondicherry
605006, India.

Article Received on
31 March 2020,

Revised on 21 April 2020,
Accepted on 12 May 2020

DOI: 10.20959/wjpps20206-16176

***Corresponding Author**

Dr. Vimalavathini R.

Department of
Pharmacology, College of
Pharmacy, MTPG and
RIHS, Pondicherry 605006,
India.

ABSTRACT

Genus *Pyrenacantha* is a member of Icacinaceae. It contains about 30 species and it is abundantly distributed in Africa and extends to Madagascar, India and Philippines. It mainly comprises dioecious or monoecious lianas and scandent shrubs. This review focuses on the pharmacological activities of species of *Pyrenacantha* such as *Pyrenacantha staudtii*, *Pyrenacantha volubilis*, *Pyrenacantha kaurabassana*, *Pyrenacantha grandiflora*.

KEYWORDS: Screening, *Pyrenacantha*, activity.

INTRODUCTION

Genus *Pyrenacantha* belongs to large heterogeneous family “Icacinaceae”. It contains many succulent species. It has the ability to produce caudex along with vining top growths. Fruits of *Pyrenacantha* are drupes, compressed and marginated, elliptic-oblong in shape, green when young, orange or red in matured stage and turns to cream when ripened. ^[1] This review (Table 1) is on the insight of the pharmacological activities of the genus *Pyrenacantha*.

Table 1: List of species of genus *Pyrenacantha* along with their pharmacological activities.

Sl no	Parts used	Pharmacological activity	Screening method
<i>Pyrenacantha staudtii</i>			
1	Leaves	i. Analgesic activity ii. Anticonvulsant activity iii. Hypnotic activity	i. Acetic acid induced writhing in mice ii. Picrotoxin, strychnine induced convulsions in mice iii. Hexabarbitone induced sleep in mice. ^[2]
2	Leaves	Anti-ulcer activity	Aspirin, indomethacin, serotonin and reserpine induced gastric ulcers in albino rats. ^[3]
3	Leaves	Anti-inflammatory activity	Egg albumin and agar induced paw oedema in albino rats, adjuvant induced arthritis in rats and cotton pellet granuloma test in rats. ^[4]
4	Leaves	Anti-diarrheal activity	i. Castor oil-induced diarrhea in rats ii. Castor oil-induced enteropooling, intestinal transit and intestinal fluid in rats iii. Castor oil-induced enteropooling and intestinal transit and intestinal fluid in mice iv. Gastrointestinal motility activity in mice. ^[5]
5	Roots and leaves	Growth inhibitory and cytotoxic activity	i. Growth inhibitory activity using <i>Ranicep ranninus</i> and <i>Sorghum bicolor</i> seeds ii. Cytotoxic activity using tadpoles. ^[6]
6	3-carbomethoxypyridine isolated from leaves	Smooth muscle relaxant activity	Effect of 3- carbomethoxypyridine on oxytocin induced contractions of female Wistar rat uterus. ^[7]
7	Leaves	Antimalarial activity	In-vitro effect using cultures of chloroquine-sensitive <i>Plasmodium falciparum</i> in human erythrocytes and in-vivo effect against ANKA strains <i>Plasmodium berghei</i> infections in mice. ^[8]
8	Leaves	Insecticidal activity	Essential oil from the leaves was determined against <i>Rhyzopertha dominica</i> and <i>Tribolium castaneum</i> . ^[9]
9	Leaves	Hepatoprotective activity	Carbon tetra chloride induced hepatotoxicity in male Wistar rats. ^[10]
10	Leaves	Xanthine oxidase inhibitory effect	Invitro xanthine oxidase inhibitory activity of compounds such as kaempferol 3-O-beta-rhamnopyranosyl (1-->6)-beta-D-glucopyranoside and 4-beta-glucopyranosyl-(2-furyl)-5-methy-1, 2-glucoopyranoside phenylmethanone. ^[11]
<i>Pyrenacantha volubilis</i>			
1	Seeds	Anticancer activity	Cytotoxic activity against Breast cancer cell lines MCF-7, colon cancer cell lines 198

			HCT116, carcinoma cell lines HeLa and the ovarian cancer cell lines NCI/ADR-RES. ^[12]
2	Crude bacterial cultures from various parts of plant	Anticancer activity	Cytotoxic activity against colon cancer cell line, HCT-116. ^[13]
<i>Pyrenacantha kaurabassana</i>			
1	Tubers	Anti-HIV activity	deCIPhR assay on HIV virus type NL4-3. ^[14]
2	Tubers	Antibacterial activity	Antibacterial activity against three different strains of <i>Staphylococcus aureus</i> and <i>Helicobacter pylori</i> . ^[15]
<i>Pyrenacantha grandiflora</i>			
1	Tubers	Antimicrobial activity	Hole plate assay, Microdilution assay, Growth inhibition assay. ^[16]

REFERENCES

- Potgieter MJ, Van wyk AE. Fruit structure of the genus *Pyrenacantha* Hook. (Icacinaceae). Bot. Bull. Acad. Sin, 1994; 35: 105-13.
- Awe EO, Makinde JM, Olajide OA, Wahkeel OK, Adeloye AO. Evaluation of analgesic, anticonvulsant and hypnotic activities of *Pyrenacantha staudtii*. Afr. J. Trad. CAM, 2005; 2(2): 122 -8.
- Aguwa CN, Mittal GC. Study of antiulcer activity of aqueous extract of leaves of *Pyrenacantha staudtii* (family Icacinaceae) using various models of experimental gastric ulcer in rats. Eur. J. Pharmacol, 1981; 74: 215-9.
- Awe EO, Makinde JM, Wahkeel OK, Kolawole SO. Anti-inflammatory effects of *Pyrenacantha Staudtii* Engl. (Icacinaceae) aqueous leaf extract in rodents. TAF Prev Med Bull, 2010; 9(4): 297-302.
- Awe EO, Kolawole SO, Wahkeel OK, Abiodun OO. Antidiarrheal activity of *Pyrenacantha staudtii* Engl. (Icacinaceae) aqueous leaf extract in rodents. J. Ethnopharmacol, 2011; 137: 148–53.
- Josephine OO, Maria IM. Cytotoxic and growth inhibitory activity of aqueous extracts of root and leaf of *Rhaphiostylis beninensis* Planch ex Benth and *Pyrenacantha staudtii* Engl (Icacinaceae). J. Pharmacy & Bioresources, 2014; 11(1): 8-14.
- Falodun A, Usifoh CO, Nworgu ZAM. Smooth muscle relaxant activity of 3-carbomethoxypyridine from *Pyrenacantha staudtii* leaf on isolated rat uterus. Afr. J. Biotechnol., 2006; 5(12): 1271-3.
- Mesia GK, Tona GL, Penge O, Lusakibanza M, Nanga TM, Cimanga RK et al. Antimalarial activities and toxicities of three plants used as traditional remedies for

- malaria in the Democratic Republic of Congo: *Croton mubango*, *Nauclea pobeguinii* and *Pyrenacantha staudtii*. *Ann Trop Med Parasitol*, 2005; 4: 345-57.
9. Falodun A, Siraj R, Choudhary MI. GC-MS Analysis of Insecticidal Leaf Essential Oil of *Pyrenacantha Staudtii* Hutch and Dalz (Icacinaceae). *Trop J Pharm Res*, April, 2009; 8(2): 139- 43.
 10. Anosike CA, Uchenna B, Ogechi N. Effect of ethanol extract of *Pyrenacantha staudtii* leaves on carbon tetra chloride induced hepatotoxicity in rats. *BIOKEMISTRI*, 2008; 20(1): 17-22.
 11. Falodun A, Qadir MI, Chouldary MI. Isolation and characterization of xanthine oxidase inhibitory constituents of *Pyrenacantha staudtii*. *Acta Pharmaceutica Sinica*, 2009; 44(4): 390-4.
 12. Suma HK, Kumar V, Senthilkumar U, Kumara PM, Ravikanth G, Santhoshkumar TR, Uma Shaanker R. *Pyrenacantha volubilis* Wight, (Icacinaceae) a rich source of camptothecine 2 and its derivatives, from the Coromandel Coast forests of India. *Fitoterapia*, 2014; 97: 105-10.
 13. Soujanya KN , Siva R, Mohana Kumara P, Srimany A ,Ravikanth G , Mulani FA. Camptothecin-producing endophytic bacteria from *Pyrenacantha volubilis* Hook. (Icacinaceae): A possible role of a plasmid in the production of camptothecin. *Phytomedicine*, 2017; 160-7.
 14. Omolo JJ, Maharaj V, Naidoo D, Klimkait T, Malebo HM, Mtullu S et al. Bioassay-guided investigation of the Tanzanian plant *Pyrenacantha kaurabassana* for potential anti-HIV-active compounds. *J Nat Prod.*, 2012; 75(10): 1712-6.
 15. Boudesocque-Delaye L, Agostinho D, Bodet C, Thery-Kone I, Allouchi H, Gueiffier A, et al. Antibacterial Polyketide Heterodimers from *Pyrenacantha kaurabassana* Tubers. *J Nat Prod.*, 2015; 78(4): 597-603.
 16. Samie A, Murei A, Ramalivhana JN. Evaluation of antimicrobial activities of extract from *Pyrenacantha grandiflora* Baill. (Icacinaceae). *Pak. J. Biol. Sci.*, 2017; 20(10): 498-506.