



International Journal of Allied Medical Sciences and Clinical Research (IJAMSCR)

ISSN:2347-6567

IJAMSCR | Volume 6 | Issue 3 |
www.ijamscr.com

Review article

Medical research

A review on therapeutic uses of *pedalium murex*

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ABSTRACT

Pedalium murex is the most useful traditional medicinal plants in India. It is a small herb distributed in India, useful in development in new formulation and activities of some of this compound isolated, pharmacological studies of the extracts along with their safety and standard evaluation. The plant used by the local people as analgesic and antipyretic activities. The traditional uses of this whole plant different parts treated in urinary problems. Fruits used to reproductive disorder and enhance fertility activity and diabetics. Leaf decoction is used to diabetes. The phytochemical reported in this plant included quercetin, ursolic acid, amino acid and various fatty acids.

Keywords: *Pedalium Murex*, Phytochemical studies, Pharmacological activities.

INTRODUCTION

Pedalium murex (*P. murex*) Linn (Family: Pedaliaceae) is annual herb, which grows abundantly on the sea coasts in South India. In and around Visakhapatnam the plant is very prolific after summer rains. Name in different language: English- *Pedalium murex*, Tamil- Bora gokhru, Hindi -Bara gokhru, Malayalam- Kattunjerinji, Sanskrit- Stoolagokshura, Gujarati- Kadvagokhru, Oriya- Gokhar.

It is used for the treatment of cough, Antiseptic, Treats reproductive disorders, Gonorrhoea, Leucorrhoea, Gastro intestine disorders. The decoction is useful in irritation of the urinary organs. It grows luxuriously in fertile soils and crop land as a weed at temperatures of 25–30 degrees. The plant has medicinal attributes [1]. Two new compounds are isolated from the fruits (Heptatriacontan-4-one, tetratriacontanyloctacosanoate [2]. The decoction

of root is used as antibilary. These studies revealed that *P. murex* is a source of medicinally active compounds and have various pharmacological effects, hence, the plant encourage finding its new therapeutic uses. This plant can be explored as biopesticidal plant in the near future and potent fertility enhancing drug [3].

A glabrous annual herb with rather foetid smelling slime secreting glands occurring as a weed of waste places. It is glabrous, leaves simple, dark glands at the base, flowers yellow, solitary, axillary, 2.5 – 3 cm long, pedicel short, calyx 5 – partite, corolla – gamopetalous, lobes 5, round, spreading, stamens 4, didynamous, ovules 5 celled, style – stigma 2 lobed. Pod – obtuse, 4 angled at base, spinous, seeds oblong black. Fruits indehiscent hard drupe, pyramidal, ovoid, bluntly 4 – angled with 4- sharp spreading spines, Glabrescent hairs are present in the throat of corolla tube. Lying at each right angle at the base, abruptly narrowing into hollow tube like extension

attached with rim of calyx and short curved pedicel, sharp mucronate apex, measuring 1.5. to 2.cm in length and about 05 to 1 cm in diameter. Colour yellow.

According to Ayurveda, *Pedaliium murex* is cooling tonic, aphrodisiac, improves appetite and urinary discharges, vesicular calculi, cough, asthma, pain, cures skin diseases and heart troubles, piles, leprosy. It purifies blood, diuretic, removes stone in the bladder. According to Unani system of medicine, it is diuretic, cures strangury, gleet, gonorrhoea, lumbago, tonic, enriches blood, increases mensural flow, good gargles for mouth troubles and painful gums, stomachic, appetizer., 2,4,5-trihydroxy 5,7-dimethoxy flavones and triacotanyldotriacontanoate were isolated from the fruits. It is also used in the treatment of urinogenital disorders [4].

Phytochemical studies

Fruits of *Pedaliium murex* and other constituents such as sitosterol, ursolic acid, dinatin, pedalitin, luteolin, 2',4', 5'-trihydroxy-5,7-dimethoxyflavone, caffeic acid, protocatechuic acid, o,p-coumaric acids, ferulic acid, arginine, glycine, histidine, tyrosine, threonine, aspartic acid, glutamic acid. Other compounds such as Heptatriacontan-4-one, tetratriacontanyl octacosanoate, vanillin, pentatriacontane, hexatriacontanoic acid, hentriacontanoic acid, triacontanyl dotriacontanoate, rubusic acid, nonacosane, tritriacontane, triacontanoic acid, tritriacontanoic acid, and sitosterol-D-glucoside were also present in the fruits of *Pedaliium murex*. Steroids, alkaloids, reducing sugar, phenolic compounds, saponins, zanthoproteins, tannins and flavonoids were tested using HPLC methods. Flavonoid compounds exhibit inhibitory effects against multiple viruses. Numerous studies have documented the effectiveness of flavonoids such as swertifrancheside [4].

PHARMACOLOGICAL STUDIES

Antioxidant Activity

The *in vitro* antioxidant activity of *P. murex* reported was for DPPH activity and nitric oxide, hydrogen peroxide superoxide scavenging activity *in vivo* activity is using carbontetra chloride

induced hepatotoxic model in rats at 70mg/kg body wt implying their important to human health. [14].

Comparitive studies of different fraction antioxidant activity

The ethyl acetate (EA) fraction was found to have high levels of phenolic content [(295.75±1.31) mg GAE/g]. This fraction exhibited higher total antioxidant capacity, higher percentage of DPPH radical scavenging activity [(135.11±2.95) µg/mL], nitric oxide [(200.57±4.51) µg/mL], hydrogen peroxide [(217.91±6.12) µg/mL], deoxyribose [(250.01±4.68) µg/mL] and highly reduced activity. Correlation coefficient ($r^2=0.914$) was found to be significant between total phenolic content and total antioxidant activity. The results indicate that the ethyl acetate fractions are rich in phenolic antioxidants with potent free radical scavenging activity implying their importance to human health [13].

Anti-hyperlipidemic activity

The anti hyperlipidemic potential of the methanolic extract from the fruits of *P. murex* at dose level of 200 and 400 mg/kg, in HFD rats. Biochemical studies determined serum Low density lipoproteins, very low density lipoproteins, total cholesterol, high density lipoproteins, and triglycerides levels were noted and compared with animals activities treated with standards atorvastatin. The methanolic extract of this plant produced significant increase in HDL ($P < 0.05$) levels at tested doses significant decrease in triglycerides ($P < 0.01$), LDL ($P < 0.001$), VLDL ($P < 0.01$), cholesterol ($P < 0.001$) [6].

Insecticidal and anti-feedent effect activity:

Impact of ethanol extract of *P. murex* root (0.1%, 0.2%, 0.4% and 0.8%) were screened for its anti-feedent and insecticidal activities against third, fourth and fifth instar larvae of *Spodopteralitura* (*S. litura*) (Fab.) by leaf-dip method. The larval mortality more than 50 percent at higher concentration (0.8%) was observed in the ethanol root extract. Stage dependant LC₅₀ value was observed for *S. litura* (0.100%, 0.118% and 0.258% for third, fourth and fifth nymphal instars). *P. murex* impact was stronger than the neem based biopesticidal of neem gold. Hence this plant can be explored as biopesticidal plant in the near future [7].

Anti-nephrolithiatic activity

P. murex (Linn), useful in urinary diseases conditions is distributed in the coastal areas of south India. The work was to study the anti nephrolithiatic activity of various extracts of *P. murex*. Petroleum ether, chloroform, ethanol and aqueous extracts of the plant were prepared and evaluated for anti nephrolithiasis activity. rats were treated with the prepared extracts. This plant reported to significantly reduced anti nephrolithiatic activity [8].

Nephroprotective activity

The ethanolic extract of fruits of *P. murex* was evaluated for nephroprotective activity in cisplatin induced renal damage in rats. Administration plant ethanolic extract at a dose of 200 mg/kg given by oral route was determined using creatinine and blood urea and change in body weight as indicators of kidney damage. Cystone is standard. This extract is significantly reduced the cisplatin induced nephrotoxicity. [9].

Antiulcer activity:

Peptic ulcer is largely due to an alteration in lifestyle and diet. The antiulcer activity of the aqueous extract of leaves of *P. murex* on ethanol induced gastric lesions was investigated in our studies. Aqueous extract of leaves extract induced gastric juice at a dose. 200 mg/kg was given to different groups, one hour before the administration of ethanol. Marked gastric mucosal lesions were observed with ethanol. Ulcer index, total acidity, acid volume, total protein and diminution of glutathione was noted. Pretreatment with extract of leaves particularly at a dose of 200 mg/kg in a single and 100 mg/kg for 15 and 30 days treatment and increased the level of glutathione. Therefore the extract of leaves of could be regarded as a favorable anti-ulcer could be attributed to its content of flavonoids and mucilage [10].

Anti-inflammatory activity

The various parts of *Abutilon indicum* and *P. murex* such as root, leaves and seeds are documented to possess various medicinal properties. Animal studies were performed using carragenan induced paw oedema model used wistar rats. The results shoes the methanolic extract is produced higher anti-inflammatory activity at a dose of 400 mg/kg body

Antibacterial activity

Methanolic extract of leaf and fruit was used against 12 different pathogenic microorganisms for their antibacterial activity. The maximum antibacterial activity was noted against gram positive bacteria than gram negative bacteria. Positive control (streptomycin) showed antibacterial activity and there was no inhibition with negative control. More antibacterial activity was observed in methanolic extract against gram positive bacteria *Streptococcus progeny* and *Enterococcus faecalis* than the gram negative bacteria [15-16].

Hepatoprotective activity

Aqueous and alcoholic extract of fruits of *P. murex* did not show any mortality up to 2000 mg/kg. Significant reduced hepatoprotective activity at 400 mg/kg dose of was observed in alcohol and isoniazide induced liver damage. All the elevated liver biochemical parameters (SGPT, SGOT, TB, TG and TC) in alcohol and isoniazide intoxicated rats decreased significantly near by to normal level by extract of fruits of *P. murex*. Photomicrograph of liver sections also has shown hepatoprotective activity. Flavonoids and tannins present in aqueous alcoholic extract may be responsible for hepatoprotective action by scavenging free radicals [17-20].

Aphrodisiac activity and curative effects

Chronic ethanol exposure may result in testicular damage and infertility in males. Petroleum ether extract of *P. murex* (PEPM) is evaluated in this study for its ability to increase aphrodisiac activity to ethanol induced germ cell damage and infertility in rat models. The effect on fertility factors such as total body weight, percentage of pregnancy, litter size were also significantly increased ($P < 0.01$) in comparison with the ethanol-treated group. Increases in sperm motility and count were observed in PEPM treated groups in a dose-dependent manner ($P < 0.01$; $P < 0.001$) as compared with the plant -treated group [21].

Protective effect of prostane in experimental prostatic hyperplasia in rats

P. murex is a one of the component in prostane, a herbal formulation, and was studied for its efficacy on 5α -reductase inhibition, α -adrenergic

antagonistic activity and testosterone-induced prostatic hyperplasia by 5 α -reductase inhibition, which was evaluated using rat prostate homogenate as an enzyme source. Adrenergic antagonistic activity was evaluated using isolated rat vas deferens. Experimental prostatic hyperplasia was induced in rats by giving testosterone 3 mg/kg s.c. for 21 days. The prostate dose-dependently inhibited 5 α -reductase activity and exhibited α -adrenergic antagonistic activity. The treatment with prostate at 250, 500 and 750 mg/kg body weight, p.o. for 21 days significantly reduced the prostatic weight, the epithelial height and the stromal proliferation in experimental prostatic hypertrophy [22].

Other Applications

Plant drugs and excipients have used importance high synthetic materials because they are nontoxic, low expensive and freely available. The purpose of this study is to search for a cheap and effective natural excipient that can be used as

an effective alternative for the formulation of pharmaceutical suspensions. used as a suspending agent. They have low rate of sedimentation, high viscosity, slightly basic pH and are easily redispersible anti diabetic activity. The plant used by the local people as analgesic and antipyretic activities .the traditional uses of this whole plant different parts treated in urinary problems .fruits used to reproductive disorder and enhance fertility activity and diabetics.leaf decoction is used to diabetes.

The alcoholic extract of the fruits of *Pedaliium murex* reduced blood pressure in dog and rat, which was blocked by atropine sulphate. It also caused contraction of the smooth muscle of guinea ileum and rabbit intestine. The decoction of the fruits showed diuretic activity in rats. The alcoholic extract showed abortifacient activity in rats IN alloxin induced diabetics. Oral administration of ethanolic extract at a dose 100 to 200 mg/kg body wt reduced in glucose level and increase in plasma insulin standard drug is glibenclamide [23].

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How to cite this article: G.Alagumanivasagam. A review on therapeutic uses of pedalium murex. Int J of Allied Med Sci and Clin Res 2018; 6(3): 621-625.

Source of Support: Nil. **Conflict of Interest:** None declared.