

Short Communication

Phytochemical Screening and Antibacterial efficacy of *Artabotrys hexapetalus*

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Medicinal plants constitute an effective source of both traditional and modern medicine. These plants have been shown to have genuine utility and about 80% of the rural population depends on them as primary health care. Therapeutic properties of many herbs were reported in Rig-Veda and the herbal medicine has been receiving a high lightened interest in the entire health care horizon. *Artabotrys hexapetalus* belonging to family Annonaceae is widely distributed in the southern part of China, and is used in traditional Chinese medicine for the treatment of malaria and scrofula. The present study was aimed at qualitative analysis of phytochemicals and Antibacterial efficacy of Acetone and Ethanol extract of leaves of *Artabotrys hexapetalus*. The study revealed the presence of secondary metabolites such as alkaloids, Flavonoids, sterols, tannin and terpenoids. The antibacterial efficacy of ethanol extract had outperformed the action against *E. coli*, *Bacillus subtilis* and *Salmonella typhi*. In case of acetone extract, the highest zone of inhibition was observed against *Staphylococcus aureus*.

Key words: Antibacterial, Health care, Rig-Veda and Secondary metabolites etc,

The medicinal plants are important substances for the study of their traditional uses through the verification of pharmacological effects and can be natural composite sources that act as new anti-infectious agents (Ushimaru *et al.*, 2007). The Phytochemical substances synthesized by plants as secondary metabolites serve as the molecules of plant defense against predation by microorganisms, insects and herbivores. Furthermore, some of which involve in plant odor, pigmentation and flavor. However, several of these molecules possess medicinal Properties (Syed *et al.*, 2011). There has been an increasing incidence of multiple resistances in human pathogenic microorganisms in recent years, largely due to

indiscriminate use of commercial antimicrobial drugs commonly employed in the treatment of infectious diseases. This has forced scientist to search for new antimicrobial substances from various sources like the medicinal plants (Iwu *et al.*, 1999). *Artabotrys hexapetalus* [(L.f.) Bhandari] (Annonaceae) is widely distributed in the southern part of China and is used in traditional Chinese medicine for the treatment of malaria (Li *et al.*, 1997), scrofula (Li and Yu, 1998) and anti-implantation/anti-fertility activity (Johri *et al.*, 2009). This species is globally distributed in India, Sri lanka, Java and south china. Within India, it is indigenous to south India and very commonly cultivated in gardens throughout

the country for its very fragrant flowers. The fruit and bark of madana is used to treat fever, diarrhoea, dysentery, bruises, cuts, pains, sprain, inflammation, gout, helminthiasis, leprosy, skindisease, wound, ulcers, tumours, amenorrhoea, dysmenorrhoea, cough, asthma, bronchitis, flatulence, colic and constipations. In the current study, the phytochemical screening and antibacterial efficacy was performed using Acetone and Ethanol extract of *Artabotrys hexapetalus*.

MATERIALS AND METHODS

Selection and screening of plants

The leaves of *Artabotrys hexapetalus* (Figure 1) was collected in and around Erode District, Tamil Nadu. The plant materials were taxonomically identified and authenticated by the Botanical survey of India. The voucher specimen was deposited there for future reference and registered with no: BSI/SRC/5/23/2013-14/Tech.



Figure 1. Image of *Artabotrys hexapetalus*

Preparation of extract

The powdered leaves of *Artabotrys hexapetalus* were extracted with acetone and ethanol respectively by maceration method (Pandey and Tripathi, 2014).

Phytochemical analysis:

Phytochemical screening was carried out by the method described by Odebody and Sofowara, (1978).

Alkaloids

Plant extract were added with 2ml of HCl followed by few drops of amyl alcohol and mixed well to observe the reddish brown precipitate.

Flavonoids

Formation of yellow coloration which disappears on standing, when 5ml of dilute ammonia solution and concentrated sulphuric acid were added sequentially to portion of the extract confirms the presence of flavonoids.

Saponins

1 ml of extract was diluted with 10ml of distilled water to observe the foam formation (frothing test).

Sterols

The presence of sterol was confirmed by colour change from violet to blue on addition of 2ml acetic anhydride and 2ml sulphuric acid to 0.5g plant extract.

Tannins

1 ml of plant extract was treated with few drops of 5% ferric chloride and the formation of brownish green coloration was observed.

Terpenoids

1 ml of plant extract was mixed with 3ml of chloroform and few drops of sulphuric acid to observe reddish brown coloration.

Antimicrobial activity

The extracts of acetone and ethanol were dissolved in an adequate amount of dimethyl sulfoxide respectively. Mueller Hinton agar plates were prepared followed by swabbing of microbial cultures such as *E. coli*, *Bacillus subtilis*, *Staphylococcus aureus* and *Salmonella typhi* obtained from MTCC, Chandigarh. Well was prepared followed with 50ul, 100ul and 150ul of extracts were added to distinct well with DMSO as control

and incubated the plates at 37° C for 24 hours to observe the zone of inhibition.

RESULTS

Phytochemical Screening

The phytochemical analysis for acetone and ethanol extract had shown for the presence of some bioactive compounds in the plant. In this extract, six bioactive constituents were tested out of which four were present in both the extract. Saponins were observed to be present in ethanol extract alone whereas terpenoids in acetone extract alone. The Phytochemical screening of *Artabotrys hexapetalus* are shown in Table 1.

Antibacterial Efficacy of acetone and ethanol extract

The Zone of Inhibition in the plate showed the antibacterial efficacy of the acetone and ethanol extract of *Artabotrys hexapetalus* leaves against the bacterial test pathogens namely *E.coli*, *Bacillus subtilis*,

Staphylococcus aureus and *Salmonella typhi*. On comparison with the acetone and ethanol extracts, ethanol extract of *Artabotrys hexapetalus* outperformed the action against *E.coli*, *Bacillus subtilis* and *Salmonella typhi*. In case of acetone extract, the highest zone of inhibition was observed against *Staphylococcus aureus*. The diameters of zone of inhibition obtained by both the acetone and ethanol extract are tabulated respectively in the Table 2.

Table 1. Phytochemical screening of acetone & ethanol extract of *Artabotrys hexapetalus*

S.No	Photochemical	Acetone extract	Ethanol extract
1	Alkaloids	Present	Present
2	Flavonoids	Present	Present
3	Saponins	Absent	Present
4	Sterols	Present	Present
5	Tannins	Present	Present
6	Terpenoids	Present	Absent

Table 2. Antibacterial efficacy of *Artabotrys hexapetalus*

No.	Test Microorganism	Acetone extract (3 mg/ ml)		Ethanol extract (3mg/ ml)	
		Volume (µl)	Zone of inhibition in Diameter(mm)	Volume (µl)	Zone of inhibition in Diameter(mm)
1	<i>E.coli</i>	50	21	50	20
		100	22	100	23
		150	23	150	25
2	<i>Bacillus subtilis</i>	50	21	50	22
		100	23	100	24
		150	24	150	25
3	<i>Staphylococcus aureus</i>	50	20	50	18
		100	22	100	19
		150	23	150	19
4	<i>Salmonella typhi</i>	50	15	50	20
		100	22	100	22
		150	20	150	25

DISCUSSION

The Phytochemicals such as alkaloids, Flavonoids, Sterols and tannins were found to be present in both the acetone and ethanol extract providing as an important constituent in acting against the tested microorganisms.

The ethanol extract had shown the higher zone of inhibition compared to acetone extract which mean that the components other than tested for the presence may played an effective role in producing the zone of inhibition for ethanol extract. Earlier similar

work was carried out using various extracts of flowers of *Artabotrys hexapetalus* (Manjula et al., 2011) reporting that the flowers are having potent antibacterial and antioxidant properties that made to do the current work using leaves which also depicted that the leaves also possess effective antimicrobial properties.

Further research is needed to know about the bioactive compounds present in the ethanol extract of *Artabotrys hexapetalus*.

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