JOURNAL OF PURE AND APPLIED MICROBIOLOGY, October 2009. Vol. **3**(2), p. 801-803

Antimicrobial Activity and Preliminary Phytochemical Analysis of *Begonia malabarica* Lam

S.N. Suresh* and N. Nagarajan

PG and Research Department of Botany, Kongunadu Arts and Science College Coimbatore-29, India.

(Received: 03 May 2009; accepted: 14 June 2009)

In the present study, the methanolic extract of the stem of *Begonia malabarica* was subjected to preliminary phytochemical studies and antimicrobial studies against certain human pathogenic microorganisms. The phytochemical analysis showed the presence of Flavanoids, Carbohydrates, Proteins, Steroids, Resins, Tannins and Thiols. The antimicrobial activity analysis shows that activity against bacterial strains is comparatively less than that of the fungal strains.

Key words: *Begonia malabarica*, Phytochemical analysis, Antimicrobial activity.

Plants are potent biochemists and have been components of phytomedicine since times immemorial; man is able to obtain from them a wondrous assortment of industrial chemicals. Plant based natural constituents can be derived from any part of the plant like bark, leaves, flowers, roots, fruits, seeds, etc (Gordon and David, 2001). The medicinal actions of plants are unique to particular plant species or groups are consistent with this concept as the combination of secondary products in a particular plant is taxonomically distinct (Wink, 1999). The systematic screening of plant species with the purpose of discovering new bioactive compounds is a routine activity in many laboratories. In particular, the search for components with antimicrobial activity has gained increasing importance in recent times, due to growing world wide concern about the alarming increase in the rate of infection by antibiotic-resistant microorganisms (Davies, 1994).

According to world health organization (WHO), more than 80% of the world's population relies on traditional medicines for their primary

* To whom all correspondence should be addressed.
E-mail: drsnsuresh@yahoo.co.in
Mob.: +91-9791200300

health care needs. The medicinal value of plants lies in some chemical substances that produce a definite physiologic action on the human body. The most important of these bioactive compounds of plants are alkaloids, flavonoids, tannins and phenolic compounds. The phytochemical research based on ethno-pharmacological information is generally considered an effective approach in the discovery of new anti-infective agents from higher plants (Duraipandiyan, *et al*, 2006).

The study plant Begonia Lam. of Begoniaceae has about 900 species found in tropical and subtropical regions of the world wherein 45 species are present in India (Santapau and Henry, 1993). The herb, *Begonia malabarica* Lam., known as Ratha soori in Tamil is found in the hilly regions of Southern India and Sri Lanka (Clarke, 1879). The medicinal herb *Begonia malabarica* is used by *Malasar* and *Malai Malasar* tribal community of Pollachi to cure arthritis and common joint pains (Suresh, 2008).

MATERIAL AND METHODS

Plant material and extraction

The leaves of *B. malabarica* were collected in January 2006 from Anamalai Hills, Western Ghats, Tamil Nadu, India. The shadow-dried and coarse stem powder (100 g) was successively extracted with methanol using a Soxhlet apparatus. The extracts so collected were distilled on a water bath at atmospheric pressure and the last traces of solvent. The extract was used in antimicrobial and phytochemical studies.

Phytochemical studies

The extracts were tested by preliminary phytochemical screening (Harborne, 1976).

Antimicrobial studies

Fresh leaf material (30 g) was weighed, chopped and divided into three portions. Each portion was crushed by grinding in a mortar and transferred to a suitable glass bottle and 50 ml of distilled water was added. First bottle was autoclaved at 80 °C for 20 min, the second was heated at 100 °C for 20 min and the third was mechanically shaken (200 rpm) in cold temperature for 2 h. The extracts were filtered using cheesecloth and 0.45 _m filter paper and transferred to sterile closed containers. The crude extract was considered as 100% extract. By adding sterile distilled water, 50% of the extract was prepared (Sen and Nandi, 1951). Ethanol extract at different concentrations (100, 75, 50, and 25 mg/ml) were prepared in the same solvents of extraction and tested with solvent controls for antimicrobial activities.

RESULTS AND DISCUSSION

The preliminary phytochemical studies revealed the presence of Flavanoids, Carbohydrates, Proteins, Steroids, Resins, Tannins and Thiols (Table 1). The extracts did not answer for Alkaloids, Saponins, Phenols and Glycosides. Regarding the antimicrobial activity, the activity is more against fungal strains than the bacterial strains (Table 2). The activity against certain bacterial strains was high comparing to that of fungal strains. The maximum activity was observed against *Vibrio cholerae* (17), the maximum among the fungal strains was observed against *Aspergillus niger*. In certain concentrations the activity was maximum, but no activity was seen in the less concentrations of same strains. In contrast to the early reports (Catalano et al 1998 and Moore, 1959) the activity of the extract against fungal strains were high, especially in *Aspergillus fumigatus* followed by *Aspergillus parasiticus*. The polarity of the solvent seems to play an important role in exhibiting potential antibacterial activity.

Table 1. Preliminary phytochemical study on water and ethanolic extract of *Begonia malabarica* Lam

S.No	Test	Ethanol extract
1.	Alkaloids	-
2.	Flavanoids	+
3.	Saponins	-
4.	Carbohydrates	+
5.	Proteins	+
6.	Phenols	-
7.	Steroids	+
8.	Glycosides	-
9.	Resins	+
10.	Tannins	+
11.	Thiols	+

+ indicates the presence and – indicates the absence of the chemical constituents.

Table 2. The antimicrobial activity of the ethanolic extract of *Begonia malabarica* Lam

S. No	Name of the organism	Zone of inhibition (mm)				DMSO control	Standard ciproflaxin
		100 mg/ml	75 mg/ml	50 mg/ml	25 mg/ml		
Bacteria							
1	*Escherichia coli*	15	12	-	-	-	16
2	*Klebsiella pneumoniae*	-	14	11	9	-	13
3	*Vibrio cholerae*	17	13	9	-	-	15
4	*Proteus vulgaris*	-	12	8	-	-	13
5	*Micrococcus luteus*	14	-	9	7	-	12
Fungal							
1	*Aspergillus niger*	10	-	9	7	-	20
2	*Aspergillus fumigatus*	14	8	-	7	-	14
3	*Trichoderma viridi*	-	-	9	-	-	16
4	*Aspergillus parasiticus*	12	8	7	-	-	15
5	*Aspergillus flavus*	10	7	-	7	-	14

In the present study the activity was observed against both the microbial strains. The results suggest that traditional folk medicine could be used as a guide in our continuing search for new natural products with potential medicinal properties.

REFERENCES

1. Catalano, S., Cioni, P.L., Panizzi, L., Morelli, I., Antimicrobial activity of extracts of *Mutisia acuminata* var. acuminata. *Journal of Ethnopharmacology* 1998; **59**: 207-209.
2. Clarke, C.B., Begoniaceae. In: Hooker, J.D. (Ed.), Flora of British India, vol. 2. L. Reeve & Co, London, 1879; 635-656.
3. Davies J., Inactivation of antibiotics and the dissemination of resistance genes. *Science* 1994; **264**: 375-382.
4. Duraipandiyan, V., Ayyanar, M., Ignacimuthu, S., Antimicrobial Activity of Some Ethnomedical Plants Used by Paliyar Tribe from Tamil Nadu, India. BMC complementary and alternative medicine. 2006; 635.
5. Gordon MC, David JN., Natural product drug discovery in the next millennium. *Pharm Biol* 2001; **39**: 8-17.
6. Harborne, J.B., Phytochemical Methods. Chapman & Hall, New York, 1976; 1-288.
7. Moore, W.C., British Parasitic Fungi. Cambridge University Press, London, 1959; 17.
8. Santapau, H., Henry, A.N., A Dictionary of the Flowering Plants in India. *Council of Scientific Industrial Research*, New Delhi, 1993; 1-198.
9. Sen, S., Nandi, P., Antibiotics from the Pteridophytes. *Science and Culture.* 1951; **16**: 328-329.
10. Suresh, S.N., The mycorrhizal studies in the plant species of Anamalai Hills, Western Ghats, Tamilnadu and the effect of *Glomus aggregatum* inoculation on *Begonia malabarica* Lam. *Ph.D Thesis* 2008.
11. Wink M ., *Introduction Biochemistry, role and biotechnology of secondary products*. In: M Wink, Ed, Biochemistry of Secondary Product Metabolism. CRC Press, Boca Raton, 1999; 1-16.