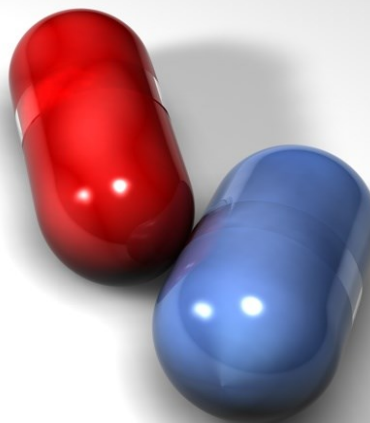


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## Letter to the Editor

### Exploration of antioxidant and antimicrobial potential of methanolic extract of root stock of *Premna herbacea*

Sir,

The unstable radical tries to steal electrons from other molecules and causes damage to the structural and functional proteins, lipids, DNA and other vital molecules. Sometime such damages become irreversible and lead to various diseases (Vanderauwera et al., 2011). Another problem in current scenario is microbial resistance to chemotherapeutic/antimicrobial agents. Infectious diseases account for approximately one-half of all death in tropics (Lobo et al., 2011). This problem created a serious requirement in developing new antimicrobial agents.

So, the goal of current research was directed towards finding naturally-occurring antioxidants and antimicrobial agents of plant origin, which will be in support to internal antioxidants for preventing reactive oxygen species mediated and microbial damages. Bharangin, obtained from hexane extract of *Premna herbacea* root nodules, was reported to have antimicrobial activity against gram positive and gram negative bacteria and fungi (Murthy et al., 2006). Based on this report, we tried to explore the antimicrobial potential of other extracts and fractions of *P. herbacea*. The purpose of this study was to evaluate *P. herbacea* as new potential source of natural antioxidants and antimicrobial agents.

The extracts of *P. herbacea* and their fractions were prepared by our group earlier and described in literature (Dhamija et al., 2013). Aqueous extract, alcoholic

extract, ethyl acetate fraction and butanol fraction of alcoholic extract were used for this study. Determination of antioxidant activity was carried out using various models like DPPH, ABTS radical, superoxide scavenging assay, iron chelating activity assay, total antioxidant capacity and non-enzymatic hemoglobin glycosylation assay. Broth serial microdilution method using microtitre plate of 96-wells was employed to determine minimum inhibitory concentration (MIC) values (Kumar et al., 2012). Stocks of all extracts and standard antibiotic chloramphenicol were prepared by dissolving in dimethyl sulfoxide as solvent. The MIC was the lowest concentration where no viability was observed after 24 hours on the basis of metabolic activity (Klancnik et al., 2010).

Several concentrations ranging from 5-200 µg/mL of the aqueous & alcoholic extracts; and ethyl acetate & butanol fraction of alcoholic extract of *P. herbacea* were tested for their antioxidant activity in different *in vitro* models. It was observed that free radicals were scavenged by the test compounds in a concentration dependent manner in all tests. The antioxidant activity was estimated by IC<sub>50</sub> value and the values of aqueous & alcoholic extracts; and ethyl acetate & butanol fraction of alcoholic extract were 73.2, 55.1, 12.5 and 25.4 µg/mL (DPPH radical scavenging); 70.6, 22.7, 8.9 and 14.7 µg/mL (ABTS radical scavenging), 12.0, 41.8, 9.4 and 20.9 µg/mL (iron chelating activity), 375.7, 284.5, 94.7 and 313.4 µg/mL (superoxide scavenging), respectively. In the total antioxidant capacity assay, 1 mg of aqueous & alcoholic extracts; and ethyl acetate & butanol fraction of alcoholic extract were found to be equivalent to 49, 64, 71 and 59 µg of ascorbic acid and showed 38.2, 78.8, 89.2 and 54.3% inhibition of hemoglobin glycosylation

**Table I: Antimicrobial activity of *Premna herbacea* extracts and fractions on Gram negative and Gram positive organisms**

Organism	Strain	MIC value of various extracts and standard (µg/mL)				
		Aqueous	Alcohol	Ethyl acetate	Butanol	Chloramphenicol
Gram negative						
<i>Escherichia coli</i>	MTCC 40	160	80	40	80	2
<i>Serratia marcescense</i>	MTCC 97	320	80	80	160	16
<i>Pseudomonas aeruginosa</i>	MTCC 1036	640	80	40	320	64
Gram positive						
<i>Staphylococcus aureus</i>	MTCC 3160	320	40	20	80	2
<i>Sphingobium japonicum</i>	MTCC 6362	80	160	40	80	2

respectively. The antimicrobial activities of *P. herbacea* extracts and fractions against both Gram negative and Gram positive microorganisms obtained by broth microdilution method (**Table I**).

The results showed that the ethyl acetate fraction of alcoholic extract possessed best antimicrobial activity as compared to other extracts and fractions. Ethyl acetate fraction of alcoholic extract was also showing good activity against resistant bacteria (*P. aeruginosa*) even better than chloramphenicol.

These extracts or fractions may contain different compounds for the activity in concern. Since one fraction of alcoholic extract, i.e., ethyl acetate fraction is potential, both as antioxidant and antimicrobial so this could be a motivation and idea for research to work on determination of chemical constituent/s responsible for such activities.

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