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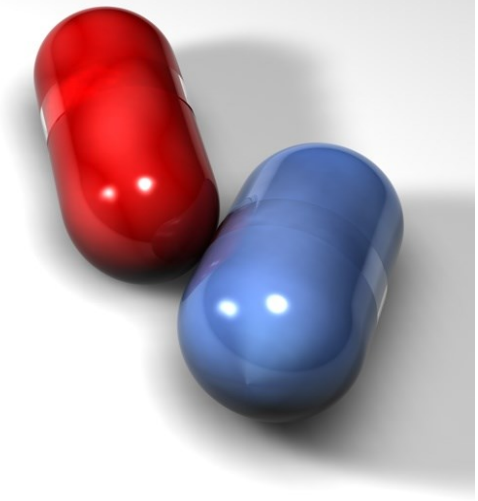

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Letter to the Editor

In vitro antimicrobial and antioxidant potentials of selected medicinal plants used by the indigenous tribes of Andaman and Nicobar Islands, India

Sir,

Systematic screening of plants used in traditional medicines could pave the way for the discovery of novel and effective compounds (Diallo et al., 1999). In the contemporary, emergence of multidrug resistant strains of bacteria is being frequently noticed, and quite recently, this phenomenon has been critically analyzed and documented (Chethana et al., 2013). It indicated the necessity to continue the search for newer compounds to combat new infections. In the present study, the traditional knowledge of treatment among the Nicobarese tribe was generated (Chander et al., 2014), and 18 plant species which are regularly used in traditional medicines were selected, to determine their antibacterial and antioxidant activities as well as preliminary photochemical analysis.

Hundred grams of coarsely powdered dry leaves were extracted by cold percolation method, by using 95% methanol as a solvent and keeping it for 72 hours at room temperature (Chattopadhyay et al., 2001). The whole plant extract was collected in a conical flask, filtered, and the solvent was evaporated to dryness under reduced pressure in an evaporator (Eppendroff 5304) at 45°C. Resulted residues were stored at 4°C for the purpose of further *in vitro* studies.

The plant extracts were screened for the presence of different classes of secondary metabolites including alkaloids, flavonoids, triterpenes, sterols, tannins and saponins using previously described methods (Harborne, 1998; Kokate et al., 2004). The plant extracts were screened for antibacterial activity using the agar well diffusion method (Rojas et al., 2006). DPPH assays of sample were performed according to the procedure as reported by Singh et al. (2015).

The phytochemical studies reveals that the extracts of medicinal plants have variety of phytochemical constituents, namely alkaloids, triterpenes, flavonoids, tannins, steroids and saponins, whereas some of the phytochemical are restricted to certain medicinal plant species except the alkaloids which was reported in all the studied plant species (Table I). However, saponins were absent in seven extracts while in six extracts

Table I

Phytochemical analysis of the methanol extracts of selected ethnomedicinal plants

Scientific name	Alkaloids	Flavonoids	Triterpenoids	Sterols	Tannins	Saponins
Abutilon indicum (L.) Sweet	Present	Present	Present	Present	Present	Present
Ageratum conyzoides L.	Present	Present	Present	Present	Absent	Absent
Annona squamosa L.	Present	Present	Present	Present	Present	Absent
Boesenbergia rotunda (L.) Mansf.	Present	Present	Present	Present	Present	Present
Cleome viscosa L.	Present	Present	Absent	Absent	Present	Present
Ganophyllum falcatum Blume.	Present	Present	Present	Present	Present	Present
Glyptopetalum calocarpum (Kurz.) Prain	Present	Present	Present	Present	Present	Present
Ipomoea obscura (L.) Ker.- Gawl.	Present	Absent	Absent	Present	Present	Absent
Leea aequata L.	Present	Absent	Present	Present	Absent	Absent
Leea indica (Burm.f.) Merr.	Present	Present	Present	Present	Absent	Absent
Macaranga peltata (Roxb.) Muell.	Present	Absent	Present	Present	Absent	Absent
Morinda citrifolia L.	Present	Present	Present	Present	Present	Present
Moringa oleifera Lam	Present	Present	Present	Present	Absent	Present
Premna corymbosa (Burm.f.) Rottl. et Willd.	Present	Present	Present	Absent	Present	Absent
Senna alata (L.) Roxb.	Present	Present	Absent	Absent	Absent	Present
Tabernaemontana crispa Roxb.	Present	Absent	Absent	Absent	Present	Present
Urena lobata L.	Present	Present	Present	Present	Present	Present
Wedelia biflora (L.) DC.	Present	Present	Present	Present	Present	Present

Table II

Antimicrobial and antioxidant activities of the selected ethnomedicinal plants

Botanical name	*S. aureus*	*S. epidermidis*	*B. cereus*	*E. coli*	*P. aeruginosa*	*K. pneumonia*	*C. albicans*	DPPH activity IC_{50} (µg/mL)
A. indicum	–	–	–	11.0 ± 0.0	–	9.7 ± 0.6	–	80.7 ± 0.5
A. conyzoides	–	–	–	–	–	–	–	96.1 ± 1.7
A. squamosa	–	–	–	–	–	–	–	49.3 ± 0.7
B. rotunda	14.3 ± 0.6	17.7 ± 0.6	17.0 ± 0.0	14.7 ± 1.5	9.7 ± 0.6	12.3 ± 0.6	–	51.4 ± 2.7
C. viscosa	–	–	–	–	–	–	–	136.1 ± 2.3
G. falcatum	–	–	–	14.7 ± 0.6	–	–	–	149.5 ± 3.3
G. calocarpum	18.3 ± 1.5	15.7 ± 1.5	19.7 ± 0.6	–	11.3 ± 0.6	–	–	63.2 ± 0.1
I. obscura	–	–	–	–	–	–	–	557.6 ± 32.6
L. aequata	12.3 ± 0.6	–	–	12.0 ± 0.0	–	–	–	67.5 ± 0.6
L. indica	–	–	–	–	–	–	–	44.2 ± 0.2
M. peltata	–	–	–	–	–	–	–	46.7 ± 0.8
M. citrifolia	21.3 ± 0.6	17.0 ± 1.0	14.0 ± 1.0	15.7 ± 1.5	13.3 ± 1.2	21.7 ± 0.6	13.3 ± 0.6	26.4 ± 0.9
M. oleifera	–	–	10.7 ± 0.6	–	–	9.7 ± 0.6	–	44.9 ± 0.2
P. corymbosa	11.3 ± 2.1		–	12.7 ± 0.6	–	–	–	74.3 ± 0.6
S. alata	–	–	–	–	–	–	12.0 ± 1.0	124.2 ± 1.3
T. crispa	–	–	–	–	–	–	–	64.3 ± 2.9
U. lobata	–	11.3 ± 0.6	14.0 ± 0.0	10.0 ± 0.0	–	–	–	47.5 ± 3.1
W. biflora	13.3 ± 0.6	–	–	–	–	–	–	263.9 ± 12.3
Ascorbic acid	ND	ND	ND	ND	ND	ND	ND	13.9 ± 0.1
Gentamicin	17.7 ± 0.6	21.7 ± 0.6	22.7 ± 1.2	18.3 ± 0.6	12.7 ± 0.6	14.0 ± 0.0	–	ND
Nystatin	–	–	–	–	–	–	17.7 ± 0.6	ND

'–' indicates No activity; 'ND' Not done

tannins were not found.

The antimicrobial activities of the investigated extracts against human pathogens used by agar well diffusion method were shown in Table II. Extracts was compared with gentamicin and nystatin as standards. Results obtained in the current study relieved that selected plant extracts were found to possess potential anti-microbial activity against tested organisms. The *M. citrifolia* extract showed activity against all the pathogens tested followed by *B. rotunda* and *G. calocarpum* while the highest activity (21.7 ± 0.6) was shown by *M. citrifolia* against *K. pneumonia*.

The effect of anti-oxidant on DPPH radical scavenging was thought to be due to their hydrogen donating ability or radical scavenging activity. The free radical scavenging activity depends upon the chemical composition of extracts (Nilgun et al., 2007). The DPPH radical scavenging results showed that *M. citrifolia* extract exhibited highest activity having IC_{50} value 26.4 ± 0.9 µg/mL followed by *L. indica* and *M. oleifera* (Table II).

Thus, this study indicates that scientific studies carried out on medicinal plants having traditional claims of effectiveness might warrant fruitful results.

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M. Punnam Chander and P. Vijayachari

Department of Medical Microbiology and Molecular Biology, Regional Medical Research Centre (Indian Council of Medical Research), Port Blair 744 101, Andaman and Nicobar Islands, India.

email: pblicmr@sancharnet.in

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