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Short Cummunication

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Bioactivity of Marine Organisms: Part XI- Screening of some Marine Flora from the Indian Coasts**

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Abstract

With a view to explore of finding the new molecules with therepeutic efficacy for human use, the alcoholic extracts of 33 indentified species of marine flora, collected from Indian coasts, were prepared and screened for a wide range of biological activities. Of these, 1 extract showed antifilarial activity, 1 showed antiamoebic effect and the 1 showed antitrichomonas activity.

Key words: Marine flora, Ethanol extracts, Broad biological screening, 3 active extracts.

Introduction

A programme for the screening of marine flora and fauna extracts of the Indian coasts was started about 20 years ago at this Institute. So far about 350 marine flora and fauna species have been screened for their bioactivity. It is intened to publish the data collected in this programme from time to time, as series of papers, with a view to explore the possibilities of finding new molecules, with proven therapeutic efficacy for human use. The results of biological screening of about 350 marine organisms, mainly collected by National Institute of Oceanography, Goa (India) and Central Drug Research Institute, Lucknow (India) have been reported Bhakuni *et al* 1992; Dhawan *et al* 1993; Kamat *et al* 1981, 1991, 1992; Naik *et al* 1989, 1990; Naqvi *et al* 1980; Siddhanta *et al* 1997 and Lakshmi *et al* 2006a, 2006b. The present communication deals with the biological activites of the extracts of 33 marine plant species. The biological screening includes tests for antibacterial, antifungal, antitrichomonas, antiprotozoal, anthelmintic, antiviral, antifertillity, hypoglycemic, effects on cardiovascular system and central nervous system (including gross behavior), effect on isolated tissues, diuretic and anti-inflammatory activities.

Materials and Methods

Collection of the marine flora

Under the National Project "Development of Potential Drugs from the Ocean", marine floras were collected from the coasts of Goa, Maharashtra, Tamil Nadu, Gujarat, Orissa and Andaman and Nicobar Islands of India during pre-and post-monsoon periods. The material was rinsed with water to free them from extraneous matter, shade dried.

Preparation of the extracts

The air dried and powdered material was filled in glass percolators, extracted with 95% ethanol at room temperature by percolation. The first extract was collected after two days. The process was repeated five times. The solvent from the combined percolates was removed under reduced pressure below 40^{o}C. The extract was finally dried in a vacuum desiccator and tested for a wide range of pharmacological activities, while a few of them were screened for antileishmanial, antitubercular and anthelmitic activities. The details of these tests have been described earlier Bhakuni *et al* 1969, 1971; Dhar *et al* 1968 and Dhawan *et al* 1977. The experiments were performed after necessary approval of IACC of the Institute.

Results and Discussion

In Table I, the marine floras have been listed alphabetically, with collection place, date of collection, parts of the parts used and family. The results of the biological screening of the crude extracts, found active in the primary biological screening, are also indicated. Among active extracts, 1 showed artifilarial activity out of 26 tested, 1 showed antiamoebic activity out of 11 tested while 1 extract exhibited anti-trichomonas activity out of 28 tested.

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Table I. List of marine flora screened, place and time of collection and summary of results of biological tests

Codes for plant parts: [FR: Fruits, LF: Leaves; PL: Entire plant; PX: Entire plant without root; RB: Root bark; ST: Stem] Codes for biological tests: [A. Antibacterial (A_2 *Staphylococcus aureus;* A_4 *Escherichia coli;* A_6, *Mycobacterium tuberculosis* $H_{37}R_v$; A_9, *Streptococcus faecalis,* A_{10}, *Klebsiella pnuemoniae;* A_{11}, *Pseudomonas aeruginosa);* B. Antifungal *(*B_1, *Candida albicans:* B_2, *Cryptococcus neoformans;* B_3, *Trichophyton mentagfrophytes;* B_6*.) Aspergillus fumigatus;* B_7, *Sporotrichum schenckiii,* B_{14}, *Candia parapsilosis (*ATCC-22019)); C. Antiprotozoal C_1, *Entamoeba histolytica strain* STA; C_4, *Plasmodium berghei*; C_5, *Plasmodium falciparum*; C_6, *Giardia lamblia)*; D, Anihelmenthic (D_8 Antifilarial against *Brugia malayi*) Antiviral (E_6, *Hdrpes*) *simplex virus;* E_8, *Influenza virus;* E_9, *Japanese* B *Encephalitis virus*; G. Antifertility G_2, *Anti-implantation in rats;* G_3, Spermicidal, G_{14}, *Anti-trichomonas*; H. Hypoglycemic H_1, Glucose loaded rat model*;* H_2, Streptozotocin inuced rat model; J. Effect on cardiovascular system J_2, (Effect on blood pressure; J_9, Anit-thrombotic), J_{10}, Anti-ischemic; L. Effect on central nervous system (L_1, Gross effects); R. Hypolipidemic R_1, Anti-cholesterolemic in triton treated rat model and Y Anti-obestiy (Y_1, Appetite Suppressant)].

Botanical Name (Part) (Family)	Locality and State	Month and Year of Collection	Biological Tests Conducted	Activity Observed
Aglaia cucullate (Roxb.) Pellegrin (PX) Meliaceae	Paradeep (Orissa)	Nob. 2003	$A_{2,4,6,9\text{-}11}$,$B_{1\text{-}3,6,7,14}$,$E_{9,}$ $G_{2,3,}$ $H_{1,}$ L_1	-
Barringtonia racemosa Roxb. (FR) (Barringtoniaceae)	South Andaman (A.& N. Islands)	Mar. 2003	$A_{2,4,6,9\text{-}11}B_{1\text{-}3,6,7,14}$,$D_{8,}$ $E_{6,9,}$ $G_{2,3,}$ $J_{9,10}$	-
Barringtonia racemosa Roxb. (PX) (Barringtoniaceae)	South Andaman (A. & N. Islands)	Mar. 2003	$A_{2,4,6,9\text{-}11}B_{1\text{-}3,}$ $_{6,7,14,}E_{9,}G_{2,3}$ $H_{1,}$ L_1	-
Bruguiera sexangula (Lour.) Poir. (PX) (Rhizophoraceae)	South Andaman (A. & N. Islands)	Dec. 2005	$D_{8,}E_{9,}$ $G_{2,3,}$ $H_{1,}$ R_1	-
*Brugueira cylindrical (*L.) BI (PX) (Rhizophoraceae)	Chidambaram (Tamil Nadu)	Jun. 2002	$A_{2,4,6,9\text{-}11}B_{1\text{-}3,6,7}$ $_{,14,}$ $C_{1,5,}E_{6,9}$ $G_{2,}$ $H_{1,}$ $L_{1,}$ R_1	-
Caesalpinia bonduc Roxb. (PX) (Caesalpiniaceae)	South Andaman (A. & N. Islands)	Dec. 2005	NONE	-
Caulerpa scalpelliformis (R. Br.) Web. V. Bosse (PL) (Caulerpaceae)	Ramnad (Tamil Nadu)	Nov. 2000	$A_{2,4,6,9\text{-}11,}$ $B_{1\text{-}3,6,7,}C_{1,4,6,}$ $G_{2,3,14}$ $H_{1,}$ $L_{1,}$ R_1	-

Contd.

Table I. To be contd.

Caulerpa scalpelliformis (R. Br.) Web. V. Bosse (PL) (Caulerpaceae)	Ramnad (Tamil Nadu)	Nov. 2002	$A_{2,4,6,9\text{-}11,}$ $B_{1\text{-}3,6,7,14,}$ $E_{9,}$ $G_{2,3,}$ $H_{1,}$ $L_{1,}$	-
Cerbera manghas L. (FR) (Apocynaceae)	South Andaman (A & N Islands)	Mar. 2004	$A_{2,4,6,9\text{-}11}$ $B_{1\text{-}3,6,7,14,}$ $E_{9,}$ $G_{2,3,}$ $H_{1,}$ $J_{9,10,}$ R_1	
Cerbera manghas L. (PX) (Apocynaceae)	South Andaman (A & N Islands)	Mar. 2004	$A_{2,4,9\text{-}11,}$ $B_{1\text{-}3,7,14,}$ $E_{9,}$ $G_{2,3,}$ $H_{1,2}$	
Chaetomorpha torta (Farlow) MC Clatchie (PL) (Cladophoraceae)	Ramand (Tamil Nadu)	Jul. 2001	$A_{2,4,9\text{-}11,}$ $B_{1\text{-}3,6,7,14,}$ $C_{1,6,}$ $D_{8,}$ $E_{8,9,}$ $G_{2,3,}$ $H_{1,}$ $J_{2,}$ R_1	C_1 (Antiamoebic)
Chondrococcus hornemanii (Mert.) Schmitz (PL) (Rhizophyllidaceae)	Ramnad (Tamil Nadu)	Feb. 2006	$A_{6,}$ $B_{1\text{-}3,6,7,14}$ $G_{2,}$ J_9	-
*Cynometra ramiflo*ra L. (FR) (Fabaceae)	South Andaman (A. & N. Islands)	Jan. 2002	$A_{2,4,6,9\text{-}11,}$ $B_{1\text{-}3,6,7,14,}$ $C_{1,}$ $D_{8,}$ $E_{6,8,9,}$ $G_{2,3,}$ $H_{1,}$ $J_{2,}$ $L_{1,}$ R_1	-
Cynometra ramiflora L. (PX) (Fabaceae)	South Andaman (A. & N) Islands	Mar. 2004	$A_{2,4,9\text{-}11,}$ $B_{1\text{-}3,6,7,14,}$ $E_{9,}$ $G_{2,3,}$ H_1	-
Dalbergia candentensis (Dennst.) Prain (PX) (Fabaceae)	South Andaman (A. & N) Islands	Aug. 2002	G_2	-
Derris elegans Benth. (PX) (Fabaceae)	South Andaman (A. & N) Islands	Aug. 2002	G_2	-
Dolichandrone spathacea (L.) (K.) Schum. (PX) (Bignoniaceae)	south Andaman (A. & N Islands)	Aug. 2002	$A_{2,4,9\text{-}11,}$ $B_{1\text{-}3,6,7,14,}$ $C_{1,}$ $E_{6,8,9,}$ $G_{2,3,}$ $H_{1,}$ $L_{1,}$ R_1	-
Gelidiella acerosa (Forsk) *Feldman et* Hamel. (PL) (Gelidiellaceae)	Ramnad (Tamil Nadu)	Nov. 2000	$A_{2,4,6,9\text{-}11,}$ $B_{1\text{-}3,6,7,}$ $C_{1,4,6,}$ $E_{6,8,9,}$ $G_{2,3,14,}$ $H_{1,}$ $L_{1,}$ R_1	-

Contd.

Table I. To be contd.

Heritiera fornes Buch.-Ham. (PX) (Sterculiaceae)	South Andaman (A. & N Islands)	Dec. 2005	NONE	-
Hypnea musciformis (Wulf.) Lamour (PL) Hypneaceae	Okha (Gujarat)	Jan. 2000	$A_{2,4,9\text{-}11,}B_{1\text{-}3,6,7}$ $C_{4,6,}$ $D_{8,}$ $E_{8,\ 9,}$ $G_{3,}$ $H_{1,}$ R_1	-
Intsia bijuga (Colebr) O. Kutze (PX) (Caesalpiniaceae)	South Andaman (A. & N Islands)	Mar. 2004	$A_{2,4,9\text{-}11}B_{1\text{-}3,6,7,14}$ $E_{9,}$ $G_{2,3,14}$ $H_{1,}$	-
Kandelia candel (L.) Druce (PX) (Rhizophoraceae)	Kendrapara (Orissa)	Nov. 2003	$A_{2,74,6,9\text{-}11,}$ $B_{1\text{-}3,\ 6,7,14}$ $E_{9,}$ $G_{2,3,}$ $H_{1,2,}$ $J_{9,10}$	-
Kandelia candel (L.) Druce (LF) (Rhizophoraceae)	Kendrapara (Orissa)	May 2000	$A_{2,4,9\text{-}11,}B_{1\text{-}3,6,7,}C_{1,4,6}$ $D_{8,}$ $E_{6,8,9,}$ $G_{2,3,}L_{1,}$ R_1	-
Kandelia candel (L.) Druce (ST) (Rhizophoraceae)	Kendrapara (Orissa)	May 2000	$A_{2,4,6,9\text{-}11,}B_{1\text{-}3,6,7,}C_{4,6,}$ $D_{8,}$ E_8 $G_{2,3,}$ $H_{1,}$ $L_{1,}N,$ $R_{1,}$ Y_1	-
Lumnitzera racemosa Willd. (PX) (Combrataceae)	Chidambaram (Tamil Nadu)	Jun. 2002	$A_6,$ $C_1,$ $E_{6,8,9,}G_{2,3,}$ $H_1,$ L_1	-
Lyngbya majuscula J. Ag (PL) (Oscillatoriaceae)	Ramnad (Tamil Nadu)	Jul. 2001	$A_{2,4,6,9\text{-}11,}$ $B_{1\text{-}3,6,7,}$ $D_{8,}$ $E_{6,8,9}$ $G_{3,}$ $H_{1,}$ R_1	D_8 (Antifilarial)
Monochoria vaginalis Phesl (PL) (Pontederiaceae)	South Andaman (A. & N Islands)	Jan. 2002	$A_{2,4,9\text{-}11,}$ $B_{1\text{-}3,6,7,14}$ $C_{1,}$ $D_{8,}$ $E_{6,8,9,}$ $G_{3,}$ $H_{1,}$ R_1	-
Rhizophora apiculata (BI.) (RB) (Rhizophoraceae)	South Andaman (A. & N Islands)	Nov. 2000	$C_{6,}$ $G_{14,}$ $H_{1,2}$	G_{14} (Anti-trichomonas)
Rhizophora mucronata Lamk. (LF) (Rhizophoraceae)	(Kendrapara) (Orissa)	May 2000	$A_{2,4,6,9\text{-}11,}$ $B_{1\text{-}3,6,7,}$ $C_{1,4,6,}$ $D_{8,}$ $E_{6,8,9}$ $G_{2,3,}$	-
Rhizophora mucronata Lamk. (ST) (Rhizophoraceae)	(Kendrapara) (Orissa)	May 2000	$A_{2,4,6,9\text{-}11,}$ $B_{1\text{-}3,6,7,}$ $C_{1,4,6,}$ $D_{8,}$ $E_{6,8,}$ $G_{2,3,}$ $L_{1,}$ $N,$ $R_{1,}$ Y_1	-
Rhizophora apiculate BI. (RT) (Rhizophoraceae)	South Andaman (A. & N Islands)	Dec. 2000	$H_{1,2,}$	-

Contd.

Table I. To be contd.

Rhizophora lamarkii L. (PX) (Pontedpriaceae)	Chidambaram (Tamil Nadu)	Jun. 2002	$A_{2,4,6,9\text{-}11,}$ $B_{1\text{-}3,6,7,14,}$ $C_{5,}$ $G_{2,3,}$ $J_{2,}$ $L_{1,}$ R_1	-
Sonneratia griffithii Kurz. (PX) (Sonneratiaceae)	South Andaman (A. & N. Islands)	Jan. 2002	$A_{2,4,9\text{-}11,}$ $B_{1\text{-}3,6,7,14,}$ $C_{5,}$ $G_{2,3}$ $H_{1,}$ $J_{2,}$ $L_{1,}$ R_1	-
Sonnerlatia griffithii Krrz (PX) (Sonneratiaceae)	South Andaman (A. & N. Islands)	Mar. 2004	NONE	-
UIva reticulata Forssk (PL) (Ulvaceae)	Ramnad (Tamil Nadu)	Nov. 2000	$A_{2,4,6,9\text{-}11,}$ $B_{1\text{-}3,6,7,}$ $C_{1,4,6,}$ D_8 $E_{6,8,9,}$ $G_{2,3,}$ $H_{1,}$ $L_{1,}$ N, $Y_{1,}$	-

A comprehensive biological screening of 33 marine plant species, occurring in Indian coasts, has been carried out. Many of these marine floras have been investigated chemically as well as biologically. However, the natural substances vary depending upon the ecological factors such as time and area of collection, etc. Interestingly, few of the marine floras showed biological activities that are not reported so far in literature.

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