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Short report

Antimicrobial activity of some Sri Lankan Rubiaceae and Meliaceae

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Abstract

Ninety solvent extracts (*n*-hexane, dichloromethane and methanol) obtained from the leaves, bark and stem of 13 Sri Lankan Rubiaceae and two Sri Lankan Meliaceae plants have been screened for antibacterial and antifungal activities. *Morinda tinctoria, Mussaenda frondosa, Psychotria gardneri* and *Psychotria stenophylla* displayed the widest spectrum of antibacterial activity.

Keywords: Rubiaceae; Meliaceae; Antibacterial activity; Antifungal activity

Plant material. Thirteen plants of the Rubiaceae and two plants of the Meliaceae (Table 1), were collected from Central Province of Sri Lanka in August, 2000 and identified by comparison with specimens available at the National Herbarium, Peradeniya, Sri Lanka. Voucher specimens of the plant material are deposited at the Institute of Fundamental Studies.

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Table 1
Antibacterial and antifungal activity of some Sri Lankan Rubiaceae and Meliaceae plant extracts

Plant		Extract	*B.c* (mm)	*B.s* (mm)	*E.c* (mm)	*M.l* (mm)	*A.n* (mm)	*S.c* (mm)	*U.m* (mm)
RUBIACEAE									
1.	*Benkara malabarica*	LD	–	–	–	–	–	9	–
	(Lam.) D.D.Tirvengadum	LM	–	–	–	–	8	–	–
		BH	8	–	7	–	–	11	–
		BD	–	–	–	–	8	13	–
		BM	–	–	8	–	–	–	–
2.	*Canthium coromandelicum*	LD	–	9	–	–	–	–	–
	(Burm.f) Alston	LM	8	13	8	–	–	–	–
		BH	–	8	8	–	–	9	–
		BD	8	9	9	–	–	13	–
3.	*Canthium dicoccum*	LH	–	–	7	–	–	–	–
	(Gaertn.) Merr.	LD	–	–	7	–	–	–	–
		LM	–	9	–	–	–	11	–
		BH	8	9	8	–	–	12	–
		BD	8	–	9	–	–	18	–
		BM	10	18	11	–	–	17	–
4.	*Haldina cordifolia*	LD	–	–	9	–	–	12	–
	(Roxb.) Hook.f	LM	–	–	–	8	–	–	–
		BD	10	–	9	–	–	23	9
5.	*Ixora calycina* Thw.	LH	–	10	–	–	–	–	–
		LD	–	–	10	–	–	10	–
		LM	–	–	–	10	–	–	–
		BD	14	–	11	–	–	17	–
		BM	7	–	8	7	–	9	–
6.	*Morinda tinctoria* Roxb.	LH	7	10	12	–	10	–	–
		LD	8	–	11	–	–	12	–
		BD	–	11	10	–	–	13	–
		BM	7	–	–	8	–	–	–
7.	*Mussaenda frondosa* L.	LD	8	11	9	–	–	15	–
		LM	–	9	–	–	–	–	9
		BH	8	–	–	8	–	9	–
		BD	8	–	–	8	–	9	–
		BM	–	12	8	–	–	–	–
8.	*Psychotria gardneri*	LD	–	–	–	–	8	–	–
	(Thwaites) Hooker	LM	9	–	9	8	–	14	–
		BH	–	–	–	–	9	–	–
		BD	–	9	–	–	–	9	–
		BM	15	10	16	12	–	–	–

Table 1 (*Continued*)

Plant		Extract	*B.c* (mm)	*B.s* (mm)	*E.c* (mm)	*M.l* (mm)	*A.n* (mm)	*S.c* (mm)	*U.m* (mm)
9.	*Psychotria nigra*	LM	8	–	–	7	–	–	–
	(Gaertner) Alston	BH	8	–	–	–	–	–	–
		BD	8	–	–	–	–	10	–
		BM	11	–	11	9	–	17	–
10.	*Psychotria stenophylla*	LD	–	–	7	–	–	–	–
	Thwaites) Hooker	BD	8	10	7	8	9	–	16
		BM	–	–	–	21	–	–	–
11.	*Saprosma foetens*	LH	8	–	11	–	–	12	–
	(Wight) K. Schum.	LD	–	–	–	–	–	13	–
		LM	–	–	8	–	–	11	–
		BD	7	–	–	–	–	–	–
		BM	–	9	–	–	–	10	–
12.	*Tarenna asiatica* (L.)	LH	8	–	10	–	–	–	–
	Alston	LD	8	9	8	–	–	8	–
		LM	8	–	–	–	–	9	–
		BD	–	–	7	–	–	–	–
		BM	8	–	–	–	–	11	–
13.	*Wendlandia bicuspidata*	LH	–	–	–	–	–	9	–
	Wight & Arn.	LD	–	–	–	–	–	10	–
		BH	–	–	–	–	–	9	–
		BD	–	–	–	–	–	9	–
MELIACEAE									
14.	*Agalia congylos* Kost.	LH	–	11	–	–	–	–	–
		LD	8	–	–	–	–	–	–
		BH	8	–	11	–	–	13	–
		BD	14	9	8	–	–	21	–
		BM	8	–	–	–	–	14	–
15.	*Munronia pumila*	SH	–	10	11	–	–	14	–
	Wight	SD	7	–	–	7	–	–	–
		SM	–	–	–	–	–	9	–
	Ref. compounds								
	Ampicillin		18	17	30	30	42	–	–
	Tetracycline		46	40	39	20	26	41	–
	Tetraconzaole	–	–	–	–	24	24	24	–

[a]Zone of inhibition, including the diameter of the filter paper disc (6 mm); 1 mg of extract in a disc, 20 μg of ampicillin or tetracycline in a disc; –, no activity; L, leaves; B, bark; S, stem; H, *n*-hexane; D, dichloromethane, M, methanol; *S.c, Saccharomyces cerevisiae*; *U.m*, *Ustilago maydis*; *E.c*, *Escherichia coli*; *M.l*, *Micrococcus luteus*; *B.s*, *Bacillus subtilis*; *B.c*, *Bacillus cereus*; *A.n*, *Aspergillus niger*.

Uses in traditional medicine. *Benkara malabarica* (abdominal pain, throat infections) [1], *Haldina cordifolia* and *Ixora* sp. (dysentery, fever, gonorrhoea, bronchitis), *Morinda tinctoria* (rheumatism, diarrhoea, wounds), *Mussaenda frondosa* (white leprosy, jaundice, asthma), *Tarenna asiatica* (applied on boils, suppuration), *Wendlandia bicuspidata* and *Aglaia* sp. (dysentery, fever, diarrhoea, ulcers, rheumatism) and *Munronia pumilia* (dysentery, fever, purification of blood) [2].

Tested materials. *n*-Hexane, dichloromethane and methanol extracts obtained from the leaves, bark and stem of the species listed in Table 1.

Studied activity. Antibacterial and antifungal activity by disc diffusion method [3].

Used micro-organisms. Listed in Table 1.

Results. Only the extracts active against at least one micro-organism are reported in Table 1.

Conclusion. *M. tinctoria*, *M. frondosa*, *P. gardneri* and *P. stenophylla* showed a wide spectrum, being active against six of the seven micro-organisms tested. *W. bicuspidata* displayed activity only against the yeast-like fungus *S. cerevisiae*, which appears to be the most sensitive of the seven micro-organisms tested. The fungi *A. niger* and *U. maydis* appear to be the least sensitive species in this study. The data reported indicate that a high percentage of the plant extracts have antimicrobial activity, mainly against bacteria and yeasts. The fungi *A. niger* and *U. maydis* appear to be, the least sensitive.

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