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Antibacterial Activity of some Indigenous Plant Extracts

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The antibacterial activities i.e. zone of inhibition and MIC were observed for the methanolic extracts (15 Nos.) of some indigenous plants of Tripura, India against *S. aureus, B. pumilis, S. dysenteriae, E. coli and V. cholerae.*

Keywords: Antibacterial activity, Indigenous plants, Tripura.

Plants constitute of effective source of traditional and modern medicine. A large number of plants are screened for their possible pharmacological values and are well established in the field of traditional system of medicines. Some common plants those are already established as herbal medicine for having their varied traditional uses, in the North- Eastern part of India were taken for present investigation. The selected plants *Momordica charantia* Linn. (Family: Cucurbitaceae), *Moringa oleifera* Linn. (Family: Moringaceae), *Cassia tora* Linn. (Family: Casealpinaceae), *Milkania micrantha* Kunth (Family: Asteraceae), *Holorrhena antidysenterica* (Family: Apocyanaceae), *Thevita peruviana* Merrill Syn (Family: Apocynaceae), *Alocasia indica* (Family: Araceae), *Aegle marmelos* (L). Corr. Serr (Family: Rutaceae), *Pedilanthus tihymaloides* (Family: Euphorbiaceae), *Ageratum conyzoides* (Family: Asteraceae), *Ficus hispida* (Family: Urticaceae), *Amarus roxburghii* (Family: Euphorbiaceae) and *Clerodendrum infortunatum* Linn (Family: Verbanceae) were marked as the medicinal plants used by the tribal communities of Tripura, India. Antibacterial screening of the methanolic extract of specific parts of these plants were carried out against certain species of bacteria and the zone of inhibition in mm and MIC in mg / ml are reported in Table 1.

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EXPERIMENTAL

Fresh plants were collected from in and around Agartala, Tripura, India in the month of March – April, September – October and identified by the Dept. of life Science (Botany branch), Tripura University, Agartala, Tripura, India. Respective parts of the plants were dried under shed. The materials were crushed by a mechanical grinder. The powdered materials of each plant were extracted with methanol in Soxhlet apparatus. The fractions were then dried separately under reduced pressure to get solid masses, free from solvents. The solid fractions of the respective plants were redissolved in dimethyl formamide (DMF) and their antimicrobial activities were observed against gram positive bacteria: *Staphylococcus aureus* ATCC 29737, *Bacillus pumilis* ATCC 14884 and gram negative bacteria: *Escherichia coli* ATCC 10536, *Shigella dysenteriae* ATCC 12796 and *Vibrio cholerae* 3241 by cup-plate method[1,2] and their minimum inhibitory concentration (MIC)[3] in mg/ml were also determined. Results are displayed in Table 1.

MATERIAL AND METHODS

Test solutions of the extract were prepared by dissolving 250 mg of each separately in 5ml of sterile DMF. A 0.1% w/v solution of chloramphenicol was also prepared as standard. The test organisms were seeded separately into sterile nutrient agar medium by uniformly mixing 1ml of inoculum with 20ml sterile melted nutrient agar cooled to 48 – 50^0, in a sterile Petri dish. When the agar solidified, three holes of uniform diameter (6mm) were made, in each of the case, using a sterile borer. Two drops of each of the test solutions, obtained from each plant, as well as the standard solution (Chloramphenicol) and the DMF (as blank) were also placed in each hole separately under aseptic condition and the plates were thus maintained at room temperature for 2 hr to allow the diffusion of the solutions into the medium. All the plates were then incubated at 37^0C for 48 hr and the zone of inhibition were measured. The MIC were also determined by using spectrophotometer at 600 nm.

RESULTS AND DISCUSSION

The results showed the antibacterial activity of *H. antidysenterica* against *E. coli, V. cholerae & S. dysenteriae; M. charantia* against *B. pumilis; M. oleifera* against *S. aureus, V. cholerae* & *E. coli; C. tora* against *S. aureus, B. pumilis, V. chalerae* & *E. coil; M. micrantha* against *B. puilims* and *E. coil; A. conyzoides* against *S. aureus, B. pumilis, E. coil* and *V. cholerae; F. hispida* against *S. aureus, B. pumilis,* and *S. dysenteriae; A. roxburghii* against *S. aureus* and *B. pumilis.* Other plants i.e. *T. peruviana, A. indica, A marmelos, P. tihymaloides* and *C. infortunatum* showed activities against all tested bacteria. Activities of all plant extracts were not at per and significant considering dose in compare to the activity of standard chloramphenicol.

Table 1. Antibacterial activities of methanolic extracts of various parts of different indigenous plants

S. No.	Name of the plant	Part extracted	Zone of inhibition in mm(MIC in mg/ml) against bacteria				
			S. aureus	*B. pumilis*	*S. dysenteriae*	*E. coli*	*V. cholerae*
1.	*M. charantia*	Leaf	NA(1500)	09(800)	NA(1500)	NA(1750)	NA(1800)
2.	*M. oleifera*	Leaf	17(450)	NA(1750)	NA(1500)	18(400)	09(800)
3.	*C. tora*	Leaf	19(500)	17(400)	NA(1500)	17(400)	08(750)
4.	*M. micrantha*	Leaf	NA(1500)	07(1000)	NA(1750)	08(850)	NA(1600)
5.	*H. antidysenterica*	Leaf	NA(1500)	NA(1500)	12(650)	08(850)	13(700)
6.	*T. peruviana*	Seed	18(500)	15(500)	18(600)	20(600)	22(600)
7.	*T. peruviana*	Fruit	10(900)	08(1100)	14(500)	15(550)	10(750)
8.	*A. indica*	Root	23(450)	26(400)	21(450)	23(450)	23(500)
9.	*A. marmelos*	Fruit	26(400)	19(550)	22(450)	27(400)	22(500)
10.	*A. marmelos*	Leaf	25(450)	20(600)	23(500)	26(400)	21(450)
11.	*P. tihymaloides*	Leaf	08(1200)	11(1000)	13(800)	16(900)	12(800)
12.	*A. conyzoides*	Leaf	13(900)	08(1250)	NA(1600)	15(750)	19(500)
13.	*F. hispida*	Bark	20(500)	22(500)	10(700)	NA(1600)	NA(1500)
14.	*A. roxburghii*	Leaf	23(450)	21(500)	NA(1500)	NA(1550)	NA(1500)
15.	*C. infortunatum*	Leaf	17(600)	18(550)	12(650)	NA(1500)	11(850)
16.	Chloramphenicol (standard)	-	28(27)	25(26)	23(25)	31(29)	30(28)

NA - Not Active

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