NEMATICIDAL PROPERTIES OF SELECTED MARINE ALGAE FROM KARACHI COAST
Preliminary Report

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SUMMARY: One percent extracts of twenty five marine algae were assayed for their nematicidal properties using Helicotylenchus indicus as test nematode. After 48 hrs., the number of active nematodes was reduced by 78% in Cystoclonium purpureum, 75% in Chaetomorpha antennina, 95% in Centroceras clauulatum, 90% in Dictyota indica and 44% in Scinaia fasicularia.

Key Words: Extracts, marine algae, nematode, Helicotylenchus indicus.

INTRODUCTION

The use of chemicals for the control of plant parasitic nematodes has its limitations viz., higher cost which is non-remunerative in most crops, non-availability of chemicals and appliances, chances of increased activity of pathogens not effected by chemicals and finally the most important one is the toxic effects of the chemicals to plants, animals and man.

In order to find an alternate, nematicidal activity of marine algae for the first time is being studied.

Earlier, marine algae have been reported to be antimicrobial Pratt *et al.* (1), Ross (2), Burkholder *et al.* (3), Welch (4), Usmanghani *et al.* (5).

This paper reports on the nematicidal activity of 25 marine algae collected from Karachi coast against a cosmopolitan ectoparasitic nematode of roots *Heelicotylenchus indicus* (Siddiqi, 1963). Some of the important hosts of this nematode reported by Khan *et al.* (6), Maqbool (7), Khan (8), Bilqees *et al.* (9) from Pakistan are *Annona squamosa L., Capsicum annum L., Citrus aurantifolia (Christm.), Cucumis melo L.,* and *Zea mays L.*

MATERIAL AND METHODS

Marine algae were collected from the Arabian Sea (Karachi coast) and tested for nematicidal activity. The Voucher specimen were kept in well labeled bottles. The method of Blunden and Rogers (10) was modified, and air dried sea weeds were powdered mechanically and extracted in 50% ethanol and water (11). The extract was concentrated under reduced pressure below 40°C in a rotary evaporator. 1% of dried material in powder form was used to determine nematicidal activity.

For isolation of nematodes 200 c.c soil samples (Depth 15-25 cm) from paddy (*Oryza sativa* L.) fields were subjected to improved Baermann funnel method. It consisted of a nylon net fitted to a wooden frame. A tissue paper was laid over the nylon net and soil was uniformly spread over. The frame was placed in an enamel tray to which water was poured till the soil on the tissue paper moistened.

The arrangement was left for 48 hours after which the nematode water suspension was collected in petri dishes and nematodes picked under dissecting microscope. The experiment was performed at room temperature (28 ± 2°C). After 1 hour and 48 hours the number of active nematodes were counted. Percent mortality and Z-value were calculated (Table 1).

RESULTS AND DISCUSSION

Twenty five species of marine algae of Karachi coast were tested for nematicidal activity, but positive results were obtained with only five (Table 1), these being distributed in the Cladophorates, Gigartinates, Ceramiales, Dictyotales and Rhobophyta. Among the activity of all the five positive extracts *Centroceras clauulatum* reduced the number of active nematodes by 95%, followed by *Dictyota indica* 90%, *Cystoclonium purpureum* 78%, C*haetomorpha antennina* 75% and *Scinaia fasicularis* 44%. Since five marine algae out of twenty five have been shown positive results as nematicides it is worthwhile to study the activity of other marine algae found in Karachi coastal region as it is possible that they might contain nematicidal compounds.

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Table 1: Screening of Marine Algae for Nematicidal Activity.

S. No.	Name of Marine Algae	Control 0.0 min.	Number of active nematodes recovered (Initial Number = 100)			
			after 1 hr	after 48 hrs.	% Reduction	Z-Value
	CLADOPHORALES					
1.	Chaetomorpha antennina (BORG.) KUTZ.	100	40	25	75	17.44
	SIPHONOCLADALES					
2.	Valoniopsis pachynema (MART.) BORG.	100	100	100	0	...
	BRYOPSIDALES					
3.	Bryopsis pennata LAMOUR	100	100	100	0	...
	CODIALES					
4.	Codium iyengarii BORG.	100	100	100	0	...
	CAULERPALES					
5.	Caulerpa faridii NIZAM.	100	100	100	0	...
6.	C. raeemosa (FORSSK.) J.AG.	100	100	100	0	...
	CRYPTONEMIALES					
7.	Halymenia porphyriae formi (BORG.) PARKINSON	100	100	100	0	...
	GIGARTINALES					
8.	Cystoclonium purpureum (BUDS.) BATT.	100	32	22	78	19.02
9.	Gracilaria folifera (FORSSK.) BORG.	100	100	100	0	...
10.	Hypnea pannosa J.AG.	100	100	100	0	...
11.	H. valentiae (TURN.) MONT.	100	100	100	0	...
12.	P. telfairiae (W HOOK. et HARV.) ex KUTZ	100	100	100	0	
13.	Solieria chordalis (C.AG.) J.AG.	100	100	100	0	
	RHODYMENIALES					
14.	Botryocladia leptopoda (J.AG.) KYLIN.	100	100	100	0	
	CERAMIALES					
15.	Centroceras clauulatum (C.AG.) MONT.	100	15	5	95	45.23
16.	Laurencia filiformis (C.AG.) MONT.	100	0	0	0	
17.	L. glomerata (KUTS.) KUTZ.	100	100	100	0	
18.	L. obtusa (Huds.) LAMOUR	100	100	100	0	
	DICTYOTALES					
19.	Dictvota (Huds.) LAMOUR.	100	100	100	0	
20.	D. indica SOND. ex KUTZ.	100	30	10	90	30.0
21.	Stoechospermum marginatum (C.AG.) KUTZ.	100	100	100	0	
	SCYTOSIPHONALES					
22.	Colomenia sinuosa (ROTH) DERB. et SOL.	100	100	100	0	
23.	Lyengaria stellata (BORG.) BORG.	100	100	100	0	
	FUCALES					
24.	Sargassum tenerrinum J. AG.	100	100	100	0	
	RHODOPHYTA					
25	Scinaia fasicularia (BORG.) HUISMAN	100	90	56	44	8.97

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