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Fishing Methods and Antibacterial Activity of The Indian Sacred Chank Turbinella Pyrum (*Xancus Pyrum* - Linnaeus, 1758) of Gulf of Mannar, Southeast Coast at Thoothukudi District

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Abstract*:- The indain sacred chank is an important gastropods exploited commercially in a more coastal states in India. The major portion is from Gulf of Mannar and Palk Bay. It was found that large number of chanks were landed by the trawlers operating Thoothukudi coastal area. The chanks were also entangled, in small numbers, in the indigenous boat seines. An estimated 25421 chanks were landed during the observation period of six months. For the conservation of this valuable gastropod, restrictions on fishing chanks below a particular size appear to be necessary. Bacterial strains of *Escherichia coli, Klebsilla pneumonia, Proteus mirabilis, Vibrio cholarae, Salmonella paratyphi.

Keywords: Antibacterial, Turbinella pyrum, Chank, mollusca.

INTRODUCTION:

The sacred chank *Turbinella pyrum* (= *Xancus pyrum* Linnaeus, 1758) forms a commercial fishery along the south-east coast of India. In the Gulf of Mannar (GoM), there are about 10 chank beds extending from Vaipar to Tiruchendur and exploited from Tuticorin. The nutritive value of molluscs is governed by the various ecological and environmental parameters in ambience (Appukuttan,K.K, Mathew Joseph,K.T.Thomas). The understanding of biochemical composition in various marine organisms plays a very important role in providing their nutritive value (Ganesh,K. Dr.B.Geetha and J.Shoba. et.al., 2018). The natural products isolated from marine molluscan have been tested for a broad range of biological activities. Molluscan metabolites have been most commonly tested for neuromuscular blocking action, anti-predator, antimicrobial, anti-neoplastic and cytotoxic activity. Perhaps the most promising metabolite isolated from a marine mollusc is Dolastatin 10, an anti-neoplastic peptide isolated from the sea hare *Dolabella auricularia* (Thomas, P.A., 1979). The natural products isolated from marine molluscan have been tested for a broad range of biological activities. Molluscan metabolites have been most commonly tested for neuromuscular blocking action, anti-predator, antimicrobial, anti-neoplastic and cytotoxic activity.

REVIEW OF LITERATURE:

Thomas (1979) reported that among the destructive boring sponges associated with chanks in Indian waters, *Cliona celata* predominated in the Chank beds of Gulf of Mannar, Palk Bay and Nagapatanam, whereas *C. vasifica* was considerably more in Andaman waters. (Ganesh,K. and Dr.B.Geetha et.al.,2017) studied the large scale exploitation of sacred chank, *X. pyrum* using modified trawl net (chanku madi) along Rameshwaram coast and its probable adverse impacts. *Turbinella pyrum* sp and *Turbo* sp resources displayed a declining trend in catch indicating considerable overfishing in Andaman waters (Abrego, F.M.C.,A.T. Granados. and F.F. Andolais, 1994). The periodical sweeping of foot ropes with sinker chains of trawl nets appeared to cause severe damage to the egg capsules thus bringing down the recruitment of the chanks due to high mortality rate at the young stage in Gulf of Mannar (Nazerath Nisha, Ganesh,K. and Dr.B.Geetha, et.al., 2018). Lipton and Selvakku (2000) studied on the breeding, rearing and sea ranching of chanks in the Gulf of Mannar. The discharge of thermal effluents caused extensive damage to chank and pearl oyster beds of Tuticorin in Gulf of Mannar (Ranjiga Anjali,A. and Ganesh,K. and Dr.B.Geetha, et.al, 2018). Domestic and municipal discharges, copper smelting plant and coral mining (habitat destruction) were the other threats declining the molluscan resources in Tuticorin coast. Melkani (2006) indicated that habitat destruction, over exploitation and 29 localised pollution are the major threats to the biodiversity of molluscan fauna in Gulf of Mannar Marine Biosphere Reserve. Exploitation of egg capsules of sacred chank for medicinal purposes in Gulf of Mannar region affected the

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recruitment and renewal of the population and it is also needed that the observation of two years fishing holiday once in every three years for the conservation of chank resources (Rao, G.S., R. Sarvesan, P.V. Sreenivasan, 2004). The fishing for chanks should be banned for three months (January to march) every year in order to conserve the egg capsules and baby chanks. Murugesan,V. Ganesh,K. and B.Geetha *et al.*, (2019) worked on freezing preservation of fresh-shucked oysters. Murugesan,V. Ganesh,K. and B.Geetha, J.Manju. et.al., (2019) reported a method of processing and preservation of prawn pickle. Thomas, P.K., *et al*., (2002) observed the levels of trimethylamine oxide and its derivatives in fish and shellfish.

MATERIALS AND METHODS:

Bacterial strains such as *Escherichia coli, Klebsilla pneumonia, Proteus mirabilis, Vibrio cholarae, Salmonella paratyphi.* The above clinical pathogens were obtained from Department of Clinical Microbiology, Raja Muthiah Medical College (RMMCH), Annamalai University, Tamil Nadu, India.

RESULT:

Antibacterial activity

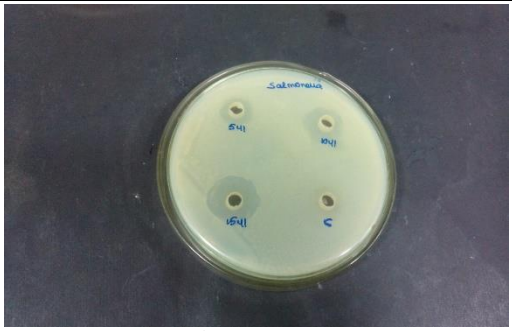
Extracts were tested for the inhibition of microbial pathogens. Antimicrobial assay was carried out by using agar well diffusion method described by El-Masry *et al.* (2000). All the bacterial strains were inoculated in the sterile nutrient broth (HIMEDIA, Mumbai) and incubated at 37º C for 24 hours. The 24hours cultures were swabbed on the surface of the Muller Hinton agar plates and wells were punched out using a sterile cork borer (6mm). The different concentrations (500µg/ml) of extracts were loaded into the wells respectively. The plates were incubated at 37ºC for 24 hours. The zone of inhibition was measured as millimetre (mm), excluding the well diameter. The assay was carried out in triplicate.

Sl. No.	Bacterial Pathogens	Antibacterial activity (zone of inhibition-mm)			
		A	B	C	D
1.	***E. coli***	12.05±1.05	10.23 ± 0.89	9.12 ± 0.5	7.54 ± 1.12
2.	***K. pneumonia***	14.00 ± 0.89	11.10 ± 0.55	24.10 ± 1.12	3.90 ± 1.55
3.	***P. mirabilis***	23.10 ± 0.25	2.45 ± 0.50	23.10 ± 0.01	2.76 ±1.55
4.	***V. cholarae***	22.12 ± 0.45	± 1.60	22.00 ± 1.20	3.88±1.10
.	***S. paratyphi***	21.14 ± 0.55	± 1.12	16.40 ± 0.65	3.30±1.55

Plate – 1

Incubated plates of *klebsiella pneumoniae* with the X.pyrum extracts

Incubated plates of *Proteus mirabilis* with the X.pyrum extracts showing inhibition zones



Antibiotic disc assay of *Salmonella paratyphii* with the *X.pyrum* extracts

Antibiotic disc assay of *Salmonella paratyphii* with the *X.pyrum* extracts showing zone of inhibition

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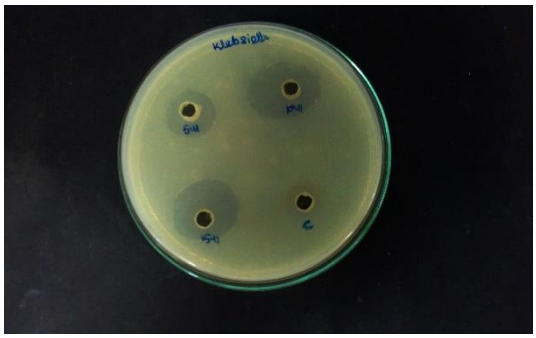
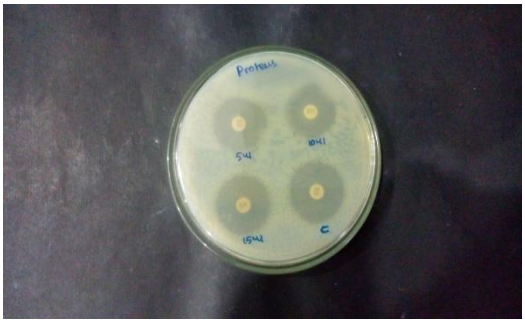


Antibiotic disc assay of *klebsiella pneumoniae* with the X.pyrum extracts



Antibiotic disc assay of *klebsiella pneumoniae* with the X.pyrum extracts showing zone of inhibition

InVitro Evaluation of Antibacterial Activity

The antibacterial activity in the case of every crude extract sample was determined by the presence or the absence of the inhibitory zone around the well. In the present study Antibacterial efficiency of X.pyrum extracts were examined and tested against five different bacterial pathogens. The different pathogens such as *E. coli, K. pneumoniae, P. mirabilis, V. cholarae and S. paratyphii* which gaves the results and were mentioned in table 1 as zone of inhibition. The results revealed variability in the inhibitory concentrations of each extract for used bacteria. The extracts showed activities in different Concentrations from 50 to 500µg/mL respectively. *P. mirabilis* showed highest rate of inhibition following *K. pneumoniae, E. coli* with the extract of *X.pyrum* activity. The lowest variation was observed for *S. paratyphii following V. cholarae.* The extracts were active against all the pathogens with average inhibition zone ranging from 3.3 to 24.10 mm. *P. mirabilis, K. pneumoniae, and E. coli* were relatively sensitive, while *S. paratyphii following V. Cholarae* were little resistant to the extracts. *The mean antibacterial level showed all the five pathogens responded the X.pyrum extracts. This proves the presence of antibacterial activity in the chanks used in the present study. The detailed results are depicted in agar plates as pictures (1-12)*

CONCLUSION:

Animals have a numerous antimicrobial systems that often evolved as part of host defense mechanisms. Many of the antimicrobial agents inherent to animals are in the form of antimicrobial peptides (polypeptides). The current study agrees the above facts and correlated the results positively. The extracts were active against all the pathogens with average inhibition zone ranging from 3.3 to 24.10 mm. *P. mirabilis, K. pneumoniae, and E. coli* were relatively sensitive, while *S. paratyphii following V. Cholarae* were little resistant to the extracts.

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