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Extraction and screening of bioactive compounds with antimicrobial properties from selected species of molluscs and crustaceans

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The marine life constitute almost 80% of the world biota (MaCarthy & Pompon, 2004) and are source of unique natural products used as food, fragrances, pigments, insecticides, medicines etc. More or less 10,000 pharmacologically bioactive compounds have been derived from marine invertebrates such as tunicates, sponges, soft corals, sea hares, nudibranchs, bryozoans, sea slugs and other marine organisms (Fuesetani, 2000).

The secondary metabolites derived from number of marine animals possess antibiotic, anti parasitic, antiviral and anti cancer activities (Grabley & Thierick, 1999; Cooper 2004 a, b; Simmons *et al.*, 2005). The Tyrian purple an ancient dye pigment is the first natural product of marine origin reported in literature. It is generated from the hypobranchial glands of muricid gastropods is also found in their egg masses is known to chemically defend the developing larvae against microbial infection (Kirsten *et al.*, 2009; Benkendorff *et al.*, 2011). Beside that wide range of bioactive metabolites known to occur in sponge genera *Helicona, Petrosia* and Discodema that act as powerful anti-cancer and antinflamentary agents (Jha & Zi-rong, 2004). Marine toxins such as tetrodoxin, soxitoxins, ciguatoxins and brachtoxin serve as specific sodium channel blockers and are useful in neurophysiological and neuropharmaclogical studies (Kao & Levinson,1986; Dechraoui et al., 1999; Auyoung, 1999; Jha & Zi-rong, 2004).

Among marine invertebrates, marine molluscs are the good source of bioactive metabolites. The bioactive compounds extracted from many classes of molluscs exhibit antitumor, antileukemic, antibacterial and antiviral properties (Karniya *et al*., 1989; Pettit *et al*; 1988; Anand *et al*; 1997; Rajagangapathy et al; 2000). Bioactive agents have been reported from marine mulluscs such as Aplysia sp. (Stallard & Faulkner (1974), *Phyllidae* sp. (llagedone et al., 1999), bivalves (Jayaseeli, 2001), gastropods (Emmerson & Ayyakannu, 1992) and their egg masses. Chromodorolide-A isolated from *Chromocloris cavae* exhibits in vitro antimicrobial and cytotoxic activities (Kumar *et. al*., 2004). Similarly, ammonium sulfate precipitated protein (SF-50) isolated from the sperm theca gland of Telescopium sp., showed anti microbial effect on *Escherichia coli.* (Pakrashi, et.al. 2001). The anti microbial activity of oyster *Crassostrea madrasensis* and mussel *Perna viridis*, (Annamalai et al., 2007) winged oyster *Pteria chinensis* (Chellaram *et al*., 2004) have been tested in India. Information is also available on the antibacterial activities of horse mussel *Modiolus modiolus* (Haug et al., 2004). In Pakistan only such information is available on siphonarid gastropods (Bano, 2009).

The recent development in research on multi-drug-resistant bacteria suggests that animals living in unsanitary and unhygienic conditions have developed ways of protecting themselves against pathogenic microorganisms (Stix, 2006; Yoneyama & Katsumata, 2006; Wright & Sutherland, 2007; Bennett, 2008; Li & Nikadio, 2009; Fischbach & Walsh, 2009; Gootz, 2010;). Such animals could be a good source of antibiotics against human pathogens as it has been observed with cockroach research that cockroach brain tissue have powerful antibiotic properties and would serve as good source of antibiotics in future (Lee *et al*., 2010). Due to the emergence of antimicrobial resistance against antimicrobial compounds, the need to search for new antibiotic compounds originating from natural resources is emphasized. New antimicrobial agents are required to meet the challenge posed by the emergence of multidrug-resistant microorganisms.

The Manora Channel lies in south of the city of Karachi about 8 km from center of the city. The Channel is about 8 km long and 850 to 1000 m wide. The Channel receives effluents from Lyari River, which discharges its domestic and industrial effluents brought from the northwest region of Karachi city (Ahmed, 1977). The Channel also receives pollutants from Karachi Fish Harbour, shipyards, power plants and ships visiting the Karachi Port (Saleem &. Kazi, 1995). Despite being the hot spot of pollution, the Channel is a rich source of invertebrate and vertebrate fauna (Nazneen *et al*., 1994; Begum, 1998). Thus, it is reasonable to speculate that the resident animals possess potential and possibly novel antimicrobials to ward off infections. The overall aim of this study is to gather preliminary information on the antimicrobial activity of selected species of invertebrates from Manora Channel for potential use in the development of new antibiotics.

Biography

Kiran is Ph.D. Scholar doing her research in the field of Microbiology. She has done her graduation post graduation from University of Karachi Pakistan. After post graduation she persuaded her MS in the field of Marine Biology and her research work was based upon innate immunity of sea animals. She worked for journal of Pakistan medical students as regional chairperson. She has attended many conferences related with Biotechnology, Medical Science. She did many short courses for drug and molecular medicine from top medical college of Pakistan. She served as visiting lecturer in the top class medical college of Pakistan as Physiology Demonstrator.

She worked as Research Volunteer for one year in the Multi disciplinary lab MDL in the Aga Khan hospital Pakistan. Then She got fully funded Scholarship from Chinese Government for her Ph.D. in the year 2012-2015. Now days she is working on yeast and its cloning and biotechnological techniques. She is also working over her first publication whose abstract is submitted and will present in this conference.

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