Ethno-medicinal Uses of Some Shell Fishes by People of Krishn River Basin of South-Telangana, India

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A B S T R A C T
The present investigation was carried out to study the uses of shell fishes by People of Krishna River Basin of South-Telangana, India. It was found that after removal of shell and mantle of Pila, Bellamya, Lamellidens and Parreysia, the flesh of these molluscs in various forms consumed for the cure of some ailments of local people and also provide essential animal proteins, steroids, vitamins and minerals to the people of the region. The flesh of Pila and Viviparous sp. is used as medicine to cure asthma, swelling of joints, burns by aboriginal people of this region. The foot portion of these edible shell fishes is eaten in the form of curry as well as in roasted form at regular intervals. The soup of eggs of these species are also used as medicine and given to children suffering from rickets. The flesh of Lamellidens, is eaten in the form of cooked curry and given to people suffering from cardiac diseases and blood pressure. It was also observed that the local people of the region consumed these shell fishes to cure a number of other ailments such as rheumatism, calcium metabolism, heart diseases, conjunctivitis, giddiness, nervousness, dehydration and various gastro intestinal disorders.

Keywords: Krishna basin, shell fishes, South-Telangana, Diseases

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Molluscs have long provided a source of medicinally useful products for many cultures around the world. Bivalve mussels (Mytilidae) were used as therapy in ancient Crete (Kamm, 1997) and more recently have been subject to several patents as a source of antimicrobial (de Faire, 1999; Roch et al., 2001) and antiviral (Rothman, 1984; Bichurina et al., 2001) peptides. Molluscs also feature in a number of traditional medicines from South Africa (Herbert et al., 2003), India (Prabhakar & Roy, 2009) and China (Hu, 1980; Yeung, 1983). Several molluscan derived therapies are listed on the Homoeopathic Materia Medica (Boericike, 1999) and extracts from the New Zealand green-lipped mussel, Perma canaliculus, are included in the natural Medicines and natural products from molluscs are under development for pharmaceutical drugs (Simmons et al., 2005).

Recently, Ziconotide, derived from the venom of predatory cone snails, was the first marine drug to be approved for clinical use (Prommer, 2006), as a treatment for chronic pain. Dolastatin 10, and synthetic analogues, from the aplysian Dolabella auriculata are currently in Phase II clinical trials as anticancer agents (Madden et al., 2000). first identified from the saccoglossan Elysia rufescens (Lopez-Macia et al., 2001), as well as ES-285 from the bivalve Mactromeris polyynma have passed through Phase I clinical trials (Den Brock et al., 2005). There appears to be no correlation between the number of species from different molluscan taxa that are used in medicines and the number of species that have been subject to investigation in the natural products.

The lack of correlation is largely driven by the heterobranch molluscs, which rarely feature in molluscan medicines, despite intensive chemical investigation. Conversely, the Cephalopoda are used in a wide range of traditional medicines, but there are relatively few chemical investigations. Listings of Cephalopods in the Chinese Materia Medica include squid and cuttlefish (Sepia sp.) as ‘bone’, as well as the meat, ink and eggs from cuttlefish (Hu, 1980). Sepia ink is also listed in the homoeopathic Materia Medica for the treatment of depression (Cazalet, 2007). The internal shells of the species Spirula spirula were the most expensive marine invertebrate on sale at the traditional medicine market in Durban (Herbert et al., 2003). The medicinal applications of these species remain unknown and they are yet to be subjected to any detailed natural product investigations. Several species of chiton (Polyplacophora) were also amongst the most valuable marine invertebrate taxa reported in a survey of South African traditional medicines (Herbert et al., 2003).

Natural and traditional medicines from bivalve molluscs, primarily comprise ground shells, whole-body powders and mother of pearl from the subclass Pteriomorphia, including oysters (Ostreina), pearl oysters (Pterioida), clams (Arcoidea) and mussels (Mytiloida). Oyster shell lysate from Ostrea edulis provides a bioavailable form of calcium carbonate for osteoporosis patients (Fujita et al., 1990) and is used in the homoeopathic treatment of bone deficiencies (Cazalet, 2007). Oyster shell has also been shown to prevent gastric ulcers in vivo using a rodent model (Nie et al., 1994).

Oyster shell (Crassostrea gigas, Ostrea spp.) is used as a Chinese remedy to treat headaches, dizziness, palpitations, insomnia, sweating, leucorrhrea and uterine bleeding, whereas oyster extract powder (Crassostrea gigas) is promoted as a dietary supplement containing natural taurine and zinc for cardiovascular health, liver problems, arthritis, skin problems wound healing and resistance to infection. Several alkaloids have been isolated from Ostrea rivularis, a traditional Chinese medicine used to treat vertigo, tinnitus, pulmonary tuberculosis and to reduce phlegm (Ouyang, 2006).

Practically no information is available on the shell fisheries potential of the Krishna river basin and the uses of shell fishes as medicines to cure various ailments of the local people. Therefore, the objectives of present study is to provide information on the ethno-medicinal uses of shell fishes for the cure of a number of prevailing diseases in this wetland dominated region of South-Telangana.

2. Experimental

Krishna river of North-Telangana comprising districts of Warangal, Medak, and Sanga reddy urban areas and were selected for the present study. Shell fishes exploited by different categories of people in these three districts were collected. Extensive field trips were conducted regularly and data were collected after survey, interviews and on spot enquiries. The shell fishes were collected and preserved in 3% formalein and brought to the laboratory. The intact animals were washed thoroughly in running tap water and slightly decalcified in aqueous acidic medium to find out growth rings. The specimens were identified with the help of available literature (Sharma et al. 1983; Subba Rao et al. 1986). The collected specimens were submitted in the museum of University Department of Zoology, Kakatiya University, Warangal and Telangana, India. The uses of these shell fishes as food, medicines, vitamin supplements etc. were investigated after random sampling of different families, villages and block level people of the area.

3. Results and Discussion

The present study on the status of shell fisheries and their ethno-medicinal uses by the inhabitants of the area of South-Telangana reveals that the river basin of this region is rich in diversity of molluscan and crustacean fauna. The diversity, abundance and dominance of shell fishes indicate well established balanced ecosystem for supporting a complex food web exists in this basin. The abundance of shell fishes in terms of species diversity indicates a good life support system for fishes and birds. Shell fishes are the major component of the macro-invertebrates, they form link between zooplankton and vertebrate taxa, such as fishes and birds and play a key role in the energy flow and bio-
geochemical cycle of the wetland habitats. A number of fish and avian fauna diversity directly depend upon the molluscs population of these habitats. The commercial aspect of shell fishes as raw material for food, finance, recreation, medicines, vitamins and minerals supplements etc., for local human population and ecological aspect for increasing biological diversity and maintaining ecological balance for the animals occupying the higher trophic level of the food chain. Thus, the considerable scope with respect to the shell fisheries for their medicinal value and these resources need judicious utilization on commercial basis to generate employment opportunity and enhance the income of the local people.

A) Collection of mussels from Krishna River
B) Removal of Nutritional and medicinal parts of pila species
C) Liquid of pila species

Nutritional and Medicinal Uses of Some Edible Gastropoda, Pelecypoda and Crustacea

The foot of Pila sp; Bellamya sp; Lamellidens sp; and Parreysia sp is large, muscular, rich in proteins, vitamins (A, B, D) and minerals but is fat free (omega-3 fatty acids). It is used as main nutritional element in the form of soup, curry as well as roasted by aboriginal and their allied of Krishna region of South- Telangana. The visceral mass is also used as food in curry form after elimination of gastrointestinal tract in one hand and on other hand the muscular parts such as hepatopancreas of Paratelphusa sp. and entire muscular pars of Macrobrachium sp. are also rich in proteins, vitamins and minerals but is not fat free because these animals contain enormous amount of fat body which are used as food. Thus, Paratelphusa and Macrobrachium are calorigenic and these provide energy rich food to the local people.

Table 1

<table>
<thead>
<tr>
<th>S.No</th>
<th>Disease</th>
<th>Species used to cure diseases</th>
<th>Method of application for cure of diseases</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Blood pressure</td>
<td>Parreysia species</td>
<td>Soup prepare the from the foot of Parreysia sp.</td>
</tr>
<tr>
<td>2</td>
<td>Cardiac ailments</td>
<td>Lamellidens sp</td>
<td>Soup prepared from the foot of Lamellidens Sp. and Parreysia sp. is used to cure the cardiac ailments and to control blood pressure</td>
</tr>
<tr>
<td>3</td>
<td>Asthma</td>
<td>Bellamya sp.</td>
<td>Soup prepared from the foot of Bellamya sp is used to cure these diseases.</td>
</tr>
<tr>
<td>4</td>
<td>Arthritis</td>
<td>-do-</td>
<td>Soup prepared from the foot of Bellamya sp is used to cure these diseases.</td>
</tr>
<tr>
<td>5</td>
<td>Joint pain</td>
<td>-do-</td>
<td>Soup prepared from the foot of Bellamya sp is used to cure these diseases.</td>
</tr>
<tr>
<td>6</td>
<td>Rheumatism</td>
<td>-d-</td>
<td>Soup prepared from the foot of Bellamya sp is used to cure these diseases.</td>
</tr>
<tr>
<td>7</td>
<td>Conjectivities</td>
<td>Bellamya bengalensis</td>
<td>To get cured from conjunctivitis, Bellamya bengalensis are collected from pond and are kept in clean fresh water in a earthen pot for night and the water is used like eye drop. This method is</td>
</tr>
</tbody>
</table>
8  Giddiness and dehydation  Lamellidens sp  The shell powder of Lamellidens sp. mixing dehydration with honey is used for the remedy of giddiness and dehydration.

9  Nervousness  Lamellidens sp  The shell powder of Lamellidens sp. mixing dehydration with honey is used for the remedy of giddiness and dehydration.

10 Night blindness  Bellamya sp. Pila sp  Curry of the foot of Bellamya sp is eaten regularly by aboriginal people of Krishna region to cure night blindness and for better eye sight.

11 Anaemia  Paratelphua Sp. Macrobra chium Sp.  Soup and curry prepared from these shell fishes, helpful in the cure of anaemia and vitamin deficiencies; cure paralysis, promote strength; cure arthritis.

Negi and Palyal (2007) studied the traditional used of animal and animal products in medicine and rituals by the Sloka tribes of district Pithoragarh, Uttaranchal (India). They observed that the meat of Paratelphusa is believed to a promoter of strength, corpulence and is a good remedy for the diseases of the blood. Roy and Singh (2007) have investigated the ethno-medicinal uses of animal diversity by the tribal people of Santhul Pargana (Jharkhand: India) and found that termites, earthworms, Pila Unio, frog, snakes, rat, pigeon, are taken as food for the cure of rheumatism, asthma, anaemia, promote digestion, muscle dystrophy, promote lactation, cure tuberculosis, cure paralysis, regulate menstrual disorder etc. The local treatment procedures using indigenous method to cure a number of diseases is called horopathy in the region. In the similar manner in the region of North-Bihar, which is wetland dominated the use of shell fishes in the treatment of a number of diseases on one hand and daily food item on the other hand are common practice. Therefore, the conservation and management of these shell fishes are necessary for the sustenance of local people. The uses of shell fishes as ethno-medicines in Krishna basin is a traditional medical practice. Ethno-medicinal studies are health care practices, the prevalence of illness and the distribution of Knowledge about illness attributes. Of all the shell fishes studied Pila and Lamellidens are exploited by the local people for the cure of rickets in children, control of blood pressure and cure of cardiac diseases (Table 1 and Fig1), cure of night blindness. Paratelphusa and Macrobrachium are generally used to compensate the nutritional deficiency, minerals and steroids requirement. These shell fishes are consumed by high income populations and are used to cure anaemia and to overcome vitamin deficiency. There is acute pressure on these shell fishes in the Krishna river basin as local human population exploit them recklessly. Consequently there is declining trend in the propagation of these shell fishes in the region. The conservation and management of these shell fishes are needed for the maintenance of good health and free from diseases among local people of the region. The general ecological conditions prevailing in Krishna basin of South-Telangana is congenial for the propagation and sustenance of shell fisheries in the region. The general limnological conditions viz. pH always in alkaline range, normoxic water, absence of FCO2, presence of CO3 - alkalinity, silicate is appreciably in low quantities, PO4 - is in very meagre amount, NO3 is in moderate amount and total hardness in less amount of the Krishna river basin indicate good physico-chemical condition for the propagation growth and maintenance of shell fishes.

The local inhabitants directly depend on these shell fishes for food and also to supplement multinomial deficiency. In this rural region the shell fisheries is the only solution for the protein-rich food demand of the local people as both high cost and low cost proteins for both high income and low income populations may get through these. Shell fishes grow in combination with paddy, Makhana (Furryale ferox) Shinghara (Trapa bispinosa) and other aquacultural programmers offer a highly efficient way of expanding animal protein supporting in a protein hungry world. It was observed that Unio, Pila and Parreysia (including shell) dominates in food in one hand and in crustaceans Crabs (Paratelphusa spinigera) and prawn (Macrobrachium sp.) on the other hand. Shell fisheries are a solution to the world food problem because it is easily available source of low cost animal protein for lower income populations. The shell of Pila sp. Unio sp. Parreysia sp. are used as lime, button, healing wounds and their been used could also for magico-religious purposes.

4. Conclusion
Maintaining good health and a sense of well-being are top priorities for many people today. Both health and well-being are strongly related to diet. The relationship of diet to overall health and the effect of diet on the incidence of certain chronic illnesses, such as heart disease, diabetes and cancer, continue to be active areas of nutrition research. Compared to the past, people today are generally more careful in managing their diets to reduce the chances of contracting life-threatening diseases. People are also paying more attention to better manage any diseases they may already have and to change their lifestyles to sustain longer and healthier lives. Based on current dietary recommendations, this paper states that whether shellfish should be included in a healthful diet.

5. Acknowledgements
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6. References