



Journal of Pharmaceutical and Biological Research

Journal Home Page: www.pharmaresearchlibrary.com/jpbr



Review Article

Open Access

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

Swapna Padidela, T. Ravinder Reddy*

Laboratory of Eco-physiology and toxicology, Department of Zoology, Kakatiya University, Warangal, Telangana, India

ABSTRACT

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

ARTICLE INFO

CONTENTS

1. Introduction	250
2. Materials and Methods	250
3. Results and discussion	250
4. Conclusion	252
5. Acknowledgement.	252
6. References	253

Article History: Received 05 March 2015, Accepted 09 April 2015, Available Online 21 June 2015

*Corresponding Author

T. Ravinder Reddy
Department of Zoology, Laboratory of
Eco-physiology and toxicology, Kakatiya
University Warangal, Telangana, India
Manuscript ID: JPBR2509



PAPER-QR CODE

Citation: Swapna Padidela, et al. Ethno-medicinal Uses of Some Shell Fishes by People of Krishn River Basin of South-Telangana, India. *J. Pharm. Bio. Res.*, 2015, 3(1): 249-253.

Copyright © 2015 Swapna Padidela, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

1. Introduction

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 Homeopathic Materia Medica (Boericke, 1999) and extracts from the New Zealand green-lipped mussel, *Perna 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 aplousioid *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 polynyma* 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.) “bone”, as well as the meat, ink and eggs from cuttlefish (Hu, 1980). *Sepia* ink is also listed in the homeopathic *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 Pteriomorpha, including oysters (*Ostreina*), pearl oysters (*Pterioidea*), clams (*Arcoidea*) and mussels (*Mytiloidea*). 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 homeopathic 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, leucorrhoea 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% formalin 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 hepato- pancreas of *Paratelphusa* sp. and entire muscular parts 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

S.No	Disease	Species used to cure diseases	Method of application for cure of diseases
1	Blood pressure	<i>Parreysia species</i>	Soup prepare the from the foot of <i>Parreysia sp.</i>
2	Cardiac ailments	<i>Lamellidens sp</i>	Soup prepared from the foot of <i>lamellidens Sp.</i> and <i>Parreysia sp.</i> is used to cure the cardiac ailments and to control blood pressure
3	Asthama	<i>Bellamya sp.</i>	Soup prepared from the foot of <i>Bellamya sp</i> is used to cure these diseases.
4	Arthritis	-do-	Soup prepared from the foot of <i>Bellamya sp</i> is used to cure these diseases.
5	Joint pain	-do-	Soup prepared from the foot of <i>Bellamya sp</i> is used to cure these diseases.
6	Rheumatism	-d-	Soup prepared from the foot of <i>Bellamya sp</i> is used to cure these diseases.
7	Conjectivities	<i>Bellamya bengalensis</i>	To get cured from conjunctivitis, <i>Bellamya bengalensis</i> 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

			considered best for the cure of this disease in this region.
8	Giddiness and dehydration	<i>Lamellidens sp</i>	The shell powder of <i>Lamellidens sp.</i> mixing dehydration with honey is used for the remedy of giddiness and dehydration.
9	Nervousness	<i>Lamellidens sp</i>	The shell powder of <i>Lamellidens sp.</i> mixing dehydration with honey is used for the remedy of giddiness and dehydration
10	Night blindness	<i>Bellamya sp.</i> <i>Pila sp</i>	Curry of the foot of <i>Bellamya sp</i> is eaten regu- <i>Pila Sp.</i> larly by aboriginal people of Krishna region to cure night blindness and for better eye sight.
11	Anaemia	<i>Paratelphua Sp.</i> <i>Macrobrachium Sp.</i>	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 Santhal 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 (*Furyale 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

We sincerely thank to Dr. S. Venkateshwarulu for the identification of molluscan species and to the Head, Department of Zoology, Kakatiya University, Warangal, for the providing laboratory facilities.

6. References

1. Kamm, R. (1997). Mussels as therapy in ancient Crete. *Sudhoffs Arch Z Wissenschaftsgesch* 81, 235–237.
2. De Faire, J. (1999). Use of an antimicrobial composition. Patent Number WO9909835.
3. Rothman, U.S.E. (1984). Polypeptide fraction isolated from the haemolymph of the common mussel for use as an antiviral medicine. Patent No. SE431215.
4. Herbert, D. G., Hamer, M. L., Mander, M., Mkhize, N. & Prins, F. (2003). Invertebrate animals as a component of the traditional medicine trade in KwaZulu-Natal, *South Africa. African Invertebrates* 44, 327–344.
5. Prabhakar, A. K. & Roy, S. P. (2009). Ethno-medical uses of some shell fishes by people of Kosi River Basin of North-Bihar, India. *Ethno-Medicine* 3, 1–4.
6. Yeung, H-C. (1983). *Handbook of Chinese Herbal Formulas*. Institute of Chinese Medicine, Rosemead, LA, USA.
7. Boericke, W. (1999). *Homeopathic Materia Medica, 9th Edition*, presented by Medi-Winhomeo Books. Available online homepage.ntlworld.com/homeopathy/advice/Remedies/materia medica.
8. Simmons, T. L., Andrianasolo, E., McPhail, K., Flatt, P. & Gerwick, W. H. (2005). Marine natural products as anticancer drugs. *Molecular Cancer Therapeutics* 4, 333–342.
9. Prommer, E. (2006). Zinconotide: A new option for refractory pain. *Drugs of Today* 24, 369–378.
10. Madden, T., Tran, H. T., Beck, D., Huie, R., Newman, R. A., Puzstal, L., Wright, J. J. & Abbruzzese, J.L (2000). Novel marine-derived anticancer agents: a phase I clinical, pharmacological and pharmacodynamic study of dolastatin 10 (NSC 376128) in patients with advanced solid tumors. *Clinical Cancer Research* 6, 1293–1301.
11. Lopez-Macia, A., Jimenez, J. C., Royo, M., Giralt, E. & Albericio, F. Synthesis and structure determination of kahalalide F (1,2). *Journal of the American Chemical Society*, **2001**, 123: 11398–11491.
12. Fujita, T., Fukase, M., Miyamoto, H., Matsumoto, T. & Ohue, T. (1990). Increase of bone mineral density by calcium supplement with oyster shell electrolysate. *Journal of Bone & Mineral Research* **11**, 85–91.
13. Ouyang, M. A. (2006). A new adenosyl-alkaloid from *Ostrea rivularis*. *Natural Product Research* 20, 79–83.
14. Sharma UP, Roy SP, Rai DN (1983). Aquatic Molluscs of Bhagalpur. *J Biol Bull India*, 5(2): 147- 155.
15. Subba Rao NV, Mitra SC (1982). Bioecology of two Malaniid Snails (*Mollusca: Gastropoda*) in a pond near Calcutta. *Bull Zool Surv India*, 34(1 and 2): 21-34.
16. Negi CS, Palyal VS (2007). Traditional uses of animal and animal products in medicine and rituals by the Shoka tribes of district Pithoragarh Uttaranchal, India. *Ethno-Med*, 1(1): 47-54.
17. Roy SP, Singh BK (2007). Ethno-medicinal uses of animal diversity by tribal people of Santhal Pargana in Jharkhand, India, In: AP Das, AK Pandey (Eds.): *Advances in Ethno-botany*. Dehra Dun: Bishen Singh Mahendra Pal Singh, pp. 211-217.
18. Byrd-Bredbenner, C., Moe, G., Beshgetoor, D., and Berning, J. (2009). *Perspectives in Nutrition*. Eighth Edition. McGraw-Hill, New York. 686 pp. Department of Health and Human Services and the Department of Agriculture as the *Dietary*
19. Food and Nutrition Board. (2004). Dietary Reference Intakes (DRIs): Tolerable Upper Intake Levels (UL), Elements. Food and Nutrition Board, Institute of Medicine, National Academies Press and Washington, D.C.
20. King, I., Childs, M.T., Dorsett, C., Ostrander, J.G. and Mosen, E.R. (1990). Shellfish: proximate composition, minerals, fatty acids, and sterols. *J. Am. Diet. Assoc.* 90: 677.
21. Muller, O. and Krawinkel, M. (2005). Malnutrition and health in developing countries. *Can Med Assoc J.* 173: 279.
22. Herbert, D.G., Hamer, M.L., Mander, M., Mkhize, N. & Prins, F. Invertebrate animals as a component of traditional medicine trade in KwaZulu-Natal, South Africa. *African Invertebr.* **2003**, 44: 327–344.
23. Cazalet, S. (2007). *Materia Medica: Repertorium Homeopathicum (Reversed Kent's Repertory)* Homeopathe International. [http://www. homeoint. org/hidb/kent/index.htm](http://www.homeoint.org/hidb/kent/index.htm). Accessed online.
24. Hu, M.Y.; Sucré, E.; Charmantier-Daures, M.; Charmantier, G.; Lucassen, M.; Himmerkus, N.; Melzner, F. Localization of ion-regulatory epithelia in embryos and hatchings of two cephalopods. *Cell Tissue Res.*, **1980**, 339, 571–583.