

A review on potential medicinal usage of aquatic sources W. S. R. to freshwater snail for anorectal disorders in traditional system of medicines

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Abstract

Nowadays environmental changes and increased populations are threatening the natural source of drugs in such a way that the whole world is dependent on the drugs prepared from synthetic procedures, unlike natural sources they are compounds that might cause allergic reactions and complications in humans. In the olden days, humans completely relied on nature as they knew the importance of ecology and various ways to protect nature from encroachment. Due to overburdening of the population and encroachment of the forest, an umpty number of natural sources are currently becoming endangered and extinct. Many natural sources have the potent activity to curb infections from bacteria, fungi, viruses, parasites, etc, and also have anti-cancer properties, etc. Searching for an alternative source for endangered species of different natural sources is the need of the hour. So, this review article gives an insight into the medicinal usage of marine sources snails in the Indian traditional system of medicine concerning Ano rectal disorders.

Keywords: Ano-rectal diseases; Ayurveda; Siddha; Indian traditional system; Water snail

1. Introduction

More than 70% of the world is covered with water, which gives an insight us to look through water origin sources for the management of various diseases. Marine pharmacology is a developing science in the current era; it has so many treasures in hidden forms. Marine plants and animals are unique in their genetics and biochemical activity. Many sea origins like coral, pearl, oyster, conch, cowrie, and Snails have so many medicinal uses. Even in modern medicine, marine sources play a vital role in drug development. Not only from marine sources, traditional system medicines in India have a practice of medicines also from freshwater sources. Ayurveda and Siddha systems of medicine are the major traditional systems in India. Both the sciences have so many treasures it which are not at all fully disclosed to the world. Snail from fresh waters has more medicinal value in anorectal disorders as folklore, they use complete snail with mollusk as a dish for hemorrhoids and fissure in ano. In the Siddha and Ayurveda systems of medicine, they use snails in Bhasma form after certain processing techniques in anorectal disorders and duodenal ulcers.

2. Importance of marine drugs in modern pharmacology

Marine sources of drugs are the newly developing area in the field of modern pharmacology. Streptomyces species of the Indian coastal waters have an important role in the production of antibiotics ^[1]. Eicosapentaenoic acid isolated from *phaedactylum tricorntutum* is effective in a multidrug-resistant variety of *Staphylococcus aureus* ^[2]. Extract of green

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seaweed *Ulva reticulata* having neuroprotective activity currently approved for Alzheimer's^[3]. Currently, many drugs are available in the market like cytarabine for different types of leukemia, vidarabine for Kerato conjunctivitis, ziconotide as a potent analgesic drug, trabectedin for soft tissue sarcoma and relapsed cases of platinum-sensitive ovarian cancer.^[4]

3. Aquatic sources of medicinal drugs in ayurveda

In modern medicine, marine pharmacology is developing in recent days. But in our traditional ayurvedic system of medicine, many aquatic sources of drugs which are mentioned in our Samhitas before 2000 yrs ago in *Annapana Adhyayam* of *Sutrasthanam Acharya Charaka* mentioned a quote of *Vaarishayam*.^[5] They know both the medicinal importance as well as the harmful effects of aquatic sources in older days. For example, In *Charaka Samhita*, Charaka categorized the *chilichima* variety of fish as *apathya ahara* and *rohita* types of fish under *pathya ahara*.^[6] *Shankha* (Conch), *Sambukam* (Snail), *Pravalam* (Corals), *Muktha* (Pearl), Shukthi, Kapardhika, Samudra lavanam, and also some Ratnas are mentioned in Ayurveda Shastra with its method of preparation and its potential therapeutic uses.

4. Aquatic sources of medicinal drugs in the siddha system of medicine

The Siddha system also has so many unique aquatic sources of drugs which are mentioned in older days in textbooks. *Sangu*, *Muthu*, *Muthu Chippi*, *Pavalam Nathai*, *Aamai* (Tortoise), Soli, Kadal Kal, Pooneer Etc., it also contains various types of medicines along with their preparatory methods, mode of administration, and their therapeutic uses. The Siddha system of medicine also contains many *Rasamarundhugal*, and *Perumarundhugal* which are prepared using these marine raw drugs.

5. Incidence of anorectal disorders and its necessary for traditional medicines intervention

Nowadays Anorectal disorders are categorized under lifestyle disorders due to various lifestyle and dietary modifications. Sedentary lifestyles, Lack of fiber intake are the major reason for the preponderance and prevalence of anorectal disorders. Management of Ano rectal diseases requires surgery as the major treatment option in modern medicine. The percentage of recurrence and fear about surgery from the patient side is a major drawback in the management of Ano rectal diseases. Unlike modern medicines traditional system of medicines has a lot of options other than shastra karma (Surgery). Agni karma (cautery), and Ksharakarma (alkaline paste or thread) are the major two options in Ayurveda same way chutigai and Karanool chikitsai are available in the Siddha system also. The main drawback of the traditional system from the patient's side is a lack of quick action and relief but both the above treatment modalities achieve it through their specific actions, in these modalities both the chance of recurrence and worry about the surgical intervention is rectified through its astounding results.

5.1. Utility of freshwater snails in traditional system

Pile globose from the ampullariidae family commonly called apple snail is the major variety of freshwater snails used for anorectal disorders in the traditional system of medicines through various methods of preparation and mode of administration. In folklore, they are directly collecting the snail from fresh water like ponds and preparing them as a dish for hemorrhoids and fissures. So much research has already been conducted on this snail in the traditional system of medicine including the toxicity study of nathai parpam. The mollusc of pila globose has several valuable medicinal uses, local people of the Kosi River basin of the north Bihar region use these snails because it has essential animal proteins, steroids, vitamins, and minerals. With this snail, they are treating various disorders like rheumatism, calcium metabolism, heart disease, conjunctivitis, and various GIT disorders.^[7]

6. Physicochemical and nutritional values of pila globose

Pile globose have rich protein content and glycolipids especially it is having oleic, lauric, and palmitic type of fatty acids. It has Neutral lipid 22.61%(approx.), glycolipid 56.65% (approx.), A phospholipid is 18.71% (approx.) of its total lipid content. In general, it has 21.47% protein, 1.80% of fat, 75.31% of moisture, and 1.31% of ash content in it. ^[8] The above study reveals it is a rich protein source with low lipid content that too essential fatty acids in its composition.

7. Possible mechanism of wound healing in fissure in ano

Cephalopods have layers of collagen fibers on the outer and inner muscle surfaces. The nacreous Layer of the snail has so many biomedical uses. The outer layer or periostracum is a mixture of a protein called conchin it is very useful to

rebuild collagen. Collagen has importance in all stages of wound healing with its chemotactic nature by attracting the fibroblast to the wound site. and the inner layer has calcium carbonate in it. Studies reveal that calcium-based nanoparticles accelerate wound healing both intravenously and as an external application by the release of ionized calcium in the wound bed which disintegrate the acidic wound microenvironment. [9]

8. Importance in gastrointestinal disorders

The main component of snails is 80 % water content, which may help in the formation of stools. The presence of calcium compound might be the most important factor of snails in its action on GIT and ANORECTAL diseases. Study reveals that an increase in 100 mg/day of calcium lowered the risk of colorectal cancer by 5 % and 1000mg/day intake of calcium decreased the incidence by 37% of colorectal cancer and 50% of colon cancer.[10]

A randomized double-blind trial in patients with a history of colorectal adenomas revealed 1200 mg/day of calcium supplement has a significant reduction in the risk of recurrent colorectal adenomas. [11]. It is because of the ability of calcium to combine with bile salts in the intestines reducing the rectal epithelial proliferation rate. [12]. Snails have a rich fat composition in them that it is softening the stool and relieve the patient from constipation which is the major cause of many anorectal disorders.

9. Conclusion

Marine pharmacology is an emerging science and Ayurvedic preparations also need scientific validation even though it is mentioned in shastra. The above review gives knowledge about the aquatic drugs that will help the AYUSH fraternities to develop new research-based concepts and formulations. Freshwater snail has very good wound healing activity and their chemical compositions work in many GIT disorders also, so they will work in anorectal disorders which already exist in traditional practices.

Compliance with ethical standards

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Disclosure of conflict of interest

No conflict of interest to be disclosed.

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