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The Medical Importance of Snails " A review"

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A B S T R A C T

This research article provides a comprehensive review of the medical importance of snails from a medical standpoint, whether negative or positive on humans and animals, and whether their effect is direct or indirect. The medical importance of snails in general is in two ways: either as a carrier of disease or as a source of therapeutic agents. There are many aquatic snails that are considered intermediate hosts for parasitic flatworms. Some of them contribute to the spread of schistosomiasis, for example, and it causes great concern for public health. This disease may lead to chronic disease and can lead to severe damage to some organs of the body. Some marine snails, such as cone snails, produce conotoxins. This toxin is a biologically active compound with pharmaceutical potential. It is a powerful neurotoxin that is being studied for its analgesic properties and the possibility of using it as new painkillers. The study of snail biology and their interactions with parasites and bioactive substances offers promising approaches to combating diseases and developing new medical treatments. This study was supported by pictures and diagrams of the life cycle of some snails to clarify some concepts.

1. INTRODUCTION

Snails have attracted the attention of researchers in the field of pathology, especially aquatic snails. Snails represent a diverse group of molluscs that live in various terrestrial and aquatic environments, both salty and fresh, around the world. They play important ecological roles and this comes thanks to their different and diverse environmental adaptations in addition to the roles and stages of their life [1-3]. In this introduction, we see a general overview of the importance of medical snails and their direct or indirect impact on the environment, public health, and pathology. They play an important role in transmitting some transmissible and endemic diseases between humans and animals, as they are secondary hosts for many types of parasites that cause us many diseases, such as schistosomiasis and *fasciola*. There are many different helminth diseases in which these parasites urgently need these snails as a secondary or tertiary host to complete a stage of their life cycle in order to spread the disease to others. Here, we must know the importance of these snails as a secondary or intermediate host, which is essential for understanding the dynamics of parasitic diseases in

systems. On the one hand, they contribute to combating diseases by maintaining the delicate balance of this ecosystem, in addition to their contribution to consuming and breaking down organic materials and thus contributing to the decomposition process and releasing essential nutrients back into the water, thus feeding aquatic plants and supporting the food chain, other than snails and the extent of their contribution. Accumulation of organic materials can occur, leading to imbalances such as excessive growth of some organisms and not others, which leads to an increase and environmental imbalance that gives us an increase in the number of microbes and viruses and an attempt to violate the laws of the selective systems of nature, thus increasing epidemics, diseases, and health problems for the individual and society [4,6,7,44,45]. On the other hand, the mission of snails contributes to treating many diseases and injuries, such as burns and treating the effects of skin inflammation and acne. They contribute to clearing and purifying the skin and the skin through their secretion of the mucous substance that snails use to skate on. It represents the way snails move, especially terrestrial snails, and it is secreted in abundance in some types, such as snails. African because this substance is mucous and a chemical composition composed of compounds that are of great benefit to the skin and treat

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it from pigmentation and dead cells, and this is what you find popular in tourist [47-49].

There is a family of Conidae (cone snails), which are marine snails that produce a toxic compound that contains conotoxins, which are complex peptides that have strong and specific effects on the nervous system.

Specifically, ion channels. Research in the field of conotoxins has led to the development of a new type of analgesic such as ziconotide, which is used to treat severe pain in some patients with chronic pain who do not respond to pain medications [65].

Thus, understanding the medical importance of snails includes prevention and treatment of some discovered diseases, and continuing research generates the innovation of new treatments and clear mechanisms in understanding the medical field of snails.

2. MATERIALS AND METHODS,

Most work methods begin by collecting snails according to their terrestrial or aquatic environment, using multiple methods such as manual collection, scanning net, or catching them. These snails are then diagnosed and classified according to their taxonomic characteristics using taxonomic keys. Sometimes molecular techniques are used to determine the types of snails if this is difficult. Then, Examining the snail or dissecting it and using different techniques to detect the presence of larvae or parasitic eggs, such as sedimentation and filtration, or using PCR techniques or some serological and immunological studies to diagnose snails (ELISA), or sometimes it does not require dissecting it, but simply collecting samples of the mucus it secretes to take it. Samples for the purpose of making smears to develop a bacterial culture or to reveal the chemical description of the mucus, how many compounds, and analyze them for their components, or to use methods to extract a specific compound or substance that has an effect or effectiveness, and this is done through biochemical tests and methods [7,8,9,10,11,12,47,48,49].

Most of the diseases that snails contribute to in completing their life cycle as an intermediary and thus contribute to the spread of diseases and epidemics are dioecious parasites with hosts. This process begins as soon as the eggs leave the body of the final host, passing through the intermediate host until the parasite's morphological transformation and the departure of the intermediary. This is what is shown through the life cycle of one of the parasites that It needs a shell to complete its life cycle [12,13].

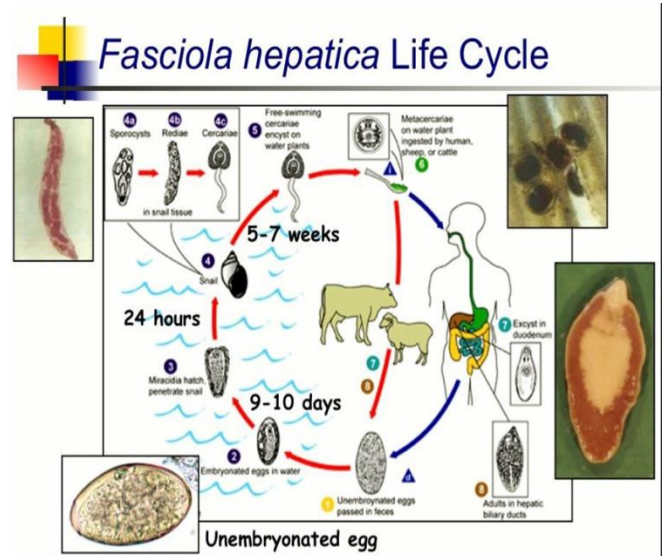


Figure 1. A picture of the life cycle of *Fasciola hepatica* that need intermediated hosts [13]

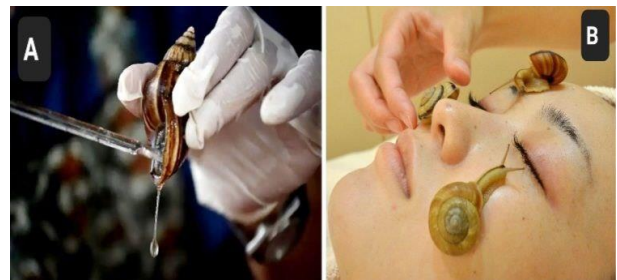


Figure 2. A shows the mucus secreted by the snail, B represents how the snail is used to clean the skin and crawl over the face [50,51]

Here we mention the most important research that is concerned with explaining the medical importance of snails as a mediator or as a direct influence. The research results of this article reached a number of types of snails studied in various medical fields, which are as follows:

Very extensive studies have talked about types of snails as an intermediate host for many parasitic diseases and the importance of the role of the secondary host in completing the parasite's life cycle. There were many types of snails, including:

- Important intermediate hosts of the parasitic schistosomiasis, an important disease and global public health concern e.g. *Biomphalaria* snails [7,17,18,31,32,33,38,42,45] , As an intermediate host for many trematodes, such as *Fasciola hepatica*, Hypodermic cysts and *Echinostoma spp.* Studies have shown an increase in infection rates with this type of parasite, which includes snails of this category, and this indicates its role as an important intermediate host, as in

Planorbidae snails [30,36,37, 40,41] , as an intermediate host for *Fasciola hepatica*, a worm that causes fascioliasis in humans and livestock. Most studies talk about the susceptibility of *Lymnaea* groups to infection with *Fasciola hepatica*. The majority of studies also talk about the genetic diversity of the same group, the genetic strains of snails as in the group Lymnaeidae snails [15,17,37,40,44] , As an intermediate host for various trematodes that infect fish, it has an indirect impact on public health and ecosystems, and its examples are many, as in Physidae snails, such as *Physa acuta*, *Echinoparyphium spp.* and *Diplostomum spp.* [17,19,20, 256 ,30, 33,42] And also Melanopsidae snails [14,20, 25,33] And another group Valvatidae snails *Valvata spp.* such as *Echinoparyphium spp* [,23,26] , Thiariidae snails like *Centrocestus spp.* and *Echinostoma spp* [24,25] , Ampullariidae snails includes snails like *Pomacea spp.* and *Marisa spp.* [28,29,47]

• The second part of the research includes studies on the mucous secretions of various snails, especially terrestrial ones. Either it is included in a specific drug to treat and clear the skin, or the use of mucus by adding other substances to aid in bacterial treatment, or survey studies on the mucous secretions of a specific snail for the purpose of knowing its efficiency in inhibiting the action of certain bacteria [52,53,54,55, 56,57,58,59, 60,61, 62,63].

3. CONCLUSIONS

Snails play an essential role in the medical field and transmit diseases or help spread or infect them. This comes through what snails play in the life cycle of various parasites, as they facilitate their growth and complete reproduction, and without them, the parasite cannot cause infection and spread the epidemic. It has also been found that snails contribute to the treatment of some disease conditions and infections spread in the skin with the help of their mucous secretions. Snails are of high nutritional value through the minerals and vitamins they contain, which contribute to strengthening the individual's immunity, especially marine ones, and the damage these organisms cause is not far from the medical field. In environmental systems, especially aquatic systems, to increase bacterial and environmental pollution and thus increase and localize transmissible diseases.

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Arabic Abstract

يعرض هذا المقال مراجعة شاملة الأهمية الطبية للقواقع ، سواء كانت سلبية أو إيجابية على الإنسان والحيوان، وما إذا تأثيرها مباشر أو غير مباشر. وجاءت الأهمية الطبية للقواقع بشكل عام في ناحيتين: إما باعتبارها ناقلة للمرض أو كمصدر للعوامل العلاجية. هناك العديد من القواقع المائية التي تعتبر مضيئاً ثانوياً للديدان المسطحة الطفيلية. فبعضها يساهم في انتشار مرض البلهارسيا مما يسبب قلقاً كبيراً على الصحة العامة. وقد يؤدي هذا المرض إلى الإصابة بمرض مزمن ويمكن أن يؤدي إلى أضرار جسيمة في بعض أعضاء الجسم. أو تنتج بعض القواقع البحرية، مثل القواقع المخروطية، سمومًا ككونوتوكسينية. هذا السم هو مركب نشط بيولوجياً وله إمكانات صيدلانية. وهو سم عصبي قوي تتم دراسته لخصائصه المسكنة وإمكانية استخدامه كمسكنات جديدة للألم. تقدم دراسة بيولوجيا الحلزونات وتفاعلاتها مع الطفيليات والمواد النشطة بيولوجياً أساليب واعدة لمكافحة الأمراض وتطوير علاجات طبية جديدة. وقد تم دعم هذه الدراسة بالصور والرسوم البيانية لدورة حياة بعض القواقع لتوضيح بعض المفاهيم.
