

Editorial

Lichen Compounds: Promising Molecules to Combat Neglected Parasitic Diseases

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EDITORIAL

Neglected Tropical Diseases (NTD) are a diverse group of diseases that prevail in tropical and subtropical conditions in 149 countries, affecting more than 1 billion people. Among the NTDs classified by WHO are listed parasites such as trypanosomiasis, leishmaniasis, schistosomiasis, dracunculiasis, filariasis, onchocerciasis and geohelminthiasis. The number of people affected by these diseases is higher in regions of greater poverty, and there is a direct relationship between the prevalence of these diseases and the human development index (HDI) [1].

Research aimed at the study and control of Neglected Diseases is encouraged by public and private research centers, but scientific production is hardly reversed in therapeutic advances such as new drugs, diagnostic methods and vaccines. The main reason given for the therapeutic deficit in this field is the low interest of the pharmaceutical industry, since being endemic diseases in low-income populations, mostly in developing countries, the potential for profitable return to these industries would be minimal [2].

Lichens, symbiotic associations between fungi and algae, produce substances that are classified into intracellular products (proteins, carbohydrates, vitamins and carotenoids) and extracellular (secondary metabolites). The various metabolites produced by lichens are organized into different classes, such as the classes of depsides, depsidones, dibenzofurans, xanthenes, benzyl esters, anthraquinones, among others, which have a high biotechnological potential, already reported in several scientific studies [3, 4].

The use of lichens is diverse and ancient. Different genera of lichens are used to treat various diseases such as fevers, diarrhea, skin diseases, epilepsy, seizures, asthma, bronchitis, inflammation, leprosy, gallbladder stones, etc. [5]. It is noteworthy, however, that despite the growing interest in research that seeks to elucidate the potential of these biomolecules in several areas of biological sciences and medicine, research aimed at combating parasitic diseases is still scarce.

Research has shown the efficacy of usnic acid in *in vitro* tests against the parasites *Schistosoma mansoni*, *Leishmania*

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infantum chagasi and *Trypanosoma cruzi*, causing extensive damage to cell membranes and cytoplasmic components of protozoa and tegumentary damage in *S. mansoni* helminth [6-8]. Other metabolites such as galactomannan isolated from *Ramalinacelastris*, as well as the depside and triterpenes of *Pseudocypbellaria coriifolia*, also presented promising antiparasitic activity on *L. amazonensis* and *T. cruzi*, respectively [9,10].

Recent studies have demonstrated the efficacy of lichen depsides as the barbatic, and usnic acid in the control of snails of the genus *Biomphalaria*, intermediate hosts of the *S. mansoni* biological cycle, in the embryonic stages and in their adult phase. In addition to the biocidal activity on snail vectors, the divaricatic and barbatic acids present biological activity on the larval form infecting to man of *S. mansoni*, in a few hours of exposure [11-13]. The distribution of vector snails is an extremely important factor in the transmission of schistosomiasis, and its control becomes a priority for the reduction of disease transmission due to the interruption of human contact with cercariae released by snails in freshwater collections.

Registered for years, neglected parasitic diseases carry a significant social stigma, often resulting in isolation, leading them to avoid seeking medical treatment. They have a significant social impact, since they affect individuals in the productive age range and hamper child growth, interfering in the cognitive construction and, consequently, the capacity for growth and social development of future generations [14]. In view of this scenario, the natural products from the endemic countries, with emphasis on lichenic compounds, still little studied against this group of diseases, appear as an alternative of low cost and easy access to the population. However, the role of the scientific community is to develop interest and elucidate questions related to these bioproducts and their biological activities in the face of neglected parasitic diseases.

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