Propolis on Infectious Diseases

Subjects: Microbiology

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Infectious diseases are a significant problem affecting the public health and economic sta- bility of societies all over the world. Treatment is available for most of these diseases; however, many pathogens have developed resistance to drugs, necessitating the development of new thera- pies with chemical agents, which can have serious side effects and high toxicity. In addition, the severity and aggressiveness of emerging and re-emerging diseases, such as pandemics caused by viral agents, have led to the priority of investigating new therapies to complement the treatment of different infectious diseases. Alternative and complementary medicine is widely used throughout the world due to its low cost and easy access and has been shown to provide a wide repertoire of options for the treatment of various conditions. In this work, we address the relevance of the effects of propolis on the causal pathogens of the main infectious diseases with medical relevance; the ex- isting compiled information shows that propolis has effects on Gram-positive and Gram-negative bacteria, fungi, protozoan parasites and helminths, and viruses; however, challenges remain, such as the assessment of their effects in clinical studies for adequate and safe use.

Keywords: propolis ; antimicrobial ; bioactive compounds

1. Introduction

Currently, most health systems around the world are based mainly on the prevention of diseases. The world is constantly exposed to a large number of pathogens that cause emerging and re-emerging disease. These pathogens differ widely in terms of severity and probability and have varying consequences for morbidity and mortality, jeopardizing not only health but also social and economic well-being. It is absolutely necessary to have a global health system that is able to prevent and respond effectively to the expanding and evolving infectious diseases, as well as solving an increasingly widespread antimi- crobial resistance [1]. The need to prevent, identify, and respond to any infectious disease that compromises global health stability remains a national, regional, and international priority[2].

Existing natural products could be potential resources to find different compounds for the development of new drugs and relevant medicine [3], creating an area of study of great importance, since the immense difference of natural molecules could contribute bi- oactive compounds that help in therapeutic improvement[4]. Propolis is a natural resin- ous product elaborated by bees from material obtained from various botanical sources; it is mixed with bees' wax and enzymes secreted by the bee's salivary glands[5]. Character- istically, its composition is 50% resin, 30% wax, 10% essential oils, 5% pollen, and 5% other substances[6]. The propolis was informed to present about 300 distinct compounds[7] . The characteristic chemical groups identified in propolis are phenolic acids or their esters, flavonoids, terpenes, aromatic aldehydes and alcohols, fatty acids, stilbenes, and ?-ster- oids [7][8]. In addition, both the biomedical effect and composition of propolis have a very high variability according to the region of collection, the surrounding plant sources, and the seasons [9],[10]. Many reports have shown that propolis possesses antibacterial, anti- fungal, antiparasitic, antiviral, antioxidant, anti-inflammatory, antitumor, antidiabetic, and immunomodulatory properties[11][12][13][14][15][16][17][18][19]. Propolis is a bee product that contains a great variety of biomedical properties and a great spectrum of components that could be prom- ising candidates for drug discovery, which could be used to treat characteristic affections of distinct diseases. Notably, infectious diseases are a public health problem, since they do not have adequate treatment because many pathogens have developed resistance to the different drugs used against them. This is where propolis and many other alternative and complementary medicine products play an important role, since they are easily ac- cessible, allowing a high percentage of the world population to use them, providing op- tions to complement current treatments. As such, it is necessary to clinically analyze the effectiveness of propolis to evaluate its potential in human health promotion.

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