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Antimicrobial Activities of *Lawsonia inermis* - A Review

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Abstract: World is endowed with a rich wealth of medicinal plants. Man cannot survive on this earth for long life without the plant kingdom because the plant products and their active constituents played an important role. There is a widespread belief that green medicines are healthier and more harmless or safer than synthetic ones. Medicinal plants have been used to cure a number of diseases. Though the recovery is slow, the therapeutic use of medicinal plant is becoming popular because of its inability to cause side effects and antibiotic resistant microorganisms. Seeking healing by using plants is an ancient practice. Various cultures applied poultices and imbibed infusions of hundreds, if not thousands of indigenous plants dating back to prehistory. The development of new antimicrobial agents is a research area of the utmost importance.

Key words: Medicinal plants · Therapeutic use · Antimicrobial agents

INTRODUCTION

Resistance to such antimicrobial agents by pathogens [1, 2] continues to be alarming worldwide. The increased prevalence of antibiotic resistant bacteria emerging from the extensive use of antibiotics may render the current antimicrobial agents insufficient to control at least some bacterial infections. Ancient Egyptians are said to have prepared both oil and an ointment from the henna flowers for making the limbs supple. In early Islamic culture henna usage is very evident in the book of "Prophetic Medicine" where the medicinal practices of the Prophet Mohammed (PBUH), as mentioned by his followers and others that were close to him in his household, were recorded [3].

Antibacterial Activity: The antimycobacterial activity of quinonoid compounds, particularly those isolated from natural sources, has remained unexplained. The antibacterial activity of the natural naphthoquinone products alkannin and shikonin and their derivatives has been investigated [4]. In general they are active against gram positive bacteria such as *Staphylococcus aureus*, *Enterococcus faecium* and *Bacillus subtilis,* but are inactive against gram negative bacteria [5]. In nosocomial infection, *Staphylococcus aureus* is one of the most prevalent microorganisms worldwide. Methicillin resistant strains represent 15-45% of all *Staphylococcus aureus* isolates [6]. Inhibitory action of henna was shown against both gram negative and gram positive microbes. In one report the inhibitory action was greatest against *B. anthracis* as it stood out from other tested bacteria [7].

Lawsone, the antimicrobial agent in henna [7, 8] exerted inhibitory effects upon common nosocomial urinary tract pathogens such as *Escherichia coli, Proteus mirabilis, Klebsiella pneumoniae, Pseudomonas aeroginosa* and *Staphylococcus aureus* at certain concentrations [9].

Antimycotic Activity: Lawsone has been shown to be effective against oral *Candida albicans* isolated from patients with HIV/AIDS [10]. During antifungal screening of higher plants, the leaves of *Lawsonia inermis* were found to exhibit strong fungitoxicity where naphthoquinones were found to be the active factor [11]. *Lawsonia inermis* exhibited absolute toxicity [12] against ringworm causing fungal species such as Microsporum *gypseum* and *Trichophyton mentagrophytess*.

Virucidal Activity: The ethanol extract of *Lawsonia inermis* was studied [13]. *Lawsonia inermis* extract inhibited Sindbis virus at a minimum concentration. The virucidal activity of *Lawsonia inermis* needs more work.

Antiparasitic Activity: The discovery of quinine [14] from *Cinchona succiruba* (Rubiaceae) and its subsequent development as an antimalarial drug [15] represented a

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milestone in the history of antiparasitic drugs from nature for the treatment of all parasitic diseases caused by *Plasmodium, Leishmania* [16] and *Trypanosomia* [17] species.

CONCLUSION

Henna has a wide spectrum of antimicrobial activity including antibacterial, antiviral, antimycotic and antiparasitic activities. With the ever increasing resistant strains of microorganisms to the already available and synthesized antibiotics, the naturally available Lawsonia inermis (henna) could be a potential alternative.

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