Peptides and proteins with antifungal activity from medicinal plants

Marzieh Zarghani[a], Maryam Tabarzad[b], Tahereh Hosseinabadi[a*]

Authors' Affiliations:
[a] Department of Pharmacognosy and Biotechnology, School of Pharmacy, Shahid Beheshti University of Medical Sciences, Tehran, Iran
[b] Protein Technology Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Abstract presenter:
Marzieh.Zarghani; PharmD student Department of Pharmacognosy and Biotechnology, School of Pharmacy, Shahid Beheshti University of Medical Sciences, Tehran, Iran
E-mail: mzarghani.93@gmail.com

****Correspondence:***
Tahereh.Hosseinabadi; Department of Pharmacognosy and Biotechnology, School of Pharmacy, Shahid Beheshti University of Medical Sciences, Tehran, Iran
E-mail: T.hosseinabadi@sbmu.ac.ir
*Mailing address: **N0** 2660, Vali-e-asr Ave., Tehran, Iran*

Abstract

Introduction: Peptides and proteins are bio-macromolecules with diverse interesting bioactivities, formed of amino acids joined by peptidic bounds. Their resources include animals, plants, fungi, bacteria and insects. Various biological effects from these agents including antioxidant, antimicrobial, anti-inflammatory, anti-hypertensive and opioid activity have been reported. Antimicrobial peptides have been isolated from roots, seeds, flowers, stems, and leaves of a wide variety of species and have demonstrated activities towards phytopathogens, as well as against human pathogenic organisms such as viruses, bacteria, fungi, protozoa and parasites. Antifungal proteins have captured the attention of a large number of investigators regarding to their economic implications. Plants are one of the attractive sources of antifungal peptides and proteins.

Methods and Results: Searching keywords of bioactive peptides and proteins, antimicrobial, antifungal and plant in different search engines resulted in numerous published articles. According to the litritures, herbal antifungal proteins and peptides can be classified, based on their structures and/or functions, into groups including chitinases, glucanases, thaumatin-like proteins, thionins, and cyclophilin-like proteins. These proteins may demonstrate different fungal specificities. The mechanisms of antifungal actions of only several antifungal proteins including thaumatin-like proteins and chitinases have been elucidated. Some of the chitinase-like proteins have been reported from plants for instance: Dolichin, an antifungal protein from field beans (Dolichos lablab) with strong antifungal activity against *Rhizoctonia solani*, a 28 kDa, protein from cowpea (*Vigna unguiculata*) seeds, pinto bean (*Phaseolus vulgaris* cv. *pinto*) seeds, and ricebean (*Delandia umbellata*) seeds, another protein from *Panax notoginseng* (sanchi ginseng) roots with potent antifungal activity against *F. oxysporum* and Pananotin from sanchi ginseng roots.

Conclusions: From this survey it can be concluded that different proteins and peptides of diverse structures are elaborated by a diversity of plants with wide antifungal activities. Some of these antifungal proteins have also exhibited antiviral inhibitory activitis toward the enzymes of human immunodeficiency virus.

Key words: Peptides, Protein, Antimicrobial, Antifungal, Plants