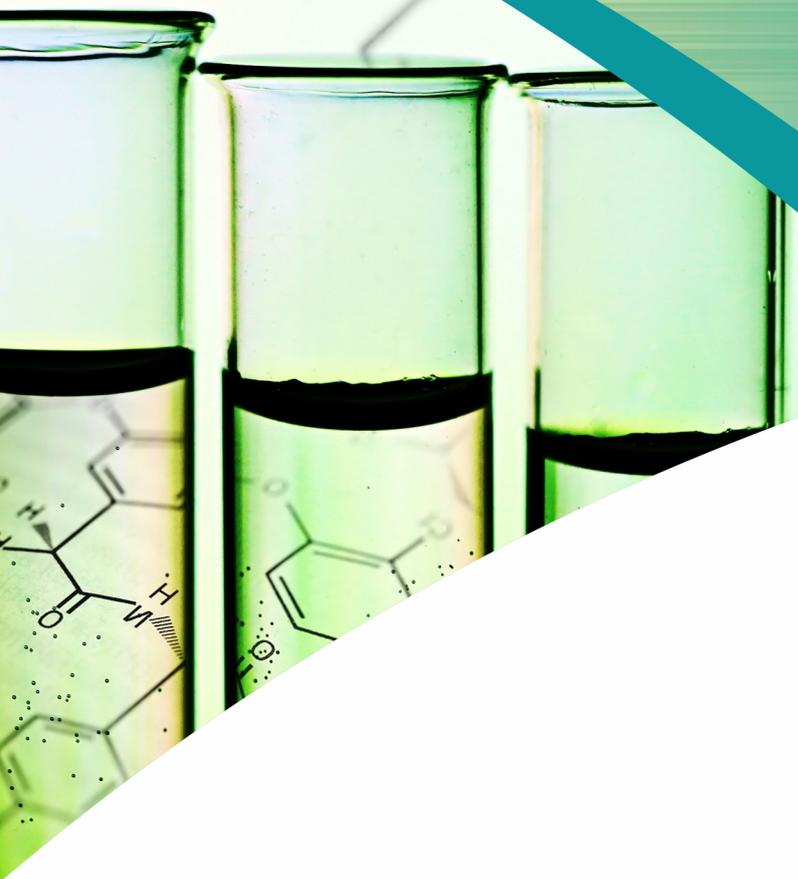


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An Overview on Plant Derived Antimicrobial Peptides: Potential Antibiotics Against Resistant Pathogens

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ABSTRACT

Background: Like any other living organism, plants too undergo attacks of insects, fungi and bacteria. These challenges result in the development of an efficient defense mechanism, through the synthesis of secondary metabolites, which includes antimicrobial peptides (AMPs). Also, AMPs can be isolated from various plants and parts of the plant like, leaves, roots, seeds, flowers & fruits.

Aim: To know the different antimicrobial peptides isolated from the plants and to provide an outlook on their biotechnological potential.

Methods: AMPs have the ability to interact with several targets in Gram positive and negative bacteria, protozoa, yeast, fungi and viruses. Also, some infections show high resistance to traditional antibiotics, in that case AMPs are promising due to their broad spectrum antibacterial activity. Among them Colistin and Polymixin B, are widely used in clinical practice (Table 1).

Table 1: Classes of plant derived AMPs, source & name of peptides:

| Class | Source | Peptide | Antimicrobial Activity |
|--------------------------------|--|----------|---------------------------|
| Defensin | Avocado (<i>P. americana</i>) | PaDef | <i>E. coli</i> |
| | Fruit peppers (<i>C. annuum</i> var. <i>Yolo Wonder</i>) | J1 | <i>S. cerevisiae</i> |
| Lipid transfer proteins (LTPs) | Chili pepper (<i>C. annuum</i> L.) | Ca-LTP1 | <i>C. tropicalis</i> |
| 2S Albumin | Passion fruit (<i>P. alata</i> Curtis) | Pa-AFP1 | <i>C. gloeosporioides</i> |
| Glycine rich protein | Guava seeds (<i>P. guajava</i>) | Pg-AMP1 | <i>Klebsiella</i> sp. |
| Snakin | Jujuba fruits (<i>Z. jujuba</i>) | Snakin-Z | <i>A. Niger</i> |
| Napin | Coconut water (<i>Trapa natans</i>) | Tn-AFP1 | <i>F. oxysporum</i> |
| Unclassified | AMPs from fruits | Cn-AMP3 | <i>S. aureus</i> |

Result: AMPs defense mechanism makes them the new antibiotic substances, also the defensins used in agro-products with antifungal activity will be used for growth of agricultural production. AMPs can also be associated in inflammatory response, infectious diseases, immunosuppressive and tumoral diseases. The broad spectrum antimicrobial activity in some peptides suggest their potential for treating cancer & parasitic infections.

Conclusion: Storage organs and reproductive tissues of fruits are responsible for the production and accumulation of AMPs as the first line of defense. The AMPs promising activity as antimicrobials could be used in synergism with other drugs, chemical combinations and modifications to improve AMPs bioactivity.



Aims & Scope

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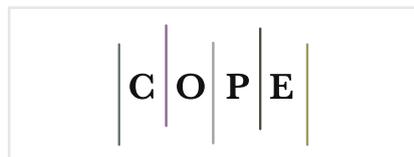
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