

## Natural Antimicrobial Agents: III. Suprapein™

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### Abstract

A series of effective Natural Antimicrobial Agents have been developed with interesting characteristics. Biopein™<sup>(1,2)</sup> and Neopein™<sup>(2)</sup> have been described. Lately, Suprapein™ has been developed and tested against an array of bacteria and fungi with different susceptibilities. The organisms included gram positive *Staphylococcus aureus*, gram negative *Escherichia coli*, *Salmonella typhimurium*, *Klebsiella pneumoniae* and *Pseudomonas aeruginosa*, acid-fast bacterium *Mycobacterium smegmatis*, the Yeast *Candida albicans* and the filamentous mold *Aspergillus niger*. For comparison the following well-known synthetic preservatives were used viz. Phenoxyethanol (PE), Phenyl Ethyl Alcohol (PEA), and a combination of Methyl and Propyl Parabens (MP) in a ratio of 5:4. The Minimum Inhibitory Concentration (MIC) was determined for each agent. Suprapein™ had the lowest MIC (0.45%) followed in increasing order by PEA (0.60%), PE (1.00%) and MP (2.16%), according to their capability of inhibiting all the tested organisms. Suprapein™ can therefore, be used as an effective natural alternative to commonly used synthetic ingredients in appropriate formulations for product preservation. Its composition and use are patent pending.

### Introduction

Consumers are staying away from anything synthetic, including preservatives. This is due to numerous unforeseen complications noticed or experienced as carcinogenicity, teratogenicity, liver, heart, respiratory or nervous system problems.

The Composition and MIC for Biopein™ and Neopein™ have been reported<sup>(1,2)</sup>. Suprapein™ has been introduced as a third member of the series of Natural Antimicrobial Agents, developed at Bio-Botanica, with different physical and chemical characteristics to give the formulator more choices to comply with his needs as to which preservative would be best suitable for the product.

Suprapein™ is an optimum synergistic combination of Botanical Fractions of the Following Herbs:

- *Origanum vulgare* L. and *Thymus vulgaris* L. which contain effective Phenolic ingredients, Carvacrol and Thymol (Figure 1).
- *Cinnamomum zeylanicum* Nees which contains mainly cinnamaldehyde and Eugenol (Figure 2).
- *Rosmarinus officinalis* L. which contains 1,8-Cineole, Camphor, alpha-Pinene and also small amounts of Rosmarinic Acid (Figure 3).
- *Lavandula officinalis* L. which contains Linalyl acetate and Linalol (Figure 4).
- *Mentha piperita* L. which contains Menthol, Menthyl Acetate and Menthone (Figure 5).
- *Citrus limon* L. which contains Limonene together with the Aldehyde geranial, neral and citronellal (Figure 6).
- *Hydrastis canadensis* L. which contains Berberine and Hydrastine alkaloids (Figure 7).
- *Olea europaea* L. which contains Oleuropein, the first secoiridoid compound to be isolated (Figure 8).

Martindale<sup>(3)</sup> reported comparatively high phenolic coefficients for certain Suprapein™ constituents viz. For Thyme, 15; for

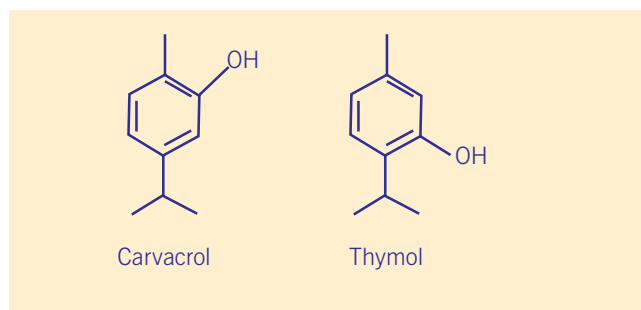


Figure 1.

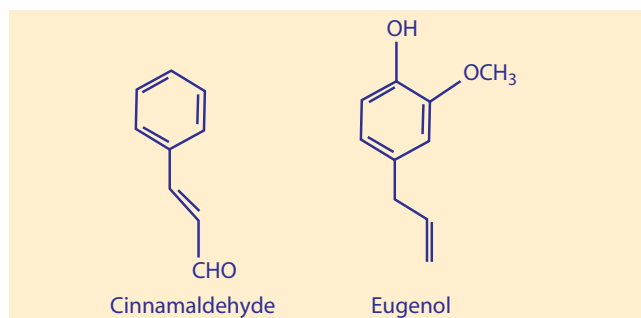


Figure 2.