



Question "How does menthol and carvone in mint work?"

22:38 Tue 12th Feb 2008

Answer : "In general, essential oils such as menthol or carvone damage the structural and functional properties of bacterial

cell membranes and this is reflected in the dissipation of the two components of the proton motive force: the pH gradient and the electrical potential.

In both menthol and carvone, thymol and carvacrol are present as impurities and the latter two substances disrupt the membrane integrity, which further affects pH homeostasis and equilibrium of inorganic ions. The disruption of the cell membrane in this manner causes leakage of ions, ATP, nucleic acids, and amino acids with inevitable consequences for the bacteria.

Nutrient uptake, nucleic acid synthesis and ATPase

activity may also be affected, leading to further damage of the cell .

Menthol and Carvone are essentially phenols and they exhibit similar mechanisms of toxicity on a cellular level in microorganisms and fungi as some of the more well known phenols. This means that Gram positive organisms are invariably killed by exposure to them. This is one of the reasons why menthol compounds are used in the treatment of the pathogens such as *Helicobacter pylori* and *Clostridium perfringens* in the human gut.

Gram negative organisms on the other hand, often show considerable resistance to essential oils due to the presence of a hydrophilic outer membrane that blocks the penetration of the hydrophobic essential oils to the target cell membrane.

Some interesting papers on this subject were published by Khayyal et al in 2001. Look for papers published by Tassou et al in 2004 for further information."

16:25 Sat 16th Feb 2008