



## Selection of the essential oils in BigShot Maxim “Not just a casual happening”!

Essential oils being complex mixtures of volatile organic compounds are generally produced as secondary metabolites in plants. They are constituted by hydrocarbons (terpenes and sesquiterpenes) and oxygenated compounds (alcohols, esters, ethers, aldehydes, ketones, lactones and phenols). PreVasive’s search for essential oils extracted from different specific families have shown high repellency against arthropod species.

Our research has established specific terpenoids containing functional groups that are highly biologically active as mosquito repellents. The research reveals repellent activities of 20 synthesized terpenoids with two functional groups, one being negatively charged end containing either ester/ether bonds or an ethanol hydroxyl group and the other with a positively charged end containing alkane groups.

The research revealed that the positive end is more favorable for mosquito receptor interactions and its magnitude characterizes the electrophilic nature - (*an atom, ion, or molecule: having an affinity for electrons*) of the group consequently the mosquito *repellent* -*receptor* interactions are related to electrophilic interactions. Also, current research demonstrated that molecular descriptors such as dipole moment and boiling point are closely related to repellent activity.

Generally, the dipole moment is related to lipophilicity or specific electrostatic interactions with the mosquito receptors whereas boiling point/vapor pressure might determine duration of contact with olfactory chemo-sensilla of the mosquitoes. Although repellent activity of essential oils are generally attributed to particular natural compounds, a synergistic phenomenon is established among these metabolites and the results is an increased bioactivity compared to isolated components. This synergistic-effect is elevated within specific percentages of naturally occurring minor oils within the major constituent.

Therefore, the minor constituents found in low percentages act as synergists enhancing the effectiveness of the major constituents through a variety of mechanisms. Essential oils act quickly in a vapor phase and are very effective knockdown and repellent when first applied as they usually dissipate within a short period of time due to essential oils high volatility. “ However”, this property is improved through the development of PreVasive’s formulations that keep the active ingredients bio-persistence for a much-extended period of time. The repellent molecules thus interact with the female mosquito olfactory receptors thereby blocking the sense of smell which therefore becomes a barrier in the recognition of host by the mosquitoes while simultaneously effecting immediate contact knock down of the airborne mosquito.

PreVasive selects along with its natural organic primary essential oils specific minor constituents that express elevated functional groups biologically active as mosquito repellents and formulates these oils into a natural bio-persistent carrier for long lasting results in the outdoor environment.