

Effect of Essential Oil of *Alpinia speciosa* on V H<sup>+</sup>- ATPases of *Saccharomyces cerevisiae*.

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V H<sup>+</sup>-ATPases are extremely important for the physiology of all eucaryotes including insects. They are responsible for the intestinal alkalization and urinary excretion. Certain essential oils show both properties of larvicides and inhibit hydrolytic activity of V and P type ATPases of *Aedes aegypti*. Those enzymes therefore may be targets in the control of the vector and in the study of the mechanism of toxicity of these substances. To this end the *Saccharomyces cerevisiae* yeast can be used as a model microorganism since its ATPases are rather well characterized. The aim of our study was to evaluate the action of the *Alpinia speciosa* essential oil and  $\alpha$ -pinene, its main component (~90%) on the H<sup>+</sup> transport across the intracellular membranes of *S. cerevisiae*. The  $\Delta$ pH formation (difference of chemical proton potentials across membrane) was monitored by fluorescence quenching of ACMA. The essential oil of *Alpinia speciosa* (1  $\mu$ M) caused inhibition of 47% of the steady state and 52.6% of V<sub>0</sub> of H<sup>+</sup> transport. Surprisingly,  $\alpha$ -pinene (1  $\mu$ M)) did not affect the H<sup>+</sup> transport under conditions when the essential oil has shown inhibition. We suggest that another minor component(s) of the essential oil can block the yeast V H<sup>+</sup>-ATPase. Additional possibility is the synergistic action of the minor component(s) of the oil with  $\alpha$ -pinene.

Key words: V H<sup>+</sup>-ATPases, essential oil, *Saccharomyces cerevisiae*, *Alpinia speciosa*  
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