Dose-effect studies of some essential oils on swine spermatozoa

PRELIMINARY RESULTS: Melaleuca alternifolia and Terpinen-4-ol

The aim of the study was to evaluate the effects of Melaleuca alternifolia essential oil (EO) and its principal compound, the Terpinen-4-ol, on the principal morph-functional parameters of swine spermatozoa. Terpinen-4-ol seems to play a key role in mediating antimicrobial activity of the Melaleuca alternifolia essential oil. The experimental protocol was previously validated and described by the authors briefly, after Gas Chromatography characterization of the EO, experimental samples were prepared by suspending a fixed number of spermatozoa in 5 mL of swine fertilization medium (FSM) with 10 different concentrations of EO. After 3 hours of incubation at 37°C (± 2°C), the samples were evaluated for Viability (Evans-Nigrosine staining), Objective Motility (CASA), Acrosome Status (Carnosine blue staining) and pH. The same experimental protocol was applied for terpinen-4-ol, adjusting the tested concentrations to its presence in the used EO (3.5%)

ACHEIVEMENTS

The results of the toxicity studies allowed for the identification of EO concentrations well tolerated by swine spermatozoa: up to 0.6 mg/mL for Rosmarinus officinalis and up to 0.8 mg/mL for Melaleuca alternifolia. Such concentrations will be used for further studies. Terpinen-4-ol does not seem to have effects on the spermatozoa, despite being the most active compound of Melaleuca alternifolia according to literature. On the other hand, Thymbra capitata resulted to be toxic for spermatozoa, thus will be excluded from the future studies.

Nonetheless, the latter may be proposed as a spermicidal agent.

Papers: