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In vitro* antagonistic combinatory effect of palm oils rich in lauric acid with oxacillin towards *Staphylococcus aureus

Klara Lalouckova and Eva Skrivanova

Institute of Animal Science, Czech Republic

Interactions of antibiotics with natural compounds are in case of synergy a promising source of new antimicrobials in terms of combating antibacterial resistance. On the other hand, their antagonistic interactions especially with food and feed are undesirable and potentially dangerous. Palm oils are heterogeneous substances occurring naturally e.g. in breast milk and can be routinely found in daily diet of both humans and animals. Therefore, the aim of our study was to evaluate possible interactions between palm oils (*Astrocaryum vulgare*-tucuma, *Cocos nucifera*-coconut, and *Elaeis guineensis*-palm oil) containing medium chain fatty acids (prevalence of lauric acid; C12:0) and oxacillin towards methicillin-sensitive and resistant strains of *Staphylococcus aureus* by checkerboard method *in vitro*. Firstly, fractional inhibitory concentration (FICs) of three above mentioned palm oils in combination with oxacillin against three *S. aureus* strains were tested. Following findings of gas chromatography, susceptibility to combinations of lauric acid and oxacillin was tested towards ten strains of *S. aureus*. It has been proven, that palm oils and lauric acid alone possess anti-staphylococcal properties (minimum inhibitory concentrations-MICs=240-512 µg/mL and 242-256 µg/mL, respectively). Interesting results were found during the testing of combinatory effect. All three palm oils and lauric acid in higher concentrations (1024-2048 µg/mL) induced antagonistic interactions (FIC \geq 4) with effective concentrations of oxacillin; FICs in range 4.02-8.56 for palm oils and 4.01-4.28 for lauric acid. To best of our knowledge, this is the first case of observed antagonistic interactions between palm oils and lauric acid with oxacillin. Such an antagonism induced by quite common combination of foodstuff with antibiotic is of serious concern and should be avoided.

Biography

Klara Lalouckova is a PhD candidate in the Department of Microbiology at Nutrition and Dietetics of the Czech University of Life Sciences in Prague and works as a Research Assistant at the Institute of Animal Science in Prague, Czech Republic. Her final thesis deals with the topic of interactions of antibiotics and compounds of natural origin (palm oils, fermented soy bean products).

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