Susceptibility of bacteria isolated from pigs to tiamulin and enrofloxacin metabolites - DTU Orbit (05/12/2018)

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Susceptibilities to metabolites of tiamulin (TIA) and enrofloxacin (ENR) were tested using selected bacteria with previously defined minimal inhibitory concentrations (MIC). The TIA metabolites tested were: N-deethyl-tiamulin (I)TIA), 2 beta-hydroxy-tiamulin (2 beta-HTIA), and 8 alpha-hydroxy-tiamulin (8 alpha-HTIA), and the ENR metabolites were: ciprofloxacin (CIP) and enrofloxacin N-oxide (ENR-N). Bacteria, all of porcine origin, were selected as representatives of bacterial infections (Staphylococcus hyicus and Actinobacillus pleuropneumoniae), zoonotic bacteria (Campylobacter coli) and indicator bacteria (Escherichia coli and Furthermore the effects of these compounds were tested on the microbial community of active sludge to test any negative effect on colony forming units (CFU). DTIA had a potency of 12.5-50% of the potency of TIA. 2-HTIA and 8 alpha HTIA had potencies less than 1% of the potency of TIA. ENR-N had a potency of 0.75-1.5% of the potency of ENR, while CIP and ENR had similar potencies. Results obtained here indicate that CIP and DTIA could contribute to the selective pressure for uphold antimicrobial resistant bacteria in animals under ENR or TIA treatment. The most potent metabolites CIP and DTIA showed considerable potencies against activated sludge bacteria compared to the parent compounds. EC50 (µg/ml) for ENR, CIP, TIA, and DTIA were 0.018 [95% CI: 0.028-0.149], 0.064 [95% CI: 0.007-0.046], 6.0 [95% CI: 3.6-9.8], and 9.7 [95%, CI: 5.8-16.3], respectively. This indicates that the compounds can change the bacterial population in the sludge, and hereby falter the properties of the sludge.

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