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Minimum inhibitory and bactericidal concentrations (MIC & MBC) of honey and bee propolis against multidrug resistant (MDR) *Staphylococcus sp.* isolated from bovine clinical mastitis

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With the emergence of antibiotic-resistant Staph. sp., searching for antimicrobial agents other than antibiotic is of great concern. The study aimed to determine both MIC & MBC of different honey samples against these strains since it was conducted with 64 Staph sp. recovered from bovine mastitis which were tested *in vitro* against 11 antimicrobial agents. The most multidrug resistant (MDR) strains (n. 19) representing the four species; *S. aureus* (n. 6), *S. intermedius* (n. 3); *S. epidermidis* (n. 5) and *S. saprophyticus* (n. 5) were tested against six honey batches; marjoram, cotton, two different fennel samples and two different trefoil samples as well as they were tested against 10% w/v propolis-fennel honey mixture. Both MIC & MBC of the six honey samples and propolis-honey mixture against every tested strain were determined. The study concluded that all tested bacterial strains, despite of being MDR- were sensitive to the antimicrobial activity of all tested honeys but differently. Against all Staph sp., trefoil honey batch-2 had the lowest MIC value (20.83% v/v) but cotton had the lowest MBC one (37.92% v/v) among the six tested honey batches without any significant differences, while 10% w/v propolis-fennel honey mixture showed the lowest both MIC & MBC values against all Staph sp. As a whole, the study had (13.96 & 28.26% v/v respectively) high significant differences ($p > 0.01$). Against different Staph sp., it was found that propolis honey mixture had the lowest MIC value against *S. intermedius* followed by *S. aureus* as 6.2 & 7.25% v/v respectively with high significant differences ($p > 0.01$), and MBC values as 12.5 & 14.58% respectively. Among the different Staph. sp., *S. aureus* was the most sensitive species to the honey antimicrobial action since MIC & MBC as 13.3 & 27.1% v/v respectively with highly significant differences ($P > 0.01$).

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