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Isolation of antibiotic resistant bacteria from different waste sources and determination of their level of resistance.

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The use of antibiotics as feed additives or growth promotersfor livestock, is popular in animal farming. The selective pressure exerted by such measures may induce resistance to antibiotics among bacterial populations and promote the dissemination of antibiotic resistance in the environment through animal manure. Apart from that, antibiotics can be released into the environment through waste water treatment plants in pharmaceutical industries, which could also promote the selection of antibiotic resistant bacteria. The antibiotic resistant gene cassettes of bacteria may be found within the bacterial chromosome or in mobile genetic elements.Antibiotic resistance conferred within the mobile genetic elements is considered important, as they are easily subjected to horizontal gene transfer, resulting in new resistant varieties. The gene cassettes may contain gene sequences responsible for the resistance of one or more antibiotics and heavy metals. In this study, we have used animal manure collected from two different farms (the veterinary teaching farm of the University of Peradeniya and a private farm in Colombo) and waste water samples collected from a pharmaceutical industry located in Colombo area, to isolate antibiotic resistant bacteria. In order to determine their level of resistance to selected antibiotics (ampicillin, tetracycline, chloramphenicol and kanamycin) and heavy metals (Cu, Cd, Ni and Cr), disk diffusion test was carried out according to the Kirby-Bauer technique in the presence of different concentrations of the antibiotics and heavy metals. Plasmid profiles of the isolated bacterial cultures were analysed using standard plasmid extraction procedures.According to the results obtained, bacterial isolates exhibited varying degrees of resistance to the antibiotics tested. Out of thethirteenbacterial isolates isolated in this study, JM1 was resistant to all the different concentrations of three of the four antibiotics used. Isolate PF-M, which was isolated through multiple drug enrichment steps, exhibited resistance to all the concentrations of antibiotics and heavy metals used. All isolates contained plasmids >10 kb in size. However, further studies are required to determine whether the antibiotic resistant gene cassette is plasmid conferring or not.

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