

Prevalence of antibiotic resistance in lactic acid bacteria isolated from the faeces of broiler chicken in Malaysia

Abstract

Background Probiotics are commonly used as feed additive to substitute antibiotic as growth promoter in animal farming. Probiotic consists of lactic acid bacteria (LAB), which enhance the growth and health of the animal. Probiotic also have higher possibility to become pathogenic bacteria that may carry antibiotic resistant gene that can be transmitted to other LAB species. The aim of this study was to identify the LAB species in the faeces of broiler chicken and to determine the prevalence of antibiotic resistant in LAB of broiler chicken. Methods Sixty faeces samples were collected from wet markets located in Klang Valley of Malaysia for the isolation of LAB using de-Mann Rogosa Sharpe medium. Thirteen species of LAB were obtained in this study and the identification of LAB was performed by using API test kit on the basis of carbohydrate fermentation profile. Antibiotic susceptibility assay was then carried out to determine the prevalence of LAB antibiotic resistance. Results *Lactococcus lactis* subsp *lactis* was found in nine out of sixty faecal samples. *Lactobacillus paracasei* was the second common LAB species isolated from chicken faecal. No significant difference ($P > 0.05$) was found between the occurrence of *Lactobacillus brevis*, *Lactobacillus curvatus*, *Lactobacillus plantarum*, *Leuconostoc lactis mesenteroides* subsp *mesenteroides*/destranium and *Pediococcus pentosaceus* isolated from 5 different locations. Most of the isolated LAB was resistant to antibiotic and high variability of the antibiotic resistance was observed among the LAB against 15 types of antibiotics. Penicillin, amoxicillin, chloramphenicol, and ampicillin had significant higher ($P < 0.05$) inhibitory zone than nalidixic acid, gentamycin, sulphamethoxazole, kanamycin, and streptomycin. Conclusions Many species of LAB were isolated from the faecal samples of broiler chicken that resistance to the common antibiotics used in the farm. The development of resistant against antibiotics in LAB can be attributed to the long term exposure of antibiotic as growth promoter and therapeutic agents. Thus, it is essential to advise farmer the safety measure of antibiotic application in animal farming. Additionally, the supplementation of probiotic in animal feeding also needs more attention and close monitoring.

Keyword: Lactic acid bacteria; Antibiotic resistance; Broiler chicken