

## COLONIZATION WITH ANTIBIOTIC RESISTANT ORGANISMS IN THE NASAL TRACT AND CLOACA OF DUCKS

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### ABSTRACT

Ten antibacterial agents belonging to 9 different groups of antibiotics viz. aminoglycosides, cephalosporins, chloramphenicol, fluoroquinolones, nitrofurantoin, penicillin, polymixin, tetracyclines and sulphonamides were used for in vitro sensitivity testing. The results indicated that the organisms of nasal passage were 100% resistant to six antibiotic drugs. The organisms showed intermediate sensitivity to four drugs. Similarly, the organisms from cloaca were 100% resistant to Oxytetracycline, Cefuroxime, Ampicillin-cloxacillin, Colistin, Nitrofurantoin and Cotrimoxazole, sensitive to Ciprofloxacin and Ceftriaxone, and intermediate sensitive to Chloramphenicol and Gentamicin. Colonization specifically by antibiotic-resistant organisms followed a similar pattern in both the tracts. The results of nasal swab and cloaca indicate the exact pattern of resistance and very close pattern in sensitivity. Thus, the organisms showed complete resistance towards tetracycline, penicillin, polymixin, sulphonamide and nitrofurantoin groups of antibiotics. The results of this study have demonstrated that indiscriminate use of the antibiotics is frequently associated with emergence of resistance in bacteria of ducks.

### INTRODUCTION:

The antimicrobial agents are of great value for devising curative measures against bacterial infections. Progressively increasing resistance to these agents is thus a serious cause of concern and periodic monitoring of drug resistance of these organisms should be carried out in different geographical areas so that appropriate agent can be chosen for empiric therapy.

The problems of multi-drug resistant are very intricate in developing nations like India and other South East Asian countries (Motyl et al, 1985 ; Toltzis, 2003). Mounting concerns for emergence of drug-resistance in various aquatic animals and birds are reflected in a number of reports viz. Motyl et al. (1985), Soliman (1999), Chandrakanthi et al. (2000), Vivekanandhan et al. (2002), Chang et al. (2003) and Nawaz et al. (2006).

### MATERIALS AND METHODS

In this study, total ten samples, five each from nasal passage and cloaca were collected aseptically from five ducks. The samples were collected aseptically using sterile swabs in nutrient broth. Muller Hinton media was used for drug sensitivity. Ten antibacterial agents belonging to 9 different groups of antibiotics viz. aminoglycosides, cephalosporin, chloramphenicol, fluoroquinolones, nitrofurantoin, penicillin, polymixin, tetracyclines and sulphonamides were used for in vitro antibacterial sensitivity testing using the disc diffusion assay ( Bauer , 1966 ).

### RESULTS AND DISCUSSION

High percentage of antimicrobial resistance and emergence of multiple drug resistance was observed. The results indicated that the organisms of nasal passage were 100% resistant to six antibiotic drugs viz. Oxytetracycline, Cefuroxime, Ampicillin , Cloxacillin, Colistin, Co-trimoxazole and Nitrofurantoin. The organisms showed intermediate sensitivity to four drugs viz. Chloramphenicol, Ciprofloxacin, Ceftriaxone and Gentamicin. Similarly, the organisms from cloaca were 100% resistant to Oxytetracycline, Cefuroxime, Ampicillin-cloxacillin, Colistin, Nitrofurantoin and Cotrimoxazole, sensitive to Ciprofloxacin and Ceftriaxone, and intermediate sensitive to Chloramphenicol and Gentamicin.

Colonization specifically by antibiotic-resistant organisms followed a similar pattern in both the tracts. The results of nasal swab and cloaca indicate the exact pattern of resistance and very close pattern in sensitivity. Thus, the organisms showed complete resistance towards tetracycline, penicillin, polymixin, sulphonamide

and nitrofurantoin groups of antibiotics.

There are various reports showing antibiotic resistance pattern of enteric organisms (Wasfy et al., 2000, Kaskhedikar, 2008). But comparatively very few reports are available specially on antimicrobial testing of organisms isolated from duck. Nonga, and Muhairwa (2009) reported prevalence and antibiotic susceptibility of thermophilic *Campylobacter* isolates from free range domestic duck. All *C. jejuni* isolates were susceptible to streptomycin, nitrofurantoin and amikacin. Forty eight percent, 74% and 82% of isolates were resistant to cefuroxime sodium tetracycline and ampicillin respectively. Between 20-50% of isolates; were resistant to erythroycin , gentamicin , cloxacillin and amoxicillin. Norfloxacin and ciprofloxacin had lower *C. jejuni* resistance of 10% and 16%, respectively. Tsai and Hsiang (2005) reported that when cloacal swabs were sampled from 100 duck farms in Taiwan, *Salmonella* isolates were found 100% susceptible to amikacin, amoxicillin/c1avulanic acid, ceftraxone, cephalothin, ciprofloxacin, norfloxacin, ofloxacin, and polymyxin B. A markedly higher antimicrobial resistance to amoxicillin, florfenicol, flumeqUine, josamicin/trimethoprim, nalidixic acid, nitrofurantoin, norfloxacin, ofloxacin, polymyxin B, sulfamethoxazole/trimethoprim and tetracycline was also found in *Campylobacter* isolates. Thus, their findings are in partial concurrence with the present study.

Probably this study is the first report from this area. Ducks are given regularly the antibiotics through drinking water as a regular practice of management. The results of this study also demonstrate that indiscriminate use of antibiotics is frequently associated with emergence of resistance in bacteria in ducks.

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