

A preliminary study on isolation and characterization of potentially pathogenic bacteria from wild bird droppings around the Kandy Lake, Central Sri Lanka

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Abstract

Birds are potential carriers of pathogens for different infectious zoonotic diseases. Different pathogens including, bacteria, fungi, viruses and parasites carried by wild birds may affect humans through direct or indirect transmission. This study was mainly focused on the bacterial composition in wild bird droppings around the Kandy Lake area. Fifty samples of fresh bird droppings from House Crow (15), Little Cormorant (20), Rock Pigeon (05), Little egret (05) and Black-crowned Night Heron (03) were collected at five different sample collection points using sterile swabs. Each Swab was dip in 1 mL of 0.85% w/v saline solution, shaken well and kept for 30 minutes. After the pretreatment, 50 μ L from each was spread on LB and M17 agar media. Plates were incubated at 37 °C for 24 hours. Colony counts were taken and different morphotypes were subcultured. Isolates were Gram stained and morphologically identified. The highest count was obtained from House Crow (5.5×10^3 CFU/mL) while lowest obtained from Rock Pigeon (3.6×10^3 CFU/mL). In total 20 different bacteria were isolated and 12% were Gram-positive and 88% were Gram-negative. *Lactococcus* sp. was obtained from all birds and Individual organisms from Staphylococcaceae (*Staphylococcus* sp.), Enterobacteriaceae (*Serratia* sp., *Enterobacter* sp., *Klebsiella* sp., *Proteus* sp., and *E. coli*), Bacillaceae (*Bacillus* sp.) and Enterococcaceae (*Enterococcus* sp.) were morphologically identified. Both pathogenic (*Staphylococcus* sp., *E. coli*) and opportunistic pathogenic (*Enterobacter* sp.) bacteria were isolated from bird droppings which suggests that these birds can harbor potentially pathogenic bacteria, probably reflecting the presence of such isolates in their sources of food and/or water in the environment. These birds are not migratory birds, but often change their habitats within the city, according to their behaviors. This may lead to the transmission of those bacteria between birds. Since Kandy Lake area is highly populated, droppings can be in contact with the human via direct and indirect ways. This poses a public health hazard to the humans and to the environment if they accumulate in one place for a long period of time. Therefore, further studies should be carried out to determine the incidence of human infections by bird droppings in the Kandy Lake surrounding area.

Key words: Zoonotic diseases, bird droppings, pathogenic bacteria, human infections

Justification

- 1. Zoonotic diseases are infectious. There are no non-infectious zoonotic diseases.**

Reviewer's comment was accepted and revised in the abstract and the extended abstract.

- 2. No information on pathogenesis though it says study pathogenesis?**

In this study we focused on whether we can find microbes which pathogenic to human from the bird droppings. Therefore, we have compared our results with previous literature and have concluded that these organisms might cause diseases in humans. Reviewer's comment was accepted and revised in the abstract and the extended abstract.

- 3. What is the pre-treatment?**

The pretreatment was carried out for the dilution of the contents in bird droppings. Each Swab was dip in 1 mL of 0.85% w/v saline solution and it was shaken well and kept for 30 minutes. The method was revised in the abstract.