

Isolation of Antibiotic Resistance Gene from *Staphylococcus aureus* from Chicken Poultry Farm in Bogor West Java Indonesia

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INTRODUCTION

Staphylococcus aureus is an opportunistic pathogen in human and another animal species. It also associated with staphylococcosis, osteomyelitis, arthritis, and bumble foot disease in poultry [1]. Antibiotics including penicillin, erythromycin and tetracycline are widely used for treating infection caused by *S. aureus* [2].

Chicken poultry play important role in food supply as one of protein source in Indonesia. West Java province has largest population of chicken poultry, where Bogor has the largest population of chicken poultry with 19.75.850 chicken in 2018 [3]. In order to maintain the production, farmers used antibiotics for prophylaxis, growth promotor, and therapy. However, extensive use of antibiotic can be found in low income and developed country, caused the increasing number of antibiotic resistant bacteria [4].

The aim of this study is to determine the antibiotic resistance pattern of *S. aureus* isolated from cloacal swab of chicken poultry in Bogor West Java Indonesia.

MATERIALS AND METHODS

Sample collection

A total of 30 samples were collected from chicken cloacal swab from chicken poultry farm in Parung Panjang, Bogor West Java stored in phosphate buffered saline (PBS) then cultured in mannitol salt agar (MSA) plate. Culture was incubated at 37°C for 24 hours. Suspected colony was identified by biochemical test such as catalase test, glucose microaerophilic fermentation, and coagulase test.

Antibiotic susceptibility

Positive strain of *Staphylococcus aureus* tested for its susceptibility against several antibiotics by Kirby-Bauer disk diffusion method on Mueller-Hinton plate. Antibiotics tested were tetracycline (30 µg), oxytetracycline (30 µg), ampicillin (10 µg), gentamycin (30 µg), nalidixic acid (30 µg), chloramphenicol (5 µg), and erythromycin (15 µg). The diameter of inhibition

zone growth was measured after overnight incubation and the result was interpreted based on Clinical and Laboratory Standard Institute (CLSI) 2018 guidelines.

RESULT AND DISCUSSION

S. aureus caused staphylococcosis that affects all bird species. The disease is generally transmitted in feed, litter, and water. It may also be transmitted through transovarially, which is by way of the egg. Acute avian Staphylococcosis in chickens is occurred the clinical sign as diarrhea, depression and inflammation of the joints [5].

A total of 30 samples were isolated from healthy chicken poultry. Fifteen samples were positive *S. aureus* after cultured in MSA and biochemical identification. Antibiotic susceptibility test was performed for the *S. aureus*.

Table 1. Resistant pattern of *Staphylococcus aureus* by disk diffusion method (n %)

Antibiotic	Susceptible strain	Resistance strain
Tetracycline	0 (0)	15 (100)
Oxytetracycline	0 (0)	15 (100)
Ampicillin	0 (0)	15 (100)
Gentamycin	15 (100)	0(0)
Nalidixic acid	6 (40)	9 (60)
Chloramphenicol	12 (80)	3(20)
Erythromycin	0 (0)	15 (100)

The result showed that *S. aureus* in this study were considered multidrug resistance bacteria. Six strain were resistant to 4 and 5 antibiotics meanwhile 3 strain were resistant to 6 antibiotics. The high percentage of antibiotic susceptibility may be due to low using of those antibiotics in poultry farm [6].

Antibiotics such as erythromycin, penicillin and tetracycline are commonly used to treat bacterial infection in chicken poultry. Similar result showed in [7] where *S. aureus* 100% resistant to penicillin, tetracycline, erythromycin, and nalidixic acid meanwhile it sensitive to gentamycin. This study also has similar result with [8] where *S. aureus* resistant to erythromycin

(73.08%), penicillin-G (96.15%) and tetracycline (80,76%) while it still sensitive to gentamycin (50%). This result indicated that *S. aureus* was resistant to commonly used antibiotics.

CONCLUSION

This study provides evidence that *Staphylococcus aureus* isolated from chicken poultry from Bogor West Java was multidrug resistant and resistant to commonly used antibiotics and still sensitive to least used antibiotics. Further analysis needed to determine the gene encoded resistance to antibiotics

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