MOLECULAR DETECTION OF AVIAN PATHOGENIC *ESCHERICHIA COLI* (APEC) USING VIRULENCE GENE *ompT* VIA POLYMERASE CHAIN REACTION (PCR) ASSAY IN BROILER CHICKENS

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This Final Year Project Report entitled **"Molecular Detection of Avian Pathogenic *Escherichia coli* (APEC) using Virulence Gene *ompT* via Polymerase Chain Reaction (PCR) assay in Broiler Chicken"** was submitted by Nur Afizah Binti Che Majid in partial fulfilment of the requirements for the Degree of Bachelor of Science (Hons.) Biology, in the Faculty of Applied Sciences, and was approved by

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ABSTRACT

MOLECULAR DETECTION OF AVIAN PATHOGENIC *Escherichia coli* (APEC) USING VIRULENCE GENE *ompT* VIA POLYMERASE CHAIN REACTION (PCR) IN BROILER CHICKENS

Avian pathogenic *Escherichia coli* (APEC) cause severe respiratory and disease in chicken known as colibacillosis. Colibacillosis affects the economic losses in production of animals around the world and cause the increases of the mortality and morbidity rate in early growth of young chicks. Therefore, it become difficult to carry out the infection control measures for APEC since it spreads quickly. This study aims to detect APEC culture-based method and molecular-based method of PCR. The first phase of this study used culture-based method involving the cloacal swabbing method to isolate sample from chickens. Followed with using sorbitol MacConkey and eosin methylene blue (EMB) agar as selective media to differentiate *E. coli* from other bacteria in the sample. Next, Microgen GN A was used as biochemical tests that consists of 12 different tests for the confirmation of *E. coli*. The finding showed seven out of 35 chicken sample were positive with *E. coli.* Culture-based method successful to isolate pure culture of *E. coli* with confirmed characteristics such as growth pink colony on sorbitol MacConkey agar, deep purple colony with a green metallic sheen on eosin- methylene blue agar and pink rod shape using gram staining. In molecular-based method the assay starts with extraction DNA from genomics bacteria of *E. coli* to obtain pure DNA, designing specific primer of *ompT* gene for APEC, optimization of PCR and DNA visualization using agarose gel electrophoresis. The PCR able detect APEC with specific primer of *ompT* at 236 bp amplicon. The optimal annealing temperature after optimization PCR was 66.1°C. Molecular-based method is preferable to used due to the highly specific, sensitive and rapid in detecting the *ompT* gene. Therefore, it proves that molecular detection able to give a highly precise and accurate result.

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