

ABSTRACT

Muhammad Sina Marsdeva Parady, 24020221140073. **Identification and Detection of Virulent Genes and Biofilm Formation of *Klebsiella pneumoniae* Bacteria from Gourami Fish (*Osphronemus goramy*) Using Multiplex PCR** (under the supervision of Siti Nur Jannah and Lila Gardenia)

Giant Gourami (*Osphronemus goramy*) is a type of freshwater fish that is commonly consumed in Indonesia. Among several diseases that infect gourami, *Klebsiella pneumoniae* bacteria is one of the causative agents of disease in these fish. *K. pneumoniae* is a gram-negative that is thought to cause bleeding in fish, and pneumonia if it infects humans. This study aimed to determine the presence of *Klebsiella pneumoniae* bacteria in gourami and identify several virulent genes, namely *fimH*, *khe*, and *uge*, which play a role in host cell colonization. The methods used included molecular identification of *K. pneumoniae* by PCR, detection of virulent genes by multiplex PCR, biofilm formation test, and molecular identification for phylogeny relationships. The analysis in this study revealed 31/34 (91.18%) candidate *K. pneumoniae* isolates from gourami in Parung, Banyumas, and Depok areas. In the 5 tested *K. pneumoniae* isolates, 2/5 (40%) had all three genes *fimH*, *khe*, and *uge* that support bacterial virulence against gourami cells. In addition, *K. pneumoniae* was found to be categorized as strong 2/5 (40%), moderate 2/5 (40%), and weak 1/5 (20%). There was an important relationship between *fimH* gene expression and *K. pneumoniae* biofilm production. Phylogenetic analysis confirmed three isolates as *K. pneumoniae* and the rest were *Enterobacter* sp. and *K. oxytoca*. This research implies the threat of pathogenic bacteria in water and provides information for further research on the development of targeted treatments against virulent genes. Furthermore, an alarm or early warning to people who consume gourami fish so that it can be produced properly.

Keywords: *biofilm, virulent genes, giant gourami, Klebsiella pneumoniae, multiplex PCR*