MOLECULAR CHARACTERIZATION OF INSULIN-LIKE GROWTH FACTOR 1 (IGF-1) GENE IN CATTLE (*Bos indicus*) AND WATER BUFFALO (*Bubalus bubalis*) WITH CYSTIC OVARIAN FOLLICLE

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An Undergraduate Thesis Submitted to the Faculty of the College of Veterinary Science and Medicine, Central Luzon State University, Science City of Muñoz, Nueva Ecija, Philippines in Partial Fulfillment of the Requirements for the Degree of

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ACCEPTANCE SHEET

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ABSTRACT

RIVERA, ROMANO MARCO B., Department of Pathobiology, College of Veterinary Science and Medicine, Central Luzon State University, Science City of Muñoz, Nueva Ecija, Philippines, **June 2019, MOLECULAR CHARACTERIZATION OF INSULIN-LIKE GROWTH FACTOR 1 (IGF-1) GENE IN CATTLE (*Bos indicus*) AND WATER BUFFALO (*Bubalus bubalis*) WITH CYSTIC OVARIAN FOLLICLE**

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Cystic ovarian follicle (COF) is a significant cause of subfertility, especially in dairy cattle. It develops when one or more follicles fail to ovulate and subsequently does not regress but maintains their growth and steroidogenesis. Insulin-like Growth Factor 1 (IGF-1) gene is found in many cell types and is essential for normal fetal and postnatal growth and development. It is also associated with normal follicle and antral follicle development. It also participates in a cascade in the hypothalamo-pituitary-gonadal axis resulting to luteinizing hormone (LH) surge that can affect the presence of COF.

Insulin-Like Growth Factor (IGF-1) gene in cattle and water buffalo with cystic ovarian follicle (COF) was characterized using DNA sequencing. A total of three ovarian samples (two normal one cystic) were collected in abattoirs in Nueva Ecija and Pangasinan while a total of two blood samples (one cattle and one water buffalo) were collected from the Philippine Carabao Center (PCC). Collected samples were processed at Molecular Biology and Biotechnology Laboratory, PCC wherein they were subjected to DNA extraction, conventional Polymerase chain reaction, and Gel electrophoresis. After that, PCR products were sent to First Base Malaysia for DNA sequencing. Sequences derived were compared with DNA sequences in the Gene Bank to detect polymorphisms.

Results showed that in comparison with the IGF-1 gene sequences with the accession numbers; *Y18831.1* and *FJ196583.1*, there were 307 polymorphisms detected. The derived sequences, however, were closely homologous to *Bos mutus yak QHI chromosome 21* and *Ovis canadensis canadensis isolate 43U chromosome 18 sequence* meaning the segment of the sequence derived may not be exclusive to the IGF-1 gene.

Keywords: cattle, cystic ovarian follicle (COF), IGF-1 gene, water buffalo

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