MORPHOLOGICAL AND HISTOLOGICAL IDENTIFICATION OF RUMEN AMPHISTOMES AFFECTING PHILIPPINE WATER BUFFALOES (*Bubalus bubalis*) IN NUEVA ECIJA

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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

This undergraduate thesis entitled **"MORPHOLOGICAL AND HISTOLOGICAL IDENTIFICATION OF RUMEN AMPHISTOMES AFFECTING PHILIPPINE WATER BUFFALOES (*Bubalus bubalis*) IN NUEVA ECIJA"** prepared and submitted by **FIONA AMOR G. MARZAN**, in partial fulfillment of the requirements for the degree of **DOCTOR OF VETERINARY MEDICINE**, is hereby accepted:

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BIOGRAPHICAL SKETCH

The author, Fiona Amor Gallardo Marzan was born at Guimba, Nueva Ecija on November 30, 1995. She is the second daughter of Mr. Francisco C. Marzan, Jr. and Mrs. Charito G. Marzan

She finished her elementary education in Guimba East Central School where as she consistently receives honors and also inclined to different extracurricular activities like drum and lyre, and being a varsity of badminton as well as a member of the student publication. She took up high school at Bartolome Sanggalang National High School (formerly Guimba National High School) where she also maintain being an honor student and continuously involved to extracurricular activities. She was an active officer of the student government from first year to third year representative and elected as Vice President during her last year in student government. She was also a writer in the student publication "The Echoes" during her 4 year in high school.

She admitted to college at the Central Luzon State University to continue her dream and passion. She became a member of the Society for the Advancement of Veterinary Education and Research where she gain leadership skills at different aspects. She graduated Bachelor of Science in Animal Husbandry and took up Doctor of Veterinary Medicine on the same institution.

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ABSTRACT

MARZAN, FIONA AMOR G., College of Veterinary Science and Medicine, Central Luzon State University, Science City of Muñoz, Nueva Ecija, Philippines. **June 2019, MORPHOLOGICAL AND HISTOLOGICAL IDENTIFICATION OF RUMEN AMPHISTOMES AFFECTING PHILIPPINE WATER BUFFALOES (*Bubalus bubalis*) IN NUEVA ECIJA.**

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The study aimed to describe and identify the different rumen amphistomes affecting Philippine buffalo (*Bubalus bubalis*) in Nueva Ecija. Amphistome parasites were collected to different slaughter houses in Nueva Ecija. Collected samples were processed and mounted at Research laboratory at the College of Veterinary Science and Medicine to morphologically characterize the parasites. And further examination were done at Providence Hospital for histological identification. The study was conducted from May 2018 to July 2018. One genus from the family Gastrothylacidae and some unidentified species were recovered from the rumen of water buffalo slaughtered in various slaughter houses in Nueva Ecija. The parasites recovered were identified as *Fischoederius philippinensis* (Eduardo and Javellana, 1988), and the other parasites are undescribed and unidentified species of the superfamily Paramphistomoidea.

Keywords: Amphistomes, *Fischoederius philippinensis,* Superfamily Paramphistomoidea

LITERATURE CITED

Anuracpreeda, P., Wanichanon, C. & Sobhon, P. (2008) *Paramphistomum cervi*: Antigenic profile of adults as recognized by infected cattle sera. Exp. Parasitol., 118(2): 203-207.

Blood, D.C., Radotits, O.M., Arundle, T.M. & Gay, C.C. (1990). Textbook of Veterinary Medicine. 7th Ed.Bailliere Tindal, London, UK.

Dinnik, J.A. 1 964. Paramphistomum sukumum sp. nov. and other stomach flukes from cattle in the Sukumaland area of the Lake Region, Tanganyika. Parasitology, 54(2): 20 1-209.

Eduardo, S.L. (1937). The taxonomy of the family Paramphistomidae with special reference to the morphology of species occurring in ruminants. Syst. Parasitol., 5: 25-79.

Eduardo, S.L. The taxonomy of the family Paramphistomidae Fischoeder, 1901 with special reference to the morphology of species occurring in ruminants. I. General considerations. Systematic Parasitology 4, 7-57 (1982) 0165-5752/82/0041-007/$10.20 © 1982, Dr. W. Junk Publishers, the Hague. Printed in The Netherlands.

Eduardo, S.L. & Cesar Ramon H. Javellana. *Fischoederius philippinensis*, a new species of gastrothylacid parasite from ruminants in the Philippines* Trans. Nat. Acad. Science & Tech. (Phils.) 1988: 1 0: 1 77-1 86

Fernando, C.H.; J.I. Furtado; A.V. Gussev; G. Hanek; & S.A. Kakonge. 1972. Methods for the study of freshwater fish parasites. University of Waterloo Biol.CJgy Series N. 12. 76 pp.

Fukui, T. (1929) Studies on Japanese amphistomatous parasites, with revision of the group. Japanese Journal of Zoology, Transactions and Abstracts, 2, 219-351.

Hansen, J. & Berry, B. The epidemiology, diagnosis and control of helminth parasites of ruminants. ILRAD 1994. Published by the International Laboratory for Research on Animal Diseases, P.O. Box 30709, Nairobi, Kenya. Printed by the International Livestock Centre for Africa Addis Ababa, Ethiopia. ISBN 92-9055-703-1

Horak, I.G. (1967) Host-parasite relationships of *Paramphistomum microbothrium* Fischoeder, 1901, in experimentally infested ruminants, with particular reference to sheep. Onderstepoort Journal of Veterinary Research, 34, 451-540.

Iqbal, M.N., Shahzad, K.A. & Muhammad, A., 2013. Identification and prevalence of *Paraphistomum cervi* in naturally infected water buffaloes of central Punjab, Pakistan. *Veterinaria,* **1:** 9-12

Jithendran, K.P. & T.K. Bhat. 1999. Epidemiology of parasites in dairy animals in the North West Humid Himalayan Region of India with particular reference to gastrointestinal nematodes. Trop. Anim. Health Pro., 31(4): 205-214.

Khan, A.G., 2003. Rangelands and livestock in Pakistan, northern areas program, Gilgit. 47.

Khan, U.J., Tanveer, A. & Maqbool, A. (2008) Epidemiological studies of paramphistomosis in cattle. Vet. Arhiv., 78(3): 243-251.

Lebbie S.H.B., Rey, B. & Irungu, E.K. (1994). Small ruminant research and development in Africa, Proceedings of the Second Biennial Conference of the African Small Ruminant Research Network, ILCA (1994), pp. 1–5.

Luna L.G. Mannual of Histologic Staining Method of the Armed Forces Institute of Pathology. 3rd ed. New York, Toronto, London, Sydney: McGraw Hill Book Co; 1968.

Muhammad, A., Shah, S.I., Iqbal, M.N., Ali, S., Irfan, M., Ahmad, A. & Qayyum, M., 2015. Prevalence of *Gigantocotyle explanatum* in buffaloes slaughtered at Sihala Abattoir, Rawalpindi. *Punjab Univ. J. Zool.,* **30**(1): 11-14.

Näsmark, K.E. (1937) Revision of the trematode family Paramphistomidae. Zoologiska Bidrag frhn Upsala, 16: 301-565.

Ozdal, N., Gul, A., Ilhan, F. &Deger, S. (2010) Prevalence of Paramphistomum infection in cattle and sheep in Van Province, Turkey. Helminthologia, 47: 20-24.

Philippine Statistic Authority. April to June 2017. Performance of Philippine Agriculture. Retrieved on October 8, 2017 from the World Wide Web: http://psa.gov.ph

Prasad, A. & Verma, Tk. (1999). On the prevalence and community dominance among paramphistomes infecting domestic ruminants. Journal of Veterinary Parasitology, 13: 129-133.

Rafiullah, Turi, A.A., Sajid, A., Shah, S.R., Ahmad, S. & Shahid, M. (2011). Prevalence of gastrointestinal tract parasites in cattle of Khyber Pakhtunkhwa. *ARPN J. Agri. and Biol. Sci.,* 6(9): 9-15

Sey, O. (1982). The morphology, life-cycle and geographical distribution of *Paramphistomum cervi* (Trematoda: Paramphistomata). Miscnea. Zool. Hung., 1: 11-24.

gh, N.K., Singh, H., Haque, J.M. & Rath, S.S. (2012). Prevalence of parasitic infection in buffaloes in and around Ludhiana District, Punjab, India: A preliminary stud *J. Buffalo Sci.,* 1(1): 1-3.

ail, S.M., Qurreshi, M.S., Khan, S., Durani, F.R. Andihsanullah, 2009. Inheritance economic traits of diary buffalo in Pakistan. Sarhad J. Agric., 25(1): 87-93.

lsby, E.J. 1982. Helminths, Arthropods and Protozoa of Domesticated Animals. 7th e Bailliere Tindall, London.pp.119-127.

don, V., Roy, B., Shylla, J.A., & Ghatani, S. Amphistomes. Chapter 11. Department Zoology, North-Eastern Hill University, Shillong 793 022, Meghalaya, Ind Medicine and Biology 766, DOI 10.1007/978-1-4939-0915-5_11, © Spring Science+Business Media New York 2014

naguti, S. (1952) Parasitic worms mainly from Celebes. Part 5. Trematodes mammals. Acta Med. Okayama, 8(4): 341-352.