Histopathological Assessment of Cadmium Effect on Testicles and Kidney of *Oreochromis niloticus* in Different Salinity

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Abstract. This study was aimed to determine the effect of cadmium on testicles and kidney structure of *Oreochromis niloticus* in different salinity. Twenty-seven *Oreochromis niloticus* at age of 5±0.5 months with average size 11±1 cm and average weight 250±50 g were used and divided into nine treatment groups with variations in salinity (0, 5 and 10 $^{0}/_{00}$) and cadmium levels (0, 2.5, and 5 ppm). After two weeks of treatment periods, testicles and kidney was collected and then processed into histological slide. Result showed that cadmium and salinity variations caused change in diameter of seminiferous tubules in the testicles. Kidney structure also showing various damage such as necrosis and inflammation from groups treated with various concentration of salinity and cadmium. Smallest diameter of seminiferous tubules of the testicles and the highest percentage necrosis and inflammation of kidney was found from salinity:cadmium = $0^{0}/_{00}$: 5 ppm treatment.

Key words : *Oreochromis niloticus*, cadmium, salinity, seminiferous tubules, testicles, kidney

INTRODUCTION

Environmental pollution, especially on water is public problem, because water is essential for the life. Some pollutant such as microbiology materials (bacteria and parasites); organic substances (pesticides, detergents, insecticides, and household waste); and inorganic materials (salts, acids, and metals), as well as other chemicals have been found in the river (Qiao et al., 2007). In the increasingly industrialized society, heavy metal waste concentration in the water is also found to be increased that it was possible to achieve toxicity level for aquatic life. One of the heavy metals having toxic effect was cadmium (Cd). The Cd was found in the river and marine environment (Almeida et al., 2009). Changes of heavy metal in aquatic systems was depended on specific factor caused by chemical or physical effect of the surrounding environment. The different of the salinity would affect Cd absorption rate in fish tissue. Variation of salinity level could affected on the toxicity of Cd, the higher the salinity Cd toxicity on fish would lower. Water in the river and reservoir was commonly used as source of water supply of fish, but increasing level of heavy metal pollution in the water threatened aquaculture activities. Development and deployment of tilapia in the river and reservoir was very rapid, because this fish had rapid growth, large body size, tasteful flesh, and less thorn, also high breeding and survival rate. Tilapia species was generally characterized by large tolerance to salinity, however, its capacity to adapt to brackish or seawater might be modulated by environmental factors. Major osmoregulation mechanisms involved in salinity adaptation was presented.

Cadmium was known to possess long half-life inside the body of living organism (Patrick, 2003). Such contaminant was health-endangering towards organisms which admitted through food chain and accumulated in tissues such as kidney and reproductive organs (Kostnett, 2007). Accumulation of Cd in the reproductive organ of organism could affect reproductive processes thus affecting survival of the species. Cadmium had carcinogenic and

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