

Weerasak Taengphan 2011: Respiratory Burst Activity in Nile Tilapia, *Oreochromis niloticus* Linn. Macrophages Activated by *Mycobacterium lacticola* and *Escherichia coli*.
Master of Science (Zoology), Major Field: Zoology, Department of Zoology. Thesis Advisor:
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Mycobacterium lacticola, acid fast bacteria found in soil and water, has been firstly reported in 2004 to cause disease. The aim of this study was to investigate the respiratory burst of the head kidney isolated macrophages of Nile Tilapia, *Oreochromis niloticus* exposed to *M. lacticola*. The experiment was compared with *Escherichia coli*, gram-negative bacteria, and macrophage-activating agents, mycolic acid and lipopolysaccharide (LPS) which were the respective cell wall components of *M. lacticola* and *E. coli*. The cultured macrophages were activated with *M. lacticola*, *E. coli*, mycolic acid and LPS for 60 min. The supernatant of the cultures was subjected to determine toxic radical concentrations by phenol red method, griess reaction assay and superoxide anion assay. The results showed that mycolic acid could stimulate macrophage to release nitric oxide, hydrogen peroxide and superoxide anion at concentrations 4.44 ± 1.4 , 2.19 ± 0.2 and 2.09 ± 0.15 nmol/ml, respectively. In cultures activated with *E. coli* and LPS coincided with the release of superoxide anion at concentrations 29.63 ± 0.71 and 29.54 ± 1.56 nmol/ml, nitric oxide 16.52 ± 0.28 and 17.09 ± 0.69 , and hydrogen peroxide 10.87 ± 0.05 and 11.06 ± 0.16 nmol/ml, respectively, but this was not the case in culture treated with *M. lacticola*. Furthermore, the activities of the antioxidant enzymes, glutathione peroxidase (GSH-Px), catalase (CAT) and superoxide dismutase (SOD), were evaluated from the supernatant of cell fraction by colorimetric assay, Cayman's catalase assay and RANSOD, respectively. Significantly, activated macrophages by mycolic acid were able to increase the activities of GSH-Px, CAT, SOD at 124 ± 11.67 , 115.69 ± 1.67 and 124.67 ± 3.65 mU, respectively. Moreover, *E. coli* and LPS were able to increase the activities of GSH-Px at 280.48 ± 30.91 and 275.67 ± 13.07 , CAT at 258.48 ± 0.99 and 255.26 ± 3.16 and SOD at 256.99 ± 5.07 and 250.48 ± 4.20 mU, respectively. Unfortunately, activated macrophages by *M. lacticola* was not increased the activities of antioxidant enzymes.

Student's signature

Thesis Advisor's signature