

Mucosal responses of brown-marbled grouper *Epinephelus fuscoguttatus* (Forsskl, 1775) following intraperitoneal infection with *Vibrio harveyi*

ABSTRACT

Groupers are popular aquaculture species in South-East Asia, but their cultivation is affected by infectious disease outbreaks. Mucosa-associated lymphoid tissues provide a first-line defence against pathogens; however, few studies are available relating to cellular or proteomic responses of mucosal immunity in grouper. Skin, gill and intestine were sampled from brown-marbled grouper *Epinephelus fuscoguttatus* (Forsskål, 1775) at 4 and 96 hr post-infection (hpi) and 7 days post-infection (dpi) following intraperitoneal infection with *Vibrio harveyi*, and stained with haematoxylin/eosin and Alcian Blue/periodic acid–Schiff. Skin mucus was analysed by 2D-gel electrophoresis, and proteins modulated by the bacterial infection identified. In the infected fish, significant increases in sacciform cells in skin and increased levels of nucleoside diphosphate kinase in mucus were detected at 4 hpi. At 96 hpi, goblet cells containing acidic mucins significantly increased in the intestine, while those containing mixed mucins increased in skin and gills of infected fish. Proteasome subunit alpha type-I and extracellular Cu/Zn superoxide dismutase levels also increased in mucus. Rodlet and mast cells did not appear to respond to the infection. Mucosal tissues of grouper appeared actively involved in response to *Vibrio* infection. This information may help future research on improving grouper health, production and vaccine development.

Keyword: Goblet cells; Grouper; Mucosal immunity; Sacciform cells; Skin mucus proteins