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VALIDATION OF TWO *PMX-LUCIFERASE* REPORTER SYSTEMS TO STUDY VIRUS - HOST INTERACTION

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Viral diseases represent an important threat in aquaculture. Therefore, the development of strategies and tools to understand fish susceptibility, virus-host interaction, or to identify viral virulence markers is a priority. Fish possess an effective antiviral response mediated by type I interferon, IFN I, a cytokine that induces the expression of a set of genes, called IFN-stimulated genes (ISGs), which generate an antiviral state in infected and surrounding cells. Among ISGs, *mx* genes are considered markers of the IFN I response, since Mx proteins show direct antiviral activity and *mx* genes display strong and quick induction, which varies according to viral virulence. In addition, *mx* transcription is blocked by several viruses. Therefore, the level and time-course of *mx* induction reflect virus-host interaction. This idea prompted the development of *in vitro* experimental systems consisting of RTG-2 cells stably expressing luciferase under the control of *mx* promoters to study virus-host interplay. Specifically, Senegalese sole and sea bream *mx* promoters have been evaluated in this study.

Both systems were inoculated with different doses of viral isolates relevant in aquaculture: Infectious Pancreatic Necrosis Virus, IPNV, Viral Haemorrhagic Septicaemia Virus, VHSV, and Nervous Necrosis Virus, NNV. Each isolate triggered a characteristic profile in each experimental system. The sensitivity of both experimental systems in detecting two NNV isolates in infected tissues was tested, and the NNV antagonistic activity was also characterized. The minimal viral dose required to detect *pmx* induction and/or blocking is a possible virulence marker for these isolates. Thus, both experimental systems have been validated and can be used to get more insight on virus-host interaction and contribute to fight viral infections in aquaculture.

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