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Abstract

Despite numerous biosecurity benefits provided by land-based, closed-containment water recirculation aquaculture system (RAS) operations, opportunistic pathogens, such as *Saprolegnia* spp. oomycetes (causative agents of saprolegniasis) can still represent disease threats if environmental conditions are unfavorable, during vulnerable fish life-stages, or following stressful procedures. Saprolegniasis in general is associated with enormous losses in Atlantic salmon *Salmo salar* aquaculture, especially during the early rearing fry stage, smoltification, and following vaccination. We have investigated strategies to reduce saprolegniasis during each of these high-risk production cycle stages; however, at the time of abstract submission, only one study has been completed, while the remaining two are ongoing and will be presented at the workshop. To assess post-vaccination saprolegniasis, we applied daily peracetic acid (PAA) bath treatments at three dosages while evaluating the effects of these treatments on biofilter performance in replicated (12) experimental-scale RAS stocked with Atlantic salmon parr (200 fish per RAS, 94g mean weight) following intracoelomic injection vaccination. The PAA doses assessed were 0.2, 0.5, and 1.0 mg/L, and these were applied to each culture tank for a period of six weeks post-vaccination. Survival, waterborne *Saprolegnia* spp. colony counts, gill, spleen, and kidney histopathology, and biofiltration function (measured by total ammonia nitrogen (TAN) removal efficiency), were assessed. Visible skin lesions and fin erosion, hemorrhage, and observable *Saprolegnia* spp. infection were also evaluated. While no major post-vaccination saprolegniasis occurred in this study, survival was statistically ($p<0.05$) lower in control salmon, and visible saprolegniasis was significantly more prevalent in the control group. Despite less saprolegniasis being associated with PAA treatment, all treatment groups were associated with significantly lower fish weight by study's end. Biofilter TAN removal efficiency was not impacted by PAA administration at all dosages. Results suggest that low-dose PAA might be effective in reducing post-vaccination saprolegniasis while not significantly impacting RAS biofiltration. Further research, however, is necessary to confirm these findings, especially in commercial settings experiencing significant issues with saprolegniasis.

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