

點帶石斑種魚使用石斑虹彩與神經壞死病毒雙價不活化疫苗降低垂直感染之風險

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摘要

本次試驗共計使用 41 尾青斑用以評估石斑虹彩病毒(Grouper iridovirus, GIV)與病毒神經壞死病毒(Viral nerves necrosis, VNN)不活化雙價疫苗應用於石斑魚種苗場之效用評估。免疫前種魚體內樣本以定量聚合酶連鎖反應檢測及定量病毒核酸檢出分析發現:以卵子樣本之檢出率最高為 4.1% (2/41)，並可定量檢出分別攜帶 GIV (1780 copies/ul)與 VNN (97.1 copies/ul)之病毒核酸含量，此結果證實 GIV 具有垂直感染之傳播途徑。分析免疫後 1 個月青斑種魚體內 VNN 血清中和抗體力價發現:有 50%種魚位於高力價(1:1810 至 1:5120 倍之抗體力價)及 45%種魚位於中等力價(抗體力價介於 1:452 至 1:1280 倍)，其抗體力價相較高於 GIV 血清中和抗體力價之分布；GIV 血清中和抗體力價有 50%種魚抗體力價位於 1:57 倍至 1:320 倍之間及 40%種魚之抗體力價位於 1:452 倍至 1:1280 倍之間，顯示免疫組種魚對於 VNN 具有較高免疫源性且其激起之中和抗體力價亦較高於 GIV。另外，評估使用疫苗前後青斑魚種之各試驗組體內病毒核酸檢出量之變化發現:青斑於免疫前被檢出帶有 GIV (1780 copies/ul)與 VNN (97.1 copies/ul)病毒核酸，但於免疫後 1 個月其體內已無法檢出 GIV 與 VNN 病毒核酸。綜合上述評估結果顯示：種魚之免疫注射除可提高種魚體內具有保護能力之抗體力價並可激活特異性中和抗體而達到清除體內卵子細胞中病毒核酸含量而降低垂直感染之途徑。

關鍵字: 石斑、神經壞死與虹彩病毒雙價不活化疫苗、石斑魚種苗場

**A bivalent inactivated vaccine of viral nerves necrosis virus
and grouper iridovirus applied to grouper broodfish
(*Epinephelus coioides*) reduces the risk of vertical
transmission**

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Abstract

Forty-one broodfish of orange-spotted groupers (*Epinephelus coioides*) were selected to evaluate the effectiveness of the viral nerves necrosis (VNN) virus and the grouper iridovirus (GIV) inactivated bivalent vaccine in grouper broodfish. Real-time quantitative PCR analysis resulted in a detection rate of 4.1% (2/41) for both VNN and GIV in *E. coioides* broodfish eggs. In addition, approximately 1780 copies of GIV viral DNA were detected in broodfish eggs pre-vaccination and thus confirmed vertical transmission of GIV in *E. coioides* broodfish. A significant increase of the serum antibody titer of anti-VNN was >50% higher in the high titer level (1:1810 to 1:5120) and 45% higher in the moderate titer level (1:452 to 1:1280), which were both respectively higher than the serum antibody titer of the anti-GIV display 50% (10/20) in a titer of 1:57 to 1:320 and 40% (8/20) in a titer of 1:452 to 1:1280 one month post-vaccination. These results demonstrate that VNN is a highly antigenic virus and can effectively induce neutralizing antibodies better than GIV. Furthermore, the VNN and GIV viral copy numbers were 97.1 and 1780 copies/ μ g DNA, respectively, in broodfish eggs pre-vaccination. One month after the vaccination, the viral genomes of VNN and GIV were undetectable in egg specimens. These results indicate that immunization can induce a specific neutralized antibody conferring protection, and the infected antigen can thereby be eliminated by immunity *in vivo*. We therefore demonstrate that the specific antibodies of GIV and VNN induced by vaccination can reduce the risk of vertical transmission of VNN and GIV in *E. coioides* broodfish.

Key words: viral nerves necrosis virus, grouper iridovirus inactive bivalent vaccines,

grouper broodfish, *Epinephelus coioides*