

TUMSAT-OACIS Repository - Tokyo

University of Marine Science and Technology

(東京海洋大学)

[5] Diseases Caused By Viral Pathogens

| | |
|-------|---|
| メタデータ | 言語: eng 出版者: 公開日: 2016-05-13 キーワード (Ja): キーワード (En): 作成者: 中井, 敏博, 佐野, 元彦, 吉水, 守, 笠井, 久会, 伊丹, 利明, Sudhakaran,, Raja メールアドレス: 所属: |
| URL | https://oacis.repo.nii.ac.jp/records/1270 |

DISEASES CAUSED BY VIRAL PATHOGENS

Toshihiro Nakai

Graduate School of Biosphere Science, Hiroshima University, 1-4-4 Kagamiyama, Higashi-Hiroshima 739-8528, Japan

Motohiko Sano,

Department of Marine Biosciences, Tokyo University of Marine Science and Technology, Konan 4-5-7, Minato-ku, Tokyo 108-8477, Japan.

Mamoru Yoshimizu, Hisae Kasai

Laboratory of Biotechnology and Microbiology, Faculty of Fisheries Sciences, Hokkaido University, Hakodate, Hokkaido 041-8611, Japan

Toshiaki Itami

Department of Aquaculture, Faculty of Agriculture, University of Miyazaki, 1-1 Gakuen Kibanadai-nishi, Miyazaki 889-2192, Japan.

Raja Sudhakaran

School of Biosciences and Technology, VIT University, Vellore 600 014, Tamilnadu, India

Keywords: Viral disease; Freshwater fish, SVC, CCVD, KHVD, HVHN, EHN, Red sea bream iridoviral disease (RSIVD), Viral nervous necrosis (VNN), Megalocytivirus, Betanodavirus, Salmonid disease, IPN, IHN, VHS, OMVD, ISA, shrimp, virus

Contents

1. Freshwater Fish
 2. Marine Fish
 3. Salmon and Trout Viral Diseases
 4. Shrimp Diseases
- Glossary
Bibliography
Biographical Sketches

Summary

Viral diseases cause particularly severe damages in aquaculture in the world, mainly due to lack of effective chemotherapeutics and limited numbers of commercially available vaccines. Some of the diseases have spread among wild populations of fish as well as cultured ones, resulting in considerable loss in fisheries and the natural resources. In this section, we selected important viral diseases of fish and shellfish (shrimp), and describe their disease agents, geographical distributions, host ranges, and diagnostic and control methods. These include five diseases (SVC, CCVD, KHVD, HVHN, EHN) in freshwater fish except for warm-water fish, two (RSIVD, VNN) in marine fish except for salmonids, five (IPN, IHN, VHS, OMVD, ISA) in salmon and trout, and six (WSD, YHD, IHHN, TS, WTD, IMN) in penaeid shrimp. Most of the diseases are currently listed by the World Organization for Animal Health (OIE) and thus are of great importance for the

international trade of aquatic animals.

1. FRESHWATER FISH

Motohiko Sano

1.1. Synopsis/Abstract

This section describes the viral diseases affecting warm-water fin-fish in fresh water. Although many viral diseases and the causative viruses have been reported to date, this section focuses on the five most important viral diseases.

1.2. Introduction

Fresh water fish form the largest segment of the world aquaculture production and a major part of the catch-fish industry in inland waters. The harvest of farmed warm-water fish is increasing, and consequently, fry production of fish species for aquaculture has also rapidly increased and disease problems have become the largest obstacle in aquaculture operations. Some diseases of cultured fish (e.g. koi herpesvirus disease) have spread to wild populations of fish which pose serious threats to the ecosystem. .

Wolf (1988) described 59 fish viruses, and, subsequently, the number of fish viruses reported continues to increase so far. Viruses of warm-fresh water fish of major importance are shown in Table 1.1 (Sano et al, 2011). This section focuses on diseases caused by 5 of the viruses in the table: spring viremia of carp, channel catfish virus disease, koi herpesvirus disease, herpesviral hematopoietic necrosis and epizootic hematopoietic necrosis. These diseases are transboundary aquatic animal diseases, of international concern due to their significance in the international trade of aquatic animals. Most of the diseases in this section are currently listed by the World Organisation for Animal Health (OIE) (Aquatic Animal Health Code 2012).

| Virus | Taxonomy (Family) | Main Host |
|--|------------------------------|---|
| DNA Virus | | |
| Carp herpesvirus (CHV) (=CyHV-1) | Alloherpesviridae | Carp (<i>Cyprinus carpio</i>) |
| Goldfish hematopietic necrosis virus (GFHNV) (=CyHV-2) | Alloherpesviridae | Goldfish (<i>Carassius auratus</i>) |
| Koi herpesvirus (KHV) (=CyHV-3) | Alloherpesviridae | Carp |
| Channel catfish virus (CCV) (=IcHV-1) | Alloherpesviridae | Channel catfish (<i>Ictalurus punctatus</i>) |
| Ictalurus melas herpesvirus (IcmHV) (=IcHV-2) | Alloherpesviridae | Black bullhead (<i>Ameiurus melas</i>) |
| <i>Herpesvirus anguillae</i> (HVA) (AngHV-1) | Alloherpesviridae | Japanese eel (<i>Anguilla japonica</i>), European |
| White sturgeon herpesvirus 1 (WSHV-1) (=AciHV-1) | Alloherpesviridae | White sturgeon (<i>Acipenser transmontanus</i>) |
| White sturgeon herpesvirus 2 (WSHV-2) (=AciHV-2) | Alloherpesviridae | White sturgeon |