

# Incidence and genetic analysis of white spot syndrome virus (WSSV) in farmed shrimps (*Penaeus indicus* and *Litopenaeus vannamei*) in Iran

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## Abstract

White spot syndrome virus (WSSV) is a double-stranded DNA virus that causes the most serious losses to shrimp farmers worldwide. Since the first WSSV incidence in Iran in 2001, it has caused several outbreaks of disease with high mortality and economic loss in the Iranian shrimp farming industry. During this study from May 2010 to November 2015, WSSV was also diagnosed as the causative agent of ten of fifteen unexplained mass mortality events (70-100 %) in farmed shrimp (*Penaeus indicus* and *Litopenaeus vannamei*) in four provinces along the coastal areas of the Persian Gulf and the Gulf of Oman. Thus, this highlighted that WSSV outbreaks are continuing in Khuzestan, Bushehr, and Sistan and Baluchestan provinces, as well as the first outbreak of the virus in Hormozgan province in Iran. Sequence analysis of the amplified region using World Organization of Animal Health (OIE) recommended primer sets also confirmed the presence of WSSV genome. Sequence analysis of variable number of tandem repeats (VNTRs) within the coding regions of ORF75 of Iranian WSSV strains revealed two repeat patterns (11 and 5 RUs) that were identical to some Indian isolates, while they differed by deletion and insertion of one 45 bp RUs from the repeat patterns of reference genomes from Thailand (12 RUs) and South Korea (4 RUs), respectively. This suggests that India may be the main source of origin into Iran where movements of the virus are probably occurring via importation of live post-larvae from this country.

## Introduction

White spot syndrome virus (WSSV) is an enveloped, large double-stranded DNA virus belonging to the family Nimaviridae (genus *whispovirus*; Vlak et al., 2005) that is the causative agent of a contagious disease (White Spot Disease; WSD) with high cumulative mortality (up to 100%) and rapid disease onset in more

than 98 crustacean species including penaeid shrimps, crayfish, lobsters and crabs (Escobedo-Bonilla et al., 2008; Lo et al., 1996; Sánchez-Paz, 2010).

White spot syndrome (WSS) was first detected in China (Fujian province) in 1991 to 1992 and

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