

# Detection of Red-spotted grouper nervous necrosis virus (RGNNV) in shrimp and squid of the Mediterranean Sea

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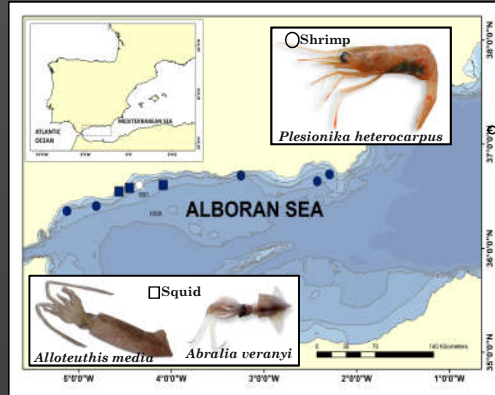
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Nervous necrosis virus (NNV) is a betanodavirus that causes viral encephalopathy and retinopathy (VER) or viral nervous necrosis (VNN) in fish. Genotypes are discriminated according to genomic RNA2 encoding the coat protein. The RGNNV and its reassortant with SJNNV genotype currently threat Mediterranean aquaculture. The virus can be transmitted through water, between fish, or through contaminated food including trash shellfish.



Invertebrate animals were collected in the Alboran Sea during the Mediterranean International Trawl Survey (MEDITS) in 2015. Total RNA was isolated from frozen ocular tissue. NNV was detected through sequencing using primers that discriminate RNA2 of RGNNV and SJNNV (1,2). RGNNV was detected in all three species analyzed and in eight of nine locations studied.

NNV is detected for the first time in the Alboran Sea.

In the Mediterranean Sea, RGNNV is widely distributed between areas and to date has been detected in four Classes and seven Families of marine invertebrates. But this study detected, for the first time, the RGNNV in squid and shrimp.

Clustering of RGNNV RNA2 sequences isolated from Mediterranean fish and shellfish suggest that RGNNV is being widely transmitted between shellfish, fish, and ecosystems.

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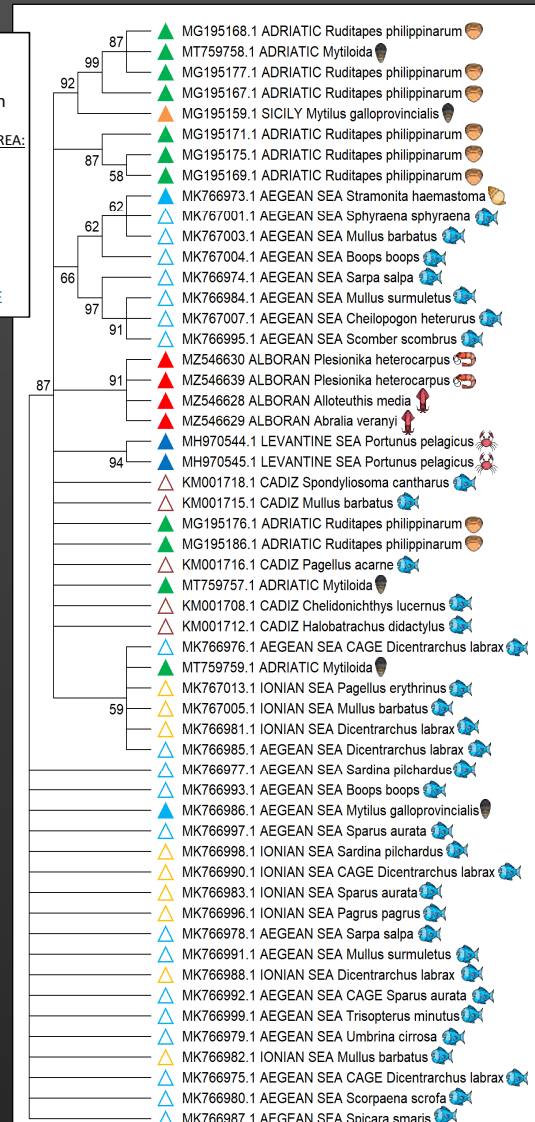
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HOST SPECIES:

△ Fish  
▲ Shellfish

COLLECTION AREA:

CADIZ  
ALBORAN  
SICILY  
IONIAN  
ADRIATIC  
AEGEAN  
LEVANTINE



## Detection of RGNNV in shellfish collected in the Mediterranean Sea.

Classification <sup>a</sup>	Species	Collection Area	Tissue <sup>b</sup>	Sequence <sup>c</sup>	Reference
Mollusca Bivalvia					
Mytiloidea Mytilidae	Mytilus galloprovincialis	Greece, Aegean Sea.	n.i.	MK766986	(3)
	Xenostrobus securis	Sicily, Italy.	Hepatopancreas	MG195159	(4)
		Italy, Adriatic Sea.	Hepatopancreas	MT759757- MT759760	(5)
Veneroidea, Veneridae	Ruditapes philipinarum	Italy, Adriatic Sea.	Hepatopancreas	MG195167- MG195186	(4)
Mollusca Gastropoda					
Neogastropoda Muricidae	Stramonita haemastoma	Greece, Aegean Sea.	n.i.	MK766973	(3)
Mollusca Cephalopoda					
Myopsida Loliginidae	Alloteuthis media	Spain, Alboran Sea.	Ocular tissue	MZ546624- MZ546628	This study
Oegopsida Enoplateuthidae	Abralia veranyi	Spain, Alboran Sea.	Ocular tissue	MZ546629	This study
Arthropoda Malacostraca					
Decapoda Pandalidae	Plesionika heterocarpus	Spain, Alboran Sea.	Ocular tissue	MZ546630- MZ546642 <sup>d</sup>	This study
Decapoda Portunidae	Portunus pelagicus	Israel, Levantine Sea.	Nerve tissue	MH663494, (6) MH663495, MH970545, MH970544	

<sup>a</sup>Phylum, Class, Order, Family. <sup>b</sup>n.i. not indicated. <sup>c</sup>GenBank accession number for RNA2 sequence. <sup>d</sup>Excluding MZ546633 and MZ546638.

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