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Polymorphism in a serine protease inhibitor gene and its association with the resistance of bay scallop (*Argopecten irradians*) to *Listonella anguillarum* challenge

Vinu S. Siva, Lingling Wang, Limei Qiu, Zhi Zhou, Chao Liu, Jialong Yang, Chuanyan Yang, Linsheng Song



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1 **Polymorphism in a serine protease inhibitor gene and its association with**
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3 ***anguillarum* challenge**

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5 Vinu S Siva^{1,2,3}, Lingling Wang¹, Limei Qiu², Zhi Zhou², Chao Liu¹, Jialong Yang², Chuanyan
6 Yang¹, Linsheng Song^{1*}

7 ¹Key Laboratory of Mariculture & Stock enhancement in North China's Sea, Ministry of Agriculture,
8 Dalian Ocean University, Dalian 116023, China

9 ²Key laboratory of Experimental Marine Biology, Institute of Oceanology, Chinese Academy of
10 Sciences, Qingdao 266071, China

11 ³Centre for Climate Change Studies, Sathyabama University, Jeppiaar Nagar, Rajiv Gandhi Salai,
12 Solinganallur, Chennai, Tamil Nadu 600 119, India

13
14 **Abstract**

15 Serine protease inhibitors (SPIs) play a crucial role in regulation of both host and bacterial serine
16 protease. They are classified into several protein families, where Kazal-type inhibitors are one of
17 families with multi-domain. In the present study, the polymorphism of *Ai*SPI from Bay scallop
18 *Argopecten irradians* was found to be associated with disease resistance of bay scallop against
19 *Listonella anguillarum*. Nine single nucleotide polymorphisms (SNPs) were identified in the exon
20 region of *Ai*SPI, where five SNPs were non-synonymous mutation. Three of these mutations were
21 located in “kazal-like 3” domain, two SNP loci positioned at +536, +1312 were selected for further
22 association studies. For the locus +536, the genotype frequency of A/G in the resistant stock (12.8%)
23 was significantly lower ($p < 0.05$) than that in the susceptible stock (35.1%), while, the genotype A/A

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