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Riemerella anatipestifer AS87_01735 gene encodes nicotinamidase (PncA), an important virulence factor

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Riemerella anatipestifer is a major bacterial pathogen that causes septicemic and exudative diseases in domestic ducks. In our previous study, we found that deletion of AS87_01735 gene significantly decreased the bacterial virulence of *R. anatipestifer* strain Yb2 (mutant RA625). AS87_01735 gene was predicted to encode nicotinamidase (PncA), a key enzyme that catalysis conversion of nicotinamide to nicotinic acid, an important reaction in the NAD⁺ salvage pathway. In this study, the AS87_01735 gene was expressed and identified as a PncA coding gene using enzymatic assay. Western blot analysis demonstrated that *R. anatipestifer* PncA was located in the cytoplasm. The mutant strain RA 625 (named as Yb2ΔpncA in this study thereafter) showed similar growth rate, but decreased NAD⁺ quantities in both exponential and stationary phases in TSB culture when compared with wild-type strain Yb2. In addition, Yb2ΔpncA infected ducks showed much less bacterial loads in the blood, and no visible histological changes in heart, liver and spleen. Furthermore, Yb2ΔpncA immunization conferred effective protection in ducks against the virulent wild-type strain Yb2 challenge. Our results suggest that *R. anatipestifer* AS87_01735 gene encodes PncA, which is an important virulence factor and the mutant Yb2ΔpncA could be used as a novel live vaccine candidate.

Biography

Shengqing Yu has completed her PhD in 2002 from Tottori University, Japan and Postdoctoral studies from National Institutes of Health, USA. She is the Head of Veterinary Public Health Department, Shanghai Veterinary Research Institute, Chinese Academy of Agricultural Sciences. She has published more than 60 papers in reputed journals.

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