[29] WARGO M J. Homeostasis and catabolism of choline and glycine betaine: lessons from *Pseudomonas aeruginosa*[J]. Applied and Environmental Microbiology, 2013, 79(7): 2112-2120.

Multi-omics Approaches Based to Reveal Pathogenicity of *Vibrio parahemolyticus*

Ma Chengnv Zhang Dijun He Shan Sun Tingting Huang Zhongbai Su Xiurong Zhou Jun*
(*School of Marine Sciences, Ningbo University, Ningbo 315211, Zhejiang*)

Abstract *Vibrio parahaemolyticus* is a kind of food-borne pathogens in the world wide, which can colonize both in seawater and fresh water and pose a serious threat to the safety of aquatic products. In order to investigate the pathogenicity of *V. parahaemolyticus*, we created multi-omics technologies based on the comparative analysis of V. parahemolyticus cultured on seawater and sewage of aquaculture area near the sewage outfall respectively from protein, transcription and metabolic three levels. A total of 97 proteins showed differential expression in both culture conditions, of thses, 50 were upregulated, including polar flagellin protein FlaA, cyclic AMP receptor protein and Cbb3-type cytochrome c oxidase which related to the pathogenicity and colonization processes of *v. parahaemolyticus*. Meanwhil, 47 proteins were downregulated, including elongation factor Tu, transcriptional regulator and ATP-dependent RNA helicase SrmB. To validate these findings, seventeen genes were selected and positively confirmed via quantitative reverse transcriptase-PCR, and ten genes displayed similar expression patterns to their proteins. Furthermore, we identified a series of differential expression metabolites from *V. parahemolyticus* under different culture conditions, including malate, betaine, serine, arginine, IMP, GTP and xanthosine. According to the result of multiple omics analysis, *V. parahemolyticus* in two different culture conditions appeared larger differences in protein and metabolic levels. And these differences are related to the pathogenicity and protein synthesis, suggesting that the deterioration of aquaculture area environment can enhance pathogenicty and colonization ability of *V. parahaemolyticus*. And this status will lead to an increased risk of the edible safety of aquatic products.

Key words *Vibrio parahaemolyticus*; iTRAQ; NMR; pathogenicity; aquatic products safety

市场动态

日本健康功能性食品人气旺

据《日本农业新闻》报道,根据日本民间调查机构“富士经济”所做的一项市场调查结果,日本食品市场上那些能够满足人们对健康和美容效果的“健康意向食品”规模正在扩大。

2017 年的市场规模同比增加了 3.5%,推算规模在 1.4 万亿日元。该机构分析认为,主要是由于“预防生活习惯病以及滋补强身商品的销售额增加”。

健康意向食品在 2017 年的市场规模同比增加了 478 亿日元。从功能类别来看,特别是能预防生活习惯病的商品相比上一年增幅显著,增加了 2508 亿日元。

该机构分析称,绿茶和牛奶饮料等的饮料类约占 9 成,对市场整体的影响极大。使用了日本茶叶的三得利公司出品的“伊右卫门特茶”和保健功能性酸奶销售额一直维持高速增长,预计 2018 年市场增长率有望增加 2.8%,达 2579 亿日元。

其它功效的“滋补及强壮”类饮品销售额同比增加了 8.9%,在 1967 亿日元左右。富含维生素和咖啡因的功能性饮料销售良好。追求“美肌效果”的商品销售额也增长了 2.3%,达 443 亿日元。

(消息来源:人民网)