

水产—研究报告

厚壳贻贝 (*Mytilus coruscus*) 血细胞及血清抗菌肽的分析

廖智¹, 武梅^{2,2}, 王信超^{2,2}, 李楠楠^{2,2}, 杨林², 陈铭杰², 廖智^{2,2}

1. 浙江海洋学院

2.

摘要:

厚壳贻贝 (*Mytilus coruscus*) 是我国东部海域广泛分布的具有重大经济价值的水产养殖贝类, 其血淋巴中含有多种抗菌肽分子。为了解厚壳贻贝血细胞和血清抗菌肽分子的组成特点, 采用多维高效液相色谱对厚壳贻贝血清及血细胞的抗菌肽进行分离纯化, 从中鉴定了多种具有抗菌活性的抗菌肽分子, 质谱鉴定结合cDNA文库数据分析表明厚壳贻贝血细胞和血清的抗菌肽主要属于Mytilin和Myticin抗菌肽家族, 分子量在3 000到7 000 Da之间, 血细胞和血清抗菌肽在分子组成、抗菌谱方面均存在差异, 此外还发现有分子量在10 000 Da左右的新型抗菌肽分子。以上工作为深入了解厚壳贻贝Mytilin抗菌肽的分子多样性、了解厚壳贻贝的免疫机制以及从中筛选具有开发价值的抗菌肽分子奠定了基础。

关键词: 质谱

Analysis of antimicrobial peptides from blood and serum of *Mytilus coruscus*

Abstract:

Mytilus coruscus widely spreads all through the littoral extent of East China Sea with important economic value. Abundant peptides with antimicrobial activity were identified from hemocytes of mussel in previously works. To elucidate the compositive characterization of antimicrobial peptides from blood cell and serum of *Mytilus coruscus* hemocytes, high performance liquid chromatogram were used and several fractions with distinct antimicrobial activity were isolated from blood cell and serum of *Mytilus coruscus*, respectively. Mass spectrometry combined cDNA data analysis were performed to characterize the molecular mass and annotation of some peptides. Some of antimicrobial peptides identified in this work were considered belong to Mytilins or Myticins family with molecular mass ranged from 3000 to 7000 Da. The difference between blood cell and serum antimicrobial peptides mainly exists in molecular composition and antimicrobial spectrum. In addition, a novel peptide with strong antimicrobial activity was found in serum of *Mytilus coruscus* and the molecular mass of this peptide is more than 10000 Da. The results of this work build the foundation for further research on the molecular diversity of antimicrobial peptides, immune mechanisms of *Mytilus coruscus*, and screening for new peptides with applicable value.

Keywords: Mass spectromitry

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通讯作者: 廖智

作者简介:

作者Email: jenyang03@gmail.com

参考文献:

Zasloff, M. Antimicrobial peptides of multicellular organisms. *Nature*, 2002,415: 389 - 395.
Gill D, Nicholas B, Aaron W, et al. The roles of antimicrobial peptides in innate host defense. *Curr Pharm*

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Des, 2009, 15(21): 2377 - 2392.

Charlet M, Chernysh S, Philippe H, et al. Innate immunity. Isolation of several cysteine-rich antimicrobial peptides from the blood of a mollusk, *Mytilus edulis*. *J Biol Chem*, 1996, 271: 21808 - 21813.

Mitta G, Vandenbulcke F, Hubert F, et al. Involvement of Mytilins in Mussel Antimicrobial Defense. *J Biol Chem*, 2000, 275(17): 12954 - 12962.

Yang YS, Mitta G, Chavanieu A, et al. Solution structure and activity of the synthetic four-disulfide bond Mediterranean mussel defensin (MGD-1). *Biochemistry*, 2000, 39: 14436 - 14447.

Mitta G, Hubert F, Dyrinda EA, et al. Mytilin B and MGD2, two antimicrobial peptides of marine mussels: gene structure and expression analysis. *Dev Comp Immunol*, 2000, 24(4): 381-393.

Mitta G, Hubert F, Noè I T, et al. Myticin, a novel cysteine-rich antimicrobial peptide isolated from hemocytes and plasma of the mussel *Mytilus galloprovincialis*. *Eur. J. Biochem*, 1999, 265: 71-78.

王日昕, 廖智, 刘梅等. 厚壳贻贝血细胞cDNA文库的构建及部分EST序列分析. *海洋与湖沼*, 2009, 40(5): 603-607.
廖智, 刘梅, 王日昕, 等. 厚壳贻贝抗菌肽Mytilin和Myticin的cDNA基因的克隆与序列分析. *水产学报*, 2010, 34(7): 1025-1033.

王日昕, 刘梅, 廖智, 等. 厚壳贻贝抗菌肽Mytilin的初步鉴定. *水产学报*, 2010, 334(1): 153-159.

Bachère E, Hervio D, Mialhe E. et al. Luminol-dependent chemiluminescence by hemocytes of two marine bivalves, *Ostrea edulis* and *Crassostrea gigas*. *Dis. Aquat*, 1991, 11: 173-180.

Leippe M, Renwanz L. Release of cytotoxic and agglutinating molecules by *Mytilus* hemocytes. *Dev. Comp. Immunol*, 1988, 12: 297-308.

Friebel B, Renwanz L. Application of density gradient centrifugation for separation of eosinophilic and basophilic haemocytes from *Mytilus edulis* and characterisation of both cell groups.

Comp. Biochem. Physiol. 1996, 112: 81-90.

Pipe RK. Hydrolytic enzymes associated with the granular haemocytes of the marine mussel *Mytilus edulis*. *Histochem*, 1990, J. 22: 595-603.

Mitta G., Vandenbulcke F, Hubert F, et al. Mussel defensins are synthesised and processed in granulocytes then released into the plasma after bacterial challenge. *Journal of Cell Science*, 1999, 112: 4233-4242.

Mitta G., Vandenbulcke F, Thierry N, et al. Differential distribution and defence involvement of antimicrobial peptides in Mussel. *Journal of Cell Science*, 2000, 113: 2759-2769.

本刊中的类似文章

1. 凌建刚, 王方盛, 朱优峰, 陈国, 康孟利, 陈海燕, 吕燕, 俞静芬, 钱天寿, 王美英, 赵健, 朱勇. 土壤中POPs检测方法参数的优化[J]. *中国农学通报*, 2008, 24(07): 430-435
2. 刘凤珠, 李晓, 王颖颖. 水果醋中有机酸成分的分析[J]. *中国农学通报*, 2010, 26(20): 94-97
3. 王少敏, 王家喜, 魏树伟. 3个杏品种果实香气顶空固相微萃取气质联用分析[J]. *中国农学通报*, 2007, 23(11): 257-257
4. 胡丽花, 苏东海, 苏东民. 同时蒸馏萃取与固相微萃取法提取馒头中挥发性物质[J]. *中国农学通报*, 2010, 26(17): 98-102
5. 黄森, 刘拉平, 贾礼. 韩城大红袍花椒挥发油化学成分的GC-MS分析[J]. *中国农学通报*, 2006, 22(10): 334-334
6. 吴凤琪, 靳保辉, 陈波. 水果中8种外源性植物生长调节剂的液相色谱-串联质谱测定[J]. *中国农学通报*, 2010, 26(15): 115-119
7. 王贞强, 马波, 迟建, 赵德阳, 田益玲, 桑亚新, 淑英. 荔枝酒香气成分的GC/MS分析[J]. *中国农学通报*, 2006, 22(8): 135-135
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13. 陈兰, 唐晓红, 魏朝富. 土壤腐殖质结构的光谱学研究进展[J]. *中国农学通报*, 2007, 23(8): 233-233
14. 徐春英, 梅旭荣, 李玉中, 李巧珍. N-新戊酰, O-异丙醇酯衍生法分析小麦氨基酸含量与碳氮稳定同位素[J]. *中国农学通报*, 2010, 26(12): 51-56
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