Ⅱ-114

줄무늬감탕벌 독액에서 분리한 신규 독액 펩타이드의 특성 분석

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Isolation and Characterization of Novel Venom Peptides from *Orancistrocerus drewseni* Solitary Wasp (Hymenoptera: Eumenidae)

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실험목적 (Objectives)

Venoms of solitary wasps cause long-term, non-lethal paralysis of their prey, suggesting the presence of novel neurotoxic compounds and bioactive substances. *Orancistrocerus drewseni* is one of the dominant solitary wasp species of Eumenidae in Korea. However, venom components of *O. drewseni* have not been studied to date. We aim to isolate and characterize novel bioacitve peptides from the venom of *O. drewseni* that can be applied to develop new insecticides, antibiotics, or medical anesthetics.

재료 및 방법 (Materials and Methods)

Solitary wasps *O. drewseni* were collected from Chungnam region of Korea. Venom glands/sacs were dissected from females and immediately stored in liquid nitrogen. Venom peptide amino acid sequences were determined by Q-TOF/MS. The full-length open reading frame (ORF) sequences of three venom peptides were analyzed by 5′- and 3′-rapid amplification of cDNA ends (RACE). Antimicrobial activity and minimal inhibitory concentration (MIC) of OdVP1 were determined using synthetic peptides. Microbes, *Escherichia coli* (ATCC 11775), *Staphylococcus aureus* (ATCC 12600), and *Candida albicans* (ATCC 10231), were purchased from KCCM for antimicrobial activity test and MIC.

실험결과 (Results)

Three novel venom peptides, OdVP1, OdVP2, and OdVP3 were isolated from the venom of the solitary wasp *O. drewseni.* The full-length ORF sequences of OdVP1, 2, and 3 were analyzed by 5′- and 3′-RACE. The overall gene structure of OdVPs showed a high homology to the mastoparan B from *Vespa basalis* by containing signal sequence, prosequence, mature peptide and C-terminal glycine, but the mature peptide (14 amino acids) sequences were distinct from each other (Fig. 1). Structure estimation program showed the mature peptides of OdVPs likely have an amphipathic α-helical structure (Fig. 2). OdVP1 showed obvious antimicrobial activity against *E. coli* (gram- bacteria), *S. aureus* (gram+ bacteria), and *C. albicans* (fungi) (Fig. 3). MIC of *E. coli, S. aureus,* and *C. albicans* were <100, <200, and <10 μg/ml, respectively.

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시험성적

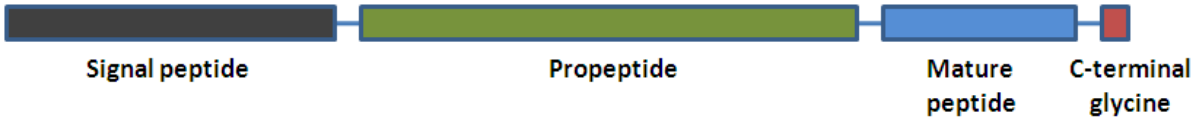

Fig. 568 Common gene structure of prepropeptides isolated from *O. drewseni* (OdVP1, 2, 3, and Od-MP), *V. basalis* (Mastoparan-B).

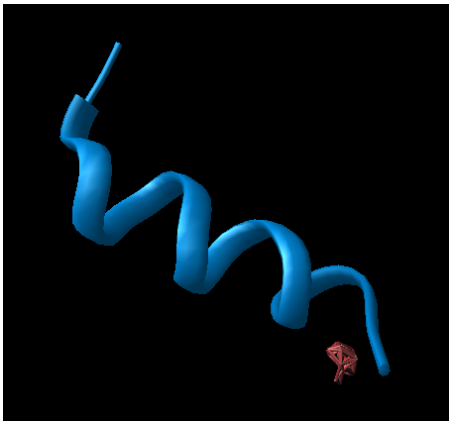

Fig. 569 Predicted 3D structure of mature OdVPs (Image by CLC Main Workbench)

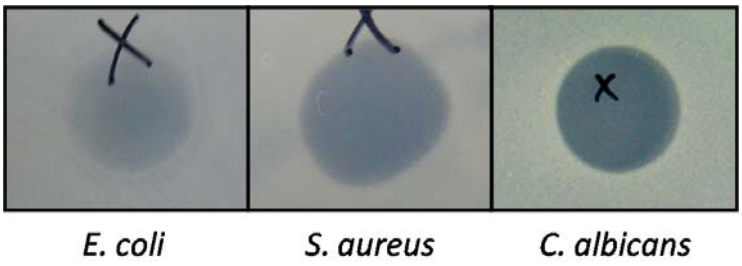

Fig. 570 Antimicrobial activity of OdVP1 against *E. coli, S. aureus* and *A. albicans*.