

Mutagenesis of AnyParP Identifies Critical Residues for Biological Activity

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AnyParP (*Antheraea yamamai* paralytic peptide) is a 23-residues peptide. Recent studies showed that synthetic AnyParP not only had paralytic activity in the larvae both *A. yamamai* and *Bombyx mori*, but also induced embryonic diapause of *B. mori*. To identify residues important for diapause egg induction activity in polyvoltine race (N4), *B. mori*, a series of synthetic mutants of AnyParP were used in bioassay system for comparing with the wild-type AnyParP. Ala replacements of Cys⁷ and Cys¹⁹ (C7.19A), Glu¹-Asn² (AA-AnyParP) as well as Met¹² (M12A) eliminated all activity. Met¹² also was replaced with Lys (K), Val (V) and Gln (Q), respectively. As a result, M12K had higher activity and M12Q had lower activity than wild-type AnyParP. M12V had activity identical to that of wild-type AnyParP. The present results indicate that the disulfide bond between Cys⁷ and Cys¹⁹ is essential for maintaining the three-dimensional structure of AnyParP and that the E¹, N² and M¹² are very critical for the diapause egg induction activity of AnyParP.