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研究报告

孔雀活化素基因(activin)ßA 亚基成熟肽序列的分子克隆及其对白孔雀起源与分类的佐证分析Molecular Cloning of Activin ßA Subunit Mature Peptide from Peafowl and Its Application in Taxonomy and Phylogeny

邹方东,童芯锌, 岳碧松 ZOU Fang-Dong, TONG Xin-Xin, YUE Bi-Song

四川大学濒危动物繁育与保护遗传学四川省重点实验室， 成都 610064 Key Laboratory for Reproduction and Conservation Genetics of Endangered Wild Life of Sichuan Province, College of Life Science, Sichuan University, Chengdu 610064, China

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摘要 参考已经克隆的活化素(activin)基因βA亚基成熟肽序列，设计一对兼并引物，从绿孔雀(pavo muticus)、蓝孔雀(pavo cristatus)和白孔雀基因组中克隆到活化素基因βA亚基成熟肽序列。测序结果表明，活化素基因βA亚基成熟肽序列长345bp，编码115个氨基酸。序列分析表明，蓝孔雀与绿孔雀核苷酸同源性为98.0%，而蓝孔雀与白孔雀核苷酸同源性为98.8%。NCBI收索结果显示，活化素基因βA亚基成熟肽序列在不同物种间都非常保守。氨基酸功能位点分析表明，活化素βA亚基成熟肽可能在细胞信号传递过程中发挥了很重要的作用。另外，利用活化素基因βA亚基成熟肽序列构建了三种孔雀的限制性酶切图谱及系统发生树。结果显示，白孔雀与蓝孔雀的亲源关系比与绿孔雀的亲源关系近。我们认为，白孔雀来源于蓝孔雀，很可能是蓝孔雀一个杂交后代或亚种，而不是人们通常所认为的仅仅是蓝孔雀的一个颜色突变体。Abstract: The sequences of activin geneβA subunit mature peptide have been amplified from white peafowl, blue peafowl (pavo cristatus) and green peafowl (pavo muticus) genomic DNA by polymerase chain reaction (PCR) with a pair of degenerate primers. The target fragments were cloned into the vector pMD18-T and sequenced. The length of activin gene βA subunit mature peptide is 345bp, which encoded a peptide of 115 amino acid residues. Sequence analysis of activin gene βA subunit mature peptide demonstrated that the identity of nucleotide is 98.0% between blue peaflowl and green peafowl, and the identity of that is 98.8% between blue peaflowl and white peafow. Sequences comparison in NCBI revealed that the sequences of activin geneβA subunit mature peptides of different species are highly conserved during evolution process. In addition, the restriction enzyme map of activins is high similar between white
peafowl and blue peafowl. Phylogenetic tree was constructed with Mega 2 and Clustalxldx software. The result showed that white peafowl has a closer relationship to blue peafowl than to green peafowl. Considered the nucleotide differences of peafowls' activin geneβA subunit mature peptides, a highly conserved region, we supported that white peafowl was derived from blue peafowl, and it is more possible the hybrid but just the product of color mutation, or maybe as a subspecies of Pavo genus.

关键词 孔雀 活化素基因 系统发生 分类 Key words peafowl activin gene phylogeny taxonomy

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Abstract

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通讯作者