



The phylogenetic relationships of *Paramesotriton* (Caudata: Salamandridae) based on partial mitochondrial DNA gene sequences

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Abstract

We examined phylogenetic relationships among newst of the genus *Paramesotriton* using partial mitochondrial gene sequences, including the ND2-tRNA^{Tyr} region (1415 bp) and the 12S rDNA-tRNA^{Val}-16S rDNA region (1774 bp), from 42 individuals of 10 recognized *Paramesotriton* species and outgroups by Bayesian inference (BI), Maximum likelihood (ML) and Maximum Parsimony (MP) methods. We found that, (1) *Laotriton laoensis* is the sister group of *Paramesotriton*, (2) the genus *Paramesotriton* is monophyletic, composed of either the *P. caudopunctatus* species group and the *P. chinensis* species group, or the subgenera *Allomesotriton* and *Paramesotriton* (3) *P. longliensis* and *P. zhijinensis* should be placed in the *P. caudopunctatus* species group or subgenus *Allomesotriton*; (4) *P. fuzhongensis* is not a junior synonym of *P. chinensis*, and there is a close phylogenetic relationship between *P. fuzhongensis* and *P. guangxiensis*.

Key words: Mitochondrial DNA sequences, Phylogeny, *Paramesotriton*

Introduction

The genus *Paramesotriton* (Caudata: Salamandridae) contains 10 known species. Except *P. deloustali* is endemic to the Tam Dao region of Vietnam (Bourret) and *P. laoensis* is found in Laos (Stuart and Papenfuss), all other species occur in China, including *P. chinensis* (Gray), *P. fuzhongensis* (Wen), *P. guangxiensis* (Huang *et al.*), *P. hongkongensis* (Myers and Leviton), *P. caudopunctatus* (Hu *et al.*), *P. zhijinensis* (Li *et al.* 2008), *P. longliensis* (Li *et al.* 2008) and *P. ermizhaoi* (Wu *et al.* 2009).

However, researchers have disagreed on the validity of some species. For example, *P. fuzhongensis* was treated as a junior synonym of *P. chinensis* (Pang *et al.* 1992). Based on molecular data of six species of this genus, Lu *et al.* (2004) argued that *P. fuzhongensis* is indeed a legitimate species, distinguished from *P. chinensis*, but the species was still treated as a synonym of *P. chinensis* (Fei *et al.* 2006). *P. guangxiensis* was once treated as a junior synonym of *P. deloustali* (Pang *et al.* 1992), but it was treated as a legitimate species (Ye *et al.*, 1993; Fei *et al.* 2006). The phylogenetic relationship of [(*P. chinensis*, *P. hongkongensis*), (*P. fuzhongensis*, (*P. guangxiensis*, *P. deloustali*))] was well supported in the study of Lu *et al.* (2004). However, Weisrock *et al.* (2006) considered that the phylogenetic relationship of *P. fuzhongensis*, *P. guangxiensis* and *P. deloustali* is (*P. deloustali* (*P. fuzhongensis*, *P. guangxiensis*)). The recently described species, *P. ermizhaoi*, was considered as a sister species of the group of *P. chinensis* and *P. hongkongensis* (Wu *et al.* 2009).

P. zhijinensis (found in Zhijin, Guizhou, China) and *P. longliensis* (found in Longli, Guizhou, China), are recently described species. Zhao *et al.* (2008) considered that *P. zhijinensis* is a sister species of *P. caudopunctatus*, and *P. zhijinensis* represents the third evolutionary lineage of *Paramesotriton*. However, the phylogenetic placement of *P. longliensis* is unclear in the genus *Paramesotriton*.

Chan *et al.* (2001) reported that the genus *Paramesotriton* was monophyletic, with *P. caudopunctatus* as basal to *P. guangxiensis*, *P. deloustali* and *P. hongkongensis*. Based on mtDNA sequence data, Lu *et al.* (2004) considered that the six species of *Paramesotriton* (*P. caudopunctatus*, *P. chinensis*, *P. deloustali*, *P. fuzhongensis*, *P.*