

**SIGNATURE OF ADAPTIVE EVOLUTION AND FUNCTIONAL
DIVERGENCE OF *TLR* SIGNALING PATHWAY GENES IN TIBETAN
NAKED CARP *GYMNOCYPRIS PRZEWALSKII***

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ABSTRACT

The Tibetan naked carp *Gymnocypris przewalskii* is a newly diverged species from Schizothoracinae fish, only dwelled in the China largest salt lake, Qinghai Lake. Its living condition is hypoxia, cold temperature and high salinity. Noteworthy, it is more susceptible to parasite infection in freshwater than wild environment. Our recent genome wide analyses studies indicated that naked carp TLR signaling pathway genes, TLR4 and TLR9 within TLR family, IRF3, IRF5 and IRF7 within IRF family underwent significant positive selection in response to the inhospitable environment triggered by the uplift of the Tibetan Plateau. The experimental evidences indicate that TLR4 gene function towards neofunctionalization when exposure to parasite infection, IRF3 and IRF4 towards significant functional divergence in biotic and abiotic stress response. These findings provide novel insights into evolutionary history and molecular mechanism of highland fish respond to environment changes.

KEYWORDS:

Positive selection, Functional divergence, TLRs, IRFs, Tibetan fish

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