Molecular systematics of racers, whipsnakes and relatives (Reptilia: Colubridae) using mitochondrial and nuclear markers

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Z. T. Nagy1, R. Lawson2, U. Joger3 and M. Wink1
1Institute of Pharmacy and Molecular Biotechnology, Biological Section, University of Heidelberg, Heidelberg, Germany;
2Osher Foundation Laboratory for Molecular Systematics, California Academy of Sciences, San Francisco, CA, USA; 3State Natural History Museum, Braunschweig, Germany

Abstract

Four protein-encoding mitochondrial genes (cytochrome *b*, NADH-dehydrogenase subunits 1, 2 and 4) and one nuclear (c-mos) gene were sequenced to infer phylogenetic relationships among Old and New World representatives of racers and whipsnakes,
Coluber
(sensu lato). New World
Coluber
(
Coluber
sensu stricto, including
Masticophis
) and
Salvadora
proved to have affinities with the Old World non-racer colubrine genus
Ptyas
(and possibly
Elaphe
s.l. and
Coronella

), whereas Old World ‘
Coluber
’ form several basally related clades; these are (1)
Hemorrhois
-(
Spalerosophis-Platyceps
); (2)
Hierophis
, with
Eirenis
nested within this paraphyletic genus and (3) ‘
Coluber
’
dorri
as the sister taxon to
Macroprotodon cucullatus
. The position of ‘
Coluber
’
zebrinus
along with
Hemerophis
socotrae
located at the base of the Old World racer radiation forming the possible sister group to all remaining Palearctic racers and whipsnakes remains less well supported. Nevertheless, inter- and subgeneric relationships among many of the Old World racer groups have been resolved..