

# Molecular systematics and phylogeny of Old and New World ratsnakes, *Elaphe* auct., and related genera (Reptilia, Squamata, Colubridae)

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## Abstract

The phylogenetic relationships of the Holarctic ratsnakes (*Elaphe* auct.) are inferred from portions of two mitochondrial genes, 12S rRNA and COI. *Elaphe* Fitzinger is made up of ten Palaeartic species.

*Natrix longissima* Laurenti (type species) and four western Palaeartic species (*hohenackeri*, *li*, *neatus*

,  
*persicus*

, and  
*situla*

) are assigned to *Zamenis* Wagler. Its phylogenetic affinities with closely related genera, *Coronella* and *Oocatochus*, remain unclear. The East Asian *Coluber porphyraceus* Cantor is referred to a new genus. This taxon and the western European *Rhinechis scalaris* have an isolated position among Old World ratsnakes. Another new genus is described for four Oriental species (

*cantoris*

,  
*hodgsonii*

,  
*moellendorffi*

, and  
*taeniurus*

).

New World ratsnakes and allied genera are monophyletic. *Coluber flavirufus* Cope is referred to *Pseudelaphe* Mertens and Rosenberg. *Pantherophis* Fitzinger is revalidated for *Coluber guttatus*

L. (type species) and further Nearctic species (*bairdi*, *obsoletus*, and *vulpinus*). *Senticolis triaspis* is the sister taxon of New World ratsnakes including the genera *Arizona*, *Bogertophis*,

*Lampropeltis*, *Pituophis*, and *Rhinocheilus*. The East Asian *Coluber conspicillatus* Boie and *Coluber mandarinus* Cantor form a monophyletic outgroup with respect to other Holarctic ratsnake genera and are referred to *Euprepiophis* Fitzinger. Three Old World species, viz.

*Elaphe*

(sensu lato)

*bella*

,

*E.*

(s.l.)

*frenata*

, and

*E.*

(s.l.)

*prasina*

remain unassigned. The various groups of ratsnakes (tribe

*Lampropeltini*

) show characteristic hemipenis features.

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