

## Abstract

Snakes (Serpentes) are a group of squamate reptiles (Squamata) including more than 3600 species. The vast majority of snakes are from the group Caenophidia, which includes approximately 90% of all extant snake species and represents the most studied lineage. Squamate reptiles are variable in sex determination and genome organisation, however, caenophidian snakes are quite stable in these respects. The typical – and probably ancestral – snake karyotype is composed of 36 chromosomes with 16 macro- and 20 microchromosomes. In all snake species, genotypic sex determination (GSD) is expected and it was assumed until recently that all snakes possessed ZZ/ZW sex chromosomes. The main reason for this is that most of the studied snakes were from the group Caenophidia and in the rest of the snake lineages it was believed that their sex chromosomes were homologous. In fact, the sex chromosomes of non-caenophidian snakes have not yet been identified – with the single exception of *Acrantophis dumerili*. Nevertheless, a recent study showed that there was an independent evolution of XX/XY sex chromosomes in pythons and boas. Sex chromosomes of these snakes are homomorphic and so far they have not been detected by classical cytogenetic methods. In this context, the aim of this study is to explore whether it is possible to identify poorly differentiated sex chromosomes in non-caenophidian snakes by molecular-cytogenetic methods. The other aim of the study is to focus on the W sex chromosome of the caenophidian snakes and its evolutionary dynamics, based on the topology and distribution of constitutive heterochromatin and repetitive sequences. While the Z chromosome of these snakes exhibits high stability across all main lineages of Caenophidia, the heterochromatic W chromosome shows a high variability in the arrangement of repetitive sequences and heterochromatin across the phylogenetic spectrum of the Caenophidia lineage, which supports the assumption that the non-recombining regions of the chromosomes are the most dynamic parts of the genome.

### Key words:

Snakes, sex chromosomes, karyotypes, evolution, heterochromatin, FISH, *Bkm*, ITS