Abstract

Ray-finned fishes (Actinopterygii) possess strikingly diverse sex sex differentiation strategies (including gonochorism, unisexuality and several types of hermaphroditism) and mechanisms of sex determination (both environmental and genetic), including frequent turnovers between abovementioned strategies and mechanisms. Although exhibiting remarkable diversity of sex determination mechanisms, only about 5% of analyzed teleost species possess cytologically recognizable (i.e. heteromorphic) sex chromosomes. Still, nine different male- or female-heterogametic sex chromosome systems at various stages of differentiation have been described along with high rate of inter- and intraspecific variability. Given that early sex chromosome evolution is best studied in evolutionarily young nascent sex chromosomes, ray-finned fishes and especially the teleost lineage (Teleostei) represent vital model group for these investigations offering new insights into the evolution of these rapidly evolving regions of vertebrate genomes. Moreover, handful of studies available so far has provided evidence for a role of emerging sex chromosomes and their turnover in processes such as ecologial adaptation, speciation or genomic conflict. Besides cytogenetic studies, which had a major impact on our current knowledge about fish sex chromosome variability and evolution, during last few years also the gradually increasing number of valuable genomic and transcriptomic studies brought important new insights on finer-scale level as they are i) capable to detect small-sized sex-determining regions on homomorphic sex chromosomes (being frequent in fishes, as might be inferred from abovementioned characteristics) and ii) to in-depth characterize its genetic content. The aim of the current thesis is to collate and summarize the current knowledge about trends in fish sex chromosome evolution along with their genetic content, and to list the molecular cytogenetic and genomic approaches useful for current and future analyzes in this field.