

Abstract:

The diploma thesis focuses on study of sex chromosomes evolution and repetitive organized genes of chosen mygalomorph and araneomorph spiders. Spiders are characterized by complexity of sex chromosome systems, their karyotypes contain multiple sex chromosomes X. Besides multiple X chromosomes they also contain a pair or two pairs of nondifferentiated sex chromosomes X and Y. The used methods include methods of classical cytogenetics (preparation of chromosome slides, C-banding) and methods of molecular cytogenetics (fluorescent *in situ* hybridization and comparative genome hybridization). Complex sex systems were discovered in the studied Theraphosidae spiders. In Theraphosidae spiders *Atropothele socotrana* and *Poecilotheria vittata* neo-sex chromosomes were found. Analysis of molecular differentiation of sex chromosomes suggests low differentiation of Y chromosome in neo-sex chromosomes and pair of nondifferentiated sex chromosomes XY. In haplogyne spider *Kukulcania aff. hibernalis* (X_1X_2Y), the Y chromosome was significantly differentiated, male specific signal covered the whole chromosome. Detection of 18S rDNA showed that karyotypes of majority of analysed Theraphosidae spiders and haplogyne spiders contain low number (1 or 2) of nucleolar organizing regions localized terminally, which corresponds with predicted ancestral state of spiders. Some Theraphosidae spiders showed increased numbers of NOR. Of another repetitively organized genes, genes for 5S rRNA and histon H3 were detected in members of *Poecilotheria* family. This is one of the first detections of these genes in arachnids.

Keywords: chromosome, constitutive heterochromatin, karyotype, mygalomorph, nucleolus organizer region, sex chromosome, spider, gene cluster