ABSTRACT

Comparative cytogenetics of the bed bug *Cimex lectularius* (Heteroptera: Cimicidae)

The human bed bug *Cimex lectularius* has started enormous spreading to all developed countries of temperate climate zone during the last ten years. Bed bug was almost eradicated by a mass use of DDT in these areas until the 70´s in the 20th century. This temporal haematophagous ectoparasite occupies particularly human dwellings and bat roosts. *Cimex lectularius* shows unusual combination of cytogenetic characteristics, general for all Heteroptera, however, not usual for other organisms. The chromosomes are holokinetic, with completely achiasmatic meiosis and inverted meiosis of the sex chromosomes. Especialy remarkable feature is intraspecific variation of the number of the X chromosomes. The variable number of chromosomes of 43 populations of *Cimex lectularius* from the Czech Republic and 27 populations from other European countries was studied in the present study. The 10 variants of karyotype were found out by using the „hotplate spreading“ method and the standard Giemsa staining. There were male karyotypes with 2n = 29, 30, 31, 32, 33, 34, 35, 37, 42 and 47 chromosomes and two females with peculiar odd number of sex chromosomes X, 2n = 33 and 43, not complementary with any male. A stable number of 2n = 26 autosomes was proved in metafaze II figures of all the males studied. However, the number of gonosomes shows extensive variation from basic state X_1X_2Y to state 20XY. The populations with 2n = 29, X_1X_2Y, a probably ancestral constitution, represent 51% of all specimens. The existence of the multiple sex chromosomes can be explained by easier chromosome X fragmentation and further persistence of different numbers of X chromosome fragments due to their holokinetic character. Dependence of higher quality of slides of chromosomes on increasing size of testes was proved in this study.

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Key words: *Cimex lectularius*, cytogenetics, chromosome number variability, X chromosome