

Spatial and Temporal Variations of the Chromosomal Inversion Frequencies across the Range of Malaria Mosquito *Anopheles messeae* Fall. (Culicidae) during the 40-Year Monitoring Period

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Abstract—The analysis of personal and published data on the frequency dynamics of chromosomal inversions within the range of *Anopheles messeae* obtained during the period from 1974 through 2014 is presented. The results showed that, in general, across the species range, during the 40 years of genetic monitoring, there was a steady (stationary) clinal distribution of inversions in the first decade (1974–1985). Then, over the period of five years (1986–1990), there was a considerable change in the inversion frequencies in favor of southwestern chromosomal variants (particularly strongly fixed in the Tomsk population), and from 1992 to the present time, these changes remained and were relatively stably reproduced in most parts of the range. It was noted that the jump in warming during the winter of 1981–1982 led to a correlated jump of the southwestern chromosomes in the Tomsk population. In connection with the general tendency toward the increase in average winter temperatures, a sharp decrease in the 2R₁ chromosome frequency in the Siberian region and Syktyvkar in the period from 1992 to the present time was observed. There is reason to assume that, over the past decade, the northern boundary of the *An. messeae* range moved northward to the tundra zone.

Keywords: malaria mosquito, *Anopheles messeae*, genetic adaptation, species range, population, polythene chromosomes, chromosomal inversion polymorphism, cytogenetic analysis, frequency distribution of inversions

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