The long-term changes in abundance of fleas on the grey marmots (*Marmota baibacina*) hosts as main vectors of plague in the Tien-Shan natural plague focus, Kyrgyzstan

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Statement of the Problem: The main problem is to survey the abundance and epizootic status of grey marmots (*Marmota baibacina*), the main hosts of plague in mountains areas of Tien-Shan and their fleas, the main vector of plague.

Methodology & Theoretical Orientation: Investigation of plague focus included rodent trapping, collection and identification of rodent ectoparasites, calculation of parasitological indices, bacteriological testing of rodents and their ectoparasites. Fleas were collected from marmot wool and nests after digging their burrows.

Findings: In Issyk-Kul region of Kyrgyzstan there were two natural plague foci: Verknenaryn (area 8000 sq.km) and Sari-Dzhas (800 sq.km). The most distant and difficult to reach high mountain area of Verknenaryn focus is Usengegush that reaches the territory of China. Epizootics of plague with different intensity were observed here many times since 1951. The average number of marmots in the area was 21.4 animals per sq.km in 2010. Such parameter was significantly lower compared to 1951-1952 (Fig. 1). There were two species of marmot fleas–*O. silantivi* and *R.li. ventricosa*. Flea load varied from 0.5 until 5.5 per animal in 1951-1978. After large epizootics reported in 1975 and resulted in isolation of 39 strains of *Yersinia pestis* the territory of Verknenaryn focus was under intensive insecticide program by dusting marmots' burrows by DDT. By 1988 prevalence of fleas was significantly reduced. Our observations suggested that abundance of fleas has increased again during last years.

Conclusion & Significance: The origin of human plague cases is in the marmot reservoir and the marmot fleas in Tien-Shan Mountains. The extermination of flea vectors lead to the break of plague transmission chain. The reduction of the plague control measures creates a risk of new plague cases.

Speaker Biography

Gulmira Sariyeva completed her Ph.D in biology, associative professor of Issyk-Kul state university, Karakol, Kyrgyzstan. After graduation of Al-Farabi - Kazakh state university, faculty of biology, she completed Ph.D in area of adaptation of plants to different environmental stresses. During further research and teaching in Issyk-Kul state university she turned her research interests in the field of sustainable development on the level of whole ecosystem, its interaction with environmental and human factors. Since 2010 she is a project manager of International Science and Technology Center in the area of plague epidemiology and epizootology in natural mountain transboundary area located in Kyrgyzstan and Kazakhstan. As a result of team work with Karakol anti-plague department big area of 5600 km2 of difficult to reach highland area was investigated: its epizootological and parasitological state was estimated first after 25-30 years. Comparative analysis with archive data is in the process.

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