

## Results of molecular-genetic and epizootological monitoring of the Saryjaz autonomous area of Tien-Shan mountains natural foci of the plague

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**Statement of the Problem:** After 30 years of the long stable period, plague activity within the transboundary Sari-Dzhas natural focus located in Kyrgyzstan and Kazakhstan, has increased since 2012. The main objective is to survey plague activity and role of natural hosts of plague, grey marmots (*Marmota baibacina*) and plague vectors – fleas and other ectoparasites in Sari-Dzhas.

**Methodology & Theoretical Orientation:** The survey of ecological, microbiological and epidemiological parameters of plague activity in the Sari-Dzhas natural focus was conducted each year from 2012 to 2016. Overall, 772 marmots, 418 small rodents, 1376 rodent ectoparasites were tested for plague, as well 32 strains of *Yersinia pestis* were characterized. Among them, 16 strains were isolated from the Sari-Dzhas focus before 2012 and 16 strains after 2012. The latter included strain obtained from human patient after plague outbreak in 2013. For VNTR analysis, DNA fragments of five reference strains of *Y. pestis* were used: CO92 (biovar *Orientalis*), KIM10 (biovar *Medievalis*), Pestoides F, Nepal516 (biovar *Antiqua*) and *Y. pseudotuberculosis* 2841. The strains were provided by Department of Pathology of the University of Texas Medical Branch.

**Findings:** The density of marmots population in Sari-Dzhas focus increased from 26.7 animals per 1 sq.km in 2012 to 51.7 in 2016. Reproductive status of marmots was also higher


in 2016 comparing to 2012: The proportion of reproductively active marmot females (pregnant or lactating) increased from 33.3% to 46.6%. The load of marmots flea during this period increased from 0,4 to 13,7. The strains of *Y. pestis* identified in the Sari-Dzhas natural focus belonged to *Antiqua* and *Medievalis biovars*.

**Conclusion & Significance:** The circulation of plague pathogen within territory of the Sari-Dzhas natural focus was continuous, but with evident fluctuation of activity. The activity of plague depends on host-parasite system, including multiple abiotic and anthropogenic factors.

### Speaker Biography

Ziyat Abdel is the head of Biomedicine and Cell Biotechnology Laboratory of Scientific Production Enterprise "Antigen" and Executive Director of Center for Medicine and Prevention "Genesis Kazakhstan", Almaty, Kazakhstan. After graduation the Karaganda State Medical Institute, specializing in hygiene, sanitation and epidemiology, he has completed Ph.D of Medical Sciences and is a doctor of highest category in social hygiene and health care organization. In 2011-2016 years he was the head of plague laboratory of Kazakh Scientific Center for Quarantine and Zoonotic Infections. He has 30 years-long practical experience in epidemiology and microbiology of especially dangerous infections, from them 21 are in anti-plague service. Abdel Ziyat has 4 author's certificates on innovative patents and deposited strains of especially dangerous infections, 55 scientific publications in Kazakhstan and international publications. He is a member of 2 international NGOs, was the head of many scientific and technical programs and participant of international scientific projects.

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