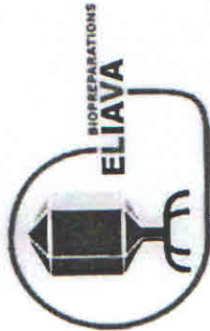


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Bacteriophages as tools for therapy, prophylaxis and diagnostics

ABSTRACT BOOK

**October 19-21, 2015
Tbilisi, Georgia**

Poster No 9

ANTIBIOTIC RESISTANT ENVIRONMENTAL BACILLI AND THEIR BACTERIOPHAGES ISOLATED FROM FRESHWATER AND MARINE ENVIRONMENTS OF GEORGIA AND ARMENIA

**Ekaterine Gabashvili¹, Nino Janelidze¹, Elene Didebulidze¹, Hovik Panosyan²,
Armine Margaryan², Inga Bazukyan², George Tsertsvadze¹, Marina Tediashvili¹,
Ekaterine Jatani¹**

¹ Eliava Institute of Bacteriophages, Microbiology and Virology, Tbilisi, GEORGIA

² Yerevan State University, Yerevan, ARMENIA

Bacilli are an extremely diverse group of bacteria colonizing a variety of habitats ranging from soil, water and insects to humans. Some bacilli strains are antimicrobial compound producers and could be intrinsically resistant to antibiotics. Such autochthonous antibiotic resistant bacteria may serve as a reservoir of drug resistance mechanisms in the different habitats and may act as antibiotic resistant gene donors for other clinically important bacteria. The aim of the study was to estimate the prevalence of culturable antibiotic resistant bacilli in different water environments of Georgia and Armenia and also to isolate bacilli-specific bacteriophages from the same sources.

The water and sediment samples have been collected from the Lisi lake and the Black Sea (Georgia) and from the lake Sevan (Armenia) in the spring and summer 2015. The abundance of antibiotic resistant *Bacillus* spp. have been estimated by plating of heated (80 °C), concentrated water samples on Tryptic Soy or Nutrient Agar plates, separately supplemented with selected antibiotics. Antibiotic susceptibility of the bacilli isolates has been tested to 8 antibiotics using Kirby-Bauer disk diffusion technique. The bacteriophages have been isolated and propagated using standard methodology. The phage morphology has been studied using transmission electron microscope (JEOL, SX100, Japan).

Our studies have shown that the abundance of bacilli was season dependant. Although higher numbers of bacilli were registered for the freshwater reservoirs, the antibiotic resistance in these bacteria was more prevalent in the Black Sea samples. For all water bodies, ampicillin and erythromycin resistance seemed to be widely spread among *Bacillus* populations, especially in sediments.

Over hundred bacilli isolates have been obtained from different water and sediment sources and their antibiotic susceptibility profiles have been determined. Most of the strains isolated from all sampling sites showed the ampicillin resistance. The high resistance has been also observed for gentamicin, thirimethoprim and tetracycline while the best antimicrobial effect has been shown for Furazolidone.

An attempt has been made to isolate bacilli specific bacteriophages from Armenian and Georgian water sources. Three phage mixtures have been isolated from Lisi lake, Sevan lake and the Black Sea samples on the bacilli resistant to at least one antibiotic. The study of phage morphology revealed that all phages belonged to the Myoviridae morphotype with diverse ultrastructure. The isolated phages will be used to explore the phage mediated antibiotic resistance gene transfer in the water habitats.

