

**MOSAIC ORGANIZATION OF THE GENOME OF TEMPERATE
BACTERIOPHAGE ZF40 OF A PHYTOPATHOGENIC BACTERIUM
*PECTOBACTERIUM CAROTOVORUM***

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The important phytopathogenic bacterium *Pectobacterium carotovorum* subsp. *carotovorum* (*Pcc*) has a restrict quantity of autonomic genetic elements which are able to carry out a horizontal genetic transfer between different strains. Bacteriophage ZF40 is the only one temperate phage of this bacterium and can be used as a genetic instrument to study its molecular genetics. The peculiarity of this phage is the ability to form the unique lysogenic state and take part in the formation of pathogenic potential of *P. carotovorum*.

It has been shown for the first time that thermal inactivation of *Pectobacterium carotovorum*'s bacteriophage ZF40 is of a double stage character. It is an evidence of phage ZF40 virions' heterogeneity. With the help of thermal inactivation a set of temperature resistant *clear*-type mutants has been obtained.

In this research the problem of phage ZF40 virions' stabilization has been solved using ficoll based buffer. To obtain highly purified phage ZF40 virions' a method of double stage centrifugation in the metrizamid gradient with following cesium chloride density gradient purification has been proposed for the first time.

Physical map of phage ZF40 genome's restriction sites for endonucleases of restriction *HindIII*, *BglII*, *PstI* and *BamHI* has been created and the main parameters of cyclic permutation have been determined. It has been shown for the first time that cyclic permutation of genome is a characteristic of virions' DNAs of wild-type phage and its temperature *clear*-mutants. Unstoppable character of wild-type phage' permutation changes into discrete one of temperature resistant *clear*-type mutants.

It has been established that phage ZF40's virion consists of three major proteins with molecular weights 39,2, 31,2 and 19,3 kDa, that have been classified as capsid, sheath and core structure proteins respectively. According to structure and protein composition phage ZF40 is similar to phage P2 of *Escherichia coli*. Structural organization of phage ZF40's genome is mosaic. It combines cyclic permuted DNA packed into P2-type virion with headfull packing mechanism.

An ability of phage ZF40 to general transduction of plasmid pKM101 is a ground for creation of vector system based on the transducing phage particles.

Results of this work concerning phage ZF40 DNA's structure are a base for detail study of molecular-genetic organization and discovery of genetic determinants of pathogenicity in the structure of bacterial and phage genomes of phytopathogenic bacterium *P. carotovorum*.