

The “Ecology of the Communities of Saprotrophic Bacterial Dissociants” Information System: A Review (<http://dis.bio.msu.ru>; scientific editors: E.S. Milko, A.P. Levitch, and P.V. Fursova)

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Phase variation (dissociation) is the splitting of a homogenous population into variants that differ in their genetic, physiological, biochemical, and morphological traits. Although phase variation is a major factor responsible for the heterogeneity of microbial populations, it is rarely taken into account in microbiological research. The current intense attention being devoted to research on phase variation is due to the rapid development of biotechnology. Emergence of inactive or low-activity variants in a population of producer microorganisms may decrease the effectiveness of biotechnological processes and hamper research work. Since the data on bacterial phase variants are rather disconnected, the creation of this site is well timed.

This review deals with a critical analysis of the structure and content of an information system (<http://dis.bio.msu.ru>) that includes electronic versions of manuscripts, authors' abstracts, monographs, and reviews published in the last 30 years devoted to bacterial phase variation. The site consists of the following main sections: a library of electronic publications, a database of experiments with phase variants, a guide to the names of the cited authors, and a site explanatory dictionary. Access is offered to the sites of scientific journals on microbiology and to electronic catalogues of some world libraries.

The library of electronic publications includes an author index, a classified catalogue, a chronological index, and lists of monographs and reviews. The classified catalogue contains publications on (1) the morphology of the cells and colonies of phase variants, (2) the frequency and direction of phase transitions, (3) the cell envelopes of bacterial variants, (4) the physiological and biochemical characteristics of the variants, (5) their different capacity for synthesis of the economically important substances, (6) their sensitivity to external environmental factors, (7) the molecular and genetic basics of phase variation (DNA composition, transfer of genetic material, migrating genetic elements, autoregulators), (8) the techniques for investigation of the phase variants, and (9) meth-

ods for mathematical modeling of the growth and consumption in communities of phase variants.

In the section on mathematical modeling, the mathematical aspects of the variational model for consumption and growth and the practical results of its application to the study of the stationary phase of growth are discussed using three variants of *Pseudomonas aeruginosa* as an example.

An explanatory dictionary for the site and N.N. Firsov's microbiological dictionary (*Microbiology*. M.: DROFA, 2005) are available.

The site cites more than 200 publications. In these works, splitting of bacterial populations into phase variants was established for the following species: *Alcaligenes eutrophus*, *Azospirillum brasilense*, *Bacillus brevis*, *B. cereus*, *B. coagulans*, *B. dastaticus*, *B. mesentericus*, *B. licheniformis*, *B. mucilaginosus*, *B. subtilis*, *Escherichia coli*, *Gluconobacter oxydans*, *Lactococcus (Streptococcus) lactis*, *Leptospira interrogans*, *Micrococcus luteus*, *Mycobacterium brevicale*, *M. mucosum*, *M. phlei*, *M. rubrum*, *M. salivarum*, *Photobacterium leiognathi*, *Proteus mirabilis*, *Pseudomonas aeruginosa*, *P. aurantiaca*, *P. atlantica*, *P. fluorescens*, *P. syringae*, *Rhodococcus erythropolis*, *R. rubropertinctus (Mycobacterium laticolum)*, *Salmonella minnesota*, *S. typhimurium*, *Shigella flexneri*, *S. sonnei*, *Acidithiobacillus ferrooxidans*, and *Francisella tularensis*.

Splitting of the population into phase variants has been established for the following species of streptomycetes and fungi: *Aureobasidium pullulans*, *Candida albicans*, *Mucor lusitanicus*, *Streptomyces ambofaciens*, *S. atratus*, *S. avernitis*, *S. lavendulae*, *S. oligocarophilus*, and *S. roseus*.

Over 400 tables containing quantitative experimental results regarding the bacterial phase variants are available in the section Experimental Database.

The reviewed site contains a large body of extremely important information and will be of interest to microbiologists, biochemists, geneticists, biotechnologists, and ecologists.

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