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BIOLOGICAL ASPECTS FOR APPLICATION OF LASER RADIATION WHEN MANAGING ECOLOGICALLY DETERMINED PATHOLOGICAL PROCESSES

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Purpose: review and analysis of our own original research on biological activity of low-level laser radiation which falls on violet, blue, orange, red and infra-red area of spectrum in experimental and clinical setting. Method and materials: during the experimental stage of the research there were used industrial lasers (He-Ne, He-Cd, semiconductor Ga-As) as well as lasers made at Southern Federal University ($He-Sr^+$, $He-Hg^+$); the object of study were rats both in intact state and simulated conditions indicating pathological processes. Clinical testing of low-level laser radiation was implemented under Rostov Research Institute of Obstetrics and Pediatrics and Psychiatric Clinic of Rostov State Medical University. Analysis of laser exposure during the experimental stage is done due to cytophotometric and histochemical methods. Outcome assessment by means of He-Ne and IR lasers was carried out using hormonal, psychophysiological, electrophysiological and biochemical methods. Results and conclusions: experimental and clinical research allowed explaining specific features of neuroendocrine system response to low-level laser radiation depending on initial state of the human. It was shown that rheogram in the exposure area can indicate efficiency of the laser used for managing reproductive system disorders. Low-level laser radiation demonstrated ability to be used to increase body's adaptation to stress.

Keywords: *biological activity, low-energy laser radiation, neuroendocrine system, electrophysiological performance.*

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THE GREAT CORMORANT (*PHALACROCORAX CARBO L.*) IN THE DON DELTA AND THE PROBLEMS OF ITS EXISTENCE

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Purpose. The cormorant (Phalacrocorax carbo L.) is an abundant species in the Don delta. The aim of the article is to clarify the causes of cormorants dwelling in the Don delta. The authors analyzed cormorant numbers, determined the damage to fishery resources damages and made recommendations to reduce the number of these birds.

Methods. The material for this article is the result of the analysis of author's observations for cormorants in the Don delta during their breeding and post-breeding migrations periods, as well as the available data in the literature on this species in the 20-21 centuries.

Results. The first breeding colonies of cormorants from 32 nests were observed on island Malyi Dvoryan the Don delta in 1975. Over the years, the numbers of the birds grew up, and began to settle in the delta of the first, and then on the Lower Don and Manych. This article contains material on the number of cormorants' dynamics in the delta from 1975 to 2016. The authors consider the reasons of the sharp increase in the number of these birds. About 5 thousand pairs of cormorants bred in the Don delta in the 2015-2016. Birds cause extensive damage to fish resources. The authors discussed measures to reduce the population of this species.

Conclusion. Appearance of cormorants and increase in their number is caused by control of a Don drain, development of pond fish breeding, pollution of reservoirs, forming of wood vegetation in the delta and the floodplain. Approbation of the available experience of cormorants quantity regulation in the conditions of Don allows implementing an effective complex of actions for decrease in number of cormorants.

Keywords: *Don delta, the great cormorant, Phalacrocorax carbo, quantity, monitoring, breeding colonies, resettlement, damage, fish resources, population control.*

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METHODS OF CULTURING AND STUDYING BACTERIAL BIOFILMS

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We review the main methods of cultivation and a research of biofilms of microorganisms in this article. Research of biofilms - direction are currently important in microbiology and medicine - lead to emergence of a large number of various methods of their receiving and a research. This methods set allows to study key parameters of biofilms and to answer a question: what is represented by these structures? In first interest for this issue was caused by biofilms as the clinical significance key factor complications in implant surgery. The problem of biofilm formation requires a revision of the standards of antibiotic treatment, as well as the practical application of disinfectants in view of the microbial resistance in biofilms at doses and concentrations, which used in clinical practice. Also important epidemiological significancy of biofilm as the factors contributing to the conservation of infections in natural foci. We review methods of dynamic and static cultivation of biofilms in vitro and in vivo and their benefits and limitations in article. Various options of a microscopy used for studying of biofilms structure and morphology, and the genetic methods of researches allowing to estimate the level of an expression of various genes and to reveal their role in biofilm formation.

Keywords: *biofilm, biofilm formation, biofilm culturing, scanning electron microscopy, transmission electron microscopy, laser scanning confocal microscopy.*

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