SUMMARY

Bagrikova N.A., Kotov S.F. Distribution and structure of communities of annual succulent halophytes in central and eastern part of Crimean Sivash region // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55) . – No.2. 3-13 P.

Localization of the communities of annual succulent halophytes in central and eastern part of Crimean Sivash region was adduced. Distribution and structure of these communities are determined by salinity and humidity of soil; relief influences non-directly. Coenotic factors have effect at the population level.

Key words: halophytes, annuals, Sivash, salinity, humidity.

Banik, M.V. Estimation of the relations between Whinchat and common stonechat abundance and habitat structure and impact of anthropogenic factors in conditions of chalk slopes in Eastern Ukraine // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55) . – No.2. 14-18 P.

The abundance of whinchat and common stonechat depends on habitat structure parameters and on impact of natural and anthropogenic factors in conditions of chalk grasslands in Eastern Ukraine. The habitat requirements of both species are quite different as the abundance of each species is influenced by the distinct set of factors.

Key words: Whinchat, Common Stonechat, abundance, habitat selection

Bardyga R. V., Karpova G. Y.,Omelchenko I. E. Characteristics of drought resistance of coriander hybrids in parameters of water exchange // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55) . – No. 2. 19-22 P.

Coriander is a valuable, eurysynusic essential oil culture. The parameters of water exchange of breeding material of coriander play the large in drought resistance the large role are played. The group og hybrids was selected on parameters of water exchange and productivity of 1000 fetuses for further selection on drought resistance.

Keywords: selection, coriander, hybrid, drought resistance, water exchange.

Biryukova T.V. Reaction of cardiovascular system on measured vestibular pressure of children with different types of blood circulation // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55) . – No.2. 23-29 P.

The article is devoted to studying of cardiovascular system reaction on measured vestibular pressure of children with different types of blood circulation. Our investigation showed that reaction of blood circulation on vestibular influence of most children is defined by initial condition of hemodynamics. Taking into account the type of blood circulation reaction, while estimating the reaction of cardiovascular system on measured vestibular pressure, proved our supposition that children with different types of blood circulation react on vestibular pressure in different ways.

Keywords: cardiovascular, hemodynamics, type of blood circulation, vestibular pressure, auditory sensory deprivation

Bugara I. O. Obtaining of callus cultures of mint and their cytological characteristics // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55) . – No.2. 30-34 P.

The callus culture of mint Zagrava, Simferopolskaya 200, Ukrainskaya perechnaya, Dvuhukosnaya and Prilukskaya 6 were obtained. The dependence of callusogenesis from genotype, explants and structure of medium is demonstarted. The cytological analysis of callus cultures has shown their high heterogeneity in morphological structure and their potential ability to morphogenesis and neogenesis of plants.

Keywords: essentialoil plants, mint, callus culture.

Vahtina T. B. Blood enzyme activity of Black Sea gobes (Gobiidae) from the bays with different anthropogenic impact // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55) . – No.2. 35-38 P.

Antioxidant enzyme activities in blood of round gobe habited three bays were studied. Activity of the enzymes with the exception of peroxidase in fish blood from Inkerman was 4 – 11 times higher as compared with the parameters of the fish from non-polluted bays.

Key words: round gobe, blood antioxidant enzymes, pollution.

Verko N.P., Chuyan E.N. , Temuryants N.A., Chirsky N.V. EMR EHF induce leucocytes priming // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55) . – No.2. 39-44 P.

The possibility of using of EMR EHF as priming agent during consecutive action of activizing stimulus has been studied. The incentive was stress-reaction modeled with infection or motility restriction of animals. It has been shown that multiple irradiation of healthy animals with low intensity EMR EHF increases potential power of neutrophils and lymphocytes. It promotes the increasing of organism resistance to further influence of damaging agents.

Key words: priming, hypocinetic stress infection unspecific resistance, EMR EHF

Glivenko A. V., Evstafyeva I. A., Evstafyeva E. V., Demchenko V. F. Heart activity depending of essential elements content in human body // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55) . – No.2. 45-48 P.

The heart work was studied in 26 children at the age of 15 years living in urbanized area with intensive traffic. The total calcium deficit, significant deficit of cuprum, ferric and zinc in human body were determined. The positive relationship between calcium content and the cardiocycle time and negative relationship between the relative time parameter and potassium content were founded. Zinc and cuprum did not effect on heart work.

Key words: heart, metals, children

Govorun A. V. Fauna of the pyralids (Lepidoptera, Pyralidae) of the biological station of A.S. Makarenko Sumy Pedagogical Institute // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55) . – No.2. 49-53 P.

The results of long-term observations are presented. The list includes 114 species, 38

species found in Sumy area at first. Phycita meliella Mann, Exophora florella Mann, Phycitodes inquinatella Ragonot were found in Ukraine at first.

Key words: pyralids, fauna, Sumy region.

Golubkova E.E., Shmaley S.V. Electromyographic study of speaking activity in children of pre-school age// Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55). – No.2. 54-60 P.

The electrophysiological characteristics of muscles and nervou structures in disjunctions of spoken acts are presented. 3 types of EMG-activities are distingushed.

Key worlds: bioelectrical activity, muscles, dysfunction-spoken acts.

Gol'din P. E. **Bone of lower jaw of harbour porpoise (*Phocoena phocoena relicta* Abel, 1905) as a registering structure** // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55). – No.2. 61-69 P.

Lower jaws of 27 harbour porpoises found dead at the Crimean coast of the Sea of Azov in 2000-2002 were studied. The samples were decalcified in 5% nitric acid, sectioned, and stained by haematoxylin. The whole bones from 9 specimens with age of 1-9 years were decalcified and divided to 1 cm segments before sectioning. Growth layers were found forming in all the jaw excluding the beginning of tooth raw. The number of completed mandibular layers corresponded to that of growth layer groups in dentine, i.e. the absolute age, in animals more than 1 year old. Growth layer is characterized by the complicated structure including one or more resting lines. The specific feature is the formation of double resting lines. Thus, there are growth layer groups in mandibula equivalent to that in dentine. Jaw branch is recommended for the age determination method instead of the end of tooth raw. Using the mandibular layering for age determination is regarded as a good additional technique along with dentine reading.

Keywords: harbour porpoise, mandibula, growth layers, age.

Dubova V.P., Oturina I.P., Reshetnik G.V. Change of condition of pigment-plastid complex and productivity of photosynthesis of a winter wheat infected by a striped mosaic virus // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55). – No.2. 70-74 P.

The influence of a virus infection on pigment-plastid complex of leaves of a winter wheat is investigation. The negative action of a striped wheat mosaic virus is shown in degradation of a population of chloroplasts, reduction of the content of pigments, decrease of the photosynthetic productivity, braking processes of growth.

Keywords: virus infection, wheat, chloroplasts, pigments, photosynthesis.

Epikhin D.V. Rare and endemic species in Simferopol and its outskirts // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55). – No.2. 75-80 P.

Occurrence of rare and endemic species of vascular plants on the territory of Simferopol is shown. Some approaches to the further study, monitoring and management are given.

Key words: endemic, rare species, urban area, monitoring, GIS.

Zhizhina M.N., Kabuzenko S.N. Correlated dependence between reactions of photosynthesis and growth of maize plants at the background of salinization and growth regulators // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55) . – No.2. 81-83 P.

Correlated dependence between indices of pure productivity of photosynthesis and growth processes of maize plant was studied at the background of chlorine salinization and exogenous growth stimulators.

It was shown that the correlated dependence between photosynthetic productivity and intensivity of growth processes reduce in conditions of salinization. Preliminary processing by solutions of evena and 6-BAP promotes increase of the coefficient of correlation between these parameters.

Zolotova - Haydamaka N.V. Influence of modeled hypokinesia on the bone tissue osteocytes state in the white rats // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55) . – No.2. 84-87 P.

The purpose of the present investigation was to study the bone tissue osteocytes state and structure in the rats under hypokinesia conditions during 28 day by histological and morphometrical methods. We concluded that changes in the osteocytes can be regaraded as elementary stages of adaptive changes of bone tissue. It is the evidence about intensification of resorptive processes in the bone.

Key words: osteocytes, bone tissue, hypokinesia.

Konareva I.N. . Psychophysiological investigation of personality // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55) . – No.2. 88-93 P.

On the basis of the received statistically significant correlation's of EEG pattern with a psychological characteristics of personality in 120 participants we have shown a neurophysiological mechanisms of development of individuality, which are based on the structural and neurochemical changes of brain systems that are formed under an influence of life experience.

Key words: electroencephalogram, event-related potentials, neurodynamics, personality.

Kondaurova Ya. G. The low and prostrate woody plants on the south coast of tne Crimea and their biomorphological peculiarities // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55) . – No.2. 94-97 P.

The biomorphological peculiarities and classification of tne low and prostrate woody plants on the south coast of tne Crimea are presented.

Key words: low and prostrate woody plants, biomorpholog, crown of architectonic, phenology.

Kondratenko O.N., Mitrofanova O.V. Influence of various concentration of vitamins on growth and development of feijoa plants (Feijoa Sellowiana Berg.) in culture in vitro // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55) . – No.2. 98-102 P.

For the first time experiments have been lead, which have shown the positive influence of ascorbic acid and tiamin-HCl on survival rate of primary explants, propagation rate and rhizogenesis induction during the clonal micropropagation in 5 feijoa' forms.

Key words: Feijoa sellowiana Berg., rhizogenesis, micropropagation, in vitro

Kondratenko O. V., Mitrofanova I. V., Prichodiko L.M. Rooting in vitro and adaptation in vivo of miniature roses (Rosa Minima L.) // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55) . – No.2. 103-108 P.

For the first time the analysis of influence of salts and auxines concentration in culture medium on induction of microshoots rhizogenesis in vitro in miniature roses "Mister Bird blue" and "Zwergkunig" has been lead. The optimum periods of adaptation in vivo and planting of minirose plants in situ were determined.

Key words: Rosa minima L., rhizogenesis, adaptation, in vitro, in vivo

Kostychenko O.V., Evstafyeva E.V., korenyuk I.I. Elctrogenic opium receptors on identified neurons of a grape snail // Uchcnyc zapiski TNU. Series: Biology, 2003. – Vol. 16 (55) . – No.2. 109-113 P.

The influence of naloxone on rhythmic activity of identified helix neurons possessing the pacemaker properties is investigated. It was found that the cell reactions on the naloxone application (10 – 100 mkM) depended on the type of neuron. It is proposed that the naloxone action is mediated by specific ionotropic opiate receptors which are controlled by endogenous opioids.

Key words: neuron, naloxone, opium receptors.

Kucherenko V.N., Kostin S. Iu. Contemporary condition of Crimean peregrin population // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55) . – No.2. 115-118 P.

These publication discusses the question of settled local peregrine population. Thr data on peregrine abundance and nest sites on Crimea at past and present time. Now the Crimean population is estimated at 50-55 breeding pairs.

Lavrikova O. V. The definition of adaptational possibilities criteria in cardio-vascular system of academic rowing sportsmen as for their physical amount of work adaptation, cardio-vascular system, physical amount of work, echocardiogramme // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55) . – No.2. 118-122 P.

A great amount of attention has been set by the problem of the current medical control provided when sportsmen carry out physical exercises. In order to study more deeply the

ways of heart's adaptation to hyperfunction one should use such a highly informative non-invasive method of research as echocardiographics.

This article regards different ways of defining the adaptational possibilities criteria in cardio-vascular system of sportsmen.

Maltseva A.G. Fauna and ecology of leaf-beetles (Coleoptera, Chrysomelidae) of coastal localities in middle stream of Seversky Donets river // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55) . – No.2. 123-130 P.

Materials on fauna, ecology and distribution of leaf-beetles (Coleoptera, Chrysomelidae) of middle stream of Seversky Donets river are given. 11 subfamilies with 51 genera and 248 species are detected. New data on trophic specialization, season dynamics and biotopical allocation are presented.

Keywords: fauna, ecology, Chrysomelidae, coastal localities, Seversky Donets river.

Matveyeva Z. S. Study of biochemical composition in the eggs of artemia from different geographical places // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55) . – No.2. 131-133 P.

Biochemical composition in the eggs of artemia (Artemia salina L.) from two geographical places (Lake Sivash and estuary Kujalnik) was investigated. Concentration of proteins and lipids in the studied objects was approximately the same but the concentration of carbohydrates was different. Energetic value of the eggs of artemia from lake Sivash was higher, thus they could be used in aquaculture.

Keywords: eggs, artemia salina, biochemical composition, energetic value.

Makhin S. A., Pavlenko V. B. ERP indices during time interval production // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55) . – No.2. 134-138 P.

While solving the experimental task on time interval production there were registered ERP values (RP, SPN, P300) in two series with available and absent feedback on time operating. We found a tendency according to which people with time underestimation bias had higher ERP values. Besides, we discovered the difference of nonlinear dependencies of intraindividual RP dynamics on produced interval duration in two series with available and absent feedback.

Key words: timing, event-related potentials, readiness potential, stimulus preceding negativity, P300

Minko V.A. The influence of low electromagnetic radiation of extremely low frequency (ELF) on infradian rhythmicity of dehydrogenases activity of leukocytes of blood of rats with low mobile activity // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55) . – No.2. 139-145 P.

The present study investigated the influence of low intercity electromagnetic radiation ELF on infradian rhythmicity of dehydrogenases activity of leukocytes of blood of rats with

low mobile activity. VMF ELF is capable to variate the time organization of physiological processes at rats with LMA, that results to development of hypersynchronization.

Key words: VMF ELF, infradian rhythmicity, dehydrogenases, LMA.

Popkova L.L., Kryzhko A.V. Features of propagation rare crimean endemic Crataegus pojarkovae Kossych in vitro condition // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55) . – No.2. 146-151 P.

Optimal nutrient medium, conditions of sterilization and preliminary processing methods of the seeds were found. Viable seedlings of hawthorn Pojarkovae have been got in two months of cultivation. The development in vitro conditions have been cutting down in 7 – 8 times as compared with natural germination and formation of seedlings ex situ for 14 – 17 months.

Key words: hawthorn Pojarkovae, propagation, in vitro.

Roshina O.V. The effect of environmental and anthropogenic factors on the enzyme activity in blood serum of scorpionfish // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55) . – No.2. 152-156 P.

The effect of environmental and anthropogenic factors on the activity of enzymes ALT, AST and ALD in blood serum of scorpionfish (Scorpaena porcus Linnaeuse) was studied. The enzyme activity was dependent on seasons. Thus, these parameters could be used for the evaluation of the physiological state of fish. The effect of water pollution on the enzyme activity was not determined.

Keywords: alanin aminotransferase, aspartate aminotransferase (AST), fructose-bisphosphate-aldolase, scorpionfish, pollution.

Sergeev M.E. The studies of leaf-beetles fauna and ecology of subfamily Alticinae (Coleoptera, Chrysomelidae) in "Pridontsovskay poyima" reservation // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55) . – No.2. 157-163 P.

The studies of the leaf-beetles fauna and ecology of subfamily Alticinae in "Pridontsovskay Poyima" reservation are presented for the first time. 13 genera with the 93 species are detected. 1 genus (Lythraria Bedel.) and 18 species are given for Southeast Ukraine for the first time. The data on seasonal dynamics, trophic specialization and biotopical allocation of Alticinae species in correspondence with main types of plants of the reservation are represented.

Keywords: fauna, ecology, Alticinae, Southeast Ukraine.

Simagina N.O. Interspecific interaction in communities of associations Halocnemetum salicorniosum // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55) . – No.2. 164-169 P.

Interactions between *Salicornia europaea L.* and *Halocnemum strobilaceum Bieb.* were studied Authentic positive connection between parameters of vitality *S. europaea* on

a gradient of remoteness from *H. strobilaceum* is revealed. Influence *H. strobilaceum* increase in processes of ontogenesis. It is possible that allelopathy is one of mechanisms of an interspecific competition.

Key words: competition, allelopathy, *Salicornia europaea L.*, *Halocnemum strobilaceum Bieb.*,ontogenesis.

Sklyarenko D.A., Bugara A.M. Application of in vitro technique for propagation of some rare and extinct plants of crimean flora // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55) . – No.2. 170-174 P.

Application of in vitro technique for preserving biodiversity of crimean flora is a perspective method in the situation of growing anthropogenic press and enforce of genetic erosion. The data of investigation for propagation of some rare and endemic plants such as Crataegus pojarkovae, Onobrichis pallasii and Sorbus domestica were presented.

Key words: endemics, rare and extinct species, clonal micropropagation, in vitro culture.

Skuratovskaya E. N. Responses of antioxidant enzymes of scorpion fish Scorpaena porcus L. on anthropogenic impart // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55) . – No.2. 175-178 P.

Activity of SOD, glutathione reductase, glut hathione-S-transferase in blood of scorpion fish habited in the bays with different anthropogenic impart was studied. Ecological situation of bays is presented. It was shown that SOD activity was significantly higher in fish blood from high polluted bays.

Key words: scorpion fish, blood antioxidant enzymes, pollution antioxidant.

Sobolev D.V. 2003. Miocene birds from the Western Black Sea coast of the Ukraine // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55) . – No.2. 179-183 P.

Some data on the composition of the species of the Late Miocene avifauna of the Western Black Sea coast and short paleoecological characteristic of this region are presented.

Key words: fossil birds, Miocene, Ukraine.

Stryukov A. A The aspects of localization of acanthocephal Corynosoma pseudohamanni Zdzitowiecki, 1984 and age and sex structure of its Pacific population // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55) . – No.2. 184-187 P.

The paper concerns the aspects of localization and age and sex population structure of acanthocephal Corynosoma pseudohamanni Zdzitowiecki, 1984 from three seal species – Leptonychotes weddelli Lesson, 1826, Lobodon carcinophagus Hombron and Jacquinot, 1842, Mirounga leonina (L.). The rank of each host was determined based on the quantitative indices of invasion.

Key words: Acanthocephala, Corynosoma, Pinnipedia, Antarctic.

Torska O.V., Ostronosova O.B., Voronyna I., Oskolskaya O.I. The impact of environmental factors on the structure of macroalgae (Black Sea) // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55) . – No.2. 188-193 P.

The destructive processes of the coastal strip and eutrophication in the regions of Karadag and Cape Tolsty area results in changing of the structures and reducing of the macroalgae biomass.

Key words: macroalgae, sediment, morphological parameters, eutrophication

Homenko L.A., Nogina T.M., PodgorskyV.S. Antibiotic sensitivity of the Rhodococcus erythropolis and Rhodococcus fascians strains isolated from soil of the 10-kilometer zone around Chernobyl nuclear power plant // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55) . – No.2. 194-197 P.

The antibiotic sensitivity of the Rhodococcus erythropolis and Rhodococcus fascians strains isolated from soil of the 10-kilometer zone around Chernobyl nuclear power plant in 1996-1997 years has been investigated. It was shown that new isolated and collection strains of these species almost do not differ on sensitivity to antibiotic substances of various chemical composition. They exhibit the resistantance to polymixin and oleandomycin and high sensitivity to neomycin, tetracycline, chloramphenicol, ristomycin and rifampicin.

Key words: bacteria, Rhodococcus, sensitivity to antibiotics.

Cherkashina A.V., Mitrofanova O.V., Kazas A.N. Embryoculture and micropropagation in vitro of Diospyros virginiana L. // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55) . – No.2. 198-201 P.

The germs from zygotic embryos of persimmon cv. Virginskaja 213 were obtained and than the micropropagation were carried out. For active regeneration of microshoots the medium with 1 mg l^{-1} zeatin is necessary.

Key words: persimmon, embryo, germ, microshoot, in vitro

Chernadchuk S.S., Vovchuk I.L. Catepsine b activity in tumor tissue of women reproductive organs // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55) . – No.2. 202-207 P.

The pH optimum of the catepsine B activity was found in endometrial carcinoma samples (6,0) and in tumor tissue of mammal (5,5). We found inversely proportional dependence between the degree of the differentiation of malignante tumor of endometrial cells and activity of the enzyme, and increase of catepsine B activity on the development of phibrose-cystose disease in mammal.

Key words: catepsine B, endometrial, mammal.

Cherny S .V., Ponomaryova V.P., Chuyan E.N., PavlenkoV.B. The evaluation of the electromagnetic radiation of extremely high frequency through registration of human brain bio-pitentials // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55). – No.2. 208-214 P.

There were studied (on 20 probationers) the properties of EEG and evoked related potentials under influence of EMR of EHF mm range and without such the influence. The changes in the experimental group under influence of EHF and in the control group were observed. Positive and negative interrelations between EEG rhythms powers and parameters of evoked potentials were discovered. The efficiency of EHF EMR influence and its principles was demonstrated.

Ravaeva M.Yu., Korenyuk I.I., Gamma T.V., Kuryanov V.O., Chupahina T.A. Effects of influense of derivatives glycopeptides on electrical activity neurons molluscs Helix albescens rossm // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55). – No.2. 215-222 P.

The summary:: At intracelluiar assignment of biopotentials identified neurons molluscs the availability neurothropic of effects of derivatives glycopeptides shown is established that all investigated connections changed a level MP and increased generation rate impulse, to a lesser degree influencing on amplitude and duration AP. The relation of responses neurons from them typologicalof features, and also from a chemical structure and concentration of the data of derivatives is revealed. The possible gears of realization neurothropic of effect of the data of connections are discussed.

Key words: molluscs, neurones, membrane potential, action potential, glycopeptides.

Podoprigora V. N. Aleksashkin I. V. Impact of catalytic peroxidation on growth of guppy Poeicilia reticulata Peters, 1859 fry. // Uchenye zapiski TNU. Series: Biology, 2003. – Vol. 16 (55). – No.2. 223-229 P.

Aspects of the impact of catalytic peroxidation on growth of guppy fry were studied. It was unambiguously proven that using the catalysts for activation of natural peroxidation in enclosed water systems for fish-farming is impermissible because it negatively affects the growth rate of the biomass.

Keywords: guppy, growth, catalytic peroxidation, enclosed water systems.