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Teresa BEDNARZ and Mieczysław NOWAK

Selected species of algae found in carp ponds of the Laskowa complex near Zator.

Acta Hydrobiol., 14, 103-112.

[in Polish with English summary]

Abstract - Notes are given on infrequent species of algae found during investigations on the plankton of carp ponds situated in the basin of the upper Vistula. Among the quoted 30, *Goniochloris fallax* (Heterokontae), *Chlorangiopsis piriformis*, *Pachycladon* sp., *Lambertia issajevii* var. *spinosa*, *Franceia elongata*, *Lauterborniella appendiculata*, *Tetraëdron cruciatum*, *T. pussillum* and *T. proteiformae* var. *granulatum* (Chlorococcales) are species of algae new for Poland.

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Teresa BEDNARZ and Mieczysław NOWAK

The selection of algae for mass culture purposes.

Acta Hydrobiol., 14, 1-18.

Abstract - From various natural environments of Poland 950 algae strains were isolated. They belonged to the genera *Chlorella*, *Scenedesmus*, *Ankistrodesmus*, *Tetraëdron*, *Coelastrum*, *Protococcus*, *Stichococcus*, and *Chlamydomonas*, and were subsequently subjected to a three-stage selection. The selection aimed at choosing productive algae strains with a high content of crude protein in the biomass. 56 productive algae strains were obtained, belonging to the genera *Chlorella*, *Scenedesmus*, and *Ankistrodesmus*. The content of crude protein in the biomass of the selected algae strains varied from 43 to 65 per cent.

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Stanisław BERNATOWICZ

Observations on the development of *Coregonus peled* (Gmel.) fry 0+ in ponds.

Acta Hydrobiol., 14, 165-172.

[in Polish with English summary]

Abstract - The main difficulty encountered in the production of stocking material of *Coregonus peled* in ponds are high losses in the first year of age. Observations were made on the growth of *Coregonus peled* fry in the period from spring to autumn. Growth rate, condition, survival, and parasites were also considered.

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Krzysztof BIENIARZ and Piotr EPLER

Ichthyofauna of certain rivers in southern Poland.

Acta Hydrobiol., 14, 419-444.

[in Polish with English summary]

Abstract - The ichthyofauna of certain rivers in Southern Poland was investigated by means of an electric aggregate. Chub was found to dominate in most rivers under study. It was only one sector of the River Ropa that salmonids were caught in an appreciable amount. In all the polluted rivers under investigation an increase in the amount of fish was observed in the places situated below the hydraulic structures augmenting water oxidation.

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Zbigniew JARA¹, Franciszek MARKIEWICZ² and Tadeusz BORY MIĄCZYŃSKI²

Results of investigations on the state of health of the trout in lakes of the Tatra National Park in the years 1966-1970.

Acta Hydrobiol., 14, 129-141.

Abstract - Investigations on the state of health of the trout *Salmo trutta* morpho *fario* and *Salmo fontinalis* were carried out during a five-year period. The occurrence of parasites *Raphidascaris acus* (Bloch 1779), *Neoechinorhynchus rutili* (Müller 1870), *Crepidostomum* sp., *Myxidium truttae*, and *Ichthyophonus intestinalis* was detected. Moreover non-parasitic diseases were observed, such as a degeneration of the hepatopancreas (as a phenomenon occurring in masses in brown trout in the Lake Morskie Oko) and single cases of inflammation of the air-bladder, of a cyst in the excretory kidney, and of a goitre of the thyroid gland in brook trout in the Lake Zielony Staw Gąsienicowy.

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Henryk KLIMOWICZ

The microfauna of activated sludge. 2. Assemblages of microfauna in block aeration tanks.

Acta Hydrobiol., 14, 19-36.

Abstract - Investigations were carried out on the microfauna of activated sludge proceeding from block aeration tanks. 67 species of microfauna were identified, 34 of which belonged to Ciliata, 26 to Rotatoria, 6 to Rhizopoda, and 1 to Flagellata. Moreover, individuals belonging to Flagellata, Nematodes, Gastrotricha, Oligochaeta, and Arachnida were found, but their species could not be determined. In the two aeration tanks the same species of microfauna prevailed, but the periods of their dominance were not always simultaneous. Microscopic analyses of activated sludge collected at the same time from two aeration tanks, treating the same sewage in similar technological parameters, always showed a different specific composition of microfauna. The variations in numbers, and the complete disappearance or appearance of individuals representing the particular microfauna species, increased with rising temperature of the environment. The occurrence of microfauna in block aeration tanks shows that the content of oxygen exceeding 2.7 mg O₂ L⁻¹ does not noticeably improve the course of the process of sewage purification.

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Łucja KRZECZKOWSKA-WOŁOSZYN

The zooplankton of a carp pond under conditions of continuous filling.

Acta Hydrobiol., 14, 307-315.

Abstract - The effect of several years' filling of the fish pond in Gołysz (District Cieszyn) on the development of zooplankton was investigated. Seasonal variations and the influence of the fish stock on the quantity and qualitative composition of zooplankton were also discussed. The most intensive development of zooplankton was found in the first year of the investigations, due to the first filling and utilization of the pond after its renovation. Permanent filling of the pond in the following years resulted in decreased amounts of zooplankton animals.

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Jerzy KWAPULIŃSKI

Beta radioactivity of periphyton in certain dam reservoirs.

Acta Hydrobiol., 14, 273-286.

Abstract - The investigations permitted the distinction of the period of maximum beta radioactivity, this being observed in the period of increased radioactivity of the water. The cumulation coefficient in the examined limnic and rheolimnic is of the order 10^3 - 10^4 .

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Jerzy KWAPULIŃSKI and Teodora ZUBIK

Influence of some hydrological parameters on changes in the radioactivity of the waters of the Rivers Czarna Przemsza and Przemsza.

Acta Hydrobiol., 14, 257-271.

Abstract - The influence of some hydrological parameters - water level, water temperature, area of the reception basin, dry residue, water flow - on the specific radioactivity of the water was established. On the basis of the investigations carried out and the known coefficient of flow changeability and dry residue, the degree of relationship between these parameters on any stretch of the river can be established. No correlation between the specific radioactivity of the water and dry residue of flow is found for $C_v^m=0.30$ and $C_v^g=0.269$.

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Maria LEWKOWICZ

Rare and new species of rotifers in the fauna of Poland.

Acta Hydrobiol., 14, 143-148.

Abstract - 25 planktonic and littoral species of Rotatoria which are rare or new for the fauna of Poland were identified. These species were found in the fishponds belonging to the Laboratory of Water Biology of the Polish Academy of Sciences at Gołysz. The following species are new for the fauna of Poland: *Volga spinifera* Skorikov 1903, *Lepadella nympha* Donner 1943, *Lecane bifurca* (Bryce) 1892, *Trichocerca jenningsi* Voigt 1957.

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Franciszek MARKIEWICZ

Inflammation of the swimbladder in the carp (*Cyprinus carpio* L.).

Acta Hydrobiol., 14, 375-397.

Abstract - In the course of inflammation of the swimbladder of carp two kinds of changes were observed - general organic changes and local ones within the swimbladder itself, changes in the carp fry being slightly different from those taking place in older age groups. While in the latter productive processes - hypertrophy of the swimbladder walls and the appearance of great masses of fibrion - were predominant, in younger carp circulatory disturbances in the form of peri-swimbladder hyperaemia, infiltrations exudates, and gas cysts were found above all. Morphological changes in artificially infected fish were similar to those occurring in natural conditions. The course of the disease and the observations and tests carried out indicate that inflammation of the swimbladder is an infectious disease. Descriptions of changes are illustrated with macro-and microscopic photographs.

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Stanisław NIEWOLAK

Fixation of atmospheric nitrogen by *Azotobacter* sp., and other heterotrophic oligonitrophilous bacteria in the Iława Lakes.

Acta Hydrobiol., 14, 287-305.

Abstract - Investigations were carried out on the distribution of bacteria fixing atmospheric nitrogen in water, bottom sediments, and netplankton of the Iława Lakes in the annual cycle, as well as on the intensity of fixing atmospheric nitrogen in pure cultures of bacteria isolated from the Lake Jeziorak. Considerable differences were noted in the development of the corresponding bacteria, according to the degree of pollution or mineralization of the water, the season of the year, and the type of the bottom. The greatest quantities of bacteria fixing atmospheric nitrogen occurred in the netplankton and in the bottom sediments of the Iława Lakes; a spring-summer maximum was distinguished in their occurrence in water and bottom sediments in May or June, and an autumn maximum in September and November. *Azotobacter beijerinckii* No 2 and 18 fixed in pure cultures the greatest quantity of atmospheric nitrogen - up to $15.9 \text{ mg } 100 \text{ mL}^{-1}$ of the medium and $15.28 \text{ mg N g}^{-1}$ of glucose. The yield of strains of the genus *Aeromonas*, *Vibrio*, *Achromobacter*, *Flavobacterium*, and *Corynebacterium* lay within the range typical of oligonitrophilous bacteria.

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Stanisław NIEWOLAK

The occurrence of heterotrophic bacteria in the waters of the Iława Lakes and some of their physiological and biochemical properties.

Acta Hydrobiol., 14, 331-351.

Abstract - Greater quantities of bacteria of the genus *Micrococcus* (34%) occur in Lake Jeziorak Mały than in Lake Jeziorak; among them are the species *M. candidus*, *M. caseolyticus*, *M. freudenreichii*, and others from dairy wastes. The sewage character of this reservoir is also indicated by the occurrence of the species *Pseudomonas aeruginosa*, *P. synchyanea*, *P. synxantha*, *P. pavonacea*, *Escherichia coli*. Bacteria of the genus *Bacillus* (33-38%) dominate in Lake Jeziorak. The strains of bacteria decomposing various forms of nitrogen and carbon occurred in great quantities among the micro-organisms isolated from Lake Jeziorak, and in lesser quantities in Lake Jeziorak Mały.

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Kazimierz PASTERNAK¹ and Jan GLIŃSKI²

Occurrence and cumulation of microcomponents in bottom sediments of dam reservoirs of Southern Poland.

Acta Hydrobiol., 14, 225-255.

Abstract - It was found that the total amount of microcomponents in sediments depends above all on their grain composition. An exception here are sediments of reservoirs supplied with strongly polluted water. The quantitative differentiation of microcomponents within each granulometric group of sediments, as well as between single samples from various zones of the reservoirs, shows a tendency to a relationship with the quantity and quality of clayey and organic matter in the sediment. The presence in the substratum of the catchment basin of the reservoirs of rock layers containing zinc and lead minerals, or dust coming from the zinc and lead industries, have some influence on the increase in the amount of these components in the sediments. The main source of microcomponents in the sediments of pure reservoirs are suspensions brought in by the water of the river, and remains of organisms developing in the reservoirs. The degree of cumulation of microcomponents in the sediments of dam reservoirs is much higher than in land soils and the soils of fish-ponds. Vanadium accumulates in the sediments in particularly large amounts. The degree of concentration of some microcomponents in the sediments of polluted reservoirs corresponds in general to the quantity and quality of pollution of their water.

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Maria PAWLACZYK-SZPIŁOWA, Maria MOSKAL and Jerzy WERETELNIK

The usefulness of biological tests for determining the toxicity of some chemical compounds in waters.

Acta Hydrobiol., 14, 115-127.

Abstract - The methods of investigations applied were distinguished by a varying sensitivity to the toxic action of selected chemical compounds. Thus, for example, the toxic action of copper sulphate (at concentration 0.01 mg L⁻¹), of lead acetate (at concentration 0.1 mg L⁻¹), and of phenol (at concentration 10 mg L⁻¹) was detected the earliest by means of the chlorophyll method, the action of aniline (at concentration 0.1 mg L⁻¹) using the method of the T.T.C. test, and that of potassium permanganate (at concentration 1.0 mg L⁻¹) and of chlorine (at concentration 1.0 mg L⁻¹) according to Warburg's manometric method. The action of arquad (at concentration 0.001 mg L⁻¹) and of aresin (at concentration 0.001 mg L⁻¹) was detected using the test organism *Paramecium caudatum*. Worthy of note in these investigations is the acceleration of the basic metabolic functions, especially of respiration and photosynthesis in the test organisms, when applying sub-limit concentrations, verging directly on toxic doses.

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Stanisław SKÓRA

The cyprinid *Alburnus bipunctatus* Bloch from the basins of the rivers Upper San and Dunajec.

Acta Hydrobiol., 14, 173-204.

Abstract - The following data were studied: length of body, weight of body, growth, age, shape of body, colouring of body, variability of 25 morphological features of the trunk, 5 features of the head, and variability of meristic features of 424 specimens of the cyprinid *Alburnus bipunctatus* Bloch caught in the

upper part of the River San and in the River Dunajec and their confluents. Analysis of the contents of the alimentary canal of this fish was also made. The linear growth of cyprinid was similar in the two investigated basins. As was the case with other fish, decrease and equalization of the relative variability of morphological features was observed. In comparison with the results of works of other authors, no great differences were found. This holds true for the means, the variability of the investigated morphological features, and the meristic features of the species discussed, which would show that this is the nominal form *Alburnus bipunctatus* Bloch.

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Stanisław SKÓRA

The roach (*Rutilus rutilus* L.) from the dam reservoir in Przeczyce.

Acta Hydrobiol., 14, 399-418.

Abstract - The body length, body weight, growth, age, variability of 30 morphological features of the body, variability of meristic features, and fertility of 205 specimens of the roach from the dam reservoir in Przeczyce were examined. Analysis of the content of the alimentary canal of this fish was carried out. The growth of the examined fish in comparison with that of this species in other reservoirs was considered as fair. A decrease and following equalization of relative variability of morphological features is similar to that in other fish. Meristic features did not deviate from the standard adopted for the roach. Individual variations of fertility of females were considerable and ranged from 12,480 to 334,464 eggs for one female. Larvae of insects and filamentous algae constituted the main components of the content of the alimentary canal of the roach.

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Józef SKRZYPCZYK¹ and Józef BANAŚ²

Abnormale Grünalge *Chlorella* 366.

Acta Hydrobiol., 14, 327-328.

Abstract - An irregularly developed mother cell of *Chlorella* 366, studied by means of electron microscopy, shows the occurrence of aplanospores with distinct inner structure and is in the presporulation stage.

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Janusz STARMACH

Characteristic of *Cottus poecilopus* Heckel and *Cottus gobio* L..

Acta Hydrobiol., 14, 67-102.

[in Polish with English summary]

Abstract - An ecological characteristic was presented of *Cottus poecilopus* Heckel and *Cottus gobio* L., fishes resembling each other in shape and mode of life, but occurring in separate regions of rivers and streams. It was found that certain features are different in the two species. The oxygen consumption, the possibility of a rapid change of the number of erythrocytes in the peripheral blood, the structure and

equipment in sensory corpuscles of the organ of the lateral line, and the sensitivity to the temperature of the water were investigated. These features, similarly as others distinguishing the two species morphologically, are closely related with the genotype, this being reflected in the difference in their chromosome sets. They explain clearly the adaptation of each of these species to different conditions of the environment. Thus, the closely characterized *Cottus* species provide a distinct example of the concordance of the biological system of the organism with the system of external factors.

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Krystyna STARZYKOWA

Populations of Cladocera and Copepoda in dam reservoirs of southern Poland.

Acta Hydrobiol., 147-55.

Abstract - Population of planktonic crustaceans were investigated in 10 dam reservoirs on rivers lying in the Vistula basin. 90 species were found in them (37 Rotatoria, 32 Cladocera, and 21 Copepoda). The most varied crustacean plankton occurred in the water of water steps, where the diversity index amounted to 23-25, and the most uniform in the lowland reservoir at Kozłowa Góra and in the submontane one at Rożnów (2). The magnitude of zooplankton production depended on the rate of water exchange and on the age of the reservoir. Three types of curves of the development of populations in the course of the season were distinguished. In the majority of reservoirs seasonal maxima were simultaneously attained by two populations. In the populations of Cladocera mature individuals prevailed and among Copepoda particular stages of development.

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Zbigniew WAJDOWICZ

Remarks on the stocking of the dam reservoir at Przeczyce with lake trout.

Acta Hydrobiol., 14, 205-212.

[in Polish with English summary]

Abstract - As the result of stocking the dam reservoir at Przeczyce numerous young lake trout were found in the river above the dam and individual adult specimens were found in the reservoir. During autumn a few spawning migrations of mature lake trout from the reservoir to the river were observed. Individual spawned females were found, but no spawning traps. Smolts of lake trout were bred from artificially inseminated spawn. The emptying of the reservoir interrupted the process of acclimatization. Some factors impeding full acclimatization, which is determined by natural spawning, are described.

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Franciszek WIĘCŁAWSKI

A method of concentrating traces of heavy metal ions from lake waters.

Acta Hydrobiol., 14, 57-66.

Abstract - The usefulness of the dithizone column for separating and initially concentrating traces of heavy metal ions (Pb, Cd, Zn, Mn, and Co) from lake waters was checked. The fully described methods applied include the collection of water samples, the preparation of the dithizone extraction column, and the determination of trace heavy metals by means of the polarographic method. The periodically great

biological production of lake waters and the variable oxygen conditions prevailing in them make it difficult to make full use of all the advantages of the tested method.

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Franciszek WIĘCŁAWSKI

Investigations on the changes in the content of heavy metals in lake waters of the Masurian Lake District.

Acta Hydrobiol., 14, 149-163.

Abstract - Waters from two levels of lakes of the Masurian Lake District were investigated from 13 November 1967 to 13 May 1968 for the content of traces of heavy metals in ionic form. The chosen lakes (Trzcinnio, Kortowskie, Mutek, Starodworskie, and Długie) represent types from beta-mesotrophy to advanced eutrophy remaining under the influence of pollution. The range of variations in the content of traces of ions of heavy metals in $\mu\text{g L}^{-1}$ determined according to the polarographic method after their preliminary concentration on a dithizone column is the following: Pb 0.2-2.2, Cd 0.0-0.3, Zn 0.2-9.7, Mn 0.0-9.8, Cu 0.1-4.5, Co <0.1. These microelements, ordered in a sequence of decreasing concentrations, form the following series: Mn, Zn, Cu, Pb, Cd, and Co. Manganese and zinc showed the greatest seasonal variability and lead the least. The occurrence of a larger amount of microcomponents of waters, particularly distinct for zinc, was observed three times in the course of these investigations, namely during the freezing over of lakes, during the period of culminant inflows of waters from the catchment basins to the lakes, and in the early season of spring "blooms" of lake waters. No passing of ions of heavy metals from sediments to waters was observed.

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Jadwiga ZYGMUNTOWA

Occurrence of free amino acids in pond water.

Acta Hydrobiol., 14, 317-325.

Abstract - The content of free amino acids in pond water was examined and found to vary from some scores to some hundred $\mu\text{g L}^{-1}$. In this water the following amino acids appeared most frequently: cystine, aspartic acid, serine with glycine, glutamic acid, alanine, valine, leucine. The concentration of free amino acids dissolved in pond water depends, to a certain extent, on the fertility of the pond, the time of day, and the layer in vertical section.

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Jan ŻARNOWSKI

Effect of the chemical composition of the medium on the growth of *Chlorella pyrenoidosa*.

Acta Hydrobiol., 14, 215-223.

Abstract - Of the investigated media those of Kanazawa and Tamiya ensured the most intensive growth of *Chlorella*. The best utilization of nutrients by the *Chlorella* cultures were observed on the Tamiya medium. Ethylenediaminetetraacetic acid (EDTA) stimulated the growth of algal cultures.

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Jan ŻARNOWSKI

The effect of ethylenediaminetetraacetic acid on the growth of *Chlorella pyrenoidosa* and its role in the dynamics of metabolism and accessibility of iron and calcium.

Acta Hydrobiol., 14, 353-373.

Abstract - The phosphorus compounds bring about oxidation and precipitation of iron from the media. Ethylenediaminetetraacetic acid stabilizes the Fe level and to a considerable degree prevents its oxidation, as well as influencing favourably the increase in biomass of *Chlorella*. The optimum concentration of EDTA in the medium amounts to about 10 mg L⁻¹. EDTA treatment in the form of a complex with iron and microelements affects the growth of *Chlorella* similarly as the addition of EDTA in the form of a separate component of the medium. The greatest increase in biomass of *Chlorella* was obtained in combinations with Fe+EDTA. In the presence of EDTA the ions of calcium do not stimulate the growth of *Chlorella*, while without EDTA they decrease the growth of alga biomass.

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