Acta Hydrobiologica

Contents of Volume 25/26 (1984)

Teresa BEDNARZ[1] and Helena WARKOWSKA-DRATNAL[2]
Toxicity of zinc, cadmium, lead, copper, and their mixture for *Chlorella pyrenoidosa* Chick..
Acta Hydrobiol., 25/26, 389-400.

Abstract - LC_{50} for *Chlorella pyrenoidosa* of zinc, cadmium, lead, and copper were 12,600, 6690, 88, and 25 l'g dm^{-3}, respectively. An artificial mixture of these metals (HMM) prepared in the basis of the chemical analysis of the waters of the River Graniczna Woda (River Mała Panew catchment basin, Silesia) was about three-times more toxic than the river water. Lower concentrations of the mixture had a toxicity approximating the global one, calculated from the toxicity of its components. Higher concentrations of the mixture were less toxic than the individual components examined separately.

Key words: toxicity, *Chlorella pyrenoidosa*, Zn, Cd, Pb, Cu, heavy metals mixture.

Authors' addresses:
[1]Institute of Freshwater Biology, Polish Academy of Sciences, ul. Sławkowska 17, 31-016 Kraków, Poland
[2]Jagiellonian University, Institute of Environmental Biology, ul. Karasia 6, 30-060 Kraków, Poland.

Irena BIELAŃSKA-GRAJNER
Rotifers (Rotatoria) of Lake Paprocańskie (Upper Silesia, Poland).
Acta Hydrobiol., 25/26, 67-79.

Abstract - From March to November 1980 rotifers were studied in the highly eutrophic artificial Lake Paprocańskie in Upper Silesia. The investigation was carried out at five ecologically differentiated sampling stations. 74 Rotatoria were determined, one of them new for Polish fauna and six rare. Macrophytes were found to influence the occurrence and number of rotifers. The species of *Phragmites communis* Trin. and *Typha latifolia* L. were the most frequent (61 and 48 taxa respectively), although not numerous. The largest number of rotifers, but with few taxa (15), were found in the open water area.

Key words: zooplankton, Rotatoria, macrophytes.

Author's address: Silesian University, Department of Ecology, ul. Bankowa 9, 40-007 Katowice, Poland.

Irena BIELAŃSKA-GRAJNER
The effect of biotic and abiotic factors on the occurrence of planktonic rotifers (Rotatoria) in the Pławniowice Duże reservoir (Upper Silesia, Poland).
Acta Hydrobiol., 25/26, 173-180.

Abstract - In a hydrobiological investigation carried out in an anthropogenic reservoir at Pławniowce Duże (the Upper Silesian Industrial Region) a dependence between the occurrence of pelagic rotifers and phytoplankton appearing in this water body was found. A dependence was also observed between the vertical distribution of rotifers and the temperature of the water, and the amount of oxygen dissolved in the water.

Key words: zooplankton, Rotatoria, phytoplankton, effect of temperature, effect of oxygen, reservoirs.

Author's address: Silesian University, Department of Zoology, ul. Bankowa 9, 40-007 Katowice, Poland.

Jan BŁACHUTA and Andrzej WITKOWSKI
Natural hybrids *Alburnus alburnus* (L.) X *Rutilus rutilus* (L.), *Alburnus alburnus* (L.) X *Blicca bjoerkna* (L.) and *Alburnus alburnus* (L.) X *Abramis brama* (L.) from the Oder river.
Acta Hydrobiol., 25/26, 189-203.

Abstract - On the basis of biometric analysis and on that of scales and pharyngeal bones three natural intergeneric hybrids of the Cyprinidae are described. Of 32 analysed meristic and plastic features the hybrid of the bleak with the roach presented 18 intermediate and 7 individual features, the hybrid of the bleak with the silver bream 21 intermediate and 9 individual, male of the bleak with the bream female 13 intermediate and 17 individual, and that one of the bream male with the bleak female 20 intermediate and 10 individual ones. The growth rate of the hybrids was slower than that of the parental species. The small number of hybrids shows that the hybridization was accidental.

Key words: cyprinid fishes, morphology, growth, hybridization.

Authors' address: Wrocław University, Museum of Natural History, ul. Sienkiewicza 21, 50-335 Wrocław, Poland.

Demetrio BOLTOVSKOY and Guillermo VÉLEZ
A simple and inexpensive device for rigging light-and-dark bottle castings.
Acta Hydrobiol., 25/26, 117-119.

Abstract - A small, transparent, perforated acrylic plate furnished with a rubber band is designed for rigging series of light-and-dark bottle sets for studies of planktonic primary production.

Key words: phytoplankton, primary production, light-and-dark bottle method.

Authors' address: Departamento de Ciencias Biologicas, Faculted de Ciencias Exacts y Naturales, Universidad de Buenos Aires, 1428 Buenos Aires, Argentina.

Maria BOMBÓWNA[1], Stanisław WRÓBEL[2] and Jadwiga ZYGMUNTOWA[1]
Different forms of organic matter in the water of mid-forest streams (Southern Poland).
Acta Hydrobiol., 25/26, 267-280.

Abstract - Pollution with dusts and gases containing SO_2 was manifested by a slower decomposition of allochthonous organic matter acumulated in the bottom. With increasing acidification of the water, large content of humic acids, and consequently a reduced activity of bacteria, the amount of DOC was lower than might have been expected. The C:N ratio in the water was similar to that in the humic acids, which flowed out from coniferous forest habitats mostly in dissolved form and from lime-hornbeam forest in particulate form. The autochthonous production of organic matter was very poor. DOC and POC, including flocculated organic matter, were chiefly carried in the run-off, this being 23 kg C ha^{-1} $year^{-1}$.

Key words: streams, SO_2, pollution, organic matter, dissolved and particulate organic carbon, humic acids, nitrogen, organic phosphorus.

Authors' addresses:
[1]Institute of Freshwater Biology, Polish Academy of Sciences, ul. Sławkowska 17, 31-016 Kraków, Poland

[2]Polish Academy of Sciences, Research Centre for the Protection of Nature and Natural Resources, ul. Lubicz 46, 31-512 Kraków, Poland.

Juan Carlos CANTERAS JORDANA
Physical, chemical, and metabolic characteristics of a peat bog in the depression of Padul (Granada, Spain).
Acta Hydrobiol., 25/26, 253-266.

Abstract - A preliminary study was made of the state of development and global metabolism of a small dystrophic lake in south Granada (Spain). The results obtained revealed water with a high specific conductance and an ion composition proper of a flat peat bog. Inorganic nitrogen showed very low values, mostly in the form of ammonia. The youngest and most productive phytoplankton was found in the bottom water, while the littoral zone showed the highest decomposition activity.

Key words: peat bog, dystrophic ecosystems.

Author's address: University of Santander, Department of Ecology, E.T.S. Civil engineering, Calle Castros, s/n. Santander, Spain.

Krystyna HOJDA
Herpon and periphytic algae in a carp pond fertilized with sugar factory wastes. 1. Systematic composition.
Acta Hydrobiol., 25/26, 17-40.

Abstract - The investigation concerned herpon and periphyton algae (with the exclusion of diatoms) on aquatic plants and polyester foil in the pond Zimowy Wielki during two seasons of cultivation. The first season (1972) was also the last of the five seasons during which sugar factory wastes were released into the pond. The following year (1973) the pond was filled with clean water from the River Bajerka. Several species new to Poland were found: *Chrysosphaera parvula*, *Ellipsoidion stichococcoides*, *Chlamydomonas debaryana*, *Chlorella fusca*, *Coleochaete scutata* fo. *minor* (?), *Characiochloris characioides*.

Key words: pond algae, systematics.

Author's address: Polish Academy of Sciences, Institute of Botany, Algological Laboratory, ul. Lubicz 46, 31-512 Kraków, Poland.

Krystyna HOJDA
Herpon and periphytic algae in a carp pond fertilized with sugar factory wastes. 2. Communities of algae.
Acta Hydrobiol., 25/26, 41-50.

Abstract - During the process of water self-purification and degradation of wastes in the pond Zimowy Wielki an investigation was carried out on the changes in the formation of agglomerations of algae on the bottom, on aquatic plants, and on polyester foil.

Key words: communities of algae on the bottom, on aquatic plants, and on polyester foil.

Author's address: Polish Academy of Sciences, Institute of Botany, Algological Laboratory, ul. Lubicz 46, 31-512 Kraków, Poland.

Tadeusz JANUSZKIEWICZ
Chemistry of surface sediments of four lakes in Northern Poland.
Acta Hydrobiol., 25/26, 227-242.

Abstract - Investigations were carried out on the chemical composition of the upper 15 to 20 cm layer of the bottom sediments of the following four lakes: Przywidz, Wierzchołek, rednik, and Gatno, lying in the Kashubian Lake District. The following were taken into consideration: pH of the sediments, hydration, losses on ignition, and the content of ammonia and total sulphur, carbonates, P_2O_5, SiO_2, CaO, MgO, Fe_2O_3, Al_2O_3, MnO, and TiO_2. The spatial distribution of components is discussed, as also atomic relations and correlations, and the sediments are classified with respect to their chemical types.

Key words: lake chemistry, lake sediments, eutrophication, pollution.

Author's address: Academy Of Agriculture and Technology of Olsztyn, Institute of Hydrobiology and Water Preservation, 10-957 Olsztyn, Poland.

Marek JELONEK
The influence of heated waters on the growth and food of the perch population (*Perca fluviatilis* L.) in the Rybnik dam reservoir.
Acta Hydrobiol., 25/26, 469-479.

Abstract - The age distribution, growth rate, and food of the perch population in the Rybnik reservoir were studied. The water of this reservoir is about 8 ^{o}C warmer than that in natural water bodies. The material was collected in May, June, August, and October of 1981. The growth rate of perch from the Rybnik reservoir was calculated and compared with that of perch in natural waters. The higher water temperature was found to influence the value and distribution of the annual growth rate. The perch in the studied reservoir fed on fish, crustaceans, insects, spawn, and detritus.

Key words: perch, dam reservoirs, heated waters, growth, food.

Author's address: Institute of Freshwater Biology, Polish Academy of Sciences, ul. Sławkowska 17, 31-016 Kraków, Poland.

Barbara KAWECKA
Biology and ecology of snow algae. 3. Sexual reproduction in *Chloromonas rostafiński* (Starmach et Kawecka) Gerloff et Ettl (Chlorophyta, Volvocales).
Acta Hydrobiol., 25/26, 281-285.

Abstract - The gametes of *Chloromonas rostafiński* were morphologically identical with the vegetative cells. The fusion of gametes, both uniform and variously shaped, was observed. Three phases of the reproduction process were differentiated: 1. The gametes unite in pairs and adhere in the area of contact; 2. A protoplasmic bridge is formed between the gametes; 3. A zygote is formed by the fusion of protoplasts within the cell wall which was formed through the connection of cell walls of the two gametes.

Key words: snow algae, life cycles, sexual reproduction.

Author's address: Institute of Freshwater Biology, Polish Academy of Sciences, ul. Sławkowska 17, 31-016 Kraków, Poland.

Alicja KONOPACKA
Morphological analysis of skeleton elements in freshwater sponges.
Acta Hydrobiol., 25/26, 157-164.

Abstract - In order to determine the taxonomic values, the shape, length, and width of macroscleres of 5 sponge species - *Ephydatia fluviatilis* (L.), *E. muelleri* (Lieb.), *Spongilla lacustris* (L.), *Eunapius fragilis* (Leidy), and *Trochospongilla horrida* Weltner - were examined by means of comparative statistical analysis. The same procedure was then applied to the macroscleres in one species collected in three different habitats. It was found that, because of the wide variability of the investigated features, resulting from the environmental conditions, they cannot be used as a basis for species diagnosis; they can only have an auxiliary value.

Key words: freshwater sponges, morphology of skelton elements.

Author's address: University of Łód, Institute of Environmental Biology, Department of General Zoology, ul. Banacha 12/16, 90-237 Łód, Poland.

Janusz KORNATOWSKI
Morphological forms of the water soldier (*Stratiotes aloides* L.).
Acta Hydrobiol., 25/26, 145-156.

Abstract - Studies on morphological differentiation in *Stratiotes aloides* L. was continued. It was found that three unstable ecophenes of *S. aloides* were produced in response to habitat conditions. The processes of vegetative reproduction by offsets and turions, which gave respectively the shapely form and the weak form of the water soldier, were analysed. Experimental cultures showed the plasticity of the shapely form producing the above-mentioned ecophenes, but gave no results with the weak form. The behavioral differentiation of the identified groups of *S. aloides* was determined.

Key words: *Stratiotes aloides* L., morphological forms, ecophenes, vegetative reproduction, diaspores.

Author's address: Polish Academy of Sciences, Institute of Ecology, Station at Mikołajki, ul. Lena 13, 11-730 Mikołajki, Poland.

Antoni KULAMOWICZ and Maria KORKUĆ
Biometrics and taxonomic classification of *Phoxinus phoxinus* (L.), Cyprinidae, Osteichthyes from the River Peczora drainage basin.
Acta Hydrobiol., 25/26, 487-495.

Abstract - Fish from six samples collected in the River Peczora catchment basin were used for comparative biometric analysis. The attribution of the investigated populations to the nominative subspecies was found. The observed differences in certain meristic features in relation to fish from lower geographical latitudes were explained by latitudinal variation.

Key words: fish, meristic features, latitudinal variation, squamation, Weberian apparatus.

Authors' address: University of Łód, Department of Comparative Anatomy and Animal Ecology, Institute of environmental Biology, ul. Banacha 12/16, 90-237 Łód, Poland.

Wanda LECEWICZ
Characteristics of the dystrophic Lake Brzeziczno on the basis of a two-year investigation of phytoplankton.

Acta Hydrobiol., 25/26, 345-357.

Abstract - The results of a 2-year floristic investigation of Lake Brzeziczno are presented. The differentiation of phytoplankton species and the percentage of different taxonomic groups in the structure of biomass and abundance of the phytoplankton were determined. The investigated lake was found to be a dystrophic water body with Chlorococcales as the characteristic indicatory group in determining its trophy.

Key words: taxonomy, algae, dystrophic lake, phytoplankton indices, trophy.

Author's address: Agricultural Academy, Institute of Natural Principles of Plant Production, ul. Akademicka 15, 20-034 Lublin, Poland.

Javier LOBÓN-CERVIÁ[1] and Susana TORRES[2]
On the growth and reproduction of two populations of gudgeon (*Gobio gobio* L.) in Central Spain.
Acta Hydrobiol., 25/26, 101-115.

Abstract - 294 gudgeon from River Jarama and 230 from the Pinilla Reservoir were used for age and growth studies. Both populations are in the lower limit of the recorded growth-in-length for European river populations. Female growth showed no significant difference from male. Spawn occurred from mid May and early June to the end of July or early August. Jarama females shed more and larger eggs at the beginning of the spawning period. Those females captured in the May-June period shed twice as many eggs per length than those captured in Pinilla in June. Differences between the two populations suggest that a recent adaptation was occurred since the introduction of the species.

Key words: gudgeon, biology, adaptation, river, reservoir.

Authors' addresses:
[1]National Museum of Natural Sciences, C.S.I.C. Paseo de La Castellana 80, Madrid-6, Spain
[2]Applied Zoology Unit, Department of Ecology, I.N.I.A. Carretera de La Coruña Km. 7, Madrid-35, Spain.

Björn MALMQUIST and Per SJÖSTRÖM
The microdistribution of three beetle species inhabiting a South Swedish stream riffle.
Acta Hydrobiol., 25/26, 409-414.

Abstract - The microdistribution of three stream-living beetle species, viz. *Haenydra gracilis*, *Elmis aenea*, and *Limnius volckmari*, was investigated in a riffle section of a South Swedish stream. Variables pertaining to the substrate, vegetation, current velocity, coarse detritus, and depth partly explained the distribution of the different species and stages of the beetles.

Key words: microdistribution, stream ecology, beetles.

Author's address: University of Lund, Department of Animal ecology, S-223 62 Lund, Sweden.

Stefan MIELEWCZYK
Quantitative investigations on Odonata, Heteroptera and Coleoptera in a drainage channel near the village of Turew (Poznań region).
Acta Hydrobiol., 25/26, 89-100.

Abstract - The dominance structure and changes in the density and biomass of Odonata, Heteroptera, and Coleoptera in the vegetative season (May to September 1979) are described for two sectors of a channel

(through meadows and woods) flowing across agricultural land. It was found that in the meadow sector the fauna of these insects was qualitatively and quantitatively richer than in the wooded one.

Key words: drainage channel, Odonata, Heteroptera, Coleoptera, dominance structure, density, biomass.

Author's address: Department of Agrobiology and Forestry, Polish Academy of Sciences, ul. wierczewskiego 19, 60-809 Poznań, Poland.

Modest MISZTAL and Halina SMAL
Changes in the bottom sediments of the Zemborzyce Reservoir near Lublin and an attempt to predict further changes.
Acta Hydrobiol., 25/26, 243-251.

Abstract - Over a period of five years samples of the bottom sediments of the Zemborzyce Reservoir near Lublin were taken and analysed. By observing the changes in chemical and granulometric composition against fluctuations in the water level in the reservoir, an attempt was made to predict the course and development of the processes of sedimentation and sediment exchange.

Key words: dam reservoir, bottom sediments.

Authors' address: Agricultural Academy in Lublin, Faculty of Agriculture, Institute of Soil Science and Agricultural Chemistry, ul. Leszczńskiego 7, 20-069 Lublin, Poland.

Modest MISZTAL[1], Danuta KRUPA[2] and Halina SMAL[1]
The chemical composition of bottom sediments and phytoplankton in the man-made Lake Zemborzyce near Lublin.
Acta Hydrobiol., 25/26, 123-133.

Abstract - The chemical composition of bottom sediments in the man-made Lake Zemborzyce near Lublin was analysed. The relationship between the chemical composition of the sediments and the specific composition and percentage content of the systematic groups in the total numbers of phytoplankton was also studied at selected sites. The content of carbon, nitrogen, and calcium in the reservoir bottom is shown on the maps presented. No relationship appeared between the composition of phytoplankton and the content of the basic available biogenes in the sediments.

Key words: man-made lake, bottom sediments, phytoplankton.

Authors' addresses:
[1]Academy of Agriculture, Institute of Soil Science and Agricultural Chemistry, ul. Leszczyńskiego 7, 20-060 Lublin, Poland
[2]Academy of Agriculture, Institute of Natural Principles of Plant Production, ul. Akademicka 15, 20-934 Lublin, Poland.

Janina PAŃCZAKOWA[1] and Teresa SZYSZKA[2]
Changes in the phytoplankton and physico-chemical properties of water of the Struga Gnienieńska stream in the period 1977-1979, and the evaluation of its pollution.
Acta Hydrobiol., 25/26, 317-330.

Abstract - Physico-chemical investigation and an analysis of the phytoplankton in the Struga Gnienieńska stream were carried out in the period 1977-1979. High values of BOD_5, oxygen consumption, mineral and

organic nitrogen, and total phosphorus were found. In the spring an increase in the number of phytoplankton was observed. The predominating algae were Chlorophyta in 1977, and Euglenophyta and Bacillariophyceae in 1979. On the basis of the calculated Pantle and Buck saprobity index, the waters of the Struga Gnieneńska stream were classified as belonging to the alpha- and beta-mesosaprobic zones.

Key words: rivers, chemistry, phytoplankton, pollution.

Authors' addresses:
[1]Poznań Technical University, Institute of Environmental Engineering, ul. Piotrowo 5, 60-965 Poznań, Poland
[2]Adam Mickiewicz University, Institute of Biology, Department of Hydrobiology, ul. Strzałkowskiego 5/7, 60-854 Poznań, Poland.

Janina PAŃCZAKOWA[1] and Teresa SZYSZKA[2]
Phytoplankton of Lake Jelonek in Gniezno against the background of the physico-chemical conditions.
Acta Hydrobiol., 25/26, 331-344.

Abstract - Lake Jelonek is a polytrophic polymictic water body of the pond type. It is characterized by high concentrations of biogenic substances, the content of mineral nitrogen varying from 0.5-4.8 mg $N\text{-}NH_4$ dm^{-3} and that of total phosphorus from 0.1-0.6 mg P dm^{-3}. A successive increase in the trophy of the reservoir was manifested by constantly increasing numbers of blue-green algae, deterioration of oxygen conditions, and rising concentrations of mineral nitrogen and phosphorus compounds.

Key words: lake, phytoplankton, chemistry, pollution.

Authors' addresses:
[1]Poznań Technical University, Institute of Environmental Engineering, ul. Piotrowo 5, 60-965 Poznań, Poland
[2]Adam Mickiewicz University, Institute of Biology, Department of Hydrobiology, ul. Strzałkowskiego 5/7, 60-854 Poznań, Poland.

Nicolaos C. PAPAGEORGIOU, Christos N. NEOPHYTOU and Christos G. VLACHOS
The age, growth, and reproduction of brown trout (*Salmo trutta fario*) in the Aspropotamos stream.
Acta Hydrobiol., 25/26, 451-467.

Abstract - Although the brown trout (*Salmo trutta fario* L.) has a wide range of distribution in the mountainous streams of Central and Northern Greece, no previous investigation on its biology has been undertaken in this country. The paper is based on 1074 brown trout collected from the Aspropotamos stream, a tributary of the River Acheloos, from March 1981 to February 1982 at monthly intervals. The age, growth, sexual maturity, fecundity, and reproduction of brown trout are discussed.

Key words: brown trout, age, growth, reproduction.

Authors' address: Aristotelian University of Thessaloniki, School of Forestry and Natural Environment, Laboratory of Wildlife and Freshwater fisheries, Thessaloniki, Greece.

Marlena PIONTEK
The regenerative ability of the planarian *Dugesia tigrina* (Girard) and the possibility of its use in

reproduction of this species.
Acta Hydrobiol., 25/26, 81-88.

Abstract - The regenerative properties of *Dugesia tigrina* were investigated with the aim of obtaining a rapid vegetative reproduction of specimens. The animals were reproduced by transverse fission (cutting). The best results were obtained by prepharyngeal fission into two equal parts. 18 days after the artificial fission the specimens regained the original body size (11.6 mm) and could be cut again. This mean that the population could be doubled in 18 days.

Key words: regeneration, planarians.

Author's address: Gagarin College of Engineering, Institute of Environmental Engineering, Department of Sanitary Biology, ul. Podgórna 50, 65-246 Zielona Góra, Poland.

Magdalena PRZYTOCKA-JUSIAK, Marzenna RZECZYCKA, Grażyna PALACZ and Małgorzata KAMUT
The growth of *Stichococcus bacillaris* in intermittent light.
Acta Hydrobiol., 25/26, 3-16.

Abstract - The growth of *Stichococcus bacillaris* was investigated in stationary cultures illuminated with intermittent light for various periods of illumination and light cycles. It was found that 21 hours of light per day led to an increase in biomass 100% greater than did 24 hours of light. A greater increase in biomass was also achieved by applying a total of 15 or 18 hours of light per day than in 24 hours of constant light. A shorter total illumination per day and shorter periods of light led to a reduction in biomass.

Key words: *Stichococcus bacillaris*, laboratory cultures, intermittent light.

Authors' address: University of Warsaw, Department of Environmental Microbiology, Institute of Microbiology, ul. Karowa 18, 00-324 Warszawa, Poland.

Dorota SIEMINIAK
Epipelic algae in marginal parts of the Przeczyce reservoir and of neighbouring sectors of the River Czarna Przemsza (Upper Silesia). 1. Algae in constantly submerged zone.
Acta Hydrobiol., 25/26, 51-66.

Abstract - In the years 1977 and 1978 investigations were carried out on the bottom-living algae in the reservoir and in the river just above and below it. The following were observed: a community of diatoms with filamentous blue-green algae trailing over the mud surface and detaching in the form of scum; a community of filamentous green algae or *Tribonema* forming conglomerations and mats which also frequently detach from the bottom and float over the water surface. The wide diversity of species found in the algal communities indicates the high degree of purity of the water both in the river and the reservoir.

Key words: herpon, epipelic algae, dam reservoir, river.

Author's address: Polish Academy of Sciences, Institute of Botany, ul. Lubicz 46, 31-512 Kraków, Poland.

Dorota SIEMINIAK
Epipelic algae in marginal parts of the Przeczyce reservoir and of neighbouring sectors of the River Czarna Przemsza (Upper Silesia) 2. Algae in periodically emerged zone.
Acta Hydrobiol., 25/26, 135-144.

Abstract - In the years 1977-1978 the occurrence of algae in the mud which emerged when the water level in the Przeczyce reservoir was lowered was investigated. Three communities were found here: diatoms with blue-green algae, a community with *Vaucheria* and one with *Botrydium granulatum*. It was found that the variability was much poorer than in the communities under water. Some of the aquatic species had disappeared while typical soil species were found (e.g. *Botrydium granulatum*, *Nostoc punctiforme*, *N. commune*, *N. edaphicum*, and *Lyngbya aerugineo-coerulea*.).

Key words: epipelic algae, soil algae, reservoirs, rivers.

Author's address: Polish Academy of Sciences, Institute of Botany, ul. Lubicz 46, 31-512 Kraków, Poland.

Tadeusz SKOWROŃSKI[1] and Krzysztof CZERNA[2]

The growth of *Stichococcus bacillaris* Näg. on media containing cadmium or zinc.

Acta Hydrobiol., 25/26, 401-408.

Abstract - The development of *Stichococcus bacillaris* Näg. on Prát's medium with ammonium carbonate as the nitrogen source was investigated. The culture medium contained cadmium at concentrations of 2.5-20 mg Cd dm^{-3} or zinc at concentrations of 5-50 mg Zn dm^{-3}. It was found that 10 mg Cd dm^{-3} or higher doses limited biomass increase in *S. bacillaris*. The effect of lower doses was insignificant. The toxic effect of zinc on the alga was observed at concentrations above 20 mg Zn dm^{-3}. Lower dose of zinc stimulated growth of the culture.

Key words: algae, *Stichococcus bacillaris* Näg., toxicity, heavy metals.

Authors' addresses:
[1]Polish Academy of Sciences, Institute of Environmental Engineering, ul. Sławińskiego 18/3, 20-080 Lublin, Poland
[2]Agricultural Academy, Institute of Natural Basis of Plant Production, ul. Akademicka 15, 20-934 Lublin, Poland.

Ryszard SOWA

Two new species of *Ecdyonurus* Eaton of *lateralis* (Curt.) group (Ephemeroptera, Heptageniidae) from the Crimea and Western Caucasus.

Acta Hydrobiol., 25/26, 181-188.

Abstract - The paper describes the male imago, female subimago, egg, and nymph of *Ecdyonurus braaschi* n. sp. from the Crimea and the male imago, male subimago, female imago, egg, and nymph of *E. zimmermanni* n. sp. from Western Caucasus (USSR). Both species belong to the *lateralis* (Curt.) group.

Key words: running waters, mayflies, taxonomy, heptageniids.

Author's address: Jagiellonian University, Institute of Environmental Biology, Department of Hydrobiology, ul. Oleandry 2a, 30-063 Kraków, Poland.

Dinesh K. SRIVASTAVA[1] and Ravindra K. TYAGI[2]

Toxicity of selenium and vanadium to the striped gourami, *Colisa fasciatus* (Bloch and Schneider).

Acta Hydrobiol., 25/26, 481-486.

Abstract - The acute toxicity of selenium and vanadium to a freshwater teleost, *Colisa fasciatus* was established by static bioassay. The 24-, 48-, 72-, 96-, and 120-h LC_{50} value of selenium were found to be 9.99, 5.77, 4.34, 2.65, and 2.25 mg L^{-1} respectively. These values for vanadium were estimated at 19.91, 13.00, 8.21, 6.41, and 4.95 mg L^{-1}. The safe concentration of vanadium for striped gourami was calculated to be 0.045 mg L^{-1} and that of selenium 0.019 mg L^{-1}.

Key words: teleost, acute toxicity, selenium, vanadium.

Authors' addresses:
[1]K.A.D. College, Department of Zoology, Allahabad-211001, India
[2]CIFR Sub-station, 24 Pannalal Road, Allahabad-211001, India.

Janusz STARMACH
Fish zones of the River Dunajec upper catchment basin.
Acta Hydrobiol., 25/26, 415-427.

Abstract - The distribution of fish species in the River Dunajec upper catchment basin is described. The division of the basin into two ecological fish zones, that of the trout and that of the barbel, was observed. Within the trout zone there occurs a zone of *Cottus poecilopus* which is a useful indicator of the value of waters for rearing trout and grayling fry.

Key words: Carpathian rivers, fish zones.

Author's address: Institute of Freshwater Biology, Polish Academy of Sciences, ul. Sławkowska 17, 31-016 Kraków, Poland.

Barbara SZLAUER
Possibilities of obtaining zooplankton from the River Płonia to feed young fish.
Acta Hydrobiol., 25/26, 165-171.

Abstract - The mass of zooplankton flowing through the channel section of the river was determined at Sites I and II, 10 and 18 km away from the point of outflow of the river from the lake. The mean zooplankton flow at Sites I and II was respectively 74.86 and 57.88 kg wet weight per 24 hrs, ranging from 500 kg per 24 hrs in May (Site I) to 0.32 kg per 24 hrs in August (Site II). During the period of demand for zooplankton, i.e. from December to May, the zooplankton flow at Site I amounted to 23,310 kg. This was sufficient live food for the rearing of approximately 4000 kg of fry.

Key words: rivers, zooplankton flow, live food of fry.

Author's address: Academy of Agriculture, Department of Hydrozoology, ul. Kazimierza Królewicza 4, 71-550 Szczecin, Poland.

Hanna SZYMAŃSKA
Periphytic algal communities in four lakes of the Suwałki Lake Districts in Poland.
Acta Hydrobiol., 25/26, 359-388.

Abstract - Periphytic algae occurring in lakes of moderately hard water were represented by the *Oedogonio-Epithemietum litorale* association, and in soft water lakes by a new association, *Bulbochaetetum augustowiense*. The author is of the opinion that the patterns of the habitat play the major role in the

determination of periphytic algal associations. The kind of phanerogam association and the direct substratum are of minor importance for periphytic growth.

Key words: lake periphyton, algal associations, *Bulbochaetetum augustowiense*.

Author's address: Warsaw University, Institute of Botany, Al. Ujazdowski 4, 00-478, Warszawa, Poland.

Kazimierz WASYLIK

Diatom communities in pure and polluted waters in the Biała Przemsza river basin (Southern Poland).

Acta Hydrobiol., 25/26, 287-315.

Abstract - Diatom communities in pure and polluted waters in Southern Poland were analysed by counting the percentage of their components and distinguishing dominant species. Communities with *Nitzschia palea*, *Meridion circulare*, *Gomphonema parvulum*, and *Navicula viridula* var. *avenacea* occurred in sectors of rivers polluted by organic municipal sewage. Communities with different species of the genus *Achnanthes* were encountered in pure waters. *Diatoma hiemale* var. *mesodon* and *Meridion circulare* were dominant taxons in spring areas. No typical communities were observed in sectors heavily polluted with industrial wastes.

Key words: communities, contamination, diatoms, pure waters, pollution effect, running waters, dominance.

Author's address: Jagiellonian University, Institute of Environmental Biology, Laboratory of Hydrobiology, ul. Oleandry 2a, 30-063 Kraków, Poland.

Andrzej WITKOWSKI[1], Bogusław KOKUREWICZ[2] and Mieczysław KOWALEWSKI[3]

Early scale development in the Danube salmon *Hucho hucho* (L.) (Pisces: Salmonidae).

Acta Hydrobiol., 25/26, 215-223.

Abstract - Early scale development in the Danube salmon *Hucho hucho* (L.) depends on the length of the fish but not its age. The first scales are found on the caudal trunk at a total length of 42.5 mm. At a length of 65.0-68.0 mm the formation of scales is completed. In this period the dependence between the diameter of a scale (S) and total length (LT) is described by the equation S = 0.137 LT - 0.5.

Key words: fish, Salmonidae, Danube salmon, scales.

Authors' addresses:

[1]Wrocław University, Museum of Natural History, ul. Sienkiewicza 21, 50-335 Wrocław, Poland

[2]Wrocław University, Zoological Insitute, Department of Comparative Anatomy, ul. Sienkiewicza 21, 50-335 Wrocław, Poland

[3]Polish Angling Union, Fish Culture Station, 34-432 Łopuszna, Poland.

Andrzej WITKOWSKI[1] and Mieczysław KOWALEWSKI[2]

Food of the Danube salmon *Hucho hucho* (L.) introduced into the River Dunajec.

Acta Hydrobiol., 25/26, 205-214.

Abstract - On the basis of material consisting of 58 alimentary tracts, the food of the Danube salmon introducted into the River Dunajec (Vistula basin) was studied. Cyprinid fishes were eaten most often and in the largest quantities, species of little economic significance predominating. Valuable species (brown

trout, grayling) were consumed rarely and in small quantities. It was found, moreover, that the Danube salmon feeds only on fish species dominant in a given part of the river. A relationship was shown between the size of the prey and the predator.

Key words: salmonid, fishes, Danube salmon, food.

Authors' addresses:
[1]Wrocław University, Museum of Natural History, ul. Sienkiewicza 21, 50-335 Wrocław, Poland
[2]Polish Angling Union, Fish Culture Station, 34-432 Łopuszna, Poland.

Andrzej WITKOWSKI
The structure of groups and the numbers of fish populations in the River Nysa Kłodzka upper catchment basin.
Acta Hydrobiol., 25/26, 429-449.

Abstract - An ichthyological investigation was carried out using a current generator at 90 stations in 24 rivers and streams of the River Nysa Kłodzka upper catchment basin (southwestern Poland). The occurrence of 22 fish species with a predominance of the brook trout was found. Coenological methods were used in determining ichthyofauna communities. These results, associated with certain elements of hydrography, permitted the classification of the water courses of the investigated basin into two fish regions (zones), that of the trout and that of the grayling. The numbers of the ichthyofauna per 1 ha of water surface were estimated.

Key words: fish, structure of groups, numbers.

Author's address: Wrocław University, Museum of Natural History, ul. Sienkiewicza 21, 50-355 Wrocław, Poland.

Jan Marian WŁODEK and Stanisław SKÓRA
Regression investigation of the length on weight dependence in seven freshwater fish.
Acta Hydrobiol., 25/26, 497-506.

Abstract - The work discusses the application of higher degree regressions and correlations to the retrospective calculations of the weight of seven freshwater species.

Key words: freshwater fish, regression, correlation, rivers, linear and curvilinear dependence, growth, weight, length.

Authors' address: Institute of Freshwater Biology, Polish Academy of Sciences, ul. Sławkowska 17, 31-016 Kraków, Poland.

Back to Acta Hydrobiologica