

Environmental Management

9501-001. Baviskar Amita, Singh Arun Kumar (Delhi Sch Eco, Delhi). **Malignant growth: The Sardar Sarovar Dam and its impact on public health.** *Environ Impact Assess Review*, **14**(5/6) (1994), 349-358 [8 Ref].

Large projects associated with industrial and economic growth in most lesser or newly industrialized countries have generally resulted in wideranging impacts on local populations. The effects may be direct, due to changes in the physical environment, or indirect, as populations are displaced and traditional lifestyles disrupted. Adverse health effects represent an important dimension, although this is often not reflected in the assessments undertaken during the planning of such projects. This article discusses the impacts of an ongoing massive river project in India on the health and welfare of affected indigenous populations.

950-002. Chakrabarti T (Natl Environ Engng Res Inst, Nagpur-440 020). **Legal aspects of hazardous waste management in India.** *J Indian Assoc Environ Manag*, **20**(1-3) (1993), 1-5.

UNEP's role in hazardous waste management is stated in brief. Rules enacted for hazardous waste management in India have been detailed. 'Cairo Guidelines', "Basel Convention" and "Categories of Hazardous Wastes" are outlined in the three Annexures.

9501-003. Chatunedi AN Cata Energy Rbs Inst, 102, Jorbagh, New Delhil 10 003). **Biodiversity in managed forests.** *Indian Forester*, **120**(9) (1994), 773-780 [4 Ref].

Every nation will have to fix its priorities. Whenever any area is closed to local and commercial use, some species try to dominate the floor. This, is a short term occurrence till the ecological succession gets going. The biggest problem in all biodiversity arcas is to keep the biotic pressure out of these areas. Protecting the biodiversity is a gigantic task in India considering that livestock population is presently around 450 million while the carrying capacity of the grazing land and forests is not more

than 50 million heads. Management for biodiversity will first need very clear objectives which will not change during the next century.

9501-004. Datta SK, Ghosh SH, Konal D, Kund AL, Bairagya CN (Field Crop Res Stn, Bardhaman-713 101, WB). **Utilisation of wetlands in West Bengal for sustainable agriculture through paddy cum fish culture, management of economic plants and aquatic animals.** *Indian Biologist*, **26**(1) (1994), -1-8 [8 Ref].

In West Bengal, a vast lowlying wetland is at present under wasteland. Hence, increasing the productivity of different types of water loving economic plants and aquatic animals suitable to such waterlogged unproductive lands is very important and need special attention. The mode of utilisation of these wetlands has been studied through different system of paddy cum fish culture, culture of economic plants for wetlands and culture of beneficial aquatic animals.

9501-005. Dinesh Kumar PK, Sankaranarayanan VN, Saraladevi K (Natl Tns) Oceanogr, Regl Cent PB No 1913, Cochin 682 018). **Cochin backwaters: an introduction to the system, prior studies, historical trends and future implications.** *Indian J Environ Prot*, **14**(2) (1994), 98-102 [49 Ref].

Studies over the last two decades in the Cochin backwater system are reviewed to have an integrated profile with a point to evaluate future development projects in terms of potential consequences to the estuarine ecosystem. The trends that have emerged from the analysis of human interferences are alarmingly similar to those in more developed estuaries worldwide. The paper emphasises that new studies with a thrust on modern sediment budget techniques will accelerate contemporary estuarine management strategies.

9501-006. Dixit RC. **Incinerator of municipal solid waste: environmental pollution and control.** *J Indian Assoc Environ Manag.* **19**(3) (1992), 92-95 [9 Ref] (Late Recd).

The characteristics of pollutants emitted from a municipal solid waste (MSW) incinerator depend upon the MSW composition and on process controlling factors. This paper describes briefly the formation of pollutants emitted and residue produced by MSW incinerator and environmental pollution control methods.

9501-007. Gadkari Anuradha (Natl Environ Engng Res Inst, Nagpur-440 020). **Role of women in environmental management.** *J. Indian Assoc Environ Manag*, **20**(1-3) (1994), 6-8 [4 Ref]

The issues concerning women with reference to environment are elaborated and a strategy towards attaining the goal of greater participation by women in environmental management is presented.

9501-008. Gupta Anil K, Pathak Dilip K (Sch Environ Bio, APS Univ, Rewa, MP, 486 003). **Enforcement of environmental Legislation for better control of pollution and hazards.** *J Env Polln*, **1**(2) (1994), 45-48 [5 Ref].

An attempt has been made to assess the effectiveness of environmental legislation and also the problems of enforcement. Some important suggestions are made to improve the present situation. Preparation and enforcement of a revised and unified environmental policy is strongly recommended.

950-1009. Joshi Asha (Dept Bot, OSB Campus, Kumaun Univ, Nainital- 263 002). **Environmental impact assessment of magnesite mining in Jhiroli area of Central Himalaya.** *Polln Res*, **13**(2) (1994), 95-100 [15 Ref].

Paper attempts to assess the impact of magnesite mining on the environmental factors such as land, air and water with particular reference to Almora Magnesite Company located in Jhiroli, Central Himalaya. Soil and water of the polluted site showed alkaline properties. Soil organic carbon and nitrogen was very low (1.14% and 0.022%) in polluted sites. No vegetation was reported in polluted site; only some bushes of *Rumex hastatus* were reported.

9501-010. Madduri VBNS, Usha S (Dept Eco7 Univ Hyderabad, Hyderabad-500 134). **Impact of thermal power plants: an environmental economics study.** *J Indian Assoc Environ Manag*, **19**(3) (1992), 75-80 [9 Ref] (Late Recd).

Paper studies the environmental impact of thermal plants by identifying the relationship between environment, energy and economic development. The study predicts the likely increase of pollution from the thermal power plants by looking into the overall energy balance in India. It has been concluded that, as the economy develops,

the production of total and thermal electricity increases and it will result in increase in the emissions of fly ash, sulphur dioxide and suspended particulates.

9501-011. Mahajan AU, Chalapati Rao CV, Kumar Pawan, Badrinath SD (Natl Environ Engng Res Inst, Nehrm Marg, Nagpur-440 020). **Strategy for environmental management in the mining industry.** *J Indl Polln Contl*, **10**(1) (1994), 1-8 [5 Ref].

New mining project, its conceptual stage should be subjected to comprehensive environmental impact assessment process to identify, predict and evaluate the impacts of the project. This would provide necessary feedback, information and help in delineating guidelines for planning, construction and operation of the project leading to proper environmental management.

9501-012. Moses GS (PG Dept Chem, Govt Coll, Rajahmundry-533 105 EG Dt, AP). **Environmenttal pollutioncontrol methods in a fertilizer factory.** *Ultra Scientist Phyl Sci*, **6**(2) (1994), 200-204 [4 Ref].

Environmental quality parameters in and around Coromandel Fertilizer factory at Visakhapatnam (A.P.) have been measured. The control measures such as processing design, modification of machinery and treatment of eSluents etc. taken up by the factory to mitigate the environmental pollution have been highlighted.

9501-013. Pandya Tvisha M, Oza GM (Dept Bot, Fac Sci, MS Univ Baroda, Vadoodara, Gwjarat). **Biodiversity for the masses.** *Indian Forester*, **120**(9) (1994) 824-826 [5 Ref].

Conservation and sustainable use of earth resources is the need of the hour. Paper emphasizes to conserve biodiversity and live in harmony with nature. The message is to be spread right from the general public, specially the school going children, university students, policy makers, technocrats and managers before the last chance is lost.

9501-014. Patnaik LN, Mohapatra PD (JK Paper Mills, Jaykaypur-765 071, Rayagada). **Pollution load a parameter for assessment of environmental impact of industries.** *Indian J Environ Prot*, **14**(3) (1994), 180-184 [12 Ref].

A quantitative expression for pollution load of an industry is essential for the rational assessment of pollution potential. The pollution load of an industry has been quantitatively expressed as the logarithm of the product of the pollution index and the volume of effluent; the pollution load ultimately defines the pollution potential of the industry and the efficiency of its effluent treatment system.

9501-015. Ravindra P, Casula Kavita (Cheml Engng, Sch Biotechno JNT Univ, Hyderabad AP). **Legal aspects and pollution control.** *J Indl Polln Contrl*, **10**(1) (1994), 53-57 [2 Ref].

There are about forty-nine central laws and nineteen state laws that have a direct or indirect bearing on protection of environment and chemical safety in India. Paper discusses the following five acts which specifically deal with environment. The Wild Life (Protection) Act, 1972, the Water (Prevention and Control of Pollution) Act, 1974, the Water (Prevention and Control of Pollution) Cess Act, 1977, the Air (Prevention and Control of Pollution) Act, 1981, and the Environment (Protection) Act, 1986.

9501-016. Rawal CL, Bhargava PM (Bharat Aluminium Co Ltd, Environ Contrl Dept, P.O. Balco Township, Korba-495 684, Bilaspur). **Environmental impact assessment Of an integrated aluminium plant.** *Indian J Environ Prot*, **14**(1) (1994), 22-25.

The aluminium industry has a very special environmental problem encountered in the disposal of red mud, control of fluoride emissions, etc. Environmental impact assessment of an integrated aluminium plants is divided in four parts, keeping in view the technologies and pollutants involved, namely mining of bauxite, alumina, smelter and fabrication plants.

9501-017. Sagar Alpana D (Jawaharlal Nehru Univ, New Delhi 110 064). **Health and social environment.** *Env Impact Assess Review*, **14**(5/6) (1994), 359-375 [40 Ref].

Paper seeks to highlight some of the relationships between the health of individuals and the social environments in which they exist. It is indicated that in many instances, it may be desirable to change the public health paradigm from the bioindividual to the social level because some of the most powerful forces that affect change in disease patterns and in the health of populations can often operate at this level. The discussions in this article are mainly rooted in the Indian social and cultural

context, but it could also be applicable in a more general sense to many other parts of the world both in the lesser industrialized as well as industrialized nations.

9501-018. Saleth R Maria (Inst Economic Growth, Univ Enclave, Delhi 110 007). **Assuring sustainability in a regional and resource specific context: the case of a groundwater aquifer system.** *Energy Env Monit*, **10**(2) (1994), 147-160 [26 Ref].

Paper develops a measure of sustainability in a regional and resource specific context by considering the case of a hypothetical ground-water aquifer system within a theoretical framework. Having reviewed the notion of sustainability and earlier attempts to measure it, a theoretical model of an aquifer system is developed to show how the temporal pattern of water extraction affects and, in turn, gets affected by the interaction of the physical, economic, and institutional aspects of the resource system.

9501-019. Sarkar Ujjaini (MN Dastur Co Ltd, Dept Utility, P-17 Mission Row Extn, Calcutta-700 013). **CRIT: a software for estimation of critical dividing streamline height.** *Indian J Environ Prot*, **14**(7) (1994), 481-485.

A central feature of complex terrain dispersion modelling (CTDM) is the use of a critical dividing streamline height (H_c) to separate the flow into two discrete layers. The software CRIT determines H_c with sufficient meteorological data. The concept of critical dividing streamline height has been used to determine whether a plume will impinge into a hill or pass around it. The flow below H_c is restricted to lie in a nearly horizontal plane, allowing little vertical movement. Consequently plume material below H_c travels around the terrain rather than up and over the terrain. The flow above H_c is allowed to rise up and over the terrain.

9501-020. Shah SA. **Ecological aspects of tropical forest management (the case of India).** *Indian Forester*, **120**(11) (1994), 981-999

The composition of the forest and, the architecture and alignment of different species within an ecosystem have been radically altered. The result is the undermining of the protective, productive, human, cultural, and environmental functions. The ecological implications of the vegetational changes on soil, water, wildlife and vegetation have been described. In absence of baseline surveys and adequate research, only observations have been indicated qualitatively.

9501-021. Sharma Ashok (Div Silviculture, Forest Res Inst, Dehradun). **Conservation of biodiversity and legal issues.** *Indian Forester*, **120**(9) (1994), 812-823.

Paper deals with the legal aspects of biodiversity conservation. There are about fifty International Conventions on the management of living resources. However, only a few of these have conservation as their primary objective. Comprehensive guidelines have been incorporated in the constitution for the citizen as well as government as regards protection to country's environment. But still some suitable legislations are required to cover some of the important areas like biosphere reserves, grassland, wetland, estuaries etc.

9501-022. Sharma Jitendra, Singh Omkar (State Forest Service Coll, Dehradun, UP). **A policy framework for ecodevelopment and sustainable use of forestry resources.** *Indian Forester*, **120**(11) (1994), 1028-1033 [3 Ref].

The idea of sustainable development may be easy to conceptualise but not so easy to put in practice in such a way that the goals of economic development and the goals of keeping intact the "environmental capital" are harmonised. It needs a distinct change in priorities, policies and strategies of management and developmental process. Paper presents a framework for ecodevelopment and sustainable management of forestry resources.

9501-023. Sharma SC, Sharga AN, Roy RK (Natl Botl Res Inst, Rana Pratap Marg, Lucknow-226 001). **Abatement of industrial pollution by landscaping.** *Indian J Environ Prot*, **14**(2) (1994), 95-97 [8 Ref].

Industrial pollution is a big menace in these days. Landscaping of industrial regions by using pollution tolerant plant species is an effective way of mitigating industrial pollution and improving the environment. Plantation on both sides of the road, central verge, traffic islands is to be done with tolerant plant species following a colour scheme besides development of greenbelt and interior landscaping to create a healthy atmosphere both aesthetically and environmentally.

9501-024. Shukla OP (Dept Biochem, Allahabad Univ, Allahabad - 211 002). **Biotechnology for environmental pollution control.** *Biol Memoirs*, **20**(1) (1994), 1-9 [40 Ref].

Biodegradation of pollutants and evaluation of their biodegradability have been mentioned. Treatment and control measures for the removal of pollutants as well as the use of biological processes for their elimination have been further enumerated.

9501-025. Singh Jarnail (Indira Gandhi National Forest Acad, Dehra Dun). **Biodiversity afforestation model approach.** *Indian Forester*, **120**(9) (1994), 860-867 [3 Ref].

The afforestation programme should be so planned, formulated and implemented that each step bring us more close to the defined goal. To protect and maintain the biodiversity of forests and to integrate the biodiversity aspect with the afforestation programme is now a need of the time and the environment. Biodiversity Afforestation Model is a step in this direction.

9501-026. Singh RK (Civil Engng Dept, Birla Inst Techno Sci, Pilani-333 031). **Impact and assessment of transportation systems on the environment.** *J Indian Assoc Environ Manag*, **19**(3) (1992), 87-91 [10 Ref] (Late Recd).

Paper discusses the air quality, noise, energy impacts and assessment of transportation systems on the environment. Suggested actions are classified into those: that aim at the technological performance of vehicles; that are concerned with geometric design and traffic flow operations; that encourage significant changes in travel behaviour; and that propose alternative urban structural forms.

9501-027. Tewari DN (Indian Coun Forestry Res Edn, Dehradun). **Forests and climate.** *Indian Forester*. **120**(1) (1994), 959-968 [23 Ref].

A forest ecosystem creates its own microclimate. The microclimate of a natural/pristine or manmade forest ecosystem is closely related to the physiognomy and architecture of the canopy. Deforestation annually accounts for about 6.4 billion metric tons of carbon dioxide emissions, or about 22 per cent of carbon dioxide emissions. Plantations and agroforestry schemes can absorb carbon dioxide, which will check global warming and climatic changes.

9501-028. Thakare Deepak B, Shinde Keshav V (Dept Microbio, Modern Coll, Sector 15A, Vashi, New Bombay-400 705). **Pollution hazards in New Bombay : recorded episodes.** *J Indian Assoc Environ Manag*, **19**(3) (1992), 81-83 [10 Ref] (Late Recd).

Some of the industries located in New Bombay are discharging noxious gases into the atmosphere, some are dumping toxic wastes into nearby streams/rivers which ultimately reach the Thane creek. The existing population of New Bombay (6 lakhs) is exposed to serious hazards of environmental pollution. Article summarizes the survey of recorded incidences, carried out in New Bombay to reveal this fact.

9501-029. Venkata Mohan S, Karthikeyan J (Sri Venkateswara Univ, Dept Civil Engng, Coll Engng, Tirupati-517 502). **Determination of COD by various closed refluxing methods an experimental investigation.** *Indian J Environ Prot*, **14**(3) (1994), 188-193 [13 Ref].

Determination of chemical oxygen demand (COD) by closed refluxing method employing various methods of refluxing is investigated in the laboratory and the results are presented. The salient features of this procedural variation of COD tests are less sample volume and chemical reagents, no cooling water, less glassware and bench space and overall reduction in time for COD test.

Air Pollution

9501-030. Bhattacharya AK (Madhya Pradesh Forest Dev Corp Ltd, Bhopal, MP). **Efficacy of tree species towards gaseous pollutants and its significance in air pollution control by plantations of pollution resistant trees.** *Indian Forester*, **120**(8) (1994), 65X 669 [50 Ref].

A good number of tree species and varieties including some conifers and many angiosperms have successfully been found to withstand and mitigate air pollution hazards. The degree of tolerance towards the pollutants, varying within wide range, is controlled by many environmental and genetic factors, and hence some resistant tree varieties can be evolved through breeding, as has been done with respect to diseases. Certain fast growing trees with proven merits of abating gaseous pollutants must be grown in urban areas and around industries forming a belt, which will not only provide fuel and timber but also improve the ambient air quality and reduce air pollution.

9501-031. Bindish Nitin, Agarwal Deepak, Jindal Sachin (Banaras Hindu Univ, Dept Cheml Engng Techno Inst Techno, Varanasi-221005). **Depletion of ozone layer.** *Indian J Environ Prot*, **14**(2) (1994), 112-113 [38 Ref].

The ozone layer in the middle atmosphere, responsible for the very existence of the stratosphere, has been observed to shrink drastically every Austral spring over Antarctica. This phenomenon, popularly known as the hole in the ozone layer, is considered to occur due to the catalytic destruction of ozone by ClO_x and Brox radicals, produced from the decomposition of mostly manmade halocarbons. If the present trend of the deepening of the hole with time will persist effects on global circulation and world climate may be expected for the near future.

9501-032. Channy Bala, Verma KS (Dept Bot, Govt Autonomous Coll Sci, Jabalpur). **Incidence of airborne fungal spores in Jabalpor city using a volumetric spore trap to assess the air quality of an indoor environment.** *Indian J Appl Pure Bio*, **9**(1) (1994), 7-10 [3 Ref]

During four months period of study, twenty seven spore types were assigned. Besides, these spore types, pollen grains, fungal mycelium, insects and insects scales, plant parts and whole sporangia were also assigned in the air. This preliminary report has gathered ample information regarding the number of aeroallergins occurring in the indoor environment and reveal the extent and nature of biopollution of indoor environment.

9501-033. Chatterjee KM, Iheragaonkar S', Saraf RK, Pal A (Environ Techno Consult, 51 East Lendhra Park, Nagpur-410 010). **Dust suppression studies with an indigenous product.** *Indian J Environ Prot*, **14**(1) (1994), 8-12 [3 Ref.].

Various segments of mining activity contribute towards environmental pollution. Of these, particulates released into the atmosphere due to plying of vehicles on unpaved haul roads deserves utmost consideration. A mathematical model is used for the prediction of dust generation on haul roads. Efficiency studies of a dust suppressant developed from industrial wastes are also presented. The developed product serves the purpose of dust control through recycle and reuse of waste material.

9501-034. Garg Alf, Chutke NL, Ambulkar MN, Joshi NG, Jhonson R, Aggar-wal AL (Dept Chem, Nagpur Univ, Nagpur-440 010). **An environmental pollution study from multielemental neutron activation analysis of air dust particulates from a paper**

mill and metropolitan cities in India. *Indian J Environ Prot*, **14**(3) (1994), 194-203 [37 Ref].

For a case study of environmental pollution in metropolitan cities and industrial surroundings 33 elements have been determined in ambient air dust particulates by employing instrumental neutron activation analysis (INAA). Sample collected from industrial, commercial and residential areas of Bombay (West coast) and Nagpur (central part) and also from the industrial surroundings of a paper mill located in environment of Assam (in eastern part) were irradiated with thermal neutrons and counted by high resolution gamma spectrometry.

9501-035. Ghosh NC, Seth SM (Natl Inst Hydro, Roorkee-247 667, UP). **Atmospheric pollutants and their effects on quality of water.** *Indian J Environ Hlth*, **36**(4) (1994) 104-114 [4 Ref].

Atmospheric pollutants get deposited on the earth's surface through various physical and chemical processes. Precipitation, being a pathway for deposition of atmospheric aerosols and anthropogenic materials, contain pollutants of varying nature, causing deterioration of physical, chemical, and biological characteristics of waters.

9501-036. Kannan V, Abubacker MN, Muthukumar B, Srimvasan S. (Dept Bot, National Coll, Tiruchirapalli-620 001). **Airborne mycoflora as a tool for pollution studies.** *J Ecobio*, **6**(2) (1994), 131-134 [9 Ref].

Airborne mycoflora- of selected locations in Tiruchy district were identified and their role in terms of their pathogenicity in plants and animals discussed. Their presence in these environments is an indication of the extent of the atmospheric pollution and it is suggested that proper control of environmental pollution is really necessary to avoid their influence on food spoilage, disease in plants and animals.

9501-037. Kumar Nandini, Kulshrestha UC, Saxena A, Kumari KM, Srivastava SS (Dept. Chem, Dayalbagh Educational Inst. Dayalbagh, Agra-282 005). **Dry deposition of formate and acetate compared at four sites in Agra.** *Energy Env Monit*, **10**(2) (1994), 131-135 [7 Ref].

Samples of dry deposition were collected and analysed for formate and acetate using perspex trays at four sites in Agra city, Ion chromatography was used for analysis. The mean fluxes of formate ranged between 18 and 89 $\mu\text{g m}^{-2}\text{d}^{-1}$ while those for acetate ranged between 25 and 103 $\mu\text{g m}^{-2}\text{d}^{-1}$. The occurrence of formate and acetate in dry deposition could be a result of the absorption of vapour phase formic and acetic acid to particles on the collector tray.

9501-038. Kumar Vikas, Choudhury KD, (Metallurg Engng Consultants (India) Ltd, Environ Engng Sec, Ranchi-834 002). **Air quality management meteorological perspective.** *Indian J Environ Prot*, **14**(1) (1994), 41-46 [11 Ref].

The role of meteorology in studying and managing the environmental pollution problems has long been recognized. An attempt has been made to give a brief account of different aspects of meteorology in managing the environment effectively using meteorological and air quality data and need for standardising air quality models.

9501-039. Misra Ranganath. Behera Prasant K (Dept Bot, Govt Coll, Phulbani-762 002, Orissa). **Bioindicator of air pollution threat caused by industries in western Orissa.** *Polln Res*, **13**(2) (1994), 203-206 [7 Ref].

The quantitative occurrence of indicator lichens like *Dirinaria* and *Rocella* and the tree bark acidity at industrial and non-industrial towns of western Orissa were investigated. The results of this study indicated that lichen distribution and tree bark acidity served as bioindicators of air pollution threat and can be used for biomonitoring the industrial pollution.

9501-040. Mukherjee S, Ray MK (Dev Consultants Ltd, Enviroprotection Div, 24B, Park Street, Calcutta-700 016). **A simplified model for use of meteorological data in dispersion calculation.** *Indian J Environ Prot*, **14**(2) (1994), 81-94 [6 Ref].

Prediction of impact of emission from elevated sources, air pollution dispersion models need meteorological data. This paper offers a model for simulating an average daily distribution of values of some meteorological parameters required for dispersion modelling using IMD tables. The model is then validated by using a detailed hourly meteorological data for 5 years of Agra. The model can be very useful for predicting time averaged around level concentration.

9501-041. Nagamoni B, Ramalingam Nf Anthoni Raj S, (Dept. Agricul Microbio, Tamil Nadu Agticl Univ. Coimbatore-641003). **Evolution of gases during parboiling of paddy.** *Polln Res*, **13**(3) (1994), 259-262 [9 Ref].

Paper reports evolution of gases during parboiling of paddy in experimental conditions. It was found that carbondioxide and foul smelling hydrogen sulphide are evolved in cold soaking process of parboiling. This process also resulted to higher loss of nutrients.

9501-042. Patel M1(, Mohanty Kadambini, Tiwari TN, Patel Tanoj Kumari (IDL Cheml Ltd, Qlty Contl Dept, Rourkela-769 016). **Assessment of ambient air quality in the Rourkela inustrial complex: Part 140.** *Indian J Environ Prot*, **14**(3) (1994), 216-220 [21 Ref].

A description on the status of ambient air quality in the Rourkela Industrial Complex during the period November 1988 to October 1991 is reported. Investigation at 5 sampling 5-1 M of E&F/ND196 stations chosen in and around the Rourkela Industrial Complex for sulphur dioxide concentration showed that 3, out of the 5, sampling stations are adversely affected by SO.

9501-043. Prakashkumar R, Ravindrar P, Gopi TV, Nair PKK (Dept Respiratory Med, Medl Coll Environ Resources Res Cent, Trivandrum, Kerala). **Incidence of alternaria, penicillium and smuts in the atmosphere of Kerala, India.** *Polln Res*, **13**(4) (1994), 355-359 [18 Ref].

An analysis of the air of Kerala was made for one year using the gravity slide methoa. The common spores present in the outdoor air was identified. The results obtained could help in understanding the common allergens which could be the major causative agents for fungal spore allergy here.

9501-044. Raghunathan KS (Stromtek Automation, Madras). **Dust concentration measurementmethods and onsite calibraffoo procedures.** *Cheml Engng World*, **29**(8) (1994), 95-99 A [2 Ref].

Awareness of the need for determinmg accurately the emission levels in a process industry is growing day by day. Emission standards and maximum levels of

emission are now set statutorily. This article introduces to readers the principle of dust level measurement, state of the art measuring techniques, and the most important aspect of onsite calibration to reflect truly the site conditions.

9501-045. Rao IN, Pasha K (Natl Thermal Power Corpn Ltd, Environ Engng; Core 6, 7th Institutional Area, Lodhi Rd, New Delhi-110 003). **Determination of critical wind velocities for thermal power plants a Gaussian plume model approach.** *Indian J Environ Prot*, **14**(1) (1994), 53-56 [6 Ref].

A Gaussian plume model is employed to find out the critical wind velocities at an ambient temperature of 25°C in the respective Pasquill stability class for a thermal power plant of capacity 200 Mw in an inland station. The model incorporates the Briggs plume rise, Briggs diffusion coefficient and Irwin power law exponents. For the purpose of model evaluation the industrial data with appropriate emission input are taken. Results are discussed and conclusions are drawn.

9501-046. Suneela SS, Viswanadhan DV, Ram Mohan HS (Sch Environ Std, Fine Arts Avenue, Cochin). **Spatial distribution of sulphur dioxide concentrations due to industrial pollution.** *Polln Res*, **13**(4) (1994), 395-401 [21 Ref].

Using Gaussian plume model spatial distribution of SO₂ concentration over Trivandrum city is determined. Various possibilities of mitigating the pollution levels are discussed and optimum locations for new industries are suggested.

9501-047. Verma KS, Sheorey Lalita (Dept Bio Sci, RD Univ, Jabalpur-482 001). **Aerobiota of a vegetable market at Jabalpur.** *J Environ Bio*, **15**(4) (1994), 325-329 [12 Ref]

Air sampling of Nimadganj (vegetable market) area at Jabalpur was done, using Rotator air sampler and exposing petri plates for 15 days. Atmospheric bacteria were also trapped by exposing nutrient agar plate. Eighteen types of bacterial strains were identified upto the generic level. All the isolates were the member of class Schizomycetes.

9501-048. Vittal Murty KPR, Srinivas Vidudala (Andhra Univ, Dept Meteorol Oceanogr, Visakhapatnam-530 003). **Estimation of diffusion parameters under different stability conditions.** *Indian J Environ Prof*, **14**(7)(1994), 505-510 [12 Ref].

Attempt is made to review and critically apprise various methods for estimation of standard deviations. The value of standard deviations depend upon the various meteorological and topographical conditions. These values vary with the turbulent structure of the atmosphere, height above the surface, surface roughness, distance from the source, wind speed and stability of the atmosphere.

Water Pollution

9501-049. Das NK, Sinha RK (Environ Bio Lab, Dept Zoo, Patna Univ, Patna-800005). **Pollution status of river Ganga at Patna (Bihar), India.** *J Freshwater Bio*, **6(2)** (1994), 159-16i [17 Ref].

The water is characterised by slightly alkaline nature, less dissolved solids, mild alkalinity, low electrical conductance and low ionic strength. The load of BOD and nutrients was higher all along the city river fronts indicating organic enrichment especially near the sewage outfall sites. Quantitatively, the river water appeared unsuitable for drinking and bathing purposes by the inhabitants of city river water fronts.

9501-050. Gautam Ashutosh, Sati OP (Dept Chem, HNB Garhwal Univ, Srinagar (Garhwal)-246 174, 501P). **Metals in the water of river Bhagirathi.** *J Env Polln*, **1(2)** (1994), 69-76 [19 Ref].

The concentrations of eight metals viz. lead, zinc, manganese, iron, cobalt, magnesium, copper, and calcium in the water of river Bhagirathi were studied from Uttarkashi to Deoprayag. The results showed that all these metals exist below toxic limit, indicating the water to be unpolluted with respect to metals in question. But, the concentration was found to increase from upstream to downstream. The concentration of metals was also higher during winter when compared with summer and monsoon. All the metals showed a positive correlation with total hardness.

9501-051. Gogoi AK, Das HC (Duliajan Sci Soc., Duliajan Coll, Duliajan-786 602, Dibrugarh). **Preliminary investigation of rain waters of Duliajan area of Dibrugarh District.** *Indian J Environ Prot*, **14(2)** (1994), 128-132 [5 Ref].

The pH of rain water of Duliajan oil town area is measured along with some of the parameters. Although there are several natural gas flare-up points in and around Duliajan oil town area which send enough pollutant gases to the atmosphere, the pH of rain waters at different sites are in the alkaline range that is in between 6.0 to 9.5. The alkaline nature of pH is also discussed.

9501-052. Gupta AK, Srivastava NK (Dept Bot, SB Degree Coll, Baraiganj, Varanasi). **Conservation and management of a tropical wetland around Varuna river.** *J Freshwater Bio*, **6**(2) (1994), 109-113 [18 Ref].

The marginal vegetation and soil structure around the river corridor is degrading fast due to biotic stresses, disposal of city sewage and factory effluents. As a result of increased eutrophication, growth of macrophytic vegetation is favoured. The quality of the water is to be improved by the diversion and/or pretreatment of the sewage and effluents. Conservation of soil and natural vegetation is possible through the plantation of certain shrubby species on the river bank.

9501-053. Gurjar BR (Cent Atmos Sci Indian Inst Techno, Delhi, Hauz Khas, New Delhi-110 016). **A simple new method to determine first stage BOD constants (K and L).** *J Indian Assoc Environ Manag*, **19**(3) (1992) 84-86 [6 Ref] (Late Recd).

BOD, a standard parameter for evaluating the pollutional load of industrial or domestic wastewaters, actually expresses the rate of biochemical reaction in which time appears as a function. For the sake of simplification, this reaction is represented by the first order equation incorporating two constant values, viz., First stage BOD, 'L' and reaction rate constant, 'K'. This paper deals with developing a simple new method to determine these values from a series of BOD measurements.

9501-054. Hosetti BB, Kulkarni AR, Patil HS (PG Dept Environ Sci, Sahyadri Coll Campus, Kuvempu Univ, Shimoga-577 203). **Water quality in Jayanthi Nalla and Panchaganga at Kolhapur.** *Indian J Environ Hlth*, **36**(2) (1994), 120-127 [2 Ref].

The study made on Jayanthi nalla during monsoon showed that it contains moderately high amount of solids. Tannery effluents contributed highest amount of solids to the stream. The water samples collected from upstream and down stream of the

confluence of the nalla into the river showed that the river water is also rich in total solids.

9501-055. Krishnamurthy SR, Bharati SG (Dept Life Sci, Kuvempu Univ Sahyadri Coll Campus, Shimoga-577 203). **Studies on the metal pollution of the river Kali, around Dandeli, (North Kanara District), Karnataka India.** *Polln Res*, **13**(3) (1994), 249-252 [13 Ref].

The study on the distribution of metal ions in the surface water's of the river Kali has been investigated. The study reveals that yearly average values of iron, zinc and lead were more at Sa, manganese, nickel, cadmium and cobalt at Ss and chromium and copper at S, sampling stations of the river Kali. It is also found that year-wise average values of all the metal ions are within the permissible limits of Rawal's Water Quality Criteria, ISI and EPA standards except iron and manganese.

9501-056. Malik Kalyani (Dept Eco, Netaji Inst Asian Ltd, 1, Woodburn Park, Calcutta-700 020). **Water quality in selected pockets of Haora Municipal Corporation area - an impact assessment.** *Indian Biologist*, **26**(1) (1994), 48-53 [6 Ref].

The Haora Municipal Corporation contains <t .47 % of the district's total population according to Census 1991. The study area includes 4 Municipal Wards, chosen with an eye to land use pattern. Tubewell sites are selected at a regular interval away from the River Ganges, towards the inner city. Suitability of the water for drinking purposes, people's acceptance/likings of the water and the relationship between the increased intestinal diseases and existing quality of water, are discussed.

9501-057. Mitra Abhijit, Choudhury Amallesh (Dept Marine Sci, Calcutta Univ, 35, Ballygunge Circular Rd, Calcutta-700 019). **Dissolved trace metals Oll surface waters around Sagar Island, India.** *J Ecobio*, **6**(2) (1994), 135-139 [7 Ref].

Dissolved Zn, Cu, Mn, Fe, Co, Ni and Pb were determined in the aquatic medium of lower stretch of the flougly estuary. Concentrations of metals increased during the monsoon months. Results of the principal component analysis suggest that the contamination of heavy metals can be accounted for by three principal components that deplete the total variance. Monitoring of dissolved Pb seems to be essential at the station located near the southern most tip of Sagar Island.

9501-058. Nag JK, Das AK (Univ Burdwan, Dept Chem, Burdwan-713 104). **Quality of drinking water in the Birbhu district of West Bengal.** *Indian J Environ Prot*, **14**(7) (1994), 516-519 [16 Ref].

To study the drinking water quality in the Birbhum district of West Bengal, water samples were collected from 61 locations. The concentrations of various metals were determined by atomic absorption spectrometry. Metals, like sodium, calcium, magnesium, chromium lead, mercury and arsenic have been detected below their permissible limit. The presence of potassium, copper and cadmium above their permissible limits have been detected in some cases. But the concentrations of manganese, iron and zinc have been estimated above their maximum admissible concentration.

9501-059. Paul JC, Mishra MM, Mishra A, Gulati JAL, Pradhan PC (Water Manag Proj, Regl Res Stn, Chiplima-76B 025). **Suctoation and quality of ground water in Hirakund command area.** *Env Eco*, **12**(3) (1994), 557-559 [12 Ref].

To explore the cause of fluctuation of ground water in Hirakund command area the data were collected on water table from different observation wells fortnightly. The contributing factors for fluctuation at different locations were determined. The ground water level remained below the zone of drawal of the field crops in areas covering near canal uncultivated and in dry farming areas. However the irrigated tract was observed to get benefit by the ground water. The analysis of water samples showed that the ground water can safely be used for irrigation

9501-069. Pervez Shamsh. Pandey GS (Ravishankar Univ, Sch Std Chem, Raipur-492 010). **Variations in rain water characteristics in areas around steel plant at Bhilai.** *Indian J Environ Prot* **14**(3) (1994) 204-209 [14 Ref].

The rain water characteristics carried out around steel plant at Bhilai during one year period indicated pH of rain water within 5.6-8.1, an inverse relationship between the pH and the total dissolved solids in the rain water, a higher concentration of sulphate compared to that of nitrate, and higher concentration of calcium, magnesium and sodium at a particular site situated in the north of steel plant on account of the contributions of dusts emitted from a cement plant situated near this sampling site. The high presence of

lead and mercury was found to be due to the presence of lead bearing particulate matter in the atmospheric air, and the emissions of mercury vapour from the burning coals in the plant.

9501-061. Rao Vejandla Sankara (Dept Zoo, VRS & YRN Coll, Chirola, Prakasam (Dist), 523 157). **Detection of organochlorine pesticide residues using gas, chromatography in nllag**

Ecology

9501-074. Bairagi SP, Goswami MM (Dept Zoo, Gouhati Univ, Guwahati-781014). **Ecology of water blooms in some ponds of NE India.** *Env Eco*, **12**(3) (1994), 568-571 [5 Ref].

Ecology of water bloom of four ponds in different topographical and ecological setup was investigated with some of the physicochemical parameters and correlate them with the bloom formation. Density of the bloom forming species and chlorophyll contents of the blooming algae were estimated. In all the four ponds the main bloom forming species was found to be *Aicrocystis aeruginosa*.

9501-075. Barbhuyan SI, Khan Asif A (Dept ZooS Aligarh Muslim Univ, Aligarh). **Studies of the structure and function of benthic ecosystem in an eutrophic body of water: physicochemical conditions and benthos.** *J Freshwater Bio*, **6**(1) (1994), 11-20 [22 Ref].

A study was conducted in an eutrophic body of water with special reference to physicochemical conditions prevailing in the benthic environment. The study revealed mud habitat as less disturbed and more stable, and so the population density of the dominant taxa varied very little. Benthic organisms have been found to be associated with rich organic pollution indicating higher rate of eutrophication in the pond.

9501-076. Bose SK, Lakra Manorama Philips (PG Dept Zoo, Ranchi Univ, Ranchi-834 008). **Studies on the macrozoobenthos of two freshwater ponds of Ranchi.** *J Freshwater Bio*, **6**(2) (1994), 135-142 [19 Ref].

The comparative study of macrozoobenthos of two fresh ponds of Ranchi in relation to certain ecological parameters revealed marked fluctuation in the species composition of benthic organisms. A significant correlation was recorded between the population number of chironomus larvae and total alkalinity content.

9501-077. Chauhan Ramesh tHimachal Pradesh Krishi Vishvavidyalaya, Regl Res Stn, Bajaura-175 125). **Zooplankton species and their dominance in Rewalsas the, Himachal Pradesh. Uttar Pradesh. J Zoo, 13(2)** (1993), 143-147 [7 Ref].

Zooplankton species of Rewalsar lake of Himachal Pradesh have been identified and studied for their presence and dominance during different seasons. In all 29 species were recorded which included I i S 4 and 14 Cladocera, Copepods and Rotatoria, respectively. Maximum (22) species were recorded in August and minimum (11) species in April. The rotatorians found main contributor to the variation in species composition.

9501-078. Dave SR, Patwari RA (Dept Microbio, Sch Sci, Gujarat Univ, Ahmedabad-380 009). **Bacterial cell mass as a hiosorpent of cadmium and mercury. Polln Res, 13(2)** (1994), 227-931 [10 Ref].

Six isolates were found to be having good metal sorption ability. Growth pH 7. 5, contact time of 30 minutes, cell age of 24 hours and nutrient broth were found to be optimum under the experimental conditions. Highest bioremoval was observed as 80 and 86 per cent of cadmium and mercury respectively. Meat extract and peptone addition have showed considerable effect for mercury removal.

9501-079. De TK, Choudhury A, Jana TK (Dept Marine Sci, Calcutta Univ, 35 BC Rd, Calcutta-700 019). **Phytoplankton community organization and species diversity in the Hugli estuary, north east coast of India. Indian J Marine Sci, 23(3)** (1994), 152-156 [20 Ref].

Phytoplankton were collected from March 1988 to February, 1990 from four different stations in the Hugli estuary. Maximum numbers of phytoplankton cells were observed between postmonsoon (SW) and early premonsoon months. Only two species, *Coscinodiscus radiatus* and *Coscinodiscus excentricus* out of 29 species dominated and they contributed 50 % to the total population. A significant negative correlation was observed between species diversity and pollution index.

9501-080. Dhamija SK, Jain Yatish (Dept Bot Environ Sci, Govt Autonomous Sci Coll, Jabalpur MP, 482 001). **Variations in the physicochemical characteristics of a lentic waterbody of Jabalpur (M.P.).** *J Env Polln*, 1(3&4) (1994), 125-128 [8 Ref].

Paper deals with an investigation of a fresh-water lake at Jabalpur for some physicochemical parameters. Significant variations in these parameters were observed throughout the period of study and their overall levels suggest the lake to be a highly polluted one calling upon for urgent measures to be taken to prevent its further deterioration.

9501-081. Goel PK, Khatavkar SD, Kulkarni AY. (Dept Polln Std, YC Coll Sci, Karad-415 124, Maharashtra). **Nitrogen to phosphorus dependent blue green algae dominance in lakes.** *J Env Polln*, 1(2) (1994), 67-68 [9 Ref].

In order to see the dependence of blue green algae on N:P ratios, a study was carried out on 10 lakes situated in Western Ghats of South Western Maharashtra. Total dissolved nitrogen and total dissolved phosphorus were estimated in the digested samples.

Biomass of blue green algae was estimated by cell volume method. The findings of the study show that the dominance of blue green algae is maintained below a lower TN :TP ratio of 22: 1. In some cases where the TN: TP ratios were typically less than 22, the blue green algae were not in dominance. This indicated that, besides TN: TP ratios) other factors may also alter the response of phytoplankton to nutrients.

9501-082. Gopalakrishnan P, Manikandavelu D, Srinivasan A (Fisheries Coll Res Inst, Tuticorin-628 008). **Ecological pertinency of Uppodai backwater (Tuticorin) for aquaculture.** *J Ecobio*, 6(1) (1993), 73-75 [5 Ref].

The Uppodai river in the vicinity of Tuticorin coast receiving salt pan effluents was investigated for a period of about two years. The observed spatial and temporal variations of depth, temperature dissolved oxygen, pH salinity, hardness, phytoplankton, zooplankton organisms/ma, lead to consider that this ecosystem can serve as a habitat for some euryhaline aquatic flora and fauna. Aquaculture prospects of this region have also been discussed in the light of above facts.

9501-083. Gupta MC, Sharma LL (Dept Limnology Fisheries, Rajasthan Agrlcl Univ, Udaipur Campus, Udaipur-313 001). **Seasonal variations in selected limnochemical parameters of Amarchand reservoir, southern Rajasthan.** *Polln Res*, **13**(2) (1994), 217-226 [37 Ref].

Seasonal variations in selected limnochemical parameters in Amarchand reservoir, southern Rajasthan revealed interrelationship among various chemical factors. The reservoir maintained good levels of dissolved oxygen even in the deeper strata. Lack of anoxia is a noteworthy feature of this reservoir and justify a low trophic status.

9501-084. Gupta Meenakshi, Sharma Leena, Saxena MM (Lab Environ Bio, Dept. Zoo, Dungar Coll, Bikaner-334 001). **Phytoplanktonic productivity of Devikund Sagar village pond (Bikaner NW Rajasthan).** *Acta Ecologica*, **16**(1) (1994), 58-62 [17 Ref].

Primary productivity studies on a village pond in the Indian desert have been carried out in relation to abiotic and biotic factors. Gross primary productivity ranged from 0.461 to 0.691 gC/m³/h. Respiration being high, the net primary production was low.

9501-085. Krishnamurthy SR, Bharti SG (Dept Life Sci, Kuvempu Univ, BR Proj, 577 115). **An investigation on the dissolved oxygen, dissolved organic matter and water temperature of the river Roli, near Dandelli in Karnataka, India.** *J Env Polln*, **1**(3&4) (1994),93-95 [14 Ref].

The dissolved oxygen, dissolved organic matter and water temperature of the river have been recorded for the period of two years between June 1986 and May 1988. The study reveals that dissolved oxygen of the river has an inverse relationship with dissolved organic matter and water temperature. The study shows that temperature, dissolved oxygen and dissolved organic matter are interrelated to each other and change in one may influence the other.

9501-086. Kumar A (Environ Bio Res Ccnt, PG Dept Zoo SK Univ, Dumka-814 101). **Seasonal trends in biological and physicochemical properties of a fish pond of Dumka (Bihar).** *Acta Ecologica*, **16**(1) (1994), 50-57 [16 Ref].

Periodicity of planktons and physicochemical properties in fish farming pond of tribal zone of South Bihar (Dumka) were studied. Seasonal variations in ambient water temperature, DO₂, FCOs carbonate, bicarbonate, total alkalinity and pH were recorded. No positive correlation between the above parameters and plankton density could be studied.

9501-087. Kumar Arvind (Environ Bio Lab, PG Dept Zoo, SK Univ, Dumka-814 101).

Role of species diversity of aquatic insects in the assessment of pollution in wetlands of Santhal Parganas (Bihar). *J Env Polln*, I(3&4) (1994), 117-120 [12 Ref].

Paper deals with the use of insect species diversity and evenness of species in the evaluation of water quality of two ponds situated in Santhal Parganas (South Bihar). The species diversity in both the ponds was found maximum in July and minimum in June. It was found that the average species diversity was lower in the tribal pond than the town pond indicating more pollution in the former than the latter.

9501-088. Laal AK, Sarkar SK, Sarkar A, Karthi Keyan M. (Riverine Div, Centl Inland Capture Fisheries Res Inst, 24 Panna Lal Rd, Allahabad-211 002). **Ecotendency of phytoplankton: an approach for categorizing algae as bioindicators for monitoring water quality.** *Curr Sci*, 67(3) (1994), 193-195 [24 Ref].

Hydrobiological investigations were made in a channel of river Ganges at Bhagalpur to study the ecotendency of phytoplankton. Different intercorrelations between abiotic parameters and phytoplankton abundance were estimated. A shift in specific algae with increase in trophicity and saprobity was clearly demarcated. It is useful in categorizing algae as bioindicators for monitoring water quality.

9501-089. Laxmaiah Ch Mahmood SK, Narendar Rao V (Dept Bot, Osmina Univ, Hyderabad-500 007, AP). **Nutrient status and biological characteristics of Nacharam Lake.** *Polln Res*, 13(3) (1994), 253-258 [11 Ref].

The studies on physicochemical and biological examination of the water of Nacharam lake were carried out with reference to phytoplankton population. It has been concluded that the raw water supply from this source is fit for industrial as well as irrigation purposes, but it cannot serve as a scarcity alternative to Hyderabad water supply.

9501-090. Maury AN, Singh D (Environ Sci Lab, Dept Bot, DS Coll, Aligarh-202 001). **Ecological investigations of saltaffected pasturelands of Aligarh habitat stud.** *Bull Pre Appl Sci*, **12B**(1&2) (1993), 37-44 [8 Ref].

The saltaffected pasturelands of Aligarh were studied for physical and chemical characteristics. The halophytic grasses, *Sporobolus marginatus* and *Chloris rontann* occupied major proportion of the high salines with heavy infestation of carbonate bicarbonate and chloride. Those sites are characteristic of nutrient deficiency in contrary to other pasture areas.

9501-091. Litra Abhjit, Trivedi Subrata, Choudhury Arnalesh (Dept Marine Sci, 35 BC Rd, Calcutta-19). **Inter relationship between gross primary production and metal accumulation by *Crassos, racucullatta* in the Hooghly estuary.** *Polln Res*, **13**(4) (1994), 391-394 [5 Ref].

Gross primary productivity in the lower stretch of the Hooghly estuary and the concentrations of Cu, Zn, Mn and Fe in the body tissue of the bivalve *Crassostrea cucullata* inhabiting the same station were estimated during June 1990 to May, 1991. Maximum concentrations of the metals were recorded during the monsoon periods when the productivity of the habitat water was extremely low. The habitat water was also characterized by low salinity and pH during this seasons.

9501-092. Nageswara Rao CA (Tool Surv India, Hillpatna, Berhampur-606 005). **Ecology of the benthic sediments of Chilka lagoon.** *J Appl Zoo Res*, **5**(1) (1994), 67-70 [8 Ref].

Data on depth salinity, sediment texture and organic carbon contents of the sediments collected from about 80 stations in the vast Chilka lagoon during September, 1987 is presented here. Division of the lagoon into different regions based on the above parameters is also given and observations on the distribution of aquatic weeds, marine grasses and algae are reported.

9501-093. Ouseph A, Sudarsanam D, Gandheeswari P, Ambrose T (PG Res Dept Zoo, Loyola Coll (Autonomous) Madras-600 034). **Influence of physicochemical parameters of river Cooum on mitotic index in tissues of *Oreochromis mossambicus* (Peters).** *J. Ecotoxicol Environ Monit*, **4**(2) (1994), 105-108 [16 Ref].

Anthropogenically altered physicochemical parameters of river Cooum reduced the mitotic index in the gill and kidney tissues of *Oreochromis mossambicus*. Incidence of mitotic spread in the gill of fish from river Cooum was 35 % when compared to an increased index (4.7%) in the gill of pond fish. Similarly, kidney cells of pond fish showed an increased incidence of mitosis when compared to the same tissue of Cooum fish.

9501-094. Pandey BL, Rao PLN, Pisolkar MD, Singh BK (Centl Inland Fisheries Res Inst, No. 6, Indraprasth Housing Soc, Gadital Hadapsar, Pune-411 028.) **Comparision of planktonic communities in different sectors of Bhatghar reservoir Pune (Maharashtra).** *J Freshwater Bio*, **6**(1) (1994), 1-10 [9 Ref].

Comparison of planktonic communities in different sectors of Bhatghar reservoir has been made. Quotient of similarity (QS) values for phytoplankton communities exhibited low value during summer and monsoon seasons for lentic versus lotic sector. A great resemblance in the phytoplankton assenblage was recorded throughout when intermediate versus lotic sector were considered. The QS values for zooplankton communities showed a greater dissimilarity in zooplankton assemblage during summer and monsoon seasons in different sectors of the reservoir.

9501-095. Pandey BN, Jha AK, Das PKL (PG Dept Zoo, Purllia Coll, Purnia-854 301). **Hydrobiological study of a swamp at Purnia, Bihar in relation to its phytoplankton fauna.** *J Ecobio*, **6**(1) (1994), 13-16 [20 Ref].

Phytoplankton of the swamp near Purnia was studied in relation to water temperature, pH, dissolved oxygen, free carbondioxide, carbonate alkalinity, bicarbonate alkalinity, nitrate, phosphate and chlorides. The bulk of phytoplankton was shared by Chlorophyceae (37%), Myxophyceae (36%), Bacillariophyceae (17%) and Euglenophyceae (10%). Chlorophyceae and Euglenophyceae were abundant during rainy season. In all, 26 species of plankton were identified, 9 belong to Chlorophyceae, 8 to Myxophyceae, 8 species to Bacillariophyceae and 1 species to Eugelenophyceae.

9501-096. Pandey BN, Jha AK, Das PKL, Pandey K (PG Dept Zoo, Purnia Coll, Purnia-854 301). **Zooplankton community in relation to certain physicochemical factors of Kosi Swamp, Purnia, Bihar.** *Env Eco*, **12**(3) (1994), 563-567 [18 Ref].

The zooplankton fauna of Kosi swamp in relation to certain physicochemical factors was studied. The bulk of zooplankton was shared by Rotifera (48.37%), Cladocera (38.97 %), Copepoda (12.29 %). Cladocerans and copepods were abundant during summer while rotifer peak was noticed during rainy season. Total zooplankton showed positive correlations with free CO₂, bicarbonate and phosphate.

9501-097. Pandit S, Adhikary S, Ro S, Mondal S (Entom Lab, Dept Zoo, Univ Burdwan, Burdwan-713 104). **Seasonal changes of some limnological factors in the river Damodar with special emphasis on the population dynamics of aquatic insects II. Hemipteran and Odonata.** *J Freshwater Bio*, **5**(4) (1993), 305-313 [12 Ref].

Present investigation showed that not only the insect orders but also the different species of insects of the same order fluctuates seasonally. The fluctuation of the population of Hemipteran and Odonatan insects in three different study area of the river Damodar showed no clear correlations within a season or month and has been discussed in relation to different chemical parameters.

9501-098. Pandit Seerna, Adhikary Sumitra, Roy Subrata (Entom Lab, Dept Zoo, Univ Burdwan, Burdwan-713 104). **Seasonal changes of some limnological factors in the river Damodar and their impact on aquatic insects.** *Env Eco*, **12**(3) (1994), 501-506 [15 Ref].

Seasonal changes of some limnological factors in the river Damodar were studied from December 1991 to November, 1992. The water was more polluted in upper than in lower Damodar. The water of upper Damodar showed acidic pH whereas it was alkaline in lower Damodar though, the velocity of water in upper Damodar was higher compared to that of lower Damodar. The insect population fluctuated throughout the year with a peak of hemipteran population during March-April whereas the diptera population showed its climax during December, March and April.

9501-099. Parvateesam M, Gupta Sudha (Microbio Lab, Bot Dept, Govt Coll, Ajmer-305 001). **Physicochemical characteristics of a lake receiving effluents from textile mills in Rajasthan.** *Polln Res*, **13**(4) (1994), 317-321 [7 Ref].

Paper deals with the adverse effects of effluents from textile mills on physicochemical characteristics of a fresh water lake situated at Kishangarh in

Rajasthan. Study reveals a marked deviation in the physicochemical characteristic. The water body was also highly polluted. Interrelationships between various parameters are also reported.

9501-100. Pati S, Sahu BK (Dept Zoo, Ravenshaw Coll, Cuttack-753 003). **Hydrology and plankton of the recently impounded Rengali reservoir of Orissa (India).** *J Freshwater Bio*, **5**(4) (1993), 283-292 [23 Ref].

Rengali reservoir of Orissa, has been studied; in relation to hydrology and plankton. The investigation covered a period of two years. Average water temperature of the reservoir was of medium range and the transparency was not high. Average dissolved oxygen level was fairly high at all times. Total alkalinity, hardness and pH indicated medium level production. The level of nutrients like nitrate phosphate and silicate was low. The annual average plankton density was 607.1 ,L/l of which 86.76 % was constituted by phytoplankton.

9501-101. Patralekh LN (Dept Bot, Deoghar Coll, B. Deoghar-814 113). **Comparative account of physicochemical properties of three freshwater ecosystem.** *J Freshwater Bio*, **6**(2) (1994), 115-119 [9 Ref].

Pond, river and thermal spring, three types of freshwater ecosystems have been investigated to compare their physicochemical properties. Comparatively thermal spring revealed higher temperature than that of pond and river. Maximum turbidity was recorded in river followed by pond and thermal spring. Higher dissolved oxygen was recorded in river than thermal spring and pond. Minimum amount of free carbon dioxide was found during summer in pond and maximum during winter in thurmalsprms.

9501-102. Pushpendra, Madhyastha MN (Bio Dept, SDM Coll, Ujjire). **Seasonal variation and diversity of zooplankton in a small pond near Mangalore.** *J Ecobio*, **6**(3) (1994), 197-200 [12 Ref]

Seasonal variation and diversity of zooplankton in a small pond near Mangalore was undertaken for one year. Both zooplankton number and diversity were low in the pond. Eleven species belonging to protozoa, rotifera, copepoda and cladocera were present. High species diversity existed in September although quantitative abundance

occurred during November, February and April. Low number and diversity of zooplankton is attributed to the acidic condition of the pond.

9501-103. Ramana PV, Sreeramalu K (Dept Zoo, Andhra Univ, Visakhapatnam-530 003). **Some aspects of limnology and fishery of Vottigedda reservoir in Andhra Pradesh.** *J Ecobio.* **6**(2) (1994), 81-88 [12 Ref].

Monthly variations in limnological parameters such as temperature, hydrogenion concentration and dissolved oxygen along with rainfall and water level of the reservoir during May 1991 to April 1992 have been studied. Among different species of fish collected. *Puntius* and *Mystus* species formed a mainstay of total fish fauna. Except *Catla catla* as all other species were native to the reservoir. The relative abundance and economic importance of each group of fish have been described.

9501-104. Shaji C, Patel RJ (Dept Bot, Sree Narayana Coll, Kollam, Kerala). **Phytoplankton ecology of a polluted pond at Anand, Gujarat.** *Ann Bio,* **10**(2) (1994), 191-197 [28 Ref].

Ecological studies of a polluted pond at Anand were made during October, 1986 to September 1988. The influence of physicochemical variables of water on phytoplankton population with special reference to four major groups was studied. The variables like temperature, total alkalinity, dissolved oxygen, calcium, chloride, nitrate, phosphate, silica and COD had profound impact on the algal flora.

9501-105. Sharma LL, Gupta MC (Dept Limno Fisheries, Univ Campus, Udaipur-313 001, Rajasthan). **Some aspects of limnology of Amarchand reservoir, district Rajsamand, Rajasthan: physical parameters.** *Polln Res,* **13**(2) (1994), 169-174 [33 Ref].

A perennial reservoir in the southern Rajasthan was studied for selected limnophysical aspects to assess role of these factors on the overall productivity status. Water clarity values between 66.0 - 336 cm indicate comparatively clear water status and the reservoir can be placed under mesotrophic category following classification. All the basis of water clarity. Interrelations of temperature and turbidity have been discussed in the paper.

9501-106. Sharma UP, PancleyKN, Prakash Ved (PG Dept Zoo, Bhagalpur Univ, Bhagalpur-812 007). **Ecology of fishes of Kawar lake wetland (Begusarai) Bihar.** *J Freshwater Bio*, **6**(1) (1994), 49-55 [13 Ref].

Ecology of fishes of Kawar lake Wetland were studied during 1993-94. Altogether 51 species of fishes belonging to 15 families and 10 orders were recorded. The range of physicochemical properties of water, and rich biotic potentiality adds to the higher productivity of fishes in the lake.

9501-107. Shukla SN, Agrawal NC, Dubey S (Govt SK PG CQ1IS Manganj, Dist Rewa MP 486 331). **Chlorophyll as an indicator of trophic status of water body.** *J Freshwater Bio*, **6**(2) (1994), 121-126 [19Ref].

Variations of chlorophyll (Chl.) a, b, c, in the Bila reservoir were studied from November 1988 to October, 1989. During the investigation period, the maximum concentrations of Chl. a (0.223 mg/m³) and Chl. c (0.193 mg/m³) were recorded in the month of April whereas the Chl. b was maximum (0.106 mg/m³) in May. Certain physicochemical factors have been also correlated with chlorophyll concentrations to evaluate their relationship.

9501-108. Singh Meena, Sinha RK (St. Xavier's High Sch, Near Gandhi Maidan, Patna). **Primary productivity and limnological profile of two ponds at Patna, Bihar.** *J Freshwater Bio*, **6**(2) (1994), 127-133 [23 Ref].

The primary productivity in two different ponds managed and sewage fed at Patna, Bihar was studied. It was observed that the primary productivity of the ponds depend mainly upon the intensity and quality of light, the carbon supply, the availability of nutrients and the biomass. The primary productivity was found to be more in sewage fed due to the presence of adequate nutrients and carbon dioxide.

9501-109. Singh Udaya Nand, Oumari Veena, Singl Gajendra Prasad (Aquaculture Res Lab, PG Dept Zoo, MS Coll, Motihari-845 401). **Qualitative and quantitative study of benthic fauna of Kararia Lake of Motihari, Bihar (India).** *J Freshwater Bio*, **6**(1) (1994), 21-25 [18 Ref],

The highest collection was in the month of August and minimum in January. It showed increasing trend from Autumn to summer months. Chironomidlarvae, oligochaetes, gastropods, pelecypods and ostracods constituted mainly the total fauna, besides scanty presence of shrimps, leeches and other insect larvae. The presence of chironomid larvae and TubiSex sp. and Nais sp. of oligochaetes were regarded as bioindicator of pollution.

9501-110. Sunil Kumar R, Antony A (Sch Marine Sci, Cochin Univ, Sci Techno, Cochin-682 016). **Impact of environmental parameters on polychaetous annelids in the mangrove swamps of Cochin, South West coast of India.** *Indian J Marine Sci.*, **23**(3) (1994), 137-142 [31 Ref].

Species composition, distribution and seasonal variation of polychaete fauna in the Cochin mangroves were evaluated. Effect of environmental parameters on the distribution of polychaetes was studied. Thirty three species of polychaetes belonging to genera under 10 families were identified. The errantia group were common than the sedentaria. Correlation was observed between polychaete fauna and salinity. Species diversity and richness was higher at st 1 (located near the Cochin barmouth) during premonsoon and postmonsoon seasons.

9501-111. Sunitha Rao G (Dept Zoo, Andhra Univ, Visakhapatnam-530 003). **Environmental constraints and meiofaunal abundance in the Gosthani estuary,** *Indian J Ecobio*, **6**(2) (1994), 103-108 [11 Ref].

The results of extensive surveys on the hydrography and meiobenthos of the annually bar closed Gosthani estuary opening into the Bay of Bengal are discussed. The major environmental constraints are periodical freshwater flooding raising the water to varied levels in total occlusion of the river mouth by a sand bar for varying periods, opening of the sand bar either manually cut or naturally bursting itself open, and the untreated sewage discharges from a segment of the city. The estuarine system becomes resilient consequent on its recovery from freshwater floods and tidal inputs gain momentum.

9501-112. Vijaykumar K (Environ Bio Div, Dept Zoo, Gulbarg Univ, Gulbarga-585 106, Karnataka). **Seasonal variations in the primary productivity of a tropical pond.** *J Ecobio*, **6**(3) (1994), 207-211 [21 Ref].

The primary production in semi tropical region of Karnataka, Attikolla pond, India was performed during 1989-90 using light and dark bottle method. The primary production reached the peak once in the month of June during annual cycle and rate of production was low during July. Temperature and transparency played an important role in determining the pond productivity.

Nature and Natural Resources Conservation

9501-113. Aluri Raju JS, Subba Reddi C, Sujatha B (Dept Environ Sci, Andhra Univ, Visakhapatnam - 520 003). **Pollination in mangrove plants.** *J Nature Conserv*, **6**(1) (1994), 89-96 [9 Ref].

Mangroves are very vital for the perpetuation of diverse communities of aquatic and terrestrial organisms. The data show that different species have developed and adapted to pollination by animals and wind. Anemophily is predominant in the genera *Rhizophora* and *Suaeda* and in *Excoecaria agallocha*. *Bruguiera* species have explosive mechanism and require birds for tripping in largeflowered species and butterflies in small flowered species. Other mangal genera are pollinated by different species of bees, wasps, flies and moths.

9501-114. Ambasht RS, Srivastava Alok K, Ambasht NK (Cent Adv Std Bot, Banaras Hindu Univ, Varanasi, UP). **Conserving the biodiversity at India: an ecological approach.** *Indian Forester*, **120**(9) (1994), 791-798 [18 Ref].

Conservation of biodiversity means the preservation and protection of the variability in organisms in such a way that human welfare and interest are ensured at an optimum level over indefinite period of time. In this respect the concept of insitu and exsitu preservation of species is important for habitat restoration and biodiversity conservation. Through its conservation, mankind will get indirect benefits of higher photosynthetic carbon fixation, more oxygen and less CO₂ in atmosphere, better balance of ecosystem and maintenance of hydrology at microhabitat level.

9501-115. Awasthi Ajay K, Sharma Sunita, Das Mihir K (Sch Environ Bio, APS Univ, Rewa-486 003). **Evaluation and status assessment of Panna National Park (MP).** *Env Eco*, **12**(3) (1994), 685-689 [8 Ref].

An evaluation and status assessment of Panna National Park was attempted. The wild animal population showed an increase in population till 1988 and then declined in 1990 and 1991. Rehabilitation and socioeconomic impact assessment of the people revealed that of the 13 villages displaced only three villages received compensation. There is an urgent need for a management plan for the national park not only from forestry view point but also from the ecological aspect of the management.

9501-116. Balchand Alungal A (Sch Marine Sci, Cochin Univ Sci Techno, Cochin-682 016). **A case study on biodiversity: Pesticide engendering of ecological-imbalance and resultant environmental consequences.** *Environ Conserv*, **21**(2) (1994), 164-166 [10 Ref].

Kuttanad, the southcentral part of the State of Kerala, is a lowlying cultivable area of rich paddy. In this region, through the ages, a lifecycle of lower order creatures had come into existence. These creatures proved to be effective controllers of insects and pests that were harmful to paddy cultivation. Use of insecticides having been either avoided or only limited.

9501-117. Chakrabarti Kalyan (Office Conservator Forests, Res Working Plan C;rcle, Calcutta). **Biological diversity and human welfare.** *Indian Forester*, **120**(9) (1994), 831-843.

Paper describes the importance of in situ conservation of biodiversity to ensure the natural process of evolution to continue without any hindrance. The results of Project Tiger areas with a concept of total ecosystem preservation in the core areas are worth mentioning here. The main reasons for the degradation of ecosystem are poverty and ignorance about the understanding of the ecosystem. People from all walks of life are to be involved in conservation education for the common benefit of mankind.

9501-118. Das BK, Singh M (Cent Adv Std Geo, Panjab Univ, Chandigarh-160 014). **Rate of sediment accumulation in lakes of Udaipur, Rajasthan, India, using the 210pb method.** *Environ Geo*, **24**(1) (1994), 28-33 [16 Ref].

Sediment accumulation rates have been determined in Udai Sagar, Fateh Sagar and Pichola lakes, which lie in the arid climatic zone, using the 210Pb method. The rate of sedimentation estimated in these lakes is 8-9, 3-42 and 2-80 mm/yr, respectively. River inflow, mining activity, and lithology contribute to controlling the sediment deposition pattern in Udai Sagar Lake whereas in Fateh Sagar and Pichola lakes, anthropogenic erosion of loosely bound terrigenous material through wave action and varying lithology are the major contributors.

9501-119. Janardhanan KK, Khaliq Abdul, Naushin Fauzia, Ramaswamy K (Centl Inst Medicinal Aromatic Plants, Lucknow-226015). **Vesicular arbuscular mycorrhiza in an alkaline usar land ecosystem.** *Curr Sci*, **67**(6) (1994), 465-469 [24 Ref]

Vesicular arbuscular mycorrhization was observed on plants growing in an alkaline usar land ecosystem that supported only scanty vegetation. Six plant species, four belonging to the pioneer vegetation and two introduced in the usar land were examined. The results indicated abundant occurrence of VAMycorrhizae on root systems of plant species of pioneer vegetation as well as introduced plants in the alkaline usar land ecosystem. Native VAM fungi of usar land ecosystem appear to be tolerant to soil alkalinity. The results suggest potential use of the native VAM fungi for the revegetation and reclamation of alkaline usar lands

9501-120. Judah Sangeeta Dolly, Oommachan M (Dept Biol Sci, RD Univ, Jabalpur-482 001). **Studies on the plants related to socio religious ceremonies in the rural and tribal areas of Jabalpur and Maldia districts.** *Indean J Appl Pure Bio*, **9**(1) (1994), 1-5 [7 Ref].

Plants are the closest companion of rural and tribal people and are an integral part of their culture. Plants are also closely inter-woven with the traditions and lifestyle of tribals and are used in socio religious ceremonies in one or another form. The present paper enumerates ninety three socioreligious plants.

9501-121. Kaushik JP (Sch Std Bot, Jiwaji Univ, Gwalior). **Effect of environment on the flora of Gwalior region of north Madhya Pradesh.** *Acta Ecologica*, **16**(1) (1994), 41-49 [11 Ref].

In past the area was having semievergreen vegetation but due to anthropogenic activities the flora of the area is changing with fast rate. Some species have become extinct (*Ceratopteris thalictroides*) and some are under threat due to arrivals of “Ultra neophytes” such as *Parthenium hysterophorus*.

9501-122. Kesava Reddy K. **Biological resources and biodiversity conservation in Andhra Pradesh.** *Indian Forester*, **120**(9) (1994), 799-806 [3 Ref].

The forest types in Andhra Pradesh range from coastal swamps to moist evergreen patches inhabiting variety of fauna. The efforts for preservation of the biodiversity in Andhra Pradesh are underway in several spheres. Public cooperation is the need of the hour.

9501-123. Kundu Nishit K, Ghose Mrinal K (Cent Mining Env, Indian Sch Mines, Dhanbad-826 004). **Studies on the topsoil of an underground coal mining project.** *Environ Conserv*, **21**(2) (1994), 126-132 [6 Ref].

Topsoil is an essential component for land reclamation in coalmining areas. The topsoil is very seriously damaged if it is not mined out separately in the beginning with a view to replacement for due reclamation of the area. An underground coalmining project in a virgin area at Raniganj coalfield was selected. Sampling plots were chosen at various locations of agricultural land within the core zone of the project, for studying the topsoil characteristics of the said project before mining.

9501-124. Lahiri AK (West Bengal Wasteland Dev Corp Ltd. Calcutta). **Conservation of biological diversity-West Bengal scenario.** *Indian Forester*, **120**(9) (1994), 807-811 [13 Ref]

There are 16 different forest types in West Bengal which has been indentified and maintained as Preservation Plots. Participative method of forest management has been taken as tool for maintenance of biodiversity on the basis of experience of Arabari experiment. The survey and evaluation method to study biodiversity has been developed. Analogous model of plantation forestry is prescribed for conservation of maximum number of species.

9501-125. Mehrotra A, Kushalpa KA (Regl Office, Western Region, Ministry of Environment & Forests, E-324, Arera Colony, Bhopal-664 016). **An approach for sustaining biodiversity in India.** *Indian Forester*, **120**(9) (1994), 759-772 [9 Ref].

India as one of the signatories of the Biodiversity Convention has made great strides for the conservation of biodiversity. Essentially, any sustainable way and wise management of biodiversity requires assessments of diversity, legal enactments and division of work at National and State levels. Paper focuses the attention on these issues and suggests an approach to find the solution.

9501-126. Mishra PK (Dept Bot, RS More Coll, Govindpur, 828109, Dhanbad). **Effects of polluted water on medicinal properties of Sarpagandha.** *Polln Res*, **13**(3) (1994), 237-240 [5 Ref]

Medicinal herbs sometimes fail to show satisfactory results. Pollution seems to be one of the major causes for this. In the present investigation a quantitative and qualitative inhibition in alkaloids of *Rauwoalfia serpentina* due to water pollution has been observed.

9501-127. Rai AM (Conservator of Forests, Seed Res, Lucknow, UP). **Role of emerging technologies for conservation of biodiversity.** *Indian Forester*, **120**(9) (1994), 781-785.

Frontier areas of technology, viz, IT, GIS, Remote Sensing, Biotechnology, Energy etc, are some of the disciplines that have important roles to play for conservation of biodiversity. Biotechnology even has the potential to reverse the trend of erosion of biodiversity. The role of these disciplines in conservation of biodiversity has been discussed. Simultaneously, attempt has been made to correlate these with other traditional disciplines so far as conservation of biodiversity is concerned.

9501-128. Rajput AM (Dept Agri Econ Farm Manag, Coll Agric, JNKVU, Indore). **Management of natural sources and crop productivity through watershed approach in central India.** *J Nature Conservator*, **6**(1) (1994), 61-66 [6 Ref].

Study is concerned mainly with the management of natural resources and crop productivity through watershed approach in Indore region of Madhya Pradesh. The

double cropped area per holding is more than twice in the watershed leading to the higher cropping intensity of 137 as against 118 in the non-watershed area. Most of the farming activity was concentrated in the kharif season and as such 86 percent farmers participated in soybean cultivation programme in the watershed area against 70 percent in the non-watershed area.

9501-129. Shukla Sangeeta, Oommachan M (Dept Biol Sci, Rani Durgavati Univ, Jabalpur - 482 001). **Certain ethnobiological observations from rural and tribal areas of Mandla and Jabalpur.** *Indian J Appl Pure Bio*, **9**(1) (1994), 41-47 [15 Ref].

Mandla district of M.P. constitutes more than 60 % tribal population whereas in Jabalpur district it is only 20%. The tribals of these districts use plants and animals in various ways such as medicine, food, other material requirements and in socioreligious and cultural ceremonies. In the present paper a number of such informations are given, some of them are less known or new.

9501-130. Singh BP (Inst Forest Productivity, Ranchi, Bihar). **Biodiversity conservation in mangrove environment.** *Indian Forester*, **120**(9) (1994), 827-830 [18 Ref].

Paper describes the biodiversity and need of its conservation in mangrove areas. Different strategies suggested are habitat and species protection, legislation, public awareness, peripheral development and research cum extension measures. The paper discusses different problems of mangrove environment and suggests measures to solve them.

9501-131. Singh KK, Prakash Anand (Taxonomy Herbarium Div, Natl Botl Res Inst, Lucknow, UP). **Studies on forest ecosystems diversity of Rajaji National Park, Uttar Pradesh in a conservation perspective.** *Indian Forester*, **120**(10) (1994), 880-890, [7 Ref].

The diverse tropical ecosystems of the park have many unique characteristics which have both scientific importance and practical Significance for overall ecodevelopment. Discussing the depleting plant resources, the possible causes and effective measures for conse.vation of threatened species are provided in this paper.

9501-132. Subramanian P (Dept Anim Sci, Sch Life Sci Bharathidasan Univ, Tiruchirapalli- 620 024, Tamil Nadu). **Mangroves: a threatened and endangered coastal ecosystem.** *J Swamy Botl Club*, **11**(1&2) (1994), 51-55 [14 Ref].

The bioactive compounds of many mangrove vegetation have significant pharmaceutical importance. It also gives room for various culture activities such as aquaculture, aquiculture, apiculture, silviculture etc. Though mangroves are fragile, they act as a 'bulwark' against cyclonic storm, coastal and river bank erosion etc. and thereby protect interior inhabitants. The economic, biological and aesthetic values of mangroves are difficult to estimate. This endangered mangrove ecosystem should be conserved to maintain the perception and functional integrity among human environment.

Health and Toxicology

9501-133. Agnihotri NP, Baroodh AK (Div Agricl Cheml, Indian Agricl Res Inst, New Delhi- 100 012). **Bound residues of pesticides in soil and plant a review.** *J Scient Indl Res.* **53**(11) (1994)c 850-861 [79 Ref].

The use of ¹⁴C-labelled pesticides has shown that a sizeable portion (20-40%) of applied activity may remain on soil or plant in nonextractable or bound form (bound residues). It is presented that bound residues generally increase with time and ageing makes the binding stronger. Various methods for estimation and characterization of bound residues are briefly described. The total ¹⁴C-bound residues can be easily estimated by combustion method.

9501-134. Ambrose T, Cyril Arun Kumar L, Vincent S, Lambert Roselyn (PG Res Dept Zoo, Loyola Coll, Madras-600 034). **Bio chemical responses of Cyprinus carpio comm-unis to toxicity of tannery effluent.** *J Ecobio*, **6**(3) (1994), 213-216 [18 Ref].

Tissue carbohydrate, protein and lipid contents in *Cyprinus carpio* var. *comn1ljinis* under the toxic stress of sublethal concentrations of composite tannery effluent exhibited statistically significant ($P < 0.05$) decline. Depletion in the three major biochemical components of gill, liver, intestine and kidney were found to be a function of sublethal concentration as well as exposure period.

9501-135. Ambrose T, Vincent S, Cyril Arun Kumar L (Dept Zoo, Loyola Coll Madras-600 034). **Susceptibility of the freshwater fish *Cambusia aginis* (Bird and Girad) *Sarotherodon mossambicus* (ieters) and *Cirrhinus mirgala* (Ham) to zinc toxieity.** *Indian J Env Toxico*, **4**(1) (1994) 29-31 [12 Ref]

Susceptibility of *Gambusia agnis*, *Sarotherodon mossambicus* and *Cirrhinus mirgala* to the toxic effects of heavy metal zinc as a function of time is elucidated. *C. nzigala* is the most susceptible species and *afinis* is the most tolerant one. Continued anonitoring and assessment of aquatic resolrcts for lilpe pollution load of zinc could be done using *C. mrigala*, as the indicator species.

9501-136. Ambrose T, Vincent S. (PG Res Dept Zoo, Loyola Coll, Madras - 600 034). **Chromium induced anaemia in the fresh water carp *Catla Catla* (Ham.).** *J Natl Eng. Conserv*, **6**(1) (1994), 67-71 [IO Ret].

Haematological response of *Catla catla* under the stress of heavy metal chromium exhibits decrease in TEC, Hb and PYC reflecting the anaemic state of lish. Resultant aliaemic condition is further attested by increase in red cell indices like MCH and MCHE. Applicability of piscine haematology in fish health under divergent conditions of life and environment is suggested.

9501-137. Amta GK, Savant KB (Dept Zoo, BNN Coll, Bhiwandi-421305). **Studies on toxicity of copper, zinc and mercury mixtures to estuarine crab *llyplax gangetica*.** *Polln Res*, **13**(3) (1994), 263-267 [I3 Ref].

Effects of mixtures of salts of copper, zinc and mercury on the survival of the crab *llyplax gas? getica* was investigated. Mixtures of copper and zinc were more toxic than expected, on the basis of toxicity of individual compounds. The presence of either copper or zinc salt protected the crab from the toxic action of mercury. The nature of interactions between copper, zinc and merowry is discussed.

9501-138. Anusha Amala A, Cyril Arun Kumar L, Selvanayagam M, Mary Saroja Y (Holy Cross Coll, Nagercoil, Tamil Nadu). **Effect of endosulfarl on oxygen consumption, red blood cell count and food utilization of freshwater fish *Ckzrius dussumieri*.** *Indian J Env Toxico*, **4**(1) (1994), 33-36 [20 Ref].

Freshwater fish, *Clarius dussumieri* collected from local pond were exposed to endosulfan, and LC50 for 48h was determined. Under sublethal conditions, oxygen consumption red blood cell count and food utilization parameter were studied. Decline in oxygen consumption rate, red blood cell count, food parameters and efficiencies were observed.

9501-139. Ayyadurai K, Swaminathan CS, Krishnaswamy V (Tamil Nadu Vet Anim Sci Univ, Madras - 600 007). **Studies on heavy metal pollution in the finfish, *Oreochromis mossambicus* from river Cauvery.** *Indian J Environ Hlth*, **36(2)** (1994), 99-103-[18 Ref].

An investigation on heavy metals present in the water and the finfish *Oreochromis mossambicus* was carried out during 1990-91, at three stations on river Cauvery, South India. The mean concentration of Cu, Fe, Mn and Zn in water was 0.0010, 0.1260 0.0073 and 0.0059 mg/L respectively and Hg was below the detectable limit. The accumulation of these metals was maximum in liver as compared to other organs of the fish.

9501-140. Bala Sashi, Sinha Ratna, Sinha MP, Mehrotra PN (Dept Zoo, Ranchi Univ, Ranchi - 834 008). **Toxicity of sublethal concentrations of some heavy metal salts on haematology of *Channa punctatus*. III Erythrocyte counts.** *J Freshwater Bio*, **6(2)** (1994), 187-190 [10 Ref].

Adult *Channa punctatus* treated at sublethal concentrations of cadmium chloride, lead nitrate and zinc sulphate for 10, 20, 30 and 40 days exhibited marked changes in total RBC count of blood. A significant decline was observed as a result of toxicity of all three heavy metal salts.

9501-141. Begum Ghousia, Vijayaraghavan Shantha (Dept Zoo, Osmania Univ, Hyderabad - 500 007, AP). **In vivo inhibition of branchial Na⁺- K⁺ and Mg²⁺ and ATPase of *Clarias batrachus* exposed to sublethal concentration of dimethoate.** *Polln Res*, **13(2)** (1994), 213-216 [11 Ref].

The sublethal toxicity of dimethoate on branchial Na⁺- K⁺ and Mg²⁺ Adenosine triphosphatase was investigated in a teleost fish *Clarias batrachus* at the end of 1st, 2nd

4th and 8th day of exposure. Adenosine Triphosphatases exhibited significant inhibition throughout the investigation.

9501-142. Bhattacharya Lata (Endocrino Environ Physiol Unit, Sch Std Zoo, Vikram Univ, Ujjain - 456 010). **Effect of DDT exposure on melanophores of the fish, *Oreochromis mossambicus*.** *J Env Polln*, **1**(2) (1994), 53-54 [6 Ref].

The fish, *Oreochromis mossambicus* was exposed to 4 ppm concentration of the DDT for 20 days. The area of melanophores in the trunk and the tail fin skins of the exposed fish showed a highly significant reduction. It also exhibited a marked increase in the stellate and punctate melanophores ($P < 0.001$) while in the control the melanophores remained in the reticulate form.

9501-143. Bose Mahuya, Vachhrajani B, Tha S, Outta KK (Indl Toxicol Res Cent, Lucknow). **Histochemical changes in the testicular tissues of rats exposed to ethylene glycol monomethyl ether.** *Indian J Env Toxicol*, **2**(2) (1992), 45-49 [17 Ref] (Late Recd).

Ethylene glycol monomethyl ether is a known testicular toxicant. In the present investigation the functional status of testicular tissues was evaluated to know whether EGME induced spermatocyte loss is a direct effect on these cells or mediated through Sertoli cells. The activity of hydrolytic enzymes of Sertoli cells decreased in association with decline in population of particular spermatogenic cell type by 12 day post exposure and regained when normal cellular association were present by 24 day post exposure.

9501-144. Bose Shambunath, Sukhopadhyay Banibrata, Chaudhury Shibani, Bhattacharya Shelley* (Environ Toxicol Lab, Dept Zoo, Visvabharati Univ, Santiniketan-731235). **Correlation of metal distribution, reduced glutathione and metallothionein levels in liver and kidney of rat.** *Indian J Environ Bio*, **32**(9) (1994), 679-681 [29 Ref].

Effect of group IIB metals on the endogenous status of metallothionein (MT) and reduced glutathione (GSH) was studied in two vital detoxifying organs namely, liver and kidney of rat. The renal GSH showed differential response to the metal treatment, the level increasing slightly by cadmium and depleting significantly by zinc and mercury. A

Isositive correlation was found between group IIB metal accumulation and 1 he manifestation of toxic response.

9501-145. Chandrashekar KR. Kaveriappa KM (Div Appl Bot, Mangalore Univ, Mangalagangothri - 574 199). **Effect of Pesticide on sporulation and germination of cortidia of aquatic hyphomycetes.** *Environ Bio*, **15**(4) (1994), 315-324 [16 Ref].

The studies on different concentration of pesticide on the sporulation of 18 species of aquatic hyphomycetes have revealed that these chemicals had no inhibitory effect on the sporulation upto 6 mg/l. At higher concentrations their effect varied. The tolerance of the organisms to the chemicals is believed to be substrate dependant.

9501-146. Charles Manoharan A, Prabakaran V (110, Nakkeerar Street, KK Nagar, Madurai - 625 020). **Acute toxicity and genotoxic effect of chromium and selenium on the common loach *Lepidocephala Zichthves thermalis*, (Bleeker).** *Geobios*, **21**(1) (1994), 44-46 [7 Ref].

Acute toxicity and toxicity interactions of chromium and selenium to *Lepidocephala thermalis* have been estimated by using standard bioassay techniques. Loach is more sensitive to latter than to former. Both are genotoxic to fish and induce the formation of micronuclei in the erythrocytes.

9501-147. Chauhan Ugam K, Mahindra A, Suryanarayana V (Microbio Biotechno Lab, Sch Environ Bio, APS Univ, Rewa - 486 003). **Influence of soil microflora in response to application of some pesticides.** *J Ecotoxicol Environ Monit*, **4**(2) (1994), 133-136 [7 Ref].

To find out the effect of pesticides on soil microbial population, the two pesticides (Stomp 30 and Butachlor) were tested for their effect on microorganisms. It was found that lower concentrations of these pesticides did not alter the activity of the organisms, but at higher concentration, most of the bacterial and fungal species were sensitive.

9501-148. Chinoy NJ, Mathews Michael, Vinod V Barot (Reproductive Endocrino Toxicology Unit, Sch Sci, Gujarat Univ, Ahmedabad- 380 009). **Toxic effects of sodium fluoride ingestion in mice.** *Indian J Env Toxicol*, **3**(1&2) (1993), 30-34 [22 Ref] (Late Recd).

Adult male mice, *Mus musculus* were treated with 10 mg/kg body weight of sodium fluoride (NaF) for 30 days to elucidate its effects on the haematology and physiology of the animal. The results of the study revealed no significant changes in haemoglobin, RBC and WBC counts after NaF treatment. Accumulation of fluoride in serum was observed as a result of NaF treatment. The decreased levels of protein in serum, liver and kidney of NaF treated mice indicated its altered metabolism in the presence of fluoride.

9501-149. Choudhary MV, Tantarale VT, Lokhande PJ, Sherekar PY, Kulkarni KM (PG Dept Zoo, Govt Vidharbha Mahavidyalaya, Amravati - 444 604). **HCH impact on feeding and growth of the freshwater fish *Rasbora daniconius* (Ham).** *Uttar Pradesh J Zoo*, **13**(2) (1993), 139-142 [16 Ref].(Late Recd).

Fish *Rasbora daniconius* were exposed to HCH sublethal concentration and their effect on feeding and growth were studied. Feeding rate was found to be decreased with increase in HCH concentration treatment. Similar pattern was observed for the growth and specific growth of the freshwater fish under different HCH sublethal concentration.

9501-150. Chowdhury A, Raha P, Guha P, Kole R, Banerjee A, Das MK (Pesticide Residue Lab, Dept Agril Chem Soil Sci, Bidhan Chandra Krishi Viswavidyalaya, Thohanpur- 741 202 Nadia, WB). **Effect of pesticides on the ulcerative disease syndrome of fish: a case study.** *Polln Res*, **13**(2) (1994), 161-167 [8 Ref].

Ulcerative disease syndrome in fish was observed at some places in Hooghly district of West Bengal. To find out the cause of this breakout, analysis of water and fish samples were taken into consideration in order to correlate the ulcerative disease syndrome of fish and the occurrence of toxic chemicals. The study revealed the presence of endosulfan (o,p'-DDT, methyl parathion and monocrotophos in water and fish tissue samples of the paddy cum fish culture system of the concerned area. But it has been revealed from this study that the pesticide residues might not be responsible for the development of ulcerative disease syndrome in fishes in that area.

9501-151. Cyril Arun Kumar L, Anusha Amali A, Selvanayagam M (Univ Environ Sci, PG Res Dept Zoo, Loyola Coll, Madras -600034). **Biochemical dynamics in *Cyprinus***

carpio communis (Linn) in response to heavy metals nickel and lead. *Indian J Env Toxico*, **3**(1&2) (1993), 35-38 [12 Ref] (Late Recd).

Freshwater fish, *Cyprinus carpio communis* was exposed to sublethal concentrations of heavy metals nickel and lead for 5, 10 and 15 days. Lethal toxicity and metal induced changes in carbohydrate, protein and lipid content in muscle and liver were observed. All biochemical parameters were found to decrease as the concentration of metal and exposure periods increases. These changes were more in liver than muscle.

9501-152. Cyril Arun Kumar L, Vincent S, Ambrose T (PG Res Dept Zoo, Loyola Coll, Madras - 600034). **Uptake and persistence of the heavy metals cadmium in tissues of the freshwater fish *Cyprinus carpio*.** *Polln Res*, **13**(4) (1994), 361-364 [8 Ref].

Uptake and persistence of the nonessential heavy metal cadmium was evidenced in gill, intestine, muscle, liver and kidney. Accumulation of the xenobiotic cadmium exhibits positive correlation with concentration as well as exposure period. Persistence of cadmium in tissues is suggested to depend on availability and persistence of the contaminant in the medium.

9501-153. Das BK, Kaviraj A (Dept Zoo, Univ Kalyani, Kalyani- 741235). **Partitioning of cadmium in the sediment of an experimental common carp culture system treated with potassium permanganate, cobalt chloride and vitamin B complex.** *Geobios*, **21**(1) (1994), 8-12 [9 Ref].

High proportion of Cd was detected in exchangeable form in the sediment of artificial enclosure of common carp following treatment of 2.5 mg/Cd. Fe and Mn oxides of the sediment absorbed almost equal amount of Cd, but carbonate and organic fractions showed least affinity for Cd. Vitamin B complex treatment modified the partitioning pattern of Cd.

9501-154. Dhanapakiam P, Premlatha Juliet ~ (PG Dept Zoo, Alamelu Angappan Coll (w), Komarapalayam - 638 183). **Histopathological changes in the kidney of *Cyprinus carpio* exposed to malathion and sevin.** *J Environ Bio*, **15**(4) (1994), 283-287 [6 Ref].

Effect of LCo (96 h) concentration of malathion and sevin (after exposure of 15 days) on the renal cells of *Cyprinus carpio* fingerlings was studied. Hypertrophy of renal cells changes in the nuclear structure, formation of vacuoles, necrosis and degeneration of renal components were noticed. The kidney damage was severe with malathion treatment than sevin.

9501-155. Dhawan S (Dept Zoo, Univ Lucknow, Lucknow, Uttar Pradesh - 226 006). **Effect of short term exposure of commercial BHC on ECG and EEG of duck (*anas sp.*)**. *J Ecotoxicol Environ Monit*, **4**(1) (1994), 45-52 [11 Ref].

A group of ducks was administered intravenous low doses of BHC and their ECG and EEG were monitored simultaneously. Results showed the direct effect of pesticide residue on the heart and brain. ECG exhibited the quick passage of impulse from SA node, changed auricular size, incomplete sinoatrial block, incomplete atrioventricular block, right - and left bundle branch block and shortening of resting polarized state of heart, while EEG exhibited the low voltage slow activity (LVSA) pattern showing slow activity of entire brain.

9501-156. Dutta GR, Adhikari Soma, Datta Munshi JS, Dutta HM (Univ Dept Zoo, Bhagalpur Univ, Bhagalpur-812007). **Accumulation of malathion in different organs of *Heteropneustes fossilis* (Bloch)**. *J Freshwater Bio*. **6**(2) (1994), 183-186 [9 Ref].

Quantitative estimation of malathion, has been carried out on gill, ovary, kidney, liver and muscle tissues of a teleost fish *Heteropneustes fossilis* after 10 days exposure to a sublethal concentration of malathion (6 ppm). Gill showed the maximum residual accumulation while muscle tissues showed no trace. The residual accumulation of malathion in various tissues was studied by Gas Liquid Chromatography.

9501-157. Elizabeth FX, Jayanthi (PG Res Dept Zoo, Loyola Coll, Madras - 600 034). **Effect of BHC on the excretory pattern of the snail *Vivipara bengalensis* (Lam)**. *Polln Res*, **13**(4) (1994), 365-367 [2 Ref].

The effect of different concentrations of BHC on the excretory pattern of snail *Vivipara bengalensis* were studied. The rate of ammonia and urea was reduced due to the organochlorine compound BHC. There was a slight decrease in ammonia level, during 4th hour and there was a further reduction with increasing concentration.

9501-158. Flora SJS, Tandon SK (Div Pharmaco Toxicol, Defence Res Dev Estb, Gwalior -474 002, M P). **Influence of dithiocarbamates on teratogenic effects of cadmium in hamsters.** *Indian J Env Toxicol*, **3**(1&2) (1993),39-42 [24 Ref] (Late Recd).

The pregnant hamsters were administered 0.2, 2.0, 4.0 or 6.0 mg/kg cadmium as cadmium chloride, orally, on day 8 of gestation. The examination after sacrificing the animals on day 15 of gestation revealed that embryo and fetotoxic effect and the accumulation of cadmium in maternal organs, fetus and placenta increase with the dose of cadmium. The pretreatment with a group dithiocarbamates, potential metal chelators, decreased the accumulation of cadmium in maternal kidney but could not reduce the teratogenic effects of cadmium and the accumulation of cadmium in maternal liver.

9501-159. Ganathy V, Srinivas Reddy D, Reddy SLN, Shankaraiah K (Dept Zoo, Osmania Univ, Hyderabad- 500 007). **Effect of hexachlorocyclohexane on biochemical composition of the fish *Channa punctatus*.** *J Ecotoxicol Environ Monit*, **4**(1) (1994), 15-20 [20 Ref].

Time course alterations in carbohydrate metabolism of gill were studied in the *Channa punctatus* exposed to sublethal concentration of hexachlorocyclohexane. In an exposure span of 15 days, level of glycogen, glucose, pyruvate were depleted with corresponding increase in activities of phosphorylase 'a', LDH and SDH, NAD, TCDH and NADP, ICDH, while lactate levels exhibited an inconsistent trend. The above results were found to be time specific indicating due to the susceptibility of gill to HCH intoxication.

9501-160. Govindan VS, Jacob Lija. Devika R (Cent Environ Stud, Anna Univ, Guindy, Madras-600 025). **Toxicity and metabolic changes in *Gambusia affinis* exposed to phosphamidon.** *J Ecotoxicol Environ Monit*, **4**(1) (1994) 1-6 [14 Ref].

The toxic effect of phosphamidon on *Gambusia affinis* and the metabolic changes in the total carbohydrate, total protein and total lipids in the tissues of skin, muscles, gill, liver and brain were studied for 15 days. When the fish was exposed to phosphamidon for a period of 96 h, the LC 50 values for 24, 48, 72 and 96 h were 44.8 mg, 13.2 mg, 5.0 mg and 3.0 mg/l, respectively. *G. affinis* was found to be tolerant to phosphamidon.

9501-161. Gupta Anil Kumar, Chakrabarti Padmanabha (Dept Zoo, Burdwan Univ, Burdwan-7131 04). **Toxicity of zinc to fresh-water teleosts, *Notopterus notopterus* (PaBas) and *Puntius javanicus* (Blkr).** *J Freshwater Bio*, **5**(4) (19934, 359-363 [14 Ref] (Late Pub).

The acute zinc toxicity of adult freshwater teleosts *Notopterus notopterus* (Pallas) and *Puntius javanicus* (Blkr) for 96hour were performed using static bio assay test. In separate exposures of zinc to *N. notopterus* and *P. javanicus*, the LC 50 values were estimated to be 59.79 mg/L and 29.62 mg/L respectively. The harmful concentration for *N. notopterus* and *P. javanicus* were 0.3109 mg/L and 0.1356 mg/L respectively.

9501-162. Gupta BN, Srivastava AK (Indl Toxicol Res Cent, Epidemiology Div, Mahatma Gandhi Marg, Lucknow-226 001). **Health hazards from water based building paints.** *Indian J Environ Prot*, **14**(1) (1994), 31-35, [16 Ref].

Water based building paints may contain a multitude of chemicals and are widely used in our country. Large number of persons are occupationally or environmentally exposed to these paints. The health effects of these are not well documented. The article briefly reviews the potential health problems in respect of exposure to water based paints.

9501-163. Gupta Sarita, Bhosale Snehlata, Pandya Kirtan (Dept Biochem, Fac Sci, MS Univ Baroda, Baroda-390 002). **Effect of simultaneous low level exposure of Pb and Cd on Blood and acetylcholinesterase activity in rats.** *Indian J Exptl Bio*, **32**(11) (1994), 819-821 [18 Ref].

Dose dependent study was performed to identify subcritical level of Pb and Cd. Blood AChE activity was inhibited by (0.1 mg/ kg body wt) of both lead and cadmium in isolation and combination, the extent of which increases with duration of exposure. Hepatic AChE activity however is less affected by Cd and Pb together than Pb, As along. Erythrocyte AChE activity though decrease in all groups, is not significant.

9501-164. Jabde PV, Saikh RaiNath SMH (PG Dept Zoo, MSG Coll, Malegaon Camp, Nasik-423 203, Maharashtra). **Histopathological changes in the liver of a teleost fish**

Noemacheilous aureus exposed to lethal and sublethal concentration of cypermethrin. *Indian J Env Toxicol*, **3**(1&2) (1993), 23-26 [18 Ref] (Late Recd).

Paper deals with histopathological changes in the liver of *Noemacheilous aureus*, when exposed to a synthetic pyrethroid insecticide cypermethrin at lethal concentrations of 0.6, 0.05, 0.04 and 0.03 ppm for 24, 48, 72 and 96 hrs respectively and sublethal concentration of 0.005 ppm for 10, 20, 30 days.

9501-165. Jain Rashmi, Mishra KD (Dept Zoo Aquaculture Env Lab, SSL Jain PG Coll, Vidisha-464 001). **Histopathological alterations in the liver of *Puntius ticto* due to exposure of herbicide, atrazine.** *Polln Res*, **13**(4) (1994), 375-380 [18 Ref].

Histopathological alterations were studied in the liver of fresh water teleost, *Puntius ticto* after exposure of herbicide, atrazine. Pathological lesions of liver were observed after exposure of 2 sublethal doses, 1 ppm and 10 ppm for different exposure durations. Pathological lesions include infiltration of blood cells, hypertrophy and vacuolar degeneration of hepatocytes.

9501-166. Janardan Reddy S, Nanda Kurnar NV, Ramamurthi R (Pesticides Indl Toxicol Cent, Dept Zoo, Sri Venkateswara Univ, Tirupati-517 502). **Impact of chronic phosalone toxicity on crab: 2 modulations in hydromineral balance.** *Polln Res*, **13**(4) (1994), 323-329 [10 Ref].

Toxicity of phosalone, an organophosphorus insecticide has been studied on the crab *Oziotelphusa senex senex*. The study reveals that the sublethal concentration of phosalone showed a significant effect on total body weight, hydration levels in the whole animal haemolymph, hepatopancrean and gill tissues of the crab resulting in modulations in the hydromineral metabolism.

9501-167. Jha BK, Jha BS (Univ Dept Zoo LN Mithila Univ, Darbhanga-846 008). **Ovarian histopathology in urea and ammonium sulphate intoxicated freshwater teleost, *Heteropneustes fossilis*.** *J Env Polln*, **1**(3&4), (1994), 145-148, [11 Ref].

The study reports the impact of 30day exposure to sublethal concentration of urea and ammonium sulphate on the ovary of the freshwater teleost, *Heteropneustes fossilis*. Urea induced initial stimulation of vitellogenesis followed by subsequent arrest of

ovarian growth. Besides, the cells of germinal epithelium developed hyperplasia leading to the complete fusion of the two follicles.

9501-168. Jha WIM, Jha AK, Jha BS (Dept Zoo, LN Mithila Univ, Darbhanga-846 008). **Testicular injury under chronic stress of nickel chloride in the freshwater climbing perch *Anabas testudineus*.** *J Ecotoxicol Environ Monit*, **4**(2) (1994), 127-131 [15 Ref].

The testicular injuries produced after 30 days exposure of *Anabas testudineus* to the sublethal concentration (146.7 mg/l of nickel chloride) was investigated. There was a loss of cellular organisation of the lobule due to the degeneration and rupture of the lobular wall. Autolysis of the germinal epithelium and connective tissue stroma, reduced spermatogenic activity as evident from absence of secondary spermatocytes, spermatids and sperm cells were also apparent.

9501-169. Khare RK, Verma DK (Dr. Baba Saheb Ambedkar Natl Inst Socl Sc (Mhow), Hari Pathak, Mhow, Indore-453 441). **Occupational environment and health hazards in dal mills.** *Indian J Environ Prot*, **14**(2) (1994), 133-136 [5 Ref].

A study with special reference to occupational environment and health hazards was conducted in dal mills located in Indore city (MP). During the crushing of pulses, protein dust of pulses and dust of polishing stones and sand spread out and pollute the environment. The paper discusses about the physical, chemical, biological, mechanical and psychological disorders among dal mill workers and the need for environmental education to prevent occupational health hazards and to make a healthy environment in dal mills.

9501-170. Kiran Ravi, Maharaj Poonam, Dhir Lalit K (Dept Biochem, Punjab Univ, Chandigarh-160 014). **Effect of carbofuran toxicity on hepatic glucose and lipid metabolism of rats.** *Polln Res*, **13**(4) (1994), 385-390 [13 Ref].

The effect of oral administration of carbofuran (4.5 mg/kg body weight), daily, for 15 days was investigated on rats blood glucose, pyruvate and lactate. Glycogen and lipid contents of livers were also analyzed. Observed hyperglycemia was attributed to decreased utilization of glucose and increased mobilization of liver glycogen.

9501-171. Krishna Murthy V, Bhaskar M, Govindappa S (Fish Physio Div, Dept Zoo, S V Univ, Tirupati-517 502). **Studies on lipid profiles of fish liver on acclimation to acidic medium.** *J Environ Bio*, **15**(4) (1994), 269-273 [23 Ref].

Freshwater fish, *Tilapia mossambica* (Peters) were subjected to acclimation to sublethal acidic water (pH 4.0) and hepatic lipid metabolism was studied. Considerable depletion in various lipid reserves was noticed with a remarkable increase in the tissue lipase activity. Increased levels of phospholipid and cholesterol contents in the tissue were recorded. These results could possibly be correlated to the higher energy demands and improvements in the membrane organisation induced by the acclimation to acidic water in order to get the positive survival value under the imposed acidic stress.

9501-172. Krishna Murthy V, Rajmohan HR, Venkatesh CR, Prakash MN, Rao SR (Regl Occupl Hlth Cent (South), Indian Coun Medl Res, Centl Lib Block B, MC Campus, Bangalore-560 002). **Assessment of working environment of various job processes in the factory manufacturing latex condoms.** *Indian J Environ Prot*, **14**(3) (1994), 210-215 [4 Ref].

Work environment air pollution through monitoring of total dust, respirable dust and subjective dust concentration at various sections of the factory is studied. The physical environment in terms of monitoring thermal stress, noise levels and light levels was also carried out. The control measures emerging out of this study to minimise the heat load, noise and light were suggested as recommendations to the management for implementation.

9501-173. Kumar Sheo, Kumar Sanjib (Univ Dept Bot, Bhagalpur Univ, Bhagalpur 812 007). **Toxicity test of heavy metals on Common guppy, *Lebistes reticulatus* (Peter).** *Indian J Applied Pure Bio*, **9**(1) (1994), 19-23 [8 Ref].

On administering the acute toxicity test on common guppy, *Lebistes reticulatus* (Peter) to a wide range of CuSO_4 , 5HYO , ZnSO_4 , 7HIO and $\text{Pb}(\text{NO}_3)_2$, it was observed that the concentration above 1.2 mg/l for Cu, 100.00 mg/l for Zn and 250.0 mg/l for Pb caused 100% mortality within 48 hr for Cu and Zn and within 96 hr for Pb. Behavioural changes were also studied.

9501-174. Mahajan RK, Kaur Navdeep (Guru Nanak Dev Univ, Dept Chem, Amritsar-143 005). **Estimation of chromium in the mine of occupationally exposed electroplaters.** *Indian J Environ Prot*, **14**(2) (1994), 124-127 [10 Ref].

The values found for the chromium concentration in the urine of electroplaters is in the range of 14 to 146 mg/l. A good correlation between the exposure time and the level of chromium in the body fluid of electroplaters have also been estimated. The present study also provide a comparative evaluation by voltametric method and atomic absorption method of analysis for the determination of chromium metal at trace level.

9501-175. Mahajan RT (Dept Zoo, MJ Coll, Jalgaon, Maharashtra-425 002). **Review fish toxicants of plant origin.** *Indian J Env Toxicol*, **4**(1) (1994), 7-17 [11 Ref].

A detailed survey on 150 plants used as fish poisons was undertaken for review. Out of these 85 % are indigenous while 15% are exotic. Amongst these trees (50 %) are higher in number, some are shrubs (30%), and a few are herbs (20%). Aerial parts such as leaves, fruits) stem/bark are mostly used. Underground parts i.e. rhizome or root of a few plants are employed. On studying various families, it was revealed that Leguminosae (31 %) represent higher (4 %)

9501-176. Mahajan RT, Mahajan GK, Patil BN (Biochem Comp Physio Sec, Dept Zoo, MJ Coll, Jalgaon, Maharashtra-425 002). **Some biochemical responses of the haemolymph of the crab *Paratelphusa jacquemontii* (Rathdum) exposed to oil cake of *Madhuca indica* (Gmel).** *Indian J Env Toxicol*, **4**(1) (1994), 25-28 [17 Ref].

Organic and inorganic constituents of haemolymph of freshwater crab, *Paratelphusa jacquemontii* (Rathdum) exposed to defatted oil cake of *Madhuca indica* have been studied at two sublethal dosages, significant rise in sugar, cholesterol, protein, urea, uric acid, amylase, alkaline phosphatase, SGOT (58.5%), SGPT (106 %), and potassium (145%) level in the haemolymph have been found during intoxication.

9501-177. Mandal Parabir Kumar, Mandal Anita (Sanjay Gandhi PG Inst Medl Sci, PB No. 375, Rae Bareilly Rd, Lucknow-226 001, UP). **Effects of heavy metals: a review.** *Indian J Env Toxicol*, **3**(1&2) (1993): 1-3 [54 Ref].

The effects of continuous exposure of heavy metals on various living organisms are discussed in this paper. Increase in pollution due to industrial activity has serious consequences on organisms exposed to the pollutants. An attempt is made to collect information in a review form on the basis of studies carried out by different workers.

9501-178. Mathur S (Dept Limno Fisheries, Rajasthan Agricl Univ, Udaipur Campus, Udaipur-313 001). **Molluscicide induced toxicity and gonad damage in a freshwater pulmonate *Lymnaea luteola* (Lammarek).** *Polln Res*, **13**(4) (1994), 403-409 [9 ref].

The common freshwater pulmonate snail, *Lymnaea luteola* of Rajasthan is known to be an intermediate host of digenetic trematodes. This snail was exposed to a well known molluscicide, copper sulphate in its different concentrations through static and acute bio assays. The 96 hr LC₅₀ was found to be 0.018 mg. Besides, regression equations, fiducial limits and heterogeneity are also presented.

9501-179. Mathur S, Durve VS, Gupta AK (Dept Limnology Fisheries, Rajasthan Agricl Univ, Udaipur Campus Udaipur-313 001). **Temperature dependent responses of *Lymnaea acuminata* (Lamark) to copper sulphate.** *Geobios*, **21**(3) (1994), 149-154 [18 Ref].

Toxicity of molluscicide copper sulphate was evaluated for *Lymnaea acuminata* during different months. The difference in toxicity levels was primarily due to the variations in temperature, LC₁₀, LC₅₀ and LC₈₄, their fiducial limits, regression equations, heterogeneity, presumable harmless concentrations were calculated and discussed.

9501-180. Meena Kumari B, Balakrishnan Nair N (Centl Inst Fisheries Techno, Cochin-682 029). **Effect of certain heavy metals on the survival of mussel *Perna viridis*.** *India J Env Toxicol*, **3**(1&2) (1993), 11-13 [24 Ref].

The effect of heavy metals such as Cu, Zn, Pb, Hg, Fe, Cd, Sn, As and the organic toxicant TBTO was studied on the survival of green mussel, *Perna viridis* under laboratory conditions. The 48 h. LC₅₀ values computed by probit analysis was found to be 0.83, 5.09, 13.11, 0.90, 14.49, 6.24, 5.32, 6.38 and 2.39 ppm respectively. The most toxic chemicals were Cu, tlg, and TBTO respectively.

9501-181. Metha Hemalata, Prakash AO (Sch Std Zoo, Jiwaji Univ, Gwalior-474 011). **Evaluation of LD 50 of extract of Datura metel (seeds).** *J Nature Conserv*, **6**(1) (1994), 101-104 [9 Ref]

LD 50 of various extracts of *Datura metel* (seeds) has been determined in adult rats through oral route. It has been found that its crude power, ethanolic and aqueous extract showed LD₅₀ of 5.99, 8.25, and 6.81 g/kg respectively. When these doses are expressed in terms of body surface area, the values appeared to be 34.94, 49.95 and 40.86 g/m². Results revealed that relatively ethanolic extract is less toxic than crude and aqueous extracts.

9591-182. Mishra CK, Hakim A, Kumar J (Dept Zoo, Maharaja Coll, Ara, Bihar). **Effect of monocil pesticides on the oxygen consumption and related blood parameters in *Channa punctatus* (Bloch).** *J Freshwater Bio*, **6**(1) (1994), 93-99 [27 Ref]

Oxygen consumption, RBC count and Hb content were studied in the control and 24 hours treated *Channa punctatus* to 0.005%, 9 - 15 % and 0 - 0.035 % monocil at a temperature of 21 ± 1°C. Under surfacing allowed condition the increase in VO₂ in the lower two concentrations and the decreases in the highest concentration (0.035 %) were insignificant (P > 0.05). Frequency for air gulp increased with increase in the concentration.

9501-183. Mitra Abhjit, Choudhury Amalesh (Dept Marine Sci, Univ Calcutta, 35, Ballygunge Circular Rd, Calcutta-700 019). **Heavy metal concentrations in oyster *Crassostrea cucullata* of Henry's Island, India.** *J Ecobio*, **6**(2) (1994), 157-159 [8 Ref].

Zn, Cu, Mn and Fe were determined in the soft body parts (mantle, gill and adductor muscle) of *Crassostrea cucullata*. The concentrations of Zn were higher than other metals analyzed. Gill and mantle exhibited higher concentration of metals than the adductor muscles. Concentration of all metals enhanced in all the body parts during the monsoon months.

9501-184. Mukhopadhyaya MK, Ghosh BB, Bagchi MM (Centl Inland Capture Fisheries Res Inst, Barrackpore-743 101). **Toxicity of heavy metals to fish, prawn and fish food organisms of Hooghly estuarine system.** *Geobios*, **21**(1) (1994), 13-17 [14 Ref].

Wastes

9501-220. Asthana Praveen Kumar, Bhatia Subash (Indian Inst Techno, Dept Cheml Engng, Kanpur-208 016). **Separation of phenol and paracresol from dilute aqueous waste streams.** *Indian J Environ Prot*, **14**(7) (1994), 490-496 [12 Ref].

The adsorption of phenol and p. cresol from dilute aqueous streams was studied in a fixed bed column using cation exchange resin Dowex 50 W-X8 and a bioadsorbent. Polymeric resin adsorbent (Dowex 50-X8) gave better result as compared to biosorbent. The break through profiles for the adsorption of phenol and peresol on both adsorbents for different design variables were obtained. The break through time was found to vary with the change of design variables.

9501-221. Aziz Qzair, Inam Asrif, Siddiqi RH (Plant Physio Lab, Dept Bot, Aligarh Muslim Univ, Aligarh-202 002). **Impact of treated oil refinery effluent on crop productivity and agricultural soils.** *Indian J Environ Hlth*, **36**(2) (1994), 91-98 [17 Ref].

A field study was conducted at the expermental farm of Mathura Refinery, Indian Oil Corporation, Mathura to evaluate the irrigational utility of treated refinery effluent in comparision with ground water, Growth and yield parameters, including grain yield of three cultivars of triticale and one of wheat, were studied. It was noted that effluent increased all the growth and yield parameters. Treated refinery effluent met the irrigational quality requirements as its physicochemical characteristics were within the pennissible limits. Triticale performed better than wheat.

9501-222. Bansal TK (Thapar Inst Engng Techno, Patiala-147 001). **Use of membrane teclmology for pollution abatement.** *Indian J Environ Prot*. **14**(1) (1994), 47-52 [8 Ref].

Biological and physicochemical techniques of wastewater treatment are solving the environmental problems at present but these have either no or very large pay back period. Membrane technology, whose start has been made with the desalination of waste, is nov becoming most popular in many other applications including pollution control due to its many merits.

9501-223. Bansal TK, Bajpai PK (Applied Sci Dept, Thapar Inst Engng Techno, Patiala-147 001). **Mathematical relations for pollution load estimation of metal plating industry.** *J Indl Polln Contl.* **10**(1) (1994), 21-30 [10 Ref].

Increase of dragout rate and/or concentration of dragout tank solution result in the increase of pollution load of a metal plating industry, while effluent volume gets increased on increasing rinsing water flow rate or rinsing ratio in order to maintain low TDS in the rinsing tank water. Use of more than one dragout tank and rinse is most beneficial in reducing pollution load, conserving rinse water whose scarcity is felt very much due to greater urbanization and industrialization and in minimization of wastage of costly plating chemicals. These facts are explained with the help of mathematical relations.

9501-224. Bhavani Shankar V, Muthu Krishnan N (CPR Environ Edn Cent, IA Eldams Rd, Alwarpet, Madras-600 018). **Is the groundwater in Madras city potable.** *Indian J Environ Prot.* **14**(3) (1994), 176-179 [2 Ref].

Ground water samples of open wells and deep bore wells were collected to study the variations in the parameters in 20 locations in Madras city. The results indicated that six locations had higher than permissible levels of TDS and chloride and two locations had higher than permissible levels of fluoride and two locations had higher amounts of iron. The causes of contamination of drinking water has been discussed.

9501-225. Chakradhar B, Kaul SN (Natl Environ Engng Res Inst, Nehru Marg, Nagpur-440 020). **Anaerobic fixed bed reactor system for treatment of cotton digestion waste-water.** *Indian J Environ Prot.* **14**(1) (1994), 1-7 [3 Ref].

Anaerobic fixed bed reactor system is used for the treatment of cotton digestion waste-water which is generated during the cotton digestion with alkali. Substrate removal kinetics was developed using Dewalle and Chain model and pseudomechanistic models. The values of kinetic rate constant, loading rate constant and the inhibition coefficient were determined for the system.

9501-226. Deepak Desh, Ali Wazid (Dept Cheml Engng, Univ Roorkee, Roorkee-247 667). **Effect of heavy metals on activated sludge treatment process.** *J Indian Assoc Environ Manag,* **20**(3) (1993), 9-14 [45 Ref].

Activated sludge (AS) treatment is a widely accepted biological process for both municipal sewage and industrial wastewaters. In the combined treatment of industrial waste waters having higher concentrations of heavy metals and municipal sewage, the performance of the AS process gets affected depending upon the nature and concentration of heavy metals. Heavy metals in an AS plant influence both the biokinetic and adsorption kinetic parameters.

9501-227. Deka S, Devi A (Inst Adv Std Sci Techno, Khanapara, Guwahati-22, Assam). **Impact of flaring of group gathering station (GGS) on physico-chemical properties of rice field soil at Lakowa oil field of Assam.** *Polln Res.* **13**(2) (1994), 101-105 [11 Ref].

Physicochemical properties of the soil samples collected at different distances and at two different depths were investigated. Results show that physicochemical properties of the soil samples collected at different distances and at different depths of the field situated at Lakowa, Assam have a significant impact on the soil environment up to a distance of 100 metre from the flaring point of the group gathering station (GGS).

9501-228. Desai Manik, Madamwar Datta* (*PG Dept Biosci, Sardar Patel Univ, Vallabh Vidyanagar-388 120, Gujarat). **Anaerobic digestion of a mixture of cheese whey, poultry waste and cattle dung a study of the use of adsorbents to improve digester performance.** *Environ Polln,* **86**(3) (1994), 337-340 [18 Ref].

Paper describes the results of a study aimed at improving the efficiency of anaerobic digestion of a mixture of cattle dung, poultry waste and cheese whey at a ratio of 2:1:3 (w/w on dry weight basis) in terms of total gas production, methane content and process stability by adding various adsorbents. The adsorbents appeared to improve the digester performance.

9501-229. Deshpande VP, Kaul SN, Deshpande CV (Natl Environ Engng Res Inst> Nehru Marg, Nagpur-440020). **Determination of hydraulic flow characteristic in anaerobic fixed film moving bed reactor.** *Indian J Environ Prot.* **14**(7) (1995), 497-504 [8 Ref].

Tracer studies using rhodamine b were conducted based on impulse dose technique and step decrease dose technique for determining the hydraulic flow

characteristic, namely mixing levels and effective volumes with respect to plug flow zone, stagnant zone complete mix zones in anaerobic fixed film moving bed reactor. Observations with step decrease dose of rhodar.lineb showed the percent volume of complete mix zone to be more than 90 % for the same flow rates in the case of impulse dose technique.

9501-230. Hussain Sajid, Sarma PN, Bhavani T (Indian Inst Cheml Techno, Analyt Chem Div, Hyderabad-500 007). **Characterization of effluents from a cement industry and removal of toxicity using clay and coconut shell carbon.** *Indian J Environ Prot*, **14**(2) (1994), 119-123 [10 Ref].

Laboratory studies on the characterization and treatment of effluents obtained from a cement industry have been carried out. The wastewater is found to be extremely alkaline having high BOD, COD and total dissolved solids. The effluents are treated by activated coconut shell carbon (acc) and attapulgitic (active clay) for different contact periods. Analysis of the effluents after treatment revealed considerable reduction in the concentration of BOD, COD and heavy metals. The efficiencies of acc and attapulgitic in reducing COD, BOD and metal concentrations have been compared.

Forestry and Environment

9501-260. Bajaj Manjul (Int Dev Res Cent, New Delhi). **Role and impact of government interventions in the forestry sector.** *Wasteland News*, **9**(4) (1994), 4-12 [11 Ref].

The pre-1988 forest policy caused economic decline by ignoring the underlying; ecological, ownership and participation issues, the new Forest Policy is erring in the opposite direction. Relegation of forests predominantly to ecological and subsistence functions to the neglect of monetary returns may pose a threat to the very existence of forests which could in the long run entirely subvert the otherwise laudable environmental goals of the revised policy.

9501-261. Banerjee UK, Banerjee S (Dept Silviculture Agroforestry, Dr. Y.S. Parmar Univ Horticulture Forestry, Nauni, Solan, Himachal Pradesh). **Forest management and biodiversity.** *Indian forester*, **120**(9) (1994), 78S790 [18 Ref].

Biodiversity is a concept covering all levels of biological organisation, including genes, species and ecosystems. The impact of human disturbances on forest biodiversity must be assessed. Inappropriate forest harvesting operations can lead to loss of ecosystem integrity. Revision of forest management systems may be required to conserve biodiversity.

9501-262. Kumar Ash,wani (Bio Techno Lab, Dept Bot, Univ Rajasthan, Jaipur-302 004). **Laticiferous plants as potential bioremedies for Wasteland restoration.** *J Env Polln*, **1**(3&4) (1994), 101-104 L22 Ref].

Several million ha. of land of the country suffers from salinity or alkalinity or both. A large number of latex bearing plants grow naturally in the problem soils. Some of the potential laticiferous plants such as *Calotropis procera*, *Euphorbia tirucalli*, *E. lathuris*, *E. antisiphilica* *Pedilanthus tithymaloides* were studied at the petro crops farm in the University of Rajasthan and attempts were made to increase their growth and productivity.

9501-263. Pattanayak RK, Patel MK (IDL Cheml I td. Qlty Contl Safety Lab, Rourkela 769 016). **Afforestation as a measure towards pollution abatement: the IDL experience.** *Indian J Environ Prot*, **14**(7) (1994), 520-527 [16 Ref].

Nature has provided many inexpensive air monitoring and control devices in the form of plants, herbs and flowers which can indicate many valuable clues on air pollution. It is only to select the right plants and observe them to determine the pollutional status of environment. The paper is an attempt to give an idea about the status of air pollution control in J DL Chemicals Limited, Rourkela, and dust fall on the leaves of various plants which are planted in this area.

9501-264. Ray PN (Indira Gandhi Natl Forest Acad, Dehradun). **Towards improvement of site, growth and yield information in forestry for sustainable management.** *Indian Forester*, **120**(11) (1994), 969-980 [28 Ref].

Forests of India are under tremendous pressure and large extents of such forests are under various stages of degradation. Efficiency of the forest production system is to be augmented by optimal management decisions which need quality information basic parameters of forest, such as site, stand structure, growth and yield. For better

comprehension, the spectacular development in the relevant science have been briefly reviewed, indicating their present status in Indian forest management. Ways to improve existing forest management information, and to devote research efforts towards it, have been suggested.

9501-265. Tewari DN (Indian Coun Forestry Res Edn, Dehradun). *Urban forestry. Indian Forester*, **120**(8) (1994), 647-657 [19 Ref].

Wildlife

9501-266. Prakash Ishwar (Zool Survey India, Jodhpur, Rajasthan). **Biodiversity conservation in the Thar desert.** *Indian Forester*, **120**(10) (1994), 873-879 [15 Ref].

The Thar desert has already lost the lion, cheetah, caracal, wolf and wild bear. The population of florican, houbara, great Indian bustard, desert cat, desert fox, jackals, gazelle, black buck has drastically diminished. The causative factors of vanishing wildlife have been discussed. Irrigation through the water brought through the Indira Gandhi Canal is a mighty ecological event which is transforming vast desert grasslands into extensive crop fields. The typical xeric elements are being replaced by mesic species. Several measures for the conservation of biodiversity in the IG Canal region have been proposed which should be adopted without loss of time.

9501-267. Sharma RA (Office Principal Chief Conservator Forests, Bhubaneswar, Orissa). **Participatory wild management.** *Wasteland News*, **10**(1) (1994), 25-26.

Participatory Forest Management (PFM) programmes are being implemented in India for halting forest degradation by associating local villagers in the protection of degraded forests in return for the right of usufructs like fuelwood, fodder and timber. It is suggested that the same concept can also be extended to the management of wildlife parks and sanctuaries which have recently witnessed numerous violent incidences due, mainly to increasing restriction being imposed on the life of villagers in the neighbourhood.

Energy and Environment

9501-268. Jagadeesh KS, Geeta GS, Suvarna CV (Dept Agricul Microbio, Univ Agricul Sci, Dharwad-580 005). **Fungal pretreatment of arecanut husk for methanogenesis.** *Polln Res*, **13**(4) (1994), 411-415 [9 Ref].

Arecanut husk was pretreated with the white rot fungus, *phanerochaere chrysosporium* which increased the crude protein content by over 100 %, under nutrient amended conditions. Whereas, under unamended conditions, the lignin degradation was maximum and resulted in increased methane yields.

9501-269. Rathi AKA (Cheml Po11n Contl, Govt of Gujarat9 Industries Commissionerafe, Gandhinagar). **Energy conservation environmental protection and utilization of carbon dioxide.** *Energy Environ Monit*, **10**(2) (1994), 123-130 [7 Ref]

With sustained efforts, CO₂ could be utilized in various ways which would go a long way in reducing global warming. Suitable measures need to be initiated by the developing countries also so that the same could be integrated with industrial development right at the planning stage.

9501-270. Sharnza MP (Alternate Hydro Energy Cent, Univ Roorkee, Roorkee-247 667). **Biogas generation from biomass a lab and pilot study.** *Indian J Rural Techno*, **6** (1994), 7-17 [17 Ref].

Paper attempts to cover the findings of laboratory work as well as the performance of a pilot plant (Janta Model biogas plant) of 6m³ capacity with respect to one representative feedstock i.e. Ipomea fistulosa plant stem (IFPS). The results have indicated that these biomass residues in supplementation with cattle dung yield higher amount of biogas as compared to only cattle dung.

9501-271. Sharma Satyawati, Madan Mira (Cent Rural Dev Techno Indian Inst Techno, Hauz Khas, New Delh-110 016). **Potential of mulberry (Morus alba) biomass.** *J Scient Indl Res*, **53**(9) (1994) 710-714 [81 Ref].

Mulberry (*Morus alba*) is a multipurpose plant and can play a major role in the economic development of rural as well as semi-urban areas. The different biological

aspects and the potential of mulberry for different purposes have been reviewed here. An integrated approach for its total utilization has also been discussed.

9501-272. Shivraj D, Seenayya G (Dept Microbio, Osmania Univ, Hyderabad).

Optimum total solids content for the generation of biogas from poultry litter waste. *Indian J Environ Hlth.* **36**(2) (1994)* 115-118 [11 Ref].

Present study was undertaken to investigate the pattern of biogas production with different percent total solid content and to determine the optimum total solid to be used for biogas generation from poultry litter waste. The biogas evolved and its percent methane in the digester with different solid contents is given. In all the digesters biogas production increased with increasing time.

Plant and Pollution

9501-273. Ambasht Navin K, Agarwal Madhoolika (Eco Res Lab, Cent Adv Std Bot, Dept Bot- Banaras Hindu Univ, Varanasi-221 005). **Enhanced ultraviolet radiation and its impact on agriculture crops a review.** *Energy Env Monit*, **10**(2) (1994), 141-146 [43 Ref].

Paper reviews the deleterious effects of increased levels of UV radiation on main physiological functions, morphological characters and dry weight production in a number of agricultural crop plants. Among species and cultivars of various crops, the degree of effectiveness of UV varies. Broad leaf C₃ plants are found more susceptible than C₄ plants. Leguminous species are reported to be more sensitive than the C₃ plants. This differential sensitivity of UV could lead to changes in competition with plant communities.

9501-274. Ampily R, Chauhan SK, Dubey PS (Sch Std Bot, Vikram Univ, Ujjain-456 010, MP). **Effect of SO₂ on the biology of *Alternaria tenuis* and *Fusarium solani*.** *Indian J Env Toxicol*, **3** (1993), [15-17] [15 Ref].

This study on *Alternaria tenuis* Auct and *Fusarium solani* (Mart) Sacc, was carried out to determine the effect of sulphur dioxide (SO₂) on the biology of these fungi. Almost all parameters were found to be decreased with the increase in concentration.

The study demonstrated that increasing concentration of SO₂ increase the extent of the adverse response of the two test fungi. *Alternaria tenuis* was found to be affected more than that of *Fusarium solani* by SO₂ and was highly significant in the higher concentration.

9501-275. Balashouri, Prameeladevi (Environ Bio Div, Dept Zoo Kakatiya Univ, Warangal-506 009). **Effect of tannery effluent on germination and growth of selected pulse and cereal crop plants.** *J Ecotoxicol Environ Monit*, **4**(2) (1994), 115-120 [18 Ref].

Study was carried out to assess the impact of tannery effluent on seedling growth of *Vigna radiata* (L), *Cajanus cajan* (L) and *Sorghum bicolor* (L) plants under laboratory conditions. The values of germination percentage, seedling growth, chlorophyll content and phytomass accumulation increased over control set with corresponding increase of effluent concentrations.

9501-276. Barooah Madhumita, Borthakur HP (Agric Biotechno Programme, Dept Soil Sci, Assam Agric Univ Jorhat-785 013). **Isolation of hydrocarbon degrading microorganisms from oil fields of upper Assam.** *J Indl Polln Contl*, **10**(1) (1994), 31-34.

Streak plate technique was used for isolating microorganism from oil contaminated soil collected from oil fields of Duliajan in upper Assam. This led to the isolation of five fungal strains and one bacterial strain which were screened for their ability to degrade crude oil of low and high wax composition. The ability of the individual isolates to degrade Duliajan crude oil was determined by the difference in crude content in the growth medium before and after incubation by the conventional solvent extraction procedure.

9501-277. Bhattacharjee S, Mukherjee AK (Dept Bot, Univ Burdwan, Burdwan-713 104). **Influence of cadmium and lead on physiological and biochemical responses of *Vigna unguiculata* (L) Walp. seedlings I. Germination behaviour and proline content and protease activity.** *Polln Res*, **13**(3) (1994), 269-277 [20 Ref].

Physiological and biochemical responses of *Vigna unguiculata* seedlings under the influence of cadmium and lead were investigated with reference to germination

behaviour, total protein and proline content and protease activity. The CdCl₂ at a concentration of 1000 µM was found to be completely lethal but PbCl₂ was not. Increasing concentration of both the metals decreased germination rate and the inhibition of root growth was more.

9501-278. Bhattacharjee S, Mukherjee A K (Dept Bot, Univ Burdwan, Burdwan-713 104). **Influence of cadmium and lead on physiological and biochemical responses of *Vigna unguiculata* (L) Walp. seej gs. II Cell injury, pigment, sugar, nucleic acid content and peroxidase activity.** *Polln Res*, **13**(3) (1994), 279-286 [19 Ref].

Physiological and biochemical responses of *Vigna unguiculata* seedlings under the influence of cadmium and lead were investigated. With the increasing concentration of both the metals cellular damage was prominent. Pigments like chlorophyll a and b and carotenoids also decreased. The total soluble sugar increased with the increasing concentration of heavy metals but the insoluble sugar decreased. Cadmium was more toxic than lead and the root was the most sensitive part compared with stem and leaf.

9501-279. Chauhan SVS, Jain PK (Dept Bot, RBS Coll, Agra 282 007). **Effect of SO₂ fumigation on pollen fertility in *Capsicum annuum* L.** *Acta Ecologica*, **16**(1) (1994), 30-36 [15 Ref].

Effect of various concentration of SO₂ on pollen fertility in *Capsicum annuum* L. var. Pusa Jwala was observed. The reduction in pollen fertility increased with the increase in the concentration and period of fumigation. Maximum reduction in pollen fertility (45 %) was shown by plants fumigated with 1 ppm SO₂ for 50 days at bud initiation stage.

9501-280. Chauhan SS, Jain PK (Dept Bot, RBS Coll, Agra-282 007). **In vitro pollen germination in *Capsicum annuum* L. plants fumigated with sulphur dioxide.** *J Env Polln*, **1**(3&4) (1994), 89-91 [14 Ref].

Effect of SO₂ fumigation on in vitro pollen germination in *Capsicum annuum* L. Var, Pusa Jwala was studied. Pollen grains of plants fumigated with 1 ppm SO₂ for 100 days at seedling stage showed only 28.4 % in vitro pollen germination, while the shortest pollen tubes (1345 µm) developed from pollen of plants exposed with 1 ppm SO₂ for 75 days at vegetative stage.

9501-281. Farooq Mohammad, Gupta RC, Beg MU (Indl Toxic Res Cent, PB No 80, MG Marg, Lucknow-226 001). **Sulphur dioxide abatement capabilities of common, Indian treedes-2: Psidium gejava.** *Indian J Env Toxicol*, **2**(2) (1994), 27-30 [17 Ref] (Late Recfd).

One yearold sapling of *Psidium guajava* (guava) plants were exposed to varying concentration of SO₂, for 4 hr in a continuous flow exposure chamber to determine the levels of injury in plants. It was found that mild injury and severe injury were developed at 12.0 and 17.5ppm SO₂ concentrations respectively. Absolute increase in the sulphur content was decreased while efficiency of the plant to remove sulphur dioxide per unit weight was increased at severe injury concentration when compared to that of mild injury concentrations.

9501-282. Tmam Khasim D, Nanda Kumar NV, Hussain RC) Bhagyalakshmi K, Dhanangaya Naidu M (Dept Zoo, Div Environ Bio, Sri Venkateswara Univ, Tirupati-517 502). **Chromium translocation from farm soil contaminated with chromate industrial effluents into plants.** *Polln Res*, **13**(4) (1994) 303-316 [12 Ref].

Farm soil samples contaminated with industrial chromium were studied for its translocation and accumulation pattern in different plant parts Or Arachi; *Arachis hypogaea* (peanut plant) and *Cicer arietinum* (Bengal gram plant) at different growth periods. The total chromium accumulation pattern in both the plants was root > leaves > shoot > seeds. The most edible portion of the plants showed least or insignificant accumulation of chromium irrespective of proximity to root.

9501-283. Jain Asha, Sood IS Sharma KK (Dept Chem, Govt Autonomous Coll, Ajmer-305 001, Rajasthan). **Root nodulation in the presence of heavy metals in *Vigna angiculata*.** *Polln Res*, **13**(3) (1994), 233-236 [10 Ref].

Effect of different concentrations of heavy metals on root nodulation in *Vigna angiculata* was investigated, Pot experiments were performed to evaluate the variation in root nodulation when different concentration of heavy metals were present. Nodulation was found to be the best in presence of lead and least in the presence of mercury.

9501-284. Jayaprakasll Ch, Srinivas N, Rao BV, Prasada Rao PVV (Dept Bot, Govt Junior Coll, Rajam AP). **Effect of chromium (VI) on the mitotic activity of Allium cepa root meristem.** *J Environ Bis*, **15**(4) (1994), 255-261 [13 Ref].

The effect of chromium (VI) on the mitotic activity in the root meristems of Allium cepa is reported. The parameters observed include root growth, mitotic index and phase index. With increase in concentration, Cr (VI) inhibited both root growth and mitotic index. Phase indices revealed that Cr (VI) acts as a prophase poison.

9501-285. Nirmal Kumar JI, Rana BC (PG Dept Bot, Jai Hind Coll, Dhule-424 002). **Response of Eichhornia crassipes to isoproturon.** *J Ecobio*, **6**(3) (1994), 225-227 [11 Ref].

Effect of isoproturon on chlorophylls, total sugar, protein contents of water hyacinth *Eichhornia crassipes* (Mart) Solms) was studied. The study shows that increasing concentrations of isoproturon gradually decrease the chlorophyll and total sugar. However, proteins and phenols increased in all concentrations, but slight decrease was noticed after ten days treatment.

9501-286. Patra Rashmi R, Panigrahi AK (Lab Environ Toxicol, Dept Bot, Berhampur Univ, Berhampur-760 007). **Changes in residual mercury accumulation and pigment contents in some aquatic plants, Pistia and Hydrilla exposed to solid waste of a chloralkali industr.** *J Environ Bio*, **15**(5) (1994), 299-307 [17 Ref].

Toxicological effects of leached mercury from the chloralkali industry on the changes in residual mercury content and pigment content in *Pistia* and *Hydrilla* were studied. Drastic depletion in chlorophyll content was marked in the exposed plant leaves when compared to control leaves. A significant increase in phycocyanin and carotenoid level was marked in exposed plant leaves, when compared to control plant leaves. A positive and significant increase in residual mercury level was observed in the exposed plants with an increase in exposure period.

9501-287. Saggo MIS, Kumari Poonam (Dept Bot, Punjabi Univ, Patiala-147 002). **In situ monitoring of genotoxicity of sewage sludge amended soil by screening natural vegetation.** *Polln Res*, **13**(3) (1994), 241-247 [23 Ref].

Natural vegetation was analysed to know the impact of pollution on genetic system of plants. The alternations in the abnormalities during microsporogenesis and pollen viability were studied among plants growing in the control site and the polluted site. There was increase in frequency of abnormal tetrads in nearly all species growing in the polluted site as compared to plants of same species but from nonpolluted site. The plants inhabiting the nonpolluted site showed less frequency of micronuclei than that of the inhabitants of the polluted site.

9501-288. Senthil Kumar S, Arockiasamy DI (Dept Plant Sci, Bharathidasan Univ, Tiruchirapalli-620 024). **Role of Vesicular Arbuscular Mycorrhizae in reducing the heavy metal toxicity in *Sorghum bicolor* (L) Moench with reference to nitrate reduction system.** *J Swamy Botl Club*, **11**(1&2) (1994), 25-27 [15 Ref].

The role of mycorrhizal infection in heavy metal tolerance was investigated in *Sorghum bicolor* (L) Moench, using NRA as an indicator for heavy metal toxicity. The relationship between the concentration of zinc and NRA was found to be simple linear and negative. The reduction was observed in the concentrations 50 μ M and above. VAM could recover the heavy metal toxicity only up to 'ID-50' dose namely 50 μ M. At higher concentrations, VAM fails to recover the heavy metal toxicity. VAM did not play a significant role on nitrate uptake or transport.

9501-289. Shahare CB, Varshney CK (Sch Environ Sci, Jawaharlal Nehru Univ, New Delhi-110 067). **Impact of sulphur dioxide pollution on some trees with reference to their growth.** *J Env Polln*, **1**(3&4) (1994), 149-155 [20 Ref]

The effect of SO₂ pollution in the field condition was studied examining the transplanted saplings at the polluted site of Indra Prasth Thermal Power Plant, New Delhi and comparing the results with the plants growing at relatively non polluted site of JNU. Exposure to SO₂ pollution adversely affected the plants as indicated by foliar injury in the form of chlorosis and necrosis. Phytomass was considerably suppressed

9501-290. Sharma Maneesha, Srivastava Pushpa (Dept Bot, Univ Rajasthan, Jaipur). **Influence of a dairy plant effluent on the growth of *Spirulireia subsalsa* Oerst En Gomont.** *J Env Polln*, **1**(2) (1994), 55-59 [15 Ref].

Spirulina subsalsa, a halotolerant alga, was used as test organism to analyse the influence of dairy effluent before and after treatment. The treatment effluent supported better growth of the alga than the raw effluent. Untreated effluent, however, maintained growth of the salt loving alga indicating the presence of sodium salt or its substitute in the effluent.

9501-291. Sood IS, Sindhu RS, Sharma KK (Chem Dept, Govt Col3, Ajmer-305 001). **Bioaccumulation of heavy metals by some aquatic plants.** *Polln Res*, **13**(4) (1994), 331-343 [21 Ref]

In this study of accumulation of heavy metals by aquatic plants, mercury was found to be more toxic than lead and cadmium. Aquatic plants accumulate these metals and show resistance upto some time and for some low concentrations. Three aquatic plants selected for study, Marsilea minuta Hydrilla verticillata and Nymphea stellata accumulated cadmium most followed by lead and mercury.

9501-292. Tiwari S, Agarwal SK (PG Dept Bot KM Govt Coll, Raigarh, MP). **Expected performance index of tree species in response to air pollution stress.** *Acta Ecologica*, **16**(1) (1994), 9-14 [9 Ref].

Expected performance index is an expression of the total characterization of plant species with reference to its behaviour under polluted environment. Mangifera indica was recorded to be the best plant due to its varied beneficial character, while Bauhinia purpurea and Pongamia glabra showed lowest expected performance index values.

9501-293. Tiwari S, Bansal S (Kirodimal Govt PG Coll, Raigarh, M.P. 496 001). **Air pollution tolerance indices of some planted trees in urban areas of Bhopal.** *Acta Ecologica*, **16**(1) (1994), 1-8 [34 Ref].

Air Pollution Tolerance Index values of twenty five species growing in various localities of Bhopal were calculated. Air Pollution Tolerance level of each plant was different and plants did not show a uniform behaviour. Plants having higher APTI value are more tolerant to air pollution than those having lower APTI values. Species having low APTI values may act as bioindicator of pollution.

9501-294. Tiwari S, Bansal S (Kirodimal Govt PG Coll, Raigarh-496 001). **Effect of NO₂ pollution on Mimosa elengi Linn.** *Asian J Plant Sci*, **5**(1) (1993), 83-87 [18 Ref].

Attempt has been made to study the effect of NO₂ on an evergreen species *Mimosa elengi*. Decrease in root shoot length, fresh and dry weight, photosynthetic pigments and ascorbic acid was recorded in *Mimosa elengi* exposed to NO₂.

9501-295. Tiwari S, Bansal S, Rai S (Govt PG- Girls Coll, Shivaji Nagar, Bhopal) **Assessment of air pollution tolerance of two common tree species against SO₂.** *Biome*, **6**(2) (1993), 78-82 [13 Ref].

To assess air pollution tolerance capacity of an evergreen and a deciduous plant, two such species namely *Mimosa elengi* (E) and *Ficus religiosa* (D) were selected and they were exposed to different concentration of SO₂. It was found that the degree of foliar injury was directly proportional to the concentration of pollutant. A deciduous species was more susceptible to pollution stress than the evergreen species.

9501-296. Tiwari Swarnlata, Bansal Samidha, Rai Shashi (Govt Girls Coll, Shivaji Nagar, Bhopal (MP) 462016). **Responses of *Ficus religiosa* exposed to NO₂.** *Indian J Env Toxicol*, **2**(2) (1992), 21-26 [IO Ref] (Late Recd).

Fumigation of one year old *Ficus religiosa* seedlings with various concentrations of NO₂, was carried out in closed top polythene chambers for 4 hrs daily in the morning for three months. Initially the treatment stimulated the growth of plants but later on there was reduction in growth. There were significant reductions in root shoot length, fresh and dry weight of plants exposed to NO₂. There were reductions in photosynthetic pigments of pollutant exposed plants.

9501-297. Villcent S, Anibroze T (PG Dept Zoo, Loyola Coll, Madras - 600 034). **Impact of the heavy metal cadmium on phosphatase activity in Indian major carp *Catla catla* Ham.** *J Appl Poll Res*, **5**(1) (1994), 63-68 [18 Ref].

Acid and alkaline phosphatase enzyme activity in *Catla catla* as a function of sublethal concentrations of the heavy metal cadmium reveals organ specific gradation. Under the toxic stress of Cd, enzyme activity was found to be significantly decreased

and the decline is inversely proportional to concentration of the toxicant and treatment period. Inhibition of enzyme activity is more severe in gill and intestine.

9501-298. Vijayarengan P, Lakshmanachary AS (Environ Sci Div, Dept Bot, Almamalai Univ, Annamalaiagar - 608 002). **Differential nickel tolerance in greenoram cultivars.** *Polln Res*, **13**(3) (1994), 291-296 [119 Ref].

Soaking the seeds of four greengram cultivars in aqueous solution of nickel sulphate at 50 mg Nitr for 12 hours, prior to sowing, exhibited cultivar specific differences on the growth and yield reduction. Among the four cultivars, KM-2 was the most sensitive, ADT-2 and ADT-3 were intermediate in sensitivity and AG-2160 was the least sensitive to nickel treatment.

9501-299. Waghmode AP, Joshi MA (Dept Bot, Yashwantrao Chavan Coll Sci, Vidyanagar, Karad - 415 124). **Ecophysiological studies on Eichhornia crassipes (Mart.) Solms. With special reference to nitrate reductase.** *J Env Polln*, **1**(3&4) (1994), 141-144 [13 Ref].

There is little variation in magnitude of the activity of enzyme nitrate reductase in leaf, root and offset of Eichhornia crassipes. Maximum enzyme activity is found in leaves which is followed by offset and root. Nitrate reductase in E. crassipes required 20 mM substrate concentration, slightly acidic pH essential presence of Triton X-100 and the temperature between 22-32°C for its optimum activity.