

## Environmental Management

**9203 - 001.** Agarwal Anil (Cent Sci Env, F6 Kailash Colony, New Delhi). **Elements of global environmental democracy.** *Indian Forester*, **118** (5) (1992), 317-326.

Environmental problems can be divided into two categories namely those which can be managed by local communities and the second category includes those problems which can be managed at global level. Both types of problems need support of local community, national as well as global. Environmental problems can be solved by new concepts of citizenship, global compactness and community, national and global environmental democracy. Environment can be protected in a better way by providing global right for survival, information, atmosphere and appropriate compensation for community biological knowledge.

**9203 - 002.** Ambasht NK (Bot Dept, Bararas Hindu Univ, Varanasi). **Pressing global issues on water resource management.** *Indian Forester*, **118** (5) (1992), 348-351 [4 Ref.]

The temperature of the earth is rising leading to evaporational losses and melting of snow. There is also change in water table and fast reducing of per capita water availability. Due to pollution, the quality of water is deteriorating. Water is a medium for all kinds of life forms and an important natural resource. Therefore, to solve the alarming global issues combined efforts should be made by the Government and non-governmental organisations.

**9203 - 003.** Babu SK, Joshi CS (Dept Appl Geo, Univ Saugar, Sagar, MP). **Environmental Impact studies of the industrial town Korba, MP.** *Proc Int Conf Environ Impact Coal Utilization*, IIT Bombay, 1991, 277-290 [7 Ref].

The study comprised of thermal plant coal, ash, boiler characteristics and observation on red mud, waste products generated in the area. Environmental health data have been collected in the Korba and Balco townships to assess the impact of the industries and mining on the health of people.

**9203 - 004.** Bandyopadhyay Jayanta (Int Cent Integrated Mountain Dev, GPO Box 3226, Kathmandu Nepal). **Sustainability and' survival in the mountain context.** *Ambio*, **21** (4) (1992), 297302 [43 Ref].

Paper attempts to juxtapose the theoretical debate on sustainability and the practical issues pertaining to two well-known environmental movements in the Indian Himalayan region of Tehri Garhwal. A brief review of the current debate on sustainable development is followed by a search for the reasons behind the growth of consciousness about sustainability in the forest protection movement called Chipko and a movement against a high dam at Tehri.

**9203 - 005.** Bhargava PM, Singh UC (Bharat Aluminium Co Ltd. PO Balco Township, Bilaspur 495684, MP). **Environmental auditing for sustainable development.** *Indian J Environ Prot*, **11** (12) (1991), 922-926.

It is necessary to conduct environmental audit of environment management and pollution control activities because inspite of the provisions of environmental protection laws, the industries in the persuit of profits could disregard the environmental protection and prevention of pollution. Environmental audit, therefore, would be a tool with the authorising bodies to see the compliance with law. It will also help the mining and processing industries to demonstrate their concern and greater overall awareness towards compliance of environmental protection and improvement in the alternative methods for better environment and innovations in technology with least pollution.

**9203 - 006.** Bhattacharya N. **Stabilisatlon of migrating sands and desertification control.** *Wastelands News*, **7**(3) (1992), 37 48 [41 Ref].

The review discusses sand dynamics and problems connected with sand dune migration in different countries of the world with emphasis on the technology adapted for their stabilization. Sand movements could be controlled and stabilized by vegetative growth, fencing and chemical treatments or combination of methods backed by sound management. It is necessary to have trial runs in test plots before the adapted technology is transferred to the field.

**9203 - 007.** Bose SK (Driplex Water Energy Ltd, 1, Panchsheel Community Cent, New Delhi 110017). **Integrated pulp and paper manufacturing process and its effective waste water control and management.** *J Inst Public Hlth Engrs, India*, **1991** (4) (1991), 21-27 (10 Ref].

A brief discussion has been presented on the different pulp and paper processes adopted in India along with a review on different effluent treatment methods available for better control and management of waste water.

**9203 - 008.** Das RC, Panda AM, Biswas SK (State Prevention Contl Water Polln Bd, Bhubaneswar, Orissa). **Ash management of thermal power plant: a case study.** *Proc Int Conf Environ Impact Coal Utilisation*, IIT Bombay, 1991, 213-217 [5 Ref].

Disposal of ash at less cost may not always be the best which may offset the environment and aesthetics of the particular locality. This advocates pressing for proper management for its disposal and utilisation. In this study a management strategy compatible to environment, economy and aesthetic is made with special reference to the 4 x 62.5 MW Talcher Thermal Power Station (TTPS) stage.

**9203 - 009.** Dasgupta SP (Cent Std Man Env, CK II, Sect 2, Salt Lake City, Calcutta 700091). **Sustainable development through soil and water management on the basis of micro basins.** *Cent Std Man Env*, Annual Volume, (1991). 20-25 [3 Ref].

The deterioration of the fragile environment and degradation of our land and water resources can be effectively checked and the economy boosted up by adopting microbasin development approach for rural areas in India. Obviously, the basic unit of economic development in such an approach is the village or human settlements located in a definite micro-river basin which is the only viable hydrogeological unit for management of soil and water resources. Since in such an attempt the village people concerned can be directly involved as participants in plan formulation, execution and monitoring, the system becomes automatically sustainable.

**9203 - 010.** Joshi SR (Maharashtra State Electricity Bd, Bombay). **Environmental impact of thermal power stations; mitigation by Maharashtra State Electricity Board.** *Proc Int Conf Environ Impact Coal Utilisatton*, IIT Bombay, 1991, 207-211 [5 Ref].

The environmental impact of installing a thermal power station, especially with reference to the production and disposal of fly ash, has been receiving Maharashtra State Electricity Board's attention since 1968. Constant efforts are being made to minimise the adverse effects of ash production on the environment. These efforts are briefly discussed in the paper.

**9203 - 011.** Kala JC, Min Env Forests, Lodi Rd, New Delhi 110003). **Common lands : management perspective and emerging trends.** *India Forester*, **118** (5) (1992), 379-384.

Due to the increasing of human and animal population, there is great pressure on lands (forests, other government lands and community lands). In this paper measures and models have been discussed for management of common, public, forest and community lands.

**9203 - 012.** Mehrotra KN (Div of Entom, Indian Agricl Res Inst, New Delhi 110012). **Pesticides benefits and hazards,** *Proc Environ Safety and Judicious Usage of Pesticides*, New Delhi, 25th March 1991, 12-13.

Paper gives an account of the present trends and future strategies for pesticide usage in Indian context, based on the benefits and hazards. Alternative approaches to pest management viz. Integrated Pest Management (IPM) and need for conserving usage of insecticides have been discussed. Stereoselective synthesis of chemical insecticides using native or genetically altered enzymes obtained from microorganisms, is suggested.

**9203 - 013.** Mishra UC, Ramachandran TV (Bhabha Atom Res Cent, Bombay 400085). **Environmental impact of coal utilization for electricity generation.** *Proc Int Conf Environ Impact Coal Utilization*, IIT Bombay, 1991, 117-125 [14 Ref].

Extensive studies have been carried out in this country on radioactivity content of coal and flyash and this presentation briefly summarises findings of this study. Detailed results of countrywide survey have been summarized and proper siting of thermal power stations utilizing coal as fuel can minimize environmental impact as well as ensure utilization of flyash economically and in environmentally safe ways.

**9203 - 014.** Oza GM (Dept Bot, Fac Sci, The Maharaja Sayajirao Univ Baroda, Baroda, Gujarat). **The earth summit 1992.** *Indian Forester*, **118** (5) (1992), 338-343.

Environment can not be divided on the basis of boundaries of the countries and no individual or country can remain immune to the environmental consequences of development. Protection of the local as well as the global environment must form an integral part of the development process in an increasingly interdependent world. The paper also describes purpose, reason, expected outcome and hope of Earth Summit".

**9203 - 015.** Parmar BS (Div Agril Chemls, Indian Agril Res Inst, New Delhi 110012). **Agro chemical research for environment safety.** *Proc. Environ Safety and Judicious Usage of Pesticides*, New Delhi, 25th March, 1991, 32-34.

Paper reviews the present usage of pesticides in India and alternatives to these agro chemicals from the view point of environmental safety. Limitations of biopesticides isolated from bacterial isolated and nuclear polyhedral viruses (NPV) for control of mosquito larvae and agricultural insect pests, have been discussed. Use of botanical pesticides, neem products and biodegradable as well as bio active materials have been advocated.

**9203 - 016.** Sangha GS (Punjab State Coun Sci Techno, SCO No 2935 36, Sector 22C, Chandigarh 160022). **Traffic and environment in Punjab.** *Indian J Environ Prot*, **11** (12) (1991), 890-894 [12 Ref].

The negative affects of transport activities mainly concern the operation of transport equipment as well as the construction of infrastructure. They include accidents, congestion, air and noise pollution, consumption of land, energy and raw materials, and damage to landscape and its natural beauty. Concepts and measures aimed at improving environmental quality in urban zones should be designed as per states public transport and settlement system. Some of the protected measures as a policy matter for environmental oriented traffic planning are recommended.

**9203 - 017.** Singh KN (Sch Std Geo, Vikram Univ, Ujjain). **Environmental impacts of coal mining around Bina block. Singrauli Coal field, Madhya Pradesh.** *Ultra Scientist Phyl Sct*, **4** (1) (1992), 22-26 [10 Ref].

Environmental problems emerging from the mining activities in Bina Block (Mohar Sub-basin) a part of Singrauli Coalfield in M. P. have been enumerated and discussed. The environmental parameters affecting the environs of Bina include dust, fumes, smoke, gases, noise and deforestation. The suitable measures to control the present environmental pollution have been suggested in this paper.

**9203 - 018.** Vizayakumar K, Mohapatra Pratap DJ (Indian Inst Techno, Kharagpur 721302). **Environmental Impact analysis of a coalfield.** *J Environ Manag*, **34** (2) (1992), 79-103 [46 Ref].

Paper presents a case study of EIA of a coalfield. An eclectic approach consisting of expert opinion, content analysis, SIAM, opinion surveys and Delphi surveys are used to identify the impacts. Interpretive structural modelling method is used to structure the interrelationships among the impacts. System dynamics method is used to analyse the interrelationships and to test the viability of alternative pollution control methods.

### **Air Pollution**

**9203 - 019.** Agrawal GD, Ahmed S, Sarmah NN (Envirotech East (P) Ltd. 97-C Harish Mukherjee Rd, Calcutta 700026). **Some studies on ambient air quality and human health in northeastern India.** *J Inst Public Hlth Engrs India*, **1991** (4) (1991), 38- 48.

Quantified information on impairment of human health due to long term deterioration in air quality caused by industrial, vehicular and other air pollution is scanty, particularly in India. This paper reports the data collected in health surveys conducted by the doctors and interns of Govt Medical College, Silchar at three different locations in Assam, Tripura and Mizoram in connection with environmental clearance of some proposed industrial units.

**9203 - 020.** Bansal V, Tuli DK, Srivastava SP, Bhatnagar AK (India Oil Corpn Ltd, Analyst Div, Res Dev Cent, Faridabad 121007). **Investigations of effect of chemical composition of kerosines on carbon monoxide emissions from illuminating lamps.** *Indian J Environ Prot*, **12** (2) (1992), 98-101 (3 Ref].

Kerosines of different boiling range and chemical compositions were used as fuel in illuminating lamps. The flue gases were sampled by variety of procedures and analysed by gas chromatography (GC). The chemical composition of kerosines was evaluated by nuclear magnetic resonance spectroscopy (NMR) and high performance liquid chromatography (HPLC). The data indicated that the production of carbon monoxide upon combustion had a direct correlation with the chemical composition of fuel while its distillation range had almost no effect on the emission levels.

**9203 - 021.** Dolui SK, Agrawal SP (Centl Bldg Res Inst, Org Bldg Materials Div, Roorkee 247667). **Dusts in residential buildings.** *Indian J Environ Prot*, **12** (2) (1992), 94-97 [3 Ref].

Paper describes preliminary investigation and provides data on the dust in residential buildings which includes various types of dusts collected throughout the year in residential rooms, bulk density, particle size analysis etc., and also describes behaviours of fibrous dusts generated inside the residential rooms.

**9203 - 022.** Ghose Sunil Kumar, Mishra Swadesh (Cent Std Man Env, CKII, Sector 2, Salt Lake City, Calcutta 700091). **Effect of war on environment a study of the Gulf War and Indian monsoon in 1991.** *Cent Std Man Env, Annual Volume* (1991), 16-19.

The Gulf War lasted for 21 days only. Huge volumes of toxic materials were liberated continuously from burning oil fields for ten months until the fire was extinguished in all the mines. Due to this continuous fire, huge amounts of CO<sub>2</sub>, SO<sub>2</sub>, other gases, soots and smoke particles were released in the lower atmosphere. After studying the weather elements during Indian monsoon season 1991 it was found that the Gulf War had no effect on weather of India at a distance of about 1500 km.

**9203 - 023.** Gupta Anuda, Rastogi Mukta Rani (Lucknow Univ, Dept Psychology, Lucknow 226007). **Vehicular pollution visual vigilance and eye related problems.** *Indian J Environ Prot*, **11** (12) (1991), 917-921 [23 Ref].

Paper presents the effects of exposure to vehicular pollution on visual vigilance and general eye complaints. The sample consisted of 150 traffic police constables and 100 civil policemen who were matched on age, sex, education and socioeconomic status. The general physical characteristics and the selection processes for the Sobs of the 2 groups were almost identical. The results indicated that the exposed and the controlled group differ significantly in their visual vigilance and in their reported eye complaints.

**9203 - 024.** Joshi PV (Environ Assess Div, Bhabha Atom Res Cent, Bombay 400085). **Impact of coal combustion from thermal power plants: estimates on ambient SO<sub>2</sub> levels.** *Proc Int Conf Environ Impact Coal Utilisation*, IIT Bombay, 1991. 127-140, [8 Ref].

Using a Gaussian dispersion model, ambient Ground Level Concentrations (GLC) of SO<sub>2</sub> due to Nashik Thermal Power Plant have been computed. The values are compared with National ambient air quality standard and risk involved due to the release of SO<sub>2</sub> from power plant has been assessed.

**9203 - 025.** Kateswara Rao MVR, Nabar RD, Ishack AM, (Naval Cheml Metallurgy Lab, Bombay 400023). **Inter comparision of methods for determination of carbon dioxide in combined spaces.** *Indian J Environ Prot*, **12** (12) (1992), 81-82 [2 Ref].

Estimation of CO<sub>2</sub> was carried out by employing three methods, namely wet chemical method, CO<sub>2</sub> analyser and detector tube. The chemical method is time consuming and is liable to an error upto 5%. CO<sub>2</sub> analyser and detector tubes can be used in confined spaces advantageously as both are rapid and precise.

**9203 - 026.** Kaveeshwar Rachana, Amlathe Sulbha, Gupta VK (Dept Chem Ravishankar Univ, Raipur 492010, MP). **An efficient absorbing system for spectrophotometric determination of nitrogen dioxide.** *Atmospheric Env*, **26A** (6) (1992), 1025-1027 [21 Ref].

A simple and sensitive spectrophotometric method for determination of atmospheric nitrogen dioxide using O-nitroaniline as an efficient absorbing, as well as diazotizing reagent is described. O-nitroaniline present in the absorbing medium is diazotized by the absorbed nitrite ion to form diazonium compound. This is later coupled with amino-2-naphthalene sulphonic acid (ANSA) in acid medium to give red-violet coloured dye, having  $\lambda_{\max} = 545 \text{ nm}$ . The isoamyl extract of the red azo dye has  $\lambda_{\max} = 530 \text{ nm}$ .

**9203 - 027.** Maheshwari GD, Prasad SMR (Res Dev Cent Iron Steel Authority India Ltd, Ranchi). **Carbon monoxide emissions from coke ovens.** *Indian J Environ Hlth*, **33** (3) (1991), 381-384 [2 Ref].

A study was conducted in fifteen cokeoven batteries of three integrated steel plants to ascertain the effect of various parameters on CO emission. The specific emission of CO has been found to vary with type of fuel used, battery age and waste box design. Although a trend of increasing emission of CO with decreasing excess air existed for coke oven gas, no correlation could be obtained. There exist a strong correlation between the CO emission and the age of the coke oven batteries.

**9203 - 028.** Mitra SG, Santra SC, Roychowdhury KN, (Dept Ecol Std, Sch Environ Sci, Univ Kalyani, Nadia, WB). **Air pollution biomonitoring by lichen a case study in Haldia township.** *Polln Res*, **11**(1) (1992), 43-48 [9 Ref].

The occurrence and frequency distribution of lichens of 15 selected placed in Haldia township, West Bengal were surveyed. The species and frequency of lichens were found to bear a direct relation to SO<sub>2</sub> concentration of the area. The result have shown that there is a positive correlation of lichen species distribution with SO<sub>2</sub> concentration of different zones.

**9203 - 029.** Mohan Rao N, Patel TS, Kulkarni PK, Patel PD, Kashyap SK (Natl Inst Occupl Hlth, Meghani Nagar Ahmedabad 380016). **Autoexhaust pollutants exposure and pulmonary function a comparision between shopkeepers and traffic policemen.** *Indian J Environ Prot*, **12** (3) (1992), 171-174 [9 Ref].

Pulmonary function (PI values (VC, FEV<sub>1%</sub> and FEF<sub>25-75%</sub>) test and prevalence of restrictive, obstructive and combined restrictive and obstructive impairments in

shopkeepers is compared with traffic policemen at two different traffic junctions with varying levels of oxides of nitrogen ( $\text{NO}_2$ ) pollutant. The prevalence of various impairment were compared with Michigan general population values, traffic policemen and general population values of Lucknow city. This study denoted that shopkeepers showed higher affection than policemen to the effects of autoexhaust pollutants and this may be due to longer hours of exposure.

**9203 - 030.** Mukheeee AK (204, Devika Apartments, 2010, West Street, Pune). A Kinetic theory model for rain out and wash out of globule gaseous air pollution. *Mausarn*, 42 (2) (1991), 151-154 [8 Ref].

A new theory, using kinetic theory of gases, for dissolution of gaseous air pollution and applicable both for wash out and rain out processes has been proposed. It has been shown that the current theory of wash out of gases given by Hales (1972) is a special case of the general theory proposed here.

**9203 - 031.** Pandey J, Agrawal M, Khanam N, Narayan D, Rao DN (Cent Adv Std Bot, Banaras Hindu Univ, Varanasi 221005). **Air pollutant concentrations in Varanasi, India.** *Atmospheric Env*, **26B** (1) (1992), 91-98 [23 Ref].

This study reports the diurnal patterns in the concentrations of ozons ( $\text{O}_3$ ), nitrogen dioxide ( $\text{NO}_2$ ), sulphur dioxide ( $\text{SO}_2$ ) and total suspended particulate matter (TSP) in the urban atmosphere of Varanasi city in India during 1989. The city was divided into five zones and three monitoring stations were selected in each zone. Ambient concentrations of  $\text{NO}_2$  and  $\text{SO}_2$  were maximum during winter but ozone and TSP concentrations were highest during summer.

**9203 - 032.** Pandey GH, Phadke KM, Maji CS, Aggarwal AL (Natl Environ Engng Res Inst, Nehru Marg, Nagpur 440020). **Comparative evaluation of high volume samplers.** *Indian J Environ Hlth*, **33** (4) (1991), 445-451 [2 Ref].

The High Volume method for measuring suspended particulate matter (SPM) was evaluated by sampling a real atmosphere involving use of automated Hi-Vol samplers. The comparative evaluation test involved 24 hour SPM sampling for a period of 22 days. Statistical analysis of the data showed a lack of bias between these

samplers. Details of calibration, conclusion of test programme and results of evaluation are discussed.

**9203 - 033.** Patel, MK, Tiwari TN (Qlty Contl Lab, IDL Cheml Ltd, Rourkela 769016). **Ambient temperatures at Rourkela (Indla) during the hottest months: some trends.** *Biosphere*, **2** (1990), 1- 7 [5 Ref]. (Late Pub).

Data on ambient temperature for the period 1968 1989 have been analysed to study the trends of the minimum, maximum, and average temperatures during May and June at Rourkela, India. Analysis indicates that the minimum and average monthly temperatures appear to be decreasing slowly, over the last 22 years, in both May and June.

**9203 - 034.** Prakasa Rao PS, Khemani LT, Momin GA, Safai PD, Pillai AG (Indian Inst Trop Meteoro, Pune 411008). **Measurement of wet and dry deposition at an urban location in India.** *Atmospheric Env*, **26B** (1) (1992), 73-78 [29 Ref].

Wet and dry depositions were collected in Pune city using 24-h and weekly sampling periods, respectively, from January 1984 to December 1988. All the wet and dry deposition samples were analysed for major cations and anions along with pH. The chemical composition of the dry deposition at Pune indicated maximum depositions of the alkaline substances, which are the main cause for the alkaline pH of rain water. Results of the present study have suggested that the atmospheric composition in the city is strongly influenced by natural sources rather than anthropogenic.

**9203 - 035.** Rani Ashu, Prasad DSN, Madnawat PVS, Gupta KS (Atmospheric Chem Lab, Dept Chem, Univ Rajasthan, Jaipur 302004). **The role of free fall atmospheric dust in catalysing autoxidation of aqueous sulphur dioxide.** *Atmospheric Env*, **26A** (4) (192), 667-673 [25 Ref].

The results of atmospheric free fall dust catalysed S(IV) autoxidation in acetate buffered suspensions are in conformity with the rate law. All available evidence favours the catalytic activity of dust suspensions being due to leached metal ions. Fe (III) is the main suspect, which is in agreement with the chemical analysis of dust.

**9203 - 036.** Rao UR, Chakrovarty SC (Indian Space Res Orgn Hd Qrs, Bangalore 560094). **An evaluation of global warming and its impact.** *Cum Sct*, **62** (6) (1992), 469-478 [28 Ref].

Energy balance model has been calculated to assess the magnitude of the average global warming by the middle of the next century. It is shown that an increase in temperatures by about 4 K by the year 2050 as compared to the pre-industrial era (~1800 AD) could result from the projected growth of atmospheric concentrations of major greenhouse gases. The changes in global warming are considered for different scenarios including the proposed regulatory measures on the use of CFCs.

**9203 - 037.** Salgare SA, Palathingal Trisa (Dept Bot, Inst Sci, Bombay 400032). **Effect of industrial pollution at Sewri on pollen physiology of successive flowers of *Moringa pterygosperma*.** *Bioved*, **2** (2) (1991), 131-134 [3 Ref].

Paper deals with the effect of ambient air from Sewri, one of the industrially polluted areas of Greater Bombay on the rate of pollen germination and tube growth and on the rate of decrease in pollen germination and tube growth of successive flowers of *Moringapterygosperra* Goertn Fruct. V. Institute of Science located at Colaba was taken as the unpolluted area and the experiments were set at the Institute of Science with pollen of successive flowers of *Moringa pterygosperma* collected from either sites.

**9203 - 038.** Salgara SA, Palathingal Trisa (Dept Bot, Inst Sci, Bombay 400032). **Evaluation of Industrial pollution of Bombay by pollen of *Catharanthus roseus* (red flowers).** *Bioved*, **2** (2) (1991), 195-198 [9 Ref].

Industrial pollution of Sewri inhibited the rate of pollen germination and tube growth as well as the rate of decrease in pollen germinability and tube growth of *Catharanthus roseus*. 17.74 and 45.45% was the maximum inhibition caused by the industrial pollution in the rate of pollen germination and tube growth respectively. As high as 9.63 and 39.25% inhibition was noted in the rate of decrease of pollen germination and tube growth respectively.

**9203 - 039.** Sandhu RS, Gehlan MS (H P State Polln Contl Bd, Hotel Kings, Top Floor. The Mall, Shimla 171001). **Determination of combustible and organic tarry matter proportions of the suspended particulate in the ambient air of Amritsar.** *Indian J Environ Prot*, **11** (12) (1991), 895-898 [12 Ref].

The ambient air of Amritsar is highly polluted (SPM, CM, BSPM as 426.5 + 269.9, 167.9 + 85.5, 22.2 + 28.8 mg/m<sup>2</sup>, respectively). It needs check on the pollution emitting sources in general and in the EMN and Putlighar areas, in particular, if the national monuments, like Golden Temple, Jallianwala Bagh, Durgiana Temple and Guru Nanak Dev University area are to be kept clean.

**9203 - 040.** Sharma VK, Patil RS (Cent Environ Sci Engng, Indian Inst Techno, Bombay 400076). **Size distribution of atmospheric aerosols and their source identification using factor analysis in Bombay, India.** *Atmospheric Env*, **26B**(1) (1992), 135-140 [23 Ref].

In situ measurements of mass concentration of size distributed aerosols were made using a quartz crystal microbalance cascade impactor. Aerosol samples were also collected by the conventional highvolume analyser system. The number concentrations were calculated for different sizes and these were subjected to factor analysis which gave four factors representing various source types of particulates. The use of factor analysis makes the size distribution groupings source dependent and also avoids the possible errors arising from averaging negative and positive slopes.

**9203 - 041.** Singh Gurdeep, Sharma Parveen Kumar (Cent Mining Env, Indian Sch Mines, Dhanbad 826004). **A study of spatial distribution of air pollutants in some coal mining areas of Ranigang coalfield, India.** *Env Int*, **18** (2) (1992), 191-200 [11 Ref].

Ambient air quality monitoring for suspended particulate matter, sulphur dioxide, and nitrogen oxides was carried out over a period of one year to study diurnal and seasonal variations and spatial distribution of said pollutants. Dust-fall rate measurements were carried out for a period of one month out of each season and for all the four seasons of the year. Studies were also carried out at selected work places to determine levels of the above mentioned pollutants. Studies indicate that mining and

associated activities have raised the background levels of particulate pollution in the region.

**9203 - 042.** Yogamoorthi A (Cent Future Std, Sch Int Std, Pondicherry Univ, Pondicherry 605014). **Chlorofluoro carbons abatement: the international scenario.** *J Indl Polln Contl*, **7** (2) (1991), 77-82 [16 Ref].

This article gives a comprehensive account on the various steps being taken up by different nations particularly Montreal Nations to heal the hole and protect the 'life saving natural shield' the Ozons layer. The role of Non-Governmental organisations (NGOs) excelling from different countries is also discussed. A critical analysis on the stand of developing countries in the race against CFCs abatement and the reasons for their delay in joining the race is also given. Finally, a choice of alternatives have been suggested for minimising the rate of breakdown of CFCs in the atmosphere.

### **Water Pollution**

**9203 -043.** Bhatt SD, Pathak JK (Hydrobio Lab, Dept Zoo, Kumaun Univ Campus, Almora 263601). **Assessment of water quality and aspects of pollution in a stretch of river Gosti** (Kumaun: Lesser Himalaya). *J Environ Bio*, **13** (2) (1992), 113-120 [28 Ref].

Paper deals with water quality parameter of this fluvial ecosystem with special reference to the aspects of pollution. The result of the base-flow quality analysis delineate seasonal variation in several physicochemical characteristics. The natural water of the river is pure, Bod-free and possesses a low ionic strength with dominance pattern:  $Ca^{++} > Na^+ > Mg^{++} > K^+ : HCO_3^- > Cl^- > SO_4^-$ , and are equality pure in biogenically important nutrients, while the anthropogenic emissions mixing with river Gomti contain a high pollution load in the form of sulphate, chlorides, dissolved solids, organic matter, BOD and COD.

**9203 - 044.** Chan, Yuen Tik, Bhargava DS T (Univ Roorkee, Dept Civil Engng, Roorkee 247667). **Toxicological effects of cadmium on the marine biota.** *Indian J Environ Prot*, **12** (3) (1992), 161-165 [16 Ref].

With growing industrialization, large amounts of toxic metals are finding their way into the sea. Cadmium when released into the marine environment causes extensive damage to the marine life. The adverse resultant effects can be used to identify the stated cause. A regular monitoring of the indicator organisms is needed to ensure the wholesomeness of the sea food.

**9203 - 045.** Das NC, Bandyopadhyay M, (Civil Engng Dept, Indian Inst Techno, Kharagpur 721302). **Effect of pH on heavy metal adsorption by vermiculite.** *J Inst Public Hlth Engrs, India*, **1991** (4) (1991), 1-6 [11 Ref].

Adsorption of heavy metals like Cd, Cu, Pb, and Zn on vermiculite has been investigated at different pH values. It has been found that the removal process is a function of pH of the reaction mixture. At pH 3, removal of all metals was less but with an increase of pH by 2 units, adsorption of metals increased significantly.

**9203 - 046.** Dhanaselvi M, Lakshmanperumalsamy P, (Dept Environ Sci, Bharathiar Univ, Coimbatore 641046). **Bacterial contamination of cell water in Coimbatore district, Tamil Nadu.** *Polln Res*, **10** (4) (1991), 203-207 [8 Ref].

Total aerobic heterotrophic bacteria (THB), total coliforms (TC), faecal coliforms (FC) and Escherichia coli type I (EC I) were estimated in twenty well water samples collected from the rural environment of Coimbatore district. The results indicate that the heterotrophic bacteria play a major role in the purification of water. The presence of FC, and ECI clearly reveal the insanitary conditions of the wells.

**9203 - 047.** Fulekar MH, Dave JM (Polln Monlt Lab, Sch Environ Sci, Jawaharlal Nehru Univ, New Delhi 110067). **Heavy metals release from ash pond to soil water environment: a simulated technique.** *Env Int*, **18** (3) (1992), 283-295 [18 Ref].

A column experiment was set up to provide an environment in which certain heavy metals leach from impounded ash, then enter ground water by percolation through soils, a condition that is prevailing in an ash pond. Percolation of 1 L and 2 L ash effluent per d. up to a period of 40 d., through 60 cm depth of the alluvial soil resulted in an increased pH, electrical conductivity (E.C.), and levels of heavy metals like Cr, Mn, Ni, and Pb in leachates as well as in layers of soils. The heavy metals content in

leachates was found increased with increased percolation of ash effluents. The pH of the soil was found to increase from 7.4 to 8.1.

**9203 - 048.** Garg Nikhil, Mathur Neeraj, Modak DP, Singh KP, Murthy RC, Ahmed Shakeel, Chandra SV, Ray PK (Indl Toxicol Res Cent, P B 80, MG Marg, Lucknow 226001). **Trace metals trend analysis in river Ganges at Kanpur.** *Environ*, **18** (3) (1992), 297-305 [6 Ref].

Samples were collected at locations where the river entered Kanpur and left Kanpur. Time series analysis was carried out using a moving average model to estimate the trend values free from autocorrelation. The measured and trend values were completely in accordance with the observed pattern. A significant temporary effect for iron and zinc was observed. Significant site related effects were observed from chromium due to the presence of a large number of industrial establishments, particularly tanneries, electroplating and metal processing industries. A time of year related effect on the levels of nickel, copper, zinc, and lead were observed. These differences may be attributed to drought and other natural events.

**9203 - 049.** Gupta Bharat B, Kumar Sanjay (PG Dept Zoo, DS Coll, Aligarh 202001, UP). **Self-purification of flowing sewage water of Aligarh.** *Polln Res*, **10** (4) (1991), 209-213 [13 Ref].

Flowing sewage gets self-purified like rivers and lakes. pH and dissolved oxygen gradually increase but BOD, sulphate, phosphates, nitrogen, potassium, OC and coliform bacteria decrease while flowing.

**9203 - 050.** Gupta SC (Centl Cheml Lab, Ground Water Dept, Jodhpur, Rajasthan). **Chemical character of groundwaters in Nagaur district, Rajasthan.** *Indian J Environ Hlth*, **33** (3) (1991), 341-349 [9 Ref].

Chemical analysis of ground water samples from Nagpur district showed that fluoride and nitrate concentrations increased with increase in salinity. While high fluoride waters were rich in sodium content, high nitrate waters on the other hand had relatively high percentage of calcium and magnesium. High bicarbonate content was observed in groundwaters rich in fluoride, while it was low in nitrate water.

**9203 - 051.** Israili Abdul Wahid, Khurshid Shadab (Dept Zoo, Aligarh Muslim Univ, Aligarh 202002 UP). **Distribution of heavy metals in Yamuna river water and sediments from Delhi to Allahabad.** *Polln Res*, **10** 14) (1991), 215-222 [20 Ref].

The determination of heavy metal concentration, in water and sediments of river Yamuna have been studied from Delhi to Allahabad. Present observations revealed that high concentrations of heavy metals in water were found at downstream sites in comparison to upstream sites, because huge quantity of partially treated domestic sewage and industrial effluents were discharged into the river at all cities. While in sediments contents of these metals showed considerable variation at different sampling sites. This may be due to precipitation and sedimentation of these metals. It may be concluded that downstream sampling stations got more polluted than upstream sampling stations.

**9203 - 052.** Kannan N, Rajasekaran N (PG Dept Chem, ANJA Coll, Sivakasi 626124). **Correlations of water quality parameters of printing industry effluents in Sivakasi (South India).** *India J Environ Hlth*, **33** (3) (1991), 330-335 [7 Ref].

Printing industry effluents were collected in Sivakasi and analysed bimonthly for a period of five months. Values of wastewater characteristics exceeded the permissible limits proposed by ISI for industrial effluents that could be discharged into inland surface water, into public sewers or on land for irrigation.

**9203 - 053.** Kar RN, Sahoo BN, Sukla LB (Regl Res Lab, Bhubaneswar 751013). **Removal of heavy metals from mine water using sulphate reducing bacteria.** *Polln. Res*, **11** (1) (1992), 13-18 [20 Ref].

The mine water from Dhanbad (Bihar) Coalfield was treated using anaerobic sulphate reducing bacteria to precipitate heavy metals present. The experiment was conducted using the bacteria *Desulfovibrio desulfuricans*. Significant reduction of Cu, Mn, Ni, Zn, Pb, Se and Cr metals could be achieved by this bioprecipitation technique.

**9203 - 054.** Manian S, Udaiyan K, Subramanian N (Dept Bot, Bharathiar Univ, Coimbatore 641046). **Effect of municipal sewage on the bacteriological quality of the river Kaveri, Tamil Nadu.** *Acta Botanica Indica*, **19** (2) (1991), 162-167 [16 Ref].

Water samples from river Kaveri were analysed for total coliforms, fecal coliforms, fecal streptococci and *Clostridium perfringens* and all of them showed increase in the sewage mixing site, though within the limits of ISI standards. The BOD also registered a sharp increase in the polluted site. However, there was a significant degree of self purification as the water flows.

**9203 - 055.** Manonmani K, wa Kumari J, Pongaliappan S, Swaminathan K (Dept Bot, Kongunadu Arts Sci Coll, Coimbatore 641029). **Effects of tannery effluents on the quality of an irrigation canal water.** *J Indl Polln Contl*, **7** (2) (1991), 87-91 [12 Ref].

Physicochemical analysis of the samples revealed that the tannery effluents contributed grey colour and unpleasant odour to the canal water. The levels of solids, BOD, chlorides, percent sodium and nitrogen were increased in the canal water by the tannery effluent. Effect of the toxicants were well expressed on the microbiological system of the canal water. Population of algae, fungi, bacteria and actinomycetes were affected by the effluent. Primary productivity in the canal was also very much reduced.

**9203 - 056.** Mehta UCs Mehth M (Dept Bot, RS Mora Coll, Govindpur, Dhanbad J. **Status of pollutions from coal washeries of Bihar-a report.** *Polln Res*, **11** (1) (1992), 33-55.

All 15 coal washeries of Bihar are located in the water catchment area of river Damodar. The waste waters of these washeries find their outlets to the river course directly or indirectly. They are monitored regularly by Bihar State Pollution Control (BSPC) Board. The analysis results bring out an alarming picture.

**9203 - 057.** Narasimha Rao SL (Andhra Univ, Public Hlth Environ Engng Lab, Civil Engng Dept, Coll Engng, Visakhapatnam 530003). **Visual and potentiometric estimation of dissolved oxygen with iron (II) cacotheline oxalate blue solution.** *Indian J Environ Prot*, **12** (3) (1992), 194-197 [6 Ref].

A new method has been proposed for the visual and potentiometric determination of dissolved Oxygen using iron (II) cacotheline oxalate blue solution. In alkaline pH, the reaction is accompanied by the disappearance of the blue colour. The stoichiometry of the reaction is explained and it was found to be 1: 0.8 or 5: 4. The applicability of this method to distilled water, river water and reservoir water were tested. Dissolved oxygen in the range 2 to 8 mg/l can be determined accurately.

**9203 - 058.** Ouseph PP (Cent Earth Sci Std, Trivandrum 31). **Dissolved and particulate trace metals in the Cochin estuary.** *Marine Polln Bull*, **24** (4) (1992), 186-192 [14 Ref].

The Cochin estuary is subjected to various types of effluents discharged from the Eloor and Chitrapuzha industrial belts. The study reports the concentrations of dissolved and particulate copper, zinc, cadmium, lead, nickel, and iron based on three consecutive surveys conducted during July (monsoon), November (postmonsoon) 1985 and April (premonsoon) 1986. The concentrations of dissolved and particulate copper, zinc and cadmium showed high seasonal variation.

**9203 - 059.** Pallah BS, Bansal ML, Sahota HS (Panjabi Univ, Dept Phys, Patiala 147002). **Comparison of ground waters from shallosr aquifers.** *Indian J Environ Prot*, **12** (3) (1991), 189-193 [7 Ref].

Water samples were collected from three different cities of northern India i.e.. Patiala, Ambala Cantt and Rajpura. Chemical parameters were measured using standard techniques. Study revealed that concentrations of various water quality parameters in ground water of Ambala Cantt are lower as compared to ground water of Patiala, RaJpura and ISI/WHO recommendations. The concentrations of Cd, Cr, Sr and Sb are higher in ground water of those places of Patiala and Rajpura, where wastewater used to stagnate in low lying areas for long times.

**9203 - 060.** Patel Vikram, Anami Vikram, Datta Madamwar (Dept Biosci, Sardar Patel Univ, Vallabh Vidyanagar, 388120 Gudarath). **Effects of adsorbents on anaerobic digestion of water hyacinthcattledung.** *BioresourceTechno*, **40** (2) (1992), 179-181 [11 Ref].

In an effort to improve the anaerobic digestion of water hyacinthcattle dung the effects of various adsorbents have been studied. A trend of enhanced gas production with high methane content and lower effluent BOD and COD, was found with increasing doses of the adsorbents gelatin, polyvinyl alcohol, powdered activated charcoal, pectin, kaolin, silica gel, aluminium powder, bentonite and talc powder.

**9203 - 061.** Pradhan AK, Tiwari TN, (Regl Engng Coll, Water Resources Manag Cent, Rourkela 769008). **Ground water of Rourkela: survey of some trace metals.** *Indian J Environ Prot*, **11** (12) (1991), 887-889 [7 Ref].

Concentrations of 10 traces metals (iron, magnesium, copper, manganese, zinc, calcium, sodium, potassium, aluminium, and strontium) have been determined by analysing 35 samples of ground water collected from 7 deep tubewells located in a study area of about 350 acre. The concentrations were determined with an atomic absorption spectrophotometer. These concentrations are much below their permissible limits recommended for drinking water.

**9203 - 062.** Rai UN, Chandra Prakash (Aquatic Bot Lab, Natl Botl Res Inst, Lucknow 226001). **Accumulation of copper, lead, manganese and iron by field populations of *Hydrodictyon reticulatum* (Linn) Lagerheim.** *The Sci Total Env*, **116** (3) (1991), 203-211 [15 Ref].

The potential of 'waternet' *Hydrodictyon reticulatum* to accumulate copper, lead, manganese and iron was determined in seven polluted water bodies having different physicochemical characteristics. The lead accumulation was linearly related with ambient concentration whereas in case of copper, manganese and iron it was maximum at lowest ambient level of metals. Investigations on response of alga to various concentrations of test metals under single metal treatments revealed that the algal cells are saturated at high equilibrium concentration of > 0.5 (lead). > 2.5 (copper and iron and > 5.0 (manganese) mg/l.

**9203 - 063.** Ramachandran S, Narayanan A, Pundari Kanthan NV (Cent Water Resources, Anna Univ, Madras 600025). **Nitrate and pesticide concentrations in ground water of cultivated areas in north Madras.** *Indian J Environ Hlth*, **33** (4) (1991), 421-424 [6 Ref].

The nitrate and pesticides (BHC and DDT) concentrations in groundwater of cultivated areas in North Madras were studied. The recorded values are from 0.2 to 0.6 mg/l of nitrate-nitrogen and 0.16 to 1.08 ppb of BHC, which are within the safe concentration limits. DDT was absent in all water samples.

**9203 - 064.** Ravichandran S, Pundarikanthan NV (Cent Water Resources, Anna Univ, Madras 600025). **Studies on ground water quality of Madras.** *Indian J Environ Hlth*, **33** (4) (1991), 481-487 [11Ref].

The ground water quality of Madras was studied in the context of polluted waterways of the city. A total of 150 ground water samples were collected based on square km grid pattern within the city limits. Samples were analysed for pH, EC, chloride, nitrate and phosphate. The influence of waterways on the ground water was examined using ion contour maps and statistical analysis of the data EC and chloride distribution indicated a good correlation between them and delineated different classes of ground water quality in the city.

**9203 - 065.** Saha AK, (Dept Geo, Presidency Coll, Calcutta). **Genesis of the arsenic in ground water in parts of West Bengal.** Centre Std Man Env, Annual Volume(1991), 1-10.

The ground water between 15m 80m below ground level in some places of Murshidabad, Nadha and north & south 24 parganas has been found to contain arsenic at above permissible level of 0.05 mg/litre. During 1988-91 a comprehensive investigation to inquire into nature, degree and cause of the arsenic pollution was carried out. It has been found that the water of the intermediate aquifer is polluted with arsenic. Neither the shallow first nor the deep aquifer contain above permissible arsenic. The ground water in arsenic infested zone is characterised by high iron, arsenic, Ca, Mg and biocarbonate with low chloride, sulphate and fluoride. The pH is in the range of 7.8.

**9203 - 066.** Saha D, Sarkar SS, (Presidency Coll, Cent Std Man Env, Calcutta 700073). **Chemical quality of groundwater in relation to its depth zones.: In Agartala Sonamura Valley, Tripura a statistical appraisal.** *Indian J Environ Prot*, **11** (12) (1991), 930 935 [3 Ref].

Two broad aquifer systems exist in the Agartala Sonamura valley in the westernmost extremity of the Tripura Mizoram folded mountain chain. The shallow aquifer system is characterised by low permeability and the groundwater occurs under water table conditions. While, in the deeper aquifer system the groundwater occurs under confined to semiconfined condition and the average transmissivity is in the tune of 1100 m<sup>2</sup>/day. Two rigorous statistical tests, namely linear discrimination function and factor analysis have been carried out using some selected chemical attributes and extent of variation of the chemistry of groundwater belonging to the two aquifer systems were investigated.

**9203 - 067.** Sharma CB, Ghose NC, Bhaduri SK, Kumar P (Public Hlth Inst, Patna 800004). **Contamination of river Ganga by fly ash from thermal power plant at Barauni Industrial Complex, Bihar.** *Proc Int Conf Environ Impact Coal Utilization*, IIT Bombay, 1991 265-276 [29 Ref].

Barauni Thermal Power Plant discharges 15,900 tons of fly ash per month to the river Ganga causing severe contamination by toxic elements. A high concentration of arsenic, chromium, lead, nickel and cadmium in Ganga water samples around Barauni is a direct consequence of fly ash discharge into the river. Extract of Nirmaly seed (*Strychnos Potatorum* Linn) in 8 ppm dose coagulates and recovers up to 62.85% of ash from the waste slurry. The toxic elements present in undigested fly ash have been observed to be well attenuated into harmless forms, besides being fully compensated for all its nutritional deficiencies.

**9203 - 068.** Singh Bijay, Sadana US, Arora BR (Dept Soils, Punjab Agricul Univ, Ludhiana 141004). **Nitrate pollution of ground water with increasing use of nitrogen fertilizers in Punjab.** *Indian J Environ Hlth*, **33** (4) (1991), 516-518 [1 Ref].

Nitrate concentration in water samples from 26 wells in Ludhiana district were estimated in April and November 1982 covering monsoon season and again in November/December 1988. Relatively higher nitrate-N content of well waters in November than in April 1982 confirms that when ground water, is recharged during the monsoon season, nitrates get leached to the water table. Multiple correlation between nitrate-N content of well waters and amount of fertilizer N applied in 1988 and depth to water table was 0.56.

**9203 - 069.** Yogamoorthy A (Cent Future Std, Sch Int Std, Pondicherry Univ, Pondicherry 605014). **Race against marine oil spill the international scenario.** *Encology*, **6** (9) (1992), 30-34 [7 Ref].

During 1970s, the danger of pollution from ships especially oil pollution (as a result of tanker accidents and ballast water discharge) was growing substantially each year. International efforts have been taken up through various international conventions and protocols, to curb tanker accidents and minimise the discharge of ballast water by means of introducing various technological measures. Two potential sources of oil spill and various international conventions for the prevention of marine oil spill internationally, are discussed.

### **Noise Pollution**

**9203 - 070.** Bhatnagar Namita, Patwardhan Asha, Raja Gopalan S (Nagpur Univ, Dept Home Sci, Amravati Rd, Nagpur 440010). **Evaluation of noise pollution in the home environment.** *Indian J Environ Prot*, **11** (12) (1991), 910-916 [11 Ref].

Present work aims at finding out location wise variation of noise, measurement of sound pressure levels inside and outside the house, collection of information on the noise response of community population through a detailed questionnaire. In almost all the locations noise levels were found to be above the recommended levels for comfortable community living.

**9203 - 071.** Ramalingeswara Rao P, Seshagiri Rao MG (Dept Engng Phys, Coll Engng, Andhra Univ, Waltair 530003). **Urban traffic intensity a prediction of (Leq) noise levels.** *Indian J Environ Hlth*, **33** (3) (1991), 324-329 [4 Ref].

Traffic Noise levels have been measured continuously over 24 hr period in Visakha patnam city in 1986 and 1987. The data were compared and the possible factors responsible for the change in the noise levels are discussed. The measured LN values were compared with the values computed from an equation proposed by the authors for prediction of noise levels from traffic data for different zones.

**9203 - 072.** Rao PR, Seshagiri Rao MG (Dept Environ Engng, Natl Thermal Power Corp Ltd, Core 6, 7th Floor, Scope Complex, Lodhi Rd, New Delhi 110003). **The prediction of annoyance due to heavy vehicular traffic.** *Energy Env Monit*, **8** (1) (1992), 13-17 [8 Ref].

A social survey was conducted in 43 locations in Visakhapatnam where noise levels were measured, in order to study the residents' reaction to the problem of noise pollution. In all 1195 interviews were conducted at 43 locations and the traffic count was also made of these sites. The multiple correlations and multiple regression equations for mean dissatisfaction versus the heavy vehicular traffic and  $L_{eq}/L_{10}$  are predicted. It is found that although the index  $L_{eq}$  is a better criterion of annoyance than the number of truck passages, a composite index with the general form  $a L_{eq} + b \log N_n$  nevertheless appears to be more reliable in predictions.

### **Ecology**

**9203 - 073.** Bandyopadhyay Gautam (Dept Zoo, Presidency Coll, Calcutta). **Distribution of algae on tannery waste.** *J Bengal Nat Hist Soc*, **10** (2) (1991), 6973 [8 Ref].

Results of ecological studies on algae of effluent stream of tanneries in Calcutta are presented. Altogether twentyone species of algae were recorded and these were the natural algal coloniser responsible for decomposition of waste through biological means.

**9203 - 074.** Bhaskara Rao, V, Narasimha Rao GM, Sarma GVS, Krishna Rao B (Dept Geo, Andhra Univ, Waltair 530003). **Mangrove environment and its sediment character in Godavari estuary, east coast of India.** *Indian J Marine Sci*, **21** (1) (1992), 64-66 [5 Ref].

True mangrove plants and associated mangroves were present near to the waterfront whereas other halophytes were present near the transitional zone. High density of mangrove population was observed where silt was high in the sediments of mangrove environment.

**9203 - 075.** Chaturvedi A, Roy Chaudhuri N, Saini GL, Mookerjee A (Sch Environ Sci, Jawaharlal Nehru Univ, New Delhi 110067). **Ceresan a mercury fungicide and its interaction with DNA.** *Indian J Environ Hlth*, **33** (4) (1991), 505-515 [18 Ref].

Ceresan, a mercury fungicide, is still used in India as a seed dressing. W and Ceresan treatment of the free living nitrogen fixing bacterium *Azotobacter vinelandii* and its cellfree DNA, had effect on the survival, viscosity, melting temperature and nitrogenase enzyme activity.

**9203 - 076.** Choudhary Sunil K, Singh RB. Nayak Mamtat Choubey Shobha (Polln Res Lab, Dept Bot, TNB Coll, Bhagalpur 812007). **Diurnal profile of some physico chemical and biological parameters in certain perennial pond and river Ganga at Bhagalpur (Bihar).** *J Freshwater Bio*, **4** (1) (1992), 45-51 [14 Ref].

Variations in physicochemical parameters together with phytoplankton and zooplankton population density in perennial pond and river Ganga at Bhagalpur were studied at an interval of 4 hour over a 24 hour period at surface and at 0.5 m, and 1m depths. Well marked diel periodicity have been recorded in respect of some of the factors analysed.

**9203 - 077.** Dayal Gopal, Taneja Ajay, Sharma BS (St Johns Coll, Chem Dept, Agra 282002). **Limnological studies on Kitham Lake of Agra: an assersment of water quality.** *Indian J Env1ron Prot*, **12** (2) (1992), 102-104 [15 Ref].

Paper discusses the physicochemical characteristics of Kitham lake water in Agra. The physico chemical monitoring of the water over a period of 1 year from June 1990 to May 1991 reveals its suitability for human consumption.

**9203 - 078.** Edward JK Patterson, Ayyakkannu K (Cent Adv Std Marine Bio, Annamalai Univ, Parangipettai 608502 Tamil Nadu). **Studies on the ecology of plankton community of Kollidam estuary, South east coast of India, L phytoplankton.** *Ma1zasagar*, **24** (2) (1991), 89-97 [19 Ref].

The variations of phytoplankton with social reference to abundance and distribution have been studied in relation to various physicochemical parameter. Regular monthly samplings were made from two stations in the Kollidam estuary for a period of

two years. The maximum plankton density for both the years was recorded in the summer season whereas the minimum was noted in the monsoon season.

**9203 - 079.** Jagadeesan P, Ayyakkannu K (Cent Adv Std Marine Bio, Annamalai Univ, Parangipettai 608502). **Seasonal variation of benthic fauna in marine zone of Coleroon estuary and inshore waters, south east coast of India.** *India J Marine Sci*, **21** (1) (1992), 67-69 [23 Ref].

The occurrence and abundance of benthic fauna in the marine zone of Coleroon estuary (st 1) and inshore waters (st 2) have been studied for a year. The maximum density of fauna were recorded at st 1 and st 2 during premonsoon and summer respectively. In both stations polychaetes were the dominant taxa and followed by crustacea.

**9203 - 080.** Khatri TC (Dept Zoo, Univ Jodhpur, Jodhpur 392001). **Seasonal distribution of zooplankton in Tskhotia lake.** *Env Ecol*, **10**(2) (1992), 317-322 116 Ref].

Year round studies conducted on zooplankton population at Lakhotia lake of Pali city located in the western part of Rajasthan, showed three peaks, first in the summer, second in monsoon and the third in winter. Quantitatively, the lake was rich and qualitatively it was similar to other lakes of the same region. Three peaks revealed quick turn over of zooplankton and its relatively rich population make the lake suitable for pisciculture.

**9203 - 081.** Menon Girish G, Neelakantan B (Dept Marine Bio, PG Cent, Karnataka Univ, Kodibag, Karwar 581303). **Chlorophyll and light attenuation from the leaves of mangrove species of Kali estuary.** *Indian J Marine Sct*, **21** (1) (1992) 13-16 [10 Ref].

Chlorophyll a, b, and a b and ab content of young, intermediate and old leaves, collected from two areas (sun and shade), of 12 species of mangroves of Kali estuary were determined. Chl a, b and a + b varied significantly between leaf types and plant types. No significant difference was noticed in the chl a: b ratios. A significant relationship was observed between attenuated light and total chlorophyll content.

**9203 - 082.** Murugan A, Ayyakkannu K (Cent Adv Std Marine Bio, Annamalai Univ, Parangipettai 608502). **Ecology of Uppanar backwater, Cuddalore: II nutrients.** *Mahasagar*, **24** (2) (1991), 103-108 [8 Ref].

Studies were carried out in Uppanarbackwater of Cuddalore to investigate the distribution and seasonal variation of dissolved nutrients like reactive phosphate, nitrate, nitrite and silicate. The input of wastes from sewage outlets and coconut husk retting grounds was found to have its bearing on the nutrient contents.

**9203 - 083.** Pandey BN, Lal RN; Mishra PK, Jha Ak (PG Dept Zoo, Purnia Coll, Purnea 854301). **Seasonal rhythm in the physicochemical properties of Mahananda river, Katihar, Bihar.** *Env Eco*, **10** (2) (1992), 354-357 [17 Ref].

Physicochemical parameters and species composition of zooplankton and phytoplankton community were examined during January to December 1990 in the river Mahananda of Katihar, Bihar. The result revealed well defined seasonal variations. The zooplankton population followed the bimodal cycle of abundance. High turbidity in the river affected zooplankton abundance during monsoon. Various physicochemical parameters such as alkalinity, nitrate and phosphorus values revealed that the river was moderately eutrophic.

**9203 - 084.** Ramalakshmi Y, Chauhan VD, (Marine Algae Discipline, Centl Salt Marine Cheml Res Inst, Bhavnagar 364002). **Ecological study of Sargassum swartzii (Turn). C. Ag on the coast of Port Okha, Gujarat.** *J Environ Bio*, **13** (2) (1992), 135-144 [17 Ref].

The distribution of macroalgae on the coast of Port Okha was not indicative of any particular zonation pattern. Poisson's distribution analysis indicated the regular distribution of Sargassumswartzii occurrence. The relative frequency and density of the species was maximum during the months of July-September.

**9203 - 085.** Ramesh AM, Katti RJ, Hafiharan V, Bhat Chandra, Chandra Sekhar Gupta TR (Univ Agricl Sci, Coll Fisheries, Mangalore 575002). **Phytoplankton of the coastal waters of Mangalore.** *Env Eco*, **10** (2) (1992), 310-316 [17 Ref].

A study on the distribution of phytoplankton in the coastal waters of Mangalore for a period of one year revealed that the changes in environmental parameters particularly brought about by the large quantities of fresh water through the NetravathiGurpur estuary coupled with the terrigenous input of humic materials largely controlled and abundance of diatoms and dinoflagellates were high during the postmonsoon season.

**9203 - 086.** Saini VP, Sharma SK, Sharma LL (Dept Limno Fisheries, Univ New Campus, Udaipur 313001, Rajasthan). **Production of algae (*Calothrix* spp) using urban, sewage.** *Polln Res*, **11** (1) (1992), 27-31 [12 Ref].

Production of algae (*Calothrix* spp), using urban sewage at tempted with success in the present investigation. Urban sewage was tried in five doses. These trials were studied in relation to water chemistry and algal growth, and their proximate composition. Significantly decreasing trends in water quality parameters indicated usefulness of algae culture for the recycling and biological transformation of sewage effluent. Moreover, O<sub>2</sub> showed increased level with decreasing sewage dosage.

**9203 - 087.** Sambandan K, Kannan K, Raman N (Cent Adv Std Bot, Univ Madras, Guindy Camp, Madras 600025). **Distribution of vesicular arbuscular mycorrhizal fungi in heavy metal polluted soils of TamilNadu, India.** *J Environ Bio*, **13** (2) (1992), 159-167 [17 Ref].

A survey of VAM fungi in heavy metal polluted soils in Tamil Nadu was conducted. The sites contained highest amount of Zn followed by Cu, Pb, Ni and Cd. Out of 18 plant species examined, 16 species were found to be mycorrhizal. Percentage of VAM colonization and diversity in the spore density in the rhizosphere soils were studied.

**9203 - 088.** Sarwar SG, Wazir Manzoor A (Hydrobiol Res Lab, SP Coll, Srinagar 190001). **Physicochemical characteristics of a freshwater pond of Srinagar (Kashmir).** *Polln Res*, **10** (4) (1991), 223-227 [28 Ref].

The physicochemical features of a freshwater pond of Srinagar were investigated. The pond is alkaline, calciumrich and with bicarbonate type of alkalinity.

The values for specific conductance, phosphorus and nitrate nitrogen indicate its eutrophic nature.

**9203 - 089.** Sharma BK, Dudani VK (Dept Zoo, NE Hill Univ, Shillong 793014). **Rotifers from some tropical ponds in Bihar species composition, similarities and trophic indicators.** *J Indian Inst Sci*, **72** (2) (1992), 121-130 [34 Ref].

The rotifer communities of five fish ponds in Darbhanga City, North Bihar, contain 53 species and subspecies) belonging to 22 genera and 16 families and Reflect a broadly tropical character. Comments are made on species composition and similarities of the rotifer faunas of different ponds, their trophic status and on the distribution of various documented taxa. Some specimens of *Brachionus falcatus* infected by a microsporid, *Bertramia asperospora* are also examined.

**9203 - 090.** Sharma OP, Saini UP, (Dept Limno Fisheries, Rajasthan Agricul Univ, Udaipur Campus, Udaipur 313001). **Evaluation of pig manure fertilization in relation to zooplankton production and water quality.** *J Ecobio*, **4** (1) (1992), 27-31 [14 Ref].

The results of pig manure fertilization in cement cisterns in relation to zooplankton production and water chemistry are presented. Four doses of pig manure were tried i.e. 200, 300, 400 and 500 mg/l. The zooplankton population was significantly higher in treated cisterns as compared to control.

**9203 - 091.** Siddiqi SZ, Rama Rao Kaza V (Zool Surv India, Freshwater Biol Stn, 1-1-300/B, Ashok Nagar, Hyderabad 500020 AP). **Limnologic Investigations on a recent major fish kills (*Notopterus notopterus*) in Hussain Sagar, Hyderabad, India.** *Polln Res*, **10** (4) (1991), 191-198 [16 Ref].

Mass mortality of fishes has become an annual recurrent feature in Hussain Sagar (Lake), Hyderabad. The present investigation was undertaken to gather requisite physiochemical data on critical parameters like ammonia nitrogen and the contributory role of pH, temperature and dissolved oxygen in enhancing the toxicity of ammonia to fishes.

**9203 - 092.** Singh Ravindra (Dept Zoo, JRS Coll, Jamalpur 811214). **Seasonal fluctuations in macrophytic biomass and productivity of the feeder tanks of Jamalpur, Munger, Bihar.** *J Curr Biosci*, **8**(4) (1991), 118-123 [8 Ref].

Macrophytic biomass and productivity of the two Feeder tanks of Jamalpur were studied. Biomass of the South tank ranged from 593 g.m<sup>-2</sup> in July to 113 g.m<sup>-2</sup> in October, mainly due to *Eichhomia crassipes*. The maximum macrophytic biomass of the North tank was 225.34 gm<sup>-2</sup> in July and minimum 94.68 gm<sup>-2</sup> in November due to *Hydrilla*, *Azolla* and *Ceratophyllum*.

**9203 - 093.** Sinha AK, Tayal S, Srivastava DK, Pandey DC, Singh R, VaJpayee Purnima, Srivastava Seema (Env Res Cent, Feroze Gandhi Coll, Raebareli 229001). **Diurnal variations of physicochemical and biological characteristics of Ganga water at Kanpur, UP** on Makar Sankranti Day 1987, *Comp Physs Ebo*, **17** (1) (1992), 31-40 [13 Ref].

Paper embodies observations on diurnal variation of physicochemical and biological characteristics of Ganga water at Kanpur, UP. These studies were carried out on Makar Sankranti Day, 1987. Most of the parameters were in lower range during night and higher during day time. The tannery wastes also resulted in a very high count of MPN of coliform. Plankton density was observed to increase during night and decrease with the rise of temperature of the day. The mass bathing remarkably reduced the plankton density. The tannery effluents at the time of heavy discharge resulted in sudden decline of plankton density.

**9203 - 094.** Sreepada RA, Rionker CU, Parulekar AH, (Natl Inst Oceanogr, Dona Paula, Goa 403004). **Bio chemical composition and caloric potential of zooplankton from Bay of Bengal.** *Indian J Marine Sci*, **21** (1) (1992), 70-73 [19 Ref].

Proximate composition and variations in protein, lipid, carbohydrate, ash and organic carbon in zooplankton from 42 stations in the Bay of Bengal are reported. Average percentage of moisture, protein, lipid, carbohydrate, ash and carbon were 85.62, 4.95, 1.54, 0.43, 4.4 and 4.16 respectively on wet weight basis. A good correlation of caloric potential with protein and lipid indicated to a certain extent that

protein and lipid act as metabolic reserves of the zooplankton in the area of investigation.

**9203 - 095.** Tanti KD, Saha SK (Eco Res Lab, Dept Zoo, RD & DJ (PG) Coll, Munger 811201). **Limnobiologic studies of the thermal springs of Rajgir (Bihar).** *J Freshwater Bio*, **4** (1) (1992), 31-38 [15 Ref].

Paper deals with the limnobiologic studies of the hot springs along thermal gradient located at Rajgir. The temperature remains more or less constant at the source throughout the year. There are variations in the physicochemical parameters along the thermal gradient. Interaction of different physicochemical parameters undoubtedly controls the distribution of biota in thermal springs.

**9203 - 096.** Varghese Mathew (Room No. 36, ELC Hostel, Chindwara 480001). **Seasonal primary production in the macrophytic community of Govindgarh lake, Rewa MP).** *J Ecobio*, **4** (1) (1992), 11-14 [16 Ref].

Seasonal macrophytic biomass and productivity of Govindgarh Lake were studied. Twelve species of three vegetational life forms were found. Maximum production was obtained during summer and minimum during winter. Daily net production was  $0.083 \text{ g}^2 \text{ day}^{-1}$ .

**9203 - 097.** Verlenkar XN, Dhargalkar VK (Natl Inst Oceanogr, Dona Paula, Goa 403004). **Primary productivity and nutrients in the Indian sector of the southern ocean.** *Indian J Marine Sci*, **21** (1) (1992), 6-12 [42 Ref].

Hydrography, nutrient and biological productivity data collected from 1981 to 1986 in the Indian sector of the Southern Ocean between  $11^\circ$  to  $53^\circ$  E longitude are reported. The physical processes are most active in this region, with nutrient rich water upwelling at the Antarctic divergence (AD) at  $65^\circ\text{S}$  and water down welling at the Antarctic convergence (AC) or subtropical convergence (STC) to the north. Chlorophyll a, primary productivity and zooplankton estimations suggest that the regions south of AC are more productive than others.

**9203 - 098.** Vijay Kumar K, Paul Ravindra (Dept Zoo, Karnataka Uni,v, Dharwad 580003). **Primary productivity of two standing water bodies of Dharwad, Karnataka.** *Env Eco*, **10** (2) (1992), 261-264 [17 Ref].

Primary production in two freshwater bodies of Dharwad area were studied. The maximum gross production rates recorded for the surface waters respectively were 0.98 gC/m<sup>2</sup> per hour at Attikolla pond and 0.56 gC/m<sup>2</sup> per hour at Nuggikeri tank. Observations revealed distinct fluctuations in the rates of gross and net production and utilization of organic matter during respiration of these two water bodies.

### **Nature and Natural Resources Conservation**

**9203 - 099.** Chand Basha S, Sankar S, Balasubramanian K (Kerala Forest Res Inst, Peechi, Kerala). **Bio diversity of Silent Valley National Park: a phytogeographical analysis.** *Indian Forester*, **118** (5) (1992), 361-366 [5 Ref].

The Silent Valley National Park is the largest chunk of comparatively undisturbed area aboding tropical rain forest in the whole of Western Ghats. The flora of the area is fascinating from the phytogeographical point of view with Asiatic endemic, Indo-Sri Lankan elements dominating the scenario. These are followed by Pantropic, Australo-Asian, Indo-African and other forms.

**9203 - 100.** Dinesh MS, Nagendran CR, Ramaswamy SN (Dept PG Std Res Bot, Manasagangotri, Univ Mysore, Mysore 570006). **Endemic plants of Mandya district an enumeration.** *J Swamy Botl Club*, **8** (3 & 4) (1991), 73-75 [3 Ref].

34 endemic species were collected from Mandya District. 24 belong to dicots and 10 to monocots. The district has a small area of deciduous forests and scrub jungles. Riverin islands have interesting endemics like *Iphigenia mysorensis* Arekal & Swamy. Conservational measures are recommended to protect the vegetation of the district.

**9203 - 101.** Garson PJ, Young L, Kaul R (Dept Bio, Univ Newcastle, Newcastle upon Tyne, NE1 7RU, UK). **Ecology and conservation of the cheer pheasant *Catreus wallichii*: Studies in the wild and the progress of a reintroduction project.** *Biol Conserv*, **51** (1) (1992), 25-35 [37 Ref].

The cheer pheasant *Catreus wallichii* is an endangered species frequenting open habitats in the Himalayan foothills of Pakistan, India and Nepal. Part of this paper describes how early successional habitats used by cheer at one intensively studied site are maintained by a traditional form of scrub clearance and single season crop growing on a long rotation, together with seasonal grazing. A review of the habitat characteristics and land use patterns at a series of other present day cheer sites reveals that, with the exception of a few small refuges, all component habitats are heavily disturbed.

**9203 - 102.** Ghosh Dhrubajyoti, Sen Susmita (Calcutta Metropolitan Water Sanitation Authority, 32 BBD Bag (South), Calcutta 700001). **Developing water logged areas for urban fishery and a waterfront recreation project.** *Ambio*, **21** (2) (1992), 185-186 [4 Ref].

Paper discusses about the efforts of Muddially Fishermen's Cooperative Society Ltd for conserving the wetlands under Calcutta Port Trust. The MFCS uses this urban wetlands as resource efficient open spaces with the creation of urban fishery and waterfront recreation. The system adopted by MFCS provides an opportunity to the pond system projects of the new low cost sanitation initiatives under the Ganga Action Plan.

**9203 - 103.** Jagtap TG (Natl Inst Oceanogr, Dona Paula Goa 403004). **Marine flora of Nicobar group of islands in Andaman Sea.** *Indian J Marine Sci*, **21** (1) (1992), 56-68 [7 Ref].

The marine flora of 4 islands comprised 66 species of marine algae, 7 of seagrasses, and 10 of mangroves. Maximum number of marine algae and mangroves were reported from Great Nicobar Island, whereas more species of seagrasses were observed from Nancowry and Katchall islands. Mangroves were dominated by *Rhizophora stylosa* and *Bruguiera gymnorhiza* whereas sea grasses were dominated by *Cyrnodocia rotundata* and *Enhalus acoroides*.

**9203 - 104.** Khullar Pankaj (Silviculture Res, Forest Res Inst, Dehra Dun). **Conservation of biodiversity in natural forests through preservation plots a historical perspective.** *Indian Forester*, **118** (5) (1992), 327-337 [5 Ref].

The conservation of biodiversity is a subject that is attracting worldwide attention today. The first Preservation Plot, for preservation and study of floristics was established

in Bihar in 1906. The network of Preservation Plots now numbers 309. Today, when large areas are no longer available for closure for the preservation of flora and fauna, a network of Preservation Plots, such as those already established in India, can be the solution to the problem of preservation of the animal and plant genetic resources.

**9203 - 105.** Misra OP (Botl Surv Indian, Allahabad 211002). **Wetland and aquatic flora of Narmada Valley (M.P.).** *J Econ Taxonomy Bot*, **15** (3) (1991), 501-507 [15 Ref].

Paper presents an account of wetland and aquatic flora of Narmada River Valley in Madhya Pradesh. More than 3000 plant specimens consisting of 359 species, under 170 genera of 67 families have been collected, along with field data on their habitat, flowering/fruited period and distribution. Rare, endangered and threatened plants species have been identified.

**9203 - 106.** Naithani HB, Negi JDS, Thapliyal RC, Pokhriyal TC, (Forest Res Inst, Dehradun). **Valley of flowers: need for conservation or preservation.** *Indian Forester*, **118** (5) (1992), 371-378 18 Rep.

The vegetation of the Bhyunder Valley in the Nanda Devi National Park, situated in the Garhwal Himalaya, is unique and abounding in biological diversity. Proper cataloguing of species diversity is important from the point of view of evolving strategies of the conservation of rare and endangered species. A wide variety of herbs which presented a marvel of nature's landscaping when in flowering during the period of summer rains and which attracted trekkers from all over the world have dwindled considerably in recent years. This is due to the banning of grazing in the valley which has led to overdominance of some faster growing, and taller species resulting in the suppression of a number of less aggressive species. An attempt has been made to underline some factors which might have been responsible for decline in floral diversity.

**9203 - 107.** Rawat JK, Sharma SK, (Forest Res Inst, Dehradun). **Conservation of biological diversity in the Garhwal Himalayas.** *Indian Forester*, **118** (5) (1992), 352-360.

Biological diversity in the Garhwal Himalaya has been described highlighting the endangered species of flora and fauna there. Various conservation efforts in progress in the region, grouped under habitat and species protection, legislation and public

awareness and voluntary agencies, have been reported. Some suggestions for promoting biodiversity conservation have also been put forward.

## Wastes

**9203 - 211.** Abbasi SA, Bhatia KKS, Nandeshwar MD. Nipaney PC (Cent Polln Contl Biowaste Energy, Pondicherry Univ, Pondicherry 605014). **Environmental impact of pulpmill effluents on an estuary on the Malabar coast.** *J Inst Public Hlth Engrs India*, **1991** (4) (1991), 28-37 [7 Ref].

The impact of the effluents of a pulpmill on the ecosystem of the receiving estuary was assessed in terms of physico-chemical parameters, plankton and fishery. The impact was well marked and drastic; the water quality at the discharge point and at the grossly polluted zone spanning 2,4km. had deteriorated to such an extent that it completely destroyed the fishes and only a few highly tolerant semi-micro and macroorganisms could survive.

**9203 - 212.** Alappat Babu J. George TK (Cent Environ Sci Engrg, Indian Inst Techno Powai, Bombay 400076). **Studies on the phosphorus adsorption capacity of tile powder.** *J Inst Public Hlth Engrs, India*, **1991** (4) (1991), 7 - 15 [9 Ref].

Removal of phosphorus from waters with cheap adsorbents like activated clay has been proved to be viable and efficient. Tile powder was found to be having an adsorption capacity of 2.500 mg of phosphorus per gram at equilibrium in batch mix studies at pH 6.0 for a contact time of 2 hours. Phosphorus adsorption characteristics of tile powder in batch mix and continuous flow columns are studied.

**9203 - 213.** Ali Manzoor, Deo Namita (Regl Engrg Coll, Environ Engrg Lab, Dept Chem, Rourkela 769008). **Effect of pH on adsorption process of chromium (VI) with a new low cost adsorbent.** *Indian J Environ Prot*, **12** (3) (1992), 202-209 [15 Ref].

The effect of pH on adsorption process of a new low cost adsorbent material 'rice straw' (*Oryza sativa*) was studied in the present investigation. The adsorption of  $\text{Cr}^{+6}$  on straw was found to be fully pH dependent at room temperature and the percent adsorption of  $\text{Cr}^{+6}$  varied widely, that is from 100% at low pH of 1-3 to 60-70% for

solutions of pH from 4 to 12 from its dilute aqueous solution. The process of adsorption of  $\text{Cr}^{+6}$  on straw, though involves the pH adjustment but is effective, economical and convenient and the adsorption is complete.

**9203 - 214.** Attakoya S, Prasad VS, Nagaraja SV (Dept Civil Engng, Sri Jayachamarajendra Coll Engng, Mysore). **Performance study of granulated flocculators.** *Inds J Environ Hlth*, **33** (4) (1991), 498-504.

The performance of granulated bed flocculators with pebbles, crushed stones and coarse sand was compared with that of mechanically agitated flocculator, and the results have been reported. The particle sizes used were 0.5 to 1, 1 to 2, 5 to 10, 12 to 20 and 25 to 60 mm. The bed depths varied from 10 to 100 cm. Turbid waters of 50, 100 and 200 NTU, were used for the study. Alum was used as the coagulant. It was observed that any of the three bed materials tested would be suitable for granulated bed flocculators.

**9203 - 215.** Bansal TK, Sharma HR (Thapar Inst Engng Techno, Patiala 147001). **Chromium removal by adsorption on rice husk ash.** *Indian J Environ Prot*, **12** (3) (1992), 198 - 201 [11 Ref].

The possibility of utilizing rice husk ash as an adsorbent for the removal of  $\text{Cr}^{6+}$  from solution has been investigated in a batch type experiment. The effect of solution pH, adsorbent and solute concentration on the extent of  $\text{Cr}^{+6}$  removal are reported. It is observed that favourable conditions are an equilibrium time of 4 hr, pH of 2 and RHA dose of 4 gm/100 ml.

**9203 - 216.** Bhargava DS, Killedar DJ (Dept Civil Engng, Univ Roorkee, Roorkee 247667). **Judgement of equilibrium time during adsorption - a rational approach.** *Indian J Environ Hlth*, **33** (4) (1991), 464-480 [22 Ref].

Batch adsorption studies were conducted to assess the effects of some parameters such as the dose of adsorbent, initial solute concentration, pH and particle size of the adsorbent, on the equilibrium time. The equilibrium time was found to be a function of a dimensionless parameter pH and size of adsorbent. A rational criteria is suggested to estimate the equilibrium time.

**9203 - 217.** Chakravarti SK (Dept Appl Phys, Regl Engng Coll, Kurukshetra 132119). **Uranium trace and alpha activity characterization of coal and fly ash using Particle Track Etch Technique.** *Proc Int Conf Environ Impact Coal Utilization*, IIT Bombay 1991, 103-110 [13 Ref].

Paper reports a simple method called Particle Track Etch (PTE) technique, for trace determination of uranium content in coal and fly ash samples by making use of low cost and versatile plastic detectors known as Solid State Nuclear Track Detectors (SSNIDs). Total alpha activity has also been estimated using these SSNBs. It is observed that the alpha activity is a function of uranium concentration for most of the natural samples of coal studied except for mixtures of fly ash samples where relationship is found to be on higher side.

**9203 - 218.** Chandran Sandhya, Chitra S, Sasidhar P, Lal KB, Amalriat RV (Centralised Waste Manag Facility, FR & NWM Gr, BARC, Kalpakkam 603102). **Cerium uptake by cell immobilized Actinomycetes.** *Indian J Environ Hlth*, **33** (4) (1991), 519 - 522 [10 Ref].

The study indicated that Actinomycetes immobilized Ca alginate beads can be effectively employed in the uptake of cerium (IV), The study also showed that both cell viability and matrix stability are required for immobilization to be an effective method for treatment of effluent.

**9203 - 219.** Chaphekar Sharad B (Salim Ali Sch Eco, Pondicherry Univ, Pondicherry 605014). **Plants for covering ash from coal based thermal power plant.** *Proc Int Conf Environ Impact Coal lutilization*, IIT Bombay, 1991, 291 - 296 [4 Ref].

Paper discusses about storage of ash in pits and covering the same with a sheet of water to satisfy the needs of the environmental protection locally, till the problems of space, water and leaching of heavy metals become evident and progressively more limiting. Disposal of ash on ground which is then covered by plants is practised in some places. Effectiveness of plant cover to arrest erosion by wind or water depends on the type of plant cover, bushes and trees leaving sufficient scope for formation of gullies. Moreover, health of these perennials becomes of suspect quality once the deep root systems grow beyond the manure pits.

**9203 - 220.** Deb. Roy Mukti, Dara SS (Dept Chem, VECE, Nagpur 400011). **Studies on fibre-reinforced lime-fly ash composites.** *Proc Int Conf Environ Impact Coal Utilisation*, IIT Bombay, 1991, 193-200 [11 Ref].

Mechanical and durability properties of some fibre-reinforced lime-fly composites have been studied. The fibres studied up to a certain percentage were found to contribute towards the improvement in compressive strength. The durability of lime-fly ash composites have been studied in different corrosive media.

**9203 - 221.** Deepak Desh, Gupta Ajay Kumar (Dept Cheml Engng, Univ Roorkee, Roorkee 247667). **Hexavalent chromium removal from waste water.** *Indian J Environ Hlth*, **33** (2) (1991), 297-305 [13 Ref].

Reduction precipitation and adsorption processes have been studied for the removal of  $\text{Cr}^{+6}$  from synthetic wastewater. Results indicated that sulphide precipitation process using  $\text{H}_2\text{S}$  gas was more efficient than other processes.

**9203 - 222.** Dey Avijit, Sarkar Dipankar, Sengupta B, Banerjee S (Dev Consultants Ltd, 24-B, Park Street, Calcutta 700016). **Wastewater treatment in pulp and paper industry - trend and practices.** *Indian J Environ Prot*, **11** (12) (1991), 899-905 [24 Ref].

Bleach plant effluents that contain chlorine have been identified as the major source of pollution. Reduction in chlorinated organics can be achieved through application of extended delignification or oxygen delignification or the combination of both. Resin acid, un-saturated fatty acids and their derivatives contribute to toxic characteristics of wastewater. The major detoxification processes include biological and physico-chemical processes. Moreover the odour problem from lagoons can be lessened by the application of black liquor oxidation system. Finally anaerobic treatment of mill effluent is gaining momentum as a cost effective alternative as it offers a pay-back on investment.

**9203 - 223.** Gajghate DG, Saxena ER, (Natl Environ Engng Res Inst, Nehru Marg, Nagpur 440020). **Removal of lead from aqueous solution by active carbon.** *Indian J Environ Hlth*, **33** (3) (1991), 374-379 [16 Ref].

Effect of surface area and particle size of active carbon and pH on adsorption of lead by active carbon was investigated. Results indicate that  $PbNO_3^+$  ions are the major species involved in the surface association. The study of effects of chromium and mercury on lead adsorption by active carbon is undertaken.

**9203 - 224.** Goswami Mamta, Naik ML (Dept Bio Sci, Ravishankar Univ, Raipur 492010). **Effect of fertilizer effluent on chlorophyll contents of *Cyamopsis tetragonoloba* Taub.** *J Environ Bio*, **13** (2) (1992), 169-174 [13 Ref].

The effect of a phosphatic fertilizer factory effluent on chlorophyll contents of *Cyamopsis tetragonoloba* Taub has been studied. Effluent was found to be acidic in nature (pH 2.26) with higher concentration of total dissolved solids, fluoride and sulphate. Ground water taken as control as well as diluent. Chlorophyll contents improved under 10% effluent solution, but higher concentrations adversely affected the chlorophyll contents, and virtually a negative correlation existed between the two.

**9203 - 225.** Guruswamy R, Elangovan R (Anna Univ, Cent Environ Std, Madras 600025). **Evaluation of kinetic parameters of activated sludge treating chrome tannerzr waste.** *Indian J Environ Prot*, **12** (2) (1992), 110-114 [12 Ref].

Experiments were conducted by operating a laboratory scale completely mixed continuous flow activated sludge system to treat settled chrome tannery wastewater and to develop biokinetic parameters for the same. The BOD and COD removal ranged from 84 to 96 % under steady state operations indicating thereby that settled chrome tannery effluent could be treated by controlled activated sludge system.

**9203 - 226.** Hart Brian R, Powall MA, Sahu KC, Tripathy S, Fyfe WS (Dept Geo Univ Western Ontario London, Ontario Candada). **Mineralogic and element association of coals from the Gevra Mine, Korba Coal Field, Madhya Pradesh, India.** *Proc Int Conf Environ Impact Coal Utilization*, IIT Bombay, 1991, 39-58 [23 Ref].

Channel samples from the Gevra mine, Korba are currently being investigated as part of large project to look at the trace element content/distribution of coals and coal by-products from several large coal mining areas in India. This part of the study involves identifying trace elements associated with the mineral phases in these coals and associated sediments.

**9203 - 227.** James Jose (Regl Res lab, (CSIR), Bhopal 462026). **Rice-husk-ash cement-a review.** *J Scient Indl Res*, **51** (5) (1992), 383-393 [10 Ref].

The use of silica from rice-husk for the production of various material including rice-husk ash-lime binder, has gained significance. The decomposition of husk, the properties of the silica ash, including its crystallization and the ash-lime reaction, are-reviewed. The use of optimum ash/lime ratio is recommended for obtaining consistently good performance for the mortar. A method for the determination of this ratio is also discussed.

**9203 - 228.** Jojo PJ, Rawat A Prasad Rajendra (Dept Appl Phys, ZH Coll Engng Techno, Aligarh Muslim Univ Aligarh 202002). **Uraninsn content in coal and Sy ash samples.** *Proc Int Conf Environ Impact Coal Utilization*, IIT Bombay 1991, 97- 102 [5 Ref].

Paper measures the U-content in coal samples of different collieries used as fuel in Thermal Power Plant Kasimpur (U.P.) and in the fly ash collected from there. The samples were ground very finely and sieved through a 100 mesh sieve. The U-content in coal shows a variation of 1.07 to 6.67 ppm in uniform distribution and 26.82 to 74 ppm in non-uniform distribution.

**9203 - 229.** Krishna D, Reddy PJ, Gadghate D. Nandi T (Indian Inst Cheml Techno, Hyderabad 500007). **Association of COD and BOD for industrial waste-waters.** *Indian J Environ Prot*, **11** (12) (1991), 927-929 [4 Ref].

An attempt has been made to study the inter-relationships between BOD and COD for industrial wastewaters from various other industries, like sugar, brewery, distillery, slaughter house, dairy, tannery, textile, starch tapioca, edible oil, coffee (arabica) and pulp and paper (sulphate) by the application of regression model.

**9203-230.** MohanBrij, Rastogi SC, Saxena RC (Regl Labour Inst, Sarvodaya Nagar, Kanpur 208005). **An assessment of physico-chemical characteris-tics of the wastewater of Kadarabad drain, Modinagar.** *Indian J Environ Prot*, **11** (12) (1991), 906-909 [9 Ref].

A study was conducted in the Kadarabad drain, Modinagar, U.P., to assess the status of pollution through physico-chemical characteristics of the waste-water. Wide

impact on the characteristics of the drain water was observed due to the addition of untreated industrial and domestic waste of the Modinagar Industrial Township (MIT) which warrants treatment of industrial waste at the source itself. The pollution load on different stations of the drain and results of the statistical analysis are presented in the paper.

**9203 - 231.** Nandgaonkar RR ISch Std Geo, Vikram Univ, Ujjain). **Occurrence and distribution of trace elements in coal of Pathakhera coalfield, Madhya Pradesh, to assess the potential of environmental pollution.** *Proc Int Conf Environ Impact Coal Utilization*, IIT Bombay 1991, 59-66 [7 Ref].

Paper includes data on analytical determinations made on representative samples of coal and concentrates of different lithotypes from coal seams of Pathakhera coalfield of Satpura Gondwana basin. This coal is utilised at Satpura Thermal Power Plant at Sarni. The samples of fly ash and bottom ash are also collected and analysed to compare the data so that the assessment of the environmental pollution potential can be made. The analytical data for the 18 important elements have been discussed for their range values, average content and enrichment factor.

**9203 - 232.** Negi BS, Meenakshy V (Environ Assess Div, Bhabha Atomic Res Cent, Trombay, Bombay 400085). **Characterisation of coal fly ash from thermal power plants in India.** *Proc Int Conf Environ Impact Coal Utilization*, IIT Bombay, 1991, 143-152 [7 Ref].

Fly ash collected from 22 thermal power stations spread over the country were analysed for various elements. Using energy dispersive X-ray fluorescence (EDXRF) and instrumental neutron activation analysis (INAA) methods. The results show that the concentrations of these elements vary widely but are within the normal range of values.

**9203 - 233.** Patil A, Gopal R, Dube SK, Mandal PK, (Res Dev Div, Natl Thermal Power Corpn Ltd. New Delhi 110048). **Characterisation and utilisation of coal ash in the context of Indian super thermal power station.** *Proc Int Conf Environ Impact Coal Utilization*, IIT Bombay, 1991, 153-164 [11 Ref].

Paper discusses the various properties of dry, fly ash, wet bottom ash, and the pond ash where both fly ash and bottom ash are disposed of presently in wet slurry

form. Based on the characterisation of these ashes, their relative technological advantages for utilization of raw materials in manufacturing building materials is discussed including difficulties expected on account of the different parameters. It also discusses the constraints that are being faced in India towards utilisation of ash and technological improvements that are required in the future generating stations to overcome some of the constraints.

**9203 - 234.** Palit A, Gopal R, Ray DN, Jain SK (Res Dev Div, Natl Thermal Power Corpn, New Delhi 110048). **Leaching characteristics of coal ash.** *Proc Inst Conf Environ Impact Coal Utilization*, IIT Bombay, 1991, 219-238 [15 Ref].

Paper discusses the methodology adopted and gives the results obtained for different liquid-solid ratios by column and cascading methods including interpretation of the data.

**9203 - 235.** Pandey RA, Parhad NM, Kumaran P (Natl Environ Engng Res Inst, Nagpur). **Biological nitrification of LTC wastewater.** *J Environ Sci Hlth*, **A27** (1) (1992), 41-61 [19 Ref].

The wastewater, after the removal of phenolics with and after the elimination of colour causing compounds was tested for nitrification both at batch scale and in continuously fed completely mixed activated sludge system. Further the effect of alkalinity on nitrification was also studied. The results indicated that ammonia removal efficiency of 72 and 90 per cent in the case of coloured and decolourized effluent respectively could be achieved at optimum HRT of 48 hours. Further it has been observed that the colouring compounds like polymerized phenols and hydantions affect nitrification in general and nitrification in particular.

**9203 - 236.** Pathak Satish R, Misra, Sudhindra N (Dept Chem, Bhavnagar Univ, Bhavnagar 364002). **Land treatment studies on utilization of effluent waters from chemical plants for agro-forestry.** *Polln Res*, **11** (1) (1992), 19-26 [7 Ref].

Investigations are in progress to utilize pre-treated effluent from manufacturing plants of Excel Ind. Ltd. for raising agroforestry. The design approach along with the experimental results so far obtained towards land treatment of effluent have been

discussed in this paper. Subabul (*Leucaena leucocephala*) was found to grow well on soil being irrigated by the effluents.

**9203 - 237.** Pavanaguru R, Venkat Reddy D (PG Cent Kothagudem Sch Mines (Osmania Univ), Kothagudem, AP 507101). **Geochemical significance of some trace elements in coal bearing horizons of Kothagudem area, Godavari coal belt, Andhra Pradesh -a case study.** *Proc Int Conf Environ Impact Coal Utilization*, IIT Bombay, 1991, 67-74 [13 Ref].

Studies on the coal bearing horizons of Kothagudem area exhibit significant abundance of trace elements. Lithology and structure complemented their occurrence in addition to the enclosed mineral matter of coal. The geochemical determinants pose innumerable issues on the environment and warrant a detailed integrated programme in the light of the rapid rate of exploitative activity contemplated in this decade.

**9203 - 238.** Periasamy K, Srinivasan K, Murugan PK (Dept Chem, Inst Road Transport Techno, Erode 638316). **Studies on chromium (VI) removal by activated groundnut husk carbon.** *Indian J Environ Hlth*, **33** (4) (1991) 433-439 [4 Ref].

The activated carbon prepared by carbonisation of groundnut husk with sulphuric acid followed by thermal activation showed 80% removal of chromium (VI) at optimum pH 2.0 when a minimum chromium (VI) carbon ratio of 0.00416 was maintained. The above ratio was valid even for higher concentrations of chromium (VI).

**9203 - 239.** Powell MA, Hart BR, Fyfe WS, Sahu KC, Tripathy S, Samuel C (Dept Geo, Univ Western Ontario London, Ontario, Canada N6A 5B7). **Geochemistry of Indian coal and flyash, environmental considerations.** *Proc Int Conf Environ Impact Coal Utilization*, IIT Bombay 1991, 23-38 [14 Ref].

This work has determined the geochemistry of coals and related sediments from mine samples collected at Neyveli, Kobra and Talcher which account for approximately 15% of all the coal mined in India yearly. Data from mine samples indicate significant variations in the vertical distribution of trace elements and partitioning between high and low ash samples.

**9203 - 240.** Rahaman Abdul A, Devi Ambika, Ezzo M Sosamma, Prabhakar J (Dept Zoo, AWM Sri Pushpam Coll (Auto), Poondi, Thanjavur 613503). **Distillery effluent treatment using Artemia.** *Indian J Exptl Bio*, **30** (4) (1992), 313 - 316 [11 Ref].

Artemia functions as living filter for the secondary treatment of distillery effluent, which reduces up to 69% of the total solids and 33.34% of BOD in the saline medium of 60 ppt. Chemical analysis of diluted effluent after treatment with Artemia showed a significant ( $P < 0.001$ ) decrease in the electrical conductivity, calcium and potassium values.

**9203 - 241.** Rajakumar G Suseela, Basu SK, Nandy SC (Bacterio Lab, Centl Leather Res Inst, Madras). **Degradation of pentachlorophenol by Pseudo monas aeruginosa.** *Indian J Environ Hlth*, **33** (4) (1991), 425 - 432 [25 Ref].

A Pseudomonas strain capable of degrading pentachlorophenol (PCP) was isolated around tannery soil and characterised as Pseudo-monas aeruginosa. By adaptation the bacterium was able to grow in nutrient broth containing PCP at a concentration of 1500 mg/l. The bacterium which mineralized PCP and several other chlorophenols is sensitive to 3,4 - and 3,5 - dichlorophenols at higher concentrations.

**9203 - 242.** Rajamani S, Gupta SN, Mitra RB, Schaapman JE, Pelckmans HHA (Centl Leather Res Inst, Madras). **Chrome recovery and reuse in India.** *Water Env Techno*, **4** (1) (1992), 60 - 63.

Pilot plant studies were carried out in one of the commercial tanneries at Kanpur. The results indicate that the chrome recovery and reuse system can be easily adopted in Indian tanneries and that chromium recovery and reuse is profitable in addition to the direct financial benefits. The pollution problem caused by chromium discharge may be better managed and sludge disposal minimized by using this clean technologies.

**9203 - 243.** Rawat A, Jojo PJ, Khan AJ, Tyagi RK, Prasad Rajendra (Dept Appl Phys, ZH Coll Engng Techno, Aligarh Muslim Univ, Aligarh 202002). **Radon activity in a coal fired thermal power plant.** *Proc Int Conf Environ Impact Coal Utilization*, IIT Bombay, 1991, 111-115 [7 Ref].

Measurements of radiation exposure due to air-borne radon in the plant have been made with an emphasis on the radon activity with height. About 30 CR-39 plastic track detectors of 2cm x 2cm size were exposed in bare mode at different locations and heights inside the Thermal Power Plant area ZB" at Kasimpur (U.P.) for 100 days. The exposed detectors were etched in 6N NaOH solution at 70° C for 10 hours to reveal the tracks due to radon and its daughters. The tracks were counted by an optical microscope of magnification 400X.

**9203 - 244.** Rawat-Narendra S, Ranjana Km (Dept Appl Chem, Indian Sch Mines, Dhanbad 826004). **Utilization of flyash for adsorption of Cd (II) in aqueous media.** *Proc Int Conf Environ Impact Coal Utilization*, IIT Bombay, 1991, 239-253 [27 Ref].

Removal of Cd(II) from water by adsorption on fly ash is a function of concentration, pH, temperature and particle size. The adsorption of Cd(II) has been found to be nearly 70% under optimal conditions. Initial rates of adsorption of Cd(II) decreases progressively after the first 30 minutes and slowly approaches equilibrium in 120 minutes. The increase in adsorption of Cd(II) with pH has been explained on the basis of surface complex formation.

**9203 - 245.** Ray Rajan (Cheml Engng Sec, Coll Ceramic Techno, 79 AC Banerjee Lane, Calcutta 700010). **Utilisation of flyash - a review.** *Cheml Ind New*, **37** (4) (1991), 335-339 [34 Ref].

A brief survey has been made on the recent studies on effective utilisation of fly ash. It has been established that finer fraction instead of bulk fly ash improves the compressive strength and other properties of fly ash concrete to a considerable extent. Grinding of raw fly ash has also a similar impact. Low Ca-fly ash increases the resistance to sulfate and chloride attack. However, at low temperature, high Ca fly ash exhibits more chloride resistance.

**9203- 246.** Rayalu SS, Kumaran P, Rao KSM (Natl Environ Engng Res Inst, Nehru Marg, Nagpur 440020). **Chemical transformation of phenolics in coal carbonization wastewater.** *Indian J Environ Prot*, **12** (3) (1992), 210 - 218 [19 Ref].

Paper presents the results pertaining to the chemistry of colouring reactions of the phenolics by oxygen. Monohydric phenol, catechol, hydroquinone, resorcinol all

identified in coal carbonization wastewater [CCW] have been observed to undergo oxidative coupling as evidenced by the bathochromic shifts, resulting in high colour, intensities. The hypothesis on the polymerised products of phenolics responsible for intense colouration has been extended to explain the intense colouration in CCW as phenolics are the dominant pollutants present in it.

**9203 - 247.** Reddy RC, Raw PM, Gajghate DG, Murthy MRK, Rao MV (Natl Environ Engng Res Inst, Zonal Lab, IICT Campus, Hyderabad - 500007). **Treatment and disposal of waste-water discharged from a beta-naphthol plant- a case study.** *Indian J Environ Prot*, **12** (3) (1992), 184-188 [15 Ref].

Laboratory studies were carried out for treatment of wastewater from a plant producing 3 tonne/ day of 2-naphthol. Combined wastewater is highly alkaline with high COD (2200 g/l) and BOD (200 mg/l), and total dissolved solids. Sulphite bearing wastewater is pretreated separately and combined with other wastewater. After pH adjustment and dilution, these wastewaters are treated by aerobic biological methods. Biologically treated wastewater is non-toxic to fish which is confirmed by the bio-assay studies.

**9203 - 248.** Sammaiah P, Murthy DVS, Sastry CA (Indian Inst Techno, Dept Cheml Engng, Madras 600036). **Evaluation of comparative performance of different support media in the anaerobic attached growth bioreactors for the treatment of wastewaters.** *Indian J Environ Prot*, **11** (12) (1991), 881-886 [13 Ref].

Present study was carried out to evaluate the performance of anaerobic filters receiving synthetic milk waste employing different support media for the attachment of micro-organisms. Results conclude that at low loading rates more than 80% COD removal was recorded in all the reactors. A rough surface support media (bricks) enhanced the biomass accumulation and performance and the specific biogas yield obtained in this study varied from 0.37 - 0.429 m<sup>2</sup>/Kg COD added.

**9203 - 249.** Sankaranarayanan M, BrittoAJ, BashaCA, Vijayavalli R (Centl Electro Cheml Res Inst, Karaikudi 623006). **Investigations on the electrochemical removal of copper using bed reactors.** *Indian J Environ Hlth*, **33** (3) (1991), 317-323 [25 Ref].

Continuous flow electrolysis has been carried out in a double packed bed flow-by electrolyser using graphite particles for the electrodes, in a batch type recirculation reactor system, using synthetically prepared effluent containing 120 mg/L of copper at a constant applied voltage of 30 V. The flow rate varied from 30 to 120 lit/hr in 5 steps viz 30,45,60,90 & 120 lit/hr. The concentration of  $\text{Cu}^{2+}$  was reduced from 120 to 2.5 mg/L after a period of 3.25 hours at the flow rate of 120 lit/hr, with removal efficiency of 98 percent.

**9203 - 250.** Sarma Nikhileswar (Nagaon Paper Mill, Centl Lab, Jagiroad 782410). **Paper mill effluent and its biological treatment.** *Indian J Environ Prot*, **12** (2) (1992), 89-93 [5 Ref].

The physico chemical characteristics of effluent of a typical Pulp and Paper Mill at its different stages of treatment are studied. The biological treatment considerably improves the characteristics of the effluent in respect of DO, BOD and COD to safe limits. The organic load of the effluent is considered to be a major hindrance in the biological treatment and needs removal before treatment.

**9203 -251.** Sasidhar P, Ayengar Bharathan, Anand Babu C, Siriah HN, Lal KB, Amalraj RV (Centralised Waste Manag Facilities, Fuel Reprocessing Nuclear Waste Manag Gr, Bhabha Atom Res Cent, Kalpakkam 603102). **Coprecipitation of selenites from acidic effluents.** *Indian J Environ Hlth*, **33** (4) (1991), 440-444 [8 Ref].

Coprecipitation of selenium of hydrous iron (III) oxide was successfully employed as a treatment method for effluents containing selenium. The optimisation of iron dosing at pH 5.0 was also carried out. The resultant supernatant, with selenium concentration well below the prescribed limits, could be discharged safely into the environment.

**9203 - 252.** Saxena Dinesh K (Bot Dept, Bareilly Coll, Bareilly, Uttar Pradesh). **Eichhornia crassipes fcg the treatment of a match factory waste.** *J Indl Polln Contl*, **7** (2) (1991), 83-86 [7 Ref].

The objective of the study was to assess the feasibility to upgrade WIMCO factory effluent by concept of treating with aquatic macrophytes. A pilot study at WIMCO factory, at Bareilly shows that DO 234.6%, total solids 31.44%, and total kjeldahl

nitrogen removal of 27%, respectively was achieved in 20 days. Later on (after 5 days) water hyacinth plant showed sign of decay.

**9203 - 253.** Sengupta J (Natl Bldg Orgn, New Delhi). **Characteristics of Indian coal ash and its utilisation as building material.** *Proc Int Conf Environ Impact Coal Utilisation*, IIT Bombay, 1991, 165-183 [13Ref].

The paper describes the various characteristics of Indian coal ash and its related standard. It attempts to highlight the various applications of coal ash in the construction. The present trend of coal ash utilization in the developed countries and its occurrence in India has also been dealt briefly.

**9203 - 254.** Sharma Raghu Rama S, Bandyopadhyay M (Environ Engng, Dept Civil Engng, IIT Kharagpur). **Treatment of pulp and paper mill effluent by up-flow anaerobic filter.** *Indian J Environ Hlth*, **33** (4) (1991), 456-463 [5 Ref].

An anaerobic filter, with burnt earthenware rings of potters clay as medium was used for the treatment of pulp & paper mill waste. Waste water was fed at COD concentrations of 1000, 2000, 4000, 6000 mg/L, and the filter performance with respect to COD reduction, and gas production, was studied for various hydraulic loading conditions.

**9203 - 255.** Singh Arvind, De SK (Sheila Dhar Inst Soil Sci, Univ Allahabad, Allahabad 211002, UP). **Influence of Industrial wastes on the soil amino acids.** *New Agriculturist*, **2** (2) (1991), 237-240 [4 Ref].

Amino acid composition of and humic acid extracted from normal soil in the presence of industrial waste (basic slag, press-mud and mollasses). at 20,40,70, p.c. (of water holding capacity) soil moisture condition and 15 and 30 days time of reaction, the addition of basic slag between 20% and 70% moisture condition of soil in-creased the quantity and quality of and humic acids.

**9203 - 256.** Singh DK, Lal Jyotsna (Dept Chem, Hercourt Butler Technol Inst, Kanpur). **Removal of toxic metal ions from waste water by coal based adsorbent.** *Polln Res*, (1992), 37-42 [11 Ref].

The enhancement of Hg (II), Zn (II) Cu (II) and Cd (II) sorption from aqueous solutions by bituminous coal through impregnation was explored in the laboratory using batch adsorption process and down flow column studies. The impregnated coal exhibited high selectivity for Pb (II) and Hg (II).

**9203 - 257.** Singhal DK, Kumar Arvind, Saraswat IP (UP Jal Nigam, Hardwar, tJP). **Removal of colour from paper mill waste using fly ash.** *Proc Int Conf Environ Impact Coal Utilization*, IIT Bombay, 1991, 225-264.

Paper presents the use of fly ash to overcome the problem of colour in the paper mill effluent. Cost of fly ash is less since it is a byproduct of the paper industry itself, thus leading to recirculation of the industry's wastes. However, the quantity of fly ash required for appreciable colour removal is comparatively large and the sludge disposal remains a problem.

**9203 - 258.** Sinha PK, Ayengar Bharathan. Amalraj RV (Centralised Waste Manag Facility, Bhabha Atom Res Cent, Kalpakkam. 603102). **Chemical treatment of thorium bearing waste.** *India J Environ Hlth*, **33** (3) (1991), 312-316 [4 Ref].

Effluents containing fine particles of thorium oxide are generated during its pelletisation. Phosphate and oxalate precipitation systems may be used for removing the particulate thorium oxide, dissolved thorium or other actinides from the effluent. Paper deals with laboratory studies on these two precipitation systems used for the removal of dissolved and suspended thorium species.

**9203 - 259.** Sudhani W, Bhatt NM, Singh Manjeet (Civil Engng Dept, Fac Techno Engng, MS Univ Baroda, Baroda). **Phenol toxicity on the biomass from an activated sludge plant treating petrochemical effluent.** *Indian J Environ Hlth*, **33** (3) (1991), 306 - 311 [8 Ref].

Occasionally a large amount of phenol gets into the wastewater treatment plant in the phenol discharging industries, creating shock loading. conditions on activated

sludge systems. Addition of phenol upto 1600 mg/L as a pulse dose in the stabilized activated sludge re-actor does not cause significant adverse effects. Addition of 400 mg/L of phenol in continuous mode every day can maintain the plant operating parameters to certain extent, but the concentration at 800 mg/L has caused complete upset of operating plant.

**9203 - 260.** Tripathy S, Powell MA, Hart BR, Sahu KC, Fyfe WS (Dept Earth Sci, IIT Bombay, Bombay 76). **Mineralogy of Indian coal fly ash.** *Proc Int Conf Environ Impact Coal Utilisation*, IIT Bombay, 1991, 185- 192 [22 Ref].

Samples of ash obtained from a number of Indian thermal plants, from various points of collection have been chemically analysed and their stoichiometric mineral compositions have been calculated.. The results have been compared. Formation of various mineral phases have been discussed and their environmental implication in solid waste disposal has been pointed out.

**9203 - 261.** Upadhyaya, US, Singh B (Univ Roorkee, Inst Paper Techno, Saharanpur 247001). **Decolourisation of effluent from pulp and paper industry.** *Indian J Environ Hlth*, **33** (3) (1991), 350-356 [1 Ref].

Chemical aspects of colour removal of effluent from pulp and paper industry are discussed. The use of calcium hypochlorite during alkaline extraction reduced the colour of effluent by 84 % without affecting the quality of pulp. The use of chlorinated back water during brown stock washing reduced the colour of brown stock effluent by 60% without affecting the quality of pulp.

**9203 - 262.** Upadhyay Rajeev, Pandey GN (UP Polln Contl Bd, 257 Janakpuri, Avas Vikas, Bareilly 243122). **Environmental pollution control in woollen textile industry.** *J Indl Polln Contl*, **7** (2) (1991), 55-56 [12 Ref].

Paper contains the proper and detailed description of different pollutions along with the sources and harmful effects on the receiving streams/rivers. Various techniques to reduce the pollution load in such a way that the cost of treatment is minimal have also been discussed. A comparison of different effluent treatment methods for woollen textile industry is also given.

**9203 - 263.** Upadhyay Rajeev, Pandey GN (UP Polln Contl Bd, 257, Janakpuri, Avas Vikas, Bareilly 243122). **Environmental pollution control in cotton textile industry.** *J Indl Polln Contl*, **7** (2) (1991), 67-75 [12 Ref].

Cotton textile industry with an annual production of about 400 million meters of cloth and approximately 1000 million Kg of yarn, is one of the biggest industry in the country. A large volume of waste water is originated from the different process in the mill. A combination of physical-chemical followed by biological treatment for textile effluent is considered in this paper.

**9203 - 264.** Veena V, Sahu AK, Patel M (Pulp Paper Res Inst, Jaykaypur 765017, Orissa). **Paper mill sludge in agricultural soil amendment and effluent water for irrigation.** *IPPTA*, **4** (1) (1992), 112-121 [17 Ref].

Greening of earth along with environmental control have been conceived by efficient utilization of the effluent water and sludge generated by Indian pulp and paper mills for irrigation and agricultural soil amendment. The N, P, K, values and other properties of primary, secondary sludges and composed primary sludge from paper mill have been evaluated for agricultural purpose. Use of effluent water for irrigation of food crops and pulp wood trees is discussed and results of effluent water treatment in eucalyptus are presented.

**9203 - 265.** Wasay SA (Min Env Forests, CGO Complex, Lodi Rd, New Delhi 110003). **Leaching behaviour of trace toxic metals from flyash, their seepage control to groundwater and utilisation of flyash.** *J Environ Sct Hlth*, **A27** (1) (1992), 25-39 [3 Ref].

The leaching characteristics of chromium (III), chromium (VI) mercury (II) and arsenic from flyash were investigated at various pH levels. It was estimated at., pH 7.0 that about 40% of these toxic elements present in flyash was leachable and may leach out to groundwater. Twelve monitoring wells were selected surrounding the dumping site for studying these metals in groundwater. The ash transport water samples of the pond were also examined for their toxic metals A control technology is suggested for seepage control of these trace toxic metals to groundwater with proper synthetic liners. A method

for flyash utilisation is developed for building materials/smooth road or airport runway construction.

## Forestry and Environment

**9203 - 266.** Adhikary BS, Joshi Mukesh, Rikhari HC, Rawat YS (Dept Bot, Kumaun Univ, Nainital 263002). **Cluster analysis (dendrogram) of high altitude (2150-2500m) forest vegetation around Pindari glacier in Kwnaun Himalaya.** *J Environ Bio*, **13** (2) (1992), 101-105 [10 Ref].

Paper deals with the cluster analysis of high altitude vegetation along an altitudinal gradient of 2150-2500 m within river Pindar Catchment of Kumaun Himalaya. A total of four forest communities were identified, viz, mixed broadleaf, silver fir dominated mixed broadleaf, silver fir and alder forest. The total basal area and density across the forest countries were in the range of 45.0-87.0 m<sup>2</sup> ha<sup>-1</sup> and 480-1600 no. ha<sup>-1</sup> respectively.

**9203 - 267.** Kushalapa KA (Office of Conservator of Forests (Centl) Bhopal, Madhya Pradesh). **Saving natural forests.** *The Indian Forester*, **118** (5) (1992), 344-347 [3 Ref].

The ecological balance is being upset due to the rapid rise of human population and their increased demands for more utilisation of natural resources. The existing natural forests are protecting our living environment. It is necessary to pay a special attention to protect, preserve and maintain the natural forests.

**9203 - 268.** Mahendra AK, Rai MP, Rawat JK (Resource Surv Manag Div, Forest Res Inst, Dehra Dun). **Forest for energy in rural economy.** *Chem Indian Forester*, **118** (4)(1992), 256-259 [2 Ref].

Firewood consumption (total and per capita in each household) have been examined for three regions, according to distance from the forests in the hilly areas. The analysis has clearly shown that distance from forests has significant effect on total and per capita firewood consumption. Easy availability of firewood increases its consumption. Also a bigger household consumes larger quantity of firewood but does it

more efficiently. There-fore, firewood saving devices should be thrust in areas near the forests to decrease the firewood consumption.

**9203-269.** Shaikh MHA (State Forest Surv Coll, Coimbatore). **Ecological approach to waste land development.** *Myforests*, **28** (1) (1992), 123-128.

Afforestation techniques and choice of species should relate to the ecological conditions of the planting site. The paper calls for making use of ecological index of the locality to determine plantation parameters. It describes a technique of afforestation different from the traditional one adopted in highly degraded area in Bagalkot Division of Karnataka.

**9203 - 270.** Soni P, Vasistha HB, Kumar Om (Div Eco Env, Forest Res Inst, Dehra Dun). **Global environment security: role of tropical forest therein.** *The J Indian Forester*, **118** (5) (1992), 367-370 [15 Ref].

The paper summarizes the changing pattern of environmental degradation, identifies causes of these catastrophies and discusses the role of tropical forests in ensuring the global environmental security. Steps have been suggested which will assist in protection, preservation, conservation and afforestation of tropical forests. Need to have a partnership of developed countries in preserving the global environment and greening of the earth has been stressed.

**9203 - 271.** Sukumar R, Dattaraja HS, Suresh HS, Radhakrishnan J, Vasudeva R, Nirmala S, Joshi NV (Cent Ecol Sci, Indian Inst Sci. Bangalore 560012). **Long term monitoring of vegetation in a tropical deciduous forest in Mudumalai, southern India.** *Curr Sci*, **62** (9) (1992), 608-616 [21 Ref].

As part of an international network of large plots to study tropical vegetation dynamics on a long-term basis, a 50-hectare permanent plot was set up during 1988-89 in the deciduous forests of Mudumalai, southern India. Within this plot 25,929 living woody plants (71 species) above 1 cm DBH (diameter at breast height) were identified, measured, tagged and mapped. This article discusses the need for large plots to study vegetation dynamics.

## Wildlife

**9203 - 272.** Choudhury Anwaruddin (Near Gate No 1 of Nehru Stadium, Islampur Rd, Guwahati, Assam 781007). **Status of wild elephants *Elephas maximus* (Linn) in Cachar and north Cachar hills, Assam - a preliminary investigation.** *J Bombay Nat Hist Soc*, **88** (2) (1991), 215-221 [8 Ref].

The Cachar and North Cachar hills districts of southern Assam once held large populations of wild elephants. However, habitat destruction and poaching has made them locally extinct in many areas. Though a very good elephant population still exists in Assam, in these two areas their status is vulnerable.

**9203 - 273.** Desai Ajay D (Bombay Nat Hist Soc, Hornbill House, opp Lion Gate, Bombay 400023). **The home range of elephants and its implications for management of the Mudumalai Wildlife Sanctuary Tamil Nadu.** *J Bombay Nat Hist Soc*, **88** (2) (1991), 145-156 [11 Ref].

Paper highlights the management issues raised by the study of home range of elephants in and around Mudumalai WS. The findings are also relevant to the design and management of other elephant areas. Some of the critical problems have been discussed and recommendation suggested.

## Energy and Environment

**9203 - 274.** Balasubramanian PR, Kasturi Bai R (Sch Energy, Env Nat Resources, Madurai Kamraj Univ, Madurai 625021). **Biogas plant slurry utilization through *Wolffia aquatic* plant culture.** *Env Eco*, **10** (2) (1992), 247-251 [8 Ref].

By utilizing the gobar gas plant effluent, the performance of aquatic plant, *Wolffia* biomass production was carried out. The experiments were conducted in out-door miniponds. Nutrient utilization by *Wolffia* plants were studied. The growth of these plants were 22.26 g wet weight m<sup>-2</sup> day<sup>-1</sup>. The crude protein content of these plants was

39.56+8.30 %. Results indicate the potential use of biogas plant slurry for the aquatic plant Wolffia biomass production.

**9203 - 275.** Balasubramanian PR, Kasturi Bai R (Sch Energy Env Nat Resources, Madurai Kamaraj Univ, Madurai 625021). **A study on the utilization of digested biogas plant slurry for aquatic plant biomass production.** *Polln Res*, **11** (1) (1992), 1-11 [26 Ref].

The biological treatment of anaerobically digested cattle dung was evaluated by using the aquatic plants *Lenrna* sp. and *Wolffia* sp. Different concentration of cattle dung and digested biogas plant slurry were used for the aquatic plant biomass production. The plant biomass production was more (150% increase) in 1.0% concentration of biogas plant slurry than without slurry.

**9203 - 276.** Chhabra KK, Mathur AN (Rajasthan Agricul Univ, Renewable Energy Cent, Coll Techno Agricul Engng, Udaipur 313001). **Energy recovery through waste management technique.** *Indian J Environ Prot*, **12** (2) (1992), 115-122 [11 Ref].

The techniques using anaerobic treatment have been success-fully experimented under laboratory and field conditions for agrobased industries wastes. Paper deals with the different techniques, and their viability under field conditions for ex-traction of methane rich biogas and reduction of biochemical oxygen demand (BOD) and chemical oxygen demand (COD) of high concentrated effluents, industrial solid wastes and agriculture wastes.

**9203 - 277.** Dhanpal D (Dept Geogr, Univ Madras, Madras 600005). **Rural energy and the quality of air-with special reference to a tribal area in Tamil Nadu.** *Energy Env Monit*, **8** (1) (1992) [11 Ref].

The study aims to measure the amount of fuelwood used by households and to estimate the amount of pollutants emitted from burning of firewood for cooking. For the present study, 85 households in a tribal panchayat called sittings in Dharmapuri district of Tamil Nadu state were surveyed. Results indicate that the sampled households burn 254 tonnes of fuelwood annually. Correlation analysis shows that annual income and firewood consumption of households are negatively correlated ( $r = -0.11$ ) or the income

and pollutants are negatively correlated. Some suggestions are given to minimize air pollution resulting from fuelwood burning.

**9203 - 278.** Kulkarni Vijay, Khanna Purushottam (Natl Environ Engng Res Inst, Nagpur 440020). **Environmental issues in power generation.** *Productivity*, **32** (4) (1992), 650-660 [21 Ref].

The production, transport and of different sources of energy raise a number of important environmental concerns that transcend the issues of availability and cost. However, environmental cost are often intangible and the analytical tools traditionally used in the energy sector, therefore, fail to deal with the environmental impacts in a comprehensive manner. This paper describes environmental implications of various fuel cycles for power generation and illustrates the role of environmental impact assessment (EIA) in energy planning as also its applications for management of environmental impacts of thermal, hydroelectric and nuclear power projects.

**9203 - 279.** Kumar Shankar, Singh SK, Mazumdar NB, Shekhar H (Sulabh Inst Technol Res Dev, Buddha Marg, Patna 800001). **Effect of organic loading rate for energy generation and environmental sanitation.** *Indian J Environ Prot*, **12** (2) (1992), 83-88 [18 Ref].

Energy in form of biogas generated during anaerobic fermentation of human excreta depends on the effect of organic loading rate, pH of feed slurry, ambient temperature of the environment and temperature and pressure of the digester. Good methanogenic activity in the digester has been found in the case of zero organic loading rate, that is on a particular day when no fresh feeding has been provided to the digester.

**9203 - 280.** Rajagopal R, Chitra N (Chem Inter 13, Sanjeevini, Sion Trombay Rd, Mankhurd, Bombay 400088). **Environmental impacts of bioenergy.** *Energy Env Monit*, **8** (1) (1992), 1-6 [11 Ref].

Paper highlights the environmental impacts associated with the generation of biomass and its conversion to energy. It is indicated that large-scale generation of biomass is likely to have serious impacts on the quality of water, soil and biota. Remedial measures have been suggested. Paper calls for an attempt to identify the gaps in the knowledge about the existing resources and technologies.

**9203 - 281.** Ranade DR, Meher KK, Gadre RV (Dept Microbio. MACS Res Inst, Pune 411004, Maharashtra). **Microbial pre-treatment to biomass for biogas production.** *Biovigyanam*, **17** (2) (1991), 61-65 [8 Ref].

Agricultural residues, aquatic weeds and vegetable market waste are organic wastes amenable to anaerobic digestion for production of biogas. Use of such biomass in non-stirred biogas plants presents problems in feeding of waste to digester, scum formation of fermenting slurry etc. To overcome these difficulties, physical pre-treatments of mechanical pulverization, pulping and heat-alkali have been suggested. Present paper describes this pretreatment and its application for biogas production from biomass. Salient features of microbial pretreatment are simplicity in its use even for family size biogas plant.

## **Plant and Pollution**

**9203 - 282.** Bansal S, Tiwari S, Rai S (MP Polln Contl Bd, Paryavaran Parisar, E-5, Arera Colony, Bhopal 462016). **Phytotoxicological responses of Ficus religiosa to SO<sub>2</sub> exposures.** *Indian J Environ Hlth*, **33** (3) (1991) 366-373 [31 Ref].

Healthy one year old saplings of *Ficus religiosa* were exposed to different concentrations of SO<sub>2</sub> for 4 hr every day for three months, to observe their morphological and biochemical responses. It was observed that plant responses increased with the increase in pollutant concentration.

**9203 - 283.** Dubey Rajeeb (Govt Engng Coll, Dept Mining Engng, Bilaspur 495009). **Studies on the status of flora in and around Korba region.** *Energy Env Monit*, **8** (1) (1992), 19-22 [8 Ref].

Studies were conducted to evaluate the responses of existing vegetation to emissions of various pollutants from thermal power stations in the Korba region. The indicators chosen for the study were: leaf area, dust deposition on leaves, pH of wash water and sugar content of leaves. Suitability of pollution resistive paints in the Korba region has also been examined.

**9203 - 284.** Gunamani T, Gurusamy R, Swaminathan K (Dept Bot, Kongunadu Art Sci Coll, Coimbatore 641029). **Effect of dust pollution on the dermal appendages and anatomy of leaves in some herbaceous plants.** *J Swamy Botl Club*, **8** (3 & 4) (1991), 79-85 [6 Ref].

The cement kiln exhaust of a cement factory, deposits 2.430g/ as m<sup>2</sup>/day of cement dust on the flora present in the vicinity of the factoer. The aerial parts of all the plants studied are coated fully with the dust which affects the morphology and anatomy of the plants. Due to the heavy deposition of the cement kiln dust, a significant percentage of stomata are clogged with the dust. Giant sized stomata, stomata with single guard cell and shrinkage of guard cells are the other abnormalities CI observed regarding stomata.

**9203 - 285.** Gunamani T, Arjuman MC (Dept Bot; Kongunadu Arts Sci Coll, Coimbatore 641029). **Studies on the cement dust induced abnormalities in some timber yielding plants.** *J. Swamy Botl Club*, **8** (3 & 4) (1991), 87-96 [7 Ref].

The flora present in the vicinity of a cement factory was heavily deposited by the kiln exhaust dust. The morphology and anatomy of the plants are affected by the cement kiln dust. The aerial parts of all the plants studied are fully coated with the dust. The deleterious effects of the dust on the morphology of the leaves are expressed by the reduction in size of the leaf, necrosis, damaged leaf margin, change of colour, curling of leaves etc.

**9203 - 286.** Ilangovan K, Vivekanandan M (Dept Bot, Bharatidasan Univ, Tiruchirapalli 6200Z4, Tamil Nadu). **Effect of oil pollution on soil respiration and growth of *Vigna mungo* (L.) Hepper.** *The Sci Total Env*, **116** (1 & 2) (1992), 187-194 [17 Ref].

As a result of continuous aqueous oil effluent irrigation in about 25 acres of crop field, oil compounds infiltrated up to 50 cm depth of the soil. In an oil-polluted soil, respiration was always higher than the uncontaminated soil. Total hydrocarbon content of the polluted soil was quantified by infrared spectrophotometric technique. A significant correlation was observed between oil concentration (total hydro-carbons) in the upper layer of the soil and air temperature.

**9203 - 287.** Jain Aruna (Dept Bot, Govt MLB Col, Bhopal 462001). **The status of chlorophyll content in some herbaceous plants of polluted and non-polluted sites of Bhopal.** *Indian J Pure Appl Bio*, **7** (1) (1992), 65-70 [5 Ref].

Present studies reveal that *Cassia tora* shows chlorophyll content in normal environment whereas *Xanthium strumarium* and *Argemone mexicana* show high values of chlorophyll in polluted environment. Hence *Xanthium strumarium* and *Argemone mexicana* grow luxuriantly in polluted areas and may be regarded as pollution indicators.

**9203 - 288.** Kalimuthu K, Poornima S, Lakshmanan KK (Dept Bot, Bharathiar Univ, Coimbatore 641046 Tamil Nadu). **Effect of nuvan and thiobencarb on pollen germination in *Eucalyptus tereticornis*.** *Indian J Environ Hlth*, **33** (3) (1991) 388-389 [13 Ref].

The pollen tube showed a decrease in length at all concentrations of nuvan, except 0.1 ppm where there is a slight promotive effect. The higher concentrations inhibited the pollen germination. In all the concentrations width increased in comparison to the control. With thiobencarb treatment maximum length of pollen tube was observed at 0.1 ppm and minimum at 0.5 ppm but it was less than the control. Increase in concentration reduces the pollen tube length as well as pollen germination.

**9203 - 289.** Lenka Maheswar, Panda Kamal K, Panda Brahma B (Genetic Toxicology Lab, Dept Bot, Berhampur Univ, Berhampur 760007). **Monitoring and assessment of mercury pollution in the vicinity of a chloralkali plant. IV. Bio concentration of mercury in in situ aquatic and terrestrial plants at Ganjam India.** *Arch Environ Contam Toxicol*, **22** (2) (1992), 195-202 [23 Ref].

In situ aquatic and terrestrial plants including a few vegetable and crop plants growing in and around a chloralkali plant at Ganjam, India were analyzed for concentrations of root and shoot mercury. The aquatic plants found to bioconcentrate mercury to different degree. The study indicates that the mercury pollution is very much localized to the specific sites in the vicinity of the chloralkali plant.

**9203 - 290.** Maheswari Devi K, Gopal V (Neurophysio Behavioural Sci, Dept Zoo, Bharathiar Univ, Coimbatore 641046). **Biomonitoring potential growth rate of Ophiocephalus striatus.** *Indian J Environ Hlth*, **33** (4) (1991), 452-455 [19 Ref].

Ophiocephalus striatus exposed sublethal concentrations of various pollutants - Cu, Cd, Hg, Pb, DDT and metacid exhibited progressive weight loss. At the end of the 5th week the weight loss was 12.35 + 1.75%, 36.5 + 2.0%, 43.15 + 1.4%, 25.4 + 2.5%, 52.5 + 1.7% and 39.2 + 1.4% respectively.

**9203 - 291.** Mishra Sanjay, Awasthi Aji K, Parmar SPS (Sch Environ Bio, APS Univ, Rewa 486003). **Underground and aboveground biomass allocation in dominant plant species, growing in and around lime stone mine sites.** *Env Eco*, **10** (2) (1992), 434 - 436 [5 Ref].

The biomass allocation in dominant annual species was more in shoot than in root. Analysis of variance of root/ shoot biomass ratio revealed no significance between different topographic situations (0.0063) and also between seasons (0.03) obviously, root/shoot biomass ratio was un-influence of different seasons and different topographic conditions. Further, it would take long time to reclaim such sites naturally as the biomass contribution of annual species was too low.

**9203 - 292.** Modi Shweta, Siddiqui N, Rai S, Rai PK (Dept Bot, Govt Girls' Coll, Shivaji Nagar, Bhopal 462016). **Foliar inquiries in Diospyros melanoxylon Roxb. Corom, exposed to auto-exhaust pollution.** *Indian J Appl Pure Bio*, **7** (1) (1992), 29-32 [19 Ref].

Present studies were undertaken to find out the behaviour of Diospyros melanoxylon exposed to such pollution in terms of morphological, anatomical and biochemical characteristics. The roadside, samples exhibited certain changes which may be considered as plant injuries, obviously due to auto-emissions.

**9203- 293.** Mukerjee Chandan, Mukherji Subhendu (Dept Bot, Cent Life Sci, Univ North Bengal). **Effect of cadmium toxicity on cell wall hydrolases and peroxidase isoenzymes.** *Indian Biologist*, **23** (2) (1991), 26-29 [15 Ref].

Rice seedlings were used in the assay of cell hydrolysing enzymes and mung bean seedlings were used in the study of peroxidase isoenzymes. Peroxidase aymogram pattern shows that five isoenzymes were present in control but in Cd treated set three peroxidases with  $R_f$  values 0.25, 0.37 and 0.45 were found. The activity of cadmium treatment bonds was far greater than that of the corresponding control enzyme bonds. The activities of cell wall hydrolyzing enzymes were appreciably lowered by Cd treatments.

**9203 - 294.** Muthuchelian K (Sch Energy, Env Nat Resources, Madurai Kamraj Univ, Madurai 625021). **The phytotoxic effect of heavy metals on nitrate reductase (EC 1.6.6.1) activity in leaves of *Cycas circinalis* Linn.** *J Curr Bio Sci*, **8** (4) (1991), 124 - 128 116 Ref].

Investigations were carried out to determine the phytotoxic effect of heavy metals on nitrate reductase activity in *Cyeas circinalis*, a tropical gymnosperm. Leaf segments treated with heavy metals, irrespective of the concentration inhibited the NR activity. The drastic inhibition of nitrate reductase activity within & short term exposure suggest that these heavy metals exert their toxicity through reduced NAD (P) H supply and may be due to competition for binding site.

**9203 - 295.** Nighat Parveen, Chaghtai SA, Kher SS (Dept Bot, Saifia Coll Sci Edn, Bhopal 462001). **Study of physico-chemical characteristics of sugar factory waste and its effect on seed germination of some wild trees.** *Ultra Scientists Phyl Sci*, **4** (1) (1991), 90-91 [4 Ref].

Analytical data revealed the physico-chemical characters of the sugar factory effluent. The effluent was found acidic and contained sufficient amount of various forms of pollutants resulting in total solids to be 1694.0 mg/l and total dissolved solids 1592.0 mg/l. Effect of the factory waste was studied on the seed germination of some leguminos trees. It has been shown that the toxicity is proportional to the degree of dilution of the waste.

**9203 - 296.** Pandey, DD, Sinha CS, Mishra CP, Nath R (Eco Res Lab, Dept Bot, SPM Coll, Bihar Shariff 803101). **Response of soils of agroeco system to coal dust pollution.** *Env Eco*, **10** (2) (1992), 389 - 390 [6 Ref].

Study was conducted in the coal field area of Dhanbad district of Bihar especially Jharia coal field to know the response of physical and chemical parameters of soil of agroecosystem to coal dust pollution. The control agroecosystem was away from the coal field area where the dust load was zero. The textural class, texture, bulk density, water holding capacity, organic carbon, total nitrogen, CN ratio and pH were determined. All these parameters showed higher values in control than in polluted agroecosystem soil except for organic carbon and nitrogen.

**9203 - 297.** PandeyDD, Sinha CS, Tiwari MG (Eco Res Lab, Dept Bot, SPM College, Udantpuri, Biharsharif 803101). **Impact of coal dust pollution on biomass, chlorophyll, nutrients and grain characteristics of wheat.** *J Ecobio*, **4** (1) (1992), 19-22 [13 Ref].

The effect of coal dust pollution on biomass, chlorophyll, nutrients and grain characteristics of wheat was studied in coal field area of Dhanbad, Bihar. The chlorophyll of polluted wheat plant was reduced to 8.9% to total chlorophyll at the age of 75 days. The levels of nitrogen and potassium were comparatively low in polluted wheat plant except phosphorus.

**9203 - 298.** Saquib M, Ahmad Z, Zaheer A, Malabar Abbas A (Dept Bot, Aligarh Muslim Univ, Aligarh 202002). **Impact of air pollution on some weeds of tropical agroecosystem.** *J Environ Bio*, **13** (2) (1992), 145-148 [15 Ref].

The pollutants caused by coal burning in the thermal power plant significantly damage the development of leaves and fruits and the growth and biomass of root and shoot in *Anagallis arvensis* Linn. While only the root length and fruit number are affected significantly in *Triponella incisa* Benth. In both the species the loss was the minimum in reference to root length and maximum to fruit number per plant in the polluted locality.

**9203 - 299.** Satyakala G, Jamil Kaiser (Bio Gr, Indian Inst Cheml Techno, Hyderabad 500007). **Chromium induced biochemical changes in Eichhornia crassipes (Mart) Solms and Pistia stratiotes L.** *Bull Environ Contam Taxto*, **48** (6) (1992), 921 - 928 [21 Ref].

The study aims at to understand the quantitative uptake and accumulation of chromium by two aquatic weeds, water hyacinth and water lettuce and their effect on physiological and bio-chemical parameters. Metal accumulation in both plants apparently led to changes in the metalloenzymes by displacement or replacement of metal ions resulting in changes in both photo synthetic and respiratory activated. An increase in respiration led to yellowing of the leaves.

**9203 - 300.** Saxena RM (Dept Bot, Agra Coll, Agra 282002). **Effect of motorway pollution on seed health of some vegetablecrops.** *India J Environ Hlth*, **33** (3) (1991), 385-387 [11 Ref].

Present communication deals with the seed and seedling health of ten vegetable crops of India, widely cultivated for their nutritional value, under the impact of highway pollution in Agra city along National Highway No. 2. Results indicate that motorway pollution reduced viability, germination, yield and seedling vigour of all the crops. The moisture contents of the seed showed an increased value.

**9203 - 301.** Saxena RM, Singh Ranvir (Bot Dept, Agra Coll, Agra). **Impact of air pollution on soil and phylloplane mycoflora of bajra (Pennisetum typhoides) S & H.** *Indian J Environ Hlth*, **33** (3) (1991), 357 - 365 [128 Ref].

A comparative study of the soil and phylloplane of bajra (*Pennisetum typhoides*) cultivated around Mathura Refinery, was undertaken during kharif 1989. In general, soil and phylloplane of the plants harboured higher fungal forms in terms of their total population, colony per mg. Of soil and per 100 cm<sup>2</sup> of leaf area, within 1 km. distance as compared to content.

**9203 - 302.** Singh Nandita, Yunus Mohd, Singh SN, Ahmad KJ (Environ Bot Lab, Natl Botl Res Inst, Lucknow 226001). **Perfonance of Vicia Saba plant in relations to simulated acid rain and/or endosulphan treatment.** *Bull Environ Contam Toxico*, **48** (2) (1992), 243-248 [11 Ref].

The performance of *Vicia faba* plants in relation to simulated acid rain and endosulphan treatment has been studied. The study revealed that *Vicia faba* is very sensitive to acid rain. Its sensitivity increases when acid rain is combined with endosulphan.

**9203 - 303.** Tiwari MG, Srivastava ON (PG Dept Bot, Deoghar Coll, Deoghar 814113). **Genus *Psephonema* Skuja from limestone mining polluted waters of Rohtas district, Bihar: a new record from India.** *Env. Eco*, **10** (2) (1992),

461-462 [2 Ref]. *Psephonema aenigmaticum* Skuja occurred as plankton in the samples collected from a channel carrying limestone quarry effluent near Kalyanpur lime and cement works Rohtas district of Bihar during the first week of February 1985. The vegetative filaments resembled chinese specimens in the shape, size, structure of the filament and the cell.