# Environmental Management

**9701-001.** Adinarayana J, Rama Krishna N, Gopal Rao K (Cent Std Resources Engng, Indian Inst Techno, Powai, Bombay 400076). **An integrated approach for prioritisation of watersheds.** *J Environ Manag,* **44**(4) (1995), 375-384 [9 Ref].

Paper describes a new concept of introducing Integrated Resources Units (IRUs) in the model. An IRU is the smallest, but viable, planning unit which leads to strategies ideally suited for scientific development of a watershed. The IRUs encompass all the relevant watershed resources, generated from map, ground and space based systems, and is the strategic unit for assigning the erosivity and transportability values of the detached material in the SYI model for gradation of priority classes of subwater sheds.

**9701-002** Ambasht RS, Srivastava NK, Srivastava Ajit K (Eco Res Lab, Dept Bot, Banaras Hindu Univ, Varanasi 221005). **Freshwater resources and wetland ecosystem functions.** *Vasundhara,* **1**(1996), 39-45 [18 Ref].

Wetlands are most valuable as store house of gene pools besides plant and animal food sources and sources of water for drinking domestic and industrial purposes. Contaminated water of mismanaged wetlands are responsible for a large number of diseases in mankind which account for nearly fifty per cent of the human deaths. Eutrophication of wetlands and destruction of marginal vegetation lead to many serious problems including up welling of beds, floods and reduced water storage capacity. Education and awareness of wetland ecology and management are urgently required at all levels.

**9701-003.** Arvind SS, Muley EV (Admn Staff Coll India, Belle Vista, Hyderabad 500049). **Labelling ecofriendly products in India-an emerging option for environmental production,** (The) *Environmentalist,***15**(2)(1995) 115-121 [11 Ref].

Paper examines the steps involved in establishing the Indian ‘Eco-mark’. For the successful implementation of the scheme the effective coordination of a number of aencies is necessary. Consumers, as well as manufacturers, have to be educated in the longterm benefits of the scheme. Initiatives necessary for the successful implementation of ‘Ecomark’ have been highlighted.

**9701-004.** Banerjee SP (Cent Mining Env. Indian Sch Mines, Dhanbad). **Legislation and standards relating to environmental protection.** *Environmentally Viable Mining Techno Fragile Ground Conditions* (Eds BB Dhar & AK Dube), 236-248.

Indian concern with environmental protection may be considered to have started in earnest with the organisation of the UN conference on the Human Environment held in June, 1972 in Stockholm. Some of the legislations having impact on mining projects or general environment enacted since then are listed and some important features of these legislations are discussed.

**9701-005.** Bhalla JK (ACC Ltd, Gagal Quarry, Barmana, Distt-Bilaspur, H.P.) **Transport system for hill mining area.** *Environ mentally Viable Afining Techno Fragile Ground; Conditions* (Eds BB Dhar & AK Cube), 129-133.

Paper discusses about transport system for hill mining and concludes that cost over a long period ultimately decides the mode of transport. Selected method of transport should be studied in detail preferably at a place where the working conditions are similar. Unconventional methods mostly entail huge installation cost but economical for typical huge deposits over a long period.

**9701-006.** Bisht NS, Srivastava AC (Fores Res Inst, Dehra Dun). **Sustainable management and conservation of drinking water resources in Himalayas.** *Indian Forester*, **121**(7) (1995), 608-611.

Scarcity of water has become a regular feature in most of our cities. The ground water table is going deeper day by day because we are ignoring the natural ways (in situ methods) of storing water. An attempt has been made to highlight the problem of drinking water in U.P. hills alongwith some measures to conserve and utilise these resources on sustainable basis.

**9701-007.** Chandra Sudhir, Kehri HK (Dept Bot, Univ Allahabad, Allahabad-211002) **PGPR and VAM: Promising biocontrol agentsfor future.** *Vasundhara,* **1**(1996), 9-18 [92 Ref].

Biological control is a reliable and safe alternative, therefore, during the past few decades a significant priority has been given to search for new and effective biocontrol

agents by the research and development community. So far, six microbial biocontrol agents for plant diseases have been registered in the US. Few more types of microbial biocontrol agents have been discovered by the scientists which have proved their potentiality to control the deleterious microbes beyond their expectations viz. Plant Growth Promoting Rhizobacteria (PGPR) and Vesicular Arbuscular Mycorrhiza (VAM).

**9701-008.** Chowde Gowda M, Raghavan GSV, Ranganna B, Barrington Suzelle (Div Agricl Engng, Univ Agricl Sci, GKVK Bangalore-560065). **Rural waste management in a south Indian village case study.** *Bio-resource Techco,* **53**(3) (1995), 157-164 18 Ref].

A microlevel study was carried out in a typical south Indian village to assess the quantity and type of wastes generated and its present mode of management. This information was used to identify the appropriate technologies which could enhance the value of the waste produced and at the same time. improve the economic conditions of rural people. About 77N. of the waste generated in the village was used as domestic fuel7 animal fodder and organic fertilizer for crop production. The rest (23°t) was left out in open fields for natural decomposition.

**9701-009.** Das MR (Cent Cellular Molecular Bio, Uppal Rd, Hyderabad-500007). **Technology and environment.** *J. Environ Resources,* **2**(1 -4) (1994) 7-13.

The general scenario of the global environment with particular reference to climate change and its factors, hazards from toxic chemicals and radioactivity the energy sector and the relevance of non-conventional energy resources and the conflicting interests of ecologists and economists have been reviewed. Paper suggests that the best approach is to think of the protection of ecological systems as a long term investment. which in fact means a reversal of the course of disinvestment that has resulted in non-renewable environmental damage. in mane areas of developmental pursuits.

**9701-010.** Dhar BB (Centl Mining Res Stn, Dhanbad, Bihar). **Environmental scenario of Indian mining with special reference to fragile moufitainous ground conditions.** *Environmentally Viable Mining Techno Fragile Ground Conditions* (Eds.B.B. Dhar & AK Dube). 1-18 [6 Ref].

Attempt has been made to highlight some of the environmental issues associated with mining industry as a whole and with some added emphasis on ecofragility. Also, reference has been made to environmental laws associated with industry in India. This paper will help a planner or a practicing engineer to assess the environmental obligations and issues prevalent in the country, vis-a-vis its relationship to the over all developmental process of the country.

**9701-011.** Dube AK (Centl Mining Res Stn Unit, Roorkee-247667). **Some aspects of environment friendly mining technology.** *Environmental Viable Mining Techno Fragile Ground Conditions* (Eds BB Dhar & AK Dube). 134- 166.

In the hilly terrain of Himalayan region the mining activities are going on since last 50 years. There is thus a need to study the current scenerio and short comings of mining practices before thinking about environmentally viable mining technology. It would be worthwhile if new concepts are tried in the mining process and the transportation techniques. Paper discusses these aspects with an intent of enthusing scientific culture in future mining operations.

**9701-012.** John KT, Iyer S Neelam (Ins Petroleum Safety Environ Manag, Oil Natural Gas Corpn Ltd, Margao, Goa). **Oil spill source identification an overview.** *Polln Res,* **14**(4) (1995), 391-402 [55 Ref].

Due to the complex nature of the crude oil2 identification of the oil sample can be achieved through evaluating suitable properties or components. Various strategies and analytical techniques used for identification of crude oil residues have been reviewed. Com ponents of crude oil viz. bio markers, which are least susceptible to weathering process and inorganic constituents, which are specific to the origin of the oil are selected for finger printing of the oil.

**9701-013.** Krishna Akhouri Pramcd ( GB Pant lnst Himalayan Env Dev, Sikkim Unit, P.O. Tadong, Gangtok-737102, Sikkim). **Remote sensing approach for watershed based resources management in the Sikkim Himalaya: a case study.** *Photonirvachak* **24**(2) (1996), 69-83 [17 Ref].

The usefulness of remotely sensed data from earth resource satellites for watershed management is discussed for an eastern Himalayan watershed covering

39.09 km2 area. The biophysical conditions were assessed based on field experience. The remote sensing in puts were important in deriving the relevant details faster and precisely.

**9701-014.** Mahadevan Anandhavalli (Cent Future Std, Madurai Kamaraj Univ, Madurai-625021). **Multidisciplinary (infusion) model for environmental education: feasibility survey at school level.** *:Eco Env. Conserv,* **1**(1-4) (1995), 79-84 [7 Ref].

Science and social studies are the subjects preferred for Environmental Education (EE) integration. Aesthetic aspects of EE can be incorporated in language study and problems based on simulated environmental concepts could be included in Mathematics. The integration of EE perhaps leads to the choice of better instructional strategies by the teachers. But adopting this multidisciplinary 4 infusion model would require analysing and restructuring the existing curriculum and appropriate teacher training.

**9701-015.** Mohnot JK, Prasad VVR (CMRS Unit, CBRI, Roorkee-247667) **Alternative to blasting environmental considerations for fragile ground conditions of Himalaya.** *Environmentally Viably Mining Techno Fragile Groand Conditions* (Eds BB Dhar & AK Dube), 222-235 [6 Ref].

The Himalayas represent the youngest and the most active & fragile mountain system in the world. The exploitation of minerals for the industrial development and economic prosperity of the region has influenced adversely its environment. Scientific innovations in mineral getting process, management of mine waste and restoration of mined out areas to near natural surroundings may save the environment.

**9701-016.** Mondal SC (Lambidhar Mine Project (UPSMDC), Mussoorie). **A case Study of limestone mining at Lambidhar Project.** *Environmentally Viable Mining Techno Fragile Ground Conditions* (Eds BB Dhar & AK Dube) 117-128.

The exploitation o£ mineral wealth in the Himalayan region, has to take into account all sorts of natural hazards. Unscientific milling in the region also contributes to these ecological hazards. Hence, the whole operation has to be scientifically planned and implemented after elaborate study of geological status and environmental impact assessment (EIA) of the area. This calls for the preparation of an EMP.

**9701-017.** Muthreja IL (Dept Mining Engng, Visweswara Regl Coll Engng, Nagpur). **Measures to control air and water pollution in ecologically fragile areas.** *Environmentally Viable Mining Techno Fragile Ground Condi tions* (Eds BB Dhar & AK Dube), 106-116.

The ecologically fragile areas are characterised by their low resilience capability, environmental sensitivity and week geological formations. A small disturbance to environ ment in such areas may bring a noticeable change in existing ecosystem. The exploi tation of mineral in fragile areas may pose many environmental problems. Measures to be taken against air pollution and water pollution in such areas are discussed here.

**9701-018.** Nair SM (Natl Museum Natural Hist, Barakhamba Road, New Delhi). **Creating environmental awareness among children.** *J Environ Resources,* **2**(1-4) (1994), 31-33.

The solution for imparting environmental education can best be achieved through children, taking advantage of their capacity for receptivity of ideas and innovative mental orientation. The means and methods for such education have been proposed and ex plained.

**9701-019.** Nath R (Dept Mining Engng, Banaras Hindu Univ, Varaliasi-2210.05) **Mine planning for hill deposits.** *Environmentally Viable Mining Techno Fragile Ground Conditions* (Eds BB Dhar & AK Dube), 82-92 [3 Ref].

Hill deposits present special problems to a mine planner on account of many considerations like remote geographical location, complex geological setting, hilly terrain, generally fragile rock and ore body conditions, complex gravitational, tectonic and residual stress configuration coupled with stringent environmental protection and control measures. Paper deals with mine planning keeping in view the special problems that may arise in case of hill deposits.

**9701-020.** Prasad Lokeshwar (Pyrites, Phosphate Cheml Ltd, Dehradun). **Mining of rock phosphate in lesser Himalayas and environmental problems.** *Environmentally Viable Mining Techno Fragile Ground Conditions.* (Eds BB Dhar & AK Dube), 93-105.

Study of Maldeota rock phosphate mines at Dehradun proves that even in sensitive area like the Himalayas, mining can be carried out with a systematic and scientific approach. The stabilisation of mined areas and overburden dumps followed by massive plantation can restore the premining eco balance to a large extent. By giving special emphasis on social forestry and needs of local population, the reclaimed mined areas can be put to productive use.

**9701-021.** Puri DN, Narain Pratap, Dhyani SK (Centl Soil Water Conserv, Res Trng Inst. Dehradun). **Soil working technique in degraded lands-Eucalyptus hybrid.** *Indian Forester,* **121**(7) 1995, 600-607 [5 Ref].

Degraded boundery river beds, occupying a sizable area of Doon Valley, support only scrub vegetation due to inherent physical and chemical soil constraints. To rehabilitate such lands with Eucalyptus hybrid, an experiment was carried out on soil working filled with original half replaced and full replacement of excavated soil with good top soil. Results revealed that on an average 100 cm deep holes and pits produced 1.43m and 1.83m height and 158 cm and 2.18 dbh respectively.

**9701-022.** Rai MK (Environ Conserv Prot Danielson Coll, Chhindwara-480011, MP) **Ecolonomy -an amerging discipline for Sustainable development.** *Eco Env Conserv,* **1**(1-4) (1995) 125-127 [6 Ref].

Ecology and Economics are two different field of knowledge. But they are related to 4-1 M of FlNDl97 each other in terms of environment. Attempts are being made by the researchers of the world to fuse both the discipli1les. A new term "Ecolonomy" has been discussed which have been proposed by various workers. The main aim of merging two discipline is sustainable development.

**9701-023.** Sharma DK (Fuels & Biofuels Engng Lab, Cent Energy Std7 Indian Inst Techno, New Delhi-110016). **Environmental pollution prevention and central by effective waste treatment and management.** *J Scient Indl Res,* **54**(10) (1995), 589-593 [4 Ref].

Dynamics of interaction of different wastes in soil water and air has been studied. Studies on bioremediation of chemically contaminated soil are reported. Fugitive emissions should be arrested. Biochemical techniques in combination with photo

chemical, chemical, thermo chemical, and physico chemical pre-treatment techniques are promising for the development of effective waste treatment processes in future. Faster anaerobic fermentative degradation techniques are required for the effective treatment and management of wastes. These techniques also generate biogas as a by product. and occasionally manure too.

**9701-024.** Shrivastava MB, Shrivastava Minakshi, Lal CB, (B-10413, Nirala Nagar, Lucknow-226Q07). **Grazinglands, canses of their deterioration and improvement in India.** *Indian J Forestry,* **18**(3) (1995), 177-191 [61 Ref].

Paper describes the livestock problems, their status and role in Indian- economy. Grazinglands village pastures, wastelands, forest lands and natural meadows their definition, present status and economy have been described. Causes of deterioration in grazinglands and forest lands have been summarised separately. Various remedial measures to improve the existing grazinglands, their rehabilitation, management on sustained basis through the improvement in livestock and grazinglands have been suggested. Introduction of leguminous spp. have been emphasized.

**9701-025.** Singh AK, Pandey AK (Natl Bureau Fish Genetic Resources, (TCAR). 351/28, Dariyapur, Talkotora Rd, Lucknow 226004). **Genetic constraints in management of endangered fishes.** *J Nature Conserve.* **7**(2), (1995), 99- 105 [59 Ref]

In an effort to enhance, restore or re-establish the eroding fishery resources, species are moving from outside and are being introduced to the totally new environments. This unregulated movement of species are often causing unexpected damage to the recipient populations. It is stressed that the transfers between genetically distinct groups should not be made for maintaining the genetic diversity of the wild stocks.

**9701-026.** Soni AK (Centl Mining Res Stn, CBRI, Roorkee 247667). **Socio economic conditions of the inhabitants of mineral belts of Himalaya: an analysis.** *Environmentally Viable Mining Techno Fragile Ground Conditions.* (Eds BB Dhar and AK Dube), 192-221.

clear cut policies of government the growth of mineral industry in Himalaya even after Independence was not significant. The ultimate effect of such controversies have

resulted in setting up of very less number of industries thereby making the region a backward. The rugged and inhospitable topography was also a one major contributory factor towards the non development of the whole area.

**9701-027.** Subramanian G, Uma L (Natl Facility Marine Cyanohacteria, Bharatidasan Univ, Tiruchirapalli 620024). **Cyanobacteria in pollution control.** *J Scient Indl Res,* **55** (8&9) (1996), 685-692 [79 Ref].

Pollution control through bioremediation is the most economical and ecofriendly approach. Using oxygen evolving microalgae in general and cyanobacteria in particular would be advantageous in many ways. Most gaseous and liquid pollutants are metabolized by cyanobacteria fairly rapidly bringing down their levels in the atmosphere and effluents. A number of toxic compounds such as phenolics pesticides and antibiotics as well as recalicitrant chemicals such as lignin can he degraded and detoxified by them.

**9701-028.** Vasistha HB, Kumar Om (Eco Env Div, Forest Res Tnst, Dehradun). **Species suitable for ecological restoration of mined ands in Doon-Mussorie hills.** *Encology,* **10**(2) (1995) 8-13 [21 Ref1.

For successful implementation of environmental restoration programme some basic study i.e. premining bench mark survey is required. Then overburden should be analysed. Reclamation of these areas is possible by firstly survey of adjoining forest areas. On the basis of that survey selection of plant species for reclamation, which fulfil the requirement of local people i.e. fuel, fodder and timber is to be planted.

**9701-029.** Vijaya R, Mahadevan Anandhavalli(Cent Future Std, Madurai Kannlaraj Univ, Madurai 625012). **Non-governmental organizations and their role in environmental educationa futuristic studv.** *Eco Env Conserz* (1-4) (1995), 85-89 [8 Ref].

Environmental Education (EE) is needed for all. Non-Governmental organizations (NGOs) should play an important role in imparting EE to the general public especially in a country like India, where a considerable proportion of the public are illiterate and poor. Paper tries to identify the growth pattern of NGOs in India. This also identified the objectives, target groups and materials of EE of the NGOs.

**9701-030.** Yadav R (Dr. BR Ambedkar, Envil on Water Manage Cent, 399, Zaruri Bazar, Ranikhet 263645). **Ganga Action Plan, Phase l: an overview.** *J Ecotoxico Environ monit,* **6**(1) (1996), 11-20 17 Ref].

To clean the river Ganga, Ganga Project Directorate was established in 1985 and Ganga action plan was launched in 1986. The main pollutants come from untreated discharged of domestic and industrial wastes of 27 major cities situated on the bank of the river in U.P. Under the programme, 68 gross pollutants were identified from among more than 450 industrial units that were discharging effluents into the river, 261 schemes were set up for the interception, diversion and treatment of effluents.

**9701-031.** Yogamoorthi A (Cent Futul e Std, Pondicherry Univ, Pondicherry 605014). **The response of industries in replacing CFCs.** *Eco Env Conserl,* **1**(1-4) (1995), 91-96 [9 Ref].

CFCs were developed in the late 1920s as an answer to the home refrigerator business. But the turning point occurred only after the British Investigator identified the hole in the stratosphere ozone layer over Antarctica and simultaneous research on the reaction behind the Ozone depletion, prompted the whole world to find out an alternative to replace the highly effective Ozone depletion substances that are derived from CFC. This article looks into the various achievements made internationally in replacing CFCs through different substitutes with relatively lesser effect on the stratospheric ozone layer.

## Air Pollution

**9701-032.** Agrawal Madhoolika (Dept Bot, Banaras Hindu Univ, Varanasi 221005). **Biomonitoring of air pollution.** *Vasundhara,* **1**(1996), 55-63 [42 Ref].

The Potential ecological impact of air pollution is determined by the contaminants environment partitioning, exposure pattern, toxicity and species sensitivity. Biological monitoring clearly shows the pathways and points of accumulation of pollutants in communities. Cell organells, organs, individuals, population, community and ecosystems show different levels of sensitivity and can be employed as ecological indicators to assess and predict changes in air environment with time. Biomonitoring is an essential addition to chemical monitoring.

**9701-033.** Gupta Hari Om, Sharma Brij Mohan (Archaeol Surv India, 29, New Centl Rd, Dehradun 248001, UP). **Impact of industrial activity on the ambient air quality in Dehradun-Rishikesh-Haridwar Valley (U.P.)** *Indian J Forestry,* **18**(01) (1995), 26-34 [8 Ref].

Impact of the pollution generated by the developing industrial area in Dehradun-Rishikesh-Haridwar Range has been assessed by measuring concentrations of modest and most harmful pollutants. The stations were set up within 10 km radius from the centre Lal Tappar. The data collected infers the zone polluted with suspended particulate matter and carbonmonoxide. On the other hand the concentration of sulphur dioxide has been found in appreciable quantity sometimes more than the safer limit. The air pollution index has been calculated as a cumulative effect of SPM, S02 and CO. The whole area has been categorised on the basis of pollution index. The variation of pollution level index correlated with standard deviation.

**9701-034.** Gupta VK, Verma AK (Sch S-td Chem, Pt Ravishankar Shukla IJniv, Raipur 492010, MP). **Respirable dust exposure in iron and steel industries.** *Cheml Environ Res,* **3** (1&2) (1994), -147 149 ;[4 Re (Late Recid).

Dust is known to be the common hazard in industry. In a work place eveery operation can produce a dusty working environment. The effect of dust on the health is influenced by the size and the chemical composition of a dust. Dust size ranging from

0.1 to 5μm are termed as respirable clust, which can remain in the alveolar passage of the lungs. The particles of the size 15 to 25μm is likely to be caught in the nasal passage or at the back of the throat, and above 25 μm settles down due to gravitational pull and does not come under the breathing zone of the exposed person. The present study deals with the monitoring the respirable dust.

**9701-035.** Jain Sudesh Kumar (Cheml Engng Dept, Univ Roorkee Roolkee). **Air pollution control in India.** *Chem Engng world,* **30**(9) (1995), 73-79 [15 Ref]

Air, nowadays also contains sulphurdioxide, carbon monoxide, nitrogen oxidesetc., which are extremely harmful for human health. Virulence of air pollution was realised in late eighties after Bhopal Gas Tragedy (BGT) and an effective air quality management started taking shape in India afterwards. The basic components of air quality management are legislation and regulations, emission inventory, air quality standards & monitoring, air dispersion models and installation of pollution control equipment which have been discussed in this paper.

**9701-036.** Kishore VVN, Joshi Veena (Tata Energy Res Inst, Darbori Seth Block, lndia Habitat Cent, Lodi Rd, New Delhi 110003). **Greenhouse gas emission from cookstoves.** *Energy Env Monit,* **11**(2) (1995), 161-165 [8 Ref].

One of the undertainities in the accurate estimation of greenhouse gases (GHGs) is related to the combustion of biomass in cooking stoves in developing countries. This paper uses available data on fuel use in various stoves and emissions from different storefuel combinations to estimate GHG emissions from cookstoves in India. In conclusion, the gaps in data are highlighted and current efforts to build such an inventory are descried.

**9701-037.** Kulshrestha UC, Kumar N7 Saxena A, Khare P, Kumari KM, Srivastava SS (Dept Chem, Fac Sci, Dayalbagh Edn Inst, Dayalbagh, Agra 282005). **Chemical composition of atmospheric aerosol at three representative sites in Agra.** *Energy Env Azlonit* **11**(2) (1995). 177-181 [19 Ref].

Water soluble components of atmospheric aerosols have been determined at three sites representing different levels of anthropogenic activity in Agra. The levels of suspended particulate matter (SPM) recorded were very high when compared with the

Central Pollution Control Board (CPCB) standards for sensitive areas. All the components were higher at the industrial site. A calculation of the anioncation balance of the aerosol showed an excess of cations, indicating the alkalinity of the aerosol at these sites.

**9701-038.** Pandey PK, Mathur RP, *Pande PK, Godbole PN (*Cent Environ Engng, Civil Engng Dept, Univ Roorkee, Roorkee). **Dry deposition at an urban location.** *Indian J Environ Hlth.* **37**(2) (1995), 95-98 [7 Ref].

Studies at Saharanpur showed that dry deposition were minimum in monsoon and maximum in winter. The deposition of ionic component were mainly from natural sources. The dry deposition velocities of aerosols were observed to be increasing with their mass median diameter. The study has suggested that the atmospheric composition in the city is strongly influenced by natural sources rather than anthropogenic.

**9701-039.** Shukla SP, Vyas D (Cent Adv St Bot, Banaras Hindu Univ, Varanasi 221005). **Global warming management.** *Vasundhara,* **1**(1996), 73-74 [7 Ref].

Fundamental uncertainties are inherent in policy action to come up with the threat of global warming. An effective approach will be to retard the activities which contribute to global warming by providing attractive options. One such option as regards solar energy is proposed.

**9701-040.** Tripathy Anamika, Bajpai Aradhana5 Tripathi DS, Tiwari Dinanath (Cent Adv Std Bot, Banaras Hindu Univ, Varanasi 221005). **Assessment of some toxic heavy metals in the atmosphere of Varanasi city.** *Energy Env Monit,* **11**(2) (1995), 183-186 L8 Ref].

Atmospheric concentrations of suspended particulate matter (SPM) and metals, have been measured at different sites in and outside the city of Varanasi. SPM and metallic concentrations were noted as maximum at Parav and minimum at Sarnath. Among the heavy metals, the concentration of Fe was found maximum, while Zn and Cu did not show any significant trend. In the high vehicular traffic frequency area, Pb was recorded significantly high.

# Water Pollution

**9701-041.** Abbasi SA, Nipaney PC (Cent. Polln Contl Biowaste Energy, Pondichery (Centl) Univ, Pondicherry 605014). **An assessment of drinking water quality of the open wells in Malappuram coast, Kerala.** *Polln Res,* **14**(3) (1995), 313-316. [lO Ref].

Water quality of forty two randomly selected open wells along Malappuram coast (Kozhikode) was studied during post monsoon. The compliance of the individual parameters as well as overall water quality was estimated with reference to international drinking water quality standards. The studies reveal that pertability of the majority of the wells (90.6%) is below permissible levels as per the ICMR and WHO standards.

**9701-042.** Ahammed Mansoor M, Chaudhuri M (Environ Engng Lab, Dept Civil Engng, Indian Inst Techno, Kanpur 208016). **Sand based filtration/adsorption media.** *J Water SRT-Aqua,* **45**(2) (1996), 67-71 [13 Ref] .

With a view to developing filtration adsorption media for use in lowcost household water purifiers, a laboratory study was undertaken to assess the potential of sand coated (impregnated) with hydroxides of iron, aluminium, calcium, or magnesium in removing bacteria, viruses and turbidity from water. The study indicated that potential of iron hyclroxidecoated or iron and aluminium hydroxidecoated sand as a filtration/adsorption medium for use in lowcost household water filters in rural areas of developing countries.

**9701-043.** Anitha Kumari S, Sree Ram Kumar N (Cell Molecular Bio Lab, Dept Zoo, Nizanl Co31, Hyderabad 500001). **Effect of water pollution on the histology of fish Channa striatus in Hussainsagar, Hyderabad, India.** *Env Eco* **13**(4) (1995), 932-934 [5 Ref].

Study was aimed to assess the histological damage caused to the fish chana striatus by various aquatic pollutants present in polluted waters of Hussainsagar. Light micro-scopic studies exhibited severe histopathological changes in kidney, liver and gills due to the impact of pollutants. Histology of kidney showed complete degeneration of uriniferous tubules indicating impairment of normal functioning of kidney.

**9701-044.** Baruah Anil Kr, Sharma Rathni N, Chowdhary Parash K (Geo Sci Div, Regl Res Lab, Coun Scient Indl Res, Jorhat 785006, Assam). **Assessment of ground water quality around oil installations of Rudrasagar, Assam, India.** *Eco Env Conserv,* **1**(1-4) (1995) 43-45 [8 Ref].

Ground water quality of shallow tube wells (15-18 m depth) around few well sites and two group gathering stations of RDS field Assam, India have been assessed. Ground water quality around well sites and group gathering stations do not indicate any significant change. Vertical migration of saline formation water to water table is not indicated. Ground water is nearly neutral and Mg-Ca-HCO type. Although its low EC, TDS, Cl, NO3 and heavy metal content conform to ISI limits and WHO guidelines, high concentrations of Fe, Mn and sometimes, Mg, along with its decomposing odour makes this water unsuitable for drinking purpose.

**9701-045.** Bhatnagar VM (Alena Cheml Canada, PO Box No. 1779, Cornwell, Ontario Canada). **Chemicals for municipal and industrial water treatment.** *Cheml Environ Res,* **2**(3&4) (1993), 193-201 (Late Pub).

The cleaning up of water is of vital concern. This article reviews the Potable municipal raw water treatment, industrial water treatment, and waste water treatment by using chemicals. Typical treatment schemes and chemicals used in these treatments are discussed.

**9701-046.** Chandra Rakesh, Bahadur Y, Sharma BK (Dept Chem, Bareilly Coll, Bareilly 243001, UP). **Monitoring the quality of river Ramganga waters of Bareilly.** *Polln Res,* **15**(1) (1996), 31-33 [10 Ref].

Monitoring of river Ramganga waters of Bareilly was carried during Gangasnan (mass bathing) period on physicochemical characteristics. Higher values of EC alkalinity hardness, calcium, magnesium, BOD, during Gangasnan and post Gangasnan are suggestive of greater pollution load.

**9701-047.** Chaturvedi Shobha, Jain Praveen, Ramachandran S, Chaturvedi R (Dept Chem, Govt MLB Coll, Bhopal 462001). **Assessment of heavy metal concentration in Kolar Dam water! near Bhopal, Madhya Pradesh (India).** *Oriental J Chem,* **11**(3) (1995), 266-267 [7 Ref].

Heavy metals which are of significant importance in potable water were determined. Among various metals analysed, the iron and manganese were found to be present above the permissible limit of drinking water. Copper, zinc and lead were observed to be present much below the concentration permitted for drinking water. However, chromium was found to exceed the permissible limit at some instances. The probability of presence of these metals is expected due to geological strata, decay and decomposition of vegetation in and around the area.

**9701-048.** Choubey VK (Natl Inst Hydrology, Jal Vigyan Bhawan, Roorkee, Uttar Pradesh). **Water chemistry of Tawa river and reservoir in Central India.** *Energy Env Monit,* **11**(2) (1995), 167-176 [20 Ref].

Attempt has been made to quantify the solute load of a river in a small forested catchment. The elemental distribution pattern has also been constructed in various reaches of the reservoir water, receiving the river discharge. The concentration of total suspended matter (TSM) decreases with an increase in TDS. A similar inverse relationship has been observed for turbidity. A positive correlation exists between TDS and secchi depth (SD).

**9701-049.** Desai PV (Dept Zoo, Goa Univ, Taleigo Plateau, Goa 403203). **Water quality of Dudhsagar river of Dudhsagar (Goa), India.** *Polln Res,* **14**(4) (1995), 377-382 [23 Ref1.

The psysicochemical characters of the river water were analysed. The river water showed high concentrations of sulphates and nitrates. IJ1 ail ten genera of phytoplanktons were observed while the zooplanktons were represented by Notholoca sp., Nauphus sp., Micronaupius sp., Karatella sp., Keretella sp. The river water was found polluted in specific periods of a year.

**9701-050.** Desai PV, Godase SJ, Halkar SG (Dept Zoon Goa Univ & Dept Zoo, Dhempe Coll, Goa). **Physicochemical characteristics of Khandepar river, Goa India,** *Polln Res,* **14**(4) (1995), 447-454 [21 Ref].

The water of Khalldepar has been used for irrigation and for domestic supply. As the river passes through the mining belts the effluents get mixed with it. The mixing of the domestic sewage, transport of mining ores by the barges, industrial wastes

deteriorate the water quality. The Khandepar river showed peak alkalinity in January and peak chlorinity in April and the water was very hard in summer. The water was acidic throughout the study period.

**9701-051.** Dhamija SK, Jain Yatish (Dept Bot, Environ Sci, Govt Autonomous Sci Coll, Jabalpur 482001). **Studies on the water quality index of a lentic water body at Jabalpur, M.P.** *Polln Res,* **14**(3) (1995), 341-346 [9 Ref].

Present work evaluates the WQI of a lentic water body (Hanumantal lake) of Jabalpur. The average value o£ water quality index for all the seasons were recorded for two stations (opposite Jain temple and Ghora Nakkas site). WQI of lake was recorded as 84.4 which indicates that lake water is not suitable for direct consumption and is not in the permissible level. It belongs to the slight pollution category.

**9701-052.** Hasan S, Mathur PK (Dept Chem, Lucknow Univ, Lucknow 226007). **Performance evaluation of Lucknow water works with specific reference to heavy metals.** *Cheml Environ Res,* **3**(2) (1994), 93-102 (17 Ref).

Lucknow water works uses Gomti river as raw water source. The water is subjected to alum coagulation, floculation, sedimentation, filteration and disinfection. This treatment was observed to be effective in the removal of copper, cadmium, chromium, lead, nickel and zinc to blow their prescribed limits. The treatment was also effective in the removal of iron to a considerable extent, however, manganese was not observed to be removed to the level conforming to Bureau of Indian Standards. It is suggested that the water works either incorporated prechlorination or prepotassium permanganate treatment to reduce manganese to the desired level.

**9701-053.** Iqbal SA, Deshmukh Mohd Munir (Dept Chem, Saifia Coll Sci Edn, Bhopal 462001). **Study on heavy metal concentrations of Halali reservoir water of Vidisha district, Bhopal.** *Oriental J Chem,* **11**(3) (1995), 290-291 [5 Ref].

Attempt was made to assess the pollution load with respect to the concentration of certain heavy metals in the water of the Halali reservoir (Vidisha, M.P.). Atomic Absorption Spectrophotometer was used for spectral analysis. The results showed higher concentration of iron and manganese, winereas, cobalt, nickel, copper and

chromium were found to have insignificant concentrations as compared to limits prescribed by Bureau of Indian Standards.

**9701-054.** Jain Sanjeev, Salman Syed (Dept Limno, Barkatullah Univ, Bhopal 462026, M.P.) **Heavy metal concentration in a highway eutrophic lake sediments and overlying water.** *Polln Res,* **14**(4) (1995), 471-476 [8 Ref].

Heavy metal concentration in water and sediments were determined in a shallow, highly eutrophic lake receiving domestic raw sewage. The concentration of different heavy metals have shown seasonal as well as station at wise variation. The values of water overlying the sediments were less as compared to the values in the sediments. The entry of heavy metals through sewage was also estimated.

**9701-055.** Jameson J, Rana BC (Dept Bio Sci, Sardar Patel Univ, Vallabh Vidyanagar 338120, Gujarat). **Pollution status of the river complex Sabarmati of Kheda region of Gujarat 1. Physicochemical characters.** *Polln Res,* **15**(1) (1996), 53-55 [13 Ref].

Pollution monitoring of five Rivers Sabarmati, Khari, Vatrak and Shedhy were carried out by analysing physicochemical parameters for two years near Kheda region of Gujarat. Many fold increase of pollution was observed at the second site due to confluence of polluted river Khari, while the third site showed slight improvement due to merger of Vatrak and Shedhy rivers.

**9701-056.** Jayakumar R, Siraz M, Siraz L (Cent Water Resources, Anna Univ, Madras). **Ground water quality of Vellar Basin, South India.** *Eco Env Conserv,* **1**(1-4) (l995), 65-70 [10 Ref].

Based on chemical analysis of ground water samples from 66 observation wells in the Vellar basin, the ground water chemical behaviour and quality were demonstrated by six spatial distribution maps. Planners and administrators can use these maps while explorations is done for new well sites in this basin. The quality of ground water in the proposed site can also be assessed. These maps can also be used for preliminary for casting of ground water quality of the basin.

**9701-057.** Joshi Arun, Chaudhuri Malay (Coll Military Engng, Pune). **Removal of arsenic from ground water by iron oxide coated sand.** *J Env Engng,* **122**(8) (1996), 769-77l [8 Ref].

In a laboratory study, iron oxide coated sand showed promise as a medium for use in small systems or home treatment units in developing areas of the world, for removing arsenic (III) and arsenic (V) from ground water. A detailed study addressing the effects of some important factors (selectivity of arse nic (TII) and arsenic (V) over one another for removal, water PH, concentration and type of competing anions and cations) on the process is needed.

**9701-058.** Kataria HC (Dept Chem, Govt PG Coll, Pipariya Hoshangabad 461775). **Turbidity measurement in ground water of Bhopal city.** *J Natzwre Conservators,* **7**(1) (1995), 79-82 [18 Ref].

Turbidity makes the water unfit for domestic purposes. Turbidity measurement is important from the aesthetic point of view. Turbidity is an expression of certain light scatter ing and light absorbing properties of the water samples. Turbidity represents non specific measurement of suspended solid constituents. In the present study turbidity was absorbed in a range of 2 to 102 N. T. U. in bore wells water of Bhopal city.

**9701-059.** Kataria HC (Dept Chem, Govt PG Coll, Pipariya Hoshangabad 461775). **Water pollution soaps, detergents and bio refractory organics.** *Oriental J Chem,* **11**(2) (1995), 199-201 [8 Ref].

Toxicity and sublethal toxicity of soaps, deter gents and biorefractory organics create water pollution and effect the ecology and micro organism, fauna and flora near the pollution load. Biologically toxic effect is significant to physiology and behaviour of organism to alter its capacity for growth and reproduction or mortality. Heterogeneity observed by a discontinued curve, shows the heterogeneity in the population of test fishes or other ani 91 M of E & Pw197 mals. Hence soaps, detergents and biorefractory organics containing water should be avoided to drain in the water reservoir to check the pollution.

**9701-060.** Kataria HC (PG Dept Chem, Govt PG Coll, Pipariya Hostangabad 461775). **Sulphate content in bore wells water of Bhopal City.** *Ultra Scientist Phyl Sci,* **8**(1) (1996), 97-100 [15 Ref].

Sulphate determination was carried out using turbidimetric method using nephelometer. In the present study sulphate content ranged from 1.6-106 ppm and mean seasonal values ranged from 2.0-91.0 ppm minimum in monsoon while maximum in winter, 36 sampling stations were taken for monitoring of borewells water.

**9701-061.** Kataria HC, Gupta SS,8 Jain OP (PG Dept Chem, Govt. PG Coll, Pipariya, Hoshangabad 461775). **Water quality of bore wells in BHEL area of Bhopal.** *Polln Res,* **14**(4) (1995), 455-462 [4 Ref].

Due to drought and MIC leakage in December 1984, it becomes necessary to evaluate the water quality of Bhopal city. Hence six sampling stations are chosen for the present study. Groundwater is the most important source of water supply for irrigation, industries and drinking purposes. The nitrates and fluoride concentrations were found with in limits but organic contamination of the water was evident.

**9701-062.** Kataria HC, Iqbal SA (Dept Chem, Govt PG Coll, Pipariya, Hoshangabad 461775). **Analysis of trace elements in lower lake water (Bhopal).** *Oriental J Chem,* **11**(3) (1995), 288-289 [6 Ref].

Storage capacity of lower lake is depleted due to regular siltation and discharge of domestic waste and sewage. Study assesses the heavy metals seasonal concentration by Atomic Absorption Spectrophotometer (AAS). Cu, Zn, Mn, Fe Ni. Cd and Cr were analysed and these trace elements ranged from 10-30, 20-32, 50-75, 15-45, BDL-16, BDL-9 and BDL p g/L respectively at different sampling sta-tions.

**9701-063.** Kataria HC, Jain OP, Gupta SS, Shrivastava RM, Shandilya AK (Dept Chem, Govt PG Coll, Pipariya, Hoshangabad 461775). **Physicochemical analysis of water of Kubza river of Hoshangabad.** *Oriental J Chem,* **11**(2) (1995), 157159 [21 Ref].

The monitoring of river water has been done seasonally near Rampur. The samples were collected from the upstream and downstream of the flowpath of the river at six points. Water temperature, sulphate and turbidity were found higher in summer

season, pH nitrate, chloride, fluoride, alkalinity, total hardness and B. O. D. were found higher in monsoon season. Iron and D.O. showed higher values in winter season. The study is aimed to assess the degree of pollution of Kubza river water and water quality status.

**970l-064.** Kumaraguru AK (Sch Energy, Env Natural Resorces, Madurai Kamaraj Univ, Madurai 625021). **Water pollution and fisheries.** *Eco Env Conserv,* **1** (1-4) (1995), 143-150 [20 Ref].

Pollution may cause morphological changes, teratogenic effects, skin ulcerations and other lesions as well as various other diseases in fish and shellfish. Bacterial contamination from domestic sewage is a problem to shellfish industry although contaminated shellfish may be marked after appropriate treatment. Of the many inorganic elements and compounds which occur as aquatic pollutants, the one which has caused great alarm is mercury. This persists for a long time in the aquatic environment and is readily accumulated in aquatic organisms including fish and shellfish.

**9701-065.** Madhukumar A, Anirudhan TS (Dept Chem, Univ Kerala, Kariavattam, Thiruvananthapuram 695581). **Hydrographic features and chemical characteristics of EdavaNadayara and Paravur backwaters.** *Polln Res,* **15**(1) (1996), 79-84 [14 Ref].

Impact of coconut husk retting on water quality of EdavaNadayara backwater has been studied. The water quality has been assessed by measuring various parameters. A significantly feature associated with retting is the complete depletion of oxygen in the retting zone and H2S, COD and BOD were significantly higher than in nonretting zone. The high contents of NO-N during monsoon was contribxlted by land drainage and high values of pO!P during premonsoon possibly caused by regeneration from sediment surface. Silicate behaves conservatively at all seasons in Paravur backwater system.

**9701-066.** Meenakumari B, Balakrishnan Nair N.* (*Centl Inst Fisheries Techno, Cochin 682029). **Trace elements in the surface waters of Cochin harbour.** *J Environ Bio,* **17**(1) (1996), 33-37 [15 Ref].

The concentration of Cu, Fe, Mn, Zn, Co, Ni, Cd and Pb present in the Cochin harbour waters was studied at monthly intervals. The average concentration of all the elements except Zn and Cd were highest in the monsoon period. The mean values for

Zn increased from pre-monsoon to post-monsoon period, but the reverse was found for Cd. No interdependancy could be noticed for the presence of trace elements for the period studied.

**9701-067.** Mishra FK, Jha SK (Dept Bot, RS More Coll, Govindpur 828109, **Dhanbad Biomonitoring of water pollution through mitotic index study.** *Polln Res,* **15**(1) (1996), 43-44 [3 Ref].

The impact of polluted water of river Damodar is studied on mitotic index and a correlation between dose of polluted water and mitotic index has been established. Onion bulbs have been used for the study. The mitotic index was found to be reducing with increasing level of pollution.

**9701-068.** Mahapatra Satya P, Kumar Mukesh, Gajbhija Vijay T, Agnihotri Narenda P (Div Agricl Cheml, Indian Agricl Res Tnst, New Delhi 110012). **Ground water contamination by organochlorine insecticide residues in a rural area in the Indo-Gangetic Plain.** *Environ Mol1it Assess,* **35** (1) (1995), 155-164 [16 Ref].

Residues of severalorganochlorineinsecticides were monitored in the ground water from a rural area near Farrukhabad in the vicinity of the Ganga River in northern India. Almost all the samples were found to be contaminated with residues of hexachlorocyclohexane (HCH) and dichlorodiphenyltrichloroethane (DDT). Residues of aldrin, endosulfan and heptachlor were also detected in a large number of samples. The concentrations of aldrin residues greatly exceeded the WHO guideline value for drinking water, concentrations of heptachlor and DDT residues also occasionally exceeded the specified limits.

**9701-069.** Ouseph PP (Cent Earth Sci Std, Thiruvananthapuram 695031). **Dissolved copper, zinc, cadmium and lead in the Coachin harbour region during a tidal cycle.** *Polln Res,* **14**(4) (1995), 403-409 [3 Ref].

Surface and bottom water sample were collected from the barmouth of Cochin harbour for a semidiurnal period and analysed for Cu, Zn, Cd, and Pb. The results indicated that dissolved metals are removed from the water column under the influence of salinity, PH and alkalinity. The results are compared with the values reported from other marine environment.

**9701-070.** Pande Yogendra N (Environ Bio Lab, KS Sakek, PG Coll, Ayodhya 224123, UP). **Impact of distillery and sugar mill effluents on hydrobiology of the Parvati lake.** *Eco Env Conserv,* **1** (1-4) (1995), 39-42 [9 Ref].

In order to assess the impact of combined efluents from distillery and sugar mill units of Nawabganj township (Gonda), on hydrobiology of Parvati Lake, the present investigation was made at four sampling sites. The result revealed that the waste water from these industries with high values of BOD, COD, TS, TN, temperature, conductance and nil or ion values of DO and free COo caused a marked ill effect on water quality, planktons, macrophytes and fish fauna of the lake at its down stream zones.

**9701-071.** Pandey BK, Sarkar UK, Bhowmik ML, Tripathi SD (Wastewater Aquacult Div, Centl Inst Freshwater Aquacult, P.O. Rahara, North 24 Parganas, West Bengal). **Accumulation of heavy metals in soil, water, aquatic weed and fish samples of sewagefed ponds,** *J Environ Bio,* **16**(2) (1995), 97-l 03 [22 Ref].

Heavy metals accumulation in soil, water, aquatic weed and fish samples of sewage fed ponds of Rahara, North 24 Paraganas were studied with the help of Atomic Absorption Spectrophotometer. Among the metals studied Fe showed higher concentrations and Cr showed lower concentrations in all the san1ples. Relationship of various metals in sewage treated pond water with soil, aquatic weed and fish samples have been presented in the present communication.

**9701-072.** Pandey Rajendra, Kumar Arvind (Environ Bio Res Lab, PG Univ Dept Bio, SiddhuKanhu Univ, Dumka 814101). **Comparative evaluation of potable water quality of tribal and nontribal villages of Santal Parganas, Bihar,** *Eco Env Conserv,* **1** (1-4) (l995), 71-74 [12 Ref].

The comparative evaluation of potable water for drinking purposes of Dumka, Bihar, India was made. It has been observed that certain standard permissible limits as suggested by World Health Organisation and Indian Standard Institution has crossed. Due to changes in the quality of drinking water the villagers suffer from a number of water borne diseases, the tribals were found to be suffering more than the non tribals.

**9701-073.** Qadri SA, Mussarrai J, Siddiqi AM, Ahmad M (Dept Bio Chem, Fac Life Sci, Aligarh Muslim Umv, Aligarh 202002). **Studies on the water quality of river Ganga at**

**Narora and Kachla (UP).** *Cheml Environ Res,* **2** (1&2) (1993), 101-108 [18 Ref] (Late Pub).

The data revealed significant seasonal variations in the physicochemical and bacteriological properties of river water. The remarkably high level of coliforms, fecal coliforms and fecal streptococci reflects the poor quality of water. Some of the E. coli isolated from the test stretch also exhibited multiple drug resistance which makes the water unfit for drinking and bathing and may pose serious problems related to public health.

**9701-074.** Rai ShivasBilas (Chem Dept, Koshi Coll, Khagaria), **Physicochemical analysis of freshwater in Farkiaplain (a part of north Gangetic plain).** *Oriental J Chem,* **11**(3) (1995), 258-259 [3 Ref].

Water quality characteristics of aquatic environments arise from a magnitude of physical, chemical and biological interaction. Water bodies, rivers, lakes and estuaries are continuously subjected to a dynamic state of change with respect to their geological age and geochemical characteristics. These are influenced by the activities of living things. The dynamic balance in the aquatic ecosystem is up set by human activities resulting in water pollution. Sometimes biological decomposition of organic matters consumes all the dissolved oxygen, which can not be made up.

**9701-075.** Ramasamy S, Muralidharan KV, Ramesh L (Sedimentology Lab, Dept Geo, AC Coll Campus, Univ Madras, Madras 600025). **Pollutants in sediment samples of Madras city, Tamil Nadu.** *Polln Res,* **14**(4) (1995), 487-498 [8 Ref.].

In a preliminary study conducted on sediment samples collected from 20 locations in Madras City, the trace amount of Fe, Cu, Ni, Zn, Pb, Cr, As and Mn were determined. An effort was also made to correlate sediment water relationship in terms of concentrations of some metals. The study helped to identify various sources of pollution such as domestic sewage, urban discharge and industrial effluents. The inference on distributive level of carbon content in sediments samples 11as helped to identify certain ‘oxygen deficient’ pockets.

**9701-076.** Sahi Ahmad M, Khan Taqveen A (Dept Geo, Aligarh Muslim Univ, Aligarh). **Water quality of shallow aquifers in Karwan-Sengar subbasin, district Aligarh, UP.** *Cheml Environ Res,* **2** (3&4) (1993), 252-259 [3 Ref] (Late Pub).

The quality of groundwater is as important as its quantity. Water being a universal solvent, its purity cannot remain intact. An attempt has been made to study the chemistry of groundwater in Karwan Sengar sub-basin, in order to ascertain its suitability for irrigation and domestic uses.

**9701-077.** Sallu BK, Rao RJ, Behera SK, Pandit RK (Sch Stud Zoo, Jiwaji Univ, Gwa lior 474011). **Diel fluctuations of some water quality parameters of the river Ganga (RishikeshKanpur) during Jmle 1994.** *Polln Res,* **15**(1) (1996), 61-65 [16 Ref].

Diel fluctuations of some water quality parameters of the Ganga river from Rishikesh to Kanpur were studied just before the rainy season. Air temperature, water temperature, pH, conductivity, total dissolved solids, dissolved oxygen and free carbondioxide were shown a selective pattern of variation. Although the pH, free carbondioxide, bicarbonates and hardness exceed the permissible limit in some places occasionally, the increase is not much harmful. The low dissolved oxygen (0.60-1.70) at Kanpur throughout the study is harmful for aquatic life and other purposes.

**9701-078.** Sahu BK, Rao RJ, Behara SK (Sch Std Zoo, Jiwaji Univ, Gwalior 474011). **Studies on some physicochemical characteristics of the Ganga river water (RishikeshKanpur) within twenty four hours sluring winter 1994.** *Eco Env Conserv.* **1** (1-4) (1995), 35-38 [9 Ref].

Water samples collected at an interval of three hours for twenty four hours from eight different stations in the Ganga river during winter were analysed on the spot for some physicochemical parameters like air temperature, water temperature, pH conductivity, total dissolved solids, free carbondioxide and dissolved oxygen. Air temperature, water temperature, free carbondioxide and dissolved oxygen show a selective pattern of variation. There 7-1 M of E & F/ND/97 is no such selective variation in conductivity and total dissolved solids which are disturbed by several factors.

**9701-079.** Saxena Alok, Bhatnagar GP* (*Dept Limno, Barkatullah tJniv, Bhopal 462006). **Available concentration of heavy metals in sewage polluted lake of Bhopal.** *Oriental J Chem,* **11**(3) (1995) 292-293 [4 Ref].

Heavy metals in Shahpura Lake at two different points have been observed due to disposing off the sewage waste directly without treatment into the Lake. The quality of water contains iron and manganese. The concentration of these metals confirm the limits of IS 2296 (1982) Class B (Outdoor bathing) and Class D (Fish culture and Wildlife propagation).

**9701-080.** Sharma P, Sanganeria S, Rawat C (Dept Chem, Jai Narian Vyas Univ, Jodhpur 342003). **Polarographic determination of arsenic in aquatic environment.** *Cheml Environ Res,* **2** (1&2) (1993), 95-99 [9 Ref] (Late Pub).

The polarographic reduction of As (III) has been investigated in sodium oxalate mediurm empioying DC polarography and Cyclic Voltametric methods. Conditions were developed in which total arsenic as As (III) could be determined in aqueous matrices at low concentrations by differential pulse polarography.

**9701-081.** Sharma Rathi N, Baruah Anil K, Bora Gobin C, Chowdhary Prash K (Geo Sci Div, Regl Res Lab, C.S.I.R., Jorhat 785006, Assam). **Assessment of physio-chemical parameters of the surface water around oil installations of Rudrasagar, Assam, India.** *Polln. Res,* **15** (1) (1996), 19-27 [15 Ref].

Levels of physicochemical parameters along with Na, K, Ca & Mg in pond/stagnant water bodies around a few selected well sites and two group gathering stations of RDS field, have been investigated. Results show marked seasonal variations and extent of lateral spreadout of contaminants is not significant. The extent of degradation around production as well as abandoned wells was however found to be less. Continuous monitoring of the surface water around group gathering stations is therefore needed.

**9701-082.** Sharma Sanjay, Mathur R (Sch Std Zoo, Jiwaji Un1v, Gwallor 474011). **Seasonal changes in ground water quality in Gwalior: health risk assessment.** *Polln Res,* **14**(4)(1995), 373-376 [9 Ref]

The study reports seasonal alterations occurring in the ground water quality in Gwalior. Various water samples from hand pumps, dug wells and tube wells were chemically investigated. The chemical quality was compared with the standards laid by W.H.O. for potable waters. Various parameters exceeded the permissible limits in different ground water sources. The study explores scope for better sanitary conditions around ground water sources for better potable water and human health.

**9701-083.** Singh Ram Karan, Anandh H (Civil Engng Dept, B.I.T.S.,Pilani, Rajasthan). **Water quality index of some Indian rivers.** *Indian J Environ Hlth,* **38**(1) (1996), 21-34 [4 Ref].

Water Quality Indices for some Indian rivers have been worked out based on published data of Central Pollution Control Board, New Delhi using modified Delphi Method. Water quality models have proved to be powerful tools in water resources management as they can incorporate the complexity of the relevant processes in the water body into a utilitarian form for management consideration.

**9701-084.** Singh (Swarup) Meena (Dept Bio-Sci, St Xaviers High School, Patna 800001.) **Impact of human activities on the physico chemical conditions of two fish ponds at Patna (Bihar), India.** *J. Fresh Water Bio,* **7**(1) (1995), 13-17 [17 Ref].

The impact of the inputs from the drains of the surrounding area and various human activities on the physicochemical characteristics of water was studied in two localities of Patna. Some of the parameters like dissolve oxygen, alkalinity, calcium, chloride, phosphate, nitrate and BOD exhibited a marked difference between the two ponds depending upon the quantity, quality and nature of organic pollutants and human activities.

**9701-085.** Singh SK, Kumar PS (Civil Engng Dept, Coll Engng Techno, Bhatinda 151001). **Correlation among different physicochemical parameters of groundwater in Karimnagar district (Andhra Pradesh).** *Cheml Environ Res,* **3**(1 &2) (1994), 109- l 16 [12 Ref] .

The statistical analysis of various physicoche mical water quality parameters of ground water of Karimnagar district (Andhra Pradesh) has been carried out in this paper. For this purpose, a systematic calculation of correlation coefficient ‘r’ between all

possible pairs of 14 water quality parameters covering whole district has been done. The results show fairly high correlations (/r/ > 0.6) among 16 pairs of these parameters. The linear relationships among varying parameters have been established and the predicted values of the dependence parameters have been compared with the corresponding observed values.

**9701-086.** Singh TN, Singh SN (UP Polln Contl Bd, Bhojubir, Varanasi 221002). **Bacteriological quality of river "Varuna" water at Varanasia preliminary survey.** *Cheml Environ Res,* **3**(1&2) (1994), 143-l54 [8 Ref]. (Late Pub).

Paper discusses a bacteriological study of river Varuna. The concentration of coliform bacteria is used as an index of civic pollution which varies with the season, water current, depth and physicochemical characteristics of water. Some coliform are faecal in nature and these reach the terrestrial and aquatic ecosystems via alimentary canal of herbivorous animals.

**9701-087.** Sinha SN, Banerjee RD (Microbio Lab,Dept Bot, Univ Kalyani, Kalyani 741235). **Pollution indicators and impact assessment of pollutants discharged into the river Ganga.** *Int J Environ Std,* **48**(3) (1995), 231-244 [25 Ref].

The water of the river Ganga was monitored for DO, BOD, Eb rH2 and sulfatereducing bacterial population (SRB) in order to test the comparative efflciency of these parameters as pollution indicators, to assess the pollutional states of the river and to evaluate the impact of pollutants on the river water. This study revealed that rH2 was an efficient pollution indicator. All the indicators showed that the river stretch receiving rayon factory effluents and untreated sewage was in a highly polluted state, and the river was found to be more polluted in its deeper layers.

**9701-088.** Srivastava GK, Singh BB (Environ Res Lab, Dept Chem, Univ Gorakhpur, Gorakhpur 273009). **Physicochemical evaluation of Ami river water.** *Polln Res,* **14**(4) (1995), 503-506. [5 Ref].

The main source of Ami river pollution is disposal of industrial effluents from M/s. Sanjai Paper & Chemical Industries Ltd. and M/s. Raina Paper and Board Industries whichv are situated on right bank of river Ami at Khaliabad. The effluents from both industries are directly discharged without adequate treatment leading to deteriorating the

quality of river water. River flows from more or less densely inhabited areas and ultimately disappeares into Rapti river near Kauri Ram, GoralVhpur, U.P., India.

**9701-089.** Srivastava GK, Singh BB (Environ Res Lab, Dept Chem, Univ Gorakhpur, Gorakhpur 272009). **Observation of algal ilora in relation to industrial pollution of Rapti river of Gorakhpur.** *Eco Env Conserv,* **1**(1-4) (1995), 53-55, [12 Ref].

Water samples from river were collected and analysed at polluted and unpolluted site for algal flora (qualitative) and physicochemical properties. During the course of investigation 34 genera and 52 species of algae were recorded at both the sites. At sites A (control) 29 genera and 36 species were recorded while 16 genera and 22 species were recorded at the polluted site. Few genera and species were common on both sites. The temperature plays an important role in development of algae.

**9701-090.** Srivastava RK, Sinha AK, Pande DP, Singh KP, Chandra H (Indl Toxico Res Cent, Lucknow, 226001 UP). **Water quality of the river Ganga at Phaphamau (Allahabad)effect of mass bathing during Mahakumbh.** *Environ Toxico Water Qlty,* **11**(1) (1996), 1-5 [11 Ref].

An examination of the water quality of the river Ganga at Phaphamau (Allahabad) was carried out at the Mahakumbh festival. It was concluded from the results that mass bathing causes significant changes in the river's water quality. The study indicated that the water at Phaphamau was not fit for drinking or bathing purposes. The presence of fecal coliforms in the water also indicated the potential presence of pathogenic microorganislus, which might cause waterborne diseases.

**9701-091.** Valsaraj CP, Ramasubramanian R, Rao VNR (Cent Adv Std Bot, Univ Madras, Madras 600Q25). **Seawater quality of the coastal waters of Madras-an assessment by chemical and biological monitoring.** *J Environ Bio,* **16**(2) (1995)) 119-129 [22 Ref].

Hydrobiological studies were conducted in the coastal waters of Madras. Data on environmental variables were obtained at fortnightly intervals. Maximum pollution was at the mouth of river Cooum which showed low dissolved oxygen, high biochemical oxygen demand and ammonia and low species diversity with a greater abundance of bluegreen

algae while the offshore station was the least polluted. Water quality improved as the tide changed from low to high even at the most polluted site.

**9701-092.** Venkata Mohan S, Jayarama Reddy S (Dept Chem, SV Univ, Tirupati 517502). **Assessment of overall water quality of Tirupati.** *Polln Res,* **14**(3) (1995), 275-282 [11 Ref].

Physicochemical parameters of Tirupati town is monitored for a period of one year with a frequency of three months to assess the quality of ground water as well as municipal supply water and to study the impact on the quality of water due to pilgrim inflow, industrialization and agriculture by selecting 15 important sampling stations. The obtained results revealed that the ground water quality and municipal supply water obtained from domestic and piigrim areas were safe for domestic consumption.

## Noise Pollution

**9701-093.** Singh Brij B, Jain VK (Sch Environ Sci. Jawaharlal Nehru Univ, New Delh; 110067). **A comparative study of noise levels in some residential, indlustrial and commercial areas of Delhi.** *Environ monit Assess,* **35**(1) (1995), 1-11 [26 Ref].

The measurements of noise levels in residential, industrial and commercial areas in the capital city of India, Delhi, were carried out in the month of March and April, 1992. Six sites in residential areas, four in industrial areas and nine in commercial areas were chosen, which were situated in different parts of Delhi. The results of statistical analysis of sound pressure levels show that commercial areas have the highest noise levels followed by industrial and residential areas. Spectral distribution of noise at octave band freauencies have also been presented for the above mentioned areas.

## Ecology

**9701-094.** Adhikary Siba P (PG- Dept Bot, Utkal Univ, Bhllbaneswar 751004, Orissa). **Ecology of freshwater and terrestrial cyanobacteria.** *J Scient Indl Res,* **55**(8&9) (1996), 753-762 [111 Ref].

Paper summarizes the present knowledge on bloom forming cyanobacteria of freshwater including the chemical nature and mode of action of their toxic products. Ecology of cyanobacterial forms occurring in a variety of sulbaerial habitats like rocks, bricks and cement wall of the tropics and deserts is also discussed. Physical parameters of these environments, characteristic cyanobacterial vegetation and mechanism of their stress tolerance in the extreme conditions are presented.

**9701-095.** Agrawal NC, Bais VS, Arasta Tazeen (I,ab Environ Bio, Dept Zoo, Dr HS Gour Vishwavidyalaya, Sagar 470003). **Comparative account of phytoplankton productivity in the Sagar lake and the Military Engineering lake -a statistical approach.** *J Freshwater Bio,* **7**(1) (1995), 27-31 [19 Ref]

Paper deals with the stationwise and seasonwise variations of the phytoplankton productivity in the Sagar Lake and the Military Engineering Lake. It was observed that the summer was the most favourable season for phytoplankton productivity in both the lakes, while winter season was found to be the most unfavourable. In the Sagar Lake, signifi1cant positive correlations of phytoplankton productivity with water temperature, nitrate and phytoplankton population were observed. Phytoplankton productivity was found negatively correlated with Secchi transparency and dissolved oxygen in the Sagar Lake wnile it was negatively correlated with Secchi transparency and dissolved oxygen in the Military Engineering Lake.

**9701-096.** Ahmad Shamlm Md, Nayak Poonan1, Hussain MA/C Eco Env Bio Lab, Univ Dept Bot, LNM Univ, Dharbanga 846004). **Diurnal rhythm of phytoplankton and certain abiotic factors of two ponds of Madhubani.** *J Freshwater Bio,* **7**(1) (1995), 41-44 [21 Ref].

Investigation on the diel variations in the physicochemical properties and phytoplankton of two freshwater perennial ponds at Madhubani revealed that pH, dissolved oxygen, free carbon dioxide, carbonate, bicarbonate and temperature of water exhibited definite at of diel variation.

**9701-097.** Bais VS, Agrawal NC, Arasta Tazeen (Lab Environ Bio, Dept Zoo, Dr HS Gour Vishwavidyalaya, Sagar 470003, MP). **Comparative study on seasonal changes in phytoplankton community in the Sagar Lake and Military Engineering Lake.** *J Freshwater Bio,* **7**(1) (1995), 19-25 [24 Ref]

Cyanophyceae in the Sagar Lake and Bacillariophyceae in the Military Engineering Lake showed their d Azis PK (Dept Aquatic Bio Fisheries, Univ Kerala, Trivandrum 695007

**Primary prodl!ctivity of the retting zones in the Kadinamkulam estuary, southwest coast of India.** *Mahasagar,* **27**(2) (1994). 97-103 [8 Ref].

Retting of coconut husk is one of the major problems of pollution in the esturies (Kayals) of Kerala. This paper discusses the salient features associated with the variation in gross and net primary productivity values in the Kadinamkulam Kayal based on fortnightly data from two selected stations. The gross primary productivity value in the

surface water ranged from 0.06 to 0.29 gClm3/day at station 1 and from 0.06 to 1.49 gClm3/day at station II.

**9701-O99.** Choudhary Sunil K, Nayak Mamta R, Verma PK (Polln Res Lab, Dept Bot, TNB Coll, Bhagalpur 812Q07). **Impact of eutrophication on the biochemical properties of Eichhornia crassipes Mart, growing in two perennial ponds at Bhagalpur.** *Env Eco,* **14**(1) (1996), 48-54 [21 Ref].

Changes in protein, starch, total sugar, reducing sugar, chla and chlb contents and activities of z and amylases in the leaf tissues of Eichhornia crassipes growing in two perennial ponds established direct influence of limnological conditions of the water bodies on the physiology of plants including flowering and propagation. The physicochemical analysis showed that both the ponds were eutrophic.

**9701-100.** Desai PV (Dept Zoo, Goa Univ, Taleigao P naji, Goa 403001). **Floral abundance at iron ore reiect dumps at Goa, India.** *Env Eco,* **14**(1) (1996), 96-98 [5 Ref].

The study of floral abundance at iron ore reject dumps revealed that the dumps show natural recolonization by the flora from the adjoining undisturbed area. The density of the flora was found to increase with the increase in the age of reject dumps. However it is necessary to hasten the process of recolonization by proper revegetation programs.

**9701-102.** Hosethi BB, Nataraj S, Chandrasekhar AS, Kamalakar SB, Patil SR (Dept Bio Sci, Mangalore Univ, Mangalore 574199). **Ecological studies on river Tunga at Shimoga with special reference to water pollution and land use.** *J. Nature Conserv,* **7**(2) (1995), 111-117 [14 Ref].

The Tunga river bed will be dry with meagre amount of flowing water during winter and summer months. The river water BOD was 5.16 mg/L at upstream, 25.5 mg/L at polluted zone and 4.4 mg/L at down streams respectively. The study revealed that river water was polluted near the city, however, the eutrophic soil is utilised for growing rice, during summer when the river bed is open, which is economically significant for poor landless farmers living on the banks of the river.

**9701-103.** Jaiswal Vijay Kumar, Singl Udaya Nand (Dept Zoo, Dr. RMLS Coll, Muzaffarnagar 845401). **Ecological relationship of soil qualities of an oxkow Lake of Muzaffarpur Bihar, India.** *Env. Eco,* **13**(4) (1995), 924-927 [10 Ref].

Soil and water qualities of an oxbow lake (Mushahari lake) were studied. The pH of soil was found higher in winter season than summer and rainy seasons, showing biomodal curve. Highest organic carbon was recorded in September and lowest in June. Organic carbon of soil and dissolved oxygen of water showed inverse relationship.

**9701-104.** Joshi BD, Bisht RCS, Semwal VP (Dept Zoo, Gurukula Kangri Vishwavidyalaya, Hardwar 249004). **Primary productivity in western Ganga Canal at Hardwar.** *Indian J Eco,* **22**(2) (1995), 123-126 [9 Ref].

Gross primary productivity (GPP!, net primary productivity (NPP) and respiration rate (RR) of western Ganga canal at Hardwar were studied. The productivity values were found increasing from late winter, reaching its peak in summer and declining there after. The values were directly proportional to transparency, temperature, sunshine and phytoplankton density.

**9701-105.** Katewa SS (Dept Bot, Coll Sci, ML Sukhadia Univ, Udaipur 313001). **Ecology of grazing lands of Aravalli hills (South vsest Rajasthan).** *J Environ Bio,* **17**(1) (1996), 43-50 [5 Ref].

Paper deals with the ecological investigations of the natural grazinglands of Aravalli hills. Three types of grazinglands have been recognised. It has been observed that the pattern of distribution of plant communities on these three types of grazinglands is largely determined by soil moisture as influenced by soil depthand texture. Aboveground dry matter production in these grazinglands varies from 35.3 q/ha to 116.6 q/ha.

**9701-106.** Kumar Arvind (Environ Bio Res Lab, PO Dept Zoo, SK Univ, Dumka, 8140iO). **Impact of organic pollution on macrozoobenthos of the river Mayurakshi of Bihar.** *Pollsl Res,* **15**(1) (1996), 85-88 tl9 Ref].

The study reports macrozoobenthos of river Mayurakshi in Bihar, India at several points unpolluted and polluted to different extent. Shannon Weanen’s diversity index

declined with increasing pollution and a sharp decline in the number of species was noted. Tubifex and Chironomous larvae were dominant at the polluted site.

**9701-107.** Kumar Arvind (Environ Bio Res Lab, PG Dept Zoo, SK Univ, Dumka 814101). **Periodicity axld abundance of plankton in relation to physicochemical characteristics of a tropical wetland of South Bihar, India:** *Eco Env Conserv,* **1**(1-4) (1995), 47-51 [20 Ref].

Considerable literature exists on the plank-tons of various lentic water bodies in India but only sporadic reports are available from Bihar. Paper studies the various planktonic groups and their seasonal abundance in relation to certain physicochemical factors in a fresh water tropical wetlands of South Bihar (Dumka).

**9701-108.** Kumar Rajesh, Srivastava SK, Srivastava AK (Dept Bot & Zoo, Sri Murali Manohar Town, PG Coll, Ballia 277001). **Investigation on the periodicity of phytoplankton in relation to certain hydrological conditions of textile industry effluents fed river at Mau (U.P.)** *Polln Res,* **14**(4) (1995), 383-390 [20 Ref].

Paper describes the abiotic and biotic CO1Ilponents of river Ton's at Mau (U.P.), receiving huge quantity of textile industry effluents. Winter months were observed to provide most propitious conditions for abundance of phytoplankton, whereas in the summer and monsoon months, river was loaded with pollutions resulting to lower phytoplankton growth.

**9701-109.** Mahajan Arjani, Kanhare RR (Dept Zoo, Govt PG Coll, Barwani 451551). **Seasonal variations of abiotic factors of a freshwater panel of Bawani (MP).** *Polln Res,* **14**(3) (1995), 347-350 [13 Ref].

The pond had low transparency (8.2 to 32 cm), alkaline pH, dissolved oxygen content varied from 6.9 to 8.3 mg/L, phosphates were present in the range of 0.1 to 2.2 mg/L. Solids level was relatively high. The water quality was suitable for fish culture.

**9701-110.** Mahajan Medha, Chakraborty A, Vadini V, Deshpande VP, Badrinath SD (Natl Environ Engng Res Inst, Nehru Marg, Nagpur 440020). **Impact of industrial pollution of ecology of Korba region.** *Eco Env Conserv,* **1**(1-4) (1995), 97-100 [9 Ref].

Paper deals with the study of effects of industrial pollution on ecology of Korba region. To assess the impact of the industrial pollution forest studies were conducted to establish baseline status of the environment in terms of diversity index, equitibility index and importance value index of individual species in different forests. The comparison of baseline data shows that the Bela and Kesla forests which are nearer to industrial sehlp are more prone to injury and diseases than Chuhiya forest which is away from the pollutant emitting zone.

**9701-111.** Mahajan Shashikant, Mandloi AK (Dept Fisheries J.N. Krishi Vishwa Vidyalaya, Adhartal, Jabalpur 482004). **Study of hydrobiological condition and the composition of zooplankton population in Adhartal pond.** *JNKVV Res J,* **27** (2) (1993), 69-71 [22 Ref] (Late Recd).

Among the zooplankton species, rotifers constituted 46.10 per cent, followed by copepods 32.45 per cent, cladocerans 11.65 per cent and other zooplankton 4.31 per cent. The distribution of zooplankton population in pond was studied in summer, rainy and winter seasons. While the abiotic and nutritional factors were found to be closely related with plankton production, a significant relationship was found between phytoplankton and zooplankton.

**9701-112.** Maruthi Kalaiselvi M, Vijayalakshmi GS, (Dept Zoo, Sri Parasakthi Coll Women, Courtallam 627802). **Ascorbic acid content in three different fungi Pleurotus species from cotton waste.** *J Ecobio,* **8** (1) (1996), 77-78 [4 Ref].

Studies were made on the ascorbic acid content in three different edible fungi viz, Pleurotus sajorcaju, P. citrinopileatus and a new strain Pleurotus species released by an agricultural research Institute Aruppukottairaised in cotton waste a cellulosic substrate. Ascorbic acid content differed in these species. The ascorbic acid content was found to be 2 mg in P. citrinopileatus, 1.5 mg in Aruppukottai species and 1.2 mg in P. sajorcaju in 100 gm of fresh weight.

**9701-113.** Pandey BN, Jha AK, Das PKL, Pankaj PK, Mishra AK (PG Dept Zoo, Purnia Coll, Purnia 854301). **On the seasonal abundance of phytoplankton in relation to certain ecological conditions in the stretch of Kosi river.** *Polln Res,* **14** (3) (1995), 283-293 [26 Ref].

Phytoplankton of the river Kosi was studied in relation to certain physicochemical factors. The bulk of phytoplankton was shared by Myxophyceae (40.07%) Chlorophyceae (37.3%), Bacillariophyceae (15.1%) and Euglenophyceae (7.47%). Chlorophyceae and Myxophyceae were abundant during summer while Bacillariophyceae and Fuglenophyceae were abundant during winter.

**9701-114.** Pandey Kaushal Kumal, Lal MS (Fishery E3io Lab, Dept Zoo, HNB Garhwal Univ, Srinagar Garhwal 246l 74 UP). **Limnological studies of Garhwal Himalayan Hillstream Khanda gad: seasonal fluctuation in abiotic profile.** *J Freshwater Bio,* **7** (l) (1995), 7-ll [21 Ref].

Seasonal variation in physicochemical factors of hill stream Khanda gad were investigated. Dissolved oxygen was found maximum in winter, when temperature was low and Nil Co2. However, COS was found maximum during monsoon with high temperature and turbidity. Hydrogen ion concentration was moderate throughout the year. The slightly alkaline water alongwith the presence of bicarbonates indicates suitability of water body for aquatic organisms.

**9701-115.** Prasad SK (Dept Zoo, Jagdam Coll, JP Univ, Chapra, 841301, Bihar). **Studies on seasonal variation of planktons in a tropical shallow pond at Chapra.** *Int J Mendel,* **12** (1-4), (1995), 59-60 [12 Ref].

Saran District of North Bihar is rich in water bodies and rivers. These ponds, if managed properly, can be developed into an ideal fish ponds and can prove to be a good source of income. Zooplanktons showed their peaks in October and December and among the phytoplanktons, chlorophyceae was maximum in July.

**9701-116.** Rawat MS, Juyal CP, Sharma Ramesh C (Dept Zoo, HNB Garhwal Univ, Srinagar Garhwal 246174, UP). **Morphometry and physicochemical profile of high altitude lake Deoria Tal of Garhwal Himalaya.** *J Freshwater Bio,* **7** (1) (1995)7 1-6 [28 Rei.

The present contribution embodies morphometric and physicochemical data on the Himalayan Lake. Deoria Tal located in the hills of Uttar Pradesh. These data on the high altitude lake will be instrumental in devising strategies for the management and

development of living aquatic resources of the lake. Statistical correlationships among different limnological parameters have also been computed.

**9701-117.** Sahu BK, Rao RJ, Behera SK, Pandit RK (Sch Std Zoo, Jiwaji Univ, Gwalior 474011). **Phytoplankton and primary production in the river Ganga from Rishikesh to Kanpur.** *J Ecobio,* **7** (3) (1995), 219-224 [20 Ref].

The density of phytoplankton, gross primary production and respiration have been estimated from the water sample of the river Ganga. Population of phytoplankton and the quantity of respiration were increased, whereas gross primary production and net primary production were decreased towards Kanpur (downstream) from Haridwar (upstream). The water quality was degraded towards the downstream due to increase of oxygen demandin{J pollutants or photosynthesis inhibitory pollutants in the river water from Garmukteswar to Kanpur.

**9701-118.** Sanjer LR, Sharma UP (PG Dept Zoo, Bhagalpur Univ, Bhagalpur 812007). **Community structure of plankton and their periodicity in Kawar lake Begusarai, Bihar.** *J Freshwater Bio,* **7** (l) (1995), 33-36 [16 Ref].

Community structure of phytoplankton and their periodicity of Kawar lake were assessed. High density of phytoplankton were recorded during summer months with Cyanophyceae recording maximum during June, Chlorophyceae during May and Bacillariophyceae during April. Low density of phytoplankton with minimum Cyanophyceae and Chlorphyceae were recorded during August and Bacillariophyceae during December.

**9701-119.** Sarwar SG, Parveen A (Hydro-bio Res Lab, SP Coll, Srinagar 190001). **Community structure and population density of zoo plankton in two interconnected lake of Srinagar Kashmir.** *POIIM Res,* **15** (1) (1996)j 35-38 [15 Ref].

Paper deals with the community structure and population density of zooplankton o£ two interconnected lakes of SrinagarKhushalsar & Gilsar. Both the lakes are subjected to intense biotic stresses and strains. A total of flftynine zooplankton species were recorded from the investigated lakes with rotifers dominating other groups with 43 species.

**9701-120.** Sevichan PJ, Madhusoodanan PV (Dept Bot, Univ Calicut, Calicut, Kerala 673635). **Ecological and economic impacts of Azolla rubra as biofertilizer in the acidic paddy fields of Kerala.** *J Ecobio,* **8** (1) (1996), 63-65 [5 Ref].

The ecological impacts. partial budget of dual cropping with different levels of chemical nitrogen fertilizers, marginal rate of return and other impacts of Azolla application with paddy in Kuttanad, Kerala are discussed.

**9701-121.** Sharma LL, Saini VP,'Sharma SK (Dept Limnology & Fisheries, Rajasthan Agricl Univ, Udaipur Campus, Udaipur 313001). **Mass production of zooplankton using community sewage.** *Polln Res,* **14**(4) (1995), 499-502 [6 Ref].

Search for an inexpensive methodology for the biological filtration of community sewage using zooplankton was attempted with success. The sewage water after impoundment was found to have altered water quality wherein the CO2, electrical conductivity, total alkalinity, nitrate nitrogen, orthophosphate and B.O.D. showed lower values with a rise in dissolved oxygen.

**9701-122.** Singh (Swarup) Meena, Sinha RK (Environ Sci Lab, Dept Zoo, Sci Coll, Patna, Bihar). **Diel variation of water quality and zooplankton community in a fresh water pond of Patna, Bihar, India.** *Eco Env Conserv,* **1** (1-4) (1995), 57-64 [21 Ref].

The work was done in all the seasons once for the study o£ water quality dunng 24 hours. The total abundance of zooplankton was less in the surface water due to solar illumination when they migrate to the bottom to save themselves from their predators and the level of oxygen is also high. At night they migrate to the surface due to the depletion of orygen at the bottom as respiratory activity dominates photosynthetic activity. Phytoplankton that are fed by zooplanktors also migrate to the surface at night for respiration.

**9701-123.** Singh TN (Centl Mining Res Stn, Dhanbad, Bihar). **Coal mining under fragile ecology. Environmentally Viable Mining Technology Fragile Ground Conditions** (Eds BB Dbar & AK Dube), 249-262.

The impact in the form of vegetation disturbance, soil erosion and deforestation is conspicuously manifested with the opencast mining white underground coal mining in

Upper Assam over a century did not cause visible impact on environment and ecology. A number of modified underground mining versions are developed to further minimise the damage to the environment and ecology The methods with improvement in surface handling, beneficiation and utilization of coal may ensure safe underground mining of coal under any condition.

**9701-124.** Thomas Sabu, Abdul Aziz PK (Dept Aquatic Bio Fisheries, Univ Kerala, Thiruvananthapuram 695007 Kerala). **Spatial and temporal distribution of nutrients in the Peppara reservoir a manmade ecosystem on the Western Ghats, South India.** *Polln Res,* **15** (1) (1996), 5-10 [13 Ref].

Peppara reservoir in Thiruvananthapuram district is one of the latest additions to the string of reservoirs dotting the Western Ghat zone in Kerala. Study represents an attempt at understanding the nutrient status of the Peppara reservoir. Data on nitratenitrogen. nitritenitrogen, phosphatephosplhorus and silicatesilicon gathered from four seasons in the reservoir, formed the basis of this paper. The annual mean value for nitrate, phosphate and silicate were found to range from 0.28 to 0.42; 0.22 to 0.32; 0.38 to 0.51 and 9. 13 to 14.34 µg/L respectively.

## Nature and Natural Resources Conservation

**9701-125.** Bose AN (Indian Bureau Mines, Nagpur). **Restoration of mined out areas with reference to Himalayan region.** *Environmental1y Viable Mining Techno Fragile Grolmd Conditions* (Eds BB Dhar & AK Dube), 43-52 [3 Ref]

Mining operations have been carried out in the ecologically fragile Himalaxan region in the past few decades. Unscientific exploitation of minerals specially limestone has caused considerable damage to the prevailing environment. Restoration of the mined out areas in such mines has received some attention in the recent past. A review of its current status and those likely to be adopted in future has been discussed.

**9701-126.** Brahma BK, Boissya CL (Dept Bot, Guwahati Univ, Guwahati 751014). **Ethnobotanical notes on certain medicinal plants used by the Bodos of Assam with particular reference to Kokrajhar district.** *Vasundhara,* **1** (1996), 82-85 [10 Ref].

About 109 medicinal plants used by the Bodo tribal of Assam either singly or in combination spreading over four families are reported. In the enumeration, the species are arranged alphabetically. The families, Bodo names and local names are also given. The detailed uses of the plants as suggested by the local Bodo people are mentioned.

**9701-127.** Dangwal LR, Rawat DS, Gaur RD (Herbarium Plant Systematics Lab, Dept Bot, PB17, HNB Garhwal Umv, Srinagar (Garhwal) 246174). **Some rare and interesting plants of Fabaceae from Garhwal Himalaya.** *Indian J Forestry,* **18** (3) (1995), 255-257 [13 Ref].

Some leguminous flora of Garnwal Himalaya region have been found to be rare and interesting. Specimens belonging to the family Fabaceae which hitherto have not been reported from Garhwal Himalaya are enumerated herein. A description of the specimens, its flowering and fruiting period, along with distribution and collector's herbarium number has been included.

**9701-128.** Jariwala S, Rai Bharat (Cent Adv Std Bot, Banaras Hindu Univ, Varanasi). **Conservation of microbial antagonists for biological control of plant diseases.** *Vasundhara,* **1** (1996). 1-8 [87 Ref].

Conservation of mircrobial antagonists is the need of day as they are the only economic alternative to replace pesticides to controi soilborne, foliar and fruit diseases, and unwanted insects and weeds harmful to agriculture. Some of them could be used as biofertilizers by virtue of their growth promoting activity as a substitute to chemical fertilizers thereby protecting the environment from hazardous effects of either pesticides of synthetic fertilizers.

**9701-129.** Laiithambika J (Thc Rutber Board, Sastri Road, Kottayam 686501, Kerala). **Rubber (Hevea brasiliensis) an environment friendly tree.** *J Environ Resources,* **2** (1-4) (1994), 27-29 [Late Recd].

Rubber, a comparative recent introduction to India, has emerged as an important resource of economic advantage. Rubber being basically of forest origin, its advantages in maintaining an ecological balance are abundant apart from providing an array of products of benefits to man. It is argued that rubber plantations can improve the quality of human life, through sustainable development.

**9701-130.** Mahato AK, Mahato Pushpa, Prasad R (Dept Bot, PTPS Coll, Patratu, Bihar 829119). **Ethnobotanical wealth of Chhota Nagpur plateau India, Part III: some medicinal plants used against diarrhoea by the people of Singhbhum district, Bihar.** *Adv Plant Sci,* **9** (1) (1996), 25-28 [2 Ref].

The people of Chhotanagpur depend upon plants for their daily needs including medicine. In fact, they are inseparable from trees as forest is their natural habitat. During the survey of medicinal plants, 27 plant species which are being used to cure diarrhoea by the people of Singhbhum district of Chhota nagpur, Bihar, India are recorded. Among them 12 plant species are known to control dysentery also.

**9701-131.** Maudgal S, Kakkar M (Min Env Forests, Govt of India, CGO Complex, Lodi Rd, N. Delhi 110003). **Mining operations in ecologically sensitive regions.** *Environmentally Viable Afining Techno Fragile Ground Conditions* (Eds BB Dhar & AK Dube), 19-30.

Environmental management is a process of natural resource optimisation for short and long term human welfare. Ihe strategy is, mineral resources need to be extracted and converted into goods & services to be of use to humans but, other resources like biodiversity & genetic material contribute to human welfare is to be protected through conservation. There is thus a delicate balance which has to be maintained to ensure that benefit streams is available on a long term basis.

**9701-132.** Pandit BR, S Kotiwar Onkar, Oza Renu A, Mahesh Kumar R (Dept Life Sci, Bhavnagar Univ, Bhavnagar 364002, Gujarat). **Ethnomedicinal plant lores from Gir forest, Gujarat.** *Adv Plant Sci,* **9** (1) (1996), 81-84 [10 Ref].

Communication deals with traditional medicinal plants, which are used by Maldharis tribe of Gir forest, as local remedies. Extensive ethnobotanical exploratory tours were conducted to remote areas of Gir forest and collected some interesting information on 45 plant species (belonging to 32 families) used to relieve various human ailments. The plant species are enumerated along with their botanical name, vernacular name and ethnomedicinal uses.

**9701-133.** Paul PK, Sharma PD (Environ Microbio Plant Pathology Lab, Dept Bot, Univ Delhi, Delhi 110007). **Biocontrol of leaf stripe disease of barley conserving fungal biodiversity.** *Vasundhara,* **1** (1996), 19-24 [36 Ref].

Diluted aqueous neem leaf extract protected barley leaves against leaf stripe disease, and 1: l0 dilutions proved as effective as 0.5°CO bavistin. Contrary to plant protection chemicals and crude biocides, diluted neem leaf extracts caused very little or no changes in the species composition of phyllophane mycoflora of treated leaves. Such a management practice apjpears to be the real environment friendly biocide tactic in plant disease control.

**9701-134.** Raveendranathan Nair G (Coll Pharmaceutical Sci, Thiruvananthapuram 695011, Kerala). **Prospects of herbal drugs.** *J Environ Resources,* **2** (1-4) (1994), t 19-21 [Late Recd].

In respect of the wide use of plant drugs in different indigenous systems of medicine in India the need to conserve and multiply these natural resources is essential. The clinical efficiency of Ayurvedic treatment of certain diseases as compared to that of Allopathy is worth mentioning. Attempts regarding the quality control and standardization of plant drugs, that had been a major lacuna are succeeding.

**9701-135.** Saha Santanu (Dept Bot, Darjeeling Govt Coll, Darjeeling 734101). **Conservation, regeneration and species selection in (India) Sunderbans.** *Env Eco,* **13** (4) (1995), 766-768 [15 Ref].

The (Indian) Sundarbans is i3oristically poorer, due to higher salinity and human interference. It is imperative to conserve the ecosystem for maintaining ecological balance, for protecting inland areas and for commercial exploitation. Artificial regeneration in foreshore lands has been done by hand and aerial seeding. Species are selected on the basis of greater utilizable biomass but should actually be done with respect to conditions prevailing at the particular area.

**9701-136.** Sivadas TK (Centl Inst Fisheries Techno, Cochin 682029, Kerala). **Monitoring and assessment of the environment for harmonising its preservation and development.** *J Environ Resources,* **2** (l-4) (1994), 24-26 [Late Recd].

Understanding the environment systematically is the essential step towards sustainable exploitation of the natural resources. Investigation methodologies depend on the instruments made available from time to time and electronic instruments have to play better roles in this area.

**9701-137.** Swaminathan MS (MS Swaminathan Res Foundation, 3rd Cross Street, Taramani Inst Area, Madras-6001 ] 3). **Bio-diversity and biological productivity.** *J Environ Resources,* **2** (1-4) (l994), 1-6 [Late Recd].

The role of science and technology in promoting the environment cause, as enshrined in the Agenda 21 with 40 action points, is greater now than even before, in the improvement of human life on earth and its protection. With the growing realisation of the need to "think locally and act globally", and Agenda 21 for Kerala alone is very relevant. An array of subjects such as diversity and pleuralism, global climate, aspects and prospects of biodiversity including the growing role of biotechnology, as also environment and society have been discussed.

## Health and Toxicology

**9701-138.** Abbasi SA, Kunhahmed T, Nip-aney PC, Soni R (Centl Polln Contl & Biowater to 1 M of E de F/ND/97 Energy, Punditry (Centl) Univ, Pondicherry 605014). **Influence of the acidity of water on chromium toxicity-a study with the telecost Nuria denricus as model,** *Polln Res,* **14** (3) (1995), 317-323 [18 Ref].

Study reports findings on the behavioural responses and survival of the telecost Nuria denriclls exposed to different levels of chromium and pH. The impacts were studied with the help of computer aided longterm toxicity test. In terms of extent of survival, chromium was found to be more toxic at pH 3. 5 and 11 compared to 7 and 9.

**9701-139.** Aditya Ajit Kumar, Bandyopadhyay Madhav Prasad (Developmental Bio Lab, Dept Zoo, Visva Bharathi Univ, Santiniketan 731235). **Mercurric chloride induced changes in Dugesia bengalensis Kawakatsu, an aquatic planarian from Santiniketan, West Bengal.** *J Environ Bio,* **16** (3) (1995), 233-236 [8 Ref].

The response of Dugesia bengalensis Kawa-katsu to different concentrations of mercuric chloride has been studied and LGo values for 24 h, 48 h, 72 h and 96 h have been determined. The results indicate that planarians exposed to different concentrations of l::igCI2 exhibit anomalous behavioural manifestation together with a dose time dependent mortality rate and some changes in the reproductive organs. The results suggest some impacts of heavy metal in delaying and retarding the growth.

**9701-140.** Anitha Kumari S, Sree Ram Kumar N (Cell Molecular Bio Lab, Dept Zoo, Nizam Coll, Basheerbagh, Hyderabad 500001, Andhra Pradesh). **Effect of water pollution on the spleen of Channa punctatus from Hussain Sagar Lake, Hyderabad, India.***J Ecotoxlco Environ Monit,* **6** (1) (1996), 49-52

Histological changes induced by aquatic pollutants in the spleen of Channa planctatus inhabiting the polluted water of Hussain Sagar Lake was investigated. Light microscopic studies revealed increment in the number and decrease in the size of the melanomacrophage centre (MMCs) of polluted water fish when compared to the control fish. The results obtained showed a stimulation of mononuclear phagocytic system related to the presence of pollutant.

**9701-141.** Anshu Amali A, Elizabeth Jayanthi FX, Cyril Arun Kumar L (PG & Res Dept Zoo, Loyola Coll, Madras 600034). **Sublethal effect of quinolphos and padan on tissues glycogen of common carp. Cyprinus carpio (Tinn)**. *Polln Res,* **14** (3) (1995), 295-298 [14 Ref].

Effect of sublethal doses of organophosphorus pesticides, quinophos and padan on glycogen content was studied in kidney, liver and muscle tissues of common carp, Cyprinus carpio. Glycogen content was found to be depleted in all the tissues as concentration of toxicants increased. Gill was found to be affected more than kidne and muscle and padan was observed to be more toxic than quinolphos.

**9701-142.** Anuradha CH, Raju TN (Dept Zoo, Nizam Coll, Osmania Univ, Hyderabad 5 00001). **Variations in alanina amino transferase and aspartate ammino transferase activity in fish Anabas scandens exposed to selenium.** *Int J Mendel,* **12** (1-4) (1995), 34 35 [5 Ref]

Variations in amino transferase activity was studied in fish Anabas scandens exposed to selenium at concentrations of 5, 10, 15 ppm for 48 hours. A significant increase in AAT, ALAT activity has been observed while the increase in ALAT activity of liver was insignificant.

**9701-143.** Athalye RP, Gokale KS (Dept Zoo, BN Bandodkar Coll, Thane (W) 400601). **Heavy metals in the gastropods Dostia violacea and Cerithideopsilla d jad javiensis from Thane Creek, India.** *Malssagar* **27** (2) (1994), 89-95 [13 Ref].

Two gastropods Dostia violacea and Cerithldeopsilla d jad javiensis inhabiting the mud flats of Thane creek (India) were investigated for Zn, Cu, Pb and Cd contents. Both were found to regulate the body metal contents and hence cannot be considered as indicators of Zn, Cu, Pb and Cd pollution.

**9701-144.** Bagchi Suvendu Nath (Dept Biol Sci, RD Univ, Jabalpur 482001). **Cyanobacteria toxins.** *J Scient Indl Res,* **55** (8 & 9) (1996), 715-727 [104 Ref].

Cyanobacteria are evidently found in almost all reports of algal poisioning. The toxins include potent neurotoxins, hepatotoxins and more selective cytotoxins. Toxins and tumor promoters, being constantly released in recreational waters, might be causing

unforeseen health hazards. New toxins will be discovered as more and more cYanohacteria are screened for. Study of the structures and function of these compounds will form part of the challenging research in this area for years to come.

**9701-145.** Basu S, Sahai YN (Dept Criminology Forensic Sci, Dr HS Gour Univ Sagar 470003). **Accumulation of organow sphosphorus pesticides in different organs of albino rat.** *J Nature Conservators,* **7** (1) (1995), 75-78 [14 Ref].

Malathion is an indirect inhibitor of cholinesterase. Its acute toxicity to mammals is considerable less, but it shows a greater tendency to be absorbed through the skin. Its acute oral toxicity is I /5 to 1/ 10th to that of parathion to laboratory animals. Paper determines the accumulation of malathion in different organs of albino rat offer varying period of time.

**9701-146.** Blwat UG, Vamsee K, Kusuma N, Vinod K, Bhat SL (Sch Ocean Sci, Karnataka Univ, Kodibag, Karwar 581303). **Toxicity of linear alkylbenzene sulfonate (LAS) on the gammarid amphipod, Parhalella natalensis (Stebbing).** *Pollx1 Res,* **14** (3) (1995), 335-340 [17 Ref].

Toxicity of LAS has been studied on a common subtidal gammarid amphipod, Parhalella natalensis (Stebbing). The LCio observed was 0.437 ppm of LAS. The animal showed some, behavioural changes like erratic swimming at lower concentrations, whereas at longer period of exposure and at higher concentrations they became totally inactive.

**9701-147.** Bhunya SP, Jena GB (Lab Genetic Toxico Wildlifti Genctics, PG Dept Zoo, Utkal Univ, Bhubaneshwar 751004, Orissa). **The evaluation of clastogenic potential of trichloroacetic acid (TCA) in chick in vivo test system.** *A1ut Res (Gen Toxico),* **367** (4)(1996), 253-259 [31 Ref].

Study evaluates the genotoxic potential of trichloroacetic acid (TCA) in chick bone marrow chromosomes, and the experiment was designed to study the dose, route, time and acute vs. subacute (fractionated) yield effects of the chemical. TCA induced chromosomal aberrations in a dose, route and tinle response manner. The results revealed the genotoxic property of TCA in the tested system.

**9701-148.** Borah Sabita, Yadav RNS (Bio Chem Lab, Life Sci Dept, Dibrugarh Univ.Assam). **Static bioassay and toxicity of two pesticides, rogor and endosulfan to the air breathing fish Heteropneustes fo*silis with special references to behaviour.** *Polln Res,* **14** (4) (1995), 435-438 [13 Ref].

Static bioassay experiments were conducted on Heleropneustes fossilis to calculate the toxicity of two pesticides, rogor and endosulfan upto 30 days at a durational interval of 5, 10, 20 and 30 days. 4.9 ppm and 6.5 ppm of rogor were found to be. LCe and LC doses for 30 days respectively. Likewise 1.3 and 1.7 ppm of endosulfan were found to be LCso and LC doses respectively.

**9701-149.** Chakravarty S, Deb MK, Mishra RK (Sch Std Chem, Pt. Ravishankar Shukla Univ, Raipur 492010, M.P.). **Extractive spectrophotometric determination of arseliic at trace level in the environmental samples**. *Cheml Environ Res,* **2** (I & 2) (1993) 109-114 [3 Ref] (Late Pub).

A simple, selective and expedient method for the extractive spectrophotometric determination of arsenic in environmental samples has been developed. The proposed method is based on the extraction, in dichloro methane, of yellow-orange coloured iodoarsenite complex with N-phenylbenzimidoyl thiourea (PBTU) in the presence of cetyltrimethylammonium bromide (CTAB). The present method is free from almost all ions examined. which are generally found associated with As. The detection limit of the method for As is 0.05 Ag ml-t aqueous phase.

**9701-150.** Chakraborty S, Deb MK, Mishra RK (Sch Std Chem, Pt Ravisankar Shukla Univ, Raipur 492010, MP). **Determination of tin in environmental samples.** *Cheml Environ Res,* **2** (3 & 4) (1993), 309-312 [12 Ref (Late Pub).

Tin, a metal of immense industrial importance enter into the environment through the effluents from steel plants, tin plating industries, power plants and during mining, smelting and roasting operations of tin ores. An effort has been made to develop a selective and sensitive method for the determination of tin at trace level in environmental samples.

**9701-151.** Chandra J, Durairaj G (Dept Zoo, Life Sci Bldg, AC Coll, Guindy Campus, Univ Madras, Madras 600025). **Haematological and biochemiical studies on the**

**toxic profile of toxaphelle in guinea pig, Cavza procellus.** *Polln Res,* **14** (4) (l995) 411-416 [14 Ref].

Detailed haematological and biochemical studies have been carried out on the toxic profile of toxaphene in guinea pig Cavia procellus. Both acute and subacute toxicity resulted in reduction in haemoglobin content as well as RBC count, while there was a significant elevation in the levels of SGPT and SGOT on both acute & subacute conditions.

**9701-152.** Chidambaram N (Marine Biol Stn, Zool Surv India, 100, Santhome High Rd, Madras 600028). **The green mussel Perna viridis as an indicator of cadmium pollution.** *Environ Bio,* **17** (1) (1996), 5-l0 [18 Ref].

Male and small sized green mussel, Perna viridis, showed more affinity to concentrate cadmium at both locations, Ennore estuary and Fishlanding centre, Madras. Mussels sampled from estuary accumulated cadmium higher than those from Fishlanding centre. Fluctuation in the values of cadmium were greater in estuarine mussels. Multiple stepwise linear regression analysis was performed to assess the role of some environmental factors on the intake of cadmium by mussel. Significant results were reported.

**9701-153.** Choubisa SL, Sompura Karun (PG Dept Zoo, SBP Govt. Coll, ML Sukha dia Univ, Dungarpur 314001). **Dental fluorosis in tribal villages of Dungarpur district (Rajasthan).** *Polln Res,* **15** (1) (1996) 45-47 [10 Ref].

A survey was made for the prevalence of dental fluorosis in eight tribal of Dungarpur district, Rajasthan (India) where fluoride (F) level in drinking waters varied from 1.1 to 5.2 ppm. Maximum (100%) and minimum (79.24%) incidence of dental fluorosis was observed at 5.0 and 1.7 ppm water F level respectively. In general, incidence of fluorosis was proportional to the F level. No specific correlation between gender and incidence of dental fluorosis was found. The maximum (99.26%) incidence of dental fluorosis was observed in subjects of 17 to 22 years age.

**9701-154.** Fendar BS, Kharat RB (Dept Chem, Inst Sci, Nagpur 440001). **Atomic absorption spectrophotometric determination of trace elements in fish from canal**

**of coal fired power plant.** *Cheml Environ Res,* **3** (1 & 2) (1994) 25-28 [13 Ref] (Late Pub).

The various fish samples collected from canal of coal fired power plant were analysed for trace metals, by atomic absorption spectrophotometry (AAS). These results were compared with those fish samples collected from canals far away from coal-fired power plant area. Results of analysis show much higher metal contamination in power plant canal fish samples.

**9701-155.** Fernandez Tresa V, Thomas George, Manoj Kumar R, Shibu Vardhanan Y, (Dept Aquatic Bio Fisheries, Univ Kerala, Thiruvananthapuram 695007). **An assessment of the toxicity levels of BHC on four aquatic organisms.** *J Environ Bio,* **17** (13 (1996), 21-24 [10 Ref].

Acute toxicity of BHC to four aquatic organisms namely, fish (Etroplus macuSItus) (Bloch), prawn (Macrobrachiu7n idella idel/a) (Hilgendorf), clam ( Villorita cyprinoide.s var Cochinensis) (Hanley) and crab (Para?elp sa hydrodrsvm1ls) (Herbst) were cletermined hy conducting short term, static bioassays. The organisms were exposed to diSerent concentrations of BHC (HCH-technical solution) and LC5,, values were determined for each organism. Ninetysix hour LCJo values for fish, prawn, clam and crab were 0.7, 0.0125, 13 and 5.8 ppm respectively.

**9701-156.** Ganesh Kumar C, Jayaraj Rao K (Dairy Microbio Div, Natl Dairy Res Inst, Karnal 132001). **Structural chemical and transmission aspects of dioxinspotential environmental pollutants.** *Curr Sci,* **69** (3) (1995), 237-239 [16 Refl

Dioxins are toxic and potent carcinogenic compounds formed as contaminants in milk and foods. Their occurrence, structure, prevalence in different food product transmission to man and detection methods are discussed briefly. The dioxins and related compounds are found as trace contaminants in the synthesis of several commercial products, importantly chlorophenols. Dioxins have also been reported to be present in cigarettes, smoke and ash. The air-borne dioxins are transmitted to man either by direct inhalation or via forage, livestock, milk and meat.

**9701-157.** Gangopadhyay S, Santra SC (Dept Ecol Stud, Sch Environ Sci, Univ Kalyani, Nadia, West Bengal). **Effect of heavy metal on chlorophyll content and nitrogenase activity of Azolla pinnata** . *Env. Polln Res,* **15** (1) (1996), 95-97 [13 Ref].

Azolla pinnal(l R. Br. was grown in HoaglaPd meclium (dil 1: 8) for 1-4 days containing 5-lS npm ef different heavy metals. Azol la thalli became grey to brown in course of time while that of control remained green. The plant thalli also became fragile. There is a marked reduction in chlorophyll content and nitrogen fixation activity after treatment with heavy metals. The reduction is directly correlated to the concentration of toxicant and period of exposure. Tt was found that copper salt is less toxic than cadmium.

**9701-158.** Goel Sandhya (Dept Cheml Engng, Univ Roorkee, Roorkee 247667). **Determination of methyl parthion in the liver and kidnewv of freshwater fish Channa pu7Zcfalus by high performance liquid chromatography.** *Env Eco,* **13** (4) (1995), 824-826 [6 Ref].

Estimation of organophosphorus pesticide, methyl parathion accumulated in fish tissue by employing HPLC technique on a zorbex ODS column using methanol +water (80:20) as solvent demonstrates that this technique may be used to measure accurately the quantity of pesticides accumulated in fish tissues.

**9701-159.** Gupta Abhik (Dept Zoo, St Edmunds Coll, Shillong 793003). **Heavy metals accumulation by three species of mosses in Shi11ong North-eastern India.** *Water Air Soil Polln,* **82** (4) (1995), 751-756 [13 Ref].

Comparisions were made of the accumulation of cadmium, copper, manganese, lead, and zinc in Plagiotheciul?l denticulatum, Bryum argenteum and sphagnu7n sp. in Shillong. Meghalaya State, north eastern India. Lead and copper levels were higher in P. denticulatum, while SpSiagnum sp. accumulated higher amounts of zinc, manganese, and cadmium. An urbansuburban gradient was evident for lead and zinc in P. denticulatum. and for cadmium in B. argeMleumw while a reverse trend could be discerned for manganese in P, arenticulatltm.

**9701-160.** Gupta Ashok Kumar, Muni Anand, Ranjana, Dalela RC (Environ Res Lab, Dept Zoo, SSM (PG) Colr Hapur 245101). **Toxic effects of chlordane and malathion**

**on certain haematological parameters of a freshwater teleost, Notopterus notopterus.** *J E7lliron Bio,* **16** (3) (1995) 219-223 rl l Ref].

The effects of sublethal concentrations of chlordane and malathion (organophosphate) were studied on certain haematolorical parameters of Notopterlls notopteres after 30 days of exposure. Among the oarameters examined the exposed fish exhibited higher values of prothrombin time (PT). white blood corpuscles (WBC)* and packed cell volume (PCV).

**9701-161.** Gupta Manisha1 Devi Santha (Electron Microscopy Sec, Natl Botl Res Inst, Lucknow 226001). **Uptake and toxicity of cadmium in aquatic ferns.** *J Environ Bio,* **16** (2) (1995), 131-136 [Ref 17].

Comparative uptake of Cd was studied in Salvinia molesta, Azolla pinnata and Marsilea tninuta. At 0.1 zrpm Cd S(rlvinin was the nlost active accumulator of Cd, followed by A zolla and Marsilea. 4 zolla and Salvinia showed ultrastructural changes at 0.1 ppm. while Mar.silea showed no such change. It is sugoested that Sallinin can be considered as an indicator of Cd in water? Izolla ideal for bioassay and Marsilea a resistant plant.

**9701-162.** Gupta PC, Murti RR, Bhonsle RB (Int Agency Res Cancer, Tata Tnst Fundamental Res, Bombay). **Epidemiology of cancer by tobacco products and the significance of DNA** *Critical Rev Toxico,* **26** (2) (1996), 183-198 r81 Ref].

These studies encompass case and case series reports, and case control, cohortz and intervention studies. The biological plausibility is provided by the identification of several carcinogens in tobacco, the most abundant and strongest being tobaccospecific Nnitro-samines. These are formed by N-nitrosation of nicotine, the major alkaloid responsible for addiction to tobacco. The etiological relationship between tobacco use and oral cancer has provided a comprehensive model for understanding carcin ogenesis.

**9701-163.** Jagan Mohan Reddy N (PG Dept Bot. Shri Shivaji Coll, Kandhar 431714, District Nanded, MS). **Aero allergenic pollen of Partheniun1 hysterophorous.** *Polln Res,* **15** (1) (1996), 29-30 [8 Ref].

Paper aims to find out the concentration of aeroallergenitic pollen of Parthenillm and their seasonal variation in relation to the allergenic patients, and to determine the incidence of sensitivity of parthenium pollen among the population in and around Aurangabad. The investigations were undertaken by using volumetric air samp]er to estimate the quantity of Parthenillm pe n seasonal variations and its role in causing the allerqic disorders to human beines.

**9701-164.** Jain Rashmi, Mishra KD (PG Dept Zoo Aquacult Env, SSL Jain Coll, Vidisha 464001). **Acute LC50 Of 2, 4-dich-lorophenoxyacetic acid to fish Rasbora daniconius: Comparative evaluation by static bioassay tests.** *J Environ Bio,* **16** (2) (1995), 105-111 [16 Ref].

Toxicity of 2.4 dichlorophenoxyacetic acid (sodium salt) to fish Rashora daniconiles was estimated by static bioassay test and residual oxygen bioassay test methods. The LC50, values estimated by static bioassay methods were found to be quite comparable to the threshold values estimated by residual oxygen bioassay test method. It is opined that the residual oxygen bioassay test is quite sensitive, and can be used for assessment of acute toxicity of toxic substances to fish.

**9701-165.** Jones Nelson D, Sunii Kumal G (PG Dept Zoo, St Johns Coll, Palayamkottai 670002). **Effects of ekalux on biochemical parameters in the fresh water fish Etropluz siiacuiatus. J Ecotoxico Environl Monit, 6** (1) (1996), 65-67 [13 RefJ.

The effect of ekalux Oll protein and carbohydrate values of muscle, liver and brain of the fish Etro/vlus maculatuk were studied. The lish exposed to different concentration of ekalux (l, 2, 3 ppm) over a period of 24, 48 and 72h simultaneously. As the concentration and the period of exposure of pesticide kept increasing, the amount of protein and carbohydrate was decreasing from 96 mg/g to 40 mg/g and 106 mg/g to 20 mg/g respectively.

**9701-l66.** Joslli TN (Dept Zoo, Govt PG Coll. Pithoragarh). **Toxicity of DDT to a freshwater hill stream fish Barilius benelelisis (Ham).** *Polln Res,* **14** (3) (1995), 369-371 [17 Ref].

The acute toxicity of DDT to a freshwater fish Barilius bendelisis was estimated by static bioassay experiment and the mortality of the fish was recorded for 96 hrs. The

water qua]ity contains the hardness of 170 mg/l as CaCOJ. The average temperature and pH value were found to be 15°C and 7.6 respectively. The safe concentration of DDT to B. bew1dilisis was calculated to be 16.0 mg/l.

**9701-167.** Kabilla V, Yamuna A, Geraldine P (Dept Anim Sci, Sch Life Sci, Bharatidarson Univ, Tiruchirapalli 620024). **Water hardness as a determinant of the potential toxicity of lead to the freshwater prawn Macrobrachium matcolesonii (H Milne Edwards).** *Polln Res,* **15** (1) (1996), 39-42 [16 Ref].

Toxicity tests with the freshwater prawn Macrobrachium enalco/mosesnii suggested that lead is less toxic in hard water (96h LGo 91.51 mg Pb/l) than in soft water (9.S mg Pb/l). The rate of accumulation was greater in prawns exposed to lead in softwater than that in prawns in hard water. In both the experimental groups, the quantum of lead accumulated in the gills and hepatopancreas was greater than that in the muscle. Possible reasons for the differing intensity of heavy metal toxicity as soft and hard water are discussed.

**9701-168.** Kalaiselvan K, SPM Prince, Subburam V (Dept Environ Sci, Bharathiar Univ Coimbatore 641064, Tamil Nadu). **Toxicity of lead to the earthworms Drawida ramnadana (Michaelson).** *Polln Res,* **15** (I) (1996), 15-18 [17 Ref].

Earthworms Drawida ramnadalla were exposed to lead in water. The 48 hr LCso concentration of lead was 2.0 ppm. Lead produced behavioural and morphological changes before the onset of death. The various behavioural changes observed were fast movement, lifting the body, curling coiling, and coiling like a knot. With increasing concentration the time taken for the initiation of morphological changes decreased. The behavioural and morphological symptoms produced were similar to that observed in earthworms exposed to Cd, however, such symptoms were produced at a relatively higher concentrations in lead.

**9701-169.** Kawshik CP, Gupta S, Kumar S, Kaushik A (Dept Bio Sci, Maharishi Dayanand Univ, Rohtak 124001). **Deltaaminolevulinic acid of children as an index of lead exposure.** *Indian J Environ1 Hlth,* **37** (2) (1995), ]15-119 [12 Ref].

Urinary deltaaminolevulinic acid ALA) in urban and suburban children of Rohtak area as an index of their exposure to lead is reported. In both the categories of urban

and suburban children the urinary 8 ALA showed an increase with age and was significantly higher in suburban than the urban children in the lower age group. The level of significance decreased with increase in age and became nonsignificant in 45 year age group.

**9701-170.** Khan Samiullah, Qureshi MA, Singh Jaibir (Dept of Applied Chem, ZH Coll Engng Techno. Aligarh Muslim Univ, Aligarh 202002). **Studies on the mobility of heavy metals ill soil.** *Indian J Envirosl Hltl1,* **38** (1) (1996), 1-6 [19 Ref].

The mobility of some heavy metals was measured through soil with decomposed organic matter as well as soils amended with some commonly used pesticides. Ammonium sulphate urea, ammonium phosphate, and potassium chloride have also been examined for their effects on the mobility. The results show that order of mobility was Ni > Mn > Cr .> Cu > Pb in all systems studied. Higher mobility was observed in soil with decomposed organic matter than in soil with organic matter.

**9701-171.** Kulshrestha SK, Krishan Gopal, Jain Anjali (Dept Zoo, Motilal Vigyan Mahavidyalaya, Bhopal 462008). **Effect of pesticides on fishesa review of recent studies in India.** *J Nature Conserv,* **7** (2) (1995), 145-188 [267 Ref].

This review is based on selected Indian studies on the effects of pesticides on various fish species. It is aimed to highlight toxicological assessments for pesticides and their effect, behaviour, integument, gastrointestinal tract, respiratory system, blood, brain, kidney, endocrine glands, gonads, fish development, biochemical and histochemical parameters and the extent of residues in fishes along with areas for further investigations.

**9701-172.** Kumar BD, Krishnaswamy K (Food Drug Toxico Res Cent Natl Inst Nutrition, Jamai Osmania, P.O. Liyde£+ahad 500007). **Detection of subclinical lead toxicity in monocasters.** *Bull Environ Contam Toxico,* **54** (6) (1995), 863-869 [21 Ref].

Study has been undertaken to evaluate the subclinical lead toxicity on haemopoetic and renal system using non invassive techniques in monocasters, who are occupationally exposed to lead fumes while preparing the type set letter blocks.

**9701-173.** Kumar Sullil, Rana SVS (Zoo Dept, DAV (PG) Coll, Dehradun 248001). **Biochemical and histopathological observations in the kidney of rat after methanol treatment.** *Uttar Pradesh J Zoo,* **15** (3) (1995), 194-198 [19 Ref].

Methanol which is an important industrial intermediate is used in manufacturing of varnishes, paints, and as alternative fuel in motor vehicle. It has slow metabolism and remains in the blood for a long time. Methanol exerts its effect through its metabolite formaldehyde and cause blood acidosis. Kidney function test along with histopathlogical and ultrastructural changes in the kidney after methanol exposure show that methanol cause increase in blood urea and decrease in urine specific gravity, pH, creatinine, hippuric acid, blood pH and serum albumin.

**9701-174.** Lyla PS, Ajmal Khan S(Cent Adv Std Marine Bio, Annarnalai Univ, Parangipettai 608502, Tamil Nadu). **Heavy metals iron and manganese in the estuarine hermit crab Clibanarius longitarszts (De Haan) of Vellar estuary.** *J Ecotoxico Environ Monit,* **6** (1) (1996), 21-28 [42 Ref].

Heavy metals (iron and manganese) estimated over a period of one year in the estuarine hermit crab £1ibanarius longitarsus along with the water and sediment components of the estuary revealed seasonal changes. Iron concentration was found to be more than that of manganese in water and it varied from 21 to 75 ppb, while manganese varied from 1.3 to 13 ppb. The maximum values in both the metals were recorded during summer and minimum during the monsoon period.

**9701-175.** Madhukumar E, Vijayammal PL (Dept Biochem, Univ Kariavattam, Thiruvananthapuram, 695581). **Changes in collagen levels in the tissues of rats exposed to cigarette smoke.** *J Ecotoxico Environ Monit,* **6** (1) (1996), 29-34 [23 Ref].

Prolonged exposure of the rats to cigarette smoke resulted in significant alternation in the metabolism of collagens. The concentration of total collagen and the distribution of soluble and insoluble collagens in aorta, lungs, heart and liver were studied. In the rats exposed to cigarette smoke, total collagen content was found to be higher in the .aorta and lungs, and significantly lower in liver. But the cardiac tissue collagen did not show any alteration.

**9701-176.** Mary Chandravarthy V, Reddy SLN (Dept Zoo, Osmania Univ, Hyderabad 500007). **Lead nitrate exposure changes in carbohydrate metabolism of freshwater fish.** *J Environ Bio,* **17** (1) (1996), 75-79 [14 Ref].

The changes in the activity patterns of the glycogen phosphorylases are clearly reflected 37 in the metabolite levels. For postexposure recovery studies the fish are transferred to uncontaminated media and the levels of metabolites and the characteristics of the enzymes are carefully noted for 15 more days. The enzymes and metabolites studies have failed to recover during initial recovery period. However, on 15th day near normal levels were observed.

**9701-177.** Mishra Kumkum (Dept Bot, Lucknow Univ, Lucknow). **Monitoring genotoxic effect of mercuric chloride by Allium test system.** *Eco Env Conserv,* **1** (1-4) (1995), 139-142 [21 Ref].

Study was undertaken to monitor and assess the genotoxic effect of mercuric compound taking the concentration which could be lowest as an environmental contalrinant and highest which might be toxic to plants and other fauna in the aquatic ecosystem.

**9701-178.** Mukherjee B, Pankajakshi GVN (Sec Environ Bio, Dept Zoo, Ranchi Coll Ranchi 834008). **The impact of detergents on plankton diversity in freshwaters.** *J Environ Bio,* **16** (3) (1995), 211-218 [26 Ref].

The species diversity of a freshwater lentic system was studied in relation to the environmental parameters and detergent input. The natural planktonic rhythm was modified by the detergents, which are toxic, and affected the growth of clean water planktonic forms. Microcystis however, seems to be tolerant.

**9701-179.** Mule MB, Lomte VS (Dept Zoo, Shivaji Univ Kolhapur 416004). **Copper sulphate induced alterations of protein in freshwater gastropod Thiara tuberculata.** *J. Ecobio,* **7** (3) (1995), 177-180 L16 Ref].

Effect of copper sulphate (CuSO ) on protein content of whole body, foot, digestive gland and mantle of freshwater snail Thiara tlherculata was studied. Individuals exposed to 5.45 and 1.14 ppm of copper sulphate as acute and ohronic treatment

respectively. The pattern of change of protein content in organs of exposed T. tuberculata suggest that the detexification of CuSO4 wls taken place. The high protein content change was found in digestive gland followed by foot and mantle.

**9701-180.** Nag U, Panda R, Sahu SK (Dept Zoo, Sonepur Coll Sonepur 767017, Orissa). **Effect of different concentrations of cadmium orl the survival and growth of earthworm Drawidavillsi, Michaelsen.** *Polln Res,* **14** (4) (1995), 443-446 [10 Ref].

Survival and growth of earthworm Drawida willsi. Michaelsen in response to different concentrations of cadmium were evaluated. LCsn value of D. willsi for 96 hours came to be 602.6 pom. On the basis of LC51 value! three sublethol concentrations of clc'nliunl were chosen (25, 50 and 100 ppm}for further study on growth.

**9701-181.** Nanda Kumar NV, Balaswamy K, Vijayalakshmi KM (Dept Zoo, SV Univ, Tirupati 517502, Andhra Pradesh). **Restorative effect of tadpole tail on succinate dehydrogenase activity in Bufo melanostictus tadpoles exposed to inorganic mercury.** *Polln Res,* **14** (3) (1995), 305-311 [29 Ref].

Succinate dehydrogenase activity pattern was studied in Buto meMnostictlts tadpoles exposed to sublethal and lethal concentrations of inorganic mercuric chloride for various lengths of time. Succinate dehydrogenase activity level showed an increase in the homogenates of whole tadpole compared to homogenates prepared without tail! thereby suggesting an unknown activation factor in tal1 on in vivo exposure.

**9701-182.** Nath Ravindra, Jaipuryar ARK (Hematology Lab, PG Dept Zoo, Patna Univ, Patna 800005). **Effect of subtethal concentration of lindana Oll peripheral hemogram in the fish Heteropnewstes fossilis (Bloch).** *Enly Eco,* **14** (1) (1996), 158-162, [15 Ref].

Effects of exposure of sublethal concentrations of lindane (00(108 miflitre on blood parameter of the fish Heterohesics fossiles after 15 30, 45, 60, 75 and 90 days were studied. The rapid fluctuations indicate the toxic effect of the pesticide on the blood of the fish and the long term toxicity as the values did not return to normal values even after 90 days.

**9701-183.** Nath Ravindra, Banerjee V (Haematology Lab, PG Dept Zoo, Patna Univ, Patna 800005). **Effect of pesticides methyl parathion and cypermethrin on the airbreathing fish Heteropneustesllossilis (Bloch).** *Env Eco,* **14** (1) (1996), 163-165 [19 Ref].

The catfish Heteropneustes fossilis were exposed to 0.03ml/litre of methyl parathion 50(}.'! En and 0.19 ml/litre of cyrxernlethrin 25',(', EC. Erythrocyte showed deformity, hypochromasia and hallow around the nucleus. The average percentage of large lymphocytes and neutrophils increased significantly but small lymphocytes decreased significantly in treated fish. CT significantly decreased in both pesticide exposures.

**9701-184.** Ovais M, Tembre M, Parveen S, Gaur A (Dept Biosci, Barkatullah Univ, Bhopal 462026). **Effect of methylamine in sublethal concentrations on the melanophores of an exotic carp Cyprinus carpio (Linn.)***.Chen11 Environ Res,* **2** (3 & 4) (1993), 291-293 [7 Ref] [Late Pub.l.

Methylamine (MA) is a carbamate compound, which is used in the manufacture of various chemicals and in several industries. After the Bhopal gas leakage tragedy, attention has been diverted to M A . Methylisocyanate (MIC) when comes in contact with water an exothermic reaction takes place which results ill the formation of carbon dioxide, N.N-dimethyl urea and methylamine. Study investigates the effect of MA on the melanophores of an exotic food fish Cyprinus carpiocommz is, known locally as common carp.

**9701-185.** Pahan K, Chatldhuri J, Ghosll D, Gachhui R, Ray 7 Mandai A (Dept Bio Chem, Univ Coll Sci, 35 Ballygunge Circular Rd, Calcutta 700019). **Enhanced elimination of Hg Cl from natural water by a broad spectrum Hg-resistant Bacillus/wasteurii strain DR2 in presence of benzene.** *Bull Environ Contam Toxico,* **55** (4) ( 1995), 554-561 [23Ref].

Study utilizes the dual characteristics of the organism for elimination of Hg-compounds and utilization of aromatic compounds, in natural conditions. Paper report the increased rate of the elimination of Hg C1 by the strain from natu1al river water in the presence of organic compounds.

**9701-186.** Prasad B, Banerjee NN, Dhar BB (Centl Mining Res lnst, Dhanbad 826001). **Environmental assessment of coal ash disposal a review.** *J Scient Indl Res,* **55** (10) (1996), 772-780, [80 Ref].

Paper reviews the physical and chemical properties of coal ashes. Different field investigations for ground and surface water contaminations due to coal ash disposal have been discussed. A detailed study of different laboratory experiments for leaching of heavy metal ions from coal ash has been described. Factors influencing the release of heavy metal ions from coal ash have also been discussed. Information regarding control technology of coal ash disposal has been included.

**9701-187.** Rai UN, Tripathi RD, Gupta Meetu, Chandra P (Aquatic Bot Lab, Natl Botl Res Inst., P.O. Box 436, Lucknow 226001). **Induction of phytochelatins under cadmium stress in water lettuce (Pristia strtiotes L).** *J Environ Sci Hlth,* **A30** (9) (1995), 2007-2026 [36 Ref].

Plants of Pistia strtltiotes L. accumulated apprecilble amounts of Cd freln aqueous solution, maximum being in roots than leaves. Accumulations was concentration. Duration dependent, however, plant reached metal steady state concentration on 7 d at 10.0 FM Cd. The accu1nulation of Cd was accompanied by a declinc in cellular levels of glutathione which was more evident in roots at different treatment durations.

**9701-188.** Rajan MR, Balasubramanian S, Raj SP (Dept Natural Resources, Sch Energy Sci, Madurai Kamaraj IJniv, Madurai 625021, 1 N). **Stratificatron of zinc, lead, copper and chromium in sewagefed-fish ponds.** *J Nature Conservator,* **7** (1) (1995), 25-33 [20 Ref].

Study deals with the translocation and distribution of zinc, lead, copper and chromium in sewagefed ponds. Zinc and chromium content is higher in sediment and lead and copper are in liquid phase. The percentage distribution of metals shows that the metal content in water is decreasing as the loading is increased. Chromium is not accumulated by any of the fish stocked. It is also observed that among the metals, the lead content is higher in fish and it is followed by zinc and copper.

**9701-189.** Rajyashree M (Dept Zoo, Nizam Coll Osmania Univ, Hyderabad 500001). **Carbamide induced alterations in some metabolic aspects of the fish Babeo rohita.** *J Ecotoxico Environ Monit,* **6** (1) (1996), 41-44 [8 Ref].

Fish Labeo rohita exposed to different sublethal concentrations (25, 50, 100 and 200 ppm), carbamide, a commonly used fertilizer which induced alterations in the protein levels and nucleic acid contents. Exposure of fish to different concentrations of carbamide led to increased nucleic acids 25 and 50 ppm, but at 100 and 200ppm a significant decrease of the same was observed.

**9701-190.** Rangoonwala Shaheda P, Suryawanshi SA, Pandey AK (Dept Zoo, Inst Sci, 15, Madam Cama Rd, Bombay 400032). **Responses of serum calcium and inorganic phosphate levels and tissue phosphatases of Ratt?ws norvegicus to sublethal administration of heptachlor.** *J. Nature Conserv,* **7** (2) (1995), 133-137 [37 Ref].

Intramuscular administration (sublethal dose; 0.50 LDso dose for 96 hrs) of heptachlor (119 mgSkg body weight daily) for four days induced significant ($P < 0.05$) hypocalcemia in Rattus norvegicus without altering serum inorganic phosphate value. The treatment decreased liver acid ($P < 0.001$) and alkaline phosphatase ($P<0.05$) activities. Though muscle acid phosphatase activity of the experimental rats also declined significantly ($P < 001$), alkaline phosphatase activity registered an increase ($P < 0.01$) over the control.

**9701-191.** Ranjitsingh AJA, Padmalatha C (Dept Bio, Sri Paramkalyani Coll, Alwar-kurichi 627412). **Occupational illness of beedi rollers in south India.** *Env Eco,* **13** (4) (1995), 875-879 [8 Ref].

The occupational environment of beedi rollers was found to be unhealthy. Beedi rollers were affected by respiratory disorders, skin diseases, gastrointestinal illness, gynaecological problems, lumbarsacral pain and several other health problems due to their occupation. Because of tobaccosis they were succeptible to tuberculosis infection. Fungal disease, contact dermatitis was recorded in 16% of the beedi roJlers. Peptic-ulcer (45%) hemorrhoids, (41%) diarrhoea (4°/O) were common gastro-intestinal problems.

**9701-192.** Ranjit Singh AJA, Haniffa MA, Padmalatha C (Dept Bio, Sri Parmakalayani Coll, Alwarkurichi 627412). **Organophosphorus pesticide toxicity to the bioenergetics of a freshwater snail, Indoplanorbis exustus Deshayes).** *Polln Res,* **15** (1) (1996), 89-93 [24 Ref].

The toxic effect of organophosphorus pesticide, dimecron to the bioenergetics of a fresh water snail, Indoplanorbis exustus (Deshayes) was studied after exposing the snail to two sublethal concentrations of dimecron, 0.675ppm and 1.375ppm for 30 days. The feeding rate of 1. exustus was affected in dimecron treated snails depending upon the concentrations of dimecron. The snails food locating capacity and foo(l grasping ability were reduced due to histopathological changes in the eyes and radulary apparatus respectively. Because of poor feeding all the parameters of energy budget were affected.

**9701-193.** Rehana Z, Malik A, Ahmad M (Dept Bio Chem, Fac Life Sci, Aligarh Muslim Univ, Aligarh 202002). **Genotoxicity of the Ganga water at Narora (UP).** *India-Mut Res* (Gen Toxico), **367** (4) (199Q, 187-192 [25 Ref].

Water samples were collected from the river Ganga at Narora (UP). High performance liquid chromatography analysis of water samples by the liquid extraction procedure indicated the presence of several pesticides. The XAD water concentrations and liquid-liquid extracted water samples were assayed for mutagenic potential by the Ames Salmonella Microsome test. The test samples exhibited a significant degree of mutagenicity with TAl02, TA100 and TA98 strains both in the presence and absence of DNA repair defective mutants, recA, lexA and polA of E. coli was observed as compared to their wildtype counterpart in the presence of XAD water concentrates.

**9701-194.** Sangha JK, Bal SK, Dhillon MK (Dept Food Nut, Punjab Agricl Univ, Ludhiana 141004). **Fluoride content of some common foods from endemic fluorosis area and their contribution to fluorosis.** *India J Eco,* **23** (1) (1996), 16-20 [7 Ref].

Fluoride content of thirty commonly consumed foods from the endemic fluorosis area were determined with special reference to feeding habits of two hundred adult men and women from eight villages of Faridkot district. The average daily fluoride intake from

all the sources was l9mg in men and 13mg in women, which was found to be very high when compared to recommended allowances of ICMR and WHO.

**9701-195.** Sekar P, Christy I (PG Res Dept Zoo, Voorshees Coll Vellore 632001). **Haematological changes in the fresh water catfish Mystus vittatus exposed to sublemal concentration of phosphamidon.** *J Ecobio,* **8** (1) (1996), 25-28 [23 Ref].

Effect of sublethal concentration of phosphamidon on haematological parameters was studied in Mystus vittatus. Phosphamidon toxicity resulted in a significant decrease in RBC (-26 % ) WBC (-16%), Haemoglobin content (10%) and PCV (-14%) and a marginal increase in MCV (-8 % j and MCH (+4.5%).

**9701-196.** Selvapathy P, Sarala Devi G (Cent Environ Std, Anna Univ, Madras 600025). **sT1 Nickel in Indian chocolates (toffees).** *Indian J. Environ Hlth,* **37** (2) (1995), 123-125 [13 Ref]

In the determination of trace elements in foods the organic matter has to be destroyed prior to the actual determination of the analyte. These procedures are time consuming and laborious. A simple low temperature leaching procedure using HCI and HNO3 for certain food stuffs has been reported. An attempt has been made to evaluate the suitability of this procedure for the destruction of organic matter in chocolate prior to analysis of nickel by atomic absorption spectrophotometry.

**9701-197.** Sengupta K, Chakraborty R, Das AK, Kesh AB, Sinha GM (Dept Chem, Burdwan Univ, Burdwan 713104). **Influence of multidentate chelating agents of cadmium and lead intoxication in Heteropneusles fossilis (Bloch).** *Cheml Environ Res,* **2** (3 & 4) (1993) 243-250 (22 Ref) [Late Pub].

The accumulation of each of cadmium (Cd) and lead (Pb) in liver. Kidney and gonad of an Indian freshwater air breathing fish Heteropneustes fossilis (Bloch) was measured during exposure of the fish to the metals (30ppm each) under controlled laboratory condition. It was observed that the level of Cd and Pb in various organs under study may be reduced after application of equimolar amounts of ethylene diamine tetraacetic acid (EDTA), or diethlene triamine pentaacetic (DTPA) as antidote.

**9701-198.** Shah Pratima, Gupta Shashi, Rai V (Sch Life Sci, Ravishankar Univ, Raipur, MP). **Effect of vanadium on Na+-l+- At Pase superoxide dismutase and protein in brain and liver tissues of Clarias batrachus (Linn).** *Polln Res,* **15** (1) (I996), 57-60 [17 Ref].

Na+ K+ At Pase, superoxide dismutase (SOD) activity and protein concentration was investigated in the liver and brain tissues of the fish Cltiriaz batrachus on exposure to 5 and 10ppm vanadium as sodium metavanadane. A decrease in the level of Na K A1 Pase activity was observed in liver and brain tissues of 5 as well as 10ppm exposed fishes, whereas a gradual increase in level of SOD activity was recorded in brain and liver tissues. The increase in the enzyme activity was more marked in liver than brain. lA decreased concentration of protein was observed in brain as well as liver tissues.

**9701-199.** Sharma Arvind, Sharma MS* (*Dept Zoo, Coll Sci, Udaipur). **Acute toxicity of zinc to certain developmental stages of Cirrhinus mrigala (Hamilton).** *J Environl. Bio,* **16** (2) (1996), 157-162 [14 Ref]

Attempt has been made to assess the acute toxicity of zinc to some developmental stages of freshwater fish Cirrhinus mrigala. Eggs of the tested fish has been found more resistant to zinc than their higher developing stages. Increased incubation period of about five hours were noted. Change in the fish behaviour was observed during the experiment.

**9701-200.** Shrivastava Anjali (Natl Environ Engng Res Inst, Nagpur 440020). **Estimated distribution of phenols in environment based on fugacity approach.** *Cheml Environ Res,* **2** (3 & 4) (1993), 209-216 [13 Ref] (Late Pub).

Estimation of distribution of ten phenols of environmental concern, in each environmental phase has been attempted here by calculating fugacities. Since actual locations in specific environments are necessarily highly complex, one attractive approach is to use evaluative model. The fugacity approach presented here can form the basis for a procedure to assess likely environmental effects.

**9701-201.** Shukla Nandita, Moitra JK, Trivedi RC (Bio Lab, Centl Polln Contl Bd, East Aljun Nagar, Shahdara, Delhi-110032). **Environmental exposure to lead and its**

**concentration in human cataract lenses from two contrasting regions in India.** *Polln Res,* **15** (1) (1996), 1-4 [20 Ref].

Keeping in view the contrasting environment Conditions of Shillong and Delhi, lead levels have been determined in cataractous lens samples obtained from patients in these regions. Lead level in the range of 13-114tl g/g have been found in fifty samples from Shillong region and in the range of 39-622 p g/g in fifty samples from Delhi region. Lead concentrations in some clear and cataract-free lenses were found to be in the range of 2.5-3.3 Se g/g. Sampies of potable water, ambient air, vegetation, soil and bovine milk of both the study area were analyzed loricad content and were found to be in the normal range in Shillong region and high in Delhi region.

**9701-202.** Sivakumari K, Ramesh M, Manavalaramanujam R, Kanagaraj MK, Manonmani R (Unit Polln Bio, Dept Zoo, Bharathiar Univ, Coimbatore 641046). **Uptake of lead nitrate by Cyprinus carpio; modified by pH.** *Polln Res,* **14** (3) (1995), 299-303 [21 Ref].

Study reports uptake of lead nitrate by Cypri-nus carpio as modified by pH. The uptake was studied in gill liver and muscle of fish. Accumulation was high at acidic pH only in gills while the uptake by liver & muscle was less.

**9701-203.** Sultana Rafia, Uma Devi V (Dept Zoo, Andhra Univ Visakhapatnam 530003). **Oxygen consumption in a catfish, Mystus ,qulio (Ham) exposed to heavy metals.** *J Environ Bio,* **16** (3) (1995), 207-210 [15 Ref].

Oxygen consumption of Mystlxs gulio (Ham) was altered due to exposure to different concentrations of CuSO4 and ZnSO4. Copper is found to be potent respiratory inhibitor than zinc.

**9701-204.** Sunil Kumar K B, Devi KS (Toxico Div, Vimta Labs Ltd, IDA phase II, Cherdapally, Hyderabad 500051) . **Methyl parathion induced teratological study in rats.** *J Enviroll Bio,* **17** (1) (1996), 51-57 [26 Ref].

Pregnant rats received daily P. (). doses of organophosphate methyl parathion (MP) from day 6 through day 15 of gestation at doses 0.5, 1 and 1.5mg/kg body weight. Dams were sacrificed on day 20 of gestation and fetuses were examined for external

and visceral anomalies. Significant decrease in dam weight gain during pregnancy and increase in resorption rate were observed in 1.5 mg MP administered rats.

**9701-205.** Tembhra Manju, ICumar Santosh (Dept Biosci, Barkatullah Univ, Bhopal 462026). **Acetylcholinesterase activity and enzme kinetics in the gut of Cuprinlts carpio subjected to acute and chronic exposure to coppcr.** *J. Scobio,* **7** (3) (1995), 191195 [22 Ref].

The acute and chronic effects of sublethal concentrations of copper sulphate on AChE of gut Cyprinus carpiw has been studied and enzyme activity, its kinetic parameters (Km and Vmax) and inhibition were determined and compared. The AChE activity significantly inhibited with all the concentrations of CuSOl. The pattern of inhibition was mixed i. e., competitive-noncompetitive. The maximum inhibition was noted with 4ppm CuSO4. The inhibition was dependent on CuSO4. concentration and its exposure period,

**9701-206.** Tomar MS, Diqallotiya RS, Shilaskar DV, Dixit NK (Dept Pharmaco, Coil Vex Sci Anim Hus,bandr\; JNKVV, Mhow 453446). **Effect of malathion on enzymes of goat liver and serum.** *J Environ. Bio,* **16** (2) (1995), 151-155 [17 Ref].

Malathion induced acute toxicity in goat by oral administration was studied. Malathion administration increased the activity of SGPT, SGOT, alkaline and acid phosphatases whereas AchE activity was decreased, which may be due to modification of active site of AchE. There was no statistically significant change in liver enzymes except AchE.

**9701- 207.** Trivedi Subrata, Mitra Abhijit, Bag Manigrib, Ghosh Indranil, Choudhury Amalesh (Dept Marine Sci, Univ Calcutta 35, BC Road, Calcutta 700019). **Heavy metal concentration in mudskipper Boleo-pAthallnus boddaerti of Nayachara Island, India.** *Indian J Environ Hlth,* **37** (2) (1995), 120-122 12 Ref].

The capacity of some marine as well as estuarine flora and fauna to accumulate potentially toxic trace metals in their tissues. far in excess of ambient level, is well known. Study undertakes to understand the metal concentrations in the liver, muscles and skeletal parts of the mudskipper Boleophthalmus boddaerti collected from Nayachara Island situated opposite to Haldia industrial belt.

**9701-208.** Vijayalakshmi S, Tilak lKS (Dept Zoo, Nagarjuna Univ Nagarjuna Nagar 522510). **Effect of pesticides on the gill morphology of Labeo rohita.** *J Ecotoxico Environ Monif,* **6** (1) (1996), 59-64 [25 Ref].

The gill tissue of monocrotophos treated Labeo rohita showed necrotic changes and alteration in the shape of filament, as a result of direct contact with pollutants. Fenvalerate intoxication caused atrophy in gill lilaments. Fusion and atrophy of secondary gill lamella were observed in L. rohita exposed to mixture of monocrotophos and fenvalerate.

**9701-209.** Vijayaraman K (Res Dept Zoo, Periyar EVR Coll, Tiruchirapalli 620023). **Acute toxicity of cadmium, copper, chromium and zinc to the freshwater prawn, Macrobrachium malcolmsonSi (Milne Edwards).** *J Nature Conservators,* **7** (1) (1995), 11-15 [15 Ref].

The acute toxicity of cadmium, copper, chromium and zinc to the commercially important freshwater prawn. Macrobraclli?!7n malcolmsonii (Milne Edwards) was evaluated in static renewal bioassay tests. The 96-hr LCso value was found to be 0.628, 0.955, 1.286 and 2.633 for Cd, Cu, Cr and Zn respectively.

**9701-210.** Vincent S, Ambrose T, Cyril Arun Kumar L, Selvanayagam M (Unit Environ Sci, PG Res Dept Zoo, Loyalo Coll, Madras-600034). **Heavy metal cadmium influenced anaemia in the riverine major carp, Catla catla (Ham).** *J Environ Bio,* **17** (1) (1996), 81-84 [16 Ref].

Piscine haematology is employed to assess the impact of heavy metal cadmium on Catla chtla. Drastic decline in TEC, Hb, and PCV reflected the anaemic state of the fish. Resultant anaemic condition was further attested by increase in red cell indices.

**9701-211.** Virk S, Sharma RC (Dept Zoo, Meerut Coll, Meerut-250001). **Effect of nickle and chromium on various life stages of Cyprinus carpio Linn.** *Instian J Eco,* **22** (2) (1995), 77-81 [9 Ref].

Acute toxicity of nickle and chromium to various life stages of Cyprinus carpio Linn. was studied. Hundred per cent hatching of eggs was observed at 0.1 and 5.0 mg/ 1 of nickel and chromium, respectively. The 96-h-LCso values of nickel ranged from 6.90

mg/1 (hatchlings) to 48.00 mg/ 1 (adults) and that of chromium from 15.14mg/1 (hatchlings) to 87.00 mg/1 (adults). On the basis of 96 h LC50 values, nickel was found to be more toxic than chromium.

**9701-212.** Zayapragassarazan Z, Anandan V (Dept Anim Sci, Sch Life Sci, Bharathidasan Univ, Tiruchirapalli-620024). **Effect of cHCH on the protein profiles of selected tissues of the airbreathing fish Anabas testudineus (Bloch).** *Env Eco,* **14** (1) (1996), 55-59 [13 Ref].

The influence of pesticide, oe HCH (lindane) on the selected tissue protein profiles was studied in an airbreathing fish Anabas testudineus. Fish were exposed to different sublethal concentrations of lindane for 2() days and the impact of pesticide stress on the quantity and quality of protein of various tissues were studied. Significant quantitative and qualitative changes were observed in gill and liver and no significant changes were noted in the muscle tissue over that of control.

## Wastes

**9701-213.** Agrawal Anjana, Shrivastava RM, Verma NK (Dept Chem, Govt Motilal Vigyan Adarsh Mahavidyalaya, Bhopal462001). **Chemical study of the effect of industrial effluents on surface and ground water surrounding Mandideep, dist Raisen M.P. (India).** *Oriental J Chem,* **11** (3) (1995), 270-271 [9 Ref].

A chemical study was carried out on the effect of industrial effluents on the surface and ground water quality surrounding Mandideep Industrial area (Dist. Raisen), M. P. with specials reference to nitrogen content. The result indicate that all the parameters analysed except nitrate content were as per 1SI 10500. In ground water 85% of the sample analysed showed nitrate content within the permissible limit. The water quality of Betwa river monitored at various points indicates that the parameters are well within the norms prescribed in ISI 2296 at many stations.

**9701-214.** Aiyagari Niranjan (Dept Clleml Engllg, Anna Univ? Madras-600025). **ETro-cess hazards - hazardous wastes disposal and mitigation methodologies.** *J Scient Indl Res,* **55** (10) (l996), 8l9-822 [9 Ref].

The hazardous wastes, available from chemical process plants, as gas, liquid and solid, are discussed for their mitigation. Techniques/ technologies are indicated. Also, a few aspects of severity are referred to. The reactions for technologies are chosen to highlight comparative approaches.

**9701-215.** Bahri UC, Jain CL (Shriram lnst Ir.cll Res, 19, Univ ltd, Delhi-110007). **Simultaneous determination of DDT (Di-chioi o Dipllenl Trichloroetllane) and mono-chlorobenzene in water and wastewater from insecticide manufacturing industry by high performance liquid chromatography.** *Polln Res,* **15** ( l ) ( l 996), 67-70 [ l l Ref] .

The chromatographic behaviour of DDT and monoclllorobenzene present in effluents of insecticide manufacturing unit were studied, using the sample cleanup proceclure developed. The samples collected were extracted with n- hexane and subjected to cleallup pro-cedure by passing the extract through packed Florosil column. The resulting solution was analysed by High Performance Liquid Chromatography using

Sibaca Resolve (5µ spherical) column and U. V. detector. The detection limits were 0.1 µg/ml for DDT and 0.15µ g/ml for monochlorobellzelle. Recovery was more than 95 (yO for D1DT and more than 90% for monochlorobenzelle.

**9701-216.** Balasubramanian N, Prahakaran TR, Lailtlla K, Ahamed A Jafar (PG Res Dept Chem, Bishop Heber Coll, Tiruclllirapal li-6200 17). **Removal of cadmium by adsorption technique.** *J Nature conservators,* **7** (l) (1995). I7-23 [17 Rcr]*

Industrial wastes cause a considerable amount of pollution to water into which these wastewaters are allowed to mix without any prior treatment and hence immediate attention is needed to remove these pollutants. Paper deals with the removal of the highly toxic cadmium metal irons from synthetic effluents and the use of cheap adsorbent, probable explanation is given to account for the variation of the percentage of adsorption applying a suitable adsorption model.

**9701-217.** Balasubramanian PR, lvastlluri Bai R (Dcpt Environ Sci, Bharathial Univ, Coimbatore 641046). **Evaluation on the effect of aeration on nutrient pattern in diluted biogas plant effluent treatment.** *Polln Rex,* **14** (3) ( 1995), 357-364 [ l l Ref].

Effect of aeration of nutrients, ammonia, nitrogen, pwhosphorous, potassium, sodium, biochemical oxygen demand and pH were evaluated in biogas planteffluent diluted at IXtO and 5't, levels. At 1% concentration of liogas planteffluent increase of available phosphorus, potassium and sodium were 0.146, 0.096 and 3.21 mg l—l dayl, respectively. Biogas planteffluent diluted at l % level can be utilized without prior aerobic treatment.

**9701-218.** Banerjee Meenakshi, Deb Malika (Algal Res Unit, Dept Bio Scie Barkatullah 46 Univ, Bhopal-462026). **Fly ash induced stimulation in growth and protein content of Spirulina plutensis.** *Cheml Environ Res,* **2** ( 1&2) (1993), 151-154 [15 Ref] (Late Pub).

Fly ash is finely divided powder thrown up a.. waste material by coal based thermal power plants. l he use of fly ash for Kiruli cultivation is based on the fact that it contains nutrient elements required for plant growth of cyanobacteria. Paper studies some of the aspects of growth characteristics of Spirulina platensis growth in medium supplemented with flyash.

**9701-219.** Barthakur HP (Assaul Agricl Univ, Jorhat-785013). **Environmental impact of oil exploration in Assam.** *Eco Env Conxerv,* **1** (1-4) (1995), 109-113.

Paper describes environmental impact of oil exploration drilling and production operation of Oil lndia Ltd. and Oil and Natural Gas Comnlission. During oil exploration crude, engine oil, lubricant etc. find their was into the environment alongwith waste water generated during production Of oil. These sources of pollutants exert their harmful effects on the natural vegetation, culivated crops and aquatic life. Further gas burning, a regular feature in oil fields of Assam adversely affects the physiology of cultivated crops in the vicinity of flare points and pollute the air with unburnt crude and shootparticles.

**9701-220.** De Arnab K (Centl Pulp Paper Res lnst, Saharanpur-247001). **Removal of phenolic compounds from waste water by adsorption.** *Cheml Environ Res,* **2** (3 & 4) (l993), 161-166 [16 Ref] (Late Pub).

Attempt has been made to cover literature and exprimental work on adsorption of phenol and its derivatives on different types of adsorbentst such as polymeric adsorbent, activated carbon, activated carbon membrance and metal oxides. It briefly covers the theoretical aspects of adsorption process followed by review of literature.

**9701-221.** Deb Roy M, Dara SS (Dept Chem, Visvesvaraya Regl Coll Engng, Nagpur-440011). **Stabilization of toxic heavy metal sludges using fibrereinforced limefly ash composites.** *Cheml Environ Res,* **2** ( I & 2) (1993), 63-74 [10 Rcf] (Late Pub).

The lime-fly ash admixture is effective for immobilization of heavy metals because of its natural alkalinity and also its capability to give enough structural strength to be land filled or to be used as a construction material. Studies have been conducted to immobilize copper, nickel and cadmium hydroxide sludges by fixation and encapsulation techniques. The effectiveness of additives such as glass wool, steel wool, bagasse and acrylic polymer in the lime-fly ash admixture has also been investigated.

**9701-222.** Gaikwad RW, Bhardwaj Vipin (Dept Cheml Engng, Coll Engng, Poona Univ, Pravaranagar-413736). **Removal of zinc from industrial effluents by fly ash.** *Indian J Environ Hlth,* **37** (2) (1995), 111-114 [7 Ref].

A series of experiments were conducted using packed column of fly ash. This set up involved high pressure drops, large amounts of fly ash and high handling costs. So a technological alternative in the form of clarifier was fabricated. The effect of varying the amount of fly ash (1.5%-5%), on zinc removal and COD reduction was studied.

**9701-223.** Gangadhar HS, Badigir MK Kantharaju ML, Mruthunjaya S (Dept Soil Sci, Univ Agricl Sci, GKVK Campus, Bangalore-560065). **Utilization of copper tailings as soil amendment in alfisols.** *Polln Res,* **14** (3) (1995), 365-367 [5 Ref].

Incubation studies were conducted to find out the feasibility of using copper tallings as soil amendment in alfisols. Copper tailings was applied at 5 per cent (weight basis) to the plastic pots containing 5 kg soil and it was equilibriated for two months. The physicochemical properties were markedly altered by the additions of copper tailings. It brought about beneficial effects.

**9701-224.** Gangadhar HS, Kale Radha D, Kantharaju ML, Gowda Andani (Dept Zoo, BS & H Coll, Univ Agricl Sci, G K VK Bangalore-560065). **Utilization of sulphllr waste residue in agriculture throngh vemicomposting and its effect on the population structure of earthworm. Eudrilus eugeniae.** *Eco Enl Conserv,* **1** (]-4) (1995), 75-77 [8 Ref].

Sulphur waste residue being a byproduct of copper mines is dumped in large quantities. The feasibility of using this waste benefically in agriculture was carried out by subjecting the waste with other organic waste for vermicomposting. The preponderance effects of this waste blended with organic matter when fed to earthworm had distinct advantage in accelerating its population. However there was spectacular reduction in biomass of earthworms when 8N, sulphur waste residue was used along with organic matter.

**9701-225.** Gogate MG, Farooqui UM, Joshi VS (Office Conservator of Forests (Res), Pune, Maharashtra). **Sewage water as potential for the tree growth- a study on teak (Tectona grandis) plantation.** *Andian Forester,* **121** (6) (1995), 472-481 [S Ref].

Discharge of Sewage Water (SW) is primary source of pollution especially near big cities. But their irrigational and manural potential can be harnessed for production of arboreal biomass. Use of SW in this context will not only decrease cost of plantation by

saving expellditL1re on manuring? but will reduce the pollutions as well. In a case study of teak plan actions irrigated with SW, it was observed that growth in terms of height and girth were significantly higher (Pz0.01) than the growth from plots irrigated with well water. However, mortality was higher in the plots irrigated with SW. Prospects of using SW as a potential for irrigation are discussed.

**9701-226.** Hanra Arnab M, Prabhakar S (Dept Civil Engng, Regl Engng Coll, Kurukshetra- 132119) . **Studies on the removal of cadmium from effluents by reverse osmosis.** *Indian J Environ Hltht* **38** (1 ) (1996), 35-40 [6 Ref].

The potential of reverse osmosis and nanofil+ration membrances for the depollution of cadmiumcontaminated effluents have been experimentally assessed and the results are reported. The results indicate, reverse osmosis polyamide membranes can he successtully used for the removal of cadmium from effluent streams to the desired levels and the water thus recovered could be reused.

**9701 - 227.** Hosetti BB (Dept Bio Sci, Mangalore IJniv, Mangalore-574199). **Treatment of sugar industry effluents by ponds and lagoons.** *Environ Bio,* **16** (2) (1995), 143-149 [12 Ref].

The efflvlents of Kumbi-Kasari Sugar Factory Kuditre, Kolhapur, was treated by the physicochemical and biological methods. Finally treated effluents were used for irrigation. The BOD of the mixed waste 247.5 mg/L was reduced to 155 mglL in the distal oxidation pond. Significant reductions in alkalinity, chlorides, hardness and calcium levels was recorded. The observation revealed that the regular undertaking of sludge removal from the ponds may certainly improve the overall efficiency of the treatment system.

**9701-228.** Iqbal Sanjeeda, Mehta SC (Dept PG Std Res Bot? BS Govt PG Coll, Jaora-457226, M P). **Microbial dynamics of an effluent affected soil.** *Polln. Res,* **15** (1) (1996), 11-13 [13 Ref].

Study is undertaken to investigate the microbial population dynamics of the soil. Sugar industry effluent is used either for irrigation purposes or remains stored in ditches for a long period. Its nutrient rich nature will definite, be changing the characteristics of field soil and ditches soil where it is disposed. The maximum number of bacteria per

gram of dry soil was recorded in November. however the minimum number of bacterial counts was recorded in the month of March, at both soil profiles.

**9701-229.** Jeevan Rao K, Shantaram MV (Dept Soil Sci Agricl Chem, Coll Agricl, AP Agricl Univ, Rajendrangar, Hydrabad-500030). **Effect of urban solid wastes on dry matter yield, uptake of micronutrients and heavy metals by maize plants.** *J Environl Bio,* **17** (1) (1996), 25-32 [29 Ref].

Potculture studies conducted to evaluate the impact of USW application on the matter yield and concentration of heavy metals in maize plant have shown that application of USW upto 33 t hat with recommended N, P and K increased the dry matter yield of maize. The plant uptake of Fe and Cu decrease and Mn and Zn increased due to application of USW.

**9701-230.** Kaul SN, Chakradhar B, Venkatraman J, Nandy T (Natl Environ Engng Res Inst, Nagpur - 440020). **Fluidized bed reactor for biogas generation from high strength waste waters.** *Cheml Environ Res,* **2** (1 & 2) (1993), 115-125 [3 Ref] (Late Pub).

Fluidized bed reactor system is a new concept in wastewater treatment. This unit is highly effective for biodegradation of organic constituents in wastewater. An attempt has been made to determine biogas recovery using this reactor system for high strength wastewater. viz. distillery.

**9701-231.** Khan Samiullah, Begam Tahira, Singh Jaibir (Dept Appl Chem, ZH Coll Engng Techno Aligarh Muslim Univ, Aligarh-202002). **Effect of fly ash on physicochemical properties and nutrient status of soil.** *Indian J Environ Hlth.* **38** (1) (1996), 41-46 [25 Ref].

The effect of varying levels of fly ash (FA) on pH, electrical conductivity (EC), and available major plant nutrients was investigated in an alkaline fine sandy loam soil of Aligarh district (U.P.). The results show a decrease in soil pH and increase in EC with the increasing diseases of FA.

**9701-232.** Khawas BH, Dara SS* (*Visvesvaraya Regl Coll Engng, Nagpur 440011). **Preconcentration and determination of trace metals using modified Techtona grandis bark.** *Cheml Environ Res,* **3** (I & 2) (1994). 13-18 [17 Ref] (Late Pub).

The technique for preconcentrating heavy metal ions such as cobalt, cadmium, copper, lead. nickel. zinc and manganese using modified Techton grandis bark substrate has been described. The substrate is capable of preconcentrating the heavy metal ions present either alone or together with each other. The percentage recovery is found to be <98.4°d,. The washed substrate column can be repeatedly reused. The method seems to be very efficient in preconcentrating heavy metal ions in environmental samples for their subsequent determination by atomic absorption analysis.

**9701-233.** Loomba K, Bandey GS* (*Sch Std Chem, Pt Ravishankar Univ, Raipur-492010 M.P.). **Selective removal of some toxic metal ions using steel plant granulated slag and external e.m.f.** *Indian J. Environ Hlth,* **37** (2) (1995), 107-110 [12 Ref].

The granulated slag of a steel plant was analysed for major and minor components. It contained iron and manganese in a state suitable for causing electrochemical reduction of a number of extraneously added metal ions. The extent of reduction of the metal ions was observed to be in the order of their standard electrode potential values. The method is applicable to industrial effluents containing one or more of these ions.

**9701-234.** Madhusree Naidu K, Raman GK (Dept Chem, SVU Coll Engng Tirupati-517502). **Distillery water-impact on Arachis hypogaea L.** *J Environ Bio,* **16** (2) (1995), 181-186 [18 Ref].

The distillery effluent effect on Arachis hypogaea L. seeds was studied. The effect of effluent on Arachis hypogaea L. seedlings growth, catalase activity, chlorophyll levels, 8 ALA contents were studied. In higher concentrations on the germination as well as the growth of the seedlings was inhibited. The distillery waste in irrigation water slightly increased the pH, organic matter and conductivity of the soils.

**9701-235.** Mandavgane SK, Dharmadhikari DN, Dara SS (LAD Coll Women,Nagpur440010). **Removal of heavy metal ions from industrial effluents by**

**ferrite coprecipitation.** *Cheml Environ Res,* **3** (1 & 2) (1994), 103-108 [8 Ref] (Late Pub).

ln ferritization technique heavy metals present in effluents are treated with appropriate quantity of Fe2 + ions, the pH of the solution is adjusted to > 9.5. The ferrites formed are characterised by X-ray diffraction analysis. The technique has several advantages such as removal of heavy metals to sub-ppm levels, recovery of the industrially useful heavy metal ferrites and doing away with the problem of sludge.

**9701-236.** Mashetty SB, Manohar S, Karegoudar TB, (Dept Biochem, Gulbarga Univ, Gulbarga 858106). **Degradation of 4-hydroxybenzoic acid by a b2cterium.** *Indian J Environ Hlth,* **37** (2) (1995), 88-94 [17 Ref].

A bacterium capable of degrading 4-hydroxybenzoic acid was isolated from the garden soil and characterised as Bacinus sp. It has an ability to utilize various other aromatic compounds. Protocatechuic acid was shown to be the intermediate by Thin-Layer Chromatographic and High Performance Liquid Chromatographic analysis. The strain degraded 4-hydroxybenzoic acid mainly through protocatechuic acid as was evidenced by the oxygen uptake and enzymatic studies.

**9701-237.** Mishra VB, Mishra SK, Upadhyay SN (Dept Civil Engng, Inst Techno, Banaras Hindu Univ, Varanasi-221005). **Selection of suitable sewage treatment technology with special reference to Varanasi.** *Vasundhara,* **1** (1996), 64-68.

The treatment facilities and the associated infrastructure developed to handle the waste water may have several limitations on the environmental and sociocultural fronts besides the associated economic constraints. The article highlights these aspects and reviews the broad guidelines for selecting suitable pollution control measures with special reference to the holy city of Varanasi situated on the bank of river Ganga.

**9701-238.** Mohite BS, Patil JM, Zambare DN, Kapali VS (Environ AnalytChem Lab, Dept Chem, Shivaji Univ, Kolhapur-416004). **Extractive separation of lead from alloy and enwronmental samples using Dibenzo-18-Crown-6.** *Cheml Environ Res,* **3** (1 & 2) (1994), 29-42 [34 Ref] (Late Pub).

A simple method has been developed for the extractive separation analysis of lead from picric acid solution with dibenzo-18-crown-6. In solvent extraction separation studies lead was extracted with 0.01 M dibenzo-18-crown-6 in nitrobenzene from 0.2 M picric acid. Various mineral acids were used as eluents. By proposed methods lead was seperated from large number of elements by selective extraction and then stripping/elution, in binary as well as from multicomponent mixtures. The method was applied for the determination of lead in real samples.

**9701-239.** Namasivayam C, Kanagarathinam A, Ranganathan K (Environ Chem Div, Dept Environ Sci, Bharathiar Univ, Coimbatore-641046). **Treatment of distillery wastewater using ‘;waste" coirpith, impregnated with ‘waste’ Fe3+ /Cr3+ hydroxide.** *Cheml Environ Res,* **3** (1 & 2) (1994), 43-52 [20 Ref (Late Pub).

Removal of turbidity and colour of distillery wastewater using Fe Cr impregnated coirpith as flocculant was studied. The optimum values for flashmixing time, flocculation time, settling time and flocculant dosage for maximum turbidity removal were found to be 2 min, 15 min, 30 min and 2 g, respectively. Under the optimum conditions for turbidity removal, other parameters like colour, COD, chloride, potassium, calcium, sodium and BOD were analysed.

**9701-240.** Nandi Seema, Mishra P, Bera AK (Dept Genetics Plant Breeding, Bidhan (Chandra Krishi Viswavidyalaya, Mohanpur-741252). **Effect of tannery effluent on seed germination and seedling growth in black gram.** *Env. Eco.,* **13** (4) (1995), 834-836 [5 Ref].

Effect of dilierent concentrations of tannery effluent on seed germination and early seedling growth in black gram (Vigna mungo L Hepper) cv T-9 was studied. At lower concentrations particularly 2.5% the effluent promoted seed germination and early seedling growth while higher concentrations regarded these processes. It is suggested that tannery effluent can be utilized for irrigating field crops only after proper dilution with water.

**9701-241.** Nandy T, Daryapurkar RA, Kaul SN, Senthal V, Singh KK (Natl Environ Engng Res Inst, Nehru Marg, Nagpur-440020). **Financial apportionment in common**

**effluent treatment plant.** *Cheml Environ Res,* **2** (3 & 4) (1993), 167-192 t21 Ref] (Late Pub).

Common Effluent Treatment Plant (CETP) is an ideal way of protecting the water environment with a collective responsibility at minimum capital and running costs. However, no industry would like to become a member of the CETP scheme unless every member industry has to pay an equitable or proportionate share of capital and running costs. Various formulations are now available to devise suitable financial apportionment in CETP which are presented in a consolidated form.

**9701-242.** Patil NB, Kapadnis BP (Sch Environ Sci, Univ Poona, Pune-7). **Decolorisation of melandoidin pigment from distillery spentwash.** *Indian J Environ Hlth,* **37** (2) (1995), 84-87 [6 Ref].

Decolorlsation of spentwash melandoidin pigment was studied by chemical and biological methods. Spentwash from an anaerobic digester was treated with hydrogen peroxide, calcium oxide and soil bacteria. At 144 hrs. Of incubation with treatment A and B, at varied concentration of hydrogen peroxide the maximum decolorisation and COD reduction was 98.67 and 88.40 per cent respectively.

**9701-243.** Patnaik S, Devi S, Padhi S (Algal Physio Lab, Bot Dept, Berhampur Univ, 760007, Orissa). **Utilization of domestic sewage and papermill effluent for algal biomass production.** *Eco Env Conserv.,* **1** (1-4) (1995), 129- l 31 [9 Ref] .

Algae biotechnology of at least selected alga] forms for application in foods, feeds, chemicals and biofertilizers is well known. Mass culture of the economic important algae in synthetic medium is very cost]y. Taking into consideration, high organic content of domestic sewage of Berhampur and papermill effluent of Rayagada (Orissa) were investigated to utilize them as cheap and efficient media for algae biomass production as well as its implication in pollution abatement programme. Four local isolates of N2 fixing blue-green algae Scytonema schmidlei, Anahaena eylindrica, Clothrix marchica, Gloeatrichia echinulata and one highly protein containing form Spirulina platensis (68%) were used as the test organism.

**9701-244.** Rajendran S, Sundararajan KS *Saraswathi Narayanan Coll, Madurai-625022, TN). **Effect of neem (Azadirachta indica. Juss) on sewage microbes.** *Eco Env Conserv,* **1** (1-4) (1995), 133-134 [5 Ref].

Neem powder when added to raw sewage reduced the microbial population in sewage. The damage caused to microbes depends on the concentration of neem powder. Neem powder seems to work as a coagulant in the sewage treatment process and in certain concentrations it causes adverse effects on certain physicochemical parameters of raw sewage. Reduction of microbes is influenced if neem powder is added to sewage being treated with aquatic plants like Pistia stratoites (L). It is suggested that judicious application of neem powder can serve as a lowcost device to reduce the microbial population in sewage treatment.

**9701-245.** Satpathy Jiban K, Chaudhuri Malay* (*Dept Civil Engng, Indian Inst Techno, Kanpur-208016). **Treatment of cadmium plating and chromium plating wastes by iron oxidecoated sand.** *Water Env Res,* **67** (5) (1995), 788-790 [11 Ref].

Iron oxide-coated sand, prepared by evaporating ferric nitrate solution in the presence of sand, was found unsuitable for removal of chromium from a mixed oxidation-state chromiumplating waste in a preliminary column test; however, it appeared promising for one-step removal of cadmium and cyanide from a cadmium-plating waste. A detailed column test with regeneration by 0.OlM NaNO3 solution at pH 3.0 iurther indicated suitability of the iron oxidecoated sand for treatment of cadmiumplating waste.

**9701-246.** Shrivastava VS, Jadhav UM, Dhande VP (Univ North Maharashtra, GT Patil Coll Campus, Organo-Environ Chem Res Lab, Nandurbar-425412). **Determination of metals in the distillery waste by inductively coupled plasma atomic emission spectrophotometric & flamephotometry.** *Polln Res,* **14** (4) (1995), 483-486 [11 Ref].

The concentration of Fe, Cu, Cd, Pb, Zn, Mn, Na & K ions have been determined by ICP atomic emission spectrometer & flame photometer in the distillery wastes. In the waste water samples the concentration of few metal ions was found to be beyond the ISI permissible limits. These studies aim at the assessment of the extent of ground water pollution by these metal ions in this region.

**9701-247.** Singh BP (Dept Environ Sci, CGV Chitrakoot, Satna). **Zinc in stream sediments of Bokaro coal belt - a geological study.** *Polln Res,* **15** (1) (1996), 49-51 [5 Ref].

In the Bokaro coal belt of Bihar, suspended sediments in the local drainage channels contain several hundred ppm Zn. It is concluded that zinc is derived by weathering of coal bearing Gondwana rocks and is transported in stream sediments by clay minerals coal dust and organic matter.

**9701-248.** Swaminathan K, Manonmani K, Gurusamy R (Dept Biotechno, Bharthiar Univ, Coimbatore-641046). **Impact of viscose rayon factory effluents on cell division.** *Polln. Res,* **14** (4) (1995), 417-421 [8 Ref].

The results of the study revealed that the viscose rayon factory effluent affect the cell division process. Mitosis was studied in the Allillm cepa L. test system and meosis in Hordeum vulgare L. The mitotic index was reduced upto 53.25°t by undiluted effluent; 50tO diluted effluent reduced the mitotic index by 48.76%. The toxicity of the effluent increased with increase in effluent concentration.

**9701-249.** Vajpayee P, Rai UN, Sinha S, Tripathi RD, Chandra P (Aquatic Bot Lab, Natl Botl Res Inst, Lucknow-226001). **Bioremediation of tannery effluent by aquatic macrophytes.** *Bull Environ Contam Toxico,* **55** (4) (1995), 546-553 [8 Ref].

Study asses the ability of floating (Spirodela polyrrhiza (L.) Schleiden), submerged (H.P drilla verticillatn (I.f.) Royle) and rooted emergent (Bacopa monnieri (L.) Pennell) and Ny)nphaea aIba (L.) species individually and in combination of H. vertlelllata and S. polyrrhiza to reduce the chromium concentration in the tannery effluent.

**9701-250.** Venkata Mohan S, Nithila P7 Jayaram Reddy S* (*Dept Chem, Sri Venkateswara Univ, Tirupati-577502). **Application of complexing capacity (CC) in the determination of organic matter (COD) in wastewater.** *Cheml Environ Res,* **3** (1 & 2) (]994), 117-120 [l2 RefJ (Late Pub).

Present investigation aims to study the adaptability of complexing capacity (CC) in determining the organic content (COD) of water/waste water in pollution monitoring.

The method studied eliminates the tedious process of chemical digestion and titration and is a direct electrochemical method involving determination of complexing organic matter using voltametric technique (ASV-Titration).

**9701-251.** Verma CL, Jain SK, Yadav RK (Centl Bldg Res Inst, Roorkee-247667). **Development of an innovative pollution control system for vertical shaft kilns.** *J Scient Indl Res,* **55** (10) (l996), 815-818 [7 Ref].

An appropriate low cost pollution control system incorporating doubledeck packed-bed scrubbercumdemister device has been evolved and developed. The unit has been fabricated and installed successfully on an experimental running kiln of capacity 10 : p d. The overall system efficiencies of the order of 80-85 per cent are obtained with the dust emissions being lowered to less than the maximum permissible value of 500 mg/nma as prescribed by the Central Pollution Control Board, Delhi, for lime shaft kiIns in the small to medium scale sectors.

**9701-252.** Verma Neelam, Kaur Gurpeet, Rehal Rajbir (Dept Biotechno, Punjabi Univ Patiala). **To study the response of cyanobacteria to Ni (11) ions from industrial waste water for selection of bioindicators.** *Polln. Res,* **15** (1) (1996), 75-77 [8 Ref].

Cyanobacteria Anabaena torulosa and Anu baena cylindrica have been used in the prei sent study to assess the functional and structural changes in these micro organisms due to pollution stress of Ni (11) ions from industrial waste water. A. torulosa was found to be more sensitive to Ni (11) ions than A. cylindric. These organisms can be used as bioindicators and bioscavangers.

**9701-253.** Virk MK, Dhillon MK, Dhaliwal GS (Dept Home Manage, Punjab Agricl Univ, Ludhiana 141004). **Impact of modernisation on sanitary conditions of rural and urban inhabitants of Ludhiana district.** *Indian J Eco,* **23** (1) (1996), 1-6 [3 Ref].

A study of sanitary conditions in Ludhiana district showed that urban households had sewage connection from municipality and disposal of garbage was in dustbins whereas rural houses had sewage connection linked with drains; soakage pits and baskets Compost pits were used for garbage disposal.

**9701-254.** Boral L (Dept Bot, NE Hill Univ, Shillong - 793014). **Variation in dominance and diversity of the vegetation during succession on a protected jhum fallow.** *Indian J Forestry*. **18** (17 J Forestly, 18 (4) (1995), 285-289 [19 Ref].

Variation in life form, dominance and diversity ot the vegetation during succession was studied on a protected jhum fallow. The species number was found to decline with succession whereas the total (community) density increased consistently on the jhum eallow. Arul1dinella be7z 1ensis was a dorninant grass species. However, other speies of grasses like Eulalia fa*tigirlttl and /m werata cylindrica were also important in the co1nmunity.

**9701-255.** Panda Prasanta K, Nanda MK, Das R, Mishra BP, Panda PK (Dept Agro nomy, B;dhan Chandra K rishi Viswavid yalaya, Kalyani-741235). **Evaluation of social forestry afforestation in Dhenkanal forests division of Orissa.** *Env Eco,* **14** (1) (1996), 14-18 [3 Ref].

Paper deals with the forest status and the physical achievements of social forestry aforestation in Dhenkanal Forest Division of Orissa. The survey revealed that the areas of functioning of various departments were different. Divisional Forest Offficer protected and maintained the standing forest, Social Forestry Division emphasised on village wood lot plantation and farm forestry and OFDCL concentrated on commercial plantation. Untimely plantation and browsing were identified as major constraints for seedling survival. Need to develop a mass consciousness of forest protection and many operational issues were suggested as solution.

**9701-256.** Patiram, Bhaduria SBS (Indian Coun Agricl Res Complex for NEH Region, Sikkim Cent, Gangtok, Sikkim). **Soil degradation in NorthEastern Hill Region of India an overview.** *Indian Forester,* **121** (4) (1995), 262-271 [7 Ref].

In the North Eastern Hill region of India, shifting cultivation (Jhum), deforestation, faulty method of cultivation on hill slopes and construction of road etc. are the major cause of soil degradation. The soil acidiity, deficiencies of bases and phosphorus limit the productivity of crops to a great extent. It is unrealistic to prohibit the cultivation of all hill slopes on which farmers depend for their livelihood. Therefore, some socially, economically and environmentally acceptable methods for sustained production are suggested. A system approach involving integrated attention to agroforestry including crop and livestock farming may be helpful in preserving the soil health.

**9701-257.** Rajan Pauline, Sundarapandian SM, Chandrasekaran S, Swamy PS (Dept Plant Sci, Sch Bio Sci, Madurai Kamaraj Univ, Madurai 62502l). **Vegetation structure and regeneration potential of a deciduous forest at Alagar hills, Madurai.** *Env. Eco,* **14** (1) (1996), 182-185 [14 Ref].

Deciduous forest vegetatioll structure and composition and natural regeneration were evaluated under the microsites of protected and disturbed study sites. The study suggested that the levels of disturbance had an effect on the regeneration potential in general and tree saping and seedlings in particular. These differences are attributed to the constant biotic stresses and the consequent damage to the site quantity.

**9701-258.** Ravan Shirish A, Roy PS, Sharma CM (Forestry Eco Div. Indian Tnst Remote Sensing, 4, Kalidas Rd, Dehra Dun-248001). **Space remote sensing for spatial vegetation characterization,** *J Biosci,* **20** (3) (1995), 427-438 [6 Ref]

The study area, Madhav National Park (MP) represents northern tropical dry deciduous forest. The national park, due to its unique location (nearest to township), is under tremendous biotic pressure. In order to understand vegetation structure and dynamics, vegetation mapping at community level was considered important. The results indicate that structural variations in the communities modulate spectral signatures of vegetation and form basis to describe community structure subjectively and at spatial level.

**9701-259.** Roy Moumita, Santra SC (Dept Ecol Std, Sch Environ Sci, Univ Kalyani, Nadia 741235, W.B.). **Non timber forest products (NTFP) resources of Jalpaiguri**

**division (West Bengal) and its current status of utilization: a brief resume.** *Eco Env Conserv,* **1**(1-4) (1995), 101-107 [6 Ref].

The study of scientific evaluation of NTFP exploitation and impapct of colllinued extraction of such products in the forest stands were not surveyed in depth. In tropics, during the past few decades, the multidimention utility of forest products were realised and thus enormous efforts have been made to quantify such products. An attempt has iDeell made to review the status of NTFP resource exploitation with reference to a forest range in West Bengal (India).

**9701-260.** Singh Jarnail, Srivastava SS (East Melghat Forest Div, Amravati, Maharashtra). **Fire protection plan in east Melghat forest division, Amravati, Maharashtra - a case study.** *Indian Forester,* **12** (7) (1995), 591-599 [3 Ref].

Fire Protection Plan for the East Melghat Forest Division, Amravati was taken up, keeping in view the extent of damage done to the forests in previous years. The plan mainly focusses on early detection, suppression and orgallisation of field staff and availab resources to control the fire which has effectively reduced the area burnt and has helped to conserve the ecology and biodiversity of the region.

**9701-261.** Singh RP, Bahar N, Negi DV (Conifers Res Cent, Shimla, H.P.). **Impact of grazing on soil erosion in forest ecosystems.** *Indian Forester,* **121** (8) (1995), 717-720 [9 Ref].

The effect of grazing on soil erosion in forest ecosystem was observed. It was seen that the grazed plot had approximately seven time more than soil loss per annum compared to ungrazed (control) plot under Cedrus deodara forest. The amounts of all the nutrients loss was recorded several times more in grazed plot than that of control. The amount of litterfall was recorded 3.3 times more annually in control stand corresponding to grazed stand.

## Wildlife

**9701-262.** Sharma RK, Sharma Sanjay, Mathur R (Natl Chambal Sanctuary, Deori, Morena, PB 29, 476001). **Wildlife survey in Madhya Pradesh-II survey report on Ken river Gharial Sanctuary.** *J Freshwater Bio,* **7** (l) (1995), 59-62 [9 Ref].

Paper deals with the water chemistry and the wildlife survey of the Ken river Gharial Sanctuary, Madhya Pradesh. Besides the two species of crocodiles and three species of turtles from the river about eleven species of herbivores and three species of carnivores have been sighted in the sanctuary area. Study species of birds have also been enlisted during the survey.

**9701-263.** Srivastava AK? Bustard HR (Natl Lab Anim Cent, Centl Drug Res Inst, Chattar Manzil, L,ucknow 226001). **Studies on geogra es Madhya Pradesh, Rajasthan, Bihar and Orissa also have appreciable number of the species. An imperative need is now felt by conservationists to protect the G. gangetzeles, the only representative of the farmly Gavialidae, by strict legal enforcement and to encourage the captive breeding and rehabilitation of the species before it become extinct.**

**9701-264. Talukdar Bibhab Kumar (Aranyak Nature Club, "Ever Green" Samanway Path (Survey) Basistha Rd, PO Beltole, Guwahati, Assam 781028). Rhino poaching in Orang Wildlife Sanctuary, Assam (India).** ***J Narltre Conservators.*** **7 (l) (1995), 1-6 [14 Ref].**

The fate of the Great Indian One-horned Rhino (Rhinoceros unicorns) at the hands of poachers has been a subject of discussion, both at the nationa and international level. The Rhinoceros unicornis represents the epitome of conservation movement in Assam. Howevcr, due to increase poaching rhinos in the protected areas of Assam, the future of the species has become uncertain. Paper describes the recent status of Rhinoceros lnicornis and threats posed due to poachine in Orang Wildlife Sanctuary, Assam.

## Energy and Environment

**9701-265.** Das P, Patdoshi AK (Regl Res Stn, Orissa Univ, Agricl Techno, G. Udaya2iri 762100). **A comparative study of flarsh chullah vs indigenous chullah.** *Env. Eco,* **13** (4) (l 995), 990-991.

The experiment revealed that considerable time and fuel wood can be saved by the use of improved Harsh chullah over the indigenous chullah. The tribal farm women can save 15.7 to 24.30h fuel wood and 23.S to 38.9°') time by the use of Harsha chullah while cooking different items.

**9701-266.** Kalia VC, Joshi AP (Cent Biocheml Techno, (CSIR) Univ Campus, Mall Rd, Delhi 110007). **Conversion of waste biomass (pea-shells) into hydrogen and methane through anaerobic digestion.** *Bioresource Techno,* **53** (4) (1995), 165-168 [8 Ref].

Waste pea-shells were digested under batch anaerobic conditions. Digestion of pea-shell slurries (PSS) at 1-5th total solids (TS) concentration, with H2 producing organisms yielded 99-362 I biogas-FI/kg organic solids reduced (biogas H2 mixture of 13, CO2 and HIS). Hydorgen constituted 33 – 46% of the total hiogas H. Methanogenesis of PSS (l-5% TS) was most effective at l % TS level. Methane accounted for 43% of the total biogas yield.

**9701-267.** Paul Subrata, Swain Sanjeeb K (Dept Geo, Univ Delhi, Delhi). **A critical analysis of noncommercial energy resource management using GIS technology: a case study in Ferozepur Jhirka 810ck, Gurgaon district, Haryana state, India.** *Energy Env. Monit,* **11** (2) (1995). 149-159 [12 Ref].

Paper links up conceptual data modelling and the spatial representation available within ARC INFO Geographic Information System (GIS) in energy resource management. GIS application to this has effectively brought out the desired results as conceptualized by integrating the non-spatial data with the spatial data of village boundary to generate a composite map depicting each energy source.

**9701-268.** Singh Bajrang, Misra PN (Natl Botl Res Inst, Rana Pratap Marg, Lucknow 226001). **Biomass, energy content and fuelwood properties of Populils deltoides clones raised in North Indian plains.** *Indian J Forestry,* **18** (4) (1995), 278-284 [18 Ref].

Biomass, energy content and fuelwood properties of certain clones of populus deltoifles were studied. Out of 15 clones tried, the performance of St-148, D-121, S7C15, St-163, G3 and G48 was reasonably good in terms of growth, basal area and survival percentage. Stand biomass, estimated from two forms of regression equations indicated that the allometric equation with dbh as 'X' variable was equally good to that of linear equation with d2h as 'x' which requires an additional measurement of plants height. The concentratins oI ash silica and nitrogen were lowest for S7C15 clone which is generally preferred for a good fuelwood quality.

**9701-269.** Singh Lokendra, Maurya MS, Ramana KV, Alam SI (Biotechno Div, Defence Res Dev Estb, Gwalior 474002). **Production of biogas from night soil at psychrophilic temperature.** *Bioresource Techno,* **53** (2) (1995), 147-149 [11 Refl

Anaerohic digestion of night soil was carried oul in 251 digester at 10°C using an adapted inoculum. Biogas production was studied at 20, 25, 30, 35 and 40 days hydraulic retention time. Digesters operated at 25 day hydraulic retention time produced 69.721 biogas/kg VS/day with a methane content of 73.0% microbial counts and enzyme activities are also reported.

**9701-270.** Sundararajan R, Jayanthi S, Sadhasivan P (Dept Civil Engng, Govt Coll Techno, Coimbatore 641013). **Anaerobic dligestion for the recovery of energy from kitchen refuse.** *Indian J Envirosl Hlth,* **38** (1) (l996), 7-12 [3 Ref].

A two phase anaerobic digester of 20 L capacity of each phase was operated at room temperature using kitchenrefuse from a students hostei as feed stock material at ?4 l 7°C The maximum biogas produced was 0.324 m3/kg VS added/day in summer at the loading rate of 3.2 kg VS/m3 of digester/day, and minimum volume of biogas of 0.156 mt/kg VS added/day at the loading rate of 2.0 kg VS/ma of digester/day was obtained in winter.

# Plant and Pollution

**9701-271.** Aziz O, Samiullah, Inan A, Khan NA (Plant Physio Lab, Dept Bot, Aligarh Muslim Univ, Aligarh 202002). **Effect of treated Mathura oil refinery effluent on the performance of lentil (Lens culinaris L. Medic).** *Cheml Environ Res,* **2** (3 & 4) (1993), 295-299 [9 Ref] (Late Pub).

Mathura Oil Refinery waste water is treated through a modern effluent treatment plant employing physical, chemical and biological processes prior to its release into the effluent drain so as to bring it to the limits of minimum national standard. After such adequate treatment the treated effluent may even contain microlevel contamination and salt concentration etc. A field experiments were conducted to study the effect of treated refinery effluent on the performance of lentil (Lens culinaris L. Medic). the effect is discussed.

**9701-272.** Baruah Debojit, Sarma SK (Life Sci Dept, Dibrugarh Univ Assam 786004). **Response of a herbaceous community to crude oil polluted environment.** *Polln Res.* **14** (4) (1995), 423-427 [8 Ref].

Forty two herbaceous species have been reported from three crude oil spilled areas of Lakwa oil field. Though the number of annual dicotyledonous were more but the density and frequency were less than the perennial monocotyledonous. The recovery rate of these monocot perennials of underground system from which new growth can occur may be resistant to crude oil. Among the familes Poaceae and Cyperaceae were found to well adapted to crude oil polluted environment of present investigation.

**9701-273.** Baruah Debojit, Sarma, SK (Dept Life Sci, Dibrugarh Univ, Assam 786004). **Vegetation of oil fields in Sibsagar, Assam.** *Indian J Environ HltS7,* **38** (1) (1996), 47-50 [5 Ref].

Attempt has been made to evaluate the effect of crude oil pollution on floristic composition, seasonal variation in density and frequency, and phenological pattern of oil

field fiora of two major oil fields of Sibsagar district of Assam (India), viz. Rudrasagar and Lakwa.

**9701-274.** Bhattacharjee S, De B, Mukherjee AD (Dept Bot, Univ Burdwan, Burdwan 713104). **Lead and cadmium mediated membrane damage in rice I. Electrolyte leakage, injury index, membrane lipid peroxidation and lipoxygenase activity.** *J Ecotoxico Environ Monit,* **6** (1) (1996), 3-10 [15 Ref].

Seeds of two rice cultivars (Ratna & Hamilton), differing in sensitivity towards salinity, when treated with PbCla and CdCIs continuously showed a relatively higher electrolyte leakage compared to control. Heavy metal induced membrane damage was found to be a function of magnitude of stress as evidenced by injury index data, greater leakage of amino nitrogen, soluble carbohydrate content and malondialdehyde level. In comparison between two cultivars, Ratna suffered greater membrane damage than Hamilton.

**9701-275.** Bhattacharjee S, De B, Mukherjee AK (Dept Bot, Burdwan Univ Burdwan 713104). **Lead and cadmium mediated membrane damage in rice: II. Hydrogen peroxide level and superoxidedismutase catalase and peroxidase activities.** *J Ecotoxico Environ Monit,* **6** (1) (1996), 35-39 [12 Ref].

Heavy metals (Pb & Cd) treatments reduced the activities of peroxidase, catalase and increased hydrogen peroxide level in two rice cultivars (Ratna & EIamilton). Activity of superoxide dismutas also declined. The results suggested the prime toxic effect of Pb and Cd on membrane integrity. Cadmium was found to be more deletorious than lead. Cultivar Hamilton was found to be affected little less than cultivar Ratna.

**9701-276.** Chattopadhyay SP (Dept Bot, AC Coll, Jalpaiguri 735101, W.B.). **Leaf-surface effects of air pollution on certain tree species in Calcutta.** *Adv Plant Sci,* **9** (1) (1996) 1-14, [24 Ref .

The effects of air pollution on leaves of twenty three species grown in Dalhousie (the highest polluted area) on Calcutta have been studied. lt has been observed that the leaves respond to pollution and undergo quantitative changes in varying degree in a number of leadsurface micromorphological characters. These changed characters have been compared with the characters of same species grown in a nonpolluted village area

(Chanderpur of Hooghly District, West Bengal) and most of the chan ges have been found to be statistically significant. Such leaf surface characters can be used as bioindicators and biomonitors of air pollution.

**9701-277.** Gangadhar HS, Badiger MK, Kantharaju ML, Gowde Andani (Dept Soil Sci, Univ Agril Sci, GKVK Campus, Bangalore 560065, Karnataka). **Utilization of sulphur waste residue as soil amendments in vertisols.** *Polln Res,* **14** (3) (1995), 331-334. [5 Ref].

Incubation studies were conducted to know the feasibility of using sulpur waste residue as soil reclaiment in vertisols. Sulphur waste residue was applied at the rate of 5 ppm sulpur level and it was incubated over a period of two months by maintaining appropriate moisture level. The physicochemical properties were markedly altered by the additions of sulphur waste residue. Its utilization in vertisols as soil amendment is being studied.

**9701-278.** Handique AK, Baruah Meenakshi (Dept Bio Techno, Gauhati Univ, Gauhati 781014). **Histochemical estimation of pollen viability following exposure to heavy metals.** *J Environ Bio,* **16** (2) (l995), 163-165 [7 Ref].

Significant loss of pollen viability occurred in case of pollens of tomato, pea and pigeon pea, following treatment with heavy metalsvizk mercury and lead in the concentration of 10 and 20 ppm. The magnitude of loss of viability is related to concentration and duration of treatment. Compared to mercury, lead has been found to be more toxic. Pollens of tomato were more tolerant, while pollens of pigeon pea were least tolerant.

**9701-279.** Jeevan Rao K, Shantaram MV (Dept Soil Sci Agril Chem, Coll Agri), AP Agril Univ, Rajendranagar, Hyderabad 500030). **Contents of heavy metals in crops treated with urban solid wastes.** *J Environ Bio,* **16** (3) (1995), 225-232 [22 Ref].

A survey conducted to study the impact of application of fresh Urban Solid Wastes (USW) on plant uptake of heavy metals in farmers fields around Hyderabad city, revealed that the heavy metals content in plants varied widely among the plant species and plant parts. The content of Zn, Cu, Pb and Ni were elevated in some plant species pointing to a potentiaf pollution hazard through their entry into the food chain.

**9701-280.** Kaushik GC (Dept Environ Sci, Coll Basic Sci Humanities, GB Pant Univ Agril Techno, Pantnagar 263145, UP). **Cytotoxicity of cement kiln dust on mitosis of roof tip cells in Vicia faba.** *J Ecotoxico Environ Monit,* **6** (1) (1996), 53-57 [l3 Ref].

Cement kiln dust (CKD) showed mitodepressive effect on the mitotic index of Vicia faba and it was inversely proportional to the concentrations of the CKD, while the frequency of abnormality during mitosis was directly proportional. Chromosomal breakage and chromosome bridges were predominantly recorded at metaphase and anaphase respectively. In view of the results the cytotoxic properties of the CKD is ascertained and it may act as a strong mutagen also.

**9701-281.** Khan Mujeebur Rahman, Khan M Wajid (Environ Polln Res Unit, Dept Bot, Aligarh Muslim Univ Aligarh 202002). **Effects of ammonia and rootknot nematode on tomato.** *Agril Ecosyst Env,* **53** (1) (1995), 71-81 [12 Ref].

Tomato plants inoculated with 2000 juveniles of rootknot nematode (Meloidogyle inc<>gnita race 1) or intermittently exposed to 152µg NH3-m-3 exhibited significant suppression in growth, yield and leaf pigments compared with uninoculated or unexposed plants. However, NHQ at 76µg m-3 did not cause significant effects. The leaves of nematodeinoculated or uninoculated plants exposed to NH3 (152 Fg m-3) turned yellow in all treatments.

**9701-282.** Lone FA, Saheed S, Parveen A, Ghouse AKM (Dept Bot, Aligarh Muslim Univ, Aligarh 202002). **Impact of coal smoke pollution on the growth performance of Ruellia tuberosa L.** . *Cheml Environ Res,* **2** (1 & 2) (1993), 41-46, [19 Ref] (Late Pub).

In an experiment conducted under field conditions, the air pollution caused by coal burning in a thermal power plant has been found to bring about a significant damage to overall growth of Ruellia tuberosa L., a common weed of the Gangetic plain. The shoot growth, above ground biomass, leaf number and area per plant, as well as number of floral buds suffered a significant loss as a result of pollution stress, while the root growth and its biomass did not get affected any signiticant level. The plants under pollution stress also exhibited some abnormal anatomical features in having reduced cortical and sylem area, pore size and enlarged pith.

**9701-283.** Moses GS (PG Dept Chem, Govt Coll, Rajahmundry 533105). **Neem tree in the control of cement dust pollution.** *Ultra Scientist Phyl Sci,* **8** (1) (1996), 123-125 [8 Ref].

Cement dust particles causes respiratory diseases in human beings. Natural control measures such as plantation around factory can solve a part of cement dust pollution problems in and around cement factorv area environment. An attempt has been made to identify vegetative species which control the cement dust pollution. For this purpose, the cement dust retention capacity of leaves have been investigated. The results indicates that leaves of Neem Tree have the highest capacity.

**9701-284.** Panda AK (Regl Res Lab, Bhubaneswar 751013). **Bioaccumulation of nickel and zinc by water hyacinth and water lettuce.** *Indian J Environ Hlth,* **38** (1) (1996), 51-53, [4 Ref].

Heavy metals are known to pollute natural water resources in the vicinity of the industrial areas, and the degraded water may pose serious health hazards to animals and human beings. Treatment of effluent is therefore necessary to bring the concentration of toxic metals to desirable limits before they are discharged. Paper reports the effect of heavy metals on floating plants such as water hyacinth and water lettuce.

**9701-285.** Pandey DD, Nand Satya (Eco Res Lab, Dept Bot, SPM Coll, Biharsharif 803101). **Effects of stone crusher dust pollution on grain characteristics of maize.** *Env Eco,* **13** (4) (1995), 901-903 [13 Ref].

The study area was confined to the Karwandia, Rohtas, Bihar to assess the eEect of stone crusher dust pollution on grain characteristics of maize, that is number of grains per cob, weight and volume of 1,000 grains, moisture, protein, total ash, fat, crude fiber, total carbohydrates, iron, phosphorus, calcium and calorific value. All characteristics of polluted grains showed lower values as compared to control except total carbohydrate and calcium.

**9701-286.** Pandian K, Rajendran N, Sriman Narayanan S (Dept Analyt Chem, Sch Chem, Univ Madras, Guindy Campus, Madras 600025). **Polarographic determination**

**of selenium from enuronmental samples using mercaptoacetic acid.** *Cheml Environ Res,* **2** (1 & 2) (1993), 47-53 [26 Ref] (Late Pub).

A polarographic method has been developed for the determination of selenium (IV) in soil samples. The method is based upon the catalytic reduction of oxidised mercaptoacetic acid by selenium (O)-mercaptoacetic acid complex in alkaline medium. The method gives a linear relation between the current and the amount of selenium taken.

**9701-287.** Rana BC, Kumar JIN (Dept Bio-sci, Sardar Patel Univ, Vallabh Vidyanagare 388120, Gujarat). **Observations on the effect of the herbicide isoproturon on aquatic targets and associated organisms.** *Bull Environ Contam Toxico,* **55** (1) (1995) 104-110 [14 Re].

To evaluate the effect of various herbicides on waterhyacinth, the present communication reports the effect of the urea herbicide isoproturon. The large scale use of this herbicide for the control of broad leaf weeds in wheat, barley, and other agricultural crops in many countries including India may lead to an increase in its concentration in aquatic ecosystem through agricultural runoff. Preliminary results of its effect on this noxious weed and associated organisms are reported here.

**9701-288.** Rangarajan TN, Arjunan MC, Ponnammal NR (Dept Bot, Kongunadu Arts Sci Coll, Coimbatore 641029, TN). **Effect of automobile pollution on few ornamental plants.** *Eco Env Conserv.,* **1** (1-4) (1995),1-6 [13 Ref].

Effects of automobile pollution on four ornamental species, were studied. As compared to the control, serial parts of all the plants growing near the bus terminals were fully coated with black or dark brown colour dust. The dust deposition on the adaxial side of the leaves was more than on the abaxial side. The frequency of trichomes is increased on the adaxial side of the leaf in all the four plants.

**9701-289.** Rath S, Padhi SK, EZar MK [Dept Horticult, Coll Agricl, Orissa Univ Agricl Techno, Bhubaneswar 751003, Orissa). **Effect of sulphur dioxide exposure on bell pepper.** *J Ecobio.,* **8** (1) (1996), 37-40 [l l Ref] .

The tolerance of capsicum (Capsicum fruitescens L. cv Californian Wonder) to sulphur dioxide exposure was conducted and fumigation of SO2 at 1.0 ppm for three hours adversely affected the number of leaves, leaf area, number of buds, flowers and fruits and the dry matter content and the chlorophyll content of the leaves.

**9701-290.** Shamnughavel P (Dept Bot, Bharathiar Univ, Coimbatore 641 046). **Effect of cement dust on stomatal structurc.** *Eco Env Conserv,* **1** (1-4) (1995), 7-9 [22 Ref].

Paper deals with the effect of cement dust on stomata of Acalypa indica. Echpta alba, Cassia auriculata, Calotropis gigal1iea and Vis1ca resea. The stomatal index (S.I) of normal leaves (control) varied from 10 to 20.1/ unit area; for cement dusted leaves the index rallged 18.3 to 39.3 per unit area. The frequcncy of altered cells from cement clusted leaves varied from 5.2 to 10.1 unit area. Cement dusted leaves showed various types of stomatal abnormalities such as stomata with a single guard cell, stomata with 4-5 subsidiary cells, and giant stomata.

**9701-291.** Sharma Manisha, Roy AN (Dept Bot, Agril Coll, Agra 282 002). **Effect of automobile exhausts on the leaf epidermal features of AzadiraeAta indica and Dalbergia sissoo.** *Int J Mendel,* **12** (1-4) (1995), 18-19 [l4 Ref].

Two road side plants of identical girth and canopy were screened for their utility as bioindicators. Length and breadth of the stomata, stomatal frequency and stomatal index, number and size of epidermal cells of leaves were studied in leaf samples from polluted and nonpolluted atmosphere in rainy, winter and summer seasons. Results show that both the plants were hypostomatic i.e. stomata were present on the lower epidermis only.

**9701-292.** Singh Kamal, Wajid Khan M, Khan MR (Tnst Agricl, Aligarh Muslim Vniv, Aligarh 202 002). **Combined effects of sulphurdioxide, a rootknot nematodes and a root nodule bacterium on some biochemical processes in pea.** *Cheml Environ Res,* **2** (1 & 2) (1993), 55-61 [29 Ref] (Late Recd).

Intermittell exposures of pea (Pisum saitvum) to SO2 at 0.1 and 0.2 ppm (3 h alternate day for 70 days) caused significant decline in foliar pigments, nitrogen and seed protein compared to unexposed plants. Synthesis of these characters was

apparently enhanced in the plallts inoculate with a root nodule bacterium, Rhizobium leguminosarum.

**9701-293.** Singh Y, Bahadur Raj (Dept Agronomy, GB Pant Univ, Agricl Techno, Pantnagar 263148). **Germination of field crops seeds in distillery effluerlt.** *Indian J Eco,* **22** (2) (1995), 82-85 [7 Ref].

Maize, rice, mustard, blackgram, pigeonpea, soyabean and chickpea seeds germinated normally in 20% effluent, whereas greengram seeds germinated normally even in 50°/o effluent. Wheat seeds were more sensitive and did not germinate in 50% effluent. Seeds germination of lentil and rice was drastically reduced in 50% effluent. In pure effluent (100% concentration) seeds of any crop did not germinate.

**9701-294.** Srivastava K, Farooqui A, Kulshreshtha K, Ahmad KJ (Environ Bot Lab, Natl Botl Res Inst, Lucknow 226 001). **Effect of flyash amended soil on growth of Laetuca sativa L.** *J Environ Bio,* **16** (2) (1995), 93-96 [14 Ref].

Study has been undertaken with a view to evaluate the impact of flyash amended soil on growth and photosynthetic pigments of Lactuca sativa L. It was seen that ten per cent treatment showed marked increase in plant growth while twenty and thirty per cent treated plants showed retarded growth as compared to control. Similar trend of increase and decrease in pigment formation was also observed. Results indicate the utilization of flyash in low concentrations for better growth, dry matter production and increased photosynthetic pigments.

**9701-295.** Subramani A, Sunderamoorthy P, Lakshmanachary AS (Dept Bot, Annamaiai Univ, Annamalainagar, 608 002). **Effect of distillery effluent on growth yield and productivity of Vigna radiata.** *Polln Res,* **14** (4) (1995), 477-481 [ll Ref].

Attempt has been made to study the effect of distillery effluents on growth, yield and productivity of vigMa radiata (Linn) Wilczck. The effluent was highly acidic and rich in total dissolved solids (TDS) and total suspended solids (TSS). Germination studies were conducted in the laboratory to investigate the eSect of distillery effiuent. The effluent when used at higher concentrations elicited deleterious effects on the growth and productivity of the crop.

**9701-296.** Sujatha P, Gupta Asha (Dept Civil Engng, Jerusalem Engng Coll, Madras 601 302). **Tannery effluents characteristics and its effect on agricuRure.** *J Ecotoxico Environ Alonit,* **6** (1) (1996), 45-48 [6 Ref].

Study was carried out to find out physicochemical characteristics of tannery effluent. Tt was compared with the irrigation water quality standards. Tannery effluent was rich in salt content. Some of the salts in the effluent were nutritious and some of them were much toxic to plant growth, as it contained chromium, chloride, sodium and sulphur. Sulphur in low amounts served as nutrient to crops, if persent in excess quantity it precipitates most of micronutrient, thus making the crops to suffer from micronutrient deficiencies.

**9701-297.** Sukul P, Handa SK (Dept Agril Chem Soil Sci, Bidhan Chandra Krishi Viswavidyalaya, Mohanpur 741 252). **Dissipation of permethrin residues in green gram.** *Env Eco,* **13** (4) (1995) 928-931 [10 Ref].

On application of 0.02% permethrin at 700 litres/hectare twice, at flowering and pod formation stage of green gram Vigna radiata (L). Wilczck, dissipation of its residues followed a first order reaction. The halflife values of permethrin on chickpea foliage and pods were 6.02 and 3.76 days, respectively.

**9701-298.** Trivedi ML, Singh RS (Dept Bot, Punjabi Univ, Patiala 147 002). **Reduction in protein contents in a few plants as indicators of air pollution.** *Polln Res,* **14** (3) (1995), 269-273 [13 Ref].

Attempt has been made to establish the relationship between air pollution and the protein contents in a few plants growing in the vicinity of Guru Nanak Dev Thermal Power Plant, Bathinda. The leaves of the plants possess various visible injury symptoms and were dusted with flyash particulars. The protein contents were also reduced significantly in the same locality.

**9701-299.** Umamaheswara Rao V, Raghu Ram M, Rao AS (Dept Bot, Nagarjuna Univ, Nagarjuna Nagar, 522 510, Guntur, A.P.). **Effect of effluent from Vijayawada thermal power station on vegetation in the surroundings.** *Polln Res,* **14** (4) (1995), 463-470 [13 Ref].

A study was undertaken to determine the effect of pollution caused by thermal power plants. Sulphur and chlorophyll content of leaves were taken as test parameters. Both sulphur and chlorophyll content of the leaves was found to be higher in test plants and no adverse effects on vegetations were recorded due to Thermal Power Station.

**9701-300.** Vihari V, Roy VK, Verma Sabita (Ethnobotanical Lab, PG Dept Bot, M S Col1, (BRA Bihar Univ), Motihari - 84540). **Effect of pollution on Launaea asplenifiolia: an ethnobotanical plant.** *Int J Mendel,* **12** (1-4) (1995), 28-29 f6 Ref].

Lalwnaea asplenifolia has many ethnobotanical importance. The plant is exposed to polluted environment of Janakpur and Raxaul. It does not show remarkable variation in anatomy and in amino acid content when compared with the specimens collected from unpolluted atmosphere of Hithauda, situated of 475 meter above sea level. Only Laspartic acid is responsive to vehicular traffic pollution.

**9701-301.** Vijayarengan P, Lakshmanachary AS (Div Environ Sci, Dept Bot, Annamalai. Univ, Annamalainagar 608 002). **Effects of nickel on growth and dry matter yield of greengram cultivars.** *Indian J Environ Hlth,* **37** (2) (1995), 99-106 [24 Ref].

Four cultivars of greengram (Vigna radiata (L) Wilczck) were grown in soil amended with nickel (0, 50, 100, 150, and 200 mg/kg) and analysed on the 45th DAS. Nickel at all levels, tested reduced the length of root and shoot, number of nodules, area of leaves and dry matter yield of root and shoot. The increase of nickel content in root of greengram did not differ with cultivars. In shoots the accunlulatitan of nicket was low itl Ag-2160 intermediate in ADT-2 and ADT-3 and high in KM-2.

**9701-302.** Wajid Khan M (Dept Bot, Aligarh Muslim Univ, Aligarh 202 002). **Air pollution and root symbionts.** *Vasundnara.* **1** (1996) 46-54 [57 Ref].

Air pollution particularly SO2, 03 and fly ash at higher levels, inhibit root nodule bacteria and VAM fungi, which are agriculturally important in relation to nitrogen and phosphorus economy of soil. They reduce dependence of the plants on fertilizers reducing the cost of inputs. For less fertilizers we need less industries and therefore less development and decreased pollution load. Under pollution stress of the plants their beneficial activities are reduced. It is an important adverse impact of air pollution which goes unnoticed.

**9701-303.** Williams AJ, Banerjee SK (Forest Eco Rehabilitation Div, Trop Forest Res Inst, Jabalpur 482 021). **Effect of thermal power plant emissions on the metabolic activities of Mangifera indica and Shorea robasta.** *Env Eco,* **13** (4) 1995, 914-919 [27 Ref].

Chemical and biochemical analysis of Mangifera indica and Shorea robusta growing around the thermal power plant at Korba (MP) revealed that there was a considerable reduction in chlorophyll, carotenoid ascorhic acid and protein and an increase of sugar in the pollution effected leaves. Nitrogen, phosphorus and potassium also decreased considerably and sulfur content increased in the polluted atmosphere. The excess of sulfur in leaves accumulated as sulfate might be expected to provide a measure of the degree of leaf contamination and an index of degree of SO2 pollution.