

Environmental Management

9801-001. Agarwal Anil, Narain Sunita (Cent Sci Env, New Delhi). **Dying wisdom - the decline and revival of traditional water harvesting systems in India.** *Ecologists (The)*, **27**(3) (1997), 112-1 16.

Over the centuries, villagers in India have developed a wide array of techniques to collect rainwater, groundwater, stream water, river water and floodwater. Since the colonial era, however, such village-based water harvesting systems have been declining, their viability undermined by increasingly centralized control over natural resources. Reviving these systems offers a realistic alternative to the large dams and water development projects being promoted by the authorities as a solution to India's water crisis.

9801-002. Baneljee SK, Williams AJ, Biswas SC, Manjhi RB, Mishra TK (Forest Eco Rehabilitation Div, Trop Forest Res Inst, P.O. RFRC, Mandla Rd, Jabalpur 482021). **Dynamic of natural ecorestoration in coal mine overburden of dry deciduous zone of M.P., India.** *Eco Env Conserv*, **2**(3&4) (1996), 97-104 [26 Ref].

Natural revegetation in coal mine overburdens of different ages in Singrauli, district Sidhi, M.P. was studied. Mine spoils were analysed for their physicochemical characteristics and nutrient status. Adjacent degraded natural sal forest was also studied to have a comparative idea about the status of successional stages and soil parameters. For successful ecological restoration of mined overburdens, it may be recommended to broadcast the seeds of such herbs and shrubs instead of going through plantation of tree species at the initial stage.

9801-003. Behera Bijay K, Tripathy GK, Inamdar Arun B, Asolekar Shyam R* (*Cent Environ Sci Engng, Indian Inst Techno, Powai, Bombay 400076). **Assessment of turbidity of sea water using remote sensing data.** *Indian J Marine Sci*, **25**(2) (1996), 103-108 [10 Ref].

The study aims at the application of Landsat Thematic Mapper (TM) data for detection and measurement of physical aspects of marine pollution in the Thane creek legion adjoining Bombay city and its suburbs. Attempt has been made to establish the

relationship between the real time values of the marine pollution parameter analysed in the laboratory and the digital counts from the remotely sensed data using statistical technique. A two step approach has been followed to relate the TM data with the marine pollution parameter. The advantage of this methodology in detection and measurement of turbidity is discussed.

9801-004. Bhardwaj BN (Dept Forensic Med Toxicol, All India Inst Medl Sci, New Delhi). **Need to include environmental toxicology in medical curriculum.** *Indian J Indl Med*, **43**(1) (1997), 14-15 [2 Ref].

Education to the younger generation in environmental matters is essential. Science and technology, as a part of their contribution to economic and social development must be applied to the identification of environmental risks and solutions of environmental problems and for the common good of mankind. Some of the environmental issues which are of prime concern and should be taught to medical students are discussed here.

9801-005. Chakrabarti Kalyan (Bikash Bhawan, North Block, 3rd Floor, Salt Lake City, Calcutta 700091). **Forestry and sustainable development.** *Everyman's Sci*, **31**(5) (1997-97), 148-152.

Forest is a priceless wealth to the human society. However, Sustainable Development is endangering this immense richness. The reduction in the genetic variety of crops and wild species could seriously affect human wealth.

9801-006. Dey Anindo, Dey Avijit (Dev Consultants Ltd., Enviro Protection Div, 24-B, Park Street, Calcutta 700016): **Emission control in cement industry trend and practices.** *Indian J Environ Prot*, **16**(11) (1996), 820-823 [1 Ref].

Paper identifies the various sources of air pollution and ways of combating them from different sections of the cement plant. It also discusses the current and alternative regulations and standards which provide guidelines to the industry to look at the air pollution abatement as an economic plus instead of economic minus.

9801-007. Elangovan R, Thamizhselvi T, Suresh Nathan N, Vijayan G (Govt Coll Techno, Coimbatore 641013). **Dynamic programming algorithms applied to sewer optimization.** *India J Environ Hlth*, **39**(1) (1997), 23-30 [4 Ref].

Paper finds out the optimal cost of a hypothetical sewer network by arriving at suitable combinations of pipe sizes and depth of cuttings. The mathematical model results in a nonlinear programming problem with nonlinear and linear constraints. Dynamic Programming Optimization Techniques has been used for the minimization of the nonlinear polynomial function. The Dynamic Programming algorithms used in this paper have been incorporated into a software and the PC version is written in QBASIC Version 4.0.

9801-008. Ghosh Bobba A, Singh Vijay P, Bengtsson Lars (Natl Water Res Inst, Burlington, Ontario, Canada L7R 4A6). **Sustainable development of water resources in India.** *Environ Manag*, **21**(3) (1997), 367-393 [91 Ref].

Despite India's vast water resources, droughts and famines are a common occurrence in many parts of country. This paper briefly surveys India's river-basin systems, drought-prone areas, hydrogeological systems, groundwater potential and utilization in light of water-quality constraints, and environmental pollute on in India. This paper concludes by clarifying the main actions required to ensure a sustainable development of water resources in India.

9801-009. Gupta AK, Chaturvedi VK, Thomas Salimol, Prasad SC (Motilal Nehru, Regl Engng Coll, Dept Civil Engng, Allahabad 211004). **The status, community participation and quality of potable water for rural community in Allahabad district.** *India J Environ Prot*, **16**(11) (1996), 811-816 [5 Ref].

A survey in rural Allahabad district revealed that in general the quantity of water supplied is not sufficient but quality is satisfactory. Community is participating in selection, maintenance of sources including minor repairs. Less than half population is willing to pay if better supply is assured. However; women are fully involved in keeping the surroundings of the sources environmentally clean.

9801-010. Gupta Ram Bilas, (89/1, Race Course, Dehradun - 248 001, U.P.), **Health hazards in town planning.** *Eco Env Conserv*, **2**(3 &4) (1996), 195-197 .

All cities and towns have expanded along the main roads/highways where there is heavy traffic of vehicles. Petty shopkeepers have encroached the footpaths and road areas-creating congestion on the roads, slow movements of vehicles, more pollution and health hazards. Town dwellers have to come on these roads for marketing and inhale dust and polluted air. Markets on the main roads are extremely hazardous to the shopkeepers who inhale dust and polluted air throughout the day.

9801-011. Guruswamy Babu P, Ravi Kumar KS, Murthy NS (Indira Gandhi Inst Dev Res, General AK Vaidya Marg, Goregaon (East), Bombay 400065). **An overlapping generations model with exhaustable resources and stock pollution.** *Ecol Econ*, **21**(1) (1997), 35-43 [19 Ref].

Paper analyses the nexus between resource exhaustion and pollution externality using an overlapping generations framework where each generation lives only for a finite period. The tax rates necessary for collecting this externality are characterized. A modified Hotelling rule is derived according to which the equilibrium resource price rises slower than the rate of interest in order to account for the damages due to the pollution stock generated by the resource used.

9801-012. Jayaraju N, Reddi KR (Dept Geo, Sri Venkateswara Univ, Tirupati 517502). **Impact of pollution on coastal zone monitoring with benthic foraminifera of Tuticorin, south east coast of India.** *Indian J Marine Sci*, **25**(4) (1996), 376-378 [7 Ref].

Magnitude of conosive effect, lower than normal ornamentation sutural thickenings, pores enlargement and widening of apertures in foraminifera were taken as indices of pollution impact on the coastal zone of Tuticorin. Pollution-causes reduced diversity with a decrease in foraminiferal population. More over, there is a reduction in size followed by test wall thickening in Ammonia and Florilus and dispersal and dilution of the pollutants resulting faunal abundances.

9801-013. Jhanwar ML (SA, Indira Nagar, Jaipur). **Application of remote sensing for environmental monitoring in Bijolia mining area of Rajasthan.** *Photonirvachak*. **24**(4) (1996), 255-264 [6 Ref].

Impact of mining Vindhyan Sandstone, at 30 centres spread over 617 sq kms, by open cast method in Bijolia area, Rajasthan on the environment, both natural and social, assessed over a period of 20 years, revealed that it had affected nearly 20 times the area of lease. The study was carried out using Multidate remote sensing data for 1984 and 1991 and topographical maps of 1971, for change detection in land use pattern with the increase in mining activity. Whereas area covered by mining activity increased by 35.3 times in 20 years, the forest cover decreased by 46.3 per cent. The dense forest decreased by 90 percent and the land under agriculture decreased by 12 per cent. Consequently the waste land increased by 67.4 per cent.

9801-014. Kadam AN, Rokade MA (Natl Inst Oceanogr, Regl Cent, 7, Bunglows, Mumbai 4000061). **Source identification of a tar residue from Mumbai beach.** *Indian J Marine Sci*, **25**(4) (1996), 379-380 [9 Ref].

A tar residue from Mumbai beach was matched with the suspected source sample from a tanker using UV, IR and GLC techniques. Negligible differences in several ratios of UV absorbances and ratios of infrared transmittances of the samples as well as their superimposable GLC fingerprint patterns indicated that the beach tar might have originated from the tanker.

9801-015. Khandelwal Sitaram (Dept Bot, Univ Rajasthan, Jaipur 302004). **Impact of dyeing industries waste water on vegetation of Luni catchment area - a case study through remote sensing technique.** *J Env Polln*, **3**(2) (1996), 77-78.

Present study was carried out along Luni river adjoining Balotara town of Barmer distt. FCC (False colour composite) of IRS-IA (Liss-II) were used for polluted as well as nonpolluted areas of Balotara which had path-33 and row-49 B2. The thematic maps were prepared on the basis of tone, texture and association of objects. Based on tone and texture, vegetation cover was classified into three categories,. dense, moderate and- scattered.

9801-016. Nair PS (Population Res Cent, Univ Kerala, Trivandrum 695581, Kerala). **Population density and urbanisation in Kerala: impact on environment.** *J Human Eco* **8**(4) (1997), 237-240 [2 Ref].

Kerala has achieved lowest levels of fertility and mortality in the country, nevertheless the population is bound to increase for at least 40 years before attaining stability. As a result, population density and tempo of urbanisation will continue to rise and this will definitely impinge seriously on the environmental problems of the state. The major source of atmospheric pollution will be due to the emission of lethal gases from vehicles. Further, Kerala poses the prospect of a large number of urban slums. Housing in urban areas is yet another problem to reckon with.

9801-017. Nand Kishor P, Rao KCK Environ Prot Trng Res Inst (EPTRI), Block No. 298, 11 Floor, Maitrivanam, HUDA Complex, SR Nagar, Hyderabad 500038). **Environmental impact assessment of bulk drug industry: a case study.** *J Indl Polln Contl*, **13**(1) (1997), 49-60 [6 Ref].

To assess the environmental impacts arising out of the proposed bulk drug industry at Nacharam Industrial Development Area, Hyderabad, rapid EIA studies were undertaken spanning one season monitoring with a view to identify, predict and evaluate the impacts based on analytical data and baseline conditions. An Environmental Management Plan delineated to mitigate the adverse impacts, a post project environmental quality monitoring programme to be perused by the proposed industry is also worked out.

9801-018, Narashima Rao SL (Public Hlth Environ Engng Lab, Dept Civil Engng, Andhra Univ, Visakhapatnam 530003). **Water pollution control in Visakha refinery. HPCL - a case study - Part I: wastewater characteristics.** *J Indl Polln Contl*, **13**(1) (1997), 1 -8 [4 Ref] .

Investigation was carried out to characterise refinery process effluent streams and analyse for oil and grease, phenetics, suspended solids, BOD, COD, cyanide, ammonical nitrogen, sulphides, mercaptans, etc. It was found that sour condensate, merox wastes, FCCU wastes are showing high levels of BOD and COD. The wastes from crude desalter, bitumen blowing unit and oil sampling lines contains maximum oil and phenolic content.

9801-019. Pandey JS, Deb SC, Khanna P (Natl Environ Engng Res Inst, Nagpur 440020). **Issues related to green house effect, productivity modelling and nutrient**

cycling: a case study of Indian wetlands. *Environ. Manag.* **21**(2) (1997), 219-224 [14 Ref] .

Models available in the literature on nutrient uptake, light availability, and chlorophyll growth have been suitably modified and integrated through the computer program CHLORF (written in "C" language), which has the advantage of being amenable to simulation under various combinations of input variables. The model has been used for sensitivity analysis in order to identify the most sensitive set of parameters whose control can form an appropriate basis for evolving pragmatic management strategies. In addition, greenhouse mitigation potential has been computed in terms of assimilation of carbon dioxide for a case study of Indian wetlands.

9801-020. Pandurangappa M, Balasubramanian N* (*Dept Chem, Indian Inst Techno, Madras 600036). **Cationic surfactant as a sensitizer for the spectrophotometric determination of hydrogen sulphide in air and evaluation of a new absorbing medium containing triethanolamine - zinc acetate - sodium hydroxide.** *Environ Polln*, **94**(3) (1996), 255-260 [12 Ref].

An extractive spectrophotometric method for the determination of trace amounts of hydrogen sulphide after fixing the gas in triethanolamine (TEA)-zinc acetate- sodium hydroxide solution is described. The method can be used to determine as little as 0.05 µg of hydrogen sulphide.

9801-021. Panigrahy PK, Sahu SD, Satyanarayana D (Cheml Oceanogr Div, Sch Chem, Andhra Univ, Visakhapatnam 530003, AP). **Factor analysis of Visakhapatnam shelf sediments, east coast of India.** *Indian J Marine Sci*, **25**(2) (1996), 154-156 [17 Ref].

Data comprising of 30 variables obtained from 15 sediment samples of Visakhapatnam shelf have been subjected to R-mode factor analyses so as to interpret the geological provenance of the sediment and the sources of pollution. The pollution facto__includes discharge of domestic sewage and industrial effluents, loading/unloading of Zn-Pb ore concentrates in harbour and occurrence of heavy and sulphide minerals.

9801-022. Pathak NN (Dept Forestry, J.N. Krishi Vishwa Vidyalaya Jabalpur 482 004 M.P.). **Agroforestry and environmental protection: a short critique.** *Indian J Forestry*, **20**(1) (1997), 49-53 [14 Ref].

A case has been made out in favour of taking up appropriate agroforestry practices to rehabilitate the natural ecosystems, replaced by one managed for subsistence of economic purposes, which in turn are more vulnerable to drought, erosion, pests and all the uncertainties of agriculture.

9801-023. Sasmal SK (Indian Inst Remote Sensing, Dehradun 248001). **Multi-spectral radiometric analysis of suspended sediment concentration in water column using a laboratory water tank.** *Indian J Marine Sci*, **25**(2) (1996), 151-153 [3 Ref].

Radiometric observations are carried out for sediment load of sandy and loamy types with concentrations from 0 to 4000 mg/l at water depths of 15, 25, 35 and 45 cm in different spectral bands with multi-band Ground Truth Radiometer compatible to IRS-LJSS-II. Landsat-TM (bands 1 to 4) and SPOT (MLA) satellite sensors. Results of statistical correlation between suspended load and spectral reflectance are found to be increasing towards longer wavelength region of radiometric channels.

9801-024. Saxena Rashmi, Sharma CL, Saxena RC (Pest Contl Res Lab, PG Dept Zoo, SSL Jani Coll, Vidisha 464001, MP). **Control of mosquitoes by biological agents.** *Bull Pure App Sci*, **14A**(2) (1995), 65-68 [11 Ref]. (Late Pub).

Investigation is aimed to work out the role of *Azolla* sp and blue green algae on the density of mosquitoes in two fresh water ponds of Vidisha district of M.P. It reveals that *Azolla* and algal bloom play a distinct role on the population of mosquitoes.

9801-025. Singh GS, Ram SC, Kunujal JC (GB Pant, Inst Himalayan Env Dev, Shamshi - Kullu). **Changing traditional land use patterns in the great Himalayas : a case study of Lahaul Valley.** *J Environ Syst*, **25**(2) (1996-97), 195-211 [19 Ref].

Paper discusses about indigenous land use techniques and agricultural technologies hidden in the vale of Lahaul in Himachal state, in the northwestern Himalayas. The area is inaccessible by road for seven months most of the years due to

heavy snowfall. On account of a shortage of suitable low-lying agricultural land in the area, people are now cultivating on $> 45^\circ$ slopes, which are causing heavy landslides.

9801-026. Singh Ramanuj Pd, Roy Dinesh Chandra, Kumar Jainendra (PG Dept, MVPG cent Coll Com, Patna 800020). **A case study of environmental management.** *Int J Mendel*, **14**(1&2) (1997), 26 [3 Ref].

Irreversible changes in ecosystems are caused by allelochemical stresses, pathogenic infections, transformation of growth habit and mutational changes in flora and fauna, Cybernetic management supplemented by modern applications such as system approach, modelling and computer simulation is the demand of the day. Study on a grass land reveals that the informations on feedback mechanism can be very useful in environmental management.

9801-027. Singh RV (Indian Coun Forestry Res Edn, Dehradun, UP). **Participatory forest management for conservation and sustainable use of plant diversity.** *Wasteland News* **12**(4) (1997), 24-31 [26 Ref].

Plant diversity conservation in the forests is of special significance in the economy of communities living in and around forests. Under the present management systems plant diversity conservation regarded to be the sole responsibility of the Forest Department (FD). Such an approach does not ensure conservation of plant diversity which, under increasing biotic pressure, is gradually depleting. This paper discusses the approach for people's participation in plant diversity conservation in the forests in India.

9801-028. Trivedy RK (Dept Polln Std, YC Coll Sci, Karad 415110). **International environmental action, commissions, policies, and environmental laws in India : Part I-International action.** *Eco Env Conserv*, **2**(3&4) (1996), 189-193 [2 Ref].

Paper describes some major actions and policy decisions at International level. The India scenario with reference to environmental regulations has also been described. It has become amply clear that a multipronged strategy is required to make environmental protection meaningful and tangible.

9801-029. Vaidyanathan Geeta, Kumar Arun (Dev Alt, B-32, Tara Crescent, Qutab Institutional Area, New Delhi 110016). **Towards sustainable production systems : closing the loops.** *UNEP Ind Env*, **19**(2) (1996), 33-37 [3 Ref] .

The fast-growing Indian construction sector is the country's single largest contributor of CO₂ emissions. This sector is characterized by increasing shortages of conventional building materials, and by technologies that use resources and energy inefficiently. A response strategy has been devised to meet the growing demand for building materials while limiting emissions.

Air Pollution

9801-030. Agrawal Madhoolika, Khanam Najma (Dept Bot, Banaras Hindu Univ, Varanasi 221005). **Variations in concentrations of particulate matter around a cement factory.** *Indian J Environ Hlth* **39**(2) (1997), 97- 102 [10 Ref]

Air quality monitoring was conducted to quantify the spatial and temporal variations in the concentrations of total suspended particulate matter (TSP) and dust fall rate around a cement factory situated in a dry tropical area. Particulate matter showed a linear spatial decrease as one moves away from the source. Concentrations of TSP often exceeded permissible limits up to 2 km SE of the source. Dust fall rate was quite significant up to 5 km SE. Dust fall rate was maximum during winter, while TSP levels were maximum during summer.

9801-031. Bag SC, Bhattacharya SK, Das BK, Saha SC, Saiyed HN (Natl Inst Res Jute Allied Fibre Techno, Indian Coun Agricl Res, 12, Regent Park, Calcutta 700040). **Characterisation of dust collected frons jute mill environment.** *India J Indl Med*, **43**(1) (1997), 8-10 [6 Ref].

Jute mill dust collected from different processing zones has been characterised by optical polarising and scanning electron. microscopy, inductively coupled plasma emission spectrometry and microbial serial dilution techniques on petri-plate exposed

samples. It is revealed that the concentrations of toxic metals and particulates are higher in high dust zone (spinning to finishing).

9801-032. Kabir Ridwan, Srivastava VK (Indian Inst Techno, Dept Cheml Engng, Hauzklas, New Delhi 110016). **Design of stack for gas emission.** *Indian J Environ Prot*, **16**(2) (1996), 921-925 [10 Ref].

Gaseous and particulate waste products are commonly discharged to the atmosphere through stacks (chimney) of some form. Attempt has been made to design a stack through which gas is emitted. Meteorological as well as environmental factors have been incorporated while designing the stack. While designing the stack, all the different environmental classes have been considered and the total system is analysed thoroughly on that basis.

9801-033. Lal M, Srinivasan G, Cubasch U (Cent Atmospheric Sci, Indian Inst Techno, New Delhi 110016). **Implications of increasing greenhouse gases and aerosols on the diurnal temperature cycle of the Indian subcontinent.** *Curr Sci*, **71**(10) (1976), 746-752 [17 Ref].

The response to transient increase of greenhouse gases and sulphate aerosols in the Earth's atmosphere on the diurnal temperature cycle over the Indian subcontinent is examined using the data generated in coupled atmosphere-ocean model experiments. An increase in annual mean maximum and minimum surface air temperatures of 0.7 and 1.0°C respectively is projected over the land regions of the Indian subcontinent in the decade 2040s with respect to 1980s.

9801-034. Mohan Rao AM, Pandit GG, Sain P, Sharma S, Krishnamoorthy TM, Nambi KSV (Environ Assess Div, Bhabha Atom Res Cent, Bombay 400085). **Non methane hydrocarbons in industrial location of Bombay.** *Atmospheric Env*, **31**(7) (1997), 1077-1085 [13 Ref]

Concentration of non-methane hydrocarbons in atmospheric air are measured in areas close to five industrial locations in the city of Bombay. Seventeen hydrocarbons are identified in 260 urban air samples using a cryogenic preconcentration system and a Gaschromatograph with a flameionization detector. These studies indicate significantly higher ratios for some of the individual hydrocarbon to acetylene in air than corresponding autoexhaust values.

9801-035. Pandey, Pandoy U (Cent Adv Std Bot, Banaras Hindu Univ, Varanasi 221005). **Adaptational strategy of a tropical shrub *Carissa carandas* L. to urban air pollution.** *Environ Monit Assess*, **43**(3) (1996), 255-265 [24 Ref].

Paper reports the adaptational response of a tropical shrub *Carissa carandas* L. to urban air pollution stress in Varanasi, India.

Different levels of air pollution input produced different sets of harmful effects. Although the air pollution level at Varanasi reduced the plant height, basal diameter, canopy area, leaf area and total plant biomass of *C. carandas*, this species retained a major fraction of its photosynthate to above-ground plant parts where foliage assumes predominance.

9801-036. Raj Sonia, Khan TI (Indira Gandhi Cent HEEPS, Univ Rajasthan, Jaipur 302004). **Effect of simulated acid rain on *Cicer arietinum* var Pant G-114.** *J Es/v Polln*, **3**(3&4) (1996), 197-201 [33 Ref].

The seedlings of *Cicer arietinum* var. Pant-G-114 tolerated simulated acid rain exposure down to pH 1.0. Below this seedlings growth was reduced and seeds succumbed at pH level 0.5. A reduction of more than 90% in root and shoot length was Observed at pH 1.0. Root dry weight decreased to 86.8% while shoot dry weight to 80.4 at pH 1.

9801-037. Rao B Padma S (Natl Environ Engng Res Inst, Nehru Marg, Nagpur 440020). **Air pollution mitigation strategy in Indian foundries.** *Indian J Environ Prot*, **16**(11) (1996), 856-861 [11 Ref].

Various aspects of foundry, such as emission comparison with such units working in other countries, actual emission monitoring results and suggesting an air

pollution mitigation strategies specifying most practical control technology option with reference to variation in emission scenarios are highlighted. Carbon monoxide emissions, apart from posing a serious health hazard, account for wastage of potential heat around 20% of the total energy input.

9801-038. Rudraiah N, Venkatachalappa M, Khan Sujit Kumar (Gulbalga Univ, Gulbarga). **Atmospheric diffusion model of secondary pollutants with settling.** *Int J Environ Std*, **52**(3) (1997), 243-267 [6 Ref].

A time-dependent mathematical model of chemically reactive atmospheric primary pollutants and their by product in a protected zone above the surface layer has been developed to study the impact of removal of larger particles when the heavy admixture is present. The results have been analysed for stable and neutral atmospheric conditions. It is shown that the effect of settling velocity on concentration of secondary pollutants is significant in a stable layer compared to the neutral case.

9801-039. Sinha Subrato, Banerjee SP (Tata Energy Res Inst, Habitat Place, Lodi Rd, New Delhi 110003). **Characterization of haul road dust in an Indian opencast iron ore mine.** *Atmos Env*, **31**(17) (1997), 2809-2814 [20 Ref].

Vehicular traffic on unpaved haul roads of the opencast mines has been identified as the most prolific sources of fugitive dust. An intensive study was carried out in Noamundi Iron ore mines of Tata Iron and Steel Co. to characterize the airborne aerosol. Percentage of suspended particulate matter at the various size ranges and free silica content of each of the size ranges of haul road dust were determined. Concentrations of eight trace elements were determined.

Water Pollution

9801-040. Anirudhan TS, Manju GN, Raji C (Dept Chem, Univ Kerala, Kariavattom, Trivandrum 695581). **Surface mass transfer process during arsenite removal from water using modified carbon.** *J Indl Polln Contl*, **13**(1) (1997), 19-27 [14 Ref].

A new method has been developed to remove arsenite ions from aquatic systems by using copper impregnated coconut husk carbon. The adsorption follows first order kinetics and is endothermic. The uptake of arsenite increases from 2.4 to 41.3 mg/g with the increase of pH from 2.0 to 12.0 at 30°C and concentration 100 mg/ L. Desorption studies revealed that the spent adsorbent can be regenerated and reused by 30% H₂O₂ in 0.5 M HNO₃.

9801-041. Barnah NK, Kotoky P, Bhattacharyya KG, Borah GC (Regl Res Lab, Jorhat 785006, Assam). **Metal speciation in Jhanji river sediments.** *Sci Total Env*, **193**(1) (1996), 1-12 [21 Ref].

The chemical forms of lead, zinc, chromium, cobalt, nickel and copper have been determined using the fractionation scheme in the bed sediments of Jhanji River, Assam, India. Significant association with the residual fraction (F5) and a scavenging action by the Fe-Mn oxide fraction (F3b) of the sediments were observed. Except copper, no significant association of other metals with the organic fraction (F4) was observed. Thus, they cannot be easily leached out and may pose less environmental risk. The sediment characteristics played a significant role in defining the chemical forms of the metals present in the sediments.

9801-042. Bhargava Nandan, Sewani Madhu (Chem Dept, Govt Coll, Kota, Rajasthan). **Periodic variation in the physico chemical characteristics of river Chambal at Kota.** *Acta Ecologica*, **18**(2) (1996), 69-71 [4 Ref].

The variation in physicochemical characteristics of water of Chambal river at Kota have been studied from November' 95 to October' 96. It has been revealed that water quality remains constant except seasonal variations in turbidity, temperature and nitrates.

9801-043. Bhat DM, Hegde Ganesh R (Cent Ecol Sci, Indian Inst Sci Field Stn, Sahyadri Colony, SIRSI 581402, Uttara Kannada Dt). **Ground water quality in Uttara Kannada district of Karnataka.** *Indian J Environ Hlth*, **39**(1) (1997), 61-64 [4 Ref].

Bore-well water samples of Uttara Kannada district were collected to investigate the quality of ground water. The chemical composition indicated fitness as per drinking water standards in most of the water samples.

9801-044. Bhattacharya BK, Gupta TRC, Katti RJ (Centl Inland Capture Fisheries Res Inst, Barrackpore 743101). **Physico-chemical characteristics of Gurupur Estuary, Mangalore receiving treated sewage.** *EMV ECO*, **15**(2) (1997), 379-384 [21 Ref].

Variations in selected physico-chemical parameters were studied at three stations of Gurupur estuary receiving primary treated sewage from Mangalore city. The values of water temperature, pH, salinity, biochemical oxygen demand and sulfide (ND-0.127 mg/litre) were low during southwest monsoon and high during summer months. Study revealed moderately polluted conditions at subsurface levels of station 2 during summer months which may be attributed to the intermittent discharge of treated sewage at this station.

9801-045. Bhole AG (Dept Civil Engng, Visvesvaraya Coll Engng, Nagpur 440011). **Theory of sludge blanket clarifiers.** *Indian J Environ Hlth*, **39**(1) (1997), 44-51 [11 Ref].

Attempt has been made to theoretically calculate the diameter and density of floc at any depth in the sludge blanket clarifier provided available head at various depths is measured. The hindered settling velocity and the free fall velocity can be calculated independently and correlated by introducing a new variable function for sludge blanket clarifier.

9801-046. Ghosh NC (Natl Inst Hydro, Roorkee 247667). **Uncertainty analysis of CBOD and DO profiles of Kali river (India) water quality using QUAL2E-UNCAS,** *Indian J Environ Hlth*, **39**(1) (1997), 8-19 [1 Ref].

Uncertainty analysis of simulated water quality profiles of carbonaceous biochemical oxygen demand (CB OD) and dissolved oxygen (DO) of Kali river has been

performed using QUAL2E-UNCAS. Sensitivity analysis, first order error analysis and monte carlo simulation are used to quantify the errors and biasness of estimation. Based on a visual comparison and statistical analysis of the observed mean concentrations and 2000 monte carlo 11 results, the model is judged acceptable.

9801-047. Jain Praveen, Ahmed Irfan (Dept Chem, Govt MLB, PG Coll, Bhopal). **Heavy metal contamination assessment of Kerwan Dam water near Bhopal (M.P.).** *Oriental J Chem*, **13**(1) (1997), 93-94 [70 Ref].

Paper studies the distribution of heavy metals in the Kerwan dam water for determining pollution load in water bodies. Heavy metals were determined using atomic absorption spectrophotometer and UV-VIS spectrophotometer. The results show high concentration of lead at all the sampling points and manganese concentration were also found high at almost all the points due to dissolution on Mn from soil and sediments was found comparatively higher and chromium is also found higher at certain points.

9801-048. Kannan R, Kannan L (Cent Adv Std Marine Bio, Annamalai Univ, Parangipettai 608502). **Physico-chemical characteristics of seaweeds beds of the Palk Bay south-east coast of India.** *Indian J Marine Sci*, **25**(4) (1976), 358-362 [9 Ref].

Hydrographic investigations at two different stations viz. Kattumavadi and Kottaipattinarn of the Palk Bay, revealed temporal variation for all the hydrographical features observed. Marked spatial variations were noticed in light penetration, dissolved oxygen and nutrient concentration. Nutrients concentration were relatively higher than that of the other parts of the Indian coast, indicating the fertile nature of this region.

9801-049. Kataria HC, Dubey KS (Dept Chem, PG Coll, Pipariya (Hoshangabad) (461775). **Trace assessment of copper and zinc in ground-water of Bhopal, (M.P.).** *Oriental J Chem*, **13**(1) (1997), 76 [4 Ref].

The methods in the present study are used as prescribed by APHA and NEERI. Eighteen sampling stations were chosen for analysis. Copper is an essential component of key-metalloenzyme. Zinc toxicity is due to galvanized pipes and percolation of wastes from industrial sewage. Concentration of copper is due to sewage nulla and other domestic sewage percolates in ground-water.

9801-050. Kataria HC, Iqbal SA, Shandilya AK (Govt PG Coll, Dept Chem, Pipariya (Hoshangabad) 461775). **Limno-chemical studies of Tawa reservoir.** *Indian J Environ Prot*, **16**(11) (1996), 841-846 [26 Ref].

The work of the Tawa project has been sincerely organised on large Tawa dam, located at a site of 823 m downstream at the confluence of Tawa and Denwa rivers. The water quality is of vital concern for mankind since it is linked with human welfare. Agricultural run-off is the major source of water pollution in Tawa dam. Physico-chemical analysis with different parameters has been done during one year span 1994-95.

9801-051. Kataria HC, Shandilya AK (PG Dept Chem, Govt PG Coll, Pipariya (Hosanghabad), MP - 461775). **Physico-chemical analysis of groundwater of Bhopal.** *J Nature Conserv*, **8**(1) (1996), 187-189 [11 Res].

The changes in physico-chemical parameters are the direct and indirect indices of quality of water. The physico-chemical parameters of hand pumps water of Bhopal have been studied seasonally for one year. Two readings have been taken in one season. Totally alkalinity, total hardness of various metals in different seasons are reported.

9801-052. Kaur H, Dhillon SS, Bath KS, Mander G (Dept Zoo, Punjabi Univ, Patiala 147002). **Analysis of the elements polluting river Ghaggar in the region of Punjab.** *J Env Polln*, **3**(2) (1996), 65-68 [8 Ref].

To assess the quality of water in the river Ghaggar, Punjab, physico-chemical analysis of water was carried out for six months. The study revealed that maximum pollution load occurred at the site receiving both sewage and industrial discharges. Sites receiving industrial and animal excretory wastes were also found to be polluted. Water was relatively cleaner at the sites where direct sources of pollution were absent. Seasonal variations in the studied parameters were also worked out.

9801-053. Khan ZA, Misra BM, Raghu K (Process Engng Syst Dev Div, Bhabha Atom Res Cent. Bombay 400085). **Thermodynamics of interaction of lindane on silty loam and silty clay loam Indian soils.** *J Environ Sci Hlth*, **B31**(5) (1996), 1015- 1027 [26 Ref] .

Interaction of lindane with silty loam and silty clay loam soils was studied in batch tests at 23, 30 and 37°C. Sorption experiments were carried out at four concentrations and for varying time of contact upto 72 hours. This was followed by desorption studies. No desorption was observed. The sorption was found to be predominantly entropic in nature and a combined effect of adsorption and chemisorption. The effect of organic matter and other chemical and mineralogical constituents of soils has also been discussed.

9801-054. Krishnamurthy SR, Bharati SG (Dep Appl Bot, Kuvempu Univ Jnanasahyadri, Shankaraghatta 577451). **Distribution of chromium in the surface waters of the polluted river Kali, Karnataka, India.** *Env Eco*, **15**(2) (1997), 448-451 [8 Ref].]

The river Kali water is polluted due to inflow of chromium through the domestic and industrial wastes. The average highest value of chromium of 0.017 mg l⁻¹ was recorded at S4 sampling station where though dilution of pollution indicating parameters took place. Further the value of chromium was below the tropical stream standard.

9801-055. Kumar B, Bhunia AB, Bhattacharyya RN (Centl Polln Contl Bd, East Zonal Office, 61, Prince Anwar Shah Rd, 4th Floor, Calcutta 700033). **Some aspects of water quality degradation along the north-east coast of India.** *J Env Polln*, **3**(2) (1996), 109-116 [11 Ref].

Paper deals with the nature and extent of marine coastal pollution along the coastal States of Orissa and West Bengal. In addition to the characteristic physico-chemical background parameters, water quality was monitored in terms of heavy metals and some selected biological determinants. Spatial and temporal changes in the concentration of these parameters from inshore to offshore waters, and their possible effects on the marine coastal ecosystem have been discussed.

9801-056. Kumaraswamy N, Kiran Kumar K, Venkata Rao MM (Environ Engng Div, KSRM Coll Engng, Cuddapah). **Groundwater quality of a coastal basin in Visakhapatnam - a case study.** *Indian J Environ Hlth*, **39**(2) (1997), 109-114 [6 Ref].
M.V.P.

Colony in Vishakhapatnam draws water for domestic needs from a shallow groundwater. The chemical quality of this water has been analysed and interpreted, inferring domestic waste water, pollution and sea water intrusion into the aquifer.

9801-057. Lal AK (Town Country Plang Org, Environ Plang Div, E-Block, Vikas Bhawan IP Estate, New Delhi - 110002). **Effects of mass bathing on water quality of Pushkar Sarovar.** *Indian J Environ Prot*, **16**(11) (1996), 831-836 [2 Ref].

Pushkar occupies a prominent position among the holy places of Hindus in the country. During the annual Pushkar fair about 2-3 lakh pilgrims congregate at Pushkar and take a holy dip in the Sarovar: The effects of mass bathing in the sarovar is described and remedial measures suggested.

9801-058. Madhu Kumar A, Anirudhan TS (Dept Chem, Univ Kerala, Kariavattam, Trivandrum - 695581). **Adsorption thermodynamics of phosphate on sediments of tropical backwater system.** *Indian J Marine Sci*, **25**(2) (1996), 125-132 [32 Ref].

The effect of phosphate concentrations, contact time, pH, diverse ions and temperature on adsorption of phosphate by sediments from retting and non-retting zones have been studied. The percent phosphate adsorbed increased with decrease in initial concentration of phosphate and increase in temperature. The adsorption capacity increased with decrease in pH, being the highest at an initial pH of 3.5.

9801-059. Mahal Pooran Singh, Datta Bithin (Dept Civil Engng, Coll Techno, GBPUAT, Pantnagar 263145, UP). **Optimal monitoring network and ground water pollution source identification.** *J Water Resources Plang Manag*, **123**(4) (1997), 197-207 [42 Ref].

A methodology combining an optimal ground-water-quality monitoring network design and an optimal source-identification model is presented. The monitoring network can be implemented in stages, in order to utilize the updated information in terms of observed concentration data from a time-varying (dynamic) network. The performance evaluation of the proposed methodology demonstrates the potential applicability of this methodology and shows significant improvement in the identification of unknown ground-water-pollution sources with limited observation data.

9801-060. Mohammad Ali, Mohamed Najar PA (Allalyt Lab, Dept Appl Chem, ZH Coli Engng Techno, Aligarh Muslim Univ, Aligarh - 202002). **Application of planar layer liquid chromatography in the analysis of water samples for heavy metals and pesticide residues.** *Indian J Environ Hlth*, **39**(2) (1997), 120-129 [72 Ref].

Review reports the application of planar layer liquid chromatography as used in the analysis of water samples for heavy metals and pesticide residues. Efforts have been made to encapsulate the literature of thin layer chromatography and paper chromatography as applied to the identification, preconcentration, separation and quantification of heavy metals present in various water samples covering the period of last twenty years.

9801-061. Pahan K, Chaudhuri J, Ghosh i DK, Gachhui R, Ray S, Mandal A* (*Dept Biochem, Univ Coll Sci, 35, B allygunge Circular Road, Calcutta 700019). **Volatilization of mercury from natural water by broad-spectrum Hg-resistant Bacillus pasteurii strain DR2.** (*The Environmentalist*, **16**(3) (1996), 179-185 [25 Ref].

A broad-spectrum mercury-resistant bacterial strain was isolated from contaminated water and was identified as Bacillus pasteurii strain DR2. It could volatilize Hg-compounds including organomercurials from its growth media. It utilized several aromatic compounds as a sole source of carbon. The bacterial strain eliminated HgCl₂ from sterile river water and the presence of benzene, toluene, naphthalene and nitrobenzene at 1 mM concentration in the system increased the rate of mercury volatilization, the volatilization rate being highest with benzenes.

9801-062. Pande N, Singh BC (Utkal Univ, Dept Chem, Bhubaneswar 751004). **Trace metals in drinking water from different sources in port city of Paradeep.** *Indian J Environl Prot*, **16**(11) (1996), 824-827 [10 Ref].

Study was conducted covering total hydrological cycle, for the determination of iron, Mn, Zn, Cu, C1; Pb, arsenic and Hg in drinking water from five different sources in the Port city of Paradeep. These sources are Mahanadi water, Taladanda water, tap water, tubewell and open well water. Results showed seasonal fluctuation.

9801-063. Pande Sunil P, Deshpande Leena S, Patni PM, Lutade SL (Natl Environ Engng Res Inst, Nagpur 440020). **Arsenic removal studies in some ground waters of West Bengal, India.** *J Environ Sci Hlth, A32(7)* (1997), 1981-1987 [5 Ref].

NEERI conducted coagulation - flocculation studies on arsenic removal on water samples collected from six sources in West Bengal which are affected by arsenic. The physico-chemical characteristics of these water samples were investigated. Extensive treatability studies have shown that a dose of 3.0 mg/L of chlorine (for pre-chlorination) followed by 50 mg/L of ferric chloride was able to remove arsenic from the raw waters. Results of arsenic removal are discussed.

9801-064. Roy NN (Regl Inst Techno, Dept Chem, Jamshedpur 831014). **Studies on organic pollutants in rivers around Jamshedpur.** *Indian J Environ Prot, 16(12)* (1996), 913-920 [18 Ref].

Pollutional load of organic pollutants, natural oils and fats, phenols and hydrocarbon oils in rivers around Jamshedpur have been monitored and the state of the river water and wastewater discharge samples studied. DO, BOD and COD were estimated by conventional methods. Natural oils and fats were estimated by extraction with light petroleum ether with Soxlet type of extractor, phenols by extractive spectrophotometric method with aminoantipyrine and hydrocarbon oils by extraction with carbon tetrachloride and passing through a florisil column.

9801-065. Sarma DRR, Rao SLN* (*Public Hlth Environ Engng Lab, Dep Civil Engng, Andhra Univ, Visakhapatnam 530003). **Fluoride concentrations in ground waters of Visakhapatnam, India.** *Bull Environ Contam Toxicol, 58(2)* (1997), 241-247 [9 Ref].

The fluoride levels in ground water of Visakhapatnam were studied in an exhaustive way, covering almost all the important areas. A case study has been taken up on the ground waters of Jaggayapalem and Sheelanagar, where abnormally high levels of fluoride existed and people were suffering with the dreadful disease of fluorosis.

9801-066. Sarma VV, Vara Prasad SJD, Gupta GVAI, Sudhakar V (Natl Inst Oceanogr, Regl Cent, 176, Lawson's Bay Colony, Visakhapatnam 530017). **Petroleum Hydrocarbons and trace metals in Visakhapatnam Harbour and Kakinada Bay, east coast of India.** *Indian J Marine Sci, 25(2)* (1996), 148-150 [16 Ref].

High concentrations of PHC were observed in the inner channels of Visakhapatnam Harbour. The estimation of trace metals in surficial sediments indicated higher contamination in Visakhapatnam harbour than in Kakinada Bay. Positive correlations between Cu, Zn Pb and Cd suggests common sources of these metals.

9801-067. Sawant CP, Shrivastava VS, Saxena GC (RBS Coll, Dept Chem, Agra 282002). **Metals in well water samples collected from tribal area of Satpura valley by ICP-AES and flamephotometry.** *Indian J Environ Prot*, **16**(12) (1996), 906-908 [12 Ref] .

The concentration of trace metals were determined by inductively coupled plasma atomic emission spectrometer and flamephotometer in well water samples. These studies are at the assessment of the extent of ground water pollution by these metal ions. In addition to above pH, conductivity and chemical oxygen demand (COD) in all the water samples have also been detected.

9801-068. Senapati NK, Sahu KC (Dept Earth Sci, Indian Inst Techno, Bombay 400076). **Heavy metal distribution in Subarnarekha river, east coast of India.** *Indian J Marine Sci*, **25**(2) (1996), 109-114 [11 Ref].

Water and sediment samples collected during three different periods were analysed for the estimation of the natural and anthropogenic heavy metal fluxes from Subarnarekha river. Enrichment ratios were calculated for both water and sediment samples with respect to global and local background concentration values separately. It was observed for water that the contamination was more when compared with global background and less when compared with local background values. The above information helps in estimating the contribution of heavy metals to - the metal flux to the Bay of Bengal.

9801-069. Shivkumar K, Pande AK, Biksham G (Dept Atom Energy, Atom Mineral Div, Civil Lines, Nagpur 440001). **Toxic trace element pollution in ground waters around Patancheru and Bolaram industrial areas, Andhra Pradesh, India: a graphical approach.** *Environ Monit Assess*, **45**(1) (1997), 57-80 [29 Ref].

The industries of the Patancheru and Bolaram area generate a cumulative 8 x 10⁶ l/day of effluents which are being directly discharged on to surrounding land,

irrigation fields, and surface water bodies which finally enter into the Nakkavagu River a tributary of the Manzira River: Present study on abundance and distribution pattern of toxic trace elements indicates the quantitative aspect of pollution in the Nakkavagu Basin. Migration patterns drawn for TDS, toxic elements indicate that pollutants discharged by the industries are entering the surface and groundwater system (aquifers) and are also migrating towards the Manzira River further deteriorating the entire hydrological setup of the area.

9801-070. Singh HP, Mahaver LR (Div Riverine Fisheries, Centl Inland Capture Fisheries Res Inst, Allahabad 211002). **Preliminary observations on heavy metals in water and sediments in a stretch of liver Ganga and some of its tributaries.** *J Environ Bio*, **18**(1) (1997), 49-53 [11 Ref].

Zinc, arsenic and chromium in the polluted water and sediments in river Ganga (Kanpur to Maranasi), Yamuna (Allahabad), Ramganga (Moradabad to Bareilly) and river Gomti (Kooraghat to Jaunpur) have been studied. It is revealed that the pollutorial load of Ganga and Gomti were maximum in respect of zinc, arsenic and chromium.

9801-071. Singh J, Singh Gurdeep, Kumar M, Srivastava Subha (Indian Sch Mines, Cent Mining Env, Dhanbad 826004). **Status of mercury pollution in river Damodar across Chotanagpur region in Bihar.** *Indian J Environ Prot*, **16**(12) (1996), 909-912 [17 Ref].

Industrialisation of the Chotanagpur plateau in South Bihar has given an impetus to determine the concentration to trace, toxic and heavy metal ions in the river water of Damodar which is the biggest river of this area for supplying water for almost all purposes. The measured concentrations varied though generally below the permissible limit for industrial effluents discharge to surface or streams. At some places, like thermal power plants, steel plants and coke oven plants, mercury concentration levels were observed higher than the threshold limit.

9801-072. Srikanth R (Div Env Sci, Dept Bot, PG Cent, Nizam Coll 500001, AP). **Chloroform levels in the drinking water of Hyderabad city, India.** *Environ Monit Assess*, **45**(2) (1997), 195-199 [16 Ref].

A one-year study was conducted on the chloroform concentration of the municipal drinking water of Hyderabad City. Results indicate a variation in haloform concentration in different seasons of the year. A maximum concentration, ranging from 67.0-70.5 $\mu\text{g/l}$ was observed during the summer. However, the mean level of chloroform was below the permissible level of 30 $\mu\text{g/l}$ recommended by WHO.

9801-073. Trivedi VH (Gujarat Univ, Dept Chem, Arts Sci Coll, Dabhoi 391110 Vadodara). **Removal of iron and manganese by potassium permanganate chemical oxidant.** *Indian J Environ Prot*, **16**(11) 17 (1996), 837-840 [5 Ref].

Iron and manganese compounds present in ground water are not awful and toxic to plant and animal with the exception of the high concentration, which creates bad taste and colour. Numbers of method have been employed to remove these duo pollutant. Paper discusses two such methods at various pH, KMnO_4 dosing to remove these pollutants.

9801-074. Verma PK, Paul DK (Life Sci Res Lab, Godda Coll, Godda 814134, (SP), Bihar). **Bacteriological water quality in a hill stream of Santal Pargana, Bihar.** *J Env Polln*, **3**(2) (1996), 97-101 [9 Ref].

Bacteriological analysis of water revealed the contaminated nature of the hill stream with total bacterial density ranging from 4,000 to 43,800/ml during the year. Highest values of density were observed during monsoon. It was positively correlated with water temperature ($r = 0.70 - 0.71$, $p < 0.01$) and rainfall ($r = 0.82 - 0.86$, $p < 0.001$).

9801-075. Zaheeruddin, Khurshid Shadab, Usman Shabeer Md (Aligarh Muslim Univ, Hydro/Environ Lab, Dept Geo, Aligarh 202002). **Heavy metal pollution in parts of Delhi.** *Indian J Environ Prot*, **16**(11) (1996), 828-830 [6 Ref].

An attempt has been made to ascertain the extent of water pollution caused due to heavy metals. Surface and subsurface water samples have been collected and analysed for various heavy metals. In most of the samples concentration of heavy metals exceed the maximum permissible limit for drinking purpose prescribed by WHO.

Noise Pollution

9801-076. Pandya GH, Verma Ravi R (Natl Environ Engng Res Inst Nehru Marg, Nagpur 440020). **Characterisation and measurement of noise levels in an urban environment.** *Indian J Environ Hlth*, **39**(2) (1997), 141-148 [11 Ref].

The existing noise pollution status of Nagpur urban environment with emphasis on objective measurement and subjective reaction of the people is reported. Road traffic noise has been a major contributor to the annoyance which is substantiated by the results of continuous monitoring of noise equivalent levels (Leq). The transportation network and vehicular noise at various intersections of the city have also been studied. Public participation, education, traffic management, proper land use, proper designing of building and green belt play a major role in noise abatement.

Ecology

9801-077. Ahmad Md Shamim (Eco Environ Lab, Univ Dept Bot. LN Mithila Univ, Darbhanga). **Ecological survey of some algae flora of polluted habitats of habitats.** *J Env Polln*, **3**(3& 4)(1996), 147-151 [11 Ref].

Deals with the study of algae of polluted habitats of sewage-fed pond, Medical College wastewater pond and tannery factory. The distributional pattern has been co-related with the physico-chemical characteristics of the effluent. Generally the members of Cyanophyceae were found dominant in all the polluted habitats. Total nitrogen, phosphate, potassium and chloride contents played a vital role in their distributional patterns.

9801-078. Arivazhagan P, Kamalaveni K (Dept Zoo, Kongunadu Arts Sci Coll Coimbatore 841029). **Seasonal variation in physico-chemical parameters and plankton analysis of Kurichi Pond.** *Env Eco*, **15**(2) (1997), 272-274 [10 Ref].

Study deals with the physico-chemical parameters and plankton analysis of pond water. The physical characteristics gradually increased and the temperature gradually decreased from July to December. The chemical characteristics gradually increased from July to December and the dissolved carbon dioxide and alkalinity gradually

decreased from July to December. The content of nutrients gradually increased from July to December.

9801-079. Arora Meeta, Saxena M (Dep Zoo, Dungar Coll Bikaner 334001). **Planktonic fauna of a desert village pond in relation to certain abiotic factors.** *EMV ECO*, **15**(2) (1997), 367-369 [15 Ref].

The planktonic fauna studied in a desert pond of Rajasthan comprised seven species belonging to Rotifera and Crustacea. Total population ranged from 12 to 136/liter, dominated by Crustacea. Correlation coefficients of various genera with abiotic factors were found.

9801-080. Balu S, Algesaboopathi C (Dept Bot, AVVM Sri Pushpam Coll, Poondi 613503, Tamil Nadu). **Ecological observations on *Eclipta prostrata* (L.) L.** *I Z J Eco*, **23**(2) (1996), 136-137 [3 Ref].

Eclipta prostrata (L.) L. is of immense medicinal importance. The plant is found to flourish mostly on domestic and industrial sewage canals, in the crevices of moist walls and pavements. It is also met with in cultivated paddy fields and other plantations like sugarcane and banana. Attempt is made to understand the phenology and life cycle of *E. prostrata* in nature and under cultivation.

9801-081. Bansikar V, Datta Munshi J, Pal JK (Univ Dept Bot, TM Bhagalpur Univ, Bhagalpur 812007). **Ecology of grasses of Ganga river basin.** *J Freshwater Bio*, **8**(1) (1996), 13 - 18 [19 Ref].

Diara lands from a part of the Ganga river basin, where flood is almost a perpetual annual feature. They are formed due to meandering and changing course of rivers. A comparative study reveals that *Saccharum spontaneum*, *Vetivaria zizalloides*, *Imperata cylindrica* and *Setaria verticillata* were the dominant species occurring in Shankarpur diara and Mahadevpur diara while *Dicanthium annulatum* was the dominant species in university botanical garden. The flood becomes the causative ecological factor for the growth of the members of Gramineae as dominant species. Because of the ever changing ecological conditions of diara lands of Ganga river basin, natural populations are subject to evolution through polyploidy, hybridization and inbreeding.

9801-082. Banse K, Vijayaraghavan Sumitra, Madhupratap M (Sch Oceanogr; Box 357940, Univ Washington) Seattle, Washington 98195-7940, USA). **On the possible causes of the seasonal phytoplankton blooms along the southwest coast of India.** *Indian J Marine Sci*, **25**(4) (1996), 283-289 [28 Ref].

Data collected off the southwest coast of India suggest that the commonly observed high concentrations of chlorophyll and rates of photosynthesis of the season may not be due to greatly enhanced chlorophyll-specific (normalized) photosynthetic rates of the bulk phytoplankton. Instead it is proposed that the seasonally increased nutrient supply primarily increases the growth rate of the otherwise more diffusion-limited large-celled species, which then can materially increase in numbers, since they are poorly controlled by grazers.

9801-083. Chandrasekhar SVA, Kodarkar MS (Freshwater Bio Stn, Zool Surv India, 1-1-300/B, Ashoknagar; Hyderabad 500020). **Diurnal variation of zooplankton in Saroornagar lake, Hyderabad.** *India J Environ Hlth*, **39**(2) (1997), 155- 159 [16 Ref].

The diurnal variation of plankton in tropics is not similar to that of temperate waters. The principal factor for diurnal movement is light. Paper reports the result of an investigation based on the collections made in Saroornagar lake at Freshwater Biological Station, Zoological Survey of India, Hyderabad.

9801-084. Datta NC, Sen Gupta Supriya (Fisheries Eco Res Unit, Dept Zoo, Univ Calcutta, Calcutta). **Role of aeration on the autotrophic and heterotrophic microbial production of a pesticide treated aquatic system.** *J Env Polln*, **3**(2) (1996), 103-108 [16 Ref].

Aeration enhances the rate of Net Primary Productivity (NPP) by reducing the demand of oxygen for respiration of microbial autotrophs in a pesticide treated aquatic system. Heterotrophic bacteria (HTB) use the fraction of organic pesticides as their carbon source for growth. Aeration could also provide more assimilatory fraction of organic compounds to C-heterotrophs leading to their faster growth and abundance.

9801-085. De Sousa SN, Sawkar K, Durga Prasada Rao PVSS (Natl Inst Oceanogr, Dona Paula, Goa 403004). **Environmental changes associated with monsoon**

induced upwelling, off control west coast of India. *Indian J Marine Sci*, **25**(2) (1996), 115-119 [21 Ref].

Coastal upwelling of nutrients during and after the southwest monsoon has been considered to support rich pelagic and demersal fisheries off the west coast of India. Studies indicate occurrence of coastal upwelling associated with Ekman transport in response to prevailing equatorward winds. The effect of upwelling on the surface distribution of properties was reduced to some extent due to coastal runoff which gives the region a patchy distribution of properties.

9801-086. Dhargalkar VK, Deshmukhe GV (Biol Oceanogr Div, Natl Inst Oceanogr, Dona Paula, Goa 403004). **Subtidal marine algal of the Dwaraka coast (Gujarat).** *Indian J Marine Sci*, **25**(4) (1996), 297-301 [8 Ref].

A total of 35 marine algal species were recorded during a survey of the subtidal flora of Dwaraka. Maximum number of species were found at 5-8 m depth. Red algal species were dominant (20), followed by green (8) and brown (7). The similarity index calculated between intertidal and subtidal species of Dwaraka was 43.40, indicating that the subtidal floral composition is as diversified as that of the intertidal region.

9801-087. Fernandez Tresa V, Thomas George, Thankappa Jamila, Mammachan Lekha, Sadasivan Deepthi, Kumar Krishna, Kumar Anil (Dept Aquatic Bio Fisheries, Univ Kerala, Beach PO, Trivandrum 695007, Kerala). **Elemental composition of marine algae occurring along the southwest coast of India.** *Environ Conserv*, **22**(4) (1995), 359-361 [9 Ref].

The southwest coast of India, especially the Kerala coast, is largely unexplored in regard to algal distribution, chemistry, and ecology. Present study intends to give a preliminary report on the incidence of metal elements in the major algal species occurring in any of 15 stations along the southwest coast of India.

9801-088. Ganga Devi T, Subha V, Vasudevan Nair T (Div Marine Chem, Dept Aquatic Bio Fisheries, Univ Kerala, Trivandrum 695007). **Abundance of iodine in marine algae of Cape Comorin.** *Indian J Marine Sci*, **25**(4) (1996), 363-364 [10 Ref].

Concentration of iodine in 18 species of marine algae (green, brown and red) from Cape Comorin were analysed by the alcoholic potash method. The values ranged from 2.54 to 70.85 mg/100 g dry weight. High iodine content was observed in red algae as compared to green and brown algae.

9801-089. Goldin Quadros, Mishra Vidya, Ullal Vidya, Atllalye RP, Gokhale KS (Dept Zoo, BN Bandodkar Coll Sci, Thane 400601). **Meibenthos of mangrove mudflats from shallow region of Thane creek, central west coast of India.** *Indian J Marine Sci*, **25**(2) (1996), 137- 141 [19 Ref].

Studies on the meiobenthos of intertidal zone of mangrove mudflats revealed dominance of nematodes (78.35%) with insignificant seasonal variations. The other constituents were tube polychaetes and oligochaetes, the latter contributing a major share to meiobenthos only at the station in the proximity of sewage outlet.

9801-090. Goswami SC, Padmavati G (Natl Inst Oceanogr, Dona Paula, Goa 403004). **Zooplankton production, composition and diversity in the coastal waters of Goa.** *Indian J Marine Sci*, **25**(2) (1996), 91-97 [21 Ref] .

Spatial and temporal variability in zooplankton production, composition and diversity in the coastal waters of Goa were studied. Zooplankton production was bimodal with primary peak during September-October and secondary peak during March-April. Secondary production computed from the zooplankton biomass values fluctuated between 24.7 and 87.2 mgC.m⁻².d⁻¹. Herbivores dominated the zooplankton community and copepods were most abundant. 21

9801-091. Gauda Rajashree, Panigrahi RC (Dept Marine Sci, Berhampur Univ, Berhampur 760007). **Ecology of phytoplankton in coastal waters off Gopalpur, east coast of India.** *Indian J Marine Sci*, **25**(2) (1996), 81-84 [24 Ref].

The spatial and seasonal variations in phytoplankton species composition and abundance in relation to physico-chemical properties were studied. During the course of investigation, Biddulphiaceae, Coscinodiscaceae and Chaetoceraeae among Centrales and Naviculaceae among Pennales emerged as floristically rich families. Of the various environmental parameters studied, change in salinity and nutrient concentrations played major role in controlling the distribution and abundance of phytoplankton.

9801-092. Handa AK, Pasrija HBD, Shrivastava AK, Jain Neeraj (Dept Civil Engng, Univ Roorkee, Roorkee 247667). **Ecological studies on Sukhana Lake** .*Env Eco*, **15**(2) (1997), 370-373 [6 Ref].

Study reports that the sediment load on the lake has been reduced along with pollution control measures and the waters are generally clear throughout the period of investigations; and the lake is mildly polluted but is still in a healthy state and may survive for long years to come.

9801-093. Joshi CB (NRC on Coldwater Fisheries (ICAR), PB No. 28, Haldwani - 263139). **Hydro-biological profile of river Sutlej in its middle stretch in western Himalayas**. *Uttar Pradesh J Zoo*, **16**(2) (1996), 97-103 [22 Ref].

Among the water quality parameters of river Sutlej in its middle stretch, the temperature (9.6-17.5°C) was found to be the factor having profound influences over the hydrobiological parameters including fish and other aquatic life. The phytoplankton population in the river was poor with an average of - 170 units/l being maximum (306 units/l) in January and minimum (53 units/l) in August, when the river was influenced with the floods. The dilution effect of floods not only reduced the plankton density but also lowered the organic carbon productivity, besides affecting the concentration of nutrients in the river.

9801-094. Kapoor K, Arora Leentha (Dept Bot, MI S Univ, Udaipur 313001). **Eco-physiological and developmental growth behaviour of cyanobacteria in different nitrogen sources**. *Eco Env Conserv*, **2**(3&4) (1996), 133-141 [22 Ref].

Growth of two cyanobacteria *Anabaena doliolum* and *Nostoc ZMuNcorums* were subjected to different sources of combined nitrogen into culture medium. The nitrogen sources used for study were KNO₃ (as nitrate), NaNO₂ (as nitrite) and NH₄Cl (as ammonium). The growth responses of cyanobacteria were determined using parameters, viz. optical density, total chl a, total carbohydrate, protein content, pH and conductivity measurements. Variations in heterocyst frequency as well as percent sporulation were also studied treating sporulation at 0.00 M as 100% in normal cultures under standard growth conditions.

9801-095. Kathiresan K, Rajendran N, Thangadurai G (Cent Adv Std Marine Bio, Annemalai Univ, Parangipettai 608502, Tamil Nadu). **Growth of mangroves seedlings in the intertidal area of Vellar PARYAVARAN estuary, southeast coast of India.**

Indian J Marine Sci, **25**(3) (1996), 240-243 [14 Ref].

Growth of *Rhizophora apiculata* Blume seedlings in lower intertidal zones, grew more rapidly than those in upper intertidal ones. The growth was about 2.5-fold greater and the leaf sprouting was about 4-fold higher in the seedlings growing in the lowermost intertidal zone than those in uppermost intertidal zone. The growth was also rapid towards the monsoon month of December associated with low salinity and high levels of nutrients.

9801-096. Kaushik JP, Saxena S (Sch Std Bot, Jiwaji Univ, Gwalior 474011). **Effect of flora and fauna on fish population of a pond.** *Indian J Appl Pure Bio*, **11**(2) (1996), 89-93 [16 Ref] .

Paper deals with the study of fish population of Gauri tank of Bhind (M.P.) in relation to planktonic and benthic fauna. Only 24 species of fish belonging to 15 genera and 5 families have been collected from the tank. In all 132 species belonging to phytoplanktons (54 species), zooplanktons (15 species), macrophytes (20 species) and benthic fauna (43 species) were collected. The fish population has close association with phyto and zooplanktons but has no significant correlation with benthic fauna.

9801-097. Kaviraj A, Ghosal TK, Hasan BMA (Dept Zoo, Univ Kalyani, Kalyani 741245). **Nutrients enrichment of water by decaying and compost aquatic macrophyte *Pistia stratiotes*.** *J Nature Conserv*, **8**(1) (1996), 159- 164 [19 Ref] .

Natural decay of aquatic macrophyte *Pistia stratiotes* significantly reduced the level of phosphate, nitrate, nitrite and ammonia of water. The decaying process was marked by depletion of dissolved oxygen and increase of free carbondioxide of water. Compost of this macrophyte rendered very high amount of phosphate and ammonia nitrogen into the water. The present experiment revealed that compost could be a very good manure in pisciculture but the dose must be adjusted to avoid the problem of eutrophication.

9801-098. Kesh Dipak, Sarkar AK, Roy AB, (Div Biomathematics, Dept Mathematics, Jadavpur Univ, Calcutta 700032). **Succession in a three-species food-chain model.** *Ecol Modelling*, **96**(1- 3) (1997), 211-219 [15 Ref].

Paper consider a succession process of three-species food-chain model in a closed biocenosis in the sense of available resources. Under this assumption it is shown that the dynamics results in the stable composition of abiotic and biotic components of the food chain with increase in resources. The qualitative character of the gradual changes in climacteric composition is determined from relationships among ecological parameters.

9801-099. Kolekar Vijay (Estualine Fishelies Cent, Centl Fisheries Sayajigunj;, Vadodara 390005). **Studies on weed associated organisms of Keetham lake near Agra (Uttar Pradesh).** *Indian J Eco*, **23**(2) (1996), 81-85 [10 Ref].

Studies on weed associated organisms were conducted in a tropical lake. Weed fauna exhibited a dominancy of molluses over other organisms during the entire period of study. The fauna were more richly associated with the leaves and roots of water hyacinth, *Eichornia crassipes*. The impact of aquatic vegetation on the seasonal distribution is also discussed.

9801-100. Kumar Arvind, Gupta HP, Singh DK (Environ Bio Res Lab, PG Dept Zoo, SP Coll, Dumka 814101). **Impact of sewage pollution on chemistry and primary productivity of two freshwater bodies in Santhal Pargana (Bihar).** *Indian J Eco*, **23**(2) (1996), 86-92 [11 Ref].

Paper deals with the limnological studies on two ecologically different water bodies at Dumka (Santhal Pargana) with special reference to their chemistry and primary productivity for a period of one year: The presence of high rates of primary productivity further indicates that the eutrophication has been at a faster rate in Singhala pokhar pond which receives domestic sewage than Barabandh pond where it is only bathing and washing of clothes.

9801-101. Kumar Arvind, Singh AK (Environ Bio Res Lab, PG Dept Zoo, SK Univ (SP Coll), Dumka 814101, Bihar). **Studies on diel cycle of certain physico. chemical**

characteristics and zooplankton in a fish pond of Santhal Pargana (Bihar), India. *J Freshwater Bio*, **8**(1) (1996), 7-12 [18 Ref].

The study on the diel variation of physico-chemical and zooplankton of a freshwater fish pond of Dumka was undertaken during winter, summer and monsoon seasons for a period of one year. The physico-chemical characteristics of water showed a well marked diel fluctuation. The variation in the abundance of zooplankton also showed a distinct increase towards the surface in nocturnal period and reduction in diurnal period.

9801-102. Kundu Satyam Kumar, Lahiri P, Choudhury A (Dept Zoo, Calcutta Univ, 35, Ballygunge Circular Rd, Calcutta 700019). **A survey of environmental features in section of the Hooghly-Malta estuarine system, West Bengal, India.** *Eco Env Conserv*, **2**(3&4) (1996), 129-132 [9 Ref].

Hydrographic data of Hooghly estuary collected for a period of two years are presented. Temperature distribution in the estuary was bimodal type. A wide range of variation (1.80-24.80%) in salinity was observed. Dissolved oxygen showed higher values during postmonsoon associated with higher transparency values, pH showed little fluctuation. Except phosphate, other nutrients showed higher values during monsoon.

9801-103. Lande Vijay, Sinha VRP (Basic Res Trng Div, Natl Environ Engng Res Inst, Nagpur 440020). **Hydrobiological observations in Thane and Bassein creeks of Bombay.** *Acta Ecologica*, **18**(2) (1996)> 130 [16 Ref].

In order to assess the physico-chemical and biological quality of Thane and Bassein creek waters, samples were collected during June 1987 to March 1988. Four sampling sites in each creek were selected. The water samples of Thane and Bassein creek exhibited variations in levels of paramters. In general chlorophyll-c levels were higher in both the creek waters. The dominant phytoplankton genera recorded were Nitzschia, Thalassiothrix, Navicula, Thalassiosira and Pleurosigma. Copepods, Rotifers and fish eggs out-numbered other zooplankton in both the creeks.

9801-104. Mahajan Anjan, Kanhere RR (Zoo Dept, Govt PG Coll, Barwani 451551). **Diurnal variation in some hydrobiological parameters of a Fish pond in tribal area of West Nimar.** *Eco Env Conserv*, 2(3&4) (1996), 105-107 [15 Ref].

Diurnal variation in the abundance of zooplankton in relation to the physico-chemical factors of water was studied in a fish pond in West Nimar. Abiotic and biotic samples were collected at three hours intervals. A well marked fluctuation in temperature pH, DO, FCO₂ and HCO₃ is recorded, but not any significant change were observed in conductivity and redox potential. The zooplankton mainly consists of protozoa, rotifera and copepods. Diurnal study has shown that physico-chemical factors are combinedly responsible for zooplanktonic migration.

9801-105. Manjunatha BR, Balakrishna K, Shankar R, Thiruvengadasami A, Krishna Prabha R, Mahalingam TR, Iyengar MAR (Dept Marine Geo, Mangalore Univ, Mangalagangothri 574199). **The transport of elements from soils around Kaiga to the Kali river. southwest coast of India.** *Sci Total Env*, 191(1&2) (1996), 109-118 [21 Ref].

The behaviour of alkali, alkaline earth and transition elements during weathering, their consequent delivery into the adjoining river system and their surficial and subsurficial distributions in the soils around Kaiga, southwest coast of India, have been investigated. The data and the metal 1 ratios indicate that alkali and alkaline earth elements are mobile and transported in the dissolved phase, whereas transition elements are predominantly present and transported in the particulate phase.

9801-106. Mendhe Kavita (Dept Bot, Govt Girls PG Coll, Indore). **Study of phytoplanktonic population of Bilawali Talab, Indore.** *Indian J Appl Pure Bio*, 11(2) (1996), 83-88 [14 Ref].

Communication deals with the monthly variation in phytoplanktonic population in relation to physico-chemical characteristics of Bilawali Talab. The phytoplanktonic populations are mainly dominated by the members of bacillariophyceae, chlorophyceae and cyanophyceae. It was found that the Bacillariophyceae dominated during winter (Jan.) whereas Chlorophyceae and Cyanopllyceae dominated in summer season (June).

9801-107. Mishra Sujata, Panigrahy (Dept Marine Sci, Berhampur Univ, Berhampur 760007, Orissa). **Copepods of Bahuda estuary(Orissa), east coast of India.** *Indian J Marine Sci*, **25**(2) (1996), 98-102 [18 Ref].

Copepods of the Bahuda river estuary were studied and the population was represented by 58 species belonging to calanoids (33), cyclopoids (15) and harpacticoids (10). Marked seasonal variations have been observed with respect to the species composition of the Copepod fauna. Higher species diversity was encountered during the premonsoon season, when the estuary was under marine influence while an opposite trend was observed during monsoon season.

9801-108. Mukhopadhyay SK (Dept Zoo, Hooghly Mohsin Coll, Chinsurah 712101). **Limnological investigations in lotic and lentic freshwater bodies in and around Darjeling, West Bengal, India.** *Geobios* **23**(2) (1996), 101-106 [15 Ref].

Very high dissolved O₂ and negligible free CO₂ content were recorded from ten high altitude freshwater bodies. Lentic waters were acidic, while lotic slightly alkaline. GPP varied from 1.26 to 13.2 C Kcal. m⁻². d⁻¹. respectively.

9801-109. Nayak GN (Dept Marine Sci Marine Biotechno, Goa Univ, Taleigao Plateau, Goa 403205). **Grain size parameters as indicator of sediment movement around a river mouth, near Karwar, west coast of India.** *Indian J Marine Sci*, **25**(4) (1996), 346-348 [13 Ref].

The distribution of grain size parameters along 11 km stretch of the beach sediments between Majali and Karwar, reveals that the mean grain size exhibits a marked decreasing trend on either side of the mouth of the Kali river. The variations in standard deviation and skewness support the distribution of mean grain size. Average standard deviation values for different months decrease from river mouth on either side.

9801-110. Padmavan G, Goswami SC (Natl Inst Oceanogr, Dona Paula, Goa 403004). **Zooplankton distribution in neuston and water column along west coast of India from Goa to Gujarat.** *Indian J Marine Sci*, **25**(2) (1996), 85-90 [18 Ref].

Zooplankton distribution and abundance in neuston layer and water column at four transects between Goa to Gujarat were studied. The ambient water temperature,

salinity and dissolved oxygen at surface layer ranged between 26.3°C and 27.3°C, 35.7 and 36.2x10⁻³ and 4.3 and 4.5ml.l⁻¹ respectively. The temperature and dissolved oxygen values decreased with depth. Zooplankton biomass and population density were higher in the water column than in the upper neustonic layer. Copepods were dominant.

9801-111. Padmavathi P., Durga Prasad MK (Dept Zoo, Nagarjuna Univ, Nagarjuna Nagar 522510). **Impact of unwanted fish on the water quality, plankton and fish production in a carp culture pond in the environs of lake Kolleru.** *J Environ Bio*, **18**(1) (1997), 79-93 [18 Ref].

In one of the ponds studies in the environs of lake Kolleru, about 21 species of unwanted fish entered and established themselves in large numbers. Due to their presence, the chemical properties of water such as were severely affected. Since most of these fishes are plankton feeders, their presence has shown an impact on the plankton production which in turn reflected in the carp production. The results were compared to that of a well managed pond devoid of unwanted fishes located in the same area.

9801-112. Padmavati G, Goswami SC (Natl Inst Oceanogr, Dona Paula, Goa 403004). **Zooplankton ecology in the Mandovi-Zuari estuarine system of Goa, west coast of India.** *Indian J Marine Sci*, **25**(3) (1996), 268-273 [10 Ref].

Seasonal variability in the physico-chemical features, zooplankton standing stock (biomass) and faunal composition in the Mandovi-Zuari estuarine system of Goa during January to December 1990 were studied. Hydrobiological characteristics were influenced by the southwest monsoon. Salinity fluctuations were drastic. This appeared to cause variations in plankton production and heterogeneity of various taxa. Zooplankton biomass and total numerical counts varied significantly between seasons and estuaries.

9801-113. Paka Swarnalatha, Narsing Rao A (Dept Bot, Osmania Univ, Hyderabad 500007). **Inter-relationships of physico-chemical factors of a pond.** *J Environ Bio*, **18**(1) (1997), 67-72 [5 Ref].

Inter-relationships of certain physico-chemical factors have been studied for a period of two years in O.U. campus pond. All the factors are in low concentrations. pH

and carbonates varied directly whereas pH and bicarbonates have shown an inverse relationship. Dissolved oxygen and organic matter have shown a negative relationship, which might be due to the utilisation of oxygen for the oxidation of organic matter.

9801-114. Prabha Devi L, Natarajan P, Saraswathy Ammal G, Abdul Aziz PK (Dept Aquatic Bio Fisheries, Univ Kerala, Beach P.O. Trivandrum 695007). **Water quality and benthic fauna of the Kayamkulam backwaters and Arattupuzha coast along southwest coast of India.** *Indian J Marine Sci*, **25**(3) (1996), 264-267 [8 Ref].

The benthic fauna of the Kayamkulam backwater and adjacent sea composed mainly of foraminiferans, polychaetes, nematodes amphipods, isopods and bivalves. The population density varied between 900-76000/m² in October and 1020-60000/m² in May. Foraminiferans were the predominant group in the sea and in the marine zone of the backwater. Polychaetes ranked second in terms of the species composition followed by bivalves. Amphipods were the predominant group in the upper reaches of the backwater.

9801-115. Ramaiah N, Raghukumar C, Sheelu G, Chandromohan D (Natl Inst Oceanogr, Dona Paula, Goa 403004). **Bacterial abundance, communities and heterotrophic activities in the coastal waters off Tamil Nadu.** *Indian J Marine Sci*, **25**(3) (1996), 234-239 [25 Ref].

Culturable aerobic heterotrophic bacterial (CAHB) numbers, total direct counts (TDC), bacterial generic composition and uptake of labelled glucose by natural microbial assemblages were studied from a few selected coastal sites off Tamil Nadu. Autochthonous microflora along the Tamil Nadu coast appears to be very active and paper suggest that these communities continue to biotransform organic materials actively at current levels of anthropogenic interactions with these waters.

9801-116. Ravikumar DR, Vittal BPR (Cent Adv Std Bot, Univ Madras, Madras 600025). **Fungal diversity on decomposing biomass of mangroves plant Rhizophora in Pichavaram estuary, east coast of India.** *Indian J Marine Sci*, **25**(2) (1996), 142 144 [14 Ref].

Mycological examination of dead wood, prop roots and seedlings of Rhizophora spp. yielded 48 fungal species belonging to 36 genera with Ascomycotina being most

prevalent. The number of fungi recorded on prop roots (44) were much greater when compared with seedlings (18) and wood (16). Each substrate had its own common, frequent and occasional fungi appearing on them. The most common and abundant fungus on wood was *Lophiostoma mangrovei*.

9801-117. Sharma ALN, Wilsanand V (Dept Life Sci, Regl Inst Edn, Bhubaneswar 751007, Orissa). **Meiofauna of the outer channel to Chilka lagoon, Bay of Bengal.** *Indian J Marine Sci*, **25**(4) (1996), 302-306 [16 Ref].

A study of the meiofauna of the outer channel of Chilka lagoon revealed the presence of 12 major taxa, of which nematodes and copepods were the dominant. The average total meiofaunal densities were significantly correlated with the sediment temperature at st. 3 ($r = 0.9972$), Eh at st.2 ($r = 0.9816$) and salinity at st. 1 ($r = 0.9914$). No significant correlation was found between total meiofaunal densities and the mean grain size and the percentage organic matter present in the sediments.

9801-118. Satpathy KK (Water Steam Chem Lab, Indira Gandhi Cent Atom Res (APCD, BARC), Kalpakkam 603102). **Seasonal distributions of nutrients in the coastal waters of Kalpakkam, east coast of India.** *Indian J Marine Sci*, **25**(4) (1996), 221-224 [9 Ref].

Annual distribution of nutrients salinity and dissolved oxygen variations in the coastal waters of Kalpakkam were studied for three years. Nutrient levels were more during NE monsoon. Phosphates and nitrites exhibited wide annual fluctuations compared to nitrates and silicates. Salinity and nutrients are in inverse relationship. Dissolved oxygen and nutrients showed positive correlation. Regression analyses between any two nutrients also showed positive correlation.

9801-119. Satpathy KK, Nair KVK (Water Steam Chem Lab, (APCD, BARC), Indira Gandhi Cent Atom Res Campus, Kalpaliam 603102, Tamil Nadu). **Occurrence of phytoplankton bloom and its effect on coastal water quality.** *Indian J Marine Sci*, **25**(2) (1996), 145-147 [18 Ref].

An intense bloom of phytoplankton dominated by *Asterionella glacialis* was observed in the coastal waters of Kalpakskam. During this period a marked reduction in dissolved oxygen (1.2 mg/l) in the surface water was noticed. A decrease in nitrate and

silicate and increase in phosphate levels were also observed. Changes in physico-chemical characteristics of the coastal waters associated with the occurrence of bloom are discussed.

9801-120. Sengupta Supriya, Dutta NC (Fisheries Eco Res Unit, Zoo Dept, Univ Calcutta, Calcutta 700019). **Zooplankton as ecotoxicity indicator in aerated pesticide treated aquatic system.** *India Biologist*, **28**(1) (1996), 9-17 [15 Ref].

The response of zooplankton to different levels of toxicants is the key factor to the estimation of toxicity degradation by artificial aeration. So artificial aeration is a technique that can be employed for detoxification of pesticide treated aquatic system as shown by higher SCI values of zooplankton population. Zooplanktons can thus be used as ecotoxicity indicator.

9801-121. Singh Anil K, Shukla Arvind N, Saxena Pankaj, Mendhe Kavita (Environ Bio Unit, Sch Std Zoo, Vikram Univ, Ujjain 456010). **Some observations on primary productivity in river Narmada (western zone) M.P. (India).** *J Env Polln*, **3**(3&4) (1996), 203-206 [15 Ref].

Gross Primary Production (GPP), Net Primary Production (NPP) and Community Respiration (R) were determined during an annual cycle in the River Narmada (India) based on the daily variations in dissolved oxygen concentration. The values of GPP, NPP and R varied between 0.3 to 1.59, 0.15 to 1.05 and 0.15 to 0.675 gC/m²/d respectively at all the selected study sites.

9801-122. Singh Arun K (Freshwater Bio Lab, BDE Coll, Patna 800001). **Abundance of macrozoobenthic organisms in relation to physico-chemical characteristics of river Ganga at Patna (Bihar), India.** *J Environ Bio*, **18**(2) (1997), 103-110 [26 Ref].

Macrozoobenthic organisms of the river Ganga at Patna (Bihar), in relation to physico-chemical characteristic of water has been investigated. Four sampling sites were selected near a sewage discharge point. A total of 23 species of macrozoobenthic organisms were collected. The role of macrozoobenthic organisms as indicator of adverse environmental conditions prevailing in river water has been discussed.

9801-123. Singh SR (PG Dept Zoo, SMMTD Coll, Ballia 277001, U.P.). **On the share of some ecological factors in the population growth of cyanophycean algae in an Ox-bow lake.** *Eco Env Conserv*, **2**(3&4) (1996), 159-161 [8 Ref].

Multiple regression analysis was used to examine the contribution of some ecological factors to the population growth of cyanophycean algae in an ox-bow lake. Temperature, dissolved oxygen and pH near neutrality have been observed to favour growth of blue green algal forms. Nutrients like nitrates and phosphates have shown statistically insignificant values.

9801-124. Sinha Rupam, Jee Chandrawati (PG Dept Environ Sci, AN Coll, Patna). **Physico-chemical studies and phytoplankton population in four ponds of Patna.** *Biojournal*, **8**(1&2) (1996), 83-89 [7 Ref].

Study includes the physical, chemical & biological characteristics of pollution load in the four studies sites of four pond water: A comparative study of phytoplankton at four ponds of Patna have been made. Many algal flora were recorded in the water belonging to Cyanophyceae, Chlorophyceae and Bacillariophyceae. The exhaustive list of phytoplankton found in different pond have been presented.

9801-125. Srivastava VK, Srivastava GK, Srivastava JK (Dept Chem, Univ Gorkhpur, 273009). **Phytoplankton productivity and physico-chemical properties of Rapti river.** *Eco Env Conserv*, **2**(3&4) (1996), 183-188 [1 Ref].

Phytoplankton productivity and physico-chemical parameters of river Rapti and three sampling sites have been carried out to assess the impact of sewage and effluents on water quality and plankton productivity. Analytical data reveal that Rapti river water is highly polluted at Raj Ghat Bridge while the up-stream Domingarh water is fairly clean, in comparison to Raj Ghat Bridge. Productivity of plankton varies from 0.21 g.c./M²/Day to 2.242 g.c./M²Day.

9801-126. Suresh K, Durairaj G, Nair KVK (Dept Zoo, Univ Madras, Madras 600025). **Harpacticoid copepods distribution on a sandy shore in the vicinity of a power plant discharge, at Kalpakkam, along the east coast of India.** *Indian J Marine Sci*, **25**(4) (1996), 307-311 [25 Ref].

Harpacticoid copepods were sampled at seven experimental stations in the vicinity of a power plant discharge on the east coast of India. Seasonally copepods were abundant during summer (Feb.-May) and less during monsoon (June-Aug.). High water temperature were recorded at stations nearer to the discharge point. Warm water in nearby stations elevated the sand (substratum) temperature and reduced copepod density. The population of copepods were restored in all stations during a plant shutdown period when normal temperatures prevailed. Salinity and dissolved oxygen level did not show any influence on copepod abundance.

9801-127. Suresh VR (ICAR Res Complex NEH Region, Manipur Cent. Imphal 795004). **Primary production by three species of Scleractinian corals and factors influencing their production at Kavaratti Atoll (Lakshadweep Islands), India.** *Env Eco*, **15**(2) (1997), 374-378 [16 Ref].

Primary production by scleractinian corals *Pocillopora damicornis* (Linn.), *Acropora formosa* (Dana) and *Porites cylindrica* (Dana) was studied for two years in relation to environmental factors at Kavaratti atoll, Lakshadweep islands. All the species showed marked monthly variations in production. Highest production was observed for the smaller form *P. damicornis*. Productivity showed species specific variations in relation to seasons and environmental factors.

9801-128. Swami BS, Suryawanshi UG, Karanda AA (Bio Div, Naval Materials Res Lab, Tiger Gate, Ballard Pier, Bombay 400023). **Hydrographic and micronutrient profile of Karwar coastal waters, west coast of India.** *Indian J Marine Sci*, **25**(4) (1996), 349-351 [10 Ref].

Five stations covering an area of 55 km² of Karwar coastal water were selected and water samples were examined for a period of 18 months. Water quality parameters were monitored. The concentrations of the elements revealed that the environment of Karwar coast was healthy and supportive to the biological productivity.

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9801-129. Balaji Rao NS, Rajasekhar D, Chengal Raju D (Dept Anthro, SV Univ, Tirupati 517502). **Folk medicine of a Rayalaseema region, Andhra Pradesh: II blood purifiers.** *Bull Pure Appl Sci*, **14A**(2) (1995), 69-72 [8 Ref] (Late Pub).

The ethnomedicinal uses of 20 plant species found in the Rayalaseema region of Andhra Pradesh reveals the methods of preparation and dose of administration of crude drug as suggested by tribal and non-tribal herbalists for blood purification.

9801-130. Bansal Surabhi, Chauhan SVS (Dept Bot, RBS Coll, Agra 282002). **Biodiversity in the genus Cassia.** *Int J Mendel*, **14**(1&2) (1997), 13-14 [13 Ref].

The genus Cassia exhibits a great deal of biodiversity, as some of them are woody perennial trees, while some are perennial shrubs and still others are annual herbs. The genus also shows a great extent of variation in its flowering period, flower colour, architecture and fruit formation. There is a great deal of diversity among the pollinators, their visitation rates and pollinating with higher degree of xenogamy among the tree species and geitonogamy is more prevalent in shrubs and herbs.

9801-131. Biswas SAS, Chandra Sumer (Systematic Bot, Bot Div, Forest Res Inst, Dehradun). **Indopiptadenia oudhensis (Brandis) Brenan - An endangered tree legume of Uttar Pradesh and Nepal.** *Indian Forester*, **123**(5) (1997), 419-421 [2 Ref].

Taxonomic status of *Indopiptadenia oudhensis* (Brandis) Brenan, a monotypic taxon typically of American and African origin has been elucidated with particular emphasis on distribution, phenology and measures proposed for conservation.

9801-132. Chhetri DR (PG Dept Bot, Darjeeling Govt Coll, Darjeeling 734101). **Floristic survey of the Kanchenjunga National Park Area in Sikkim.** *Env Eco*, **15**(2) (1997), 258-262 [17 Ref].

The Kanchenjunga National Park (KNP) area is quite rich in biodiversity. The richness of the area can be gauged from the fifteen species of Rhododendrons and nine species of Primulas collected during the study in western Sikkim area. Some man-made disturbances such as the deforestation, mountaineering, cattle grazing and traditional medical practices coupled with the fragile nature of the rock-types building the mountain system of KNP are causes of worry.

9801-133. Das P (Natl Bureau Fish Genetic Resources, PB No. 19, 35/128 Dariyapaar, Talkatora Rd, Lucknow 226004, UP). **Endangered fishes of India and strategies for their conservation.** *J Nature Conserv*, **8**(1) (1996), 191-196 [16 Ref].

The vast and varied aquatic ecosystems of India harbours about 2200 fin fish species. About 11 % of the total piscine diversity of 20,000 species of the world is Indian. Owing to many anthropogenic and ecological factors, fish abundance have been drastically declining in many conventional fishing sites. Some fishes have become scarce, a group is even endangered. Hence, conservation and management of the dwindling fish stock is indispensable from ecological, socio-economic and even survival point of view of the human beings.

9801-134. Davidar Priya (Salim Ali Sch Eco Environ Sci, Pondicherry Univ, Kalzpet, Pondicherry 605014). **Conservation priorities for the Andaman Islands.** *J Bombay Natl Hist Soc*, **93**(3) (1996), 555-558 [9 Ref].

A survey was conducted in the Andaman Islands to look at the distributional patterns of forest birds and butterflies. These two taxa were used as indicators to see what type of reserves would best conserve the biodiversity. The study showed that forests on large islands and undisturbed evergreen forests are important reservoirs of biodiversity in the Andaman Islands.

9801-135. Gopalan Sreejith, Pandit BR (Dept Life Sci, Bhavnagar Univ, Bhavnagar 364002). **Ecological status and conservation need of the grazing lands at Bhavnagar.** *Eco Env Conserv*, **2**(3&4) (1996), 115-123 [64 Ref].

Inventory and monitoring of the structure and function of the grazing land ecosystem at Bhavnagar are essential for their effective management and conservation. The structure, composition, magnitude, net primary production and its dynamics,

nutrient cycling and nutritive value of fodder grasses have been studied. The structure and function vary though they are in the same ecoclimate. The biomass productivity is comparable to the grazing lands of other localities of the area. Recommendations are made to conserve these degrading grassland ecosystems which are affected by intense biotic interference.

9801-136. Hazarika Arup K, Dutta A (Dept Zoo, Cotton Coll, Guwahati 781001). **A study of Tasek lake of Garo Hills (Meghalaya).** *Env Eco*, **15**(2) (1997), 397-402 [37 Ref].

A study of the Tasek Lake of Garo-Hills (Meghalaya) was carried out in all four seasons. The study shows that the lake is oligotrophic and it needs further management, as it could well be used for tourism purpose and also for fishery.

9801-137. Jha Pramod Kumar, Choudhary SK (Dept Bot, GLA Coll, Daltonganj, Palamau, Bihar). **Studies of native medicinal plants of Palamau district (Bihar).** *Biojoarnnl*, **8**(1&2) (1996), 41-54 [8 Ref].

Communication presents the information and enumeration of 145 species of plants belonging to 132 genera and 43 families, having medicinal values. These plants are generally utilized by the tribal people of Palamau District in the treatment of various diseases. A brief important features of plants, parts utilised, local names and their uses have been included in this paper.

9801-138. Juyal GP, Dadhwal KS (Centl Soil Water Conserv Res Trng Inst, Dehradun 248195). **Geojute for erosion control with special reference to minespoil rehabilitation.** *India J Soil Conser*, **24**(3) (1996), 179-186 [13 Ref].

Geojute - a heavy woven jute mesh, helps in establishment of vegetation by protecting seeds and plants and conserving soil and moisture for growth. Geojute has been successfully tried to revegetate the highly erodible steep mine spoil slopes at Sahastradhara. Paper suggests that the geotextiles are to be used at sites which are geotechnically stable with fast growing and locally adapted grasses.

9801-139. Kumar Arvina, Singh DK (Environ Bio Res Lab, PG Dept Zoo, SK Univ, Dumka 814101, Bihar). **Some aspects of classification, ecology and conservation of**

freshwater wetlands and their socio economic importance in Santhal Pargana (Bihar), India. *J Env Polln*, **3**(2) (1996), 83-89 [9 Ref].

Paper deals with the classification and physico-chemical profile of the wetlands of Santhal Pargana (Bihar). During the extensive survey, it was observed that Santhal Pargana has different types of wetlands. The investigation stresses the need for detailed studies and conservation of wetlands in this tribal zone of Bihar to improve the poor socio-economic conditions of the tribes like Santhals and Pahariyas.

9801-140. Kushalappa CG (Dept Wildlife Forest Bio, Univ Agricl Sci, Forestry Coll, Ponnampet 571216). **Conservation of medicinal plant genetic resources in south India.** *Forest Genetic Resources*, **No. 24**(1996) (1996), 29-32 [2 Ref].

Two hundred and fifty six medicinal plants in India have been listed in the Indian Red Data Book as endangered. Most of these wild medicinal plants are confined to certain habitats with a restricted geographic range. Their rarity coupled with large scale destructive collection from the wild has resulted in conservation efforts being initiated by governmental and non-governmental agencies (NGO's) focused on their conservation and sustainable use.

9801-141. Meher-Homji VM (French Inst, Pondichery). **Biodiversity conservation priorities.** *Indian J Forestry*, **20**(1) (1997), 1-7 [12 Ref].

A starting point for the biodiversity conservation project could be the vegetation map or forest map because it shows not only the location of the forests but also the state in which they exist. The criteria to be considered in the biodiversity conservation prioritisation programme are outlined and discussed with reference to factors like pressures on forests and impending climate change.

9801-142. Mishra SB, Narain S, Chauhan Rajeev (PG Dept Zoo, Janta Coll, Bakewal; Etawah 206124). **Study of some fresh water turtles of Panchanda.** *J Nature Conserv*, **8**(1) (1996), 121-133 [33 Ref].

Study deals with a survey of some fresh water turtles of Panchanda (Distt: Etawah, U.P.). Nine species of turtles were observed at different research stations as shown in the map of Panchanda. Marked variations were observed in the distribution of

turtles. The endangered or rare species noted were : Trionyx Zlurum, C/litra inclica and KacSluga kac11uga. The benefits of sanctuary in the conservation of turtles have been discussed.

9801-143. Naqvie Anwar (Dept Bot, Saifia Sci Coll Bhopal 462001). **Ethnomedicinal studies of Raisen district of M.P., (India).** *Indian J Appl Pure Bio*, **11**(2) (1996), 105-109 [51 Ref].

As a result of ethnobotanical exploration in the Raisen district of Madhya Pradesh (India) a number of plant species have been collected which in one way or the other are used by the Gond tribals. The present communication encompasses ethnomedicinal uses of eight species of angiosperms.

9801-144. Niyogi Soumya, Basu Subhabrata, Mitra Abhijit, Choudllury Amalesh (SD Marine Biol Res Inst, Sagar Island, 24 Pgs (S), West Bengal). **Trace metals concentration in vegetative parts of Sonneratia apetala.** *Indian J Environ Hlth* **39**(1) (1997), 67-72 [7 Ref].

To get a detailed picture of the seasonal fluctuation of metallic contamination in Hooghly Matla estuarine system, the mangrove plant, *Sonneratia apetala* was selected in the present study to detect the magnitude of accumulation of Zn, Cu and Pb separately in root, stem and leaf regions of the plant. This plant was found useful for preventing erosion with the existing environmental conditions.

9801-145. Pattnaik MR, Patra AK (Nandan Kanan Biol Park, Post - Barang, Dist. Cuttack, Orissa 754005). **Some aspects of eco-floristics pattern distribution of mangroves in Bhitarkanika of Orissa, India.** *Cheetal*, **35**(3&4) (1996), 45-55 [26 Ref].

Sixty one different species of mangrove plants have been identified at Bhitarkanika along with their ecological distinctions. Highly specialised pneumatophores, well supporting unbranched stilt roots, very peculiar phenomena of viviparous germination and succulency of leaves are some of the important characteristics of this fragile ecosystem with highly slushy as well as mostly clayey soil.

9801-146. Solanki RC, Singh A (Water Techno Cent, Indian Agricul Res Inst, New Delhi - 110012). **Soil erosion research on steep slopes in north eastern hill region of India - a review.** *Indian J Soil Conserv*, **24**(3) (1996), 187-192 [20 Ref].

Paper summarises the work done on soil erosion research in North Eastern Hill region of India during the recent past. Shifting cultivation (Jhum), 'bun' method of tuber crop cultivation, growing of pine apple on steep slopes, homestead areas and watershed based landuses indicate that 80 to 100 per cent of rainfall can be retained on hill slopes while utilizing local resources for management.

9801-147. Rai Suresh C, Sundriyal Rakesh C (GB Pant Inst Himalayan Env Dev, Sikkim Univ Tadong, Gangtok, Sikkim 737102). **Tourism and biodiversity conservation: the Sikkim Himalaya.** *Ambio*, **26**(4) (1997), 235-237.

There is a vast scope for increased tourism in Sikkim that must be viewed with response to environment preservation, and local communities must be involved with such programs. This paper illustrates how tourism activities may be implemented and managed sustainably so that vegetation and culture are protected, and tourist benefits can reach the community.

9801-148. Suresh VR, Mathew KJ (ICAR Res Complex NEH Region, Manipur Cent, Imphal 795004). **Distribution and diversity of coral fauna at Lakshadweep Atolls, India.** *Env Eco*, **15**(2) (1997), 390-396 [16 Ref].

Coral fauna of Kavaratti, Kalpeni, Agatti, Bangaram, Amini, Kadmat and Chetlat atolls of Lakshadweep was studied for their species availability and density of distribution. The study recorded 110 species divided among 40 genera and 15 families, which included 22 new records to Lakshadweep. Species diversity was highest in Kavaratti (86 species) and lowest in Kadmat (39 species) while area coverage of corals was found to be maximum in BangarHealth and Toxicology

9801-149. Adiroubane D, Letchoumanan S (Dept Agricul Entom, Pandit Jawaharlal Nehru Coll Agric, Serumavilangai (P.O.), Karaikal 609603). **HCH and DDT residues in bovine milk samples from Karaikal region in U.T. of Pondicherry.** *Pesticide Res J*, **8**(2) (1996), 115-118 [12 Ref].

Twenty one bovine samples from the milk collection centres of the Karaikal Milk Supply Co-operative Union have been evaluated for DDT and HCH residues. Only five samples showed the residues of DDT above the MRL and another three contained these below the detectable level. All the 21 samples were contaminated with HCH residues above the MRL.

9801-150. Agnihotri NP, Chatterjee S, Gajbhiye VT-, Mohapatra SP (Div Agricul Cheml, Indian Agricul Res Inst, New Delhi 110012). **Persistence and movement of endosulfan in soil in a supervised field trial at Farrukhabad.** *Pesticides Res J*, **8(2)** (1996), 152-156 [11 Ref].

Persistence and downward movement of endosulfan residues were studied in a sandy loam soil under wheat cultivation at two locations on the bank of river Ganga at Farrukhabad (U.P.). The residues of endosulfan in soil (0-15 cm) persisted for 60 days with half-life of 10.3-10.6 days. B-endosulfan was more persistent than the a-isomer. Concentration of endosulfan sulphate gradually increased upto 15 days and declined thereafter.

9801-151. Anitha Kumari S, Sree Ram Kumar N (Cell Molecular Bio Lab, Dept Zoo, Nizam Coll, Baseerbagh, Hyderabad 500001). **Histopathological lesions cause by industrial effluents in kidney, liver and gills of fish Heteropneustes fossilis in Hussainsagar Hyderabad, India.** *Bull Pure Appl Sci*, **14A(2)** (1995), 57-64 [17 Ref] (Late Pub).

Study is aimed to assess the histological damage caused to the fish Heteropneustes fossilis by aquatic pollutants present in polluted waters of Hussainsagar. Light microscopic studies revealed severe histopathological changes in kidney, liver and gills due to the impact of pollutants. Histology of kidney showed degeneration of uriniferous tubules indicating impairment of normal functioning of kidney.

9801-152. Anitha Kumari S, Sree Ram Kumar N (Cell Molecular Bio Lab, Dept Zoo, Nizam Coll, Basheerbagh, Hyderabad 500001). **Histopathological alterations induced by aquatic pollutants in Channa punctatus from Hussainsagar lake (A.P.).** *J Environ Bio*, **18(1)** (1997), 11-16 [10 Ref].

Study is aimed to assess the histological damage caused to the fish *Channa punctatus* by various aquatic pollutants present in polluted waters of Hussainsagar. Light microscopic studies exhibited severe histopathological changes in the kidney, liver, gills, intestine and ovary due to the impact of the pollutants. The significance of the results was discussed in relation to physiological stress leading to the development of anaerobic conditions at the tissue level in pollutant stressed fish.

9801-153. Baishya Santanu (Oil India Ltd, Dullajan, Assam). **Brief analysis of accident pattern in the oil fields - a field study report.** *Indian J Indl Med*, **43**(1) (1997), 31-36.

A total of 389 work accidents that occurred during the five year period between 1989 to 1993, in the Oil fields of Assam and Arunachal Pradesh have been analysed here. The type of work encountered in the Oil-Fields Industry varies widely from heavy manual work to delicate work needing manual dexterity. Accidents occur in a wide variety of situations and affect a vital segment of the work force causing immense loss to the individual family, society and the nation, both in terms of money and manpower.

9801-154. Balasubramanian S, Pappathi R, Bose A Jayanthi, Raj SP (Dept Natural Resources Waste Recycling, Sch Energy Sci, Madurai Kamaraj Univ, Nladurai 625021). **Bioconcentration of copper, nickel and cadmium in multicell sewage fed fish ponds.** *J Environ Bio*, **18**(2) (1997), 173-179 [12 Ref].

Bioconcentration of copper, nickel and cadmium in the serially connected sewage fed fish ponds was studied for 300 days. In all ponds concentration of heavy metals was many fold higher in surfacial sediment than that of overlying water. The concentration of heavy metals in all fish species in all ponds was within the permissible limits for consumption.

9801-155. Baneljee Subhadra, Bhattacharya Shelley (Environ Toxicol Lab, Dept Zoo, Sch of Life Sci, Visva-Bharati Univ, Santiniketan 731235). **Histopathological changes induced by chronic nonlethal levels of elsan, mercury and ammonia in the liver of *Channa plectatus* (Bloch).** *J Environ Bio*, **18**(2) (1997), 141-148 [30 Ref].

Study documents pathologic changes in *Channa punctatus* treated with elsan, mercury and ammonia for 90 days. The hepatopathy caused by a chronic exposure to a no mortality level of elsan is highly significant. Degenerative changes in the

hepatopancreas of *Channa punctatus* exposed to heavy metal and ammonia could be characterized by vacuolation of the hepatocytes, pycnosis in many of the necrotic cells, necrosis of the exocrine pancreatic tissue and disintegration of the sinusoids.

9801-156. Bansal AK, Bhatnagar D*, Soni GL (*Sch Biochem, DA Univ, Khandwa Rd, Indore 452001). **Effect of N-nitrosodiethylamine on lipid peroxidation and antioxidant enzymes in rat liver mitochondria: protective role of antioxidants.** *Bull Environ Contam Toxicol*, **59**(2) (1997), 254-260 [24 Ref].

Investigation was undertaken to examine the effects of NDEA on LPO and the antioxidant defence enzymes in isolated rat liver mitochondria. Antioxidants were also added to mitochondrial incubations in order to establish the involvement of free radicals in NDEA-induced LPO.

9801-157. Battu RS, Singh Balwinder, Chahal KK, Kalra RL (Dept Entom, Punjab Agril Univ, Ludhiana 141004, Punjab). **Contamination of animal feed with residues of HCH and DDT.** *Pesticide Res J*, **8**(2) (1996), 172-175 [17 Ref].

Monitoring of 105 samples of different feeds from Punjab (India) revealed 100 and 80% contamination presence of residues of EHCH and EDDT respectively. Feed concentrate, straw and green fodder showed HCH residues upto 0.26, 2.28 and 0.69 mg kg⁻¹ and DDT residues upto 0.28, 6.70 and 0.35 mg kg⁻¹, respectively. The regulation of pesticide residues within the prescribed limits in animal feed of lactating animals has been suggested.

9801-158. Bhat PN, Pillai KC (Hlth Phys Div, Bhabha Atom Res Cent, Trombay, Bombay 400085). **Berylliums in environmental air, water and soil.** *Water Air Soil Polln*, **95**(1-4) (1997), 133-146 [15 Ref].

The study was specifically aimed to obtain concentration of beryllium in various environmental matrices such as air, water and soil in the vicinity of the Beryllium Metal Plant situated at Turbhe, New Bombay. Two analytical techniques using graphite furnace were standardised for beryllium estimation. The beryllium concentration in the natural matrices studied - air, water and soil were in the range of 0.41-0.43 ng m⁻³, 0.01-0.02 ng ml⁻¹ and 325-767 ng g⁻¹ respectively.

9801-159. Chakravarty Arunabha, Pal S, Das AK, Sukal P, Bhattacharyya Anjan, Adityachoudhury N (Dept Agricul Chem, Soil Sci, Fac Agric, Bidhan Chandra Krishi Viswavidyalaya, Mohanpur 74/252, Nadia, W. Bengal). **Monitoring of endosulfan residues in market fish samples.** *Pesticides Res J*, **8**(2) (1996), 164-167 [6 Ref].

A Elve year monitoring programme in respect of endosulfan residues in large (1 kg) and small (100-200 g) fishes collected from different markets of Calcutta and suburbs, showed contamination of 227 fishes out of the 346 sampled. The level of contamination ranged from 0.01 to more than 0.3 ppm.

9801-160. Chalam AV, Sasikala C, Ramana CV, Uma NR, Rao PR* (*Microbial Biotechno Lab, Dept Bot, Osmania Univ, Hyderabad 500 007). **Effect of pesticides on the diazotrophic growth and nitrogenase activity of purple nonsulfur bacteria.** *Bull Environ Contam Toxicol*, **58**(3) (1997), 463-468 [15 Ref].

The effects of some of the xenobiotic nitroaromatic compounds, haloaromatic compounds, antibiotics and s-triazine herbicides on APB have been studied. The effect of a herbicide, 2,4 dichlorophenoxyacetic acid (2,4-D); fungicides- captan carbendazim, and insecticides on the diazotrophic growth and nitrogenase activity of two purple nonsulfur bacteria, *Rhodobacter sphaeroides* and *Rhodospseudomonas palustris* isolated from paddy fields is discussed.

9801-161. Chattopadhyay BP, Jane Alam SK (Regl Occupl Hlth Cent (Eastern), 3, L Dr M. Ishaque Rd (Kyd St), Calcutta 700016). **Spirometric standards for ventilatory function of non-smokers and different graded of smokers of Calcutta.** *Indian J Environ Prot*, **16**(12) (1996), 889-899 [57 Ref].

Pulmonary function tests (PFT) of 50 normal non-smokers and 62 normal smokers of the age range of 20-58 year were investigated. The PFT values of the present study were compared with the earlier studies of our country and abroad. It has been found that the values of Americans, Jordanians and Canadians are superior than the present study. These difference might be attributable to the differences to their life style, physical activity, nutritional and environmental status, race and ethnicity. Besides these in smokers, smoking history is one of the pronounced factors to deteriorate the pulmonary function.

9801-162. Chatterjee S, Dutta AB, Ghosh R (Dept Anim Physio, Bose Inst, P-1/12, CIT Scheme VII-M, Calcutta 700054). **Impact of carbofuran in the oocyta maturation of catfish, *Heteropneustes fossilis* (Bloch).** *Arch Environ Contam Toxicol*, **32**(4) (1997), 426-430 [21 Ref].

Investigations were undertaken to observe the influence of technical grade carbofuran (CF) on the egg maturational process of catfish, *Heteropneustes fossilis* (Bloch). The degeneration of follicular walls, connective tissues and vacuolization in the ooplasm of the stage II and III oocytes were observed in CF-treated fish (0.5-2mg/L). It appears that CF at sublethal concentrations inhibits oocyte maturational processes in catfish.

9801-163. Chhaya J, Thaker J, Mittal R, Nuzhat S, Mansuri AP, Kundu R* (*Dept Biochem, Allahabad Univ, Allahabad 211002 U.P.). **Influence of textile dyeing and printing industry effluent on ATPases in liver, brain and muscle of mudskipper, *Periophthalmus dipses*.** *Bull Environ Contam Toxicol*, **58**(5) (1997), 793-800 [12 Ref].

The experimental animal of the present study *Periophthalmus dipses*, a euryhaline teleost inhabiting the coastal mudflats, is an important constituent of the coastal food chain and is occasionally consumed by the local Elsherfolks. Therefore, in the present study an attempt has been made to assess the dose and duration dependent toxicity of dyeing and printing industry effluent on a few ion dependent ATPases in liver, brain and muscular tissues of *P. dipses*.

9801-164. Chitra KY, Sree Ram Kumar N (Cell Molecular Bio Lab, Dept Zoo, Nizam Coll, Basheerbagh, Hyderabad 500001). **Effect of water pollution on peroxidase activity in fish, *Channa gachua*.** *J Environ Bio*, **18**(2) (1997), 191-194 [11 Ref].

Paper deals with the effect of water pollution on *Channa gachua* inhabiting the lake Hussainsagar. Electrophoretic and spectrophotometric studies on the enzyme from the kidney of the polluted water fish showed decreased enzyme activity when compared with the control fish. The enzyme activity assayed in tissues like heart, gills, liver, spleen and ovary/testis was also found to be low in fish from polluted waters when compared to that in the tissues of the control fish.

9801-165. Dube SN, Mazumdar PK, Kumar D, Purnanand (Div Pharmaco Toxico, Defence Res Dev Est, Jhansi Road, Gwalior 474 002). **Cardiorespiratory and neuromuscular effects of O-Ethyl S-[2-(Disopropylamino)] Ethyl Methylphosphonothioate (VX) in rats.** *Bull Environ Contam Toxicol*, **59**(2) (1997), 246-253 [17 Ref].

The effects on blood pressure, heart rate, tracheobronchial response, neuromuscular transmission, and modulatory role of various pharmacological agents were studied after systemic administration of VX (O-ethyl S- [2-(diisopropylamino) ethyl] methyl phosphonothioate) to delineate the distinction in mechanism of action from other OP compounds.

9801-166. Gautam RK, Parihar Ritesh (Dept Zoo, St John's Coll, Agra 282002). **Enzymological alteration in the liver and kidney of a freshwater teleost Heteropneustes fossilis after toxication with lead and mercury.** *Bull Pure Appl Sci*, **14A**(2) (1995), 101-104 [10 Ref] (Late Pub).

The toxic effect of lead nitrate (PbNO₃) and mercuric nitrate (HgNO₃) on the activity of the few enzymes in the liver and kidney of *Heteropneustes fossilis* have been analysed histo-chemically. Inhibited enzyme reactions suggested damage to the plasma membrane, lysosomes and endoplasmic reticulum.

9801-167. Ghosh SK, Doctor PB, Bhatnagar VK, Yadav S, Derasari A, Kulkarni PK, Kashyap SK (Natl Inst Occupl Hlth, Meghani Nagar, Ahmedabad 380016). **Response of three microbial test systems to pesticides.** *Bull Environ Contam Toxicol*, **58**(3) (1997), 482-488.

Investigation has been carried out using three microbial tests systems namely Microtox™ the Motility test and the Growth Zone Inhibition test in an attempt to assess the toxicity of selected pesticides.

9801-168. Gupta P, Kar A* (*Thyroid Res Unit, Sch Life Sci, Devi Ahilya Univ, Vigyan Bhawan, Khandwa Rd Campus, Indore 452001). **Role of testosterone in ameliorating the cadmium induced inhibition of thyroid function in adult male mouse.** *Bull Environ Contam Toxicol*, **58**(3) (1997), 422-428 [26 Ref].

Testosterone (17 β -hydroxy-4-androsten-3-one), the principal male androgen, is produced and secreted largely by testes. This has been shown to have antiperoxidative property against xenobiotics. Present experiment is designed to investigate the ameliorating effects of testosterone, if any, against Cd induced peroxidative tissue damage that ultimately leads to thyroid dysfunction.

9801-169. Gupta Sunita, Bakre PP (Dept Zoo, Univ Rajasthan, Jaipur 302004).

Histopathological studies of various organs of freshwater gastropod *Pila globosa* after treatment with lead acetate. *Indian J Environ Toxicol*, **6**(2) (1996), 67-71 [9 Ref].

Freshwater gastropod *Pila globosa* was treated with two different doses of lead acetate viz., 0.1 and 10 mg Pb/l for 60 days and examined for histopathological changes in different body tissues. The results of adverse effects noticed have been discussed in the light of its effects at cellular level.

9801-170. Hota Satyajit (PG Dept Zoo, Gangadhar Meher Coll, Sambalpur 768001).

Arsenic toxicity to the brain, liver and intestine on a fresh water fish, *Channa punctatus* (Bloch). *Geobios*, **23**(2-3) (1996), 154-156 [9 Ref].

Heavy metals enter into aquatic inhabitant by a number of routes and cause hazardous effect on their morphology and physiology. Communication reports the alterations in certain biochemical parameters in the liver, brain and intestine in response to prolonged exposure to sublethal concentrations (5 ppm) of arsenic in freshwater fish, *Channa punctatus*.

9801-171. Jayasree R, Sarmma AV (Dept Marine Bio, Microbio Biochem, Sch Marine Sci, Cochin Univ Sci Techno, Cochin 682016). **Effect of pesticide and heavy metals on growth of marine yeasts *Candida parapsilosis* and *Debaryomyces hansenii*.** *Indian J Marine Sci*, **25**(4) (1996), 373-375 [14 Ref].

Two marine yeasts, *Candida parapsilosis* and *Debaryomyces hansenii* were found to be capable of growth in presence of the organophosphorus pesticide, Ekalux EC 25. They utilized the pesticide as a source of phosphorus, suggesting their role in degradation of organophosphorus pesticides. They were found resistant to the heavy metals tested. This study shows the potential of marine yeasts for biodegradation of organic compounds entering in the aquatic system.

9801-172. Joshi TK, Mandal A (Cent Occupl Environ Hlth, Maulana Azad Medl Coll, New Delhi). **Benzene toxicity in health care setting - a case report.** *Indian J Indl Med*, **43**(1) (1997), 18-22 [9 Ref].

A senior professor in Maulana Azad Medical College (MAMC) was recently discovered having symptoms and signs of benzene overexposure. The investigations revealed changes in blood in the form of low haemoglobin, a platelet count within normal range but towards the lower side, and a depression of complement C3 expression. Her total and differential white cell count otherwise was within normal range but lymphocytes showed a blastoid transformation.

9801-173. Kale SP, Murthy NBK, Raghu K (Nuclear Agric Div, Bhabha Atom Res Cent, Trombay, Mumbai 400025). **Studies on degradation of ¹⁴C-Nitrofen in soils under moist and flooded conditions using a continuous flow system in the laboratory.** *Bull Environ Contam Toxicol*, **59**(1) (1997), 72-75 [13 Ref].

The pesticides applied to the soil interact with natural biological systems. In this paper continuous flow system has been used to study the fate of nitrofen (2,4-dichloro-4'-nitro diphenyl ether) in soil. This herbicide was used in rice cultivation till recently. Since a major part of rice crop is grown under flooded conditions in India, paper reports the studies under flooded conditions as well.

9801-174. Karnik AB, Suthar AM, Patel MM, Pandya CB, Sadhu HG, Venkaiah K, Kashyap SK, Nigam SK (Natl Inst Occupl Hlth, Meghani Nagar, Ahmedabad, 380016). **Immunological and biochemical studies in workers exposed to inorganic mercury in chloralkali plant.** *Indian J Indl Med*, **43**(1) (1997), 4-6 [4 Ref].

Serum samples of SS workers exposed to inorganic mercury in a chloralkali plant were studied for biochemical and immunological parameters which included circulating immune complexes (CIC) and complements. The blood and urine mercury levels showed a strong significant correlation ($r = 0.88$) in the workers with oral morbidity. Correlation between blood and urine mercury levels, serum creatinine and blood mercury, alongwith alterations in CIC of immunoglobulins has a relation with oral morbidity group predominantly, than the groups made on the basis of exposure criteria.

9801-175. Kasthuri J, Chandran MR (Dept Animal Sci, Sch Life Sci, Bharathidasan Univ, Tiruchirappalli 620024). **Sublethal effect of lead on feeding energetics, growth performance, biochemical composition and accumulation of the estuarine catfish, *Mystus gulio* (Hamilton).** *J Environ Bio*, **18**(1) (1997), 95-101 [40 Ref].

Sublethal concentration of lead (Pb) on three different size groups of the estuarine catfish *Mystus gulio*, lead to decreasing trend in feeding energetics, growth rate and biochemical composition when compared to their respective controls. Of the three size groups, fingerlings seemed to be more sensitive to Pb poisoning followed by the immature and then by the mature fish.

9801-176. Kaur K, Ansal MD (Dept Fisheries, Punjab Agricul Univ, Ludhiana 141004). **Relative toxicity of some organophosphate pesticides to predatory copepod, *Mesocyclops* spp.** *Indian J Eco*, **23**(2) (1996), 133-135 [6 Ref].

Carp fry prefer rotifers as food over other zooplankton, cladocerans and copepods. Further, being predacious some cyclopoid copepods and cladocerans cause heavy mortality in carp nursery ponds. Experiments were carried out to evaluate effective concentrations of three organophosphate pesticide, viz., phosphamidon (82.5% EC), fenitrothion (50% EC) and fenthion (80% EC), required to eradicate predacious copepods in nursery ponds during rearing period (August - October) of Indian major carps fry in Punjab.

9801-177. Kavian Mahavash F, Ghatnekar Gutam S, Ghatnekar Mandar S, Ghatnekar Sudhir D (Biotechno Resource Cent, G/1, Adinath Shaikh Mistry Road, Antop Hill, Mumbai 400037). **Gamma irradiations and the fate of two earthworm species.** *Eco Env Conserv*, **2**(3&4) (1996), 125-126 [11 Ref].

Effect of low and high doses of gamma irradiation on mortality and hatchability rates of two different genera of earthworms viz. *L. rubellus* (USA) and *P. elongata* (Badlapur) are presented. Results suggests that in the either case of earthworm genera studied the mortality increases and hatchability reduces with the increased doses of gamma irradiation. Both individuals of *L. rubellus* (USA) and *P. elongata* (Badlapur) died instantly when treated with 200 kr of gamma irradiation. There has been considerable pollution of soil by radioactive fallout, and it has been suggested that the dispersal of

radioactive contaminants in soil is accelerated by the ability of living organisms to accumulate isotopes in their tissues, there is evidence that worms were important in dispersing radioisotopes [^{60}Co] through soil.

9801-178. Khillale YK (Dept Zoo, Dr Babasaheb Ambedkar Marathwada Univ, Aurangabad 431004). **Effect of pollutants on mortality and reproduction in freshwater fish-Puntius stigma.** *J Nature Conserv*, **8**(1) (1996), 101-111 [35 Ref].

Puntius stigma was exposed to pesticides, organochlorine, organophosphates and carbamates) for 96 hours at different concentrations. In the biochemical observations, the ascorbic acid level found increased at all the concentrations. Further studies like level of progesterone and testosterone in gonads, release of hormone and functioning of pituitary gland in this relation are in progress. In over all studies, it is found that the organochlorine found more toxic than organophosphate and carbamate.

9801-179. Kiran Ravi, Gera Rajiv, Aggarwal Sita (Dept Biochem, Punjab Univ. Chandigarh 160014). **Biochemical studies on aldicarb toxicity in female rats.** *Eco Env Conserv*, **2**(3&4) (1996), 165-167 [19 Ref].

The effect of oral administration of aldicarb (0.15 mg/kg body weight) for 11 days was studied on female rats. Erythrocyte acetylcholinesterase was much less susceptible to aldicarb toxicity as compared to serum enzyme. Activities of erythrocyte aldolase and glucose-6-phosphate dehydrogenase decreased, while the activities of erythrocyte lactate dehydrogenase and glutathione reductase were elevated. An increase was observed in the protein content of erythrocyte membrane. Activities of $\text{Na}^+ - \text{K}^+$ and $\text{Mg}^{++} - \text{ATPases}$ were found to be decreased.

9801-180. Krishnamoorthy P, Subramanian P (Dept Anim Sci, Sch Life Sci, Bharathidasan Univ, Tiruchirapalli 620024). **Effect of sublethal doses of copper on the hepatopancreas of the fresh water prawn, Macrobrachium lamarrei lamarrei.** *Geobios*, **23**(1) (1996), 16-18 [8 Ref].

Macrobrachium lamarrei lamarrei was exposed for two sublethal doses of copper. After 15 days, hepatopancreas was dissected out and analysed for histopathological changes. In 0.0065 ppm, the cells were elongated and highly vacuolated, whereas in 0.0215 ppm cells shrunk and encountered high damage.

9801-181. Kumar Sunil, Nath Akhileshwari (PG Dept Zoo, Patna Univ, Patna 800005). **Study of the changes in diameter of seminiferous tubules upon different oral doses of malathion of mice.** *Int J Mendel*, **14**(1&2) (1997), 27-29 [7 Refl].

Paper incorporate the summary of changes in the diameter of seminiferous tubules of testes of mice as a parameter to study degenerative changes upon different doses and duration of malathion treatment. Different sublethal oral doses of malathion causes degeneration of the seminiferous tubules leading to the decrease in the diameter of the seminiferous tubules accompanied by increase in interstitium and oedematous fluid.

9801-182. Kumaran K, Suseela Devi L (Dept Soil Sci Agricul Chem, Univ Agricul Sci, Bangalore 560065, Karnataka). **Adsorption desorption of atrazine in some selected soils of Karnataka.** *Pesticides Res J*, **8**(2) (1996), 146-151 [11 Ref].

Behaviour of atrazine in Devanul; Vijayaputra and Arikunte soil series of Karnataka revealed that the addition of organic amendment increased adsorption but the desorption was decreased. Not only native organic matter but also the nature of organic colloidal fractions determined the atrazine behaviour in soils.

9801-183. Kumaraswamy S, Rath AK, Bharti K, Ramakrishnan B, Sethunathan N* (*Centl Rice Res Inst, Cuttack, 753006). **Influence of pesticides on methane oxidation in a flooded tropical rice soil.** *Bull Environ Contam Toxicol*, **59**(2) (1997), 222-229 [16 Ref].

Pesticides, insecticides in particular, are increasingly used in rice culture. Studies indicate that most pesticides used in agriculture and public health, at recommended levels and intervals, are seldom toxic to many transformations of importance to soil fertility and environmental safety. But, recent reports have shown that certain commonly used insecticides such as hexachlorocyclohexane (HCH) and carbofuran effect stimulation or inhibition of certain important biochemical transformations in flooded soil, even at recommended levels.

9801-184. Maheswari SL, Selvarajan VR (Dept of Pharmacology Environ Toxicology, Dr. ALM. PG Inst of Basic Med Sci, Univ Madras, Taramani, Madras 600113). **Phosalone effect**

on carbohydrate metabolism in nervous system of the edible crab *Scylla serrata* (Forsk.). *J Environl Bio*, **18**(2) (1996), 195- 199 [17 Ref].

Study evaluates the effect of phosalone on carbohydrate metabolism in different regions of the nervous system of an edible crab *Scylla serrata*. Decrease in glycogen concentration and increase in protein bound sugars with no significant change in free sugar level indicate that phosalone alters carbohydrate metabolism. Phosalone also inhibits in vitro oxygen utilization by crab neural tissues.

9801-185. Malve SP, Dhaga SS (Inorganic Chem Dept, Inst Sci, Bombay 400032).

Nitrate: an environmental pollutant. *Everyman's Sci*, **31**(5) (1996-97), 158-164 [57 Ref].

A number of eopidemiological studies had correlated the intake of excessive nitrates with occurence of gastric cancer and also formation of congenital malformations. It is assumed that nitrate gets reduced to nitrite in gastro-intestinal track due to microbial activity and nitrite formed reacts with secondary amines and amides producing carcinogenic N - nitroso compounds.

9801-186. Manavalaramanujam R, Ramesh M (Unit Polln Bio, Dept Zoo, Bharathiar Univ, Coimbatore 641046). **Sublethal toxicity of phosalone on transaminases of a freshwater fish *Labeo rohita***. *Eco Env Conserv*, **2**(3&4) (1996), 179-181 [15 Ref].

Paper reports sublethal toxicity of phosalone on transaminases of a freshwater fish *Labeo rohita*. The Glutamate Pyruvate Transaminase (GPT) registered an increase in gills and heart after several days showing a percent increase of 1400 and 58. So But liver exhibited the maximum increase in its GOT activity after 8 days.

9801-187. Mary Chandravathy V, Sreedevi V, Reddy SLN (Dept Zoo, Osmania Univ, Flyderabad 500007). **Haematological alterations induced by lead nitrate in adult male Swiss albino mice**. *J Env Polln*, **3**(3&4) (1996), 207-209 [13 Ref].

Adult swiss albino mice, aged one year, were administered 0.25% of lead nitrate through drinking water for 21 days. After the exposure blood was collected to study various haematological parameters. Observations revealed significant reduction in RBC,

Hb, PCV. The increase in MCV, MCH and MCHC values exhibited reciprocal relationship with changes in RBC, Hb and PCV levels.

9801-188. Mishra CK, Hakim A, Kumar J, Tiwari KN (Kept Zoo, Maharaja Coll, Ara). **Toxic impacts of two organophosphorous pesticides on the fish *Channa punctata* (Bl), behaviour and mortality studies.** *J Freshwater Bio*, **8**(1) (1996), 39-45 [25 Ref].

Static bioassay tests were conducted on *Channa punctatus* to evaluate the toxicity of two common organophosphorous pesticides (Monocil and Diazinon). For 24 hrs. LC50 values were calculated. Monocil (LC50 0.0378+0.0004%) was about 10 times less toxic to Diazinon (LC50 0.0039+0.0004%). Alteration in behaviour of fishes have been discussed.

9801- 189. Nageswara Rao MV, Srivastava KL, Vaya VK (Defence Lab, Res Dev Orgn, Jodllpur 342011). **Measurement of radioactivity in Pipliya - 2 meteriorite : a preliminary study.** *Indian J Environ Prot*, **16**(11) (1996), 847-849 [4 Ref].

Attempt has been made to detect and quantify the radionuclides present in the meteriorite samples. It has been observed that no radionuclides of cosmogenic origin are present in the sample. Also the levels of natural radionuclides are very low.

9801-190. Nanda Prasanta (Dept Zoo, LN Coll, Jharsuguda 768202). **Nickel toxicity to liver and brain of catfish *Heteropneustes fossilis* (Bloch).** *Env Eco*, **15**(2) (1997), 329-331 [13 Ref].

Nickel induced changes in the biochemical parameters of liver and brain of *Heteropneustes fossilis* (Bloch) when exposed to 11, 20, 29 and 38 ppm of the metal protein and ascorbic acid decreased indicating stressful condition. Increase in cholesterol indicates hepatic disfunction.

9801-191. Noor Alam Md, Shafi Md, Sinha MP (Giridih Coll, Giridih 815301, Bihar). **Histopathological lesions induced by metacid 50 in the fingerlings of a carp - *Labeo rohita* Ham.** *J Env Polln*, **3**(3&4) (1996), 163-168 [14 Ref].

Exposure of the larval (fingerling) specimens of *Labeo rohita* in sublethal concentration of Metacid exposed for 48 hours showed the occurrence of histopathological lesions in varying intestines in the gill tissues and internal organs. The alterations reflected adversities in the respiratory, general metabolic, renal, osmoregulatory and digestive activities of the larval form of *L. rohita*.

9801- 192. Pandit GK, Bhattacharya A, Bose AK, Bandyopadhyay D, Das AK, Adityachaudhulz N (Pesticide Residue Lab, Dept Agricul Chem Soil Sci, Bidhan Chandra Krishi Viswavidyalaya, Mohanpur 741252, Nadia, W. Bengal). **Persistence of a-cypermethrin in cabbage and monocrotophos in three soils of West Bengal.** *Pesticide Res J*, **8**(2) (1996), 132-138 [10 Ref].

In a field trial to evaluate the persistence of a-cypermethrin, cabbage crop was sprayed with 30.45 and 60g a.i. ha⁻¹ resulting in corresponding initial deposits of 0.349, 0.565 and 0.736 ppm in cabbage head and 0.110, 0.170 and 0.228 ppm in the cropped soil respectively. Residues readily dissipated and went beyond detection on 20 d after application in cabbage head and 10 d in cropped soil samples irrespective of the treatment dose.

9801-193. Parikh JR, Rao Mohan N, Sadhu HG, Malvankar MG, Patel BD, Shak AR, Majumdar PK (Natl Inst Occupl Hlth, Meghani Nagar, Ahmedabad, 380016). **Relationship between FEV1% ratio and percentage of predicted FEV, obtained by two different regression equations -a study among cotton textile workers.** *Indian J Indl Med*, **43**(1) (1997), 11-13 [7 Ref].

Airways obstruction is an important feature of workers exposed to cotton dust. Airways obstruction can be diagnosed by FEV1% ratio as well as percentage of predicted FEV1 using different regression equations. The study results suggest that regression equation of the same population gives a better indication of an obstructive abnormality and therefore, its use is more desirable whenever available.

9801-194. Patel RB, Patel BK, Shah PG, Raj MF, Patel JA (AICRP on Pesticide Residues, Tobacco Proj, Gujarat Agricul Univ, Anand Campus, Anand, Gujrat). **Dissipation of fluchloralin in soils and its residues in chiory.** *Pesticides Res J*, **8**(2) (1996), 182-185 [6 Ref].

The degradation and persistence of fluchloralin are reported in field in sandy loam and loamy soils. Pre-plant incorporation of the herbicide @ 0.67, 0.90 and 1.35 kg a.i. ha⁻¹ showed somewhat longer persistence in the loamy soil. The half-life values in both the soils ranged between 42.4 to 45.6 days.

9801-195. Patil Manohar (Luqman Coll Sci, Gulbarga 585104). **A comparative study of brain acetylcholine content and acetylcholinesterase activity of the fish, *Notopterus notopterus* (Pallas) in two different bodies of water.** *J Env Polln*, **3**(3&4) (1996), 135-137 [10 Ref].

Deals with the brain acetylcholine content and acetylcholinesterase activity of the fish, *Notopterus Motopterus* (Pallas) of two different aquatic bodies having different level of pollution.

9801-196. Ponmani R, Dhanakhodi B (Dept Zoo, Kongunadu Arts Sci Coll, Coimbatore 641029). **Bioaccumulation and elimination of endosulfan in *Cyprinus carpio*.** *J Env Polln*, **3**(3&4) (1996), 191-194 [7 Ref].

The residue level of a and B isomers of endosulfan in the body of fish was gradually increasing with the time of exposure to several sub-lethal concentrations of the pesticide. There was positive relationship between the rate of accumulation and the concentration of the toxicant as well as the period of exposure. Slow and steady elimination of pesticide residue was observed during the period of maintenance of fish in clean water:

9801-197. Pugazhendi S (Dept Bot, Lady Doak Coll, Madurai 625002, Tamil Nadu). **Voltametric study of copper complexes in marine phytoplankton.** *J Env Polln*, **3**(3&4) (1996), 143-146 [10 Ref].

The application of differential pulse anodic stripping voltammetry (DPASV) in the two selected marine phytoplankton *Isochrysis galbana* Parke and *Synechocystis salina* Wislouch, is indicative of the existence of copper complexes in both the forms. It also confirms a greater and quicker adsorption of copper ions in the cells of *S. salina* than in the flagellate *I. galbana*.

9801-198. Rajwanshi Poonam, Singh Vibha, Gupta MK, Kuniari Vinita, Shrivastava Rohit, Ramanamurthy M, Dass Sahab (Dept Chem, Fac Sci, Dayalbagh Ednl Inst, Dayalbagh, Agra 282005, UP). **Studies on aluminium leaching from cookware in tea and coffee and estimation of aluminium content in toothpaste, baking powder and paan masala.** *Sci Total Env*, **193**(3) (1997), 243-249 [37 Ref].

Studies were conducted in order to assess the level of aluminium (Al) in samples of Indian tea, coffee, toothpaste, paan masala (mouth freshener) and baking powder. Tea leaves, were found to be a rich source of Al and a maximum of 2.2% Al is extracted in tea infusions. Coffee powder on the other hand was not found to be a rich source of Al. Baking powder was found to be a rich source of Al and 1 kg of cake prepared with 1-3 teaspoon of baking powder may contain 2-12.7 mg of Al in each serving (25g). Toothpaste also contains a significant quantity of Al, more so, when packed in Al tubes. Ingestion pattern of Al from these items by humans is also discussed.

9801-199. Ramakrishna VVS, Singh Vivek, Garg AN* (*Dept Chem, Nagpur Univ, Nagpur 440010). **Occupational exposure amongst locomotive shed workers and welders using neutron activation analysis of scalp hair.** *Sci Total Env*, **192**(3) (1996), 259-267 [36 Ref].

Elemental analysis of scalp hair of locomotive shed workers and industrial welders was used to study occupational exposure. Instrumental neutron activation analysis (INAA) was used for the determination of 17 elements. Most elements show normal distribution at 95% confidence level. Further statistical significance was tested by correlation coefficient and regression coefficients (r^2). Comparison of mean elemental data for the present population around Nagpur city matches well with the reported data for Bombay and Delhi. Comparative data from other countries are also presented.

9801-200. Ramesh AM, Gupta TRC (Chandrakant Lingdhal & G. Gangadhara Gowda Coll Fisheries, Mangalore 575002, Karnataka). **Toxicity of mercury on developmental stages of common carp *Cyprinus carpio* (Linn).** *J Env Polln*, **3**(3&4) (1996), 169- 172 [12 Ref].

Different developmental stages of common carp, *Cyprinus carpio* (Linn.), were exposed to the mercury stress with mercuric chloride. Hatching time of eggs was reduced by 2 to 4 hours depending on the concentration of mercury when compared to that with control. The results show that the tolerance of common carp to mercury increases with the development of fish. Behavioural changes of test organisms under stress were also noticed.

9801-201. Rana SVS, Kumar Sunil (Toxico Lab, Dept Zoo, CCS Univ, Meerut 250005). **Histopathological studies on the liver of rats treated individually and with a combination of xylene, toluene and methyl alcohol.** *J Environ Bio*, **18**(2) (1997), 185-190 [14 Ref].

An attempt has been made to study the histological and ultrastructural changes in the liver of rats caused by individual and combined treatment of three industrial solvents viz. xylene, toluene and methyl alcohol, Results show that methyl alcohol is more hepatotoxic than xylene and toluene. It is concluded that a weak interaction takes place at the site of their metabolism expressed as weak antagonism.

9801-202. Rana SVS, Verma S (Toxico Lab, Dept Zoo, Ch, Charan Singh Univ, Meerut 250004). **Protective effect of GSH, a-tocopherol, and selenium on lipid - peroxidation in liver and kidney of copper fed rats.** *Bull Environ Contam Toxicol*, **59**(1) (1997), 152-158 [17 Ref].

Paper describes the effects of GSH, vitamin E and selenium on lipid peroxidation in the liver and kidney of copper treated rats. Simultaneous effects on copper accumulation and glutathione cycle have been described in this communication.

9801-203. Ranjitsingh AJA, Padmalatha C, Murugesan AG (Sri Paramakalyani Coll, Alwarkurichy 627412). **The usefulness of *Indoplanorbis exustus* D. as a biological indicator in toxicological bio-assays.** *J Freshwater Bio*, **8**(1) (1996), 33-38 [15 Ref].

Short and longterm studies with an organophosphorus pesticide, malathion were carried out on the freshwater snail (*Indoplanorbis exustus* D.) to test the usefulness of this organism as a biological indicator of pesticide pollutants in surface water. Based on mortality and immobilization in the short term study (48 hrs), an EC 50 value of 40 1g/l malathion could be determined. In the long term study (70 days) an inverse time

independent relation was found between egg production rate (number of eggs produced per unit of time) and the malathion concentration in the water. The egg production was found much affected in 1.6 zg/l malathion dose.

9801-204. Rao MV, Prasannalata SN, Patil Gayatri R (Dept Zoo, Univ Sch Sci, Gujarat Univ, Ahmedabad 308008). **Effects of mercury and selenite interaction on the mouse testis and sperm.** *Indian J Environ Prot*, **6**(2) (1996), 60-62 [20 Ref].

Short term individual i.p. administration of mercuric chloride and sodium selenite to mice induced changes in testicular enzymes, proteins, sialic acids, ascorbate, glutathione and cholesterol levels, indicating altered testicular metabolic activity. However; these effects were not observed in animals injected simultaneously with sodium selenite and mercuric chloride. It is observed that the interaction of selenite and mercury plays a role in compensating their individual effects through multiple mechanisms.

9801-205. Sahoo G, Sahoo RK, Mohanty Hejmadi P (Regl Res Lab, Coun Scient Indl Res, Bhubaneswar 751013). **Distribution of heavy metals in the eggs and hatchlings of olive ridley sea turtle, *Lepidochelys olivacea*, from Gahirmatha, Orissa.** *Indian J Marine Sci*, **25**(4) (1996), 371-372 [11 Ref].

Shell and yolk-albumen of fresh eggs, hatched egg shells and newly emerged hatchlings of olive ridley sea turtle, *Lepidochelys olivacea*, along with eight nesting beach sand samples showed higher iron, zinc and lead concentrations than cobalt, chromium, copper and nickel. Beach and samples recorded higher values of all metals than the egg components.

9801-206. Sampath K, Elango P (Dept Zoo, V.O. Chidambaram Coll, Tuticorin 628008). **Lipid metabolism in common frog (*Rana tigrina*) exposed to carbaryl.** *J Environ Bio*, **18**(1) (1997), 23-26 [9 Ref].

The sublethal (400 mg/kg) and median lethal (640 mg/kg) doses of carbaryl on *Rana tigrina* for 96 hours were determined and their toxic effect on lipid and cholesterol levels in liver, kidney, muscle and intestine were studied. Cholesterol level was also studied in blood at the same period. Both treatments resulted in decreases in cholesterol through blood was observed.

9801-207. Shanmugasundaram R, Pugazhendi N, Lakshmanan C, Chidambaram Pillai S (PG Dept Bot, V.O. Chidambaram Coll, Tuticorin 628008). **Effect of certain pesticides on nitrate reductase activity of four species of marine angiosperms.** *J Env Polln*, **3**(3&4) (1996), 139-141 [18 Ref].

Effect of quinolophos, dimethoate and cypermethrine on Nitrate Reductase activity (NRA) of *Halodule uninervis*, *Halophila ovata*, *Cymodocea serrulata* and *Syringodiurn1 isoetifoliurn* were investigated. Dimethoate inhibits NRA in all four species. Quinolophos and Cypermethrin showed a positive effect on NRA in *H. ovata*.

9801- 208. Sharma LL, Saxena PN (Toxico Lab, Dept Zoo, Inst Basic Sci, Agra Univ, Khandari Campus, Agra 282002). **Carbaryl induced haematological changes in *Columba livia Gmelin*.** *J Environ Bio*, **18**(1) (1997), 17-22 [17 Ref].

Carbaryl was intramuscularly administered to blue rock pigeons at 900 mg/kg body weight for one day acute treatment and at 225 mg/kg body weight for four weeks chronic treatment to study its effect on the haematological parameters. The pesticide caused a significant decrease in the total erythrocyte count in chronically treated pigeons and hypohaemoglobinemia in both acute and chronically treated pigeons.

9801-209. Singh Alaknanda, Datta Munshi JS (PG Dept Zoo, Bhagalpur Univ, Bhagalpur 812007). **Scanning electron microscopic evaluation of the effects of short and long-term exposure of copper and mercury on the gills of *Channa punctata* (Bloch).** *J Freshwater Bio*, **8**(1) (1996), 51-55 [19 Ref].

Bioassay of two heavy metals, copper and mercury was carried out for 96h on *Channa punctata*. Fishes were exposed for 24h, 96h and 360h to sublethal doses (1/3 of LC50) of copper and mercury. Loss of microridges, fusion and thickening of gill lamellae, increased production of mucus were some of the effects observed.

9801-210. Singh KK, Kumar R (Off Proj Dir (Res) (Agric Soil Sci), Krishi Bhawan, Bikaner 334001, Rajasthan). **Pre-concentration of malathion present in water of trace level.** *Acta Ecologica*, **18**(2) (1996), 107-111 [6 Ref].

Columns packed with polyurethane foam plug, charcoal activated, alumina, resin (Dowex-50) have been tried to preconcentrate malathion from dosed water samples. Polyurethane foam plug was found to be the best method of preconcentration.

9801-211. Singh RP, (Lab Soil Sci, Dept Bot, Fac Life Sci, Aligarh Muslim Univ, Aligarh 202002, UP). **Adsorption, movement and distribution of carbofuran in different soils.** *Pesticide Res J*, **8**(2) (1996), 139-145 [20 Ref].

Adsorption and movement of carbofuran was studied with three different soils (silt loam, loam and sandy loam) of alluvial origin. Carbofuran movement, in air dried and water saturated soil columns, by leaching the soil with distilled water was in reverse order of adsorption for all the soils studied. A heavy rainfall such as 915.54, 776.22 and 640.87 cm will be needed to leach carbofuran to 152 cm depth in silt loam, loam and sandy loam soils, respectively in field conditions.

9801-212. Singhal RN, Jain M (Dept Zoo, Kurukshetra Univ, Kurukshetra 136119). **Cadmium-induced changes in the histology of kidneys in common carp, *Cyprinus carpio* (Cyprinidae).** *Bull Environ Contam Toxicol*, **58**(3) (1997), 456-462 [11 Ref].

Cadmium is important because of its use in various industrial processes, and as a by product of zinc mining, fossil fuel, base metal smelting, combustion and atmospheric transport. The fish *Cyprinus carpio communis* offers some unique experimental advantages for the study of cadmium renal toxicity due to its tolerance to temperature variations, toughness and biennial breeding. The natural level of cadmium - a stable non-volatile element, varies from 0.1 to 10 µg/l in freshwater. However; anthropogenic processes discharge can increase this level from 50 µg/l to 10 00 000 µg/l.

9801-213. Sinha N, Narayan R, Saxena DK (Embryotoxic Div, Indl Toxicol Res Cent, P.B. No. 80, Lucknow 226001). **Effect of endosulfan on the testis of growing rats.** *Bull Environ Contam Toxicol*, **58**(1) (1997), 79-86 [22 Ref].

Endosulfan, a chlorinated cyclodiene compound is used worldwide as insecticide & acaricide for the control of various pests in agriculture. Paper studies the effect of various doses of endosulfan on growing rats from weaning to 90 days of age to see the effect of this pesticide on the testis attaining sexual maturity.

9801-214. Sivakumari K, Manavalaramanujam R, Ramesh M, Lakshmi R (Unit Polln Bio, Dept Zoo, Bharathiar Univ, Coimbatore 641046). **Cypermethrin toxicity: Sublethal effects on enzyme activities in a freshwater fish, *Cyprinus carpio* var. *communis*.** *J Environ Bio*, **18**(2) (1997), 121-125 [17 Ref].

Enzyme modulation by sublethal concentrations of cypermethrin, a synthetic pyrethroid was examined in heart, liver and kidneys of fish, *Cyprinus carpio*. The activity of GOT, GPT and LDH showed marginal changes over that of their control values. The above difference might be due to the cumulative toxic effect of cypermethrin.

9801-215. Srivastava Arun K, Roy D, Sinha R, Singh ND, Srivastava SJ (Dept Zoo, 3MM Town PG Coll, Ballia 277001). **Dyes induced changes in the haematological parameters of a freshwater catfish *Heteropneustes fossilis*.** *Eco Env Conserv*, **2**(3&4) (1996), 155-158 [30 Ref].

The fish *Heteropneustes fossilis* was exposed to various concentrations of two dyes, malachite green and fuchsin basic for acute, short and long terms. A significant decreasing tendency has been observed in RBC, Hb and Hct percentage, while the values of total WBC and clotting time showed increasing trend in the fish treated with both the dyes at different time intervals. However, at lower concentrations during short and long term exposure to fuchsin basic did not show any changes in haematological parameters in comparison to the control fish.

9801-216. Surendra Nath B, Sathyanarayana Raju Ch, Suresh A, Surendra Kumar RP (Dept Zoo, Sri Krishnadevaraya Univ, Anantapur 515003). **Toxic impact of organophosphorus insecticides on the growth and economic characters of the silkworm, *Bombay mori* L.** *J Environ Bio*, **18**(2) (1997), 181-184 [17 Ref].

Effects of widely using commercial grade organophosphorus insecticides namely fenitrothion and ethion on growth and economic characters of the silkworm, *Bombyx mori* were studied. Result showed reduced growth, single cocoon weight, single shell weight, silk index and filament length than in the appropriate controls. The reduction was comparatively more lethal intoxication than in the sublethal intoxication (lethal sublethal). Ethion seems to be more effective than the fenitrothion on growth and economic characters of the silkworm.

9801-217. Swaranlatha CD, Ramamurthi R (Pesticide Indl Toxicol Cent, Dept Zoo, Sri Venkateswara Univ, Tirupati 577502, AP). **In vitro effect of cadmium chloride on the ATPase system of kidney in albino rats.** *Bull Pure Appl Sci*, **14A(2)** (1995), 91-95 [19 Ref] (Lat pub).

Different concentrations of cadmium chloride ranging from 4 to 40 μ M were added to the reaction mixture of the ATPase system and the activity levels of the ATPase were assayed in both medulla and cortex of kidney in albino rat (Wistar strain) because of their differential functional activity. Cadmium chloride inhibited ATPases in concentration dependent manner in both medulla and cortex.

9801-218. Tripathi AK, Tripathi IP, Singh RC, Singh R (Mahatma Gandhi Gramoday Vishwavidyalaya, Inst Environ Sci, Chitrakoot, 485331, Satna). **Fluoride distribution in ground water at and around Chitrakoot.** *Indian J Environ Prot*, **16(11)** (1996), 805-807 [11 Ref].

Some people of Chitrakoot area are affected by teeth problems. Considering this problem, samples have been analysed for different parameters with special emphasis given to the presence of fluoride content. Fluoride content in ground water varies from 2.7 to 1.3 mg/l. On the basis of fluoride content the area has been divided into three zones, namely safe, slightly problematic and problematic.

9801-219. Umamaheswari A, Madhavi DR, Venkataswarlu K* (*Dept Microbio, Sri Krishnadevaraya Univ, Anantapur 515003). **Siderophore production in two species of Nostoc as influenced by the toxicity of nitrophenolics.** *Bull Environ Contam Toxicol*, **59(2)** (1997), 306-312 [25 Ref].

The study undertakes to establish the nontarget effects of selected nitrophenols and p-nitrosophenol (PSNP) and p-aminophenol (PAP), the reduction metabolites of PNP towards two soil isolates of cyanobacteria, *Nostoc muscorum* and *Nostoc linckia* employing siderophore production as the toxicity criterion, and also to determine whether glucose or succinate amendment at 0.5% and addition of 10 μ M adenosine triphosphate (ATP) would annul the toxicity by the selected phenolics on siderophore accumulation.

9801-220. Varadaraj G, Muralidharan S, Subramanian MA (PG Res Dep Zoo, Chikkaiah Naicker Coll, Erode 638004). **Impact of tannery effluent on protein utilization in *Oreochromis mossambicus* (Peters).** *Env Eco*, **15**(2) (1997), 307-310 [14 Ref].

Fresh water fish *Oreochromis mossambicus* were reared in different sublethal concentrations of tannery effluent for 30 days. Various protein utilization parameters and protein conversion efficiencies in gills, intestine, liver and muscle of the fish exposed to effluent were estimated. The protein consumption, apparent digestibility and conversion efficiency were found to decrease significantly in fish at the tannery effluent stress.

9801-221. Vasanthakumari V, Nalini R, Devaraj H, Devaraj SN* (*Dept Zoo, Unit Biochem, Univ Madras, Guindy Campus, Madras 600025). **Cytotoxicity of methacrylonitrite.** *Bull Environ Contam Toxicol*, **59**(2) (1997), 274-278 [18 Ref].

Liver is an organ of particular importance in toxicological research and it is the most frequently used tissue in carcinogenesis bioassay. The use of an *in vitro* hepatic system for toxicity studies has received increasing attention in recent years. Freshly isolated suspensions and primary cultures of hepatocytes represent the most popular models.

9801-222. Venugopal NBRK, Ramesh TVDD, Reddy DS, Reddy SLN (Dept Zo, Osmania Univ, Hyderabad 500007). **Effect of cadmium on antioxidant enzyme activities and lipid peroxidation in a freshwater field crab, *Barytelphusa guerini*.** *Bull Environ Contam Toxicol*, **54**(1) (1997), 132-138 [21 Ref].

The effectiveness of the antioxidant defense systems in relation to the cadmium-induced lipid peroxidation process in the freshwater crab *Barytelphusa guerini* has been studied. This edible crab is an important component of the paddy field ecosystem. The potential for pollution-enhanced oxyradical generation and the operation of antioxidant cellular defenses in crabs offers possibility for detecting the biological impact of pollution.

9801-223. Verma Archana, Nath A (Cell Bio Reproductive Endocrino Lab, PG Dept Zoo, Patna Univ, Patna 800005). **Sub cellular response of malathion on oocytes of *Heteropneustes fossilis*.** *J Freshwater Bio*, **8**(1) (1996), 47-50 [7 Ref].

Electron microscopical studies were carried out on the ovary of an air breathing telecost, *Heteropneustes fossilis* after exposure of sublethal concentration (6 ppm) of insecticide malathion for different time periods (4 and 8 days). Treatment related gonadal changes were found. The oocytes showed degenerative changes with protuberances, fusion and blebs transformed into sheaths. The significance of these findings for assessing the risk of occupational exposure to malathion is briefly discussed.

9801-224. Verma Yogendra, Ruparelia SG, Hargan MC, Kulkarni PK (Aquatic Toxicology Lab, Natl Inst Occupl Hlth, Meghani Nagar, Ahmedabad 380016). **Acute toxicity of fenvalerate to Elsh and daphnia.** *Acta Ecologica*, **18**(2) (1996), 116-120 [13 Ref].

Acute toxicity tests were carried out using fenvalerate (20% EC) on specimen of Caladoceran *Daphnia magna* and fresh water fish, *Sarotlterodon mossambicus*. Acute toxicity of fenvalerate was estimated by determining 24 hr, LC 50 Value. The results suggest that fenvalerate is highly toxic to fish and daphnia. Moreover, daphnia has been found to be more sensitive to fenvalerate than fish. am and lowest in Kavaratti atoll. Health and Toxicology.

Wastes

9801-225. Agarwal PK, Sharma RK Singh PP* (Pest Parasite Res Lab, Dept Zoo, Bareilly Coll, Bareilly 243005). **Fish culture in derelict brick-kiln land area.** *J Environ Bio*, **18**(1) (1997), 47-48 [15 Ref].

Attempt has been made to reclaim these derelict brick-kiln land areas by using press-mud, which is a waste byproduct of sugar industry based on sulphitation process, for fish culture. Pond was developed as composite fish culture pond, stocked with indigenous as well as Chinese carps.

9801-226. Ashok Kumar R, Latha G, Rajeswari S (Univ Madras, Dept Analyt Chem, Guindy Campus, Madras 600025). **Monitoring the chromium level in the soil beds of industrial sites.** *Indian J Environ Prot*, **16**(11) (1996), 817-819 [9 Ref].

Environmental pollution due to chromium compounds is increasing with extensive industrial developments of tanneries. The study is an attempt to evaluate the chromium content of the soil samples and water samples in the vicinity of the tanneries of North Arcot district of Tamil Nadu. The chromium content of soil samples ranges from 3-6 mg/gm for soil sample and 0.09-0.123 mg/ml in water samples.

9801-227. Balasubramanya RH, Kathe AA (Centl Inst Res Cotton Techno, Indian Coun Agricl Res, Adenwala Rd, Matunga, Mumbai 400019). **An inexpensive pretreatment of cellulosic materials for growing edible oyster mushrooms.** *Bioresource Techno*, **57**(3) (1996), 303-305 [11 Ref].

Artificial cultivation of oyster mushrooms on lignocellulosic materials involves the pretreatment of the substrate with hot water to ward off the competing moulds during the spawn run. An inexpensive anaerobic pretreatment of the cellulosic materials has been suggested as an alternative to the conventional hot-water treatment.

9801-228. Basu M, Bhattacharya S, Paul AK* (*Microbio Lab, Dept Bot, Univ Calcutta, Calcutta 700019). **Isolation and characterization of chromium-resistant bacteria from tannery effluents.** *Bull Environ Contam Toxicol*, **58**(4) (1997), 535-542 [14 Ref].

Chromium (Cr), a transition metal, is one of the major sources of environmental pollution. The tanning industry, which commonly utilizes "chrome liquor" in the tanning process, discharges the effluents into the environment containing chrome salts in excess of the maximum permissible limits. Sludge deposition from such effluents, therefore, provides a natural environment for enrichment of chromium-resistant bacteria. Paper evaluates the status of chromium-resistant bacteria in the tannery effluent sediments for Calcutta-based tanning industries.

9801-229. Bhat PN, Pillai KC (Hlth Phys Div, Bhabha Atom Res Cent, Trombay, Bombay 400085). **Leachability and immobilisation of beryllium from solid waste (red-mud) generated in processing beryl.** *Water Air Soil Polln*, **94**(3-4) (1997), 297-306 [12 Ref].

Study was undertaken to obtain information on the leachability and immobilisation of beryllium from solid waste red-mud generated in processing beryl at the Beryllium Metal Plant at Vashi, New Bombay. The studies showed that 62% of the total beryllium in red-mud can be extracted by water by repeated leaching over a period

of 445 d. The mixing of the waste material with cement and casting into cement blocks reduced the leachability of beryllium to 0.11% which got further reduced to 0.02% by thermal curing of cement blocks.

9801-230. Bhole AG, Pawels Renu (Civil Engng Dept. VRCE, Nagpur 440011). **Use of synthetic polyelectrolytes for treatment of wastewater from textile industries.**

Indian J Environ Hlth, **39**(2) (1997), 115-119.

Attempt is made to treat wastewater from textile industries by chemical coagulation method. Synthetic polyelectrolytes in conjunction with man coagulants have been tried to assess their potential to remove colour; COD and S.S. from textile industries. 200 mg/L aluminium chloride with 0.3 mg/L Setlyte N10 produced 97.5 and 96.4 percent removal in colour and S . S . respectively from textile mill.

9801-231. Chanda Sunanda, Chakraborti Sibani (Leaf Protein Unit, Div Biol Sci, Indian Statl Inst, 203, BT Rd, Calcutta 700035). **Plant origin liquid waste: A resource for single-cell protein production by yeast.** *Bioresource Techno*, **57**(1) (1996), 51-54 [22 Ref].

Leaf protein was separated by heat coagulation (80°C) from leaf juices of four cruciferous plants: turnip, mustard, radish and eauliflower. Three yeasts, *Saccharomyces cerevisiae*, *Torula utilis* and *Candida lipolytica*, were grown in deproteinized leaf juices (DLJ) of these plants. The yeast cells produced in these wheys were found to be rich in protein and vitamins. The chemical oxygen demand (COD) and biological oxygen demand (BOD) values of BLJ samples were reduced significantly by the growth of yeasts.

9801-232. Dar GH* (Div Environ Sei, S.K. Univ Agricl Techno, Shalunar, Srinagar, 191 I 21 Kashmir). **Impact of lead and sewage sludge on soil microbial biomass and carbon and nitrogen mineralization.** *Bull Environ Contam Toxicol*, **58**(2) (1997), 234-248 [17 Ref].

Sewage sludge disposal on arable land is viewed as a method to reduce waste accumulation and to enrich soil fertility. However, such disposal can degrade soil ecosystems due to the presence of potentially harmful substances, such as heavy metals. Pb has assumed greater significance because currently its dispersal through

anthropogenic activities has exceeded the inputs from natural sources by about 17 fold. Study assess the effects of Pb and sewage sludge on microbial biomass and mineralization processes in soils of varied texture and organic matter content.

9801-233. Datar MT, Kale SB (Civil Engng Dept, (PG), Govt Engng Coll, U.uain 456010, MP). **Performance of a dairy effluent treatment plant.** *Indin J Environ Hlth*, **39**(1) (1997), 52-60 [6 Ref].

Studies were undertaken for performance appraisal of ETP for Ujjain Dugdh Sangh Dairy, Ujjain and a few modifications have been suggested to achieve economy and efficiency in wastewater treatment.

9801-234. Gandhi Mamta, Sangwan V, Kapoor KK, Dilbaghi N (Dept Microbio, CCS Haryana Agricl Univ, Hisar 125004). **Composting of household wastes with and without earthworms.** *Env Eco*, **15**(2) (1997), 432-434 [5 Ref].

The composting of household waste using traditional method and with earthworms has been compared. The study revealed that household waste can be converted into nutrient rich compost within 30 days. The C/N ratio is narrowed down substantially and nitrogen retention is more in compost prepared with earthworms than with out earthworms.

9801-235. Ghosh Subir Kumar, Santra SC (Dept Ecol Std, Sch Environ Sci, Univ Kalyani, Nadia, W. Bengal). **Domestic and municipal wastewater treatment by some common tropical aquatic macrophytes.** *Indian Biologist*, **28**(1) (1996), 47-58 [20 Ref].

Waste-water treatment with aquatic microphytes provided an option for selecting plants in lowcost treatment of municipal and domestic sewage water. The capacity of ecosystems that are dominated by aquatic macrophytes to assimilate and decompose inputs of nutrients and organic matter have resulted in the extended use of such systems to different types of waste waters.

9801-236. Gill RK, Jindal V, Gill SS (Dept Biotechno, Punjabi Univ, Patiala 147002). **Bioremoval of heavy metal nickel from industrial effluent.** *Indian J Env Toxicol*, **6**(2) (1996), 74-77 [12 Ref].

Bioremoval of Nickel by *Pseudomonas cepacia* was studied. It was observed that *P. cepacia* can remove high amount of nickel from effluent. It was noted that 44.8% of nickel could be removed at pH 6.0, 30°C temperature under shaking conditions with 1.5 g of biomass within seven hours of incubation. The effluent can be treated free of Ni⁺² within two regeneration cycles of the microbial biomass.

9801-237. Gowrisankar R, Palaniappan R, Ponpandi S (PG Dept Microbio, Sri Paramkalyani Coll, Alwarkurichi 627412, Tamil Nadu). **Microbiota of textile mill effluent, treatment and effect of treated effluent on plant growth.** *J Indl Polln Contl*, **13**(1) (1997), 61-65 [7 Ref].

Physico-chemical and microbiological characteristics of a textile mill effluent was analysed and data are presented. The pH of the effluent was in alkaline side with BOD values (400- 1000 mg/l) well above the stipulated limits. The effect of treated textile mill effluent on the plant (*Cymopsis tetragonoloba*) growth was evaluated, on the basis a seed germination, flowering and fruiting, Diluted effluent at concentrations of 25% and 50% was found to exert positive impact on plant growth.

9801-238. Jasuja K, Parwana HK, Rao ALJ (Punjab Polln Contl Bd, Patiala 147001). **Removal of Cr(VI) from wastewater by *Ablesmoschus esculentus*.** *Indian J Environ Hlth*, **37**(2) (1997), 103-108.

Removal of chromium(VI) from aqueous waste was investigated using adsorbent from *Ablesmoschus esculentus* (lady finger plant). The effect of pH, Cr(VI) concentration, adsorbent dose and contact time were studied in batch experiments. The removal was in general most effective at low pH values.

9801-239. Joseph Kurian, Natarajan K (Cent Environ Std, Anna Univ, Madras 600025). **Studies on wastewater from automobile service stations.** *Indian J Environ Hlth*, **39**(1) (1997), 37-43 [3 Ref].

The characterisation of wastewater from automobile service stations was conducted. In the wastewater, the total suspended solids (610-4950 mg/L), BODs (75-570 mg/L), COD (270- 1640 mg/L) and oil and grease (14-420 mg/L) were found to be the pollutants. Chemical treatment using alum and chitosan will remove these pollutants

below the tolerance limits for disposal on to land for irrigation or into the municipal sewers.

9801-240. Kayal TK, Chakravally M, Biswas GK (Centl Glass Ceramic Res Inst, Calcutta 700032). **Mathematical modelling of steady state updraft gasification of jute stick particles of definite sizes packed randomly - An analytical approach.** *Bioresource TecStno*, **60**(2) (1997), 131-141 [16 Ref].

An experimental study was carried on an insulated MS reactor of total length 1650 mm and constant diameter 76 mm for updraft gasification of jute stick particles with air as gasifying agent. The results and performances were evaluated for different sizes of jute stick particles at various superficial air inlet velocities ranging from 0.0337 to 0.1011 m s⁻¹ at STP.

9801-241. Kaushik A, Kadyan Bala R, Manchanda H, Kaushik CP (Dept Environ Sci, GJ Univ, Hissar 125001). **Soil enzymatic changes in salt - affected soils following sugar-mill effluent irrigation.** *Eco Env Conserv*, **2**(3&4) (1996), 175-177 [14 Ref].

Three important soil enzymes namely Dehydrogenase (DHA), Invertase (IA) and Urease (UA) in salt-affected soils after long-term and short-term irrigation with diluted sugar-mill effluent were studied with a view to examine its potential utility in improving the soil biological activities. The effluent stimulated DHA in all the soils significantly while IA activity also tended to increase, but there was no significant change in UA due to the effluent.

9801-242. Louis Jesudass L, Akila R (St Xaviers Coll (Autonomous), Dept I3ot, Palayamkottai 627002). **Studies on the physico-chemical characteristics of the sugar factory effluent.** *Indian J Environ Prot*, **16**(11) (1996), 808-810 [12 Ref].

The physico - chemical characteristics of the raw and treated effluents of Dharani Sugar FactoryS Vasudevanallur, Nallai Kattabomman district of Tamilnadu were investigated. The study revealed that the raw sample had the pH 9.5 and treated effluent had the pH 6.1. The dissolved oxygen was 0 in raw effluent and the other parameters showed a marked difference between the raw and treated effluent.

9801-243. Mishra SP, Roy Choudhury G (Regl Res Lab, Bhubaneswar 751013).

Removal of zinc from wastewater using waste biomass. *Int J Environ Stud*, **50**(2) (1996), 117-124 [13 Ref].

Activated sludge was used to remove zinc from wastewater. Various adsorption parameters were studied such as pH, temperature, biomass concentration as well as initial metal ion concentration. The adsorption percentage increased with pH upto ~ 4.0 and there after the pH had very marginal effect. The adsorption rate increased with the increase of temperature. Lower biomass concentration and higher initial metal ion concentration favoured higher metal loading capacity.

9801-244. Murthy BSN, Desik PKA, Reddy PJ (Indian Inst Cheml Techno, Computer Centre, Hyderabad 500007). **Application of artificial neural networks in the polluted water of industrial wastes: sugar industry.** *Indian J Environ Prot*, **16**(11) (1996), 850-855 [12 Ref].

An Artificial Neural Network model has been developed to study BOD-COD relationships of industrial wastes pertaining to sugar industry reported in the literature. Superiority of ANN in the prediction of BOD as well as COD is established on comparing with reported regression models.

9801-245. Murty MVS, Chandra TS* (* Biochem Div, Dept Chem, Indian Inst Techno, Madras 600036). **Fermentability of hemicelluloses extracted from municipal waste and commercial xylans by Clostridium sp.** *Appl Microbiol Biotechnol*, **47**(3) (1997), 212-217 [56 Ref].

The fermentability of commercial xylans and municipal waste hemicelluloses in the presence of *Clostridium* sp. has been evaluated. The amount of ethanol formed from the bagasse hemicellulose was at least three times higher than any other reported value. The current study also indicated that the source and composition of hemicellulose played an important role in determining the fermentability of the substrate for some microorganisms.

9801-246. Nanda Kumar NV, Vijayalakshmi KM (Div Environ Bio, Dept Zoo, SV Univ, Tirupati 517502, AP). **Human excreta and other solid waste disposal in environment**

by Indian Railways and remedial measures. *Eco E1lv Conserv*, **2**(3&4) (1996), 151-153 [7 Ref].

Indian Railways still follow manual scavenging for the excreta deposited at railway stations openly in the rail track. The human excreta amount desposited at two important railway stations was found to be 25,920 kg/year. The model study might be applicable to National railway network. A closed container system with automated evacuation at designated junctions is recommended to improve environmental quality by Indian Railways. The amounts of other solid wastes like plastic cups, peels of fruits and package wastes deposited are reported.

9801-247. Narasimha Rao SL (Public Hlth-Environ Engng Lab, Dept Civil Engng, Andhra Univ, Visakhapatnam 530003). **Water pollution control in Visakha Refinery, HPCL - a case study: Part II - treatment and disposal of wastewater.** *J Indl Polln Contl*, **13**(1) (1997), 9-17 [2 Ref].

The two effluent treatment units of Visakha Refinery, old wastewater treatment plant and central wastewater treatment plant with biological system for treating process effluent waters and associated cooling water treatment facilities at each unit are studied in view of Visakha refinery expansion, toxic effects of refinery effluent waters to biological life and finally to see whether the characteristics of treated effluent waters are in conformance with MINAS standards prescribed by Central Board for Prevention and Control of Water Pollution, New Delhi India or not.

9801-248. Namade Pravin N, Shrivastava VS (Cent PG Std Res Chem, Univ North Maharashtra, GTP Coll Campus, Nandurbar 425412). **Correlation and regression analysis among the distillery waste water quality parameters.** *J Indl Polln Contl*, **13**(1) (1997), 67-72 [8 Ref].

The data collected on the physicochemical characteristics of the distillery waste water have been analysed for correlation and regression among various parameters. Beside the above analysis standard deviation, relative standard deviation and coefficient of variation in all the parameters have also been evaluated, respectively.

9801-249. Palit Meehir, Tripathi DN, Sikder N, Rao NBSN (Def Res Dev Estb, Jhansi Rd, Gwalior 474002). **Evaluation of methodology for monitoring -**

Chloroacetophenone (CN) in controlled atmosphere. *Indian J Environ Prot*, **16**(12) (1996), 200-205 [9 Ref] .

Irritant co - chloroacetophenone (CN) was monitored under controlled atmosphere of nitrogen using XAD-2, XAD-4 and Tenax GC as adsorbents followed by liquid desorption with carbon disulphide, decalin, diethylphthalate and diethylether or thermal desorption. The best recovery of 80% and minimum detection limit of 0.058, µg/L were observed with XAD-2 resin as an adsorbent and carbon disulphide as an eluant. Both temperature and relative humidity were found to have profound influence on recovery and breakthrough time.

9801-250. Pandey RA, Handa BK (Natl Environ Engng Res Inst, Nehru Marg, Nagpur-440020). **Fate of organic bases during bio-oxidation of coal carbonization wastewater:** *J Environ Sci Hlth*, **A32**(1) (1997), 1-13 [15 Ref].

The fate of the organic bases has been evaluated in two stage activated sludge process, the bases do not get removed effectively even at high sludge retention time (SRT) of 10.9 days. In the seco] stage of the activated sludge process most of the bases get removed efficiently SRT of 12 days. On employing a two stage activated sludge process, the bas from coal carbonization wastewaters could be removed effectively by operating first stage at SRT of 2.18 days and the second stage of the process at 12 days ST respectively.

9801-251. Pervez Shamsh, Pandey GS (De Chem, Govt Arts Sci Coll, Durg 49201). **Mercury spillage through smoke-stakes of an integrated steel plant: effect on soil and ground water.** *Indian J Cheml Techno*, **4**(1) (1 997), 49-52 [12 Ref].

The samples of soil, ground water and pond water were collected from the susceptible and non-susceptible sites around the steel plant within a distance of 10 km. Samples were analysed for the presence of mercury by mercury analyser. Mercury concentration more than 1.0 ppm was observed in soils of high susceptible sites Mercury concentration in the range of 0.5-1.0 ppm was observed in the east and west direction of the plant upto a distance of 7 km. In case of ground water and pond water contamination, mercury concentration was found to be more than 10.0 ppb upto a distance of 10 km at high susceptible sites.

9801-252. Prasad GK, Gupta RK* (*De Environ Sci, GB Pant Univ Agril Techno Pantnagar 263145, Dt. Nainital, UP) **Decolourization of pulp and paper mill effluent by two white-rot fungi.** *Indian J Environ Hlth*, **39**(2) (1997), 89-96 [19 Ref].

Decolourization and reduction in COD of pulp and paper mill effluent by two white-rot fungi *Trametes versicolor* and *Pleurotus ostreatus* in the presence of various co-substrate/N₂ source were investigated. Mixture of starch (2.5 g/L), micronutrients and urea (1.25 g/L) was the most effective co-substrate to decolourize (93.8% colour reduction) the effluent containing *T. versicolor*. Maximum decolourization (83.5%) was achieved when urea (1.25 g/L) was added into the effluent containing *P. ostreatus*.

9801-253. Rajan MR, Raj Samtleil Paul (Sch Energy Sci, Madurai Kamaraj Univ, Madurai 625021). **Sewage recycling through composite fish culture - A study on water purification index (WPI) on the resultant sewage.** *J Nature Conserv*, **8**(1) (1996), 151-157 [19 Ref].

Study deals with how far the resultant sewage was purified after recycling through composite fish culture. The results indicated that out of the eight parameters studied, five (pH, total nitrogen, zinc, lead and copper) of them were within the permissible limit of ICMR standards and the water got purified when the purification index (WPI) was 54. It shows that the pollution level was slight to moderate in the rating scale.

9801-254. Rajan MR, Raj Samuel Paul (Dept Natural Resources, Sch Energy Sci, Madurai Kamaraj Univ, Madurai 625021). **Instantaneous growth rate of sewage grown fishes.** *J Environ Biol*, **18**(2) (1997), 127-130 [15 Ref].

Study deals with the instantaneous growth rate of sewage grown fishes. The results showed that the initial mean instantaneous growth rate is higher and a steady decrease when the culture days are increasing irrespective of BOD loadings.

9801-255. Reddy Venkata Sunil, Raju CK, Ramalingaiah* (*Dept Environ Engng, PES Coll Engng, Mandya 571401). **Effect of metal ions on anaerobic digestion of organic wastewater.** *Indian J Environ Hlth*, **39**(1) (1997), 65-68.

Biomethanation of high organic industrial wastewaters by anaerobic digestion holds promise in the abatement of the environmental pollution and energy crisis. The bacterial activity may vary from metal to metal at different concentrations. Paper investigates the threshold concentration of nickel, chromium and zinc for optimum gas yield in anaerobic digestion.

9801-256. Saravanan K, Appavu K (Dept Soil Sci Agril Chem, Tamil Nadu Agril Univ, Coimbatore 641003). **Effect of cement kiln dust deposition on physical properties of soil.** *Indian J Environ Hlth*, **39**(1) (1997), 31-36 [6 Ref].

The changes in physical properties of soils polluted with cement kiln dust were studied by analysing core soil samples from the area around a cement factory. Among the mechanical fractions of soil the silt fraction of the heavily polluted soils showed a marked increase due to dust deposition. The bulk density, particle density, total pore space, hydraulic conductivity and infiltration rates were reduced in the sites receiving higher cement kiln dust especially in the areas closer to the factory in the directions having higher wind velocities.

9801-257. Saseetharan MK, Seshadri S, Subida Rao N (Fac Civil Engng, Govt Coll Techno, Coimbatore 641013, Tamil Nadu). **Modelling of thickener area for domestic activated sludge by Talmage and Fitch method.** *Indian J Environ Hlth*, **39**(2) (1997), 130- 140 [6 Ref].

Paper develops a mathematical model for the design of the thickener area of the secondary settling tank. In developing the model, the important parameters such as mean cell residence time, MLSS concentration and underflow concentration were considered. The graphical method developed by Talmage and Fitch was used in this study.

9801 258. Saseetharan MK, Rosaline G Vimala, Rajagopal K, Seshadri S (Dept Civil Engng, Govt Coll Techno, Coimbatore 641013). **Settling studies on domestic activated sludge.** *Indian J Environ Biol*, **35** (1997), 149- 154 [3 Ref] .

Paper conducted zone settling studies on the domestic activated sludge with different initial suspended solids concentrations and had developed a mathematical model to predict the surface area of the secondary settling tank in relation with the initial

suspended solids concentration and desired under-flow concentration. In the above activated sludge studies, the effect of dissolved oxygen content was accounted for.

9801-259. Shalma SK, Slivastava Alok, Singh VP (Dept Plant Sci, Rohilkhalld Univ, Bareilly 243006, UP). **Effect of city waste on growth in urd Bean.** *Int J Mendel*, **14**(1&2) (1997), 5-6 [8 Ref].

The seeds of two cultivars of urd bean (*Vigna mungo* L. Hepper) Cv PU-30 and T-9 irrigated with different concentrations of city waste (80%, 90% & 100%) showed a marked significant reduction in growth parameters i.e. germination, seedling height, fresh weight, dry weight and chlorophyll content.

9801-260. Singh, N, Pandey V, Mishra J, Yunus M, Ahmad KJ (Environ Botl Lab, Natl Botl Res Inst, Rana Pratap Marg,-Lucknow 226001). **Atmospheric lead pollution from vehicular emissions -measurement in plants, soil and milk samples.** *Environ Monit Assess*, **45**(1) (1997), 9-19 [29 Ref].

The changing levels of lead (Pb) in the soil and vegetation along two National Highways near Lucknow, India, were investigated. The pattern of Pb deposition, as reflected by soil Pb burdens, showed decrease in concentration with increasing distances from the road margins. At both the sites Pb concentration was above background concentration even at the soil core depth of 15 cm.

9801-261. Subba Rao M, Gadgil K (Indian Inst Techno, Cent Energy Std, Hauz Khas, New Delhi 110016). **Effect of toxic metals and their complexes on BOD values in wastewater analysis.** *Indian J Enviro Prot*, **16**(11) (1996), 801-804 [5 Ref].

By transfer of heavy metals to aquatic systems through direct dumping of wastewater in water bodies, the ecosystem has been found to be disturbed. At extreme low concentrations of these heavy metals, usual methods of removal is not possible. Paper attempts to remove the toxicity of these metals through complex formation.

9801-262. Subba Rao P, Mohan V, Murthy DVS (Environ Engng Lab, Cheml Engng Dept, Indian Inst Techno, Madras 600036). **Bio-degradation of phenolic wastewaters.** *Indian J Cheml Techno*, **4**(1) (1997), 45-48 [10 Ref].

Bio-degradation of phenolic wastewaters was studied using an anaerobic contact filter with granite as the medium. The effects of influent COD concentration and detention time were studied on the COD reduction efficiency. Further the effect of nickel and cobalt additives to enhance the biogas production was also studied. The results obtained were found to be satisfactory.

9801-263. Subudli E, Kar RN (Regl Res Lab, (CSIR), Bhubaneswar). **Decontamination of metals from metallurgical effluent utilizing *Rhizopils arrhizius* biomass.** *Intl J Environ Std*, **50**(2) (1996), 111-116 [9 Ref].

Rhizopils arrhizius biomass adsorbed copper at a faster rate than nickel and the kinetics of copper adsorption remained unaffected in presence of nickel. Change in pH of mixed solution from 4.5 to 6.0 had very little but favourable effect on adsorption rate of both metals. The rate of biosorption increased with the increase of contact time from 30 to 60 minutes at lower biomass concentration (<0.30 gms.). At optimum pH (5.5) and contact time (60 mins), increase in biomass concentration from 0.1 to 1.0 gm showed a marked increase in uptake rates of both copper and nickel. About 99% of total metal could be removed from solution by taking 1.0 gm of biomass.

9801-264. Swaminathan K, Manonmani K (Dept Biotechno, Bharathiar Univ, Coimbatore 641046). **Studies on toxicity of viscose rayon factory effluents. I. Effect on water.** *J Environ Bio*, **8**(1) (1997), 73-78 [6 Ref].

The physicochemical analysis of the effluent samples revealed that the effluent was deep yellow in colour with wood pulp odour. It had high levels of BOD, COD, nitrites, phosphates, iron, zinc, oil and grease. The effluent was completely devoid of dissolved oxygen and micro-organisms. When the effluent mixed with the river water, the characteristics of the river water were adversely affected.

9801-265. Verma Neelam, Monica, Rehal Rajbir (Dept Biotechno, Punjabi Univ, Patiala). **Biosorption of lead by alginate immobilized *Anabaena variabilis*.** *ECO EMV Conserv*, **2**(3&4) (1996), 187-188 [13 Ref].

Lead biosorption was investigated under laboratory conditions with calcium alginate immobilized *Anabaena variabilis* cells. The uptake of lead ions was strongly pH dependent. Concentrations of lead ranging from 1 ppm to 10 ppm and cyanobacterium

concentration from 0.25 gm/100mL were studied. 96% removal was achieved at 2 ppm concentration of lead ions with 0.25 gm of biomass after agitating for an hour at pH 6.9.

Forestry and Environment

9801-266. Jamaluddin, Chandra KK (Forest Patho Div, Trop Forest Res Inst, Jabalpur, MP). **Distribution of VAM fungi in bauxite mine overburden plantation of Amarkantak (Madhya Pradesh).** *Indian Forester*, **123**(5) (1997), 412-418 [11 Ref].

The study of VAM fungi was made in the plantations undertaken in bauxite mine overburden soil is deficient in VAM fungi but the plantations enhance the VAM population. The VAM colonization and spore density vary in different species even in different age group of same species. The population of VAM fungi was more in undisturbed plantation in forest area, as compared with the species planted after mining. The growth and development of species was more in the plantation undertaken in the degraded forest area without mining operations.

9801-267. Nandi Aparajita, Barari S (Silviculture South Div, Midnapore, West Bengal). **Soil management, a new hope for lateritic forests of West Bengal.** *Indian Forester*, **123**(4) (1997), 280-284 [9 Ref].

A Glass House experiment was carried out to find out the effect of liming with inorganic fertilizer and organic manure on two forest plant types i.e. Eucalyptus tereticormis and Shorea robusta. As per the preliminary analysis in Glasshouse condition the growth of two plant types was found significant in limed soil with organic manure and inorganic fertilizer.

9801-268. Rathore SKS, Singh SP, Singh JS, Tiwari AK (Dept Bot, Banaras Hindu Univ, Varanasi 221005). **Changes in forest cover in a Central Himalayan catchment : inadequacy of assessment based on forest area alone.** *J Environ Manag*, **49**(3) (1997), 265-276 [37 Ref].

Changes in the forest cover of a catchment over a period of 16 years have been quantified. The process of fragmentation has been studied through changes in forest area and biomass. There has been a sharp decline in biomass, although only a marginal

reduction in forest area (3.5%) has occurred. Decline in the stocking density has also been substantial.

9801-269. Shukla P (Divl Forest Office, West Midnapore Div, Jhargram). **Vanjyoti chullah: scope of application and it's simplified version.** *Indian Forester*, **123**(5) (1997), 387-394.

Vanjyoti chullah is basically a sawdust based chullah. It consists of a cylindrical vessel of 22 cm diameter as well as height made out of tin of suitable gauge. There is an opening of 8 cm dia at the lower end and a tight top lid with 8 cm diameter hole in the middle. The openings are meant for fixing two cylinders for making 'L' shaped vent/chimney while filling the chullah with non-wood biomass. The top of the cylindrical vessel is fitted with three movable supports to support the cooking pan.

9801-270. Singh BP (Mahatma Gandhi Gramodaya Vishwavidyalay, Inst Environ Sci, Chitrakoot, 485331, Satna). **Growing trees on wastelands: a case study in Hathras tahsils, Aligarh.** *Indian J Environ Pror*, **16**(12) (1996), 885-888 [4 Ref].

Tree plantation on baren wasteland is one of the most effective means of reclaiming it. Large scale plantation of fruit trees, can be more effective and yield quicker returns. On wastelands that are not problem lands, large scale fruit tree plantation or social forestry can be profitably taken up. Such large scale tree plantation work would strain the existing facilities and techniques for elite plant material.

9801-271. Suresh Babu PK, Menon ARR, Suraj MA, Varghese AO, Pradeep Kular M (Kerala Forest Res Inst, Peechi, Kerala). **High altitude shola and grassland studies using remote sensing.** *Indian J Foresty*, **20**(1) (1997), 82-88 [9 Ref].

High altitude shola and grassland vegetation is found in Silent Valley and Eravikulam area in Kerala. The shola and grassland mapping, its present status, etc., are studied in Eravikulam National Park area by visual interpretation techniques of large scale aerial photographs and satellite data products. The detailed land cover map was prepared using 1: 15,000 black and white aerial photographs. The area estimation and comparative study of the maps were done in detail.

Wildlife

9801-272. Desai Ajay A, Baskaran N (Bombay Natl Hist Soc, Hornbill House, Salim Ali Chowk, Shaheed Bhagat Singh Road, Mumbai 400023). **Impact of human activities on the ranging behaviour of elephants in the Nilgiri Biosphere Reserve, South India.)** *Bombay Natl Hist Soc*, **93**(3) (1996), 559-569 [30 Ref].

An added problem is that of human-animal interactions at the interface of the natural habitats and their surrounding human use areas. As no hard boundaries demarcate the two, there tends to be a diffuse border which results in some animals intruding into the human use areas and causing problems. At the same time humans intruding into the surrounding natural habitat and exploiting its resources results in the degrading of the natural habitat.

9801-273. Hussain Syed Ainul, Choudhury Binod Chandra (Wildlife Inst India, PB 18, Dehradun 248001). **Distribution and status of the smooth-coated otter *Lutra perspicillata* in National Chambal Sanctuary, India.** *Biol Conserv*, **80**(2) (1997), 197-206 [32 Ref].

The distribution and relative density of smooth-coated otters *Lutra perspicillata* Geoffroy were studied along a 425 km stretch of Chambal river within the National Chambal Sanctuary, Central India. The study revealed that the distribution of otters along the river is patchy and largely restricted to the upper reaches. Recent increases in disturbance along the river due to construction of road bridges and mining activities might have put pressure on the population.

9801-274. Ramakrishnan B, Sivaganesan N, Srivastava Rajiv (Salim Ali Cent Ornitho Natural Hist, Kalampalayam, Coimbatore 641010). **Human interference and its impact on elephant corridors in Sathyamangalam Camp; Coimbatore forest divisions in Tamil Nadu, southern India.** *Indian J Forestry*, **20**(1) (1997), 8-19 [17 Ref].

Human interference and its effects in Sujalkuttai-Bannari Corridor and Kallar-Vedar Colony Corridor in Nilgiri Biosphere Reserve have been studied. Most people visit

the corridors primarily for fuel-wood collection, some of them for grazing livestock and few for collecting minor forest produce. Local people move more than 3 km from the villages in the Sujalkuttai-Eannari Corridor for fuel-wood while the elephant population use the forests. up to 2 km distance from villages, and thus there is an overlap in the habitat use by man and elephants. In both the corridors the elephants do prefer many of the plant species which are largely collected by villagers as fuel-wood.

9801-275. Shankar Raman TR (Cent Ecol Sci, Indian Inst Sci, Bangalore 560012). **63 Factors influencing seasonal and monthly changes in the group size of Chital or axis deer in southern India.** *J Biosci*, **22**(2) (1997), 203-218 [35 Ref].

Chital or axis deer (*Axis axis*) form fluid groups that change in size temporally and in relation to habitat. Predictions of hypotheses relating animal density, rainfall, habitat structure, and breeding seasonality, to changes in chital group size were assessed simultaneously using multiple regression models of monthly data collected over a 2 yr period in Guindy National Park, in southern India. The density of chital in forest was inversely related to rainfall, but positively to the number of fruiting tree species and availability of fallen litter, their forage in this habitat.

Energy and Environment

9801-276. Bhattacharyya Nandita (Family Resource Manag, Coll Home Sci, Assam Agricul Univ, Jorhat 785103). **Knowledge and fuel conservation practices of urban homemakers of Assam.** *J Env Polln*, **3**(3&4) (1996), 21 1-213.

The studies on level of knowledge and adoption of fuel conservation methods in cooking of urban homemakers were carried out in Jorhat, Assam. It has been concluded that the fuel conservation knowledge was average among the majority of the respondents. However, the knowledge was not put into actual practices.

9801-277. Chavan BL, Pawar SH (Sch Environ Sci, Shivaji Univ, Kolhapur 416004). **Household kitchen waste management using multichamber biogas plant.** *J Env Poln*, **3**(3&4) (1996), 195-196 [7 Ref].

Household kitchen waste was subjected to anaerobic digestion in a laboratory scale multichamber biogas plant to study its suitability for this plant. The study revealed that the multichamber biogas plant basically designed for fibrous waste utilization is suitable for household kitchen waste too.

9801-278. Dash. SK, Behera BK (Dept Farm, Machinery Power, CAET, Orissa Univ Agric Techno, Bhubaneswar 751003). **Potential of biomass farming for energy.** *Env Eco*, **15**(2) (1997), 303-308 [4 Ref].

The biomass consisting of food, fodder and forest crops have tremendous scope of energy. This energy could be harnessed from the biomass in conventional forms of solid, liquid or gaseous fuels having potential utilization in household, agricultural and industrial sectors. Paper deals with the possibilities of biomass farming and their utilization as an alternate source of energy.

9801-279. Raju K, Ramalingaiah W (*Dept Environ Engng, PES Coll Engng, Mandya 511401). **Methane production from orange processing waste.** *Indian J Environ Hlth*, **39**(1) (1997), 20-22 [5 Ref].

Fixed bed (film) reactors were tried effectively for the biomethanation of orange processing waste. Cheaper and locally available material were tried as alternatives to high cost PVC plugs, as fixed bed materials. Plant and Pollution

Plant and Pollution

9801-280. Agarwal S, Tiwari SL (KG Arts Sci Coll, Dept Bot, Raigarh, MP).

Susceptibility level of few plants on basis of air pollution tolerance index. *Indian Forester*, **123**(4) (1997), 319-322 [19 Ref].

The susceptibility level of plants to air pollutants, have been evaluated on the basis of their APTI value. For the purpose four parameters namely ascorbic acid, leaf extract pH, relative water content and total chlorophyll were determined and computed to get APTI. The plants with low APTI value were categorised as sensitive and with high APTI as tolerant because the former can serve as indicator and latter as sink for the abatement of air pollution.

9801-281. Arora Rajni, Chauhan SVS (Univ Dept Bot, RBS Coll, Agra 282002). **Effect of tannery effluent on seed germination and total biomass in some varieties of *Hordeum vulgare* L.** *Acta Ecologica*, **18**(2) (1996), 112- 115 [4 Ref] .

Effect of tannery effluents on seed germination percentage, seedling growth and total biomass in some varieties of *Hordeum vulgare* was under-taken, Effluents collected from Mahajan Tannery, Agra caused a significant reduction in germination percentage, length and total biomass in almost all the varieties.

9801-282. Chidaunbalam Pillai S, Pugazhendi N, Lakshmanan C, Shanmugasundaram R (Dept Bot, VO Chidambaram Coll, Tuticorin 628008). **Effect of chemical industry waste water on germination, growth and some biochemical parameters of *Vigna radiata* L. Wilcseck and *Vigna mungo* L. Heppter.** *J Env Polln*, **3**(3&4) (1996), 131-134 [14 Ref].

Suitability of treated effluent of a chemical industry on germination and growth of *Vigna radiata* and *Vigna mungo* was tested. The diluted effluent (10% v/v) was found to

be effective in promoting germination, growth, chlorophyll and protein content. The study suggests that this effluent may be used for irrigation after suitable dilution.

9801-283. De B, Mukherjee AK (Dept Bot, Univ Burdwan, Burdwan 713104). **Mercury induced metabolic changes in seedlings and cultured cells of tomato.** *Geobios*, **23**(2) (1996), 83-88 [13 Ref].

Mercuric chloride influenced the metabolism of proteins, nucleic acids, proline, hydrogen peroxide and some related enzymes in tomato seedlings and cultured cells. The injurious effect was found to be directly related to the concentration. The sensitivity of both seedlings and cultured cells was almost comparable except in case of total soluble protein content.

9801-284. Deka S, Devi A, Barthakul HP, Kagti LC (Inst Adv Std Sci Techno, Khanapara, Guwahati 781002). **Studies on the impact of crude oil pollution on the physico-chemical properties, nature of micro-organisms and growth of rice plants in soil.** *J Environ Bio*, **18**(2) (1997), 167-171 [14 Ref].

In a pot culture experiment, rice plants were grown in a bulk soil sample collected locally of added crude oil from Borholla oil field. Results revealed that the effect of crude oil treatment on pH and electrical conductivity was not significant, but increased the organic carbon content, reduced the water holding capacity and bulk density to a significant level at harvest of the crop.

9801-285. Dutta SK, Boissya CL (Dept Bot, Gauhati Univ, Guwahati 781014). **Effect of paper mill effluent on germinations of rice seed (*Oryza sativa* L. var. Masuri) and growth behaviour of its seedlings.** *J Indl Polln Contl*, **13**(1) (1997), 41-47 [14 Ref].

A study was carried out to investigate the effect of effluent of the Nagaon Paper Mill (Hindustan Paper Corporation Ltd.) on the germination of rice (*Oryza sativa* L. var. Masuri) seed and subsequent growth of seedlings. The study has revealed that effluents particularly at higher concentrations inhibit germination and growth of seedlings. Further, it has been seen that rice seeds collected from effluent affected area are less viable and even the viable seeds show delayed germination in comparison to the ones collected from control areas.

9801-286. Jain Aruna (Govt MLB Autonomous Girls Coll, Bhopal 462001). **Impact of industrial pollutants on the autoecological behaviour of Xanthium strumarium Linn.** *Indian J Appl Pure Bio*, **11**(2) (1996), 99-100 [3 Ref].

Xanthium strumarium Linn. being a weed grows luxuriantly around and away from the source of pollution. A comparative autoecological behaviour of the plant was assessed under non-polluted and polluted conditions. The plants show vigorous vegetative and reproductive growth in polluted site and also reveal early stride towards dryness.

9801-287. Jana TK, Das B (Dept Agril Chem, Soil Sci, Bidhan Chandra Krishi Viswavidyalaya, Mohanpur, Nadia, West Bengal 741252). **Sorption of carbaryl (1-Naphthyl N-methyl carbamate) by soil.** *J Environ Contl Toxicol*, **59**(1) (1997), 65 -71 [16 Ref] .

The adsorption-desorption of pesticide by active soil surfaces is one of the main processes controlling soil pesticide interaction and the sorption phenomena can influence the translocation, volatility, persistence and bioactivity of a pesticide in soil. Paper investigates the pattern and mechanisms of adsorption of carbaryl on some soil of West Bengal, India.

9801-288. Kalra Neelu, Ansari MYK, Khan Afaq Ahmad, Khursheed Talat (Dept Bot, Aligarh Muslim Univ, Aligarh 202002). **Genotoxic effects of pollution produced by Harduaganj thermal power house (Kasimpur) on Tabernaemontana divaricata.** *J Env Polln*, **3**(2) (1996), 91-96 [15 Ref].

Pollutants released by Harduaganj Thermal Power Plant resulted chromosomal aberrations in T.divaricata which lead to genotypic and phenotypic variations in the plant including decrease in pollen fertility and seed set.

9801-289. Karpate RR, Choudhary AD (Dept Bot, Univ Campus, Nagpur Univ, Nagpur 440010). **Effect of thermal power station's waste on wheat.** *J Environ Bio*, **18**(1) (1997), 1-10 [18 Ref].

The effect of fly ash and fly ash water was studied on Triticum aestivum Var. Kalyan Sona. Plants were either irrigated with 25%, 50%, 75% and 100% fly ash water

or grown in 50%, 70%, 90% fly ash amended soil. At lower concentrations the fly ash water and fly ash had stimulatory effect on the crop. However, at higher concentrations the treatment showed deleterious effect. Moreover, all concentrations of fly ash water and fly ash were found to have damaging effect on cytology and genetic material.

9801-290. Pandit BR, Prasannakumar PG (Dept Life Sci, Bhavnagar Univ, Bhavnagar 364002). **Effect of selenium on seedling growth, pigment content and protein of two crops, Sorghum bicolor L. (jowar) and Pennisetum typhoides Barm. (bajra).** *Eco Env conserv*, 2(3&4) (1996), 169-172 [22 Ref].

Effect of selenium on the seedling growth and biochemical changes in Sorghum bicolor L. (Jowar) and Pennisetum typhoides Barm. (Bajra) were studied. The germination percentage, shoot length and root length of seedlings revealed that there was a great variation with respect to different concentration of selenium solution. In both the cases the germination percentage was maximum at control and 1 ppm selenium concentration. A total inhibition was observed at 50 ppm concentration. In the chlorophyll content a gradual decrease was observed from lower to higher concentrations.

9801-291. Prasanna Kumar PG, Pandit BR, Mahesh Kumar R (Dept Life Sci, Bhavnagar University, Bhavnagar 364002, Gujarat). **Effect of dairy effluent on seed germination, seedling growth and pigment content of green gram (Phaseolus aureus L.) and black gram (Phaseolus mungo L.).** *Adv Plant Sci*, 10(1) (1997), 129-136 [30 Ref].

The effect of dairy effluent was studied on seed germination, seedling growth and pigment contents of green gram (Phaseolus aureus L.) and black gram (Phaseolus mungo L.). A gradual decrease in the germination of seeds, seedling growth and pigment contents with increase in effluent concentration was observed. The best germination, seedling growth and pigment contents was observed in 25% effluent concentration. Thus effluent can be used safely for irrigation purposes at proper dilution (25%) for beneficial cultivation.

9801-292. Saravanan S, Subramani A, Lakshmanachary AS (Div Environ Sci, Dept Bot, Annamalai Univ, Annamalai Nagar 608002). **Effect of copper sulphate on seed germination and early seedling growth of green gram (Vigna Radiata Linn. Wilczek).** *Eco Env Conserv*, 2(3&4) (1996), 163-164 [8 Ref].

Attempt has been made to assess the response of greengram under the influence of copper sulphate with special reference to seed germination and early seedling growth. Various concentrations of copper sulphate were prepared and used for germination studies. It is evident from the results obtained that the increase in the copper sulphate concentration affected all growth parameters. The concentrations above 250 mg/l-1 was found to be completely lethal.

9801-293. Satyakala G, Jamil Kaiser (Bio Div, Indian Inst Cheml Techno, Hyderabad, 500007). **Studies on the effect of heavy metal pollution on Pistia stratiotes L. (water lettuce).** *Indian J Environ Hlth*, **39**(1) (1997), 1-7 [27 Ref].

Pistia stratiotes L. plants were treated with 5-100 ppm of copper and cadmium solutions for 72 hours. The plants were able to absorb 68% of Cu, 63% of Cd at high concentrations of 100 ppm. The accumulation of metal ions in the roots was more than that in the leaves. Chlorophyll, sugar and protein contents decreased with Cu, and Cd treatment, while phenol content and enzyme activities varied differently.

9801-294. Shanmughavel P (Dept Bot, Bharathiar Univ, Coimbatore 641046). **Effect of air pollution on tobacco (*Nicotiana tabacum*) in agricultural fields.** *Eco Env Conserv*, **2**(3&4) (1996), 173-174 [12 Ref].

Effect of particulate pollutants on tobacco plants growing in the vicinity of sugar factory was studied. It was noticed that plants growing around polluted sites showed visible leaf injury symptoms like marginal necrosis, interveinal necrosis and leaf tip burns. The biomass value of polluted plants (485+40 g/plant) was lower than that of control (975+40g/plant) of plant. The causes for lower biomass value was discussed.

9801-295. Singh Anupa (Dept Bot, Gujalat Univ, Ahmedabad 380009). **Increased UV-B-L radiation reduces N₂ fixation in tropical leguminous crops.** *Environ Polln*, **95**(2) (1997), 289-291 [23 Ref].

Enhanced UV-B radiation adversely affected the net photosynthetic rate, growth characteristics and nodule activity in all three species. Maximum reduction in net photosynthesis occurred in *Phaseolus mungo* cv. Pant U-30, whereas the greatest reduction in nitrogenase activity occurred in *Vigna radiata*.

9801-296. Somasekhar RK, Siddaramaiah (Dept Bot, Bangalore Univ, Bangalore 560056). **Heavy metal concentrations in soil and crops grown with metal rich industrial waste waters.** *J Indl Polln Contl*, **13**(1) (1997), 29-40 [21 Ref].

Effluents collected from three industries rich in heavy metals were applied to soil and crop plants were grown. The plants were grown for ten weeks at which stage the leaves were sampled for the estimation of accumulated metal concentration. The impact of effluents or soil chemical properties is elucidated.

9801-297. Sri Devi Prasad T, Singh Rana P, Sastry KV (Dept Biosci, Maharshi Dayanand Univ, Rohtak 124001). **Accumulation of chromium and nickel in wheat in a field irrigated with industrial effluents and water hyacinth in Sonapat city, Haryana, India.** *J Environ Bio*, **18**(1) (1997), 33-36 [9 Ref].

The effluents of cycle manufacturing factory at Sonapat (Haryana), tanneries and other industries containing chromium and nickel are released into a sewage drain. The sewage water from the drain is used to irrigate cereals and vegetables in the adjacent fields. The levels of chromium and nickel in sewage water of the drain, Eichornia growing on the sides of the drain and in the roots, stem and leaves of Triticum aestivum was estimated.

9801-298. Srivastava RK, Ayachi Akhilesh, Pandya Monica, Khare Bhavna (PG Dept Bot Environ Sci, Govt Autonomous Coll, Jabalpur MP 482001). **Effect of ordnance factory effluent on seed germination and early growth performance of pea seeds.** *Bull Pure Appl Sci*, **14B**(1) (1995), 7-10 [11 Ref]. (Late Pub).

Effect of ordnance factory effluent on seed germination and early growth performance of pea seeds was studied. It was found that the ordnance factory effluent was highly deleterious for the germination and early growth performance of seeds and as the concentration of effluent increases the deleterious effect also increases thereby showing positive correlation.

9801-299. Tripathy Anuradha, Sahu RK (Environ Res Cent, PG Dept Bot, Khailikote Coll, Berhampur 760001). **Effect of coal fly ash on growth and yield of wheat.** *J Environ Bio*, **18**(2) (1997), 131-135 [16 Ref].

A pot experiment was conducted to study the effect of the Talcher Thermal Power Station fly ash on growth and yield of wheat. Data of the pot experiment on growth and yield reveal that 50% fly ash applied to soil increased seedling height, plant height, girth, leaf number, leaf area, spike length, dry weight etc. The soil application of fly ash not only has the potential for improving their production but also for solving of the flyash disposal problem.

9801-300. Urna Ch, Ramana Rao TV (Dept Bio Sci, Sardar Patel Univ, Vallabh Vidyanagar 388102). **Effect of cement kiln dust on Hibiscus cannabinus L.** *Geolios*, **23**(1) (1996), 59-64 [10 Ref].

Paper deals with the impact of cement kiln dust pollution on the morphochemical and epidermal features of *H. cannabinus* plants grown under simulated cement kiln dust pollution.

9801-301. Vijayawar Anjali, Pandey GP (Sch Life Sci, Devi Ahilaya Vishwavidyalaya, Vigyan Bhawan, Khandwa Rd, Indore 452001, MP). **Effect of cement dust pollution on soybean: physiological and biochemical.** *Eco Env Conserv*, **2**(3&4) (1996), 143-145 [16 Ref].

The effect of cement dust pollution on soybean (*Glycine max* (L.) Merrill cv. PK 472) was studied by periodical sampling of leaves from dusted and undusted plants till their physiological maturity. Due to cumulative accumulation and encrustation of cement dust on leaves, a gradual decline in chlorophyll content was observed. Although chlorophyll a was found relatively more sensitive to the cement dust than chlorophyll b. Quantitative estimation of certain metabolites such as protein, starch and sugar content also showed a considerable decrease.