

ENVIRONMENTAL MANAGEMENT

0501-001. Agrawal GD, Prasad R (MG Gramodaya Vishwa Vidyalaya, Chitrakoot, District Satna, MP). **Some ideas in ecofriendly management of active and abandoned mines.** *Indian J Air Polln Contl*, 4(2)(2004), 9-21 [5 Ref].

Paper describes the various types of mines, under ground and over-ground, and the environmental impact of the various mining operations. It gives some ideas for eco-friendly management of mining operations and of abandoned or exhausted mines to reduce the adverse impacts. The ideas are essentially based on environmental studies of various mines and may not be applicable to all situations.

0501-002. Aggarwal PK (Indian Agricul Res Inst, Pusa Road, New Delhi 110012). **Impact of climate change on Indian agriculture.** *Assessment Climate Change in India and Mitigation Policies*, ed. SK Dash & Prakash Rao, WWF, New Delhi, 1-9 [13 Ref].

Simulation studies indicate that the direct effects of climate change on Indian agriculture would be small in short-run provided pests could be controlled. In long run, however, the production of different crops may be seriously affected depending upon the season, level of management and the magnitude of climate change. The indirect effects of climate change through projected increased incidence of uncertainties of rainfall onset, duration and frequencies of drought and floods, availability of irrigation, soil transformations, crop-pests competition, and submergence of some coastal land due to sea level rise may be more serious than the direct effects on crop growth.

0501-003. Attri SD (Indian Meteorol Dept, Mausam Bhavan, New Delhi 110003). **Status of climate change in India.** *Assessment Climate Change in India and Mitigation Policies*, Ed. SK Dash & Prakash Rao, WWF, New Delhi, 10-17 [4 Ref].

Global attention is currently focused on the quantification of implications of climate change due to natural and anthropogenic sources. Rising levels of greenhouse gases are responsible for rapid changes in climate system. By absorbing infrared radiation, these gases control the flow of natural energy through the climate system. Impact of such a future climate on agricultural production, natural ecosystems and water

resources needs to be assessed to plan response strategies for sustained economic development and to minimize damages to human settlements.

0501-004. Baby Saji (Dept Remote Sensing, Birla Inst Techno, Ranchi, Jharkhand). **Monitoring natural resources by supervised classification of remotely sensed information: a case study of Thrissur District of Kerala, India.** *Nature Env Polln Techno*, 4(1)(2005), 149-156 [20 Ref].

Paper deals with the monitoring of natural resources of Thrissur District from the results obtained by supervised classification and interpretation of Indian Remote Sensing (IRS)-1B LISS II data. The result leads to reliable conclusion for resource utilization and management for decision makers. The study shows that generalized land use/land cover classification for large areas, their delineation and spatial distribution categories, is possible by satellite imagery because of its synoptic coverage of large area. Study on the dynamics of land use is possible because of repetitive coverage of same area.

0501-005. Badami MG (Sch Urban Planng, Mc Gill Sch Env, Mc Gill Univ, 815 Sherbrooke Street West, Montreal, Quebec, Canada H 3A2k6). **Environmental policy-making in a difficult context: motorized two-wheeled vehicle emissions in India.** *Energy Policy*, 32(16)(2004), 1861-1877 [55 Ref].

Motor vehicle activity is growing rapidly in India and other less-industrialized countries in Asia. This growth is contributing to serious health and welfare effects due to vehicle emissions, and energy insecurity, acidification, and climate change. Paper applies the problem-structuring tools of 'value-focused thinking' to inform policy-making and implementation related to this complex problem in a difficult context, with specific reference to motorized two-wheeled vehicles, which play an important role in transport air pollution but also provide affordable mobility to millions with few other attractive options.

0501-006. Bhatnagar AK, Koul Monika (Environ Bio Lab, Dept Bot, Univ Delhi, New Delhi 110007). **Impact of climate change on medicinal plants: an assessment.** *Assessment Climate Change in India and Mitigation Policies*, Ed. SK Dash & Prakash Rao, WWF, New Delhi, 18-25 [18 Ref].

Medicinal plant species are more often found in specialized eco-climatic zones, and display profound ecological adaptations to restricted climatic variables. Climate

change can alter the rate of synthesis of secondary metabolites, thus affecting the medicinal properties of the plant. Climate change may also disturb the finely tuned relationships between plants and their pollinators. Breeding patterns, phenology, pollination, seed set and seedling establishment will be worst affected.

0501-007. Bhattacharya AK, Basnyal Bijendra (Indian Inst Forest Manag, Bhopal, MP). **Indicators for assessing empowerment situation in Joint Forest Management (JFM): relevancy, methods and applicability.** (*The Indian Forester*, 129(12)(2003), 1435-1450 [18 Ref].

Paper highlights the need for assessing the empowerment status of JFM and suggests field level monitoring indicators, approaches and methods based on experience of study conducted in Madhya Pradesh for assessing empowerment through JFM. JFM resolution is explicit with regard to empowerment of local communities, but it is often experienced that the local people are not able to avail the opportunity from it due to their own socio-cultural and economic constraints. Hence, it is necessary to look critically into the empowerment situation to understand the dynamics of empowerment within the context of JFM.

0501-008. Das SR, Nandi NC (Zool Surv India, M Block, New Alipur, Kolkata 700 053). **Oxbow lake environment and management of Ichhamati river basin,** West Bengal. *J Env Sociobio*, 1(1&2)(2004), 81-90 [13 Ref].

Ichhamati river and its branches form one of the largest oxbow lake complex at Bangaon region of North 24-Paraganas district, West Bengal. Besides agricultural and anthropogenic stresses, weed infestation particularly with water hyacinth, *Eichhornia crassipes* is a major concern devouring surface of lake waters. The results of environmental studies on water characteristics, lake flora and fauna, piscicultural activities as well as management practices and problems associated with these riverine wetlands of West Bengal have been discussed.

0501-009. Dewan KK, Mustafa M, Saxena P (Dept Math, Jamia Millia Islamia, New Delhi 110 025). **Neighbourhood schools: a paradigm to combat pollution and save energy.** *J Transport Manag*, 28(3)(2004), 415-430 [9 Ref].

Paper highlights the need for a policy approach by the government sector to provide a uniform framework of the facilities in the education system to every child. The study lays an emphasis on the fact that such a framework would lead to a reduction in

the vehicular density on the roads and a fall in the pollution level. It outlines a strategy to achieve an environment-friendly and fuel-saving transport system. The thrust of the study is to conserve energy by restructuring the education system.

0501-010. Gajjar N, Shaikh M (Gujarat Indl Techl Consultancy Org Ltd, GITCO House, Opp Sardar Patel Stadium, Navrangpura, Ahmedabad 380 009). **Environment impact assessment of a township: a case study.** *Environ Polln Contl J*, 7(6)(2004), 7-11.

The EIA study of township was carried out to measure a quantum of impact on the surrounding environment during construction and operation phase. The study revealed that the construction of a new township close to small rural villages will change the character of that village forever. Thus, this new township will have overall positive, long-term, and irreversible impact on the surrounding environment. The environment management plan endeavours to mitigate the adverse impacts and motivate the positive impacts.

0501-011. Gosain AK, Tripathi CN (Dept Civil Engg, Indian Inst Techno Delhi, Hauz Khas, New Delhi 110 016). **Climate change and agriculture in India: a case study.** *Assessment Climate Chang in India and Mitigation Policies*, Ed. SK Dash & Prakash Rao, WWF, New Delhi, 29-38 [18 Ref].

Paper presents an overview of climate change problem and its implications for rice productivity in north west (NW) India. Preliminary results have indicated that, if the currently practiced management practices are followed, the mean rice yield seems to decrease and variability of rice yield shall increase due to changes in future climate. Preliminary results on the adaptation measures indicate that the adjustment in transplanting dates under future climate may overcome the low rice yield to certain extent at the selected locations. Some gap areas which need attention for assessment of realistic impact of climatic change on agriculture in India are also presented.

0501-012. Gupta Vishal (Divisional Forest Office, Seppa, Arunachal Pradesh). **Apnavan plantations in Arunachal Pradesh: an agroforestry scheme for rehabilitation of degraded Jhum lands through people participation.** *(The) Indian Forester*, 130(2)(2004), 215-225 [5 Ref].

Owing to geographical isolation and topographical remoteness, the diverse tribal groups of Arunachal Pradesh have traditionally been practicing Jhum cultivation for ages. A scheme under the name Apnavan was initiated by the Department of

Environment & Forests of the State to rehabilitate the degraded Jhum areas by involving the local people using agro-forestry practices. Paper attempts to analyze the various issues related to the scheme, the progress achieved so far and the major constraints in the way of its successful implementation.

0501-013. Jagtap Tanaji G, Komar Pant, Deepali S (Natl Inst Oceanogr, Dona Paula, Goa). **Evaluation of mangrove ecosystem of India for assessing its vulnerability to projected climate changes.** *Assessment of Climate Change in India and Mitigation Policies*. Ed. SK Dash & Prakash Rao, WWF, New Delhi. 39-51 [23 Ref].

Mangrove ecosystems would be more vulnerable to the climatic changes, as directly influenced by tides. Due to sea level rise the intertidal and supralittoral zones are likely to be extended farther inland causing destruction of existing mangroves and associated biota. The changes in the salinity concentration may cause genetic erosion as well as change in the species composition. There may be a total new assemblage of species in response to the changing salinity regime.

0501-014. Kelkar Ulka, Bhujanga Rao DD, Bhadwal Suruchi, Girisha GK, Javed Akram (The Energy Res Inst, India Habitat Cent, Lodi Road, New Delhi 110 003). **Climate change and economic changes in India: the impact on agriculture.** *Assessment of Climate Change in India and Mitigation Policies*. Ed. SK Dash & Prakash Rao, WWF, New Delhi. 52-61 [Ref].

Paper describes the application of a methodology to assess vulnerability to climate change in the context of ongoing economic changes. GIS techniques can be used to develop a vulnerability profile for Indian agriculture that incorporates physical, social, and economic elements, at the district level. This approach will provide information about the regional and social differentiation of climatic vulnerability, facilitating the development of appropriate adaptation strategies.

0501-015. Kirpalani Chandni, Jain Nisha, Bassin JK (Dept Chem, Malviya Natl Inst Techno, Jaipur 302 017). **Municipal solid waste management in Jaipur city: an overview.** *Nature Env Polln Techno*, 4(1)(2005), 143-148 [1 Ref].

Study was carried out to understand the present status of solid waste management in the Jaipur city. The total quantity of solid waste generated in the city is around 1070 TPD (tons per day) with a per capita generation rate of 0.45 kg. For disposal of biomedical

waste, the local authorities, through private contractors, have created a CTF. However, no such organized disposal facility has been provided for Municipal solid waste.

0501-016. Kulkarni BD (Indian Inst Trop Met, Pashan, Pune 411 008).

Hydrometeorological analysis of Indian rainfall: impact of climate change on water resources. *Assessment of Climate Change in India and Mitigation Policies*. Ed. SK Dash & Prakash Rao, WWF, New Delhi. 62-71 [14 Ref].

Attempt has been made to summarize the hydro-meteorological analysis of Indian rainfall that has been carried out at the Indian Institute of Tropical Meteorology. Results obtained from different hydro-meteorological studies are discussed. Results of hydro-meteorological studies will be useful for river valley projects, water management authorities, irrigation, hydropower generation and flood control agencies for their short as well as long term utilization and planning and of optimum use of vast water resources of our country.

0501-017. Kumar Rajiv (Extension Div, Forest Res Inst, Dehradun 248 006).

Sustainable utilization of mangrove ecosystem for local community development. *ENVIS Forestry Bull*, 4(2004), 43-51 [19 Ref].

The unsustainable utilization of mangroves posed a serious threat to their conservation and consequently adverse effect on the development of local communities. Realising gravity of the problem, Government of India in 1986 banned felling of mangroves and launched a centrally sponsored scheme for conservation and development of mangrove ecosystem. Mangrove ecosystem offers numerous wood and non-wood forest products for the local communities. Mangroves also provide various services to the coastal community, which are crucial for their prosperity and provide a healthy environment around them.

0501-018. Malik PK, Datta S (Cent Surface Sci, Dept Chem, Jadavpur Univ, Kolkata 700 032). **Financial sustainability of environmental investment under an empirical pollution abatement policy instrument in India: the case of wastewater treatment.** *Environ Sci Policy*, 8(1)(2004), 67-74 [26 Ref].

The policy instrument proposed in this study is framed on a deposit-refund system. The study gauges the economic benefit of the investment in ETPs under the proposed policy instrument and also to compare the economic benefit with the abatement cost using standard cost-benefit analysis, including conversion of money

flows to net-present-value at a real discount rate. Results show that a firm will be financially benefited under the proposed policy instrument if it invests in implementing and operating the pollution abatement equipment.

0501-019. Mishra UC (Hlth Safety Env Gr, Bhabha Atomic Res Cent, Mumbai 400 085). **Environmental impact of coal industry and thermal power plants in India.** *J Environ Radioactivity*, 72(1&2)(2003), 35-40 [6 Ref].

The problems associated with the use of coal are low calorific value and very high ash content. Attempts have been made to reduce the adverse environmental and ecological impacts of coal-fired power plants. Paper highlights some of these problems and gives a brief description of the solutions being attempted. Some of the recommendations have been implemented for new plants and the situation in the new plants is much better. A few coal washeries have also been established.

0501-020. Mohalik NK, Singh RKV, Sural G, Barnwal RP, Pandey J, Singh VK (Mine Fire Div, Centl Mining Res Inst, Dhanbad 826 001). **Environmental impact of coal mine fire during excavation of developed galleries by opencast method.** (*The Indian Mining Engng J*, 43(11)(2004), 30-35 [11 Ref].

Earlier, most of the coal mines were developed underground and are presently being excavated by the opencast method to increase the production, especially in Jharia coalfield. The spontaneous heating/fire has occurred in the galleries of developed pillars due to intrinsic characteristics of coal and mining operation. Paper assesses the causes of coal mine fire in the opencast workings of developed galleries and suitable suggestive measures for controlling and combating the intensity of the fires.

0501-021. Pandey R (Natl Inst Public Finance Policy, 18/2 Satsang Vihar Marg, New Delhi 110 067). **Estimating sectoral and geographical industrial pollution inventories in India: implications for using effluent charge versus regulation.** *J Dev Std*, 41(1)(2005), 33-61 [8 Ref].

Article uses the Industrial Pollution Projection System database to estimate the industrial pollution load and the associated abatement cost, which can be used to design cost-effective strategies for pollution control. It also illustrates the cost-effectiveness of market based instruments such as effluent charge vis-à-vis regulation.

0501-022. Pangtey BS, Kumar Sushil, Bihari V, Mathew N, Rastogi SK, Srivastava AK (Epidemiology Div, Indl Toxicology Res Cent, PB 80, MG Marg, Lucknow 226 001). **An**

environmental profile of brick kilns in Lucknow. *J Environ Sci Engng*, 46(3)(2004), 239-244 [10 Ref].

Twenty two kilns in Lucknow were studied to identify the environmental hazards posed by the brick kilns and to quantify the environmental degradation which could be attributed to this industry. Information about the nature and type of kiln, fuel and water sources was also collected. 18.18 per cent of the kilns had moving steel chimneys with less than prescribed height. Approximately 1.89 + 0.87 acre of fertile agricultural land was used for manufacturing of clay brick per kiln, resulting in land degradation, decrease in herb density and nutrient disorders in plants/trees in immediate vicinity.

0501-023. Parikh J, Parikh K (Integrated Res Action Development, C-50, **Asian Games Village Complex, New Delhi 110 049**). **The Kyoto Protocol: an Indian perspective.** *Int Review Environ Strategies*, 5(1)(2004), 127-144 [12 Ref].

Article describes the Clean Development Mechanism (CDM) policy of India, provides estimates of potential for a few sectors, and voices India's concern about the CDM. In particular it covers the problems of determining CDM baseline, transaction costs, and risks that have to be borne by the developing countries and determining a fair price for CO₂. It argues for more effective technology transfer and points out that, if interpreted incorrectly, CDM rules can discourage climate-friendly policies in the developing countries.

0501-024. Patwardhan SK (Indian Inst Trop Meteorol, Pashan, Pune 411 008). **Climate change and desertification: issues over Indian region.** *Assessment of Climate Change in India and Mitigation Policies*. Ed. SK Dash and Prakash Rao, WWF, New Delhi, 130-136 [13 Ref].

Human activities release greenhouse gases into the atmosphere and rising levels of greenhouse gases are expected to cause drastic climate change. Climate change will have impact on agriculture, water resources, dryland areas, human health etc. In India, on an average 18.74% of the landmass experiences arid conditions every year. Attempt has been made to assess the impact of Climate Change on desertification over Indian region.

0501-025. Ramakrishnan PS (Sch Environ Sci, Jawaharlal Nehru Univ, New Delhi 110 067). **Climate change as a component of global change and globalisation: a**

developing country perspective. *Assessment of Climate Change in India and Mitigation Policies*. Ed. SK Dash & Prakash Rao, WWF, New Delhi. 137-160 [34 Ref].

The impact of 'global change', which by itself a complex ecological phenomenon, cannot be divorced from an equally complex economic phenomenon, namely, 'globalization'. Paper tries to argue that these two global phenomena are in many ways closely inter-linked with livelihood concerns of a vast majority of marginalized sections of the society in the developing world. The implications for sustainable management of natural resources with which these societies are closely linked are discussed.

0501-026. Ramesh R, Purvaja R (Inst Ocean Manag, Anna Univ, Chennai 600 025). **Climate change and coastal ecosystems: an overview.** *Asian J Water Env Polln*, 1(1&2)(2004), 29-40 [20 Ref].

The amounts of trace gases notably CO₂, N₂O and CH₄ have been increasing in the earth's atmosphere. Increased concentration of these gases leads to a warming of the Earth's surface and the lower atmosphere. The resulting changes in climate and their impacts can be estimated without associating the origin of the warming to any one of these gases specifically. Attempt has been made to review the processes involved in climate change and its effects on sea level rise and on the coastal ecosystems.

0501-027. Rao AD (Cent Atmos Sci, Indian Inst Techno, Delhi, Hauz Khas, New Delhi 110 016). **Sea level rise and coastal hazards along the Indian coasts.** *Assessment of Climate Change in India and Mitigation Policies*. Ed. SK Dash & Prakash Rao, WWF, New Delhi. 170-180 [16 Ref].

Trends in cyclonic disturbances for the last more than 100 years reveal that there is a significant increase in the extra tropical cyclones and decrease in the tropical cyclones during recent four decades. The analysis of tide gauge records shows the sea level rise by about 10-25 cm over the last 100 years. Local subsidence in the river deltaic regions is very significant which may increase the relative rate of sea level rise. Exposure of population to sea level rise and storm surges is particularly an extremely grave consideration in Ganga-Brahmaputra-Meghna delta of Bangladesh.

0501-028. Rao PS, Gavane AG, Ankam SS, Ansari MF, Pandit VI, Nema P (Air Polln Contl Div, Natl Environ Engng Res Inst, Nehru Marg, Nagpur 440 020). **Performance evaluation of a green belt in a petroleum refinery: a case study.** *Ecol Engng*, 23(2)(2004), 77-84 [6 Ref].

A software developed by National Environmental Engineering Research Institute for the determination of the optimal width of a Green Belt (GB) in and around an industry is based on pollution attenuation coefficient of selected species of deciduous trees existing in the region. The performance of a 500 m-wide GB of a 13.5 million tones/year refining capacity was evaluated for reducing/managing various wastes generated in the west coast of India. Its overall efficiency was found to be above 60%.

0501-029. Rathi AKA, Bhanujan KV (Ind Commissionerate, Government of Gujarat, Udyog Bhawan, Gandhinagar 382 017). **Cleaner technology development – some practical steps for developing countries.** *J Environ Sci Engng*, 46(4)(2004), 257-260 [5 Ref].

Cleaner technologies often originate from developed countries. Little developmental work is continued on the products sourced from developing countries. These products are by and large low value products generating large quantities of hazardous waste per unit of production. Methodology is proposed for phasing out such dirty technologies products. The development of cleaner technologies is proposed for utilizing large quantity of hazardous waste generated from identified manufacturing process.

0501-030. Sahu NC, Mishra M (Dept Eco, Berhampur Univ, Berhampur 760 007, Orissa). **Industrial pollution: a threat to agricultural sustainability.** *J Env Ecol Manag*, 1(1)(2004), 23-40 [84 Ref].

Study is an empirical exercise in valuation of pollution damages caused by an industrial agglomeration in Angul-Talcher area in Orissa in terms of agricultural production and productivity in spite of command control supervision and abatement expenditures. Environment taxation has to be chiseled at the national level with a provision for using the revenue for local environmental promotion. Till that time, it is important to introduce a flexible refundable environmental assurance bond scheme for the Angul – Talcher region.

0501-031. Shukla PR, Sivaraman B, Yajnik A (Public Systems Gr, Indian Inst Manag, Vastrapur, Ahmedabad 380 015). **The clean development mechanism and India: firm responses, baselines and development dynamics.** *Int Review Environ Strategies*, 5(1)(2004), 257-272 [14 Ref].

Paper provides an assessment of the CDM from a developing country's perspective with specific reference to activities in India. The CDM has elicited considerable interest from various Indian industries. Paper analyses the nature of initial CDM projects in India, sector preferences, scales, and possible contributions to India's development priorities. The issues of technology transfer, transaction costs, baselines, and additionality are discussed with reference to the Indian context.

0501-032. Singh Gurdeep, Vijayan Iyer G (Cent Mining Env, Indian Sch Mines, Dhanbad, Jharkhand). **Environmental impact studies of chrome rollers used by cotton roller ginning industries and design and development of pollution free chromeless RCF rollers.** *Environ Monit Assess*, 96(1-3)(2004), 163-181 [13 Ref].

Study focuses on environmental chromium contamination and pollution caused by the use of Chrome Composite Leather-Clad (CCLC) rollers commonly used in cotton roller ginning industries and attempts to eliminate this problem by providing eco-friendly chrome-less rollers.

0501-033. Singh HS (Gujarat Ecol Edn Res Foundation, Indroda Park, Gandhinagar, Gujarat). **Marine protected areas in India: coastal wetland conservation.** (*The Indian Forester*, 129(11)(2003). 1313-1321 [11 Ref].

Extensive coastlines of India support large area of coastal wetlands, which has been estimated at over 40,230 km². A total of 97 major estuaries, 34 major lagoons, 31 mangroves areas and 5 coral reef areas have been mapped and identified, which are important for conservation and sustainable use. Management plan for conservation of mangroves and coral reefs, enactment of the Coastal Regulation Zone (CRZ) Act 1991, establishing Indian Coral Reef Monitoring Network and declaring network of sanctuaries, national parks and biosphere reserves in marine environment are some of the important initiatives taken by the Government of India for their conservation. The common issues and problems that need to be tackled urgently for ensuring an effective management set up of MPAs of the country are discussed.

0501-034. Singh RB, Sen Roy S (Dept Geo, Delhi Sch Eco, Univ Delhi, New Delhi 110 007). **Impact of climate change on mountain ecosystems.** *Assessment Climate Change in India and Mitigation Policies*, Eds SK Dash & Prakash Rao, WWF, New Delhi, 221-230 [6 Ref].

In the mountainous areas a little change or variation in climatic conditions could result in large-scale changes in the entire ecosystem. Study analyses in detail the impact of variable climatic conditions on the natural environment mainly agriculture, horticulture and extreme events. Detailed analysis shows that over the years there has been an increase in not only the number of extreme weather events but also the number of casualties taking place in the district as a result of such extreme events.

0501-035. Singh SK, Rai JPN* (*Dept Environ Sci, Coll Basic Sci Humanities, GB Pant Univ Agricl Techno, Pantnagar 263 145). **Vegetation pattern related to grazing pressure in alpine meadows of Nanda Devi Biosphere Reserve.** *J Environ Bio*, 25(3)(2004), 299-306 [22 Ref].

Study aims to analyze the interaction of prevailing biotic pressure on plant species diversity in Nanda Devi Biosphere Reserve which lies in northern part of Uttaranchal hills. Phytosociological study performed in plots of varying slope and grazing pressure intensity revealed that the dominant grasses were *Danthonia cachemyriana* and *Poa annua* and dominant forbs were *Trachydium roylei* and *Geum elatum* in all the plots. Grasses were abundant on west facing slopes while forbs preferred the even topography of east facing meadows.

0501-036. Srinivasan G (Dept Sci Techno, Techno Bhavan, New Delhi 110 016). **Need for effective science – policy interface to deal with climate change issues.** *Assessment Climate Change in India and Mitigation Policies*. Eds SK Dash & Prakash Rao, WWF, New Delhi, 245-251 [4 Ref].

The climate change issue presents a very challenging dimension in the tropics – in terms of the unique climate of the tropics, and in terms of impacts on the numerous developing and small island countries in the region. While the former stems from gaps in our present understanding of tropical oceans and atmosphere, the latter highlights the complex task of enabling developmental demands while conserving highly stressed resources in an economically and culturally diverse social context.

0501-037. Swami HM, Thakur JS, Gupta Manisha, Bhatia SPS (Dept Community Med, Govt Medl Coll, Coll Bldg, Sector 32, Chandigarh 160 047). **Improving environmental conditions of a slum in Chandigarh by an awareness campaign.** *J Environ Sci Engng*, 46(3)(2004), 252-256 [8 Ref].

An intervention project, in the form of an environmental awareness campaign was conducted in a slum of Chandigarh with a population of about 40,000. It has been observed that simple environmental awareness campaign can change the knowledge and behavioural practices of slum dwellers and could be a model for launching similar projects in other slums of India and other developing countries.

0501-038. Taneja Ajay, Satsangi Gur Sumiran (Sch Cheml Sci, Dept Chem, St John's Coll, Agra 282 002). **Critical load – a new approach, concept and applications.** *Asian J Exptl Sci*, 17(1&2)(2003), 23-34 [8 Ref] (Late Pub).

The critical load concept, steady state mass method, which is commonly used for deriving this load and its application for aquatic ecosystem have been discussed. By using this approach it is possible to identify the controls on sulphur and nitrogen oxides deposition which may be required to protect the ecosystem in future thus making it as a powerful tool for planning acidification abatement policies for a region.

0501-039. Vidya P, Padwal Desai SR, Ussuf KK* (*Dept Biotechno, Jai Res Foundation, PB No.30, GIDC, Vapi, Gujarat 396 195). **Biodegradation of polycyclic aromatic hydrocarbons by *Phanerochaete chrysosporium*.** *Indian J Env Toxicol*, 14(1)(2004), 8-12 [22 Ref].

Phanerochaete chrysosporium has been able to degrade these chemicals more efficiently in ligninolytic culture conditions than non-ligninolytic cultures. The rate of degradation of simple PAHs has been found faster than the complex ones. A mixture of PAHs has been degraded by *P. chrysosporium* with equal efficiency. The growth rate of the organism is inhibited in the presence of PAH compounds and hence prior growth of the organism is essential for efficient biodegradation.

AIR POLLUTION

0501-040. Gadgil AS, Jadhav RS (Dept Environ Sci, Univ Pune, Pune 411 007). **Street-level concentrations of suspended particulate matter (SPM), nitrogen dioxide (NO₂) and sulphur dioxide (SO₂) in Pune city.** *J Environ Sci Engng*, 46(2)(2004), 143-150 [23 Ref].

The concentration of SPM NO₂ and SO₂ were measured at 13 important traffic intersections in Pune city. In order to study the contribution of these pollutants from motor vehicles, attention was focused on the roadside, street-level concentration. The

statistical analysis of the sampling results indicates that there is not only high correlation between SPM and NO₂ but also the levels of these pollutants are above the National Ambient Air Quality Standards (NAAQS) laid down by the Central Pollution Control Board (CPCB), India. The SO₂ concentrations are found to be well below the NAAQS.

0501-041. Ghose Mrinal K (Cent Mining Env, Indian Sch Mines, Dhanbad 826 004).

Emission factors for the quantification of dust in Indian coal mines. *J Scient Indl Res*, 63(9)(2004), 763-768 [20 Ref].

Prediction equations are utilized for the development of emission factors and are used for the quantification of dust generation due to opencast coal mining. For the applications of this concept one large opencast coal project of Bharat Coking Coal Ltd (BCCL) was investigated and the amount of dust emitted due to different mining activities was quantified. Paper also focuses on the significance in the field of environmental protection and likely impacts of such study. It concludes that once the amount of dust generation is estimated, the impact on air quality can be assessed appropriately and a proper air pollution control strategy can be developed.

0501-042. Gokhale SB, Patil RS (Dept Civil Engng, Indian Inst Techno, Delhi, Hauz Khas, New Delhi). **Size distribution of aerosols (PM₁₀) and lead (Pb) near traffic intersections in Mumbai (India).** *Environ Monit Assess*, 95(1-3)(2004), 311-324 [20 Ref].

The size distribution of aerosols was measured near traffic intersections in a moderately industrial area and a heavily commercial area of the Mumbai City. It was found that PM₁₀ and Pb at both the intersections could easily be classified by the size distribution. The fractions of the PM₁₀ and that of Pb showing a tendency of trimodal distributions with the first peak at coarse mode ~9.0-10.0 μm, second at ~5.8 μm and the third at coarse mode ~1.1 μm. The significant percentage of Pb was found in the range below 2.5 μm at both the intersections.

0501-043. Gokhale SB, Patil RS (Dept Civil Engng, Indian Inst Techno, Delhi, Hauz Khas, New Delhi). **Modelling the size separated particulate matter (SSPM₁₀) from vehicular exhaust at traffic intersections in Mumbai.** *Environ Monit Assess*, 98(1-3)(2004), 23-40 [23 Ref].

Study was carried out to predict the size separated particulate matter below 10 μm size (SSPM₁₀) from vehicular exhaust at traffic intersections using modified general

finite line source model (GFLSM). The model was also applied to predict the total particulate matter for downwind distances from the road intersection. Result indicated that the model's performance was good for the finer range of particles (below 4.7 μm) with r-square values of 0.49 and 0.57 found at both the intersections respectively. At both the intersections, SSPM_{10} concentration data were found lognormally distributed.

0501-044. Gupta AK, Patil RS*, Gupta SK (*Cent Environ Sci Engng, Indian Inst Techno, Bombay, Mumbai). **A statistical analysis of particulate data sets for Jawaharlal Nehru port and surrounding harbour region in India.** *Environ Monit Assess*, 95(1-3)(2004), 295-309 [13 Ref].

The concentrations of total suspended particulate matter (TSP) and particulate matter less than 10 microns (PM_{10}) were measured at various locations in Jawaharlal Nehru port and surrounding harbour region. The annual average concentration of PM_{10} was $66.1 \mu\text{g m}^{-3}$. There are clear associations between TSP and PM_{10} data set at all the measured three sites with a correlation coefficient of 0.89, 0.69 and 0.81, respectively. Statistical analysis of air quality data shows that TSP is strongly correlated with wind speed but weakly correlated with temperature.

0501-045. Gupta I, Joseph AE (Natl Environ Engng Res Inst, 98/B, Dr AB Rd, Worli Mumbai 400 018). **Trends of particulate matter in Mumbai city.** *Cheml Environ Res*, 13(1&2)(2004), 87-94 [6 Ref].

Particulate matter concentration in Greater Mumbai is higher than the prescribed standards and WHO guidelines. A set of time series analysis methods viz. t-test adjusted for seasonality, seasonal regression on de-seasonalized data regression with weighted least square technique have been applied to identify and estimate the trend in SPM and PM_{10} levels at three monitoring sites of Mumbai. However, SPM levels have been observed to be constant. Reasons for the same have been discussed.

0501-046. Jain N, Pathak H, Mitra S, Bhatia A (Div Environ Sci, Indian Agricl Res Inst, New Delhi 110 012). **Emission of methane from rice fields – a review.** *J Scient Indl Res*, 63(2)(2004), 101-115 [126 Ref].

Methane (CH_4) with its current concentration of 1.72 ppmV in the atmosphere accounts for 15 per cent of the enhanced greenhouse effect. The atmospheric concentration of CH_4 is increasing at 0.3 per cent/y. Lowland rice soil is considered to be one of the major contributors of atmospheric methane. Emission of CH_4 from rice fields

can be reduced by: (i) midseason drainage instead of continuous flooding, (ii) use of cultivars with low emission potential, (iii) use of low C:N organic manure, and (iv) direct establishment of rice crop like dry direct seeded rice.

0501-047. Jain Renu, Dwivedi Dev Km, Gupta AB (Dept Civil Engng, Malviya Natl Inst Techno, Jaipur 302 017). **Status of air quality at selected traffic junctions of Jaipur city.** *Nature Env Polln Techno*, 3(4)(2004), 435-442 [15 Ref].

The study on vehicular air pollutant concentration with regard to CO, NO₂, SO₂ and particulate matter has been made at the four highly congested traffic junctions of Jaipur city. Based on the data obtained, a dimensionless parameter called "Air Quality Index" was determined for each pollutant. In general, the air quality index remained higher for PM₁₀ followed by CO at all the places.

0501-048. Kannan GK, Kapoor JC (Cent Fire Env Explosive Safety, Defence Res Dev Org (DRDO), Metcalfe House, Delhi 110 054). **Relationship of sulphur dioxide and its particulate converts in the urban ambient air.** *Indian J Air Polln Contl*, 4(2)(2004), 1-8 [13 Ref].

Results of ambient air quality monitoring carried out in India show that particulates encountered in urban areas are appreciably higher especially during winter and summer months, while the gaseous pollutants are much below the permissible limits. This gives a pseudo impression of clean air quality. However, recent studies of secondary pollutants formed from the gaseous species in the atmosphere, especially in the urban areas show that the subject is of great concern. Paper discusses the relationship of converted sulphate particulates and gaseous precursor sulphur dioxide present in the atmosphere.

0501-049. Krishna Rao PV, Rama Mohan Reddy V, Shyamlal, Venkata Ramani S, Venkataratnam L (Natl Remote Sensing Agency, Hyderabad 700 037). **Methane flux measurements from rice fields over Andhra Pradesh in peninsular India using remote sensing approach: a methodology development.** *Indian J Environ Sci*, 9(1)(2005), 47-52 [12 Ref].

Paper attempts to integrate the methane emissions from different broad soil units and paddy area estimation using IRS-WIFS data of Kharif and Rabi seasons in Andhra Pradesh state. The seasonal integrated flux from different soil units varied significantly and deltaic alluvial and chalka soils have shown high emission rates as compared to

coastal alluvial and red soils. The high flux rates are related to the high submergence and organic carbon content in the soil. The regional methane flux was 0.265 and 0.060 Tg (Tera grams) during Kharif and Rabi seasons respectively, from paddy cultivated area of 3.77 Million hectares in Andhra Pradesh.

0501-050. Lone PM, Khan AA, Shah SA (Air Polln Unit, Dept Bot, Aligarh Muslim Univ, Aligarh 202 002). **Study of dust pollution caused by traffic in Aligarh city.** *J Environ Sci Engng*, 47(1)(2005), 33-36 [5 Ref].

The dust pollution caused by vehicles in Aligarh city is estimated. The dust pollution was maximum on Kanpur road (46.44 gm/m²/month) followed by Agra road (38.94 gm/m²/month) and Delhi road (34.52 gm/m²/month). The least dust pollution was recorded on Anoopshahar road (20.10 gm/m²/month). The average dust fall rate per unit area was estimated to be about 35 gm/m²/month in Aligarh city.

0501-051. Mahendra SP, Krishnamurthy (Dept Civil Engng, PES Coll Engng, Mandya 571 401). **Prediction of carbon monoxide concentration due to road traffic using CALINE4 model.** *Nature Env Polln Techno*, 4(1)(2005), 39-42 [8 Ref].

A line of regression between the predicted and the measured values was obtained to calibrate the CALINE4 model. The predicted values from CALINE4 have been corrected using the calibration equation. The comparison of the corrected predictions and measured values of CO concentration showed that the values lie within close ranges and as such CALINE4 can be used in future for the prediction of CO concentrations at different locations.

0501-052. Mahendra SP, Krishnamurthy (Dept Civil Engng, PES Coll Engng, Mandya 571 401 Karnataka). **Carbon monoxide concentration due to urban traffic: a statistical approach.** *Nature Env Polln Techno*, 3(4)(2004), 473-476 [7 Ref].

Paper assesses the CO levels in the ambient air at selected arterial roads of Sheshadri road and Kempe Gowda road near junctions in Bangalore city concurrently with traffic flow and stream speed of vehicles during morning peak traffic hours. Study revealed that the traffic generated CO concentrations were closely related to the traffic flow parameters and stream speed. Further, from the statistical analysis it shows that the CO concentrations and two-wheelers with stream speeds are in good agreement and well correlated in the study locations.

0501-053. Meenakshi P, Saseetharan MK (Dept Civil Engng, Coimbatore Inst Techno, Coimbatore 14). **Urban air pollution forecasting with respect to SPM using time series neural networks modeling approach – a case study in Coimbatore city.** *J Environ Sci Engng*, 46(2)(2004), 92-101 [11 Ref].

The Coimbatore city due to its climatic conditions and industrial development is experiencing an exponential growth in the vehicular usage and fuel consumption. Paper presents the evolution of SPM forecasting models for the prediction of SPM one week in advance. Time series neural networks approach is used for modeling. The input variables are the meteorological parameters, the concentration of SPM one week before and the concentration of SPM on the monitoring day. The evolved models of SPM for selected monitoring stations will be useful for the effective functioning of the air quality management programme.

0501-054. Mohan Manju, Carmichael GR, Ferm M, Kumar Sanjay, Taneja A, Panda TC, Mohan Ram (Indian Inst Techno, Hauz Khas, New Delhi). **A study of air quality monitoring through passive diffusion sampling: regulatory implications of the technique.** *Indian J Air Polln Contl*, 4(2)(2004), 22-30 [14 Ref].

Paper presents the results of ten monitoring stations established in India under the Rains-Asia project of World Bank/Asian Development Bank. More recently, monthly measurements of sulphur-dioxide, ammonia and ozone have also been conducted using Passive Sampler Technology under WMO/Global Atmospheric Watch (GAW) Urban Research Meteorology and Environment (GURME) project. The results of this latter network for three monitoring stations in India (Agra, Cochin, Bhubaneswar) have been given and compared with the earlier data obtained for these stations on monthly basis. The study suggests that passive samplers can address important measurement issues in environmental air quality management. They can be effectively used to aid monitoring programmes during active instrument failures.

0501-055. Mukherjee I, Chakrabarty SN, Misra AK (Dept Civil Engng, Environ Engng Div, Jadavpur Univ, Kolkata 700 032). **Vertical variation of indoor particulate concentration at a location within Jadavpur University campus.** *Indian J Air Polln Contl*, 4(2)(2004), 42-51 [13 Ref].

Paper deals with the variation of $PM_{2.5}$ and PM_{10} concentrations with height. The individual concentration of these particulates has also been provided. The ratio of $PM_{2.5}$

to PM₁₀ has been computed to find out the probable reasons for the observed variations in PM_{2.5} and PM₁₀ concentrations. Metal components in the collected samples have also been analyzed to get an idea regarding the approximate source of these particulates.

0501-056. Prasad Rajendra (Envirotech Inst Pvt Ltd, A-271, Okhla Indl Area, Phase 1, New Delhi). **Urban air quality – some interesting observations.** *Our Earth*, 1(3)(2004), 8-11.

Effort has been made to expose the observations that the Envirotech Instruments Pvt Ltd has collected during their long years experience in this field. In particular, an interesting relationship between population density and suspended particulate matter (SPM)/respirable suspended particulate matter (RSPM) concentration has been observed which hardly depends upon the local meteorology and climate of the place, rather it depends upon the local polluting sources. This observation has been explained in the paper.

0501-057. Rao BPS, Rao BS, Chakole P, Manthapurwar NS, Hasan MZ (Air Polln Control Div, Natl Environ Engng Res Inst, Nagpur 440 020). **Performance of air emission generator for simulation of small-medium-scale industrial emissions.** *Indian Cheml Engng Sec (A&B)*, 43(3)(2004) 147-150 [14 Ref].

Pilot scale emission generator comprising dust and gas generator system with continuous gas monitoring equipment has been tested successfully by measuring dust concentration with flow rate, gas load with inlet flow, and gas concentration with flow rate for its suitability to simulate small-medium-scale industries in ambient condition, which would then be subjected for treatability studies to arrive at a techno-economic control option.

0501-058. Reddy MK, Rama Rao KG, Rammohan Rao I (Natl Environ Engng Res Inst, Zonal Lab, Hyderabad). **Air quality status of Visakhapatnam (India) – indices basis.** *Environ Monit Assess*, 95(1-3)(2004), 1-12 [8 Ref].

Air quality status of Visakhapatnam on indices basis is analyzed using a non-linear equation for variable parameters i.e. suspended particulate matter (SPM), sulfur dioxide (SO₂) and oxides of nitrogen (NO_x), which are main criteria pollutants in India. For current analysis seasonal air quality data is used, which indicates SPM values in winter at most of the sites and in summer at few sites are exceeding the prescribed standards. Calculated indices reveal that, in winter as well as in summer, most of the

locations experienced poor or bad air quality, which is mainly due to higher concentration of SPM and certain extent of SO₂ values.

0501-059. Sastry MS, Suneela M, Shashidhar Kumar NP, Hussain SK (Environ Prot Trng Res Inst, Gachibowli, Hyderabad 500 032). **Air quality status at selected locations in Hyderabad city.** *J Environ Sci Engng*, 46(2)(2004), 86-91 [7 Ref].

A case study for assessing the air quality status is elaborated for Hyderabad city. Monitoring was carried out at 11 locations during March 2003. These observations on air quality status and AQEI predicts that most of the localities in Hyderabad are experiencing the air pollution stress and the trend is likely to worsen in near future if proper control measures are not implemented.

0501-060. Sharma Rajnikant, Pervez Shams (Sch Std Chem, Pt Ravishankar Shukla Univ, Raipur 492 010, Chattisgarh). **Chemical characterization and enrichment of selected toxic elements in ambient particulate matter around a slag based cement plant in Chhattisgarh state – a case study.** *J Scient Indl Res*, 63(4)(2004), 379-382 [21 Ref].

Samples of Respirable Suspended Particulate Matter (RSPM) and Non-Respirable Suspended Particulate Matter (NRSPM) were collected and analyzed for selected toxic elements. Results indicated a high contribution of toxic elements in the ambient particulate matter by the stack emissions from the selected cement plant. Good positive correlation coefficient values were found for RSPM and metal concentration. Almost all the elements have shown higher enrichment factor values. Higher spatial variability values were obtained for RSPM metal concentration than NRSPM metal concentration.

0501-061. Singh Bhoomika, Agrawal Madhoolika* (*Dept Bot, Banaras Hindu Univ, Varanasi). **Impact of simulated acid rain on growth and yield of two cultivars of wheat.** *Water Air Soil Polln*, 152(1-3)(2004), 71-80 [26 Ref].

Study reports the results of a field-based experiment conducted to assess the effect of simulated acid rain (SAR) of different pH on two cultivars of wheat Malviya and Sonalika. Net assimilation rate (NAR) declined significantly at pH 3.0 in both varieties. Compared to control, yield of Malviya showed significant reductions at pH 4.0 and 3.0, whereas Sonalika responded negatively at pH 3.0. The study showed that acid rain has a significant negative effect on wheat plant performance.

0501-062. Singh Gurdeep, Puri SK (Cent Mining Env, Indian Sch Mines, Dhanbad). **Air quality assessment in Korba coalfield.** *Indian J Air Polln Contl*, 4(2)(2004), 31-41 [10 Ref].

The overall ambient status in the coalfield was found not satisfactory. In the indoor microenvironment, RSP levels were found higher than expected. Concentration levels of trace elements in the particulates varied greatly. Geological rocks in the coalfield, coal burning, wear and tear of tyres and metallic parts of HEMM and other machines operating in the coalfield were found to contribute to air pollution. Strategy for Air Quality Management has been suggested. It is based on the analysis of data pertaining to various causes of dust generation.

0501-063. Sinha SN, Patel TS, Shah SH, Desai NM, Patel GM, Mansuri MM, Saiyed HN (Natl Inst Occupl Hlth, Meghani Nagar, Ahmedabad 380 016). **A correlation of secondary aerosol (nitrate and sulfate) with respirable particulate matter (RPM) in ambient air at different traffic junctions of Vadodara city.** *J Environ Bio*, 26(2)(2005), 187-190 [11 Ref].

The correlation studies of nitrate and sulfate particulates with RPM have been established. The average concentration of sulfate and nitrate in ambient air was found $35.74 \mu\text{g}/\text{m}^3$ and $24.22 \mu\text{g}/\text{m}^3$, which ranged of 5.33-84.69 and 1.93-77.86 $\mu\text{g}/\text{m}^3$ respectively. The presence of sulfate and nitrate in RPM is 8.25% and 5.60%. Regression analysis result showed that the relationship between RPM-SO₄ was significantly ($R^2=0.66215$) correlated.

0501-064. Soni SL, Mathur HB (Mechanical Engng Dept, MR Engng Coll, Jaipur Rajasthan). **CNG substitution for reduction of pollution from potable generator set.** *Indian J Air Polln Contl*, 4(2)(2004), 65-68 [4 Ref].

S.I. engine exhaust emission characteristics with CNG fuelling, have been experimentally determined over a wide range of engine operations at various engine speeds, spark timings and compression ratios, using Timed Manifold Injection (TMI) system for efficient and trouble free operation of the engine. CNG fuelling of the engine gives low levels of exhaust CO and HC emissions while NO_x levels can be further reduced by employing higher air index, facilitated by TMI.

0501-065. Sriram G, Krishnamohan N, Gopalasamy V (Dept Mechanical Engng, SCSVMV (Deemed Univ) Enathur, Kanchipuram 631 561). **Analysis of skewness and**

kurtosis for ambient air quality monitoring data – Neyveli thermal plants. *J Scient Indl Res*, 63(9)(2004), 769-775 [7 Ref].

Application of probability analysis can be applied in other ways in air pollution problems. Positively skewed distributions are characteristics of naturally occurring phenomena. Dust fall and atmospheric particulate and gaseous concentrations are typical examples. The air quality is analyzed in respect of sulphur dioxide and suspended particulate matter in the ambient air in the neighbourhood of Neyveli Thermal Power Corporation for finding ideal location of sampling stations.

0501-066. Srivastava Anjali, Joseph AE, Wachasunder D (Mumbai Zonal Lab, Natl Environ Engng Res Inst, Nehru Marg, Nagpur 440 020). **Qualitative detection of volatile organic compounds in outdoor and indoor air.** *Environ Monit Assess*, 96(1-3)(2004), 263-271 [7 Ref].

Paper attempts to identify VOC's in outdoor and indoor air in Mumbai city India. Ambient air was adsorbed on especially fabricated stainless steel cartridge packed with activated coconut charcoal at uniform flow rate. Qualitative identification of VOC's was done by thermally desorbing air from the cartridges and subsequent analysis on Varian GC-MS using NIST Library. Thirteen VOCs in outdoor air and seven in indoor air amongst those identified, figure in the list of Hazardous Air Pollutants listed in Title III of the U.S. EPA Clean Air Act Amendments of 1990.

0501-067. Thakur Manisha, Deb Manas Kanti, Imai S, Suzuki Y, Ueki K, Hasegawa A (Sch Std Chem, Pt Ravishankar Shukla Univ, Raipur, Chattisgarh). **Load of heavy metals in the airborne dust particulates of an urban city of central India.** *Environ Monit Assess*, 95(1-3)(2004), 257-268 [22 Ref].

Dust fall samples from different sites were collected and some selected toxic metals in them were determined by AAS. Total annual flux of 11.7, 541.4, 2751.0, 14.2, 9.8, 90.9, 17.6 and 17.7 kg km⁻² y⁻¹ were measured for Cr, Mn, Fe, Ni, Cu, Zn, Sb, and Pb respectively. The results of analysis show the existence of toxic metal concentration in the order Fe>Mn>Zn>Pb~Sb>Ni>Cr>Cu in Raipur city. These large levels of metal pollutants have also been correlated with some meteorological parameters like temperature, relative humidity and wind velocity, and strong positive correlations have been observed.

0501-068. Thote NR, Heath MJ (Dept Mining Engng, Visvesvaraya Natl Inst Techno, Nagpur 440 011). **Air quality management in opencast mines: need of the hour.** *Indian Mining Engng J*, 43(7)(2004), 31-35 [9 Ref].

In opencast mines, majority of the operations produce dust. Dust particle of less than 5 mm is known as respirable dust. Reviews of the physiological effect of dust, its concentration measurement techniques, and the international standards adopted by various countries, including Indian Standards, have been critically examined in the paper.

0501-069. Tyagi SK (Air Lab, Centl Polln Contl Bd, East Arjun Nagar, Delhi 110 032). **Methodology for measurement of polynuclear aromatic hydrocarbons in air particulates: status of PAH in the urban atmosphere of Delhi.** *Indian J Air Polln Contl*, 4(2)(2004), 52-64 [16 Ref].

Paper describes sampling and analysis procedure for PAHs. Respirable SPM laden fraction as percentage of total SPM laden Total PAH was observed as 60% of the overall average during the study period. Average SPM laden TPAHs levels for the traffic intersections, petrol pumps, residential, commercial and industrial locations have been calculated as 53, 28, 30, 43, 46 ng/m³ respectively, wherein RSPM laden TPAH levels have been accounted to 83%, 64%, 33%, 65%, and 89% respectively for these places.

0501-070. Venkataraman C, Habib G, Eiguren-Fernandez A, Miguel AH, Friedlander SK (Dept Cheml Engng, Indian Inst Techno, Bombay, Powai, Mumbai 400 076). **Residential biofuels in South Asia: carbonaceous aerosol emissions and climate impacts.** *Science*, 307(5714)(2005), 1454-1456 [29 Ref].

Paper calculated that biofuel combustion is the largest source of black carbon emissions in India, and suggest that biofuel combustion needs to be addressed as a distinct source, and that cleaner cooking technologies not only could yield significant local health and air quality benefits but also could have an important role in climate change mitigation in the south Asian region.

WATER POLLUTION

0501-071. Asadi SS, Vuppala Padmaja, Anji Reddy M (Cent Env, Inst Sci Techno, Jawaharlal Nehru Technol Univ, Hyderabad 500 072). **Assessment and mapping of water pollution indices in Zone-III of Municipal Corporation of Hyderabad using**

remote sensing and Geographic Information System. *J Environ Sci Engng*, 47(1)(2005), 13-20 [12 Ref].

Water quality index was calculated from the measured parameters, based on which the study area was classified into five groups with respect to suitability of water for drinking purpose. Attribute database was integrated with spatial sampling locations map in Arc/Info and maps showing spatial distribution of water quality parameters were prepared in Arc View. Results indicated that high concentrations of total dissolved solids, nitrates, fluorides and total hardness were observed in few industrial and densely populated areas indicating deteriorated water quality while the other areas exhibited moderate to good water quality.

0501-072. Asthana A, Sunitha G, Gupta VK* (*Sch Std Chem, Pt Ravishankar Shukla Univ, Raipur, Chattisgarh). **Determination of carbon disulphide in environmental samples using leucocrystal violet.** *Cheml Env Res*, 12(3&4)(2003), 211-219 [33 Ref].

The use of leucocrystal violet to determine carbon disulphide in various environmental and biological samples is discussed. Current methodology involves the formation of yellow coloured xanthate on treating carbon disulphide with sodium hydroxide. The xanthate formed is subsequently treated with potassium iodate and the iodine liberated is reacted with leucocrystal violet. The crystal violet dye formed shows maximum absorbance at 592 nm. The method is free from the interference of other major toxicants and the other reaction conditions have been optimized.

0501-073. Bhadra Bhaskar, Chakraborty Ranadhir, Das Susanta, Nanda Ashis Kumar (Dept Chem, North Bengal Univ, Siliguri 734 430). **Investigation of some basic water quality parameters of the north Bengal Terai river Kaljani – a tributary of river Torsa, and comparison thereof with the mainstream.** *J Environ Bio*, 26(2)(2005), 277-286 [13 Ref].

Some physio-chemical parameters of Kaljani River were studied in and around Alipurduar municipality. Comparison of water quality parameters of the two rivers demonstrated higher range of alkalinity, ammonia content and chloride content in Torsa than Kaljani. River Kaljani showed higher COD range than Torsa. Mean BOD value of both these rivers ranged between 0.93-1.65 mg/l. Overall TDS content of Kaljani was found to be lower than Torsa. Maximum phosphate content was observed at the downstream of both the rivers.

0501-074. Bishnoi Narsi R, Pant Anju, Garima (Dept Environ Sci Engng, Guru Jambheshwar Univ, Hisar 125 001). **Biosorption of copper from aqueous solution using algal biomass.** *J Scient Indl Res*, 63(10)(2004), 813-816 [10 Ref].

Sorption experiments using the dead biomass of *Spirogyra* species, for copper removal were carried out to study the influence and optimization of the biosorption of Cu (II). The effect of pH, initial metal ion concentration, different contact periods, varying temperature and varying biomass quantities were also examined. It was observed that *Spirogyra* species possessed better specific uptake capacities for Cu (II), showing approximate uptake of 34.94 mg/g of biomass. *Spirogyra* species has shown much better sorption in the pH between 6.0-7.0 and at contact time of 30 min.

0501-075. Chandra Mouli P, Venkata Mohan S, Jayaram Reddy S* (Electrochemical Res Lab, Dept Chem, Sri Venkateswara Univ, Tirupati 517502). **Electrochemical processes for the remediation of wastewater and contaminated soil: emerging technology.** *J Scient Indl Res*, 63(1)(2004), 11-19 [77 Ref].

The review aims at providing an overview of electrochemical processes used for accomplishing the remediation of industrial wastewater, particularly electrooxidation process and electrocoagulation. The applicability of these technologies for the remediation of contaminated soil is also discussed. The enhanced degradation of wastewater may be attributed to the electrochemical oxidation of the organic compounds present in the aqueous phase to simple molecules, which may be easily biodegraded. The principle of electrooxidation process, involved in the remediation process was described along with specific applications.

0501-076. Chandra Ram, Pandey Praveen K, Srivastava Archana (Environ Microbio Sec, Indl Toxic Res Cent, Lucknow, UP). **Comparative toxicological evaluation of untreated and treated tannery effluent with *Nostoc muscorum* L. (algal assay) and microtox bioassay.** *Environ Monit Assess*, 95(1)(2004), 387-294 [31 Ref].

The effect on chlorophyll, protein and biomass content of *Nostoc muscorum* was studied with the luminescent property inhibition of *Photobacterium phosphorium* and compared with algal bioassay. It was observed that the luminescent property of *Photobacterium phosphorium* in microtox assay as well as the chlorophyll content of *Nostoc muscorum* in algal assay were the most sensitive parameters in toxicity evaluation of tannery effluent. The microtox assay of toxicity showed that EC₅₀ (%) in 30

min was 3.19 and 63.49 for untreated and treated tannery effluent, respectively while in algal bioassay the EC_{50} for chlorophyll was in between 0-2.5% and 100%, respectively, in untreated and treated effluent.

0501-077. Chandra Ram, Prasad RN (Dept Chem, Univ Rajasthan, Jaipur 302004).

Deterioration of water quality during mass bathing in Surya Kund, Lohargal (Rajasthan). *Indian J Environ Sci*, 9(1)(2005), 63-64 [5 Ref].

Study is related to the deterioration in water quality of Surya Kund, Lohargal (Rajasthan) during the mass bathing of religious importance. Various water quality parameters have been studied. It is necessary to take adequate precautionary measures to prevent outbreak of any epidemics.

0501-078. Chandra Sekhar M, Umamahesh NV (Dept Civil Engng, Water Env Div, Natl Inst Techno, Warangal 506004). **Mass balance approach for assessment of pollution load in the Krishna river.** *J Environ Sci Engng*, 46(2)(2004), 159-171 [12 Ref].

River Krishna in the Southern Peninsula of India is a typical receiving water body of both point and non-point discharges. Comparisons between upstream and downstream monitoring sites reveal changes in the concentrations and load to the river. This information is used to discriminate between point and non-point source contribution to pollution. The results of the mass balances indicate that non-point sources to be major contributors to the pollutant loads. The non-point sources in the study area predominantly include pollution due to agricultural practices and activities, soil erosion, dissolution of soil minerals or combination of these sources.

0501-079. Chatterjee S, Mathew SB, Gupta VK* (*Dept Chem, Government VYTPG Autonomous Coll, Durg 491001). **Colorimetric determination of traces of nitrate in various environmental and commercial samples.** *Cheml Environ Res*, 13(1&2)(2004), 111-116 [20 Ref].

Leucocrystal violet (LCV) has been proposed as simple and sensitive chromogenic reagent for the determination of nitrate in various environmental and commercial samples. Nitrate is first reduced to nitrite with zinc in alkaline medium. The reduced nitrate reacts with acidified potassium iodide to liberate iodine. The liberated iodine reacts with leucocrystal violet to form crystal violet, whose colour is measured at 592 nm.

0501-080. Das Gautam Kumar, Datta Siddhartya (Dept Cheml Engng, Jadavpur Univ, Kolkata 700032). **Studies on the impact of water quality on the adjoining wetland ecosystem of Bidyadhari river, W. Bengal.** *Indian Sci Cruiser*, 18(4)(2004), 16-21 [7 Ref].

Water quality of adjoining wetland ecosystem of Bidyadhari river basin has been gradually worsened due to admixture of industrial effluents with domestic sewage released from the Kolkata metropolis as well as from the different industries of Kolkata east through different canals. Pollutants from industrial sewage may cause biological magnification that ultimately leads to carcinogenic effect in the human body. Attempts are made to record some physico chemical parameters from six different stations of Bidyadhari river.

0501-081. Dhakad NK, Chaudhary Preeti (Government Holkar Sci Coll, Indore, MP). **Hydrobiological study of Natnagra pond in Dhar district (M.P.) with special reference to water quality impact on potability, irrigation and aquaculture.** *Nature Env Polln Techno*, 4(2)(2005), 269-272 [8 Ref].

Paper deals with the hydrobiological studies of Natnagra pond with special reference to physico-chemical characteristics. This pond plays an important role in maintaining the drinking water supply of Dhar district. It was found that the water is suitable for drinking only after proper treatment because of the presence of high level of coliforms. However, the water is suitable for irrigation and pisciculture.

0501-082. Dhar Gopal, Barat Sudip*, Mitra Dhar Kakali (*Aquacult Limno Lab, Dept Zoo, Univ North Bengal 734430, Dt. Darjeeling, West Bengal). Influence of the organophosphorus insecticide phosphamidon on lentic water. *J Environ Bio*, 25(3)(2004), 359-363 [17 Ref].

Phosphamidon significantly reduced dissolved oxygen (DO) at 1.8 mg/l exposure and reduced alkalinity at 0.9 and 1.8 mg/l. Hardness also reduced gradually but not significantly. Free carbondioxide was increased significantly at 1.8 mg/l of the insecticide compared to control. The insecticide had no influence on pH and temperature. There was maximum reduction of phytoplankton and zooplankton population at 1.8 mg/l of phosphamidon. The normal behaviour and feeding rate of air breathing teleost, *Channa punctatus* was also hampered. Therefore, phosphamidon even at low concentrations may create disorders in the aquatic ecosystem.

0501-083. Gautam Kalpana, Gautam RK (Dept Zoo, Sch Life Sci, Dr. BR Ambedkar Univ, Agra 282 002). **Water quality assessment of Keetham lake and its impact on wild life toxicology.** *J Expt Zoo India*, 8(1)(2005), 157-159 [3 Ref].

An assessment of water quality of Keetham lake has been done to know its impact on wild life toxicology of Sur Sarovar Wild Life Sanctuary. Different type of industrial discharge, fertilizers, pesticides reach to Keetham lake and contaminate it. As water quality relates to aquatic toxicology including biotic and abiotic components, numerous physicochemical characteristics such as pH, hardness, alkalinity, BOD, COD etc. often influence the water quality.

0501-084. Gawankar Kishore V, Pai Nandini (Maharashtra Polln Contl Bd, Navi Mumbai). **Qualitative and quantitative determination of pesticides in water by gas liquid chromatography using mass spectrometer detector.** *Pestology*, 28(7)(2004), 61-66 [4 Ref].

A gas chromatography method using mass spectrometer detector is proposed for qualitative and quantitative determination of pesticide residues in water using helium as a carrier gas. Seven pesticides have been included in this standard. Linear response was obtained within the concentration range of 0.8 to 8 ng/ μ l.

0501-085. Gupta K, Sharma Arti (Dept Zoo, Univ Jammu, Jammu 180 006). **Macroinvertebrates as indicators of pollution.** *J Environ Bio*, 26(2)(2005), 205-211 [29 Ref].

Various pollution indicators of stream Ban-Ganga have been identified on the basis of presence/absence/numerical abundance at various stations. They have been categorized as pollution tolerant, facultative and pollution intolerant groups in relation with the water quality at different stations of stream.

0501-086. Hasan MZ, Agarwal MM (Global Environ Agricl Cent, Aligang, Lucknow). **Recycle and reuse of water.** *Our Earth*, 1(3)(2004), 1-7.

Recycle and reuse of wastewater have become a need of time due to limited water resource. A large number of effluents, domestic sewage and industrial wastewater can be reused to a significant extent after suitable treatment. Several steps have been taken by India in the direction of pollution control employing reuse and recycle principle. The efforts have eventually resulted in the reuse of discharged treated effluents either in

the same industry or for some other purposes. Paper discusses the various ways of recover and utilization of wastewater.

0501-087. Jain Rajeev, Sharma Nidhi, Bhargava Meenakshi (Dept Environ Chem, Jiwaji Univ, Gwalior 474 011). **Electrochemical treatment of effluents from textile and dyeing industries.** *J Scient Indl Res*, 63(5)(2004), 405-409 [19 Ref].

Paper reports the results of an efficient electrochemical removal of colour and reduction in toxicity of textile industry effluents. The electrochemical behaviour is analyzed and assessed in terms of removal of colour, decrease in absorbance, time taken to completely remove colour from the dye solution, decrease in chemical oxidation demand, total dissolved solids and disappearance of any reduction peak in colourless solution, thereby indicating the absence of electrochemically active break down product.

0501-088. Jayantha KS, Ranjana GR, Sheela HR, Modang Ritu, Shivananni YS (Maland Coll Engng, Hassan, Karnataka 573 201). **Defluoridation studies using laterite material.** *J Environ Sci Engng*, 46(4)(2004), 282-288 [5 Ref].

The studies were being conducted in a column with varying depths of laterite by keeping constant gravel depth. The flow varied for all the depths and the results obtained were found to be quite encouraging as compared to some of the established costly techniques. This technique can be employed in rural areas and places where expensive techniques like electrolytic precipitation, etc. cannot be adopted.

0501-089. Kannan V, Ramesh R, Sasikumar C (PG Res Dept Bot, National Coll, Tiruchirapalli 620 001). **Study on ground water characteristics and the effects of discharged effluents from textile units at Karur District.** *J Environ Bio*, 26(2)(2005), 269-272 [18 Ref].

A study made on the physico-chemical characteristics of water samples mixed with effluent discharged from textile industries at different sites revealed the elevated levels of Ca, Mg, Na, Cr, K, Ni, Cu, Zn, CO₃, SO₄, NO₃ and Cl. The concentrations of these ions exceeded the limit prescribed by ISI. Water at these sites was found to be hard, brackish and unsuitable for drinking purpose. In all these sites, the seed germination of rice alone was significantly affected among the other crops tested.

0501-090. Khan Tabrez A, Singh Ved Vati, Kumar D (Dept Chem, Jamia Millia Islamia, New Delhi 110 025). **Removal of some basic dyes from artificial textile wastewater by adsorption on Akash Kinari coal.** *J Scient Indl Res*, 63(4)(2004), 355-364 [59 Ref].

The removal of three dyes, methylene blue, malachite green, and rhodamine B from aqueous solutions at different concentrations, pH and temperatures by Akash Kinari coal has been studied. It has been found that per cent adsorptions of methylene blue, malachite green, and rhodamine B onto the adsorbate decrease from 97.18 to 83.90, 89.16 to 79.77, and 78.40 to 67.35, respectively, when their concentrations in solutions are increased from 5 to 20 mg/L at 30 ± 1 °C and at pH 6.8, 7.2 and 5.8 respectively.

0501-091. Kumar A, Singhal V, Joshi BD, Rai JPN* (*Dept Environ Sci, GB Pant Univ Agricl Techno, Pantnagar 263 145). Lysimetric approach for ground water pollution control from pulp and paper mill effluent using different soil textures. *J Scient Indl Res*, 63(5)(2004), 429-438 [24 Ref].

An economically feasible and environment-friendly natural method of effluent treatment, i.e. lysimetric/land treatment is suggested. The four types of soil textures viz., pure soil (ST₁), soil mixed with dand in ratio of 50:50 (ST₂), 75:25 (ST₃), and 25:75 (ST₄) are taken for lysimetric treatment of this effluent. The experiment shows that the normal soil (ST₁) reduces most of the selected parameters of effluent more efficiently than ST₄, however, the pH of the effluent is not changed significantly.

0501-092. Kumar Dinesh, Jain Mukta, Dhindsa SS, Devanda HS, Singh RV (Dept Chem, Univ Rajasthan, Jaipur 302 004). **Physico-chemical characteristics of Amanishah Nallah and neighbouring ground water sources in Sanganer, Jaipur.** *Indian J Environ Sci*, 9(1)(2005), 71-74 [3 Ref].

Monitoring of Sanganer nallah and surrounding tube wells was carried out during rainy season. The results revealed that the discharge of untreated industrial effluents and sewage in to nallah have contributed considerable pollution in the ground water in its vicinal areas, and is harmful for use in agriculture and drinking purposes. The quality parameters were compared with the drinking water standards laid by WHO and ICMR. The levels of nitrate and fluoride concentration are high in tube well water samples, and need serious attention.

0501-093. Kumar Praveen, Sharma HB (Dept Zoo, BSA Coll, Mathura 281 004). **Physico-chemical characteristics of lentic water of Radha Kunda (District-Mathura).** *Indian J Environ Sci*, 9(1)(2005), 21-22 [10 Ref].

Physico-chemical properties of water of Radha Kunda (District Mathura, UP) were studied at three sampling stations. The values of BOD, COD and ammoniacal nitrogen were found above the permissible limits.

0501-094. Kumar Suresh, Sharma KP (Dept Bot, Univ Rajasthan, Jaipur 302 004). **Effects of retention time, interstitial volume and nutrients on degradation of an azo dye, methyl red, in fixed film bioreactors.** *Nature Env Polln Techno*, 4(2)(2005), 179-184 [2 Ref].

Both, degradation and decolorisation of an azo dye, methyl red, have been examined in fixed film bioreactors with mixed cultures of bacteria and fungi at different retention periods of 1 and 0.6 days. The toxicity of methyl red decreased after its degradation in the bioreactors, especially when methyl red was supplemented with both organic and inorganic nutrients. Further, reduction in toxicity of modified bioreactor outflows was higher than that of normal bioreactor outflow.

0501-095. Kundu S, Kavalakatt SS, Pal A, Ghosh SK, Mandal M, Pal T (Dept Chem, Indian Inst Techno, Kharagpur 721 302, West Bengal). **Removal of arsenic using hardened paste of Portland cement: batch adsorption and column study.** *Water Research*, 38(17)(2004), 3780-3790 [51 Ref].

The HPPC (hardened paste of Portland cement) has been used as a low-cost adsorbent for removal of arsenic from water environment. Results from batch experiments, conducted at an initial concentration of 0.2 ppm (parts per million) of arsenate, suggest arsenate removal up to 95%. Kinetic profiles were developed for various conditions. Finally, column studies were undertaken involving the new HPPC to check the suitability of the material removal of total arsenic content from water body. Kinetic experiments for the removal of arsenic by column studies revealed a film diffusion mechanism.

0501-096. Lomate Varsha, Samant Jay (Dept Environ Sci, Mumbai Univ, Sub-Center, Ratnagiri). **Drinking water pollution – a case study of Kolhapur city.** *Nature Env Polln Techno*, 4(2)(2005), 217-222 [11 Ref].

A study on pollution of drinking water of Kolhapur city was carried out for two subsequent years during different seasons. The samples were analysed for physical chemical and microbiological parameters. The results were compared with the water quality standards of different agencies. The results obtained during the study were used

to correlate the efficiency of the drinking water treatment methods used in the respective filter houses.

0501-097. Madhavi Lata K, Badrinath KVS* (* Forest Eco Div, Natl Remote Sensing Agency, Dept Space, Balanagar, Hyderabad 500 037). **Characterization of aerosols and its radiative impacts over urban and rural environments – a case study from Hyderabad and Srisailam.** *Environ Polln*, 132(3)(2004), 463-468 [14 Ref].

Study addresses the characterization of aerosols and their radiative impacts over urban (Hyderabad) and rural (Srisailam) environments by using aerosol optical depth (AOD) measurements from MICROTOPS-II sunphotometer. AOD measurements over the urban site showed high values compared to the rural site.

0501-098. Mahapatro TR (Dept Marine Sci, Berhampur Univ, Berhampur 760 007). **Behaviour of calcium and magnesium in Rushikulya estuary (Orissa), east coast of India.** *Cheml Environ Res*, 13(1&2)(2004), 141-151 [23 Ref].

Behaviour of major elements viz. calcium and magnesium has been studied in the well mixed Rushikulya estuary. These elements indicated an increasing trend in their concentrations from river to estuarine end. They exhibited higher concentrations in May-June and lower concentrations in July-September and were predominant in seawater. The ratios of Ca/Cl and Mg/Cl at varying chlorine concentrations were always within the normal oceanic ranges.

0501-099. Manzer MBH, Nehal M, Rahmatullah M (Univ Dept Zoo, LN Mithila Univ, Darbhanga, Bihar). Post and pretreatment bioecological studies of a hospital waste-fed urban pond in relation to water pollution. *Nature Env Polln Techno*, 4(2)(2005), 247-250 [21 Ref].

Physico-chemical analyses were carried out in a hospital waste-fed pond during post and pretreatment periods. In the pretreatment phase considerable variations in the water quality were observed. Maximum atmospheric temperature, water temperature, transparency, phosphate and chloride were recorded during summer, whereas pH, dissolved oxygen and calcium peaked during winter. In the post-treatment phase of the pond, the conditions drastically improved.

0501-100. Martin P, Innocent BX (Dept Zoo, AKGS Arts Coll, Srivaikundan 628 619). **Impact of pollution on the species diversity of fin fishes in the south Indian river, Tamiraparani.** *Indian J Environ Sci*, 8(2)(2004), 147-151 [19 Ref].

The highest diversity of fish species was noticed where human disturbance was minimal. In that site the contamination factor of heavy metal in water ranged between – 0.98 and 4.36. The DO, BOD and COD values were 6.99, 2.94 and 15.62 mg/l respectively. Low diversity of fish species was observed where the textile-mill effluent entered the river. The contamination factor of heavy metal in water in the site showed higher values from 2.5 to 18.2.

0501-101. Mogra D, Agarwal R, Punjabi PB, Anita SC* (*Dept Chem, ML Sukhadia Univ, Udaipur 313 002, Rajasthan). **Photochemical degradation of o-chlorobenzoic acid by photo-Fenton's reagent.** *Cheml Env Res*, 12(3&4)(2003), 227-235 [18 Ref].

The photochemical degradation of o-chlorobenzoic acid on titanium dioxide was carried out in the presence of Fenton's reagent, and progress of the reaction was monitored spectrophotometrically. The effect of the variation of various parameters such as pH, concentration of o-chlorobenzoic acid, Fe³⁺ion concentration, amount of the photocatalyst, amount of hydrogen peroxide, light intensity etc. on the photodegradation of o-chlorobenzoic acid was observed. A tentative mechanism for this degradation has also been proposed.

0501-102. Murugesan S, Dhamodhar Kumar S, Chandrika D (Dept Bot, Pachaiyappa's Coll, Chennai 600 030). **Comparative study of ground water sources from central to western region of Chennai, India.** *Nature Env Polln Techno*, 4(1)(2005), 87-91 [11 Ref].

In order to assess the spatial and temporal changes in ground water quality, well sites of central to western region of Chennai were analysed. A significant level of variation was found in respect of various parameters. The results clearly indicate that the water of the well sites is severely degraded.

0501-103. Nageswara Rao VV, Prapurna Naga (Dept Civil Engng, Chaitanya Bharathi Inst Techno, Gandipet, Hyderabad 500 075). **Statistical analysis of ground water quality parameters in an industrial area of Hyderabad.** *Nature Env Polln Techno*, 4(1)(2005), 139-142 [6 Ref].

Correlations among various ground water quality parameters were made with the data of 63 ground water samples collected from the Jeedimetla Industrial Estate in Hyderabad city. Various statistical models were applied to analyze the results, and the best fit out of all the models was chosen. The correlations were highly significant (>85%)

between the parameters pH and alkalinity as well as for pH and cadmium content, which agree with a 3rd degree polynomial. Similarly EC and DS as well as EC and hardness agree with a power fit model, EC and copper content with a sinusoidal model, and hardness and calcium content with the saturated growth rate model.

0501-104. Naik Jithender Kumar, Chapla Jayanth, Vasundhara Devi V (Dept Zoo, PG Coll Sci, Osmania Univ, Saifabad, Hyderabad 500 004). **Effect of leather tannery effluent on certain hematological parameters of a fresh water common carp – *Cyprinus carpio* (Linnaens).** *Eco Env Conserv*, 10(4)(2004), 533-535 [16 Ref].

Investigation aimed to evaluate the toxic effect of Cr compounds on certain haematological parameters in a fresh water common carp – *Cyprinus carpio* (Linn) exposed to 40 and 20% leather tannery effluent for a period of 28 days. A significant decrease in total erythrocyte count, total leucocyte count and haemoglobin concentration was observed, compared to the control.

0501-105. Namasivayam C, Kavita D (Environ Chem Div, Dept Environ Sci, Bharathiar Univ, Coimbatore 641 046). **Removal of phenol and chlorophenols from water by coir pith carbon: equilibrium and rate studies.** *J Environ Sci Engng*, 46(3)(2004), 217-232 [46 Ref].

Batch mode studies were conducted to study the removal of phenol, 2,4,6-Trichlorophenol (TCP) and Pentachlorophenol (PCP) from aqueous solution on coir pith carbon by adsorption process under varying experimental conditions such as agitation time, adsorbent dose, pH and temperature. Equilibrium adsorption data follow Langmuir isotherm for phenol and PCP and the adsorption capacities were found to be 48.3 mg and 3.7 mg/g, respectively.

0501-106. Narasimha Prasad NB, Mansoor OA* (*PG Dept Applied Geo, MES Ponani Coll, Ponani 679 586). **Assessment of groundwater quality status in Amini Island of Lakshadweep.** *J Environ Sci Engng*, 47(1)(2005), 69-74 [6 Ref].

The assessment of groundwater quality status was carried out in Amini Island. Total hardness and salinity were found to be the most critical water quality parameters exceeding the permissible limits of drinking water standards. Spatial variation diagrams of salinity and hardness have been prepared for different seasons. It is also observed from these maps that the salinity and hardness are comparatively better on the lagoon

side compared to the seaside. These maps also suggest that the salinity and the hardness problem is more in the southern tip compared to northern portion.

0501-107. Nayak BK, Acharya BC, Panda UC, Nayak BB, Acharya SK (Mineralogy Metallography Dept, Regl Res Lab, Bhubaneswar 751 013, Orissa). **Variation of water quality in Chilka lake**, Orissa. *Indian J Marine Sci*, 33(2)(2004), 164-169 [11 Ref].

The water quality parameters were studied for the entire Chilka lake covering a maximum of 23 sampling stations. The pH of water was alkaline throughout the lake and both pH and salinity varied widely. Higher pH with low salinity zones reflected disintegration of submerged weeds. Correlation analysis supported the increase of pH, high photosynthetic activity, high nutrients as well as phosphate depletion due to phytoplankton utilization in the fresh water zone.

0501-108. Neelavathi A, Chandra Sekhar KB, Ramesh Babu C, Jayaveera KN (Dept Chem, JNT Univ, Anantapur 515 001, AP). **Removal of toxic Cr(VI) by the adsorption of activated carbons prepared from simarouba shells**. *J Environ Sci Engng*, 46(2)(2004), 137-142 [14 Ref].

Removal of toxic Cr(VI) in aqueous medium was investigated using activated carbon adsorbents prepared from *Simarouba glauca* seed shells. The removal of Cr(VI) was in general most effective at pH range 2.0-4.0 and high Cr(VI) concentrations. Important characteristics of activated carbons were also investigated. The removal of Cr(VI) around 97% was observed with 1:2 impregnated activated carbon at pH 3.0 where as other adsorbent showed much lower activities.

0501-109. Nemade PD, Bendale SG, Pachpande DR, Bhole JB (Civil Engng Dept, JT Mahajan Coll Engng, Faizpur 425 524). **Arsenic-removal technologies in Bangladesh and India: an insight**. *Env Polln Contl J*, 7(6)(2004), 42-51 [14 Ref].

Paper reviewed the technologies used for arsenic removal in Bangladesh and India. All these technologies are found effective and safe for arsenic removal from tube well water. However, they need promotion and awareness for wider implementation in the acute arsenic problem areas to avoid ingestion of excessive arsenic through tube well water. The arsenic removal technologies are expected to improve further through adaptation in the rural environment of Bangladesh and India.

0501-110. Paul MK, Misra AK (Dept Chem, Lumding Coll, Lumding 782 447, Assam). **An assessment of pollution of water used for domestic purposes in Lumding town**, Assam, India. *Nature Env Polln Techno*, 3(4)(2004), 531-534 [2 Ref].

Study reports on the quality of water used for domestic purposes based on 12 parameters from 10 different sources in the area of Lumding and its vicinity. Water samples were collected in four seasons for two years and analysed for temperature, total dissolved solids, total suspended solids, conductivity, acidity, free CO₂, bicarbonate, chloride, dissolved oxygen, total hardness, calcium and magnesium. The result are discussed in relation to the health hazards due to water quality.

0501-111. Piska Ravi Shankar, Srinivas Ch, Vidyasagar G, Naik SJK (Dept Zoo, Univ Coll Sci, Osmania Univ, Hyderabad 500 007). **The impact of pharmaceutical industrial effluents on the ground water of Mahaboobnagar district**, Andhra Pradesh, India. *Aquacult*, 6(1)(2005), 107-111 [19 Ref].

Study deals with the impact of industrial effluents of a pharmaceutical industry on ground water pollution in Mahaboobnagar. 15 points are selected around the pharmaceutical industry for analysis of water by selecting 16 parameters. All the parameters except sulphates, nitrates and fluorides are high and out side the permissible limits and responsible for groundwater pollution. The ground water is polluted and is not useful for drinking and agricultural uses.

0501-112. Prasad Bijay Bhushan, Eqbal Md Zahid, Ahmad Nasi (Dept Zoo, SNS Coll, Motihari 845 401). **Biochemical parameters of soil of a sewage affected river of Himalayan region in relation to fish mortality**. *Nature Env Polln Techno*, 4(2)(2005), 303-306 [15 Ref].

Siraswa river is a polluted waterbody of Himalayan origin. The soil of this river at the selected effluent point is sandy/loam. The pH was slightly alkaline with moderate phosphate concentration. Calcium and magnesium, sodium and potassium were in good amounts. The microbes were dominated by bacteria followed by the fungi and actinomycetes. The mortality data of fish were found to be related to the concentration of materials in water and the exposure period.

0501-113. Rajaram R, Srinivasan M, Rajasegar M (Cent Adv Std Marine Bio, Annamalai Univ, Parangipettai 608 502). **Seasonal distribution of physico-chemical parameters**

in effluent discharge area of Uppanar estuary, Cuddalore, south-east coast of India. *J Environ Bio*, 26(2)(2005), 291-297 [19 Ref].

Seasonal distribution of physico-chemical characteristics and nutrients has been studied at two stations of Uppanar estuary in relation to effluent discharges from SIPCOT industries. There are 44 industries discharging their effluents into Uppanar estuary, which may influence the biota. Nutrient concentrations were higher during monsoon season and low during summer season.

0501-114. Samal AC, Bhar G, Santra SC* (*Dept Environ Sci, Univ Kalyani, Kalyani 741 235, West Bengal). **Biological process of arsenic removal using selected microalgae**. *Indian J Exptl Bio*, 42(5)(2004), 522-528 [24 Ref].

Growth of the organisms was reduced due to presence of arsenic (III) and (V) in the culture medium. In comparison to arsenic (V), arsenic (III) had more toxic effect on microalgae. Among the different algal strains, blue green algal species *Oscillatoria-Lyngbya* mixed culture showed maximum efficiency in removing arsenic (64%) after 21 days of incubation and the same algal species could remove arsenic (III), but 60% after 21 days when incubated in 0.1 mg/l arsenic (III) containing medium. Maximum removal was observed at their exponential growth phase and also sometime extended to the stationary phase.

0501-115. Sawane AP, Puranik PG, Bhate AM (Dept Zoo, Anand Niketan Coll, Warora). **Assessment of water quality of river Irai (Distt Chandrapur) on the basis of seasonal fluctuations in DO and BOD**. *J Ecophysio Occupl Hlth*, 4(1&2)(2004), 117-121 [5 Ref].

Study deals with assessment of pollution status of river Irai (Dist. Chandrapur). The increased values of BOD in river water are indicative of increased quantity of industrial effluents. The reduced DO content is due to hot ash slurry from thermal power plant. The analysis of river water to assess potability indicates that it is adversely affected by industrial effluents. The data collected from present study reveals that there is inverse relationship between DO and BOD and potability of Irai river water is below the standard permissible limit.

0501-116. Sharma Dinesh, Verma Sunita, Tomar Radha* (*Sch Std Chem, Jiwaji Univ, Gwalior 474 011). **Studies on the sorption of As(III) on the synthetic gel sodium potassium fluorophlogopite**. *J Environ Sci Engng*, 47(1)(2005), 37-42 [13 Ref].

Sorption of As(III) has been studied on the synthesized gel close to sodium potassium fluorophlogopite [$\text{Na}_{0.5} \text{K}_{0.5} \text{Mg}_3 (\text{Si}_3 \text{AlO}_{10}) \text{F}_2$] as a function of initial solution concentration at pH 2,4 and 7. The effect of parameters like equilibration time (0.5 – 24.0 hr), weight of the exchanger (30-150 mg) and temperature (25°-45°C) has been investigated. The uptake of metal ion, As(III) has been expressed in terms of distribution coefficient i.e. (kd) values.

0501-117. Sharma JD, Jain P, Sohu D (Reproductive Physio Env Toxicol Lab, Dept Zoo, Univ Rajasthan, Jaipur 302 004). **Quality status of groundwater of Sanganer tehsil in Jaipur district.** *Nature Env Polln Techno*, 4(2)(2005), 207-212 [15 Ref].

The physico-chemical analysis of potable water samples from villages of Sanganer, Jaipur was carried out in laboratory using standard techniques. The results revealed that pH, EC and alkalinity of all the samples were very high which can be correlated with high TDS and chloride. Twenty eight percent villages contained high fluoride concentration than permissible limit i.e., 1.5 ppm. A positive correlation was observed between pH and fluoride, TDS and EC. Hardness showed negative correlation with fluoride and pH.

0501-118. Sharma Moti R, Gupta AB, Bassin JK (M-26, Housing Board Colony, Hamirpur 170 001, Himachal Pradesh). **Effect of pollution on dissolved oxygen concentration in Hathli stream of Shivalik Himalayas.** *Indian J Environ Sci*, 8(2)(2004), 109-112 [7 Ref].

Paper addresses the effect of pollution on dissolved oxygen content (DO) in a Shivalik Himalayan stream during early hours of day in the summer season. The study showed that the dissolved oxygen in the stream is below 4mg/l in a stretch of 2600m and therefore water is not fit for public supply, bathing, wildlife and fish culture.

0501-119. Sharma Moti Ram, Gupta AB (Irrigation Publ Hlth Dept, M-26, Housing Board Colony, Hamirpur 177 001, HP). **Rapid BOD assimilation in Hathli stream of outer Himalayas.** *Nature Env Polln Techno*, 3(4)(2004), 451-454 [9 Ref].

Hathli is sub-tributary of River Beas in outer Himalayas, and getting polluted due to wastewater of Hamirpur town. A surface water quality model, Stream-I, developed for Ganga Action Plan was calibrated for one set of data collected freshly. The study revealed that the Biochemical Oxygen Demand (BOD) deoxygenation rate constant for this hilly stream is much higher than the values reported in the available literature for

major rivers of the world. It should be selected very carefully during water quality modeling of streams in hilly regions.

0501-120. Sharma Subhasini, Sharma Shweta, Kumar Suresh, Soni Protima, Bhardwaj Kamal Kishore, Grover Ruby, Suryavathi V, Sharma KP (Dept Zoo, Univ Rajasthan, Jaipur 302 004). **Comparative effects of two household detergent on the producer (algal communities) and consumer (fish) in the oligotrophic and entrophic microcosms.** *Indian J Environ Sci*, 8(2)(2004), 95-102 [15 Ref].

Percentage fish mortality was low and almost similar to control treatment (<10%), when they were exposed to low concentration (10 ppm) of detergents Henko and Surf excel for 30 days (chronic exposure) in the oligotrophic microcosms developed in the University Botanical garden. The RBC counts however, decreased in the detergent treatments (Surf excel = 58%; Henko = 40%). Algal species richness (20-40%), their density (20-90%) and a diversity (5-20%) were also greater in the detergent treatments.

0501-121. Singh Asha Lata, Kulshreshtha Umesh C, Venkata Mohan S, Sarma PN* (* Analyt Div, Indian Inst Cheml Techno, Hyderabad 500 007). **Fe(II) speciation and its uptake by free and immobilized cells of *Pseudomonas fluorescens* from industrial waste water.** *J Environ Sci Engng*, 46(4)(2004), 277-281 [20 Ref].

Studies were carried out to remove Fe(II) from wastewater using free and immobilized cells of *Pseudomonas fluorescens*. Studies with free and immobilized cells revealed that immobilized cells are more efficient for removal of Fe(II) than free cells. Fe(II) uptake with *Pseudomonas fluorescens* is also investigated after the addition of NaCl and MgCl₂ to the cells. It is found that the uptake has increased when sodium chloride and magnesium chloride mixed cells are used.

0501-122. Singh KK, Rupaniwar DC, Hasan SH* (*Water Polln Res Lab, Dept Appl Chem, Inst Techno, Banaras Hindu Univ, Varanasi 221 005). **Removal of lead from wastewater with rice polish.** *Cheml Env Res*, 12(3&4)(2003), 243-254 [22 Ref].

Rice polish, a low cost biosorbent has been used for the removal of lead(II) from wastewater. The conditions for the optimum removal of lead(II) (95.5%) were found as: pH6.5, initial Pb(II) concentration, 4.0 mg l⁻¹ and temperature 20°C. Dynamics of the sorption process were studied and the values of Kad (rate constant of adsorption), k_{id} (rate constant of intraparticle diffusion) and the rate parameter (b₁S_s) were calculated.

Mass transfer of Pb(II) from the bulk to the solid phase viz. rice polish has also been studied at different temperatures.

0501-123. Singh Omkar, Kumar Vijay, Rai SP (Natl Inst Hydro, Jal Vigyan Bhawan, Roorkee 247 667). **Water quality aspects of some wells, springs and rivers in parts of the Udhampur district (J&K).** *J Environ Sci Engng*, 47(1)(2005), 25-32 [19 Ref].

Water samples were collected from wells, springs and rivers/streams during pre and post monsoon seasons to evaluate drinking water quality on the basis of BIS and irrigation water quality. The study showed alkaline nature of surface and ground water. Calcium and magnesium are dominating cations and bicarbonate is major anion in the study area. At some locations the concentration of TDS, Mg, Ca, total hardness, Fe, Mn and Cr exceeded the limits set up for drinking purposes. Water quality evaluation for irrigation purposes on the basis of SAR values indicates excellent category of water.

0501-124. Singh RP, Mathur P (Dept Environ Std, MDS Univ, Ajmer 305 009). **Investigation of variations in physico-chemical characteristics of a fresh water reservoir of Ajmer city, Rajasthan.** *Indian J Environ Sci*, 9(1)(2005), 57-61 [15 Ref].

Study deals with the physico-chemical studies of an ancient but famous fresh water lake 'Ana Sagar' Ajmer, Rajasthan. Data were collected over a period of six months. The result obtained in the investigation shows that this lake is highly polluted, its water is extremely alkaline and the nitrate and phosphates are high in comparison to standard limits as of an eutrophic lake.

0501-125. Singh Vijendra, Singh Chandel CP* (*Dept Chem, Univ Rajasthan, Jaipur 302 014, Rajasthan). **Water quality of groundwater and wastewater of Jaipur city for irrigation purpose.** *Aquacult*, 6(1)(2005), 25-31 [21 Ref].

Groundwater and wastewater samples from 'Amanishah Nala' and hand pump of seven industrial areas and adjacent localities of Jaipur city were analyzed during monsoon session with the help of standard methods of APHA and Black. The values obtained were compared with standards of ISR, ICMR and WHO. The concentrations of various parameters are within permissible limits in both groundwater and wastewater but definite contaminations with special reference to EC, TDS and COD in wastewater have been observed which calls for at least primary treatment of wastewater before being used for irrigation.

0501-126. Sinha AK, Musturia Yashoda (Dept Geo, Univ Rajasthan, Jaipur 302 004). **High fluoride groundwater in Chaksu Tehsil, Jaipur, Rajasthan.** *Indian J Environ Sci*, 8(2)(2004), 103-107 [14 Ref].

The higher value of fluoride in the upper unconfined aquifers in comparison to that of the deeper aquifers reveal that it is only the unconfined zone, consisting of weathered mantle, which represents the main source for fluoride in groundwater. Suggestions have been incorporated for ameliorating the adverse high fluoride content in groundwater by blending it with calcium rich surface water through artificial recharge techniques and removing the fluoride from the solution in groundwater.

0501-127. Somasekhara Reddy MC (Dept Chem, GPR Engng Coll, Kurnool 518 002). **New reagent for determination of trace levels of nitrate in environmental samples.** *J Scient Indl Res*, 63(2)(2004), 172-176 [15 Ref].

A local industrial product, an intermediate dye, disodium salt of 4,4-diaminostilbene-2,2-disulphonic acid is introduced as a new reagent for a selective and sensitive spectrophotometric determination method of trace levels of nitrate in environmental samples like, water and soil. The stable water soluble pink azo dye formed under aqueous alkaline condition has an adsorption maximum at 520 nm. The method is applied to the determination of nitrite in water and soil samples and the results are compared with the results obtained from the standard method.

0501-128. Subramanian V (Sch Environ Sci, Jawaharlal Nehru Univ, New Delhi 110 067). **Water quality in South Asia.** *Asian J Water Env Polln*, 1(1&2)(2004), 41-54 [33 Ref].

There are significant differences in the water chemistry of the Himalayan and southern peninsular rivers. Large and small rivers also show different types of water quality. Liquid and solid waste definitely contribute to water quality in urban centers and even coastal regions. The sub-continent also suffers from problems associated with fluoride and also arsenic in different parts. Water quality studies in such aspects as POP, heavy metals and microbiology are urgently needed.

0501-129. Talnikar VD, Pant KK, Shukla NP (Inst Techno Manag, Gwalior, Madhya Pradesh). **A field study and continuous removal of fluoride in a packed column.** *J Environ Sci Engng*, 46(4)(2004), 289-292 [6 Ref].

The synthetic water performance in the light of fluoride removal was studied and compared with the actual fluoride contaminated water of different selected water collection stations. An indogeneous activated alumina was used as adsorbent. The performance of the column for fluoride contaminated water was about 94% fluoride reduction at a pH value of 7.0 and the presence of the total dissolved solids 2114 mg/l in subsoil water decreased the fluoride removal by 5%.

0501-130. Thilaga A, Subhashini S, Sobhana S, Logan Kumar K (PG Res Dept Zoo, Kongunadu Arts Sci Coll, Coimbatore 641 029). **Studies on nutrient content of the Ooty lake with reference to pollution.** *Nature Env Polln Techno*, 4(2)(2005), 299-302 [10 Ref].

The Ooty lake in Tamil Nadu is currently heavily infested with water hyacinth and other aquatic weeds. The water was found to have significant quantities of nutrients including eutrophication causing nitrogen and phosphorus, which have arrived mainly due to discharge of municipal sewage and surrounding runoff. The phosphate has reached up to a maximum of 12.2 µg/ml which is much higher as far as eutrophication is concerned.

0501-131. Thorat PR, Pathade GR (Dept Microbio, Shri Shivaji Mahavidyalaya, Barshi 413 411). **Treatment of textile industry wastewater by chemical coagulation process.** *Nature Env Polln Techno*, 4(2)(2005), 233-236 [2 Ref].

Studies were undertaken for the removal of colour and COD from textile industry wastewater by using chemical coagulation process. The different chemical coagulants used were alum, aluminium sulphate, ferric chloride and ferrous sulphate. It was found that there was 90-97% colour removal and 30-36% COD was removed from the waste. To reduce time required for flocculation and sedimentation, some anionic and cationic polyelectrolytes were used which reduced half of the time required for flocculation and sedimentation.

0501-132. Thosar MR, Lonkar AN (Dept Zoo, Inst Sci, Nagpur 440 001). Respiratory response of male fish *Lebistes reticulatus* (Peters) **exposed to sublethal concentrations of insecticide**, Metasystox. *J Ecophysio Occupl Hlth*, 4(1&2)(2004), 67-71 [9 Ref].

The respiratory response in terms of oxygen consumption was recorded at 24, 48, 72 and 96 hours. At 24 hours exposure, the decrease in oxygen consumption is

noted at 2.15 mg/l concentration while increase in oxygen consumption at 4.30 mg/l concentration is noted. At 48 hours exposure, increase in oxygen consumption is recorded at both the concentrations. At 72 hours exposure, the decrease in oxygen consumption in both the concentrations is noted but decrease is more at higher sublethal concentration. At 96 hours, again fall in oxygen consumption is recorded. The results are discussed in relation to concentrations of Metasystox, duration of exposure and also with the recovery in oxygen consumption rates.

0501-133. Vaishya RC, Gupta Sudhir Kumar (Dept Civil Engng, Motilal Nehru National Inst Techno, Allahabad 211 004). **Batch kinetic modeling of arsenic removal from water by mixed oxide coated sand (MOCS)**. *J Environ Sci Engng*, 46(2)(2004), 123-136 [25 Ref].

A new granular media developed by coating of iron and manganese on quartz sand surface proved to be effective for arsenic (III) removal from water. The media has shown alkali resistance. The rate constants, equilibrium sorption capacity and normalized standard deviations were calculated for all the three models. It was shown that all three models almost accurately predict the sorption capacity with respect to time for whole range of data points.

0501-134. Venkatasubramani R, Murali K, Meenambal T (Dept Civil Engng, VLB Janakiammal Coll Engng Techno, Kovaipudur, Coimbatore 641 042). **Ground water quality index for Coimbatore east zone**. *Nature Env Polln Techno*, 4(2)(2005), 199-202 [2 Ref].

The groundwater quality of different wards of Coimbatore east zone was assessed by examining various physico-chemical parameters. The water quality index (WQI), calculated for five parameters of these samples, ranged between 75 and 100. The results show that the water is suitable for domestic purposes.

0501-135. Vishnoi SR, Srivastava PN (Dept Bot, Jai Narain Vyas Univ, Jodhpur 342 005). **Seasonal pollution assessment through comparative hydrobiological studies in river Jojari at Salawas, Jodhpur**. *Indian J Environ Sci*, 9(1)(2005), 33-34 [2 Ref].

Water samples collected from three different sites of river was subjected to hydrobiological studies. It was found that the pH, chloride, salinity, total alkalinity, total hardness, dissolved oxygen and TDS were absolutely higher than the standard values of portable water on account of contamination of river due to industrial effluents. The river

has become unsuitable for the growth and survivability of aquatic flora and fauna. The pollution impact was found to be predominant during summer and minimal during monsoon season.

0501-136. Wagh SP, Shrivastava VS (Cent PG Res Chem, GTP Coll, Nandurbar 425 412). **Impact of heavy metals on soils and ground water.** *Nature Env Polln Techno*, 4(1)(2005), 93-96 [29 Ref].

The samples of sewage, industrial sludges and ground waters were collected from various places in Nashik city. The concentration of metals was determined by ICP-AES to evaluate the strength of pollution in soil and ground water. The degree of metal pollution and suitability of ground water for drinking were evaluated. Out of the metals, the concentration of Cu and Zn were above the limits of WHO and ISI for drinking, whereas Fe was much higher, especially in industrial areas. Cd, Pb, Ni, As and Hg were almost absent in the ground water samples.

NOISE POLLUTION

0501-137. Naik DP, Ushamalini, Somashekar RK (Bangalore Univ, Bangalore 560 056). **Noise pollution in stone quarrying industry: a case study in Bangalore district, Karnataka.** *Environ Polln Contl J*, 7(6)(2004), 62-64 [6 Ref].

Paper attempts to evaluate the effect of noise on the working environment and to suggest possible control measures to minimize the effect in the study area. The study revealed that noise pollution in the study area is mainly due to blasting, drilling, crushing, loading, unloading, machineries, and transportation. Noise due to quarrying is posing serious problems, as these activities take place very near to the residential area. Paper suggests for some appropriate safety and protective measures to be adopted towards mitigating the noise hazards.

0501-138. Rajakumara HN, Gowda RMM, Simha LU (Dept Civil Engng. **Adhiyamaan Coll Engng, Dr MGR Nagar, Hosur, Dharmapuri 635 109**). **Traffic noise prediction model at gradients of the highway.** *Adv Transport*, 16(November)(2004), 795-799 [10 Ref].

The vehicles were classified into four categories based on traffic noise levels of individual vehicles and homogeneity. Traffic noise data of individual vehicles were collected at seven locations with different gradients on the state highway [SH-17] near

Mandya city, Karnataka, India. In this study, a gradient-based noise prediction mathematical model has been developed for each category of vehicles by multiple regression analysis of data. The results of the model indicated that the gradient has more influence on traffic noise due to heavy vehicles than that due to light and medium classes of vehicles. The models developed in this study have been calibrated from the field observed data.

0501-139. Thangadurai N, Venkateswaran P, Jeevanraj S (Dept Geo, Anna Univ, Chennai 600 025). **Evaluation and analysis of the noise quality of Ambur, Tamil Nadu**, India. *J Environ Sci Engng*, 47(1)(2005), 7-12 [14 Ref].

The noise levels of Ambur town were studied in silence, residential, commercial and industrial zones. Noise levels were accessed in 22 locations in typical peak and non-peak hours of a day. In non-peak hours, a gradual decrease in noise levels is detected. The results show that the noise pollution in the city is widespread throughout most of its area. The noise in these areas is composite in nature and generated from many source near and far with no particular sound predominance. Based on the results, some remedial measures were suggested.

ECOLOGY

0501-140. Alfred JRB, Ramakrishna (Zool Surv India, Kolkata 700053). **Faunal resources in mangrove ecosystem**. *ENVIS Forestry Bull*, 4(2004), 24-31 [13 Ref].

The faunal components in a mangrove ecosystem comprising of terrestrial estuaries or marine groups are adapted for stressful situations of widely fluctuating environmental parameters. The faunal groups are generally confined to hard substrate sessile, wandering species muddy substrate with burrowing forms etc.

0501-141. Angadi SB, Shiddamallayya N, Patil PC (Dept Bot, Gulbarga Univ, Gulbarga 585 106). **Limnological studies of Papnash pond, Bidar (Karnataka)**. *J Environ Bio*, 26(2)(2005), 213-216 [24 Ref].

The physico-chemical and biological status of water of Papnash pond is analyzed. Variations in physico-chemical parameters are noted. The results revealed that the pond water is hard, alkaline and polluted. Totally 39 species of algae are reported from the four classes.

0501-142. Bahador N, Baseri Salehi M, Patil DN, Kapadnis BP (Dept Environ Sci, Pune Univ, Pune 411 007). **Seasonal variation of microbial pollution in surface water of Pune city.** *Nature Env Polln Techno*, 4(1)(2005), 53-56 [19 Ref].

The microbiological analysis of the water was carried out at the Pavana river water in Pune in three seasons viz., summer, monsoon and winter. The total viable count in monsoon was more than other seasons. Faecal coliform bacteria count was more in monsoon. Pavana river water is heavily contaminated and may act as a medium for transmission of pathogenic bacteria, which is a threat to health of the humanbeings.

0501-143. Chauhan Anuradha, Bhadauria Seema, Kumari Bhawana (Microbio Res Lab, Dept Bot, Raja Balwant Singh Coll, Agra 282 002). **Biodiversity of algal and fungal flora on monuments and temples at Jaipur.** *Nature Env Polln Techno*, 4(1)(2005), 35-38 [7 Ref].

The marble monuments and temples situated in Jaipur were studied for occurrence of algal and fungal microflora causing microbial weathering and deterioration in cultural heritage. The isolation was studied by three standard methods, swabbing, cellophane and scrapping, out of which swabbing technique was found to be the best. In temples algal forms were prominent at places with water outlets, water filled grooves and water offering places. Due to the presence of such biodeteriogens, the white walls have turned to olive green, grey, black or red, thus, destroying the aesthetic value.

0501-144. Das Sutapa, Banerjee Kakoli, Mukherjee Debarati, Bannerjee Subash, Mitra Abhijit (Dept Environ Sci, Univ Calcutta, 35, BC Rd, Kolkata 700 019). **Trace metal distribution in sediments of the West Bengal coast, India.** *Ultra Sci*, 17(1)(2005), 65-70 [10 Ref].

The coastal zone of West Bengal along with its estuarine arms is a dynamic ecosystem of the tropics, which is presently under threat due to urbanization and industrialization. Seasonal load of biologically available Zn, Cu and Pb were estimated in the surface sediment at ten different stations in the present geographical locale. The order of metal load is Zn>Cu>Pb and there exists a considerable variations of these metals with respect to space and time.

0501-145. Dongare Meena (Dept Bot, Shivaji Univ, Kolhapur 416 004, Maharashtra). **An ecological assessment of the liverworts of Panhala hill station (Maharashtra).** *J Ecophysio Occupl Hlth*, 4(1&2)(2004), 61-66 [17 Ref].

Microclimate plays a vital role in distribution of growth of liverworts. Majority are found in dense mats, epilithic and restricted to their habitats. The relationship between them has been established by studying various environmental factors acting upon them. Significant role of liverworts in soil-management, binding, conservation and erosion prevention has also been observed. These bioresources are under threat and needs conservation.

0501-146. Hebbara M, Manjunatha MV, Patil SG, Kuligod VB, Minhas PS (AICRP Manag Salt Affected Soils, Agricl Res Stn, Gangavati, Karnataka). **Response of tree species to compound effects of salinity and waterlogging.** (*The Indian Forester*, 130(1)(2004), 27-36 [17 Ref].

A field experiment was conducted to evaluate the performance of tree species in saline-waterlogged soils at Agricultural Research Station, Gangavati, Karnataka. Six tree species viz., *Hardwickia binata*, *Sesbania grandiflora*, *Acacia nilotica*, *Dalbergia sissoo*, *Casuarina equisetifolia* and *Azadirachta indica* and a grass (*Pennisetum purpureum*) was selected for the study. Tree performance was evaluated in terms of survival, height, diameter (dbh) and canopy width in different salinity blocks (range <5 to >15 dS/m). Based on various tree growth parameters, *A. nilotica* out performed all other species at all salinity levels followed by *C. equisetifolia*. Higher establishment and better growth rate made it more suitable for saline conditions.

0501-147. Joseph Diane, Kadavul K, Presena J (KM Cent PG Stud, Lawspet, Pondicherry 605 008). **Biodiversity of toxic plants in Pondicherry and their homicidal effects.** *Nature Env Polln Techno*, 4(1)(2005), 27-34 [15 Ref].

A total of 84 toxic plants were identified in Pondicherry and their toxic principles were studied. The taxonomy and action of these plants were documented. A few plants, used as suicidal tool by rural and suburban communities, have been recorded. Out of 84 plant species, six possess homicidal properties and responsible for death of 79 people for the past one year (August 2003-February 2004). The cases of plant poisoning are immense in Pondicherry either by deliberate or accidental approaches.

0501-148. Mahadev J, Hosamani SP (DOS Environ Sci, Mysore Univ, Mysore 570 006, Karnataka). **Community structure of cyanobacteria in two polluted lakes of Mysore city.** *Nature Env Polln Techno*, 3(4)(2004), 523-526 [11 Ref].

Field study was carried out on the pollution of two water bodies, Karanji lake and Dalvoi lake, Mysore city. Water samples were collected and analyzed for various physico-chemical and biological parameters. Cyanophyceae are highly tolerant organisms and prefer to grow at higher temperature and slightly alkaline conditions. *Anabaena wisconsinense*, *Arthrospira platensis*, *Merismopedia tenuissima*, *Phormidium fragile*, *Spirulina nordstedtii* and *Spirulina major* were common species that occurred in both the lakes during all the seasons.

0501-149. Mahadev J, Hosamani SP (DOS Environ Sci, Mysore Univ, Mysore 570 006). **Algae for biomonitoring of organic pollution in two lakes of Mysore city.** *Nature Env Polln Techno*, 4(1)(2005), 97-97 [13 Ref].

Two lakes situated in Mysore city were studied for their algal diversity and the possibility of using algae as biomonitors of organic pollution. Dalvoi lake has very low diversity with blooms of *Microcystis aeruginosa*, *Arthrospira platensis*, *Phormidium fragile* and *Spirulina nordstedtii*. These algae occurred as regular blooms. Karanji lake supports a wide diversity of algae and is less polluted.

0501-150. Mruthunjaya TB, Hosmani SP (DOS Bot, Univ Mysore, Manasagangothri, Mysore 570 006, Karnataka). **Application of cluster analysis of evaluate pollution in Lingambudhi lake in Mysore, Karnataka.** *Nature Env Polln Techno*, 3(4)(2004), 463-466 [4 Ref].

The cluster analysis indicates that the physico-chemical parameters are poorly related to the phytoplankton. There are only two large clusters of three and four variables, which are non-contained and can explain rest of the variables. Correlation matrix and cluster analysis appear to be handy tools in determining the important factors that control biological activity in polluted waters.

0501-151. Nandan SN, Aher NH (PG Dept Bot, SSVP's LK Dr. PR Ghogrey Sci Coll, Dhule 424 005). **Algal community used for assessment of water quality of Haranbaree dam and Mosam river of Maharashtra.** *J Environ Bio*, 26(2)(2005), 223-227 [10 Ref].

An algal community was used to assess the quality of water of Haranbaree dam and Mosam river of Maharashtra. Pollution tolerant genera and species of four groups of algae from each of three stations of Haranbaree dam and Mosam river were recorded. By using Palmer's index of pollution for rating of water samples the total score of each

station of study area was greater than 20 indicating the confirmed high organic pollution. Thirty-four pollution tolerant genera were recorded at all stations of dam and river. Out of 34 pollution tolerant genera, 27 genera and 33 genera were observed at the dam and river sites respectively.

0501-152. Pandey JS, Joseph V, Kaul SN (Natl Environ Engng Res Inst, Nagpur 440 020). **A zone-wise ecological-economic analysis of Indian wetlands.** *Environ Monit Assess*, 98(1)(2004), 261-273 [19 Ref].

In view of their sensitivity and importance, an ecological-economic analysis of wetlands has been carried out for various Indian states. Subsequently, the ecological wealths of different zones (north, south, east and west) have been computed and compared. A ratio called ANR [Artificial (A) Wetland Wealth to Natural (N) Wetland Wealth Ratio (R)] has also been devised, which is the ratio of the ecological-economic values of artificial and natural wetlands. ANR ratio is found to be the highest for Madhya Pradesh (564.1) and Karnataka (159.8) states.

0501-153. Pandit BR, Patel Dax, Pandya Ushma (Dept Life Sci, Bhavnagar Univ, Bhavnagar, Gujarat). **Biodiversity measurement of jessore sloth bear sanctuary.** *Nature Env Polln Techno*, 4(1)(2005), 113-118 [18 Ref].

Paper deals with the biodiversity of Jessore Sloth Bear Sanctuary. The vegetation was arid to semiarid and dry deciduous, thorny scrub type. The prominent species were *Zizyphus*, *Anogeissus*, *Butea* and *Prosopis*. There were 384 species belonging to 272 genera from 99 families of angiosperm. The most diverse genera were *Cassia*, *Indigofera*, and *Acaccia*. In monocots, the most diverse families were Poaceae, Asteraceae, and Cyperaceae, and the genera were *Cyperus*, *Commelina*, and *Cynodon*.

0501-154. Perumalsamy K, Thangamani A (Dept Zoo, Ayya Nadar Janaki Ammal Coll, Sivakasi (W) 626 124). **Indices of zooplankton richness and evenness and bio indicators in some perennial ponds.** *Oikoassay*, 17(1&2)(2004), 35-39 [10 Ref].

The diversity indices of zooplankton and physico-chemical parameters were studied in three perennial ponds, viz., Maruluthu pond, Kalapperumalpatti pond and Thamaraikulam pond in Virudhunagar District. A total of 34 species of zooplankton were identified. Among these, 17 species of Rotifers, 11 of Copepods, four of Cladocerans and two of Ostracods were found. The numerical superiority of zooplankton is found to

be associated with *Cyclops* sp (4.33×10^3 units/l) in Maruluthu pond. Such dominant species and sensitive species serve as bioindicators of environmental status.

0501-155. Saha TK (Dept Zoo, Annada Coll, Hazaribagh 825 301, Jharkhand). **Algal productivity in some coal dust receiving freshwater bodies in Jharkhand state.** *Nature Env Polln Techno*, 3(4)(2004), 557-561 [8 Ref].

Five coal field areas were selected in the Jharkhand state and effect of coal dust in phytoplanktonic productivity was determined in different seasons. During monsoon maximum effect of coal dust do influence productivity in the ponds of all areas except a few. Maximum values of gross primary productivity were obtained during winter and minimum in the monsoon.

0501-156. Sharma Kamayani, Bhardwaj SM, Chaturvedi RK, Sharma KP (Dept Bot, Univ Rajasthan, Jaipur 302 004). **Applicability of diversity indices for a comparative assessment of degree of pollution in lentic and lotic ecosystems, and describing vegetation characteristics.** *Nature Env Polln Techno*, 4(1)(2005), 101-106 [18 Ref].

Diversity indices were calculated for the marshy vegetation growing at the bank of three sites along a drain (lotic ecosystem) and three pools (lentic ecosystem), in order to quantify pollution caused by municipal and industrial wastes. Their applicability is also adjudged to decipher vegetation characteristics. Study revealed that the marshy vegetation along the lentic ecosystems is under more stress during spring season, while that of lotic ecosystem during late rainy season. The distribution of plant species at the study sites was best described by b-diversity.

0501-157. Singhal Pradeep K, Mahto Sadhna (Limno Lab, Dept Biosci, RD Univ, Jabalpur 482 001). **Role of water hyacinth in the health of a tropical urban lake.** *J Environ Bio*, 25(3)(2004), 269-277 [18 Ref].

Paper assesses health of the tropical urban Robertson Lake, Jabalpur which receives domestic sewage from neighboring human inhabitation and is infested with water hyacinth, Peak density of this macrophyte was $12.5 \text{ t dw ha}^{-1}$. Water hyacinth stabilized water quality and provided substantial support to bacterial density, which in turn contributed significantly to its growth and nutrient dynamics. The results denote poor health of the lake, characterized by low species diversity, fast shallowing, dominance of detritus food-webs, and the water unsuitable for human consumption.

0501-158. Solanki Sunita, Rana KS, Singh Arun Kumar (Dept Zoo, Agra Coll, Agra 282 002). Ecological status of Khari nadi at Agra. *Uttar Pradesh J Zoo*, 25(1)(2005), 101-103 [12 Ref].

The physico-chemical characteristic of the aqueous phase influence on the types and distribution of aquatic biota. Conversely, they are also influenced by the activity of the aquatic biota. It contains gases, dissolved minerals, suspended matter, and even microbes. Attempt has been made to quantify the present ecological status of Khari nadi and efforts has been made to find out the indicators of water quality in terms of planktonic studies.

0501-159. Terdalkar Sameer, Kulkarni AS, Kumbhar SN, Matheickal Jose (Dept Biotechno, Gogate Jogalekar Coll, Ratnagiri 415 612). **Bio-economic risks of ballast water carried in ships, with special reference to harmful algal blooms.** *Nature Env Polln Techno*, 4(1)(2005), 43-47 [11 Ref].

Invasive aquatic species are one of the four greatest threats to the world's oceans, which can cause extremely severe environmental, economic and public health impacts. Shipping moves over 80% of the world's commodities and transfers approximately 10 million tones of ballast water internationally each year. Along with these, several potent toxic dinoflagellate spores are also transferred through the ballast tank sediments. These spores are responsible for causing harmful algal blooms (HABs) in the local waters. Paper highlights the transfer of toxic spores and their human health impacts.

0501-160. Zafar Afreen, Sultana Naheed (Dept Zoo, AND Coll, Kanpur 208 012). **Zoo plankton and microinvertebrates of river Ganga at Kanpur.** *Uttar Pradesh J Zoo*, 25(1)(2005), 63-66 [24 Ref].

Zooplankton density was conducted of river Ganga between Parmat ghat upto Jajmau bridge covering an area of 10 km. It was observed that zooplankton density was maximum during summer and minimum during rainy season at all the selected sites. Dominant zooplankton were *Paramecium* sp., *Brachionous* sp., *Filinia* sp. and *Keratella* sp. It is concluded that the water quality of river was responsible for qualitative and quantitative variation in zooplankton at the sites studies.

NATURE AND NATURAL RESOURCES CONSERVATION

0501-161. Agnihotri Y, Samra JS, Aggarwal RK, Yadav RP, Prasad Ram (Cent Soil Water Conserv Res Trng Inst, Res Cent, Chandigarh 160019). **Recovery of dry thorny vegetation in the Shivaliks consequent of protection.** *Indian J Soil Conserv*, 33(1)(2005), 52-57 [8 Ref].

The impact of resource conservation in a Shivalik micro watershed was studied 10 years after imposition of protection. The main activity taken up in the micro watershed was the construction of an earthfill dam in 1992 at the outlet to runoff water from a contributing area of 59.6 ha consisting of sparse vegetation. The dam itself served as a physical barrier to free grazing of cattle and illicit biomass collection. Vegetation sampling using nested sampling procedures revealed significant changes in vegetation density in three topographic situations.

0501-162. Banerjee SK, Singh AK, Jain A, Shukla PK (Trop Forest Res Inst, Jabalpur, MP). **Response of conservation measures on the growth of planted species and improvements in soil properties in a degraded area.** *(The) Indian Forester*, 129(12)(2003), 1504-1516 [21 Ref].

Studies were conducted to assess improvement in soil properties due to adoption of soil-water conservation method on hilly slope in Jabalpur District of Madhya Pradesh, India. At site I *Tectona grandis* and at site II *Albizia procera* and *Albizia lebbek* were planted at 2 m × 2m spacing and in between rows staggered trenches of 3 m × 0.5 × 0.5 m were dug. Observations recorded after 4.5 years of planting showed considerable improvement in soil properties, more so on the lower slope in respect of organic carbon, available nutrients etc. Soil loss has also been reduced to a considerable extent.

0501-163. Basu Ramasankar (Achhruram Memorial Coll, Jhalda 723 202, West Bengal). **Traditional utilization of plants in intestinal, malarial and sexual diseases by tribals of Puruliya.** *Adv Plant Sci*, 18(1)(2005), 133-137 [9 Ref].

Paper documents the traditional knowledge on 36 ethnomedicinal plants which are used by tribal communities of the district of Puruliya in West Bengal for treatment of various intestinal disorders, malarial infections and sexual diseases. Traditional beliefs, concepts, knowledge and practices among them for preventing, lessening or curing diseases are accessible till now. The need for conservation of these valuable plants are

emphasized, many of which are on the verge of extinction due to rampant deforestation and denudation.

0501-164. Bhakat RK, Pandit PK (Dept Bot Forestry, Vidyasagar Univ, Midnapur, West Bengal). **An inventory of medicinal plants of some sacred groves of Purulia district, West Bengal.** (*The Indian Forester*, 130(1)(2004), 37-44 [17 Ref].

A repository of medicinal plants, the sacred groves are a unique traditional Indian way of *in-situ* conservation of biodiversity. Paper deals with 18 sacred groves of Purulia district of West Bengal and also highlights the role played by these groves in medicinal plant conservation. The study for the first time records 56 species of medicinal plants growing in these groves. It also mentions the threats to the sacred groves.

0501-165. Binita Devi K, Gupta Asha (Dept Life Sci, Manipur Univ, Canchipur). **Diversity of biotic resources of village Andro, district Imphal East (North India).** *Flora Fauna*, 10(2)(2004), 83-87 [10 Ref].

About 103 different plant species are extensively used by people of Andro village of Imphal East Distt. Manipur, North East India for their common requirement of which about 22 species are used as timber, 17 as fodder, 28 as fuel, 41 as medicine and 23 as food plants. The paper reports 30 animal resources of Andro village, 18 species of fishes and 14 animal species as nuisance species. The paper advocates for strong mechanisms and network to work with the indigenous people of the region institutional management as to ensure the utilization of the knowledge for conservation and development of the biotic resources.

0501-166. Dev Roy MK, Nandi NC (Zool Surv India, 27, Jawaharlal Nehru Rd, Kolkata 700 016). **Crustacean fishery resources of coastal West Bengal and their conservation issues.** *J Env Sociobiology*, 1(1&2)(2004), 71-80 [15 Ref].

Coastal West Bengal is dominated by mangroves, estuaries, backwaters and brackishwater bheries. All these ecosystems are very rich in fauna including the crustaceans, many of which are of commercial value. An inventory of a total of 34 species of commercially important prawns and crabs has been prepared along with a list of 13 species of ill-tapped/untapped crustaceans. The major threats to crustacean fishery of the State of West Bengal have also been discussed along with the conservation issues.

0501-167. Fulekar MH (Dept Life Sci, Univ Mumbai, Santacruz (E), Mumbai 400 098).

Urban development: a threat to mangrove ecosystems in coastal zones of Mumbai. *Nature Env Polln Techno*, 3(4)(2004), 447-450 [7 Ref].

The mangrove ecosystems are found at the confluence of land and sea that represent the inter-tidal zone. They are colonized by mangrove plants and rich diverse animal life. The mangroves are being greatly affected by various anthropogenic activities and climate changes, especially in the urban areas of coastal regions. Paper deals with the study of the threats being put upon the mangrove ecosystems of Mumbai by human activities.

0501-168. Ghosh Paromita (GB Pant Inst Himalayan Env Dev, Kosi-Katarmal, Almora 263 643, Uttaranchal). **Forest fragmentation: a threat to global biodiversity.** *ENVIS Bull: Himalayan Eco*, 12(2)(2004), 17-26 [41 Ref].

One of the greatest challenges is the conservation of locally endemic species. It is therefore vital to conserve existing forest remnants, which may harbour relic populations of local endemics. Tropical forest biotas are highly vulnerable to habitat fragmentation because of greater species richness, patchy distributions and presence of rare species with small populations. Long-lived tree species are living dead, as they are likely to be functionally extincts in fragments well before their populations have actually disappeared. Restoration and management of ecosystem fragments should be given special emphasis and appropriate measures should be taken to stop fragmentation.

0501-169. Kadavul K, Presena J, Diane Joseph R (Kanchi Mamunivar Cent PG Std, Lawspet, Pondicherry 605 009). **Traditional medicinal usage of tree barks of Pondicherry region, India.** *Nature Env Polln Techno*, 4(2)(2005), 241-246 [13 Ref].

Medicinal value of the bark yielding trees of Pondicherry region was evaluated. A total of 25 tree species belonging to 24 genera under 18 families were recorded. Family-wise, Moraceae and Caesalpiniaceae show the maximum of three species in each. The specific diseases treated by bark medicines like asthma, dysentery, ulcers, dysmenorrhoea, diarrhoea and their use as aphrodisiac have been documented. The bark medicines are used in crude form only.

0501-170. Kathiresan K (Annamalai Univ, Parangipettai 608 502). **Biodiversity in mangrove ecosystems of India: status challenges and strategies.** *ENVIS Forestry Bull*, 4(2004), 11-23 [38 Ref].

The mangroves create a unique ecological environment that hosts rich assemblages of species. Globally, the mangrove habitats continue to disappear. Paper deals with the present status of mangroves in India, threats faced by them, and strategies responding to the challenges of sustainable development of mangrove resources in this country.

0501-171. Kumar Anil, Nandi, S Hyamal K, Chandra Bhuwan, Pal Mohinder (GB Pant Inst Himalayan Env Dev, Kosi-Katarmal, Almora, Uttaranchal). **Conservation of some Himalayan medicinal plants using biotechnological approaches.** (*The Indian Forester*, 130(2)(2004), 187-198 [50 Ref].

The importance of selecting elite planting material from the natural populations and the application of molecular markers to characterize the genetic diversity within and among different populations has been discussed. Moreover, alternative methods of obtaining active principle(s) through callus, suspension and hairy root cultures for these medicinal plants have been highlighted. These aspects have been dealt with keeping in focus the dual objectives of conservation and meeting the commercial demands through cultivation.

0501-172. Kumar Nikhil (Environ Manag Gr, Centl Mining Res Inst, Barwa Rd, Dhanbad 826 001, Jharkhand). **Vetiver grass for the bioreclamation of coal overburden dumps.** *Eco Env Conserv*, 10(4)(2004), 417-430 [65 Ref].

Vetiver Grass (*Vetiveria zizanioides*) is planted for soil and water conservation. It has been described in details about the growth and development in pot and field experiments along with major nutrients and heavy metals distribution in planted grass over coal overburden dumps. It has been found that this grass has a significant role in the binding capacity of the dump material and scavenger for the heavy metals present on the dump. Moreover, it adds nutrients by its biomass and improves the physico-chemical and biological properties of the dumps to support the other planted species.

0501-173. Kumar Pradeep, Prathapasenan G (Taxonomy Lab, Dept Bot, Fac Sci, MS Univ Baroda, Vadodara, Gujarat). **Ethnobotany of Shoolpaneshwar Wildlife Sanctuary in Gujarat: a preliminary survey.** (*The Indian Forester*, 129(11)(2003), 1233-1328 [10 Ref].

Attempt has been made to understand the ethnobotany of Shoolpaneshwar Wildlife Sanctuary. Information concerning 50 angiosperms used by the local tribals

inhabiting the area has been collected during the field trips. Paper deals with the family, botanical name, vernacular name and uses of the plants.

0501-174. Muthuselvan N, Arul Manikandan PN (Peria Karamalai Tea Produce Co Ltd, Valparai 642 127). **Ethnobotany of the Irula tribes at Tadagam Reserve Forest, Coimbatore district, Tamil Nadu.** *Adv Plant Sci*, 18(1)(2005), 127-131 [14 Ref].

The Irula tribe is a Dravidian tribe distributed throughout the states of Tamil Nadu, Kerala and Karnataka. They are scattered in Coimbatore, South and North Arcot as well as Nilgiri districts. The study of medicinal plants among Irula tribes have been discussed. The elderly Irulas have a good knowledge about the medicinal plants and cures for various diseases.

0501-175. Raha Alanu Kumar (Sunderban Biosphere Reserve, West Bengal). **Biodiversity conservation in Indian Sunderban at landscape level: present status and strategies.** *ENVIS Forestry Bull*, 4(2004), 32-42 [11 Ref].

Sunderban has extremely rich diversity of aquatic and terrestrial flora and fauna. Sunderban's highly productive ecosystem sets as a natural fish nursery. Sunderban mangrove reduces the fury of cyclonic storm and prevent erosion due to tidal action. Millions of people depend on Sunderban ecosystem for their livelihood and sustenance through fishing, collection of honey and fuelwood/timber.

0501-176. Ramachandra TV (Energy Wetland Res Gr, Cent Ecol Sci, Indian Inst Sci, Bangalore 560 012). **Aquatic ecosystems: conservation, restoration and management.** *J Env Ecol Manag*, 1(1)(2004), 105-127 [16 Ref].

Aquatic ecosystems have been subjected to various levels of stresses in India, due to unplanned developmental activities in the last century leading to serious environmental degradation. Anthropogenic activities involving changes in land use ultimately affects the receiving water in that drainage. Paper emphasizes that much need is to be done to effectively manage and conserve aquatic resources. This necessitates detailed scientific investigations and without increased monitoring, some very basic attributes of aquatic systems may be unknowingly lost or severely degraded.

0501-177. Singh Bajrang, Garg VK, Singh PK, Tripathi KP (Natl Botl Res Inst, Lucknow, UP). **Diversity and productivity effect on the amelioration of afforested sodic soils.** *(The) Indian Forester*, 130(1)(2004), 14-26 [26 Ref].

New forests created on sodic wastelands, consisting of different community structure ameliorate the soil at various degrees according to productivity and diversity status. Three such forested sites were selected at Banthra Research Station of National Botanical Research Institute, Lucknow, India with different productivity and diversity indices descending from site I (S_1) to III (S_3), which were compared with a control (non forested) sodic soil site. Importance value index (IVI) decreased from 320 to 150 from site I to III. Shannon-Wiener's general diversity index was greatest in site I (1.85) and lowest in site III (1.37).

0501-178. Singh J, Bora IP, Baruah A, Hussain M (Rain Forest Res Inst, Jorhat, Assam). **Effect of shifting cultivation of nutrient status of soil in Silonijan (Karbi-Anglong) Assam.** (*The Indian Forester*, 129(11)(2003), 1329-1338 [24 Ref].

Burning resulted significant increase in soil pH, which decreased soil acidity and acidity increased as the fallow progressed. The percentage of sand increased while the clay percentage decreased after burning the sites. A drastic reduction in moisture content was recorded due to burning operation. As the fallow progressed the value increased gradually. Nutrient status of soil was recorded significantly higher in natural forest than in the fallow lands and in all cases the value was inversely proportional to depth.

0501-179. Terdalkar SS, Apte SA, Kulkarni AS (Dept Biotech, Gogate Jogalekar Coll, Ratnagiri 415 612). **Mangrove biodiversity and economics of Ratnagiri coast with special reference to Bhatye Estuary.** *Nature Env Polln Techno*, 4(2)(2005), 265-268 [6 Ref].

Bhatye estuary happens to be one of the most important estuarine regions (extends almost 35 km inside the coast up to Hattis) along the Ratnagiri coast and is a breeding ground for most of the commercially important shellfish and other fishes. The fishing potential and economy of the coast largely depends upon this region. The extent of mangrove cover is day-by-day reducing due to various anthropogenic activities. Paper highlights the floral diversity and fishery economics along the coast.

0501-180. Vidhyarthy Anil Kumar, Gupta HS* (*Divisional Forest Office, Sarrand Div, West Shinghbhum, Chaibasa, Jharkhand). **Ethnomedicinal study of some important plants of Jharkhand and their conservation.** (*The Indian Forester*, 130(2)(2004), 149-150 [4 Ref].

The increasing demand of medicinal plants has resulted in the rapid dwindling of these natural resources and there is a urgent need of systematic and conservation and sustainable production of medicinal plants. Also suitable propagation techniques are to be developed, like tissue culture etc. It is essential to have an interface between traditional trends and modern concept of production, marketing and technology of this important resource. Creating awareness and proper networking on the medicinal properties of these indigenous plants, through dissemination of research data with extension activities will go a long way in conserving nature's priceless gift.

HEALTH AND TOXICOLOGY

0501-181. Agarwal Asha, Yadav Nirupma (Dept Bot, Sch Life Sci, Dr. BRA Univ, Agra 282 002). **Effect of sulphur dioxide inhalation on serum Na⁺ and K⁺ ion concentration in albino rat.** *J Environ Bio*, 25(3)(2004), 321-323 [14 Ref].

Study assesses the effect of 60 ppm and 120 ppm exposure of sulphur dioxide gas for one hour daily for 2 and 4 week on serum sodium(Na⁺) and potassium (K⁺) ion concentration in albino rat, *Rattus norvegicus* (Berkenhout). The present findings reveal that serum sodium (Na⁺) ion concentration increased significantly after 4 week exposure to 120 ppm of sulphur dioxide, while serum potassium ion (K⁺) concentration decreased significantly after 4 week exposure to 120 ppm of sulphur dioxide.

0501-182. Asthana A, Pillai A, Gupta VK* (*Sch Std Chem, Pt Ravi Shankar Shukla Univ, Raipur). **A simple and sensitive spectrophotometric method for determination of methanol in biological and environmental samples.** *Cheml Environ Res*, 13(1&2)(2004), 5-12 [28 Ref].

A sensitive spectrophotometric method for the determination of methanol is described. The method is based on the oxidation of methanol to formaldehyde which is subsequently estimated by coupling with phloroglucinol in alkaline medium, the orange coloured dye has lmax 465 nm and obeys Beer's law in the range of 1 to 10 ppm. The standard deviation and relative standard deviation were found to be 0.032 and 3.47% respectively. The method has been applied for the determination of methanol in biological and environmental samples.

0501-183. Bakore Neela, John PJ, Bhatnagar Pradeep (Environ Toxicology Unit, Dept Zoo, Univ Rajasthan, Jaipur). **Organochlorine pesticide residues in wheat and drinking**

water samples from Jaipur, Rajasthan, India. *Environ Monit Assess*, 98(1-3)(2004), 381-389 [20 Ref].

Study was conducted to evaluate the pesticide contamination in wheat flour and drinking water from Jaipur City, Rajasthan, India using gas chromatograph. The amount of pesticide detected in wheat flour was higher than the permissible limits prescribed by WHO/FAO. In drinking water only a few pesticides exceeded the permissible limits. Seasonal variations of pesticides were also observed during the study period.

0501-184. Bhargava Anuj, Khanna RN, Bhargava SK, Kumar Sushil (Indl Toxicol Res Cent, PB No. 80, MG Rd, Lucknow 226 001). **Exposure risk to carcinogenic PAHs in indoor-air during biomass combustion whilst cooking in rural India.** *Atmospheric Env*, 38(28)(2004), 4761-4767 [33 Ref].

Paper reports the concentration and profile of carcinogenic PAHs, co-samples with respirable suspended particulate matter, in rural indoors during burning of biomass vis-à-vis liquified petroleum gas as the energy source. The seasonal variation has also been studied. Study revealed that the concentrations of carcinogenic PAHs were fairly high in breathing zone and in surrounding areas while cooking over chulha in rural India. PAHs concentrations increased substantially during biomass combustion. Concentrations were high during cow dung coke combustion and low during LPG combustion or the non-cooking period. This trend was conserved in both the seasons.

0501-185. Bhatnagar Chhaya, Regar Bhag Chand (28, Subhash Nagar, Udaipur 313 001). **Neurodegenerative effect of fluoride (NaF) on the brain of freshwater teleost, *Labeo Rohita*.** *Indian J Environ Sci*, 9(1)(2005), 15-19 [13 Ref].

The effect of chronic exposure of fluoride was most prominently observed in the sixth or innermost layer of the optic tectum. There was a decrease in the cell density and neuronal cells showed vacuolization and shrinkage of cytoplasm. Macrophage cells were also present in the layers of the optic tectum. The neurodegenerative effect of fluoride observed could be due to conformational changes in receptor proteins of cell membrane that can ultimately cause cell death.

0501-186. Borah Sabita (Dept. Zoo, Lakhimpur Girls Coll, Khelmati 787 031, North Lakhimpur, Assam). **Effect of petroleum oil on biochemical constituents and enzyme activity in kidney and liver tissues of freshwater teleost fish**

***Heteropneustes fossilis* (Bloch).** *Nature Env Polln Techno*, 4(2)(2005), 227-232 [26 Ref].

Effect of sublethal concentration of petroleum crude oil on certain biochemical parameters of freshwater fish *Heteropneustes fossilis* (Bloch) were studied for 5, 10, 20 and 30 days. Total content of protein, RNA, DNA, glycogen, glucose and activities of Acp and Alp significantly decrease (between $p < 0.05$ and $p < 0.001$) whereas, the total free amino acid contents and the activity of LDH significantly increase (between $p < 0.05$ and $p < 0.001$) in both the tissues with advancing days of stress.

0501-187. Chandra Prem, Srivastava Dhananjay K, Srivastava Arun K (Government Opium Alkaloid Work Factory, Ghazipur 233 001). **Effects of GOAW effluents on certain haematological parameters of a catfish, *Heteropneustes fossilis* (Bloch).** *J Ecophysio Occupl Hlth*, 4(3&4)(2005), 197-200 [21 Ref].

Heteropneustes fossilis were exposed to the effluents (before and after treatment) released from GOAW Ghazipur, for 10, 20 and 30 days and different haematological parameters were estimated. A significant decreasing tendency was observed in RBC count, Hb and Hct percentage while WBC count and clotting time of the blood was increased on exposure to effluent before treatment. The values of WBC count and clotting time showed an increasing tendency while RBC Count, percentages of Hb and Hct remained unaffected on exposure to the effluent after treatment.

0501-188. Chandra Saurabh, Kumar Pradeep, Pande PN, Murthy RC, Gopal Krishna, Gupta SK (Indl Toxic Res Cent, PB No.80, MG Marg, Lucknow 226 001). **Alternations in prenatal development of mice in response to solid waste leachates of metal-based industries.** *J Ecophysio Occupl Hlth*, 4(1&2)(2004), 137-144 [26 Ref].

One of the most common ways of surface and ground water contamination from hazardous metal wastes is through its leachates. The administration of leachates in pregnant mice of embryogenesis phase by oral feeding caused a significant reduction in number of implantation, number of fetuses and an increase in number of resorptions but the pre and post implantation losses percentage also increased. No significant visceral abnormality was observed in the mother mice. These findings suggest that leachates of metal-based industries might cause a significant effect on embryogenesis/organogenesis phase and fetogenesis phase.

0501-189. Chaudhary Anil, Bharti Mukta (Dept Zoo, Jai Narain Vyas Univ, Jodhpur 342010). **Haematological alterations in a fresh water fish *Saccobranchnus fossilis* (Bleeker) after long term exposure of dyes Red 6BX and T_GB₁₄ Green.** *Oikoassay*, 17(1&2)(2004), 25-28 [12 Ref].

Study deals with the alteration of haematological parameters in the freshwater fish *Saccobranchnus fossilis* after its long term exposure to different concentrations of dyes Red 6BX, and T_GB₁₄ Green. Exposure of two different dyes resulted in significant decrease in total red and white blood cell counts in all the groups. Marked decreased in the level of haemoglobin and electrolytes in all four groups (15, 30, 60 and 90 days) was also observed.

0501-190. David M, Shivakumar HB, Shivakumar R, Mushigeri SB, Ganti BH (Dept Zoo, Karnataka Sci Coll, Dharwad 580 001). **Toxicity evaluation of cypermethrin and its effect on oxygen consumption of the freshwater fish *Tilapia mossambica*.** *Indian J Environ Toxicol*, 13(2)(2003), 99-102 [19 Ref].

Mortality has been observed after exposing the fish to different concentrations of cypermethrin for 96h. The LC₅₀ has been found to be 4.789 µg/L and one-tenth of LC₅₀ (0.4789 µg/L) has been selected as sub-lethal concentration for sub-acute studies. Oxygen consumption has been determined in both lethal and sub-lethal concentrations.

0501-191. Dhanapakiam P, Sampoorani V, Kavitha M, Ramasamy VK, Chandrakala A, Aruna KC (Environ Bio Unit, PG Res Dept Zoo, Alameh Angappan Coll Women, Komarapalayam 638 183). **Gill lesions in the major carp, *Labeo rohita* exposed to lethal and sublethal concentrations of tannery effluent.** *J Environ Bio*, 25(3)(2004), 333-336 [16 Ref].

The major carp, *Labeo rohita* were exposed to (0.873%) lethal and sublethal (0.073%) concentrations of tannery effluent for 24h and 40 days respectively under static bioassay condition. The surface architecture of gill revealed severe damages such as: fusion and clumping in the middle and distal parts of the primary lamellae, swelling and deterioration of the cells. Swelling of primary and secondary epithelial cells was evident in sublethal concentration.

0501-192. Dixit Yogesh Babu, Saxena KK, Chauhan Shalini, Dubey AK (Dept Zoo, JMV, Ajitmal 206 001). **Biochemical changes in the liver of a freshwater teleost,**

***Heteropneustes fossilis* (Bloch) exposed to rogor.** *Uttar Pradesh J Zoo*, 24(1)(2005), 51-53 [11 Ref].

Catfish, *Heteropneustes fossilis* was exposed to a sublethal concentration of Rogor (10 ppm) for 48 days and it was observed that the protein content decreased, whereas the specific activities of acid phosphates (ACP) and succinate dehydrogenase (SDH) showed an increased initially. However, a temporary recovery was observed between the second and third weeks of exposure. Thereafter the animals were released to normal water for 24 days, but they did not show any sign of recovery during this period.

0501-193. Dubey Manju (Dept Zoo, Rani Durgawati Govt PG Coll, Mandla, MP 481 661). **Toxic effect of fluorosis among school children in village of Mandla district, Madhya Pradesh.** *J Ecophysio Occupl Hlth*, 4(1&2)(2004), 73-81 [15 Ref].

Study is related to reveal the main features of dental fluorosis and skeletal fluorosis. Three villages in Mandla District were taken for the study and the affected school children were assessed for dental and skeletal fluorosis. The sample was graded for dental and skeletal fluorosis. It seems that it is only the water fluoride, which is responsible for the fluorosis in the area, complicated by multiple nutritional deficiencies.

0501-194. Gomathy RD, Vijayaval K, Balasubramanian MP (Dept Pharmaco Environ Toxicol, Univ Madras, Taramani 600 113, Chennai). **Effect of mercury and cadmium on two transaminases system of a marine edible crab *Scylla serrata*.** *Indian J Environ Toxicol*, 13(2)(2003), 80-82 [9 Ref].

The effect of mercury and cadmium on the transaminase system has been studied in muscle, hepatopancreas and haemolymph of a marine edible crab *Scylla serrata*. Rearing the crabs in individual and combined concentrations, i.e. (1:1, 1:2 and 2:1) of mercury and cadmium for 96 h, has shown an overall increase in the transaminase system of muscle, hepatopancreas and haemolymph.

0501-195. Goswami K, Gachhui R, Bandopadhyay A (Dept Bio Chem, Vivekananda Inst Medl Sci, 99 Sarat Bose Rd, Kolkata 700 026). **Hepatorenal dysfunctions in lead pollution.** *J Environ Sci Engng*, 47(1)(2005), 75-80 [20 Ref].

Paper studied both liver function and renal function and blood lead concentration in random population sample of 372 men. In all the subjects both liver and renal function tests and both blood lead and urinary concentration of lead were measured. Raised

blood and urinary lead concentrations were associated with moderate changes in liver function and abnormal renal function, reflected in decrease of albumin and increased levels of liver enzymes and raised urea and creatinine concentrations. These findings emphasize the importance of measurement of blood lead concentrations in adults in the general population to combat the effects of lead toxicity before the clinical signs predominate.

0501-196. Goswami S, Dey S, Ghosh UC* (*Dept Chem, Presidency Coll, Kolkata 700 073). **Studies on removal of fluoride by hydrated zirconium oxide (HZO).** *Cheml Environ Res*, 13(1&2)(2004), 117-126 [18 Ref].

The sorption behaviour of fluoride on synthetic hydrous zirconium oxide (HZO)($\text{pH}_{\text{ZPC}}=6.8$ to 9.5) has been investigated systematically. The effect of pH, contact time, pre-drying of HZO, sorption dynamics, competition of some other ions and regeneration of used sorbent are conducted by batch method. Results show that fluoride sorption is rapid and equilibrium reaches within an hour. The optimum pH for fluoride sorption is found to be 4.0. The highest sorption capacity is 66.0 mg/g.

0501-197. Jain Kavindra, Singh Jitendra, Chauhan LKS, Murthy RC, Gupta SK* (* Cell Bio Sec, Indl Toxic Res Cent, PB No.80, MG Rd, Lucknow 226 001). **Modulation of flyash-induced genotoxicity in *Vicia faba* by vermicomposting.** *Ecotoxicol Environ Safety*, 59(1)(2004), 89-94 [32 Ref].

Cytogenetic effects of pre and post vermicomposted flyash samples were evaluated on the root meristem cells of *Vicia faba*. Seedlings of *V. faba* were directly sown in flyash and cow dung-soil mixtures (20%, 40%, 60% and 80%) and the lateral roots grown in these test mixtures were sampled at 5 days. Negative control was run parallel in cow dung-soil (CS) mixture along. Cytogenetic examinations of root meristems exposed to the FCS mixtures showed significant inhibition of mitotic index (MI), induction of chromosome aberrations (CA), and a significantly increased frequency of mitotic aberrations (MA). The increase of the aberrations was dependent on the flyash concentrations.

0501-198. Jeyaprakash R, Nagaraj P, Sivaprakasam SP, Azhagurajan A, Jinnah H Mohammad Ali (Dept Mechl Engng, Mepco Schlenk Engng Coll, Sivakasi 626 123, **Tamil Nadu**). **Hazard analysis on pollution control equipments of cement industry.** *Nature Env Polln Techno*, 3(4)(2004), 429-434 [3 Ref].

The various causes for fire and explosion hazards have been analysed by studying the plant, machineries and operations at Tamil Nadu Cements Corporation Limited, Alangulam. For this, fault tree analysis technique is used. It is a vital hazard management technique. The recommendations are suggested to prevent fire and explosion hazards in the coal circuit of the cement industry.

0501-199. Jindal R, Kaur B (Fisheries Lab, Dept Zoo, Punjab Univ, Chandigarh 160 014). **Impact of ecological factors on heavy metals toxicity to *Moina micrura* Kurj, 1874.** *Aquacult*, 6(1)(2005), 77-80 [18 Ref].

Bioassay experiments were conducted to evaluate the impact of temperature and hardness on heavy metal toxicity to a freshwater cladoceran, *Moina micrura* Kurz, 1874. The toxicity of all the metals tested viz. Cd, Cu, Hg, Zn and Cr showed a direct correlation with temperature, and an inverse correlation with hardness. However, in case of Hg, the impact was less than that of other metals.

0501-200. Jyothi B, Narayan G (Dept Zoo, Osmania Univ Campus, Hyderabad 500 007). **Study of serum cholinesterase levels in fish *Clarias batrachus* (Linn.) exposed to pesticides carbaryl and phorate.** *J Environ Sci Engng*, 46(4)(2004), 274-276 [21 Ref].

SchE levels decreased in the fish exposed to both the pesticides, the depletion being more pronounced with phorate. These results can be due to impairment of nervous system, liver damage as well as myocardial infarction. Similar findings were not only reported in experimental organisms but also found in human beings working in agricultural fields and pesticide manufacturing plants. Paper suggests that suitable occupational health and preventive measures need to be undertaken.

0501-201. Khare Sarita, Singh Sudha (Dept Zoo, Sarojini Naidu Govt PG Coll, Shivaji Nagar, Bhopal 462 016, MP). **Histochemical alterations in the gills of the fish *Nandus nandus* due to pesticidal exposure.** *Nature Env Polln Techno*, 3(4)(2004), 535-538 [8 Ref].

Histochemical changes were recorded in the gills of the fish, *Nandus nandus* exposed to sublethal concentration of endosulfan (0.04 ppm) and carbaryl (0.05 ppm) for one month. After long term exposure to both the pesticides, there was reduction in the carbohydrate contents in all parts of the gills.

0501-202. Kumar K, Saradhamani (PG Res Dept Zoo, Kongunadu Arts Sci Coll, Coimbatore 641 029, Tamil Nadu). **Effects of insecticide, Avaunt, on glycogen**

content of the freshwater fish *Cirrhinus mrigala*. *Nature Env Polln Techno*, 3(4)(2004), 515-518 [17 Ref].

The effects of insecticide, Avaunt on glycogen levels of muscle, liver, kidney and brain of the fish *Cirrhinus mrigala* were studied. The fish were exposed to different concentrations of Avaunt (0.2 ppm and 2 ppm) over a period of 24, 48 and 72 hrs. As the concentration and the period of exposure of the insecticide kept increasing, the amount of glycogen showed decrease.

0501-203. Kumar Kuldeep, Patri Priyambada, Pandey AK (Centl Inst Freshwater Aquacult, Kausalyaganga, Bhubaneswar 751 002). **Haematological and biochemical responses of the climbing perch, *Anabas testudineus* (Bloch), exposed to mercury toxicity.** *J Ecophysio Occupl Hlth*, 4(1&2)(2004), 97-107 [44 Ref].

The treatment induced alterations in the differential leucocytes count causing lymphocytosis in larger cells, lymphopenia in small cells, neutrophilia, monocytosis, eosinophilia and thrombocytopenia in 100% concentration of LC₅₀ of HgCl₂ on day 4 of the exposure. Similar, but less severe, effects were also observed on the blood constituents of the fish subjected to other concentrations of the toxicant. The serum protein levels in the blood of *Anabas testudineus* varied widely.

0501-204. Kumar Suresh, Sastry KV (Dept Biosci, MD Univ, Rohtak). **Biochemical changes induced by deltamethrin in tissues of *Channa punctatus*.** *J Ecophysio Occupl Hlth*, 4(1&2)(2004), 109-116 [27 Ref].

The impact of exposure of the freshwater teleost fish *Channa punctatus* to two sub lethal concentrations (0.07 and 0.14mg/L) of deltamethrin for 30 days was assessed. Significant ($p < 0.01$) decrease was found in N⁺/K⁺ ATPase, Ca²⁺ and Mg²⁺ ATPase activities in fish exposed to higher concentration. Ionic levels in vital tissues were significantly decreased after exposure to the two sub lethal concentrations. Brain and intestine were the most affected tissues.

0501-205. Mahalakshmi K, Muniyan M (Dept Zoo, Annamalai Univ, Annamalainagar 608 002). **Acute toxicity of heavy metal nickel on the freshwater fish *Labeo rohita* (Hamilton).** *J Expt Zoo India*, 8(1)(2005), 193-196 [11 Ref].

Acute toxicity of Nickel on freshwater fish *Labeo rohita* was studied using static bioassay method. Median lethal concentration for 3, 6, 12, 24, 48, 72 and 96 h were 99.59, 89.39, 66.74, 52.63, 44.26, 33.61 and 28.21 ppm respectively. The sign of toxicity

on the behaviour of the fish *Labeo rohita* was studied for 96 hours. Loss of equilibrium, hyper and hypo activity, changes in opercular movement, changes in orientation and locomotion, mucus coating on the body, loss of equilibrium and erratic swimming were observed.

0501-206. Maruthanayagam C, Sharmila G (Dept Zoo, Nehru Memorial Coll, Puthanampatti, Trichi 621 007, Tamil Nadu). **Haemato-biochemical variations induced by the pesticides monocrotophos in *Cyprinus carpio* during the exposure and recovery periods.** *Nature Env Polln Techno*, 3(4)(2004), 491-494 [15 Ref].

Study was designed for 15 days monocrotophos exposure followed by 15 days recovery period to understand its toxic effects on the haemato-biochemical aspects of *Cyprinus carpio*. During the exposure period, there was a significant amount of increase in blood glucose and serum cholesterol due to increased glucogenesis and increased lipid content in blood respectively. However, the serum protein level decreased in fish due to inhibition of RNA synthesis or increased proteolytic activity. During recovery period, the restoration of glucose, protein and cholesterol level was found to be slow and gradual.

0501-207. Mehra Rita, Juneja Meenu (Dept Pure Applied Chem, Maharshi Dayanand Saraswati Univ, Ajmer 305 009). **Hair as an indicator for assessing adverse effect of cadmium on human health.** *J Environ Sci Engng*, 47(1)(2005), 59-64 [27 Ref].

Occupational health problems of 240 male workers of roadways workshop, carriage workshop and battery factory were investigated. Cadmium concentrations in the hair were determined using atomic absorption spectrophotometer. Study indicates that the significant difference in cadmium levels were observed in subjects suffering from acidity, ophthalmic problems, hypertension, psychological problems, tuberculosis and their respective controls. No correlation with cadmium was obtained with cardiac diseases, diabetes, hepatitis B, respiratory problems, dermatitis and hypotension.

0501-208. Mehrotra Asha, Singh Sudha, Khare Sarita (Dept Zoo, SN Govt Girls PG Coll, Bhopal 462 016). **Endosulfan induced histopathological and histochemical changes in intestine of freshwater fish *Nandus nandus*.** *Nature Env Polln Techno*, 4(2)(2005), 213-216 [19 Ref].

Freshwater fish *Nandus nandus* were exposed to Endosulfan (0.04) for one month. After short term exposure (15 days) the outer most layer (serosa) was broken at

some places and longitudinal muscles were loosely arranged leaving very small spaces. Intestine showed detachment, rupture of mucosal fold, and degeneration of longitudinal and circular muscle at the end of one month.

0501-209. Naik S Jothender Kumar, Vasundhara Devi V, Piska Ravi Shankar (Dept Zoo, PG Coll Sci, Osmania Univ, Saifabad, Hyderabad 500 004). **Induction of hepatic mono oxygenase activity in *Cyprinus carpio* (Linn.) exposed to treated industrial effluents.** *Indian J Environ Toxicol*, 13(2)(2003), 87-90 [25 Ref].

Cyprinus carpio (Linn.) were exposed to 20 and 40% treated industrial effluents collected from Jeedimetla Effluent Treatment Limited (JETL), Jeedimetla, Hyderabad (A.P.) over a period of 28 days. Fish were sacrificed after 28th day of exposure and liver tissues were analysed to assess the relative response of mono-oxygenase activity (Cyt P₄₅₀ and Cyt b₅). The overall result reveal a significant induction in the Cyt P₄₅₀ levels in all exposed fish as compared against the controls.

0501-210. Narayan Raj, Saxena KK*, Chauhan Shalini (* PG Dept Zoo, JMV Ajitmal, Auraiya 206 001, UP). **Haematological changes in a carp *Cyprinus carpio* following exposure to diammonium phosphate.** *Int J Mendel*, 21(3-4)(2004), 65-66 [10 Ref].

The carp *Cyprinus carpio* exposed to diammonium phosphate caused marked gradual and significant fall in the leucocyte and packed cells volume (PCV). Hereas it lead to neutrophils, monocytes, lymphocytes, Eosinophils and basophils values of the intoxicated fish upto 1,500 ppm thereafter significant neutropania, monocytosis, lymphopaenia, eosinophilia and basophilia were recorded towards increasing concentration of diammonium phosphate.

0501-211. Radha G, Logaswamy S, Logankumar K (PG Res Dept Zoo, Kongunadu Arts Sci Coll, Coimbatore 641 029). **Sublethal toxicity of Dimethoate on protein, glucose and cholesterol contents in the fish *Cyprinus carpio*.** *Nature Env Polln Techno*, 4(2)(2005), 307-310 [26 Ref].

The levels of protein, glucose and cholesterol in the blood and liver of *Cyprinus carpio* var. communis, exposed to sublethal concentration of dimethoate, were determined for 7 and 14 days of exposure. The protein and cholesterol level was decreased but the glucose level increased. The effect of dimethoate on the fish was found to be significant.

0501-212. Ramamurthy N, Thillaivalvan K (Dept Phys, Annamalai Univ, Annamalai Nagar 608 002). **Determination of trace elements in dairy milk collected from the environment of coal-fired power plant.** *J Environ Sci Engng*, 47(1)(2005), 53-58 [13 Ref].

The environmental effects on herbivores mammals in and around coal-fired power plant were studied by collecting the various milk samples of cow and buffalo at five different locations along the banks of the Paravanaru river in and around Neyveli area and were prepared for trace metal determination. It was observed that the samples contain greater amounts of trace metals than that in the unexposed areas. Obviously the milk samples are contaminated with these metals due to fly ash released in such environment.

0501-213. Rana SVS, Verma Yeshvandra (Toxico Lab, Dept Zoo, Ch. Charan Singh Univ, Meerut 250 004). **Biochemical toxicity of benzene.** *J Environ Bio*, 26(2)(2005), 157-168 [81 Ref].

Human exposure to benzene in work environment is a global occupational health problem. After inhalation or absorption, benzene targets organs viz. liver, kidney, lung, heart and brain etc. Benzene causes haematotoxicity through its phenolic metabolites that act in concert to produce DNA strand breaks, chromosomal damage, sister chromatid exchange, inhibition of topoisomerase II and damage to mitotic spindle. Transgenic cytochrome P₄₅₀ IIE1 mice may help in understanding further toxic manifestation of benzene.

0501-214. Rugmony T, Suryawanshi SA, Kulkarni BG, Rangoonwala SP, Pandey AK (Dept Zoo, Inst Sci, Mumbai 400 032). **Uptake of lead (Pb) and cadmium (Cd) and their effects on certain enzymes of the estuarine gobiid fish *Boleophthalmus dussumierii*.** *J Ecophysio Occupl Hlth*, 4(3&4)(2005), 221-225 [27 Ref].

Gills of Pb-treated fish accumulated maximum metal followed by liver and muscle, however, Cd accumulation was maximum in liver followed by gill and muscle. When the fish were exposed to the combined doses of Pb and Cd, uptake of both these metals were found to be in order to liver>gill>muscle. Liver and muscle displayed declined activities of acid phosphates and alkaline phosphates under Pb and Cd exposures whereas the combined treatment of both these metal elevated acid phosphates and alkaline phosphatase activity in liver and declined in the muscle.

0501-215. Sahota HS, Singh Kulwant, Singh Manmohan, Singh Surinder, Papp Z (SSCET, Badhani, Pathankot, Punjab). **Diurnal and monthly variation of indoor radon and thoron progeny concentrations at a hillside place of northern India.** *J Environ Sci Engng*, 46(3)(2004), 233-238 [13 Ref].

Simultaneous indoor measurements of radon and thron progeny concentrations have been carried out over a period of four months at a low activity hilly area of northern Punjab, India to see their diurnal and monthly variations. The average values of equilibrium equivalent radon and thoron concentrations were 5.20 Bq m⁻³ and 0.235 Bq m⁻³, respectively, over the period August to November 2003.

0501-216. Sandhu GS, Kaur R (PG Dept Zoo, SGN Khalsa Coll, Sri Ganganagar 335 001). **Effect of fenvalerate, a synthetic pyrethroid on the blood parameters of *Heteropneustes fossilis*.** *Aquacult*, 5(2)(2004), 195-198 [20 Ref].

The effect of sublethal concentrations ranging 0.008-0.016 mg/L of a synthetic pyrethroid, fenvalerate on TEC, Hb% and MCH was studied in a freshwater air-breathing catfish, *Heteropneustes fossilis* exposed for 15d and 30d. TEC value decreased on 15d and 30d exposure at higher concentrations. Hb% increased at both exposure duration. MCH value also increased significantly on exposure of 15d and 30d. Alterations in haematological parameters may lead to serious repercussion on their oxyphoretic capacity and hence on fish growth.

0501-217. Sandhu Pramod Kumar, Pandel Upender, Gupta AB (Dept Civil Engng, Malviya Natl Inst Techno, Jaipur 302 017). **Exposure to airborne particles and their physical characterization in ambient environment of Jaipur city.** *Nature Env Polln Techno*, 3(4)(2004), 509-514 [5 Ref].

Paper finds out the levels of respirable particulare matter (RSPM) using personal sampler at 15 different sites. The particles collected on filter were analyzed for parameters like shape and size. The results of physical parameters showed that the most irregular shaped particles were higher at commercial areas. Almost equal proportion of coarse and fine particles was found at residential areas. Contrary to this, in industrial and commercial areas coarse particles were higher as compared to fine particles.

0501-218. Saraswathi K, Ramesh M, Maruthappan V, Noorthern A (Dept Zoo, Bharathiar Univ, Coimbatore 641 046). **Influence of a pyrethroid-insecticide**

fenvalerate on secondary stress responses in a freshwater teleost fish *Cyprinus carpio* var. *communis*. *Indian J Env Toxicol*, 14(1)(2004), 13-18 [29 Ref].

Paper deals with the changes in hematological, biochemical and enzymological profiles of a freshwater fish *Cyprinus carpio* exposed to sub-lethal concentration of fenvalerate, a synthetic pyrethroid insecticide. During the above treatment period, the erythrocyte count and plasma protein level have decreased, while the leukocyte count, glucose, GOT and GPT levels have increased. These increases are directly proportional to the exposure period. The significant alterations of the above said parameters have been discussed in relation to non-specific biomarkers of environmental pollutants.

0501-219. Shailajan Sunita, Chandra Naresh, Sane RT, Menon Sasikumar (Analyt Chem Lab, Ramnarain Ruia Coll, Mumbai 400 019). **Chemical analysis of heavy metals in a medicinal plant, *Asteracantha longifolia* nees using ICP-AES techniques.** *Nature Env Polln Techno*, 3(4)(2004), 443-445 [14 Ref].

There is a need for heavy metal analysis to be an integral part of the standardization of herbal medicines. *Asteracantha longifolia* is a wild herb growing in wetlands. It is used against various ailments of which rheumatism, jaundice and anaemia are few to name. Four common heavy metals Pb, Zn, Cu and Ni were analyzed by Atomic Emission Spectroscopy, which uses the technique of inductively coupled plasma (ICP-AES).

0501-220. Sharma JD, Sharma MK, Agrawal P (Reproductive Physio Env Toxicol Lab, Univ Rajasthan, Jaipur 302 004). **Effect of fluoride contaminated drinking water in albino rats *Rattus norvegicus*.** *Asian J Exptl Sci*, 18(1&2)(2004), 37-46 [28 Ref].

Healthy, adult albino rats were treated with fluoride water (1.5, 3, 4.5, 6 ppm) for 60 days. The data reveal that reduction in weight of kidney was observed after the ingestion 3 and 6 ppm of fluoride water. The haematological parameters found to be altered with higher dose of fluoride water leading to anaemic condition. The serum protein, cholesterol and phospholipids were reduced in all the groups studies. However, no change was observed in enzyme activity of serum alkaline phosphatase.

0501-221. Sharma Jyoti, Yadav Anil Kumar (Dept Chem, Govt Raj Rishi PG Coll, Alwar, Rajasthan). **Geochemical study of fluoride in ground water of Ramgarh Tehsil of Alwar district of Rajasthan.** *Indian J Environ Sci*, 9(1)(2005), 5-7 [11 Ref].

A study was undertaken for the determination of fluoride in drinking water collected at random from Ramgarh and its suburbs with the help of ion selective electrode method. Thirty five samples were collected from various villages of this tehsil. 50% samples were found contaminated with fluoride concentration varying from 0.2 ppm to 4.4 ppm. Villagers were found suffering from dental fluorosis, skeletal fluorosis and gut fluorosis and were suggested to use alum and lime as a cheap and effective method to prevent the fluorosis.

0501-222. Sharma Rajnikant, Pervez Shemsh* (*Sch Std Chem, Pt Ravishankar Shukla Univ, Raipur 492 010). **Respiratory tract contamination with selected toxic elements in a slag based cement plant environment in central India – a need of global concern.** *J Scient Indl Res*, 63(5)(2004), 462-465 [12 Ref].

The work describes estimations of selected toxic metals in a total of 92 samples of respiratory tract washout obtained from diagnosed cases of respiratory ailments in a slag based cement plant environment in central India. All the elements found in respiratory tract are good in concentration but Mn, Ni, Cr and Pb, showing somewhat higher tendency to be deposited in human respiratory tract than Zn and Co. Order of occurrences of the elements, analyzed in respiratory tract is: Mn>Pb>Cr>Ni>Zn>Co>Cd. The result shows slightly higher susceptibility for respiratory damage in female.

0501-223. Shinde VR, Kulkarni RS* (* Dept Std Zoo, Gulbarga Univ, Gulbarga 585 106). **Fecundity of the freshwater fish, *Notopterus notopterus* (Pallas) in natural and heavy metal contaminated water.** *J Environ Bio*, 26(2)(2005), 287-290 [13 Ref].

Studies in the fish exposed to heavy metals indicate that significant reduction in these parameters after exposure to heavy metals at sublethal concentration was noticed. The fecundity has straight line relationship with total length, body weight, ovary length and ovary weight in control fish which did not alter after heavy metal exposure. This study provides the viability of species in only specific environment.

0501-224. Shrivastava Sapna, Singh Sudha, Khare Aruna (Dept Zoo, Sarojini Naidu Govt Girls PG Coll, Shivaji Nagar, Bhopal 462 023). **Study of cholesterol content in muscle of carbaryl exposed *Heteropneustes fossilis* (Bloch.).** *Nature Env Polln Techno*, 4(2)(2005), 223-225 [18 Ref].

Cholesterol content in the muscle of *Heteropneustes fossilis*, exposed to sublethal concentration of carbaryl (0.04 ppm) for a period of 30 days has been studied.

The muscle showed significant decrease in cholesterol from first week of treatment onwards.

0501-225. Sindhe VR, Kulkarni RS* (Dept Zoo, Gulbarga Univ, Gulbarga 585 106). Gonadosomatic and hepatosomatic indices of the freshwater fish *Notopterus notopterus* (Pallas) in response to some heavy metal exposure. *J Environ Bio*, 25(3)(2004), 365-368 [13 Ref].

The toxicity tests for mercuric chloride, cadmium chloride and their mixture on *Notopterus notopterus* was determined by using 96h LC₅₀ concentration indicated that cadmium chloride was less toxic and mercuric chloride was most highly toxic. The order of toxicity is mercuric chloride>mixture>cadmium chloride. On exposure to heavy metals at sublethal concentration both Gonadosomatic Index and Hepatosomatic Index are reduced.

0501-226. Singh Arun Kumar, Rana KS, Solanki Sunita (Dept Zoo, Agra Coll, Agra 282 002). **Toxicity of heavy metals to Indian major carp, *Labeo rohita* (Ham.)**. *Uttar Pradesh J Zoo*, 24(2)(2004), 191-193 [11 Ref].

The toxic effect of cadmium chloride (CdCl₂) and lead nitrate Pb(NO₃)₂ has been recorded on Indian major carp, *Labeo rohita* (Ham.) in order to determine the survival range, LC₅₀ values and safe concentration. Cadmium was found to be more toxic than lead and inferred by their LC₅₀ values. The safe concentration of cadmium chloride and lead nitrate, as the general representative compounds, were estimated at 5.89 and 6.81 mg/l, respectively.

0501-227. Sinha Dharmendra Kumar, Verma P, Kumar A, Nath A (Cell Bio Toxic Lab, Dept Zoo, Patna Univ, Patna). **Changes in hepatic cells of mice *Mus musculus* under sublethal dose of endosulfan**. *J Ecophysio Occupl Hlth*, 4(3&4)(2005), 179-183 [9 Ref].

Swiss albino mice, *Mus musculus*, were treated with endosulfan in three different doses 33, 66 and 99 ppm for three different groups of mice. Observation based on light microscopy shows various damage, degeneration and toxicity caused to the pesticide induced cells. The increasing hepatic lesions may serve as bioindicators of exposure to environmental contaminants. It is possible that increased autolysis of hepatic cell could ultimately led to cell death and also affect other organs.

0501-228. Srivastava A, More A, Patil S (Natl Environ Engr Res Inst, Mumbai Zonal Lab, 89/B, Dr. AB Rd, Worli Mumbai 400 181). **Identification and estimation of volatile organic compounds inside vehicle air.** *Cheml Env Res*, 12(3&4)(2003), 221-225 [4 Ref].

The inside vehicle air quality is affected by interior décor of the car, outside air and leak in the automobile system. The inside air contain volatile organic compounds which are harmful to the health of human beings. The nature of volatile organic compounds present inside the vehicles have been established. The concentration of hydrocarbons present in inside air of Maruti cars has been determined.

0501-229. Subashini P, Manavalaramanujam R, Ramesh M, Geetha N (Unit Polln Bio, Dept Zoo, Bharathiar Univ, Coimbatore 641 046). **Changes in selected biomarkers in freshwater teleost fish, *Cyprinus carpio* var. *communis* exposed to sublethal concentrations of chromium sulphate toxicity.** *J Environ Sci Engng*, 47(1)(2005), 65-68 [28 Ref].

During sublethal treatment, plasma sodium level was increased, whereas plasma chloride level decreased throughout the experimental period. Plasma potassium level increased upto 10th day and then declined in the rest of the study period. The significant changes in the plasma electrolytes levels and Na⁺, K⁺-ATPase activity can serve as a valuable biomarker of pollutant exposure and effects.

0501-230. Suneela Motati, Reddy MK*, Reddy RC (*NEERI Zonal Lab, IICT Campus, Hyderabad 500 007). **Polycyclic aromatic hydro carbons in the ambient air of Jeedimetla industrial development area – Hyderabad.** *J Environ Sci Engng*, 46(3)(2004), 245-248 [10 Ref].

Polycyclic aromatic hydrocarbons (PAHs) are mainly associated with respirable suspended particulate matter (RSPM). It is important to determine the concentration of PAHs adsorbed on RSPM to know the extent of human exposure to these potentially carcinogenic substances. The study was carried out at 10 locations in and around the Jeedimetla industrial development area, Hyderabad. Higher concentrations of B(a)A and B(b)F were observed at Nandanagar, Py and B(a)P at Kukatpally while, FI concentrations at Allwyn Colony.

0501-231. Suresh Kumar K, Prabhakar Rao S, Krishnaiah L, Srinivasa Rao K, Naidu GRK, Chiranjeevi P (Environ Polln Monit Sec, Dept Environ Sci, SV Univ, Tirupati,

Andhra Pradesh). **Detection of lead in vegetables with new chromogenic reagent by spectrophotometry.** *Environ Monit Assess*, 98(1-3)(2004), 191-199 [20 Ref].

A new simple, rapid selective and highly sensitive chromogenic reagent dibromo-*p*-methyl-carboxyazo (DBMCA) was synthesized and studied in detail for the spectrophotometric detection of lead. Lead reacts with DBMCA to form a 1:2 blue complex having a sensitivity absorption peak at 646nm. The detection limit and the variation coefficient were found to be 2.12 $\mu\text{g mL}^{-1}$ and 1.0% respectively. The proposed method has been applied successfully for the detection of lead in vegetable leaves with good results.

0501-232. Verma RS, Khan MA, Tripathi Rashmi, Shukla Sanjiva, Sharma UD* (*Dept Zoo, Univ Lucknow, Lucknow 226 007, UP). **Heavy metal toxicity to freshwater prawn, *Macrobrachium dayanum* (Crustacea-Decapoda).** *Aquacult*, 6(1)(2005), 57-62 [59 Ref].

Static bioassay experiments were carried out to evaluate LC₅₀ values of mercuric chloride and cadmium chloride to fresh water prawn, *Macrobrachium dayanum*. LC50 values of mercuric chloride for 24, 48, 72 & 96 hr were 0.16, 0.15, 0.14 & 0.13 mg/l and of cadmium chloride were 0.24, 0.19, 0.17 & 0.15 mg/l, respectively. Animals showed hyperactivity, loss of balance, mucous coating in both the toxicants, while blackening of gills, body parts and appendages was observed only in cadmium chloride exposure. Order of toxicity in both the metals was $\text{HgCl}_2 > \text{CdCl}_2 \cdot \text{H}_2\text{O}$.

WASTES

0501-233. Acharya S, Roy US* (*Dept Chem, Visva-Bharati, Santiniketan 731 235). **Extraction chromatographic studies of mercury(II) with Aliquat-336.** *Cheml Env Res*, 12(3&4)(2003), 271-277 [10 Ref].

A selective method has been developed for extraction chromatographic analysis of mercury(II) using Aliquat-336 (a liquid exchanger) as a stationary phase in the form of column of silica gel. The exchanger as well as extraction kinetics with respect to mercury(II) has been determined. Mercury(II) has been separated from binary, ternary and quaternary mixtures of various metal ions. The proposed method is simple, rapid and selective.

0501-234. Anil Kumar SC, Manjunathaiah HM (Div Soil Sci Agricul Chem, IIHR, Bangalore 560 089). **Pretreatment of copper ore tailings for ecofriendly utilization as a source of micronutrients in agriculture.** *Indian J Env Toxicol*, 13(2)(2003), 83-86 [12 Ref].

The copper ore tailings (COT) lying waste around mining areas have been analysed for their physico-chemical properties. They have been found to contain considerable quantities of Cu and Fe, however, the DTPA extractable quantity of these micronutrients was very low. Treating and incubating COT with organic manures for 60 days at field capacity have reduced pH and EC of COT significantly. The availability of micronutrients has been found to increase significantly at 60 days after incubating over control.

0501-235. Bomane SR, Shinde CA, Khambe SD (Bharati Vidyapeeth's Dr. Patangrao Kadam Mahavidyalaya, Sangli 416 416, Maharashtra). **Vermiculture biotechnology, expert system for hotel waste management.** *J Ecophysio Occupl Hlth*, 4(1&2)(2004), 37-49 [11 Ref].

Prototype expert system has been developed for selection of a suitable hotel waste management system. Amongst the various methodologies for treatment of the hotel waste from hotels, the reuse and recycling methodology of dry waste whereas vermicomposting method for treatment of wet biodegradable solid waste found to be most suitable, feasible and economical method. The entire quantity of solid waste will get converted into good quality organic manure. The process is very simple and has greater flexibility in scale of operation.

0501-236. Dadhich Anima S, Khasim Beebi Shaik, Kavitha GV (Dept Environ Std, Coll Engng, Gandhi Inst Techno Manag, Visakhapatnam 45). **Absorption of Ni (II) using agrowaste, rice husk.** *J Environ Sci Engng*, 46(3)(2004), 179-185 [10 Ref].

Investigation was carried out to study the removal of nickel using non-conventional adsorbent, rice husk. The effects of contact time, adsorbent dosage, pH, concentration of the metal ion and isotherm models are studied in a batch process. A steady trend was observed for all variables. The adsorption percentage increased with increase in contact time, adsorbent dosage and pH, but there was a decrease in adsorption with increase in concentration of the metal ion.

0501-237. Deshpande Abhijit, Lokesh KS, Bejankiwar RS, Gowda TPH (Dept Environ Engng, SJ Coll Engng Mysore 570 006). **Electrochemical oxidation of pharmaceutical effluent using cast iron electrode.** *J Environ Sci Engng*, 47(1)(2005), 21-24 [16 Ref].

Electrochemical oxidation of low (BOD/COD) ratio pharmaceutical wastewater was investigated, using cast iron electrode. The efficiency and energy consumption of anode were estimated. Cast iron electrode has been found to be effective in removing 72% COD after 2 hours of electrolysis. In particular, it was found that the (BOD/COD) ratio had improved from 0.18 to 0.3 after 120 min. of electrolysis indicating improvement of biodegradability of wastewater. It has been found, the pharmaceutical wastewater could be effectively pretreated by anodic oxidation.

0501-238. Doke Jayant, Adhyapak Upendra, Kalyan Raman V (Dept Environ Sci, Univ Pune, Pune 411 007). **Application of moving bed biofilm reactor for removal of 2-chlorophenol from wastewater.** *Nature Env Polln Techno*, 3(4)(2004), 579-522 [12 Ref].

The Moving Bed Biofilm Reactor (MBBR) system for efficient removal of 2-chlorophenol from the wastewater has been discussed. The results indicate biodegradability of 2-chlorophenol at 30 ppm is efficient having 12 hrs HRT. MBBR offers a continuously operating, non-cloggable system of biofilm reactor with low head loss and high specific biofilm surface. The study explores the possibility of use of MBBR system for any wastewater treatment considering all the advantages of this system.

0501-239. Dutta Chitralekha, Naidu Rashmi, Yenkie MKN* (* Dept Cheml Techno, LIT Nagpur Univ, Nagpur 440 033). **Photo-oxidative degradation of synthetic organic pollutant *p*-nitrophenol.** *J Scient Indl Res*, 63(6)(2004), 518-521 [12 Ref].

Photo-oxidation of a hazardous and refractory aromatic compound *p*-nitrophenol in its aqueous solution by strong oxidizing agent hydrogen peroxide in the presence of UV radiations emitted from UV source is investigated. The UV+H₂O₂ combination generates hydroxyl radicals having very high oxidation potential which helps in complete mineralization of the organic pollutants. The photo-oxidative degradation of *p*-nitrophenol (PNP) is carried out using two different UV sources, namely an 8 W low pressure mercury vapour lamp and a 125 W medium pressure mercury vapour lamp to evaluate its effect on oxidative degradation.

0501-240. Ganguly S, Maiti SK (Cent Mining Env, Indian Sch Mines, Dhanbad 826 004). **Genesis of domestic sewage - case study of a residential university campus.** *J Environ Sci Engng*, 46(2)(2004), 79-85 [9 Ref].

Study reports on the genesis of domestic sewage in a predominantly residential university campus area of Dhanbad, Jharkhand. The domestic sewage has been collected from three different locations of the campus area and their physicochemical characteristics have been studied. These studies reveal that the extent of mineral pick-up is different for different parameter. It has been found out that in the domestic sewage, the chloride pick-up is 71%, nitrate pick-up is 97%, total hardness pick-up is 20%, iron pick-up is 98% and zinc pick-up is 98%.

0501-241. Garg Anurag, Narayana VVVSS, Chaudhary Parmesh, Chand Shri* (* Dept Cheml Engng, Indian Inst Techno, Roorkee 247 667). **Treatment of pulp and paper mill effluent.** *J Scient Indl Res.* 63(8)(2004), 667-671 [6 Ref].

Pulp and paper mill effluent (COD=0.7 kg/m³) was treated for the removal of non-biodegradable and toxic compounds by wet air oxidation (WAO) using heterogeneous catalysts. The catalysts include (CuO-ZnO) supported on alumina and ceria as well as lanthanum based perovskites. A maximum COD reduction of 83 per cent for (CuO-ZnO)/CeO₂ catalyst was obtained in 2 h reaction time at a catalyst conc. of 5 kg/m³ and the initial pH of wastewater sample at 3.0.

0501-242. Hemalatha B, Meenambal T (Environ Engng Dept, Govt Coll Techno, Coimbatore 641 013). **Experimental study of biodegradability of yard and fruit wastes with industrial effluents by vermicomposting.** *Nature Env Polln Techno*, 4(2)(2005), 189-193 [2 Ref].

An experiment was conducted to prepare vermicompost using partially decomposed fruit and yard wastes along with industrial effluents by employing indigenous earthworm species, *Eudrilus eugeniae*. Paper outlines the advantages of vermicomposting for processing wastewater and organic solid wastes into valuable soil conditioner. The data show that vermicomposting increases nutrient content and earthworm population and decreases the processing time of the waste.

0501-243. Kaushik CP, Kaushik Namrata, Sharma JK (Dept Chem, Guru Jambheshwar Univ, Hisar 125 001). **Studies on the role of adsorbents in removal of direct dyes from textile effluent.** *Nature Env Polln Techno*, 4(2)(2005), 163-166 [14 Ref].

Colour reduction in the dyeing of cotton fabric effluent containing direct dyes was carried out using commonly available adsorbents. Extent of adsorption efficiency of these materials with variable doses was studied and compared with activated carbon. It was found that adsorption efficiency of wood ash was better than the others. Effect of pH was also examined in decolourisation of dyes effluent, which shows variable impact with regard to the nature of dyes and the adsorbent used.

0501-244. Khosla C, Verma N, Rao ALJ (Dept Chem, Punjabi Univ, Patiala 147 002, Punjab). **Decolourization of paper and pulp mill effluent – a review.** *Cheml Env Res*, 12(3&4)(2003), 203-209 [46 Ref].

The physical, chemical and biological treatment processes have been presented. Although these processes reduce BOD₅ to a considerable extent but were not able to remove coloured chromophores and the COD. Modified natural resins are suggested as a low-cost alternative for the removal of colour from paper and pulp mill effluent. These methods utilizing natural biomaterials as the column material can be operative at various flow rates leading to continuous systems for the treatment of industrial effluents.

0501-245. Kulandaivel S, Vijayalakshmi B, Indumathi A, Asha Devi NK, Arun Nagendran N (PG Res Dept Zoo Microbio, Thiagarajar Coll, Madurai 625 009). **Resistance to mercuric chloride and metal accumulation by *Pseudomonas* isolated from electroplating industrial effluent.** *Nature Env Polln Techno*, 4(2)(2005), 237-240 [25 Ref].

Mercury and mercurial compounds are potential hazards in the environment. In recent days application of microbes for bioremediation of metals is gaining greater attention. *Pseudomonas* sp. isolated from electroplating industrial effluent was assessed for the efficiency of mercury accumulation. The results reveal reduction of mercury in cell free extract and accumulation in cell debris.

0501-246. Majumdar Chanchal, Mazumdar Debabrata, Mukhopadhyay Swapan K (Civil Engng Dept, Bengal Engng Coll, P.O. Botanic Garden, Howrah 711 103, West Bengal). **Study of inhibitory effects of copper, cadmium and zinc on the performance of a rotating biological contractor.** *J Indian Water Works Assoc*, 36(3)(2004), 213-217 [7 Ref].

The inhibitory effects of copper, cadmium, zinc on BOD₅ and COD removal in a laboratory scale Rotating Biological Contactor (RBC) system has been studied using

synthetic wastewater prepared from glucose, other nutrients and varying concentration of metals. The study shows that metals exhibit different levels of inhibitory effects on BOD₅ and COD removal efficiency, depending on their concentration and time of exposure.

0501-247. Meena Ajay Kumar, Mishra GK, Kumar Satish, Rajagopal Chitra*, Nagar PN (Cent Fire Explosive Environ Safety, Brig SK Mazumdar Rd, Delhi 110054). **Adsorption of cadmium(II) ions from aqueous solution using different adsorbents.** *J Scient Indl Res*, 63(5)(2004), 410-416 [28 Ref].

A comparative study on the adsorption of cadmium from aqueous solutions on a few low cost and locally available untreated and chemically treated adsorbents is carried out. Mustard husk, carbon aerogel and treated GAC are found to be most effective adsorbents in addition to treated GAC for the removal of cadmium from the aqueous solution at varying process parameters such as, pH (2-12) adsorbent dose (0.5-1.2 g/100 mL), contact time (24-72 h) and initial cadmium concentration (1-5 mg/L). Treated GAC, carbon aerogel, and mustard husk show 100, 87 and 72 per cent adsorptive removal of cadmium, respectively, under optimized conditions of pH 4 and dosage 1 g/100 mL for 2 mg/L cadmium aqueous solutions in 48 h.

0501-248. Nageswara Rao A, Lathasree S, Sivasankar B, Sadasivam V, Rengaraj K (Dept Chem, Satyabhama Inst Sci Techno, Chennai 600 119). **Removal of azo dyes from aqueous solutions using activated carbon as an adsorbent.** *J Environ Sci Engng*, 46(2)(2004), 172-178 [8 Ref].

The potentiality of commercially available activated carbon has been investigated as an effective adsorbent to remove the dyes from aqueous solutions. The effects of pH of the solution, adsorbent dose, solute concentration and temperature on activated carbon for azo dyes such as acid orange 7 and direct red 31 have been evaluated. The percentage removal of the dyes has been found to be high at neutral pH.

0501-249. Nath D, Ghosh Amitabha, Misra RN, Das Archan Kanti (Centl Inland Fisheries Res Inst, Barrackpore 700120, West Bengal). **Aquacrop production through wastewater utilization – unique depiction in East Kolkata wetlands.** *Aquacult*, 5(2)(2004), 227-234 [20 Ref].

With the advancement of urbanization the quantum of domestic and industrial sewage effluents drained into open water like rivers, rivulets etc. has increased

immensely. These sewage effluents are mostly untreated or partially treated and contain huge amount of nutrients. Fish culture utilizing the wastewater may reduce the load of nutrients by converting them in to fish flesh and in turn reducing the pollution load of the natural water bodies. The huge Kolkata sewage-fed fisheries is a unique system of aqua production through wastewater utilization and has developed through experiences of the farmers.

0501-250. Pattajoshi PK, Rout SP (Natl Aluminium Co Ltd, Damanjodi, Orissa). **Fly ash management in alumina plants at Orissa.** *Indian J Environ Sci*, 9(1)(2005), 1-4 [5 Ref].

Three major solid wastes are being generated from alumina plants with co-generation of thermal power facility. These are red mud, fly ash and lime grit. Efforts have been made to study the characteristics and possible utilization of these wastes, with special consideration to fly ash. Special attention have been provided to consider the fly ash an one of the major industrial waste of alumina plants and attempts have been made to observe its possible utilization along with other alumina plant wastes.

0501-251. Ramachandra TV, Saira Varghese K (Energy Wetlands Gr, Cent Ecol Sci, Indian Inst Sci, Bangalore). **Environmentally sound options for e-wastes management.** *ENVIS J Human Settlements*, (March)(2004), 8-15 [1 Ref].

E-wastes are considered dangerous, as certain components of some electronic products contain materials that are hazardous, depending on their condition and density. The hazardous content of these materials pose a threat to human health and environment. Many of these products can be reused, refurbished, or recycled in an environmentally sound manner so that they are less harmful to the ecosystem. Paper highlights the hazards of e-wastes, the need for its appropriate management and options that can be implemented.

0501-252. Ramakrishna Rao Achanta, Kumar Bimlesh, Patel Ajey Kumar (Dept Civil Engng, Indian Inst Sci, Bangalore 560 012). **Rectangular surface aerators.** *J Environ Sci Engng*, 47(1)(2005), 47-52 [8 Ref].

Aeration experiments were conducted in two rectangular surface aeration tanks of L/B ratios 1.5 and 2 along with a square tank (L/B=1) to study their relative performance due to shape on oxygen transfer process while re-aerating the same volume of water such that the cross-sectional area of all the three tanks is the same.

Results have confirmed that at lower dynamic conditions of the rotor the oxygen transfer coefficient is maximum in square tanks followed by rectangular tank of L/B=2 and it is the least in rectangular tank of L/B=1.5.

0501-253. Reddy Babu G, Mallikarjuna Rao K, Ramana Reddy IV (Dept Civil Engng, SVU Coll Engng, SV Univ, Tirupati 517 502). **Value addition for sludge generated from sand beneficiation treatment plant.** *Nature Env Polln Techno*, 4(2)(2005), 203-206 [13 Ref].

Paper deals with the feasibility of usage of sludge from sand beneficiation treatment plant in the production of bricks. The experimental results show that the brick earth can be replaced with treatment plant sludge up to 40% by weight without loss in strength and other brick characteristics considered satisfactory for conventional purposes. At 5% to 10% of replacement, the quality of bricks is superior to the brick made from brick earth alone and can be used for superior work of permanent nature.

0501-254. Revathi M, Kavitha B, Vasudevan T* (* Dept Indl Chem, Alaappa Univ, Karaikudi 630 003). **Removal of nickel ions from industrial plating effluents using activated alumina as adsorbent.** *J Environ Sci Engng*, 47(1)(2005), 1-6 [10 Ref].

The results indicate that the adsorption process is favored at pH 9. The adsorption data were fitted with suitable adsorption isotherm. The optimum conditions for the best adsorption have been evaluated for the following factors: dosage, contact time, pH, initial concentration of nickel ions and temperature. The process of regeneration of the adsorbent has also been studied.

0501-255. Roy M, Chakrabarti SK, Bharadwaj NK, Chandra Sandip, Kumar Sanjay, Singh Sarabjeet, Bajpai PK, Jauhari MB (Thapar Cent Indl Res Dev, Bhadson Rd, Patiala 147 004, Punjab). **Characterization of chlorinated organic material in eucalyptus pulp bleaching effluents.** *J Scient Indl Res*, 63(6)(2004), 527-535 [21 Ref].

Study deals with the bleaching of eucalyptus pulp with chlorine, hypochlorite, and chlorine dioxide and identification of various organochlorine compounds generated in the bleach effluents at different stages. Molecular weight distribution of macromolecules present in bleach effluents at different stages have also been studied.

0501-256. Saliha B Bhakiyathu, Subramanian S (Dept Soils Env, Agricl Coll Res Inst, Madurai 625 104, Tamil Nadu). **Ecofriendly utilization of distillery raw spent wash for reclamation of high pH soil.** *Nature Env Polln Techno*, 3(4)(2004), 485-490 [8 Ref].

Laboratory incubation studies were conducted with various levels of spent wash viz., 55, 110 and 225 mL kg⁻¹ soil over an incubation period of 60 days to evaluate the impact on physico-chemical and biological properties of the sodic soil. A drastic reduction or total inhibition of microbial population was observed in the soil immediately after spent wash application. The experiment also proved that a safe time gap of 40 days is required for the oxidation of organic matter present in spent wash, thus, providing a favourable environment for the multiplication of microbes.

0501-257. Seth KN, Desai PH (Dept Environ Engng, ISTAR, Sardar Patel Univ, Vallabh Vidyanagar 388 120). **Characterization and management of bio medical waste in SAE hospital, Anand: a case study.** *Environ Polln Contl J*, 8(2)(2005), 57-60 [6 Ref].

Attempt has been made to review the current biomedical waste management practices followed by SAE (Salvation Army Emery) Hospital, Anand (Gujarat). The physical composition of the hospital waste was determined during the investigation. Category-wise production of the biomedical waste and the physical composition of the hospital waste have been worked out. It is concluded that the hospital follows all the norms during segregation, packaging, labelling, and disposal as given by Gujarat Pollution Control Board under the Bio-medical Waste (Management and Handling) Rules, 1998.

0501-258. Shiny KJ, Remani KN, Jalaja TK, Sasidharan VK (Dept Life Sci, Univ Calicut, Calicut). **Removal of chromium by two aquatic pteridophytes.** *J Environ Sci Engng*, 46(3)(2004), 249-251 [10 Ref].

Study explores the possibility of utilising two common aquatic ferns, *Salvinia molesta* Mitchell and *Azolla rubra* R.Br. for scavenging chromium from solutions. Chromium removal from spiked solutions ranged from 40-99% during the seven day exposure. Results reveal their bioremoval capabilities and potential for use in wastewater decontaminant systems.

0501-259. Shrivastava Sujeet K, Banerjee Dipak K* (* Sch Environ Sci, Jawaharlal Nehru Univ, New Delhi). **Speciation of metals in sewage sludge and sludge-amended soils.** *Waste Air Soil Polln*, 152(1-3)(2004), 217-232 [41 Ref].

Study is aimed at ascertaining the chemical partitioning of Cu, Zn, Pb, Ni, Cr and Cd in sewage sludge and agricultural soils repeatedly amended with sludge. Data obtained by extraction procedure showed different metal distribution trend among the

fractions in sewage sludge and sludge-amended soils. Comparison of distribution pattern of metals in sludge and sludge-applied soils shows that there is possible redistribution of metals among the different phases.

0501-260. Shukla Anirudh, Pandel Upender (Dept Cheml Engng, Malviya Natl Inst Techno, Jaipur 302 017). **Bioplastics: a sustainable and environmental friendly technology.** *Nature Env Polln Techno*, 4(1)(2005), 71-74 [7 Ref].

Bioplastics derived from renewable resources are a new generation of materials with a broad range of commercial and technical applications. It can perform as traditional plastics when in use and completely biodegrade within a composting cycle through the action of living organisms, when designed to be biodegradable. The work is directed towards reviewing the properties, applications and environmental benefits obtained through the paradigm shift.

0501-261. Singh Bihari, Kumar Sanjay, Kumar Madanjeet (Dept Environ Sci, AN Coll (MU), Patna, Bihar). **Leaching study of trace elements from coal ashes: a case study of Bokaro thermal power station "B".** *J Environ Sci Engng*, 46(3)(2004), 203-209 [5 Ref].

Study envisages the environmental assessment of coal ashes from Bokaro Thermal Power Station. Leaching study of coal ashes was made through analysis of leachates from open percolation leaching column experiments over a period of 300 days. Trace elements were observed within the regulatory limits. Many of the trace elements evaluated were observed at below detection limits of AAS. This study suggests low cost high volume utilisation of bottom ash as fill material for reclaiming surrounding abandoned mined out areas in an environmentally acceptable manner.

0501-262. Singh DK, Rastogi Kavita (Analyt Res Lab, Dept Chem, Harcourt Butler Techno Inst, Kanpur 280 002). **Adsorptive removal of basic dyes from aqueous phase onto activated carbon of used tea leaves: a kinetic and thermodynamic study.** *J Environ Sci Engng*, 46(4)(2004), 293-302 [33 Ref].

Activated carbon has been prepared from used tea leaves impregnated with H_3PO_4 (50%, w/v) and carbonized at 300°C. Its adsorption capacity has been tested for the decolourisation of wastewater containing malachite green and methylene blue. The optimum pH range is 8-10 and dosage required is 1.2 g/L for 100% removal of both malachite green and methylene blue (100 mg/L).

0501-263. Singh Deepak, Sharma Ramesh C (Dept Environ Sci, HNB Garhwal Univ, PB 67, Srinagar-Garhwal 246 174, Uttaranchal). **Characterization and management of municipal solid waste of Srinagar-Garhwal.** *J Environ Sci Engng*, 46(2)(2004), 102-107 [24 Ref].

Characterization and physico-chemical composition of municipal solid waste of Srinagar-Garhwal, a hill town of Uttaranchal were carried out to know the composition of solid waste for its efficient management. A total of 28,56,500 kg (2,856.5 tonnes) of solid waste was produced per annum. A disposal site away from the open bank of Alaknanda has been suggested. A list of suggestions has also been made for reducing the waste generation at source.

0501-264. Srihari V, Das Ashutosh (Sch Civil Engng, SASTRA, Deemed Univ, Tirumalaisamudram, Thanjavur 613 402). **Study on phenol-sorption of two homogenized industrial wastewater-blend using activated carbon.** *Eco Env Conserv*, 10(4)(2004), 443-445 [6 Ref].

Paper aims at exploring the possibility of improvement in treatment of different industrial wastewaters of similar physical characteristics using additional reagents thereby making them chemically comparable and compatible for simultaneous treatment. The study consists of use of steel and pharmaceutical industry wastewater for adsorption of phenol using activated carbon (AC). An endeavour is also made for phenol adsorption of the homogenized-wastewater-blend.

0501-265. Sriram B, Manikandan V, Ravikumar S, Karthikeyan AVP, Jeyaraj M (Dept Indl Biotechno, Ponnaiyah Ramajayana Engng Coll, Vallam, Thanjavur 613 403). **Performance evaluation of tannery effluent treatment plant: a case study.** *Environ Polln Contl J*, 8(2)(2005), 5-12 [13 Ref].

The water samples were collected from raw water collection tank, clarifier-I, clarifier-II, and activated carbon filter and analysed for important water quality parameters. The major reduction of solid pollutants takes place in clariflocculator and clarifier and the percentage reduction of TDS, BOD, COD, chlorides, oil and grease were estimated to be 37%, 98%, 96%, 69%, and 100% respectively. The results reveal that the effluent treatment plant in this industry meet the norms of Tamil Nadu Pollution Control Board prescribed for treated water to be discharged into receiving water body.

0501-266. Srivastava RK, Ayachi AK, Sehgal Vandana (5-AP Colony Pachpedi, South Civil Lines, Jabalpur 482 001). **The clean up of cadmium rich effluents by saw dust.** *Indian J Environ Sci*, 9(1)(2005), 9-14 [10 Ref].

Removal of cadmium from aqueous solution is investigated using sawdust available in plenty in every sawmill. The effects of cadmium concentration, temperature, adsorbent amount and contact time were studied in batch experiments. Maximum removal was obtained in the pH range of 6-9 and removal of metal increased with increase in temperature. The results were found to be encouraging and 99% removal of cadmium was obtained.

0501-267. Srivastava SK, Pandey GC, Chaudhary VK (Dept Environ Sci, Dr RML Avadh Univ, Faizabad 224 001, UP). **Phytoremediation of sewage effluent by a common aquatic macrophyte, *Spirodela polyrrhiza*.** *Nature Env Polln Techno*, 3(4)(2004), 545-548 [17 Ref].

Attempt has been made to remediate the sewage water through aquatic macrophyte, *Spirodela polyrrhiza* under laboratory conditions. The experiment were carried out with and without *S. polyrrhiza* for 7, 14 and 21 days of exposure separately. The DO level in sewage was increased and the other parameters were decreased considerably after exposure with *S. polyrrhiza*.

0501-268. Vasanth Kumar K (Dept Environ Engng, Vellore Inst Tehno, Vellore 632 014, Tamil Nadu). **Ramp function breakthrough curve modelling to predict the length of eluted bed for the sorption of methylene blue onto fly ash.** *Nature Env Polln Techno*, 3(4)(2004), 477-480 [17 Ref].

Continuous dye sorption studies were carried out using down flow fixed bed adsorption columns. The length of eluted bed was estimated using breakthrough curve (graphical) method and ramp function method. Bed depth service time (BDST) model was used to predict the critical depth of fly ash bed and the critical depth was determined as 0.0268 m for a flow rate of 3mL/min.

0501-269. Veerabhadram K, Ramakrishna Rao S* (*Dept Environ Stud, Coll Engng, GITAM, Visakhapatnam 530 045). **Improvement of biological treatment of urban sewage containing detergent and oily pollutants.** *Indian J Environ Sci*, 8(2)(2004), 159-162 [6 Ref].

Urban sewage, which contains oil and detergent pollutant, is studied for its optimum treatment. It is observed that most of the parameters are responded and reduces its pollution levels when the aeration is given under batch process, which removes oil encapsulation and foam formation, reduction in BOD and COD parameters and active micro-organisms development are observed.

0501-270. Verma Tuhina, Ramteke Pramod W, Garg Satyendra K* (* Dept Microbio, Dr RML Avadh Univ, Faizabad 224 001). **Occurrence of chromium resistant thermotolerant coliforms in tannery effluent.** *Indian J Exptl Bio*, 42(11)(2004), 1112-1116 [33 Ref].

Twenty six thermotolerant strains resistant to high levels of chromium (50-250 µg/ml) were isolated from treated tannery effluent. They were also found resistant to multiple heavy metals and antibiotics. Majority of them were resistant to copper and bacitracin. Agarose gel electrophoresis results revealed that 6 strains harboured a single plasmid, whereas 3 strains exhibited 2 plasmid bands. Among antimicrobials, cotrimazole and bacitracin and among metals, Cu²⁺, Cd²⁺, Zn²⁺ and Ni²⁺ resistance were transferred most frequently at variable rates.

0501-271. Vinodhini S, Gnanambal VS, Sasikumar JM, Padmadevi SN (Dept Bot, PSGR Krishnammal Coll Women, Coimbatore-4). **Growth of two medicinal plants using bio degraded coirpith.** *Plant Arch*, 5(1)(2005), 277-279 [6 Ref].

Coirpith is a highly lignocellulosic waste and dumped on roadside in an increasing proportion and considered creating environmental pollution problem. The composted coirpith can be used as organic manure without any adverse effect on crop growth. Study is an attempt to convert the raw coirpith into good compost by using *Humicola* sp., and to assess its efficacy on the growth parameters and biochemical composition of the medicinal plants *Coleus aromaticus*. Benth and *Eclipta alba*. (L.) Hassk.

0501-272. Wahegaonkar Nilima, Sahasrabudhe Madhuri* (* Dept Bot, Vasantrya Naik Mahavidyalaya, Aurangabad 431 003). **Fungal diversity of paper industry waste and soils irrigated by the effluent.** *Nature Env Polln Techno*, 4(1)(2005), 49-52 [10 Ref].

The effluent released from the paper industries is known to contain large amounts of cellulose fibers. This effluent is used directly with very little or no treatment, for irrigation in nearby fields. Paper studies the naturally occurring mycoflora of the

effluent and the soils irrigated by such effluent to understand their possible role in degradation of cellulose. Total 85 species of fungi belonging to 40 genera were isolated from the soil and effluent samples collected. All the isolated species were screened for their cellulolytic activity.

FORESTRY AND ENVIRONMENT

0501-273. Gupta Ranjana, Srivastava Shivendra K, Mahendra AK, Pundir Ira, Kumar Dinesh (Forest Res Inst, Dehra Dun, Uttaranchal). **Impact of participatory forest management on socio-economic development of rural people: a case study in Kodsí and Talaichittor villages of Dehra Dun district.** (*The Indian Forester*, 130(3)(2004), 243-252 [5 Ref].

Study was taken up in Kodsí and Talaichittor villages of Dehra Dun District to assess the impact of Participatory Forest Management programme responsible for bringing about the desired changes. It was observed that the household income has considerably increase due to alternative job opportunities, agricultural production has increased, there is reduction in distance travelled and time spent for fuelwood and fodder collection, village women are now financially empowered, and institution building has paved the way for sustainability of the whole process.

0501-274. Jha Prem Kumar, Nanduri Uma* (* Divisional Forest Office, Ghumgur South Div, Bhanjanagar, Orissa). **Biodiversity measurements in forests of various canopy density.** (*The Indian Forester*, 129(11)(2003), 1391-1394 [6 Ref].

Biodiversity index, number of different species and total number of plants of forest ecosystem having different canopy density was measured. It was found that all the three attributes decreases with the decrease in canopy density. The decrease in these attributes can be ascribed to the rapid fall in the number of tree species. Forest degradation not only cause reduction in biodiversity but also leads to the change in the community composition.

0501-275. Pandit BR, Sutaria Kashmira (Dept Life Sci, Bhavnagar Univ, Bhavnagar 364 002). **Forest tree seeds as source of oil.** *Nature Env Polln Techno*, 4(1)(2005), 137-138 [12 Ref].

The seeds of 22 (11 leguminous and 11 non-leguminous) tree species were analyzed for their oil content. Out of these, 10 non-leguminous and 2 leguminous seeds

have fairly good amount of oil content and can be considered as oil seeds. Although the oil extracted from these seeds is necessarily not edible but can be used for non-edible purposes such as making soaps, lubricants, in leather industries, medicinal purposes or even making biodiesel. Their large plantation would also make the millions of hectares wasteland useful.

0501-276. Pradhan R, Swain SL (PG Dept Bot, GM Coll, Sambalpur 768 004).

Quantitative analysis of vegetation in a tropical dry deciduous forest of Bargarh District, Orissa. *Nature Env Polln Techno*, 4(2)(2005), 251-255 [12 Ref].

Study deals with the quantitative analysis of vegetation through density, basal area and importance value index (IVI) in a tropical dry deciduous forest of Bargarh district of western Orissa. The results indicated that *Shorea robusta* is the most ecologically dominant species in Site-III and Co-dominant species in Site-I and II. Diversity and dominance indices showed a range of 2.3 to 2.7 and 0.078 to 0.104 respectively. The relationship between diversity and dominance was observed to be inverse ($r = -0.87$).

0501-277. Ravindranath NH, Murthy Indu K (Cent Ecol Sci Cent ASTRA, Indian Inst Sci, Bangalore 560 012). **Review of studies on climate impacts on forests in India: policy implications.** *Assessment Climate Change in India: mitigation policies*. Ed. SK Dash & Prakash Rao, WWF, New Delhi. 197-217 [62 Ref].

Disturbances, both human-induced and natural, shape forest systems by influencing their composition, structure, and functional processes. A number of climate-vegetation models have also shown that certain climatic regimes are associated with, particular plant communities or groups. A change in mean annual temperature, as small as 1°C over a sustained period is sufficient to bring about changes in species composition as well as distribution of many tree species.

0501-278. Ravindranath NH, Murthy IK, Sudha P, Geetha KN (Cent Ecol Sci, Indian Inst Sci, Bangalore). **Assessment of afforestation and agroforestry as potential CDM activities in semi-arid Tumkur district, Karnataka.** *J Environ Stud Policy*, 6(1)(2003), 45-60 [10 Ref].

As assessment of the implications of afforestation and agro-forestry activities was conducted under the CDM (clean development mechanism) in the semi-arid district of Tumkur in Karnataka, India. The assessment showed that after accounting for current

and projected afforestation rates under several government programmes, the district has a surplus of degraded land for afforestation and agro-forestry activities. Afforestation and agro-forestry activities are likely to qualify any set of criteria and indicators of sustainable development by providing employment, meeting biomass needs, promoting biodiversity, and protecting watersheds.

0501-279. Siyag PR (Rajasthan Grassfarm, Khatipura Rd, Jaipur 302 015). **Climate Change and forests of India: Challenges and opportunities. Assessment Climate Change in India: mitigation policies.** Eds Sk Dash & Prakash Rao, WWF, New Delhi. 231-244 [15 Ref].

Paper examines the potential of projects under the clean development mechanism (CDM) of Kyoto Protocol in India's forestry sector. Forest management in India is concerned with achieving multiple-use objectives of production of subsistence goods for the local populations and ecological services such as watershed protection and biodiversity conservation. Paper concludes that taking certain issues and concerns into account, and following certain guidelines, there is clearly a great potential of India's forests benefiting from international carbon funds flowing from climate change negotiations.

ENERGY AND ENVIRONMENT

0501-280. Bhatt BP, Sachan MS (Agroforestry Div, ICAR Res Complex, NEH Region, Umroi Rd, Umiam 793 103, Meghalaya). **Firewood consumption pattern of different tribal communities in north-east India.** *Energy Policy*, 32(1)(2004), 1-6 [25 Ref].

Firewood consumption pattern of three tribal communities of Meghalaya, India – Garo, Khasi, and Jaintia – were studied under varying ecological, socio-economic, and socio-cultural conditions. Fuelwood consumption was highest in the Khasi community (5.81 kg/capita/day), followed by the Garo (5.32 kg/capita/day) and then the Jaintia (3.90 kg/capita/day), irrespective of their socio-economic status. The labour energy expenditure for fuelwood collection was highest for the Jaintia (88.56 MJ/capita/year) and minimum for Garo (70.64 MJ/capita/year). Since 90% of the total population uses biomass as an important source of energy, this information could be utilized for developing appropriate technology for afforestation programmes in this region.

0501-281. Kishore VNN, Bhandari PM, Gupta P (The Energy Resource Inst, Darbari Seth Block, IHC Complex, Lodi Rd, New Delhi 110 003). **Biomass energy**

technologies for rural infrastructure and village power: opportunities and challenges in the context of global climate change concerns. *Energy Policy*, 32(6)(2004), 801-810 [15 Ref].

The biomass resource base of a developing country (such as India) is comparable to that of fossil fuels. However, factors such as collection, processing, low end-use efficiency of conventional devices, and insufficient maturity of present biomass energy technologies are major barriers to utilizing available bio-resources more efficiently and on a sustainable basis. Utilization of many energy technologies, rather than a single technology, delivering energy and economic services to rural areas, seems to hold the key for successful commercialization and mainstreaming of biomass energy technologies.

0501-282. Mukhopadhyay Kakali (Cent Dev Env Policy, Indian Inst Manag Calcutta, Joka, Diamond Harbour Rd, Kolkata 700 014). **Impact of liberalized trade on energy use and environment in India.** *J Env Ecol Manag*, 1(1)(2004), 75-104 [31 Ref].

Study aims at contributing to environment trade debate by evaluating the impacts of international trade on energy use and emissions of carbon dioxide in the Indian economy during 1993-94 using Input-Output techniques. It has also constructed an index of pollution terms of trade from the energy and the carbon embodied in the exports and imports of India. Finally, the study will explore the implication of the EXIM policy of 2002. Results of 1993-94 show that India produces goods which are more environment friendly than goods it imports thus indicating a large inflow of pollution embodied in trade.

0501-283. Nair Rajesh, Shukla PR, Rana Ashish (Indian Inst Manag, Vastrapur, Ahmedabad 380 015). **Energy use and climate change: a policy analysis for India.** *Assessment of climate change in India and mitigation policies*. Ed. SK Dash & Prakash Rao, WWF, New Delhi, 72-88 [10 Ref].

Among the most important anthropogenic causes for climate change is energy use, which is dominated by fossil fuels. In the background of existing energy system in the region and the vulnerability of major natural and social systems in South Asia to climate change, paper analyses the long-term energy and emission trajectories for India under various scenarios using an integrated modeling framework. Scenarios with

regional energy cooperation and constraints on carbon emissions (650 ppmv and 550 ppmv) are also discussed.

0501-284. Nawaj I, Khan RJ, Khan ME, Tiwari GN (Cent Energy Stud, Indian Inst Techno Delhi, Hauz Khas, New Delhi 110 016). **Optimization of clean environment parameters through renewable energy sources.** *Int J Ambient Energy*, 24(2)(2003), 67-72 [16 Ref].

Attempt has been made to predict the likely increase in the CO₂ content of the atmosphere due to the increase in energy demand in the Indian context. Energy demand is likely to go up because of the rapid increase in population. Statistical methods have been employed for predicting population growth and corresponding power demand. It is found that the population predicted by the present method is in close agreement (within 0.2%) with the result given by the Central Statistical Organisation, Government of India.

0501-285. Paul S, Bhattacharya RN (Khalisani Mahavidyalaya, Khalisani, Chandannagar 712 138). **Carbon dioxide emission from energy use in India: a decomposition analysis.** *Energy Policy*, 32(5)(2004), 585-593 [35 Ref].

The factors that have influenced the changes in the level of energy-related CO₂ (carbon dioxide) emission have been discussed by means of the decomposition method. The observed changes are analysed in terms of four factors: pollution coefficient, energy intensity, structural change, and economic activity. Emission of CO₂ in the industrial and transport sectors show a decreasing trend due to improved energy efficiency and fuel switching. However, the reducing effect of the pollution coefficient and energy intensity on CO₂ emissions in the agricultural sector is almost nil. The energy intensity varies over a wider range, and has had a greater impact on energy-induced CO₂ emission than the pollution coefficient.

0501-286. Saravanane R, Sivasankaran MA, Sundararaman S, Sivacoumar R (Dept Civil Engng, Pondicherry Engng Coll, Environ Engng Lab, Pondicherry 605 014). **Anaerobic sustainability for integrated biomethanation of sugar mill waste and municipal sewage.** *J Environ Sci Engng*, 46(2)(2004), 116-122 [17 Ref].

Study investigates the viability of biogas generation by integrating the biodegradable waste product of sugar industry. The total solid content of pressmud and sewage mixture was optimized with respect to maximization of biogas yield with continuous monitoring over several operating parameters. Optimum total solid content of

5% found to yield 80m³ of biogas per ton of pressmud compared to 65m³ per ton of conventional digestion of pressmud alone.

PLANT AND POLLUTION

0501-287. Chapla J, Kamalakar JA (Dept Bot, Univ Coll Women, Osmania Univ, Koti, Hyderabad 500 095). **Metabolic responses of tropical trees to ozone pollution.** *J Environ Bio*, 25(3)(2004), 287-290 [13 Ref].

Plants fumigated with 40ppbv, 80 ppbv and 120ppbv concentrations of O₃ exhibited significant reduction in total chlorophyll content, RuBP carboxylase activity and net photosynthesis. The reduction in total chlorophyll activity ranged from 12 to 36% in *Bauhinia variegata*, 11 to 35% in *Ficus infectoria* and 3 to 26% in *Pongamia pinnata* on fumigation with O₃, while the RuBP carboxylase activity was reduced by 10 to 32% in *Bauhinia variegata*, 10 to 32% in *Ficus infectoria* and 9 to 15% in *Pongamia pinnata*. The relative higher sensitivity of tropical trees to O₃ suggests that the ambient air quality standards in tropical tree areas need to be stringent to prevent vegetation from air pollution.

0501-288. Chauhan SVS, Chaurasia Bharati, Rana Anita (Dept Bot, Sch Life Sci, BR Ambedkar Univ, Agra 282 002). **Impact of air pollution on floral morphology of *Cassia siamea* Lamk.** *J Environ Bio*, 25(3)(2004), 291-297 [14 Ref].

Cassia siamea plants growing at two different sites (polluted and non-polluted) on two important roads of Agra city exhibited significant differences in their flowering phenology and floral morphology. The flowering in plants growing at polluted site is delayed and there was a marked reduction in flowering density, flowering period, size of floral parts, pollen fertility, fruit and seed-set. These changes were found to be closely associated with the extent of air pollution caused mainly by significant in the number of automobiles.

0501-289. Dwivedi Yamini, Kumar Suresh, Jain RK (Bot Dept, BSA Coll, Mathura 281 004). **Effect of non treated and treated effluents of saree printing industries on seed germination and seedling growth of *Citrullus lanatus fistulosus*.** *Indian J Environ Sci*, 8(2)(2004), 129-131 [9 Ref].

Maximum seed germination as well as seedling growth were found in 2.5-5% concentration of non-treated effluent. On the other hand 75-95% germination was

observed in treated one. There was no germination in 50-100% concentrations of non-treated effluent. The seedling growth was better in treated effluent when compared with control (ground water).

0501-290. Gupta AK, Ray Bishwas (Dept Bot, SB (PG) Coll, Baragaon, Varanasi 221 204). Bioaccumulation of cadmium, zinc, copper and chromium by *Withania somnifera*. *Nature Env Polln Techno*, 4(1)(2005), 131-135 [20 Ref].

The metal accumulation potential of *Withania somnifera* was investigated performing pot experiments. The concentration and duration played important role in bioaccumulation of these metals. The metal accumulation was found to be higher in case of root than in the shoot. The accumulation trend was Cr>Cu>Cd>Zn. The findings indicate that the plant has enough tolerance to these metals, so can be used for flushing of industrial effluents and waste waters.

0501-291. Naik DP, Ushamalini, Somashekar RK (Jnana Bharathi, Bangalore Univ, Bangalore 560 056). **Reduction of protein and chlorophyll contents in some plant species due to some stone quarrying activity.** *Environ Polln Contl J*, 8(2)(2005), 42-44 [11 Ref].

Study has been carried out in selected quarry locations of Bangalore district for the determination of protein and chlorophyll contents in *Calotropis gigantea* (L) R. Br, *Muntingia calabura*, and *Annona squamosa* located in the vicinity near stone crushing units during summer, monsoon, and winter seasons. A significant reduction in protein and chlorophyll contents of the sampled leaves was observed compared to control, which may be attributed to the high emission and leaf deposition of dust, which adversely affects the metabolic activity of the plant.

0501-292. Nath Kamlesh, Saini Sonia, Sharma Yogesh Kumar* (* Bot Dept, Lucknow Univ, Lucknow 226 007). **Chromium in tannery industry effluent and its effect on plant metabolism and growth.** *J Environ Bio*, 26(2)(2005), 197-204 [35 Ref].

Different dilution levels of tannery treated effluent (10, 25 & 50%) and their corresponding concentration of chromium (Cr⁺⁶) (2, 5 & 10 ppm) were studied in a petridish culture experiment on seed germination and seedling growth in radish (*Raphanus sativus* L.) Result showed reduction in seedling growth and related enzymatic activities with increase in concentration of Cr⁺⁶ in treatments and effluent

both. The low concentration of chromium (2 ppm) and effluent dilution (10%) showed significant growth reduction separately.

0501-293. Pandey SN (Dept Bot, Univ Lucknow, Lucknow 226 007). **Industrial effluents and its effect on seed germination and seedling growth of *Zea mays* Linn. and *Oryza sativa* Linn.** *Biol Memoirs*, 30(2)(2004), 104-107 [19 Ref].

Study deals with the effect of effluent from electroplating industry. Effluent showed inhibitory effect on seed germination and seedling growth in the test plants. In *Zea mays* about 80% mortality of seedlings followed by leaf necrosis and browning of root tips was recorded after 15 days of growth and in *Oryza sativa* about 60% mortality followed by needle like necrotic tip in leaves and necrotic brown tip of roots was recorded after 18 days of growth. Severity of toxicity was reduced after the dilution of effluent to 50%.

0501-294. Seetharaman N, Dhanavel D, Vembu B (Dept Bot, Annamalai Univ, Annamalai Nagar 608 002, Tamil Nadu). **Effect of induced heavy metal, nickel on somatic chromosomes of *Allium cepa* L.** *Nature Env Polln Techno*, 3(4)(2004), 481-484 [9 Ref].

Paper studies the effect of heavy metal nickel, both on the somatic chromosome behaviour and on the pattern of mitotic division of *Allium cepa* L. roots. In all the concentrations roots were treated for 4 equal durations, each being 1 hour (1 to 4 hours duration at each concentration). A control was maintained with the roots treated with distilled water. The results are discussed.

0501-295. Sharma A, Aery NC (Dept Bot, ML Sukhadia Univ, Udaipur 313 002, Rajasthan). **Phytostabilisation of tailing dams: a quantification of physiological and biological responses in plants.** *J Environ Sci Engng*, 46(4)(2004), 261-267 [27 Ref].

Effect of unamended and variously amended tailings of Rajpura-Dariba mines, Udaipur, India was studied on certain physiological and biochemical responses of plants. Plants grown in unamended tailings, showed reduction in shoot-root length, shoot-root dry weight, chlorophyll content and an increase in total phenol contents and peroxidase activity. Ameliorations resulted in an increase in growth and chlorophyll contents, a decrease in total phenol contents and reduction in peroxidase activity in the test plants.

0501-296. Sharma Navin Kumar (Dept Environ Std, Sch Life Sci, Dr. BRA Univ, Khandari Campus, Agra 282 002). **Assessment of air pollution load and its effect on jawar (*Sorghum vulgare*) crop plant performances and soil physical-chemical characteristics.** *Oikoassay*, 17(1&2)(2004), 11-14 [10 Ref].

Among the five localities selected in Agra district, maximum air pollution in terms of SO₂, NO_x and SPM was obtained at Gwalior road and minimum at Dayalbagh. Analysis of variance of *Kharif* crop-Jawar plant analysis had shown significant values of plants height, number of plants and yield as the determining factor. Considering soil physical-chemical analysis results clearly indicate no direct impact of air pollution load on the Jawar crop and edaphic characteristics.

0501-297. Siddique Iram, Ansari MYK (Dept Bot, Aligarh Muslim Univ, Aligarh 202 002, UP). **Studies on the genotoxic effect of pollution on brinjal (*Solanum melongena* L.) growing around Harduaganj thermal power plant.** *Nature Env Polln Techno*, 4(1)(2005), 13-17 [6 Ref].

Study reveals the genotoxic effect of pollutants emitted by Harduaganj thermal power plant on *Solanum melongena*. Due to the effects of various pollutants the chromosomal abnormalities like reduced chiasma frequency, increased number of univalents, multivalents, laggards, stickiness, precocious separation of chromosomes and pollen sterility have been observed. It is suggested that pollution is the major cause of chromosomal/genic variations in *S. melongena* growing around thermal power plant.

0501-298. Singh Ashok Kumar, Agarwal Ashok K, Mathur PK (56, Ashok Tent House, Sonkh Rd, Krishna Nagar, Mathura 281 004). **Impact on seedling survival of *Vigna mungo* in saree printing industry effluent contaminated soil amended with varying dosage of composted rice husk.** *Indian J Environ Sci*, 9(1)(2005), 53-55 [11 Ref].

The germination was 100 percent in contaminated soil amended by composted rice husk concentration of 15%, 20% and 25% while it decreased a little (20%) in contaminated soil without any amendment. The result showed that the germination percentage and total biomass were improved by rice husk amendment but root and shoot length were only little indicating that fertility of polluted soil may be restored by rice husk amendment.

0501-299. Singh Vandna, Rajpal Shalini, Khan MG (52/6, Paliwal Flats, Radha Vihar, Kamla Nagar, Agra 282 005). **Physiological responses of pea (*Pisum sativum* L.) to**

cobalt and molybdenum under salinity I: growth and root development. *Indian J Environ Sci*, 9(1)(2005), 23-25 [14 Ref].

Pea (*Pisum sativum* L Var. arvenses) plants when subjected to sodium chloride salinity showed marked reduction in germination, dry weights of root and shoot and number of root branches. On the other hand, plants exhibited a substantial enhancement in these physiological parameters when supplied with cobalt and molybdenum under saline as well as non saline conditions. It is inferred that salinity caused reduction in crop plants may partially be alleviated by these deficient micronutrients, if provided in appropriate concentrations.

0501-300. Singh Vandna, Rajpal Shalini, Khan MG (52/6, Paliwal Flats, Radha Vihar, Kamla Nagar, Agra 282 005). **Physiological responses of pea (*Pisum sativum* L.) to cobalt and molybdenum under salinity II: pigment composition, total nitrogen, protein content and proline accumulation.** *Indian J Environ Sci*, 9(1)(2005), 27-29 [16 Ref].

Inclusion of cobalt and molybdenum in nutrient medium brought about a substantial increase in pigments composition, total N content, protein content whereas proline accumulation was reduced in pea (*Pisum sativum* L. cv. Arvenses) plants grown under NaCl salinity. Between the two micronutrients, the effect of cobalt was more pronounced and consistent and it was more so at lower (50 μ M) concentration in saline as well non-saline conditions.

0501-301. Trivedi AK, Ahmad I, Musthapa MS, Ansari FA, Rahman Q (Fibre Toxic Div, Indl Toxic Res Cent, PB No 80, MG Marg, Lucknow 226 001). **Environmental contamination of chrysotile asbestos and its toxic effects on growth and physiological and biochemical parameters of *Lemna gibba*.** *Arch Environ Contam Toxicol*, 47(3)(2004), 281-289 [60 Ref].

Lemna gibba plants were exposed to two concentrations of chrysotile asbestos and control plants were cultured in medium without chrysotile asbestos. An inhibition effect of chrysotile exposure was found on the number of fronds, root length, and biomass. Similar alterations in contents of chlorophyll, carotenoid, total free sugar, starch and protein were also found. The results indicate oxidative stress and phytotoxicity of chrysotile asbestos on duckweed.

0501-302. Uijily Maria Elizabeth, Kumaraguru AK (Dept Bot, St Mary's Coll, Tuticorin 628 001). **Accumulation of heavy metals in some species of lichens in south Tamil Nadu, India.** *J Environ Sci Engng*, 46(3)(2004), 186-193 [10 Ref].

Lichens accumulate heavy metals and have been used as bio-indicators in pollution monitoring. Nine lichen species were collected from urban, rural and hilly areas in the southern part of Tamil Nadu. Accumulation of metals differed with species and also with respect of their locations. Among the nine species, *Pyxine petricola* collected from urban areas showed greater accumulation of the heavy metals.

0501-303. Yogeetha MS, Prakash MS, Ramakrishna Parama VR, Ramegowda (Dept Civil Engng, PES Coll Engng, Mandya 571 401, Karnataka). **Effect of Cr in irrigation water on germination and growth of french beans (*Dolichos lablab* L.).** *J Environ Sci Engng*, 46(3)(2004), 194-202 [18 Ref].

The effect of Cr in irrigation water on seed germination and growth of french bean (*Bolichos lablab* L.) was investigated. Germination studies were conducted in the lab and field conditions. Seeds were treated with different concentrations (0 to 25 mg/l) of Cr in irrigation water. The percentage germination of seeds and plant growth showed a gradual decrease with increase in Cr concentration. Stimulatory effect in growth of plant was observed at lower concentration (1 to 2 mg/l). Accumulation of Cr was in the order of root>leaf>stem>pod.