

Environmental Management

0303-001. Abraham Leena, Sandhya Kiran G (Dept Bot, Fac Sci, MS Univ Baroda, Vadodara 390002). **Remote sensing in salinity studies.** *Geobios*, 30(4)(2003), 233-236 [8 Ref].

Study highlights the potentials of satellite data in mapping the saline soils in Padra taluka. Analysis of spectral reflectance of the soil in this area exhibited a notable difference between the normal and the salt affected soils. A good correlation has been observed between the spectral reflectance and different soil characteristics, exhibiting the influence of physicochemical properties on the soil reflectance.

0303-002. Bala N, Singh G, Kumar Pramod, Sinha AK (Arid Forest Res Inst, Jodhpur, Rajasthan). **Role of forests in carbon sequestration.** *Indian Forester*, 129(6)(2003), 799-806 [23 Ref].

Forestry can play a major role towards increasing the global carbon sequestration if the world's forests could be managed properly with due importance to afforestation and reforestation. Recognizing the role of forestry in carbon sequestration, the 1997 Kyoto protocol specifically mentioned afforestation and reforestation as tools that can be used to reduce level of carbon dioxide from atmosphere.

0303-003. Bhardwaj SD, Panwar Pankaj (Dept Silviculture Agroforestry, UHF, Nauni, Himachal Pradesh). **Global warming and climate change – effect and strategies for its mitigation.** *Indian Forester*, 129(6)(2003), 741-748 [34 Ref].

Article surveys predicted and projected rates of global warming and climate change due to emission of GHGs and their consequences. Effects on forests may result in shift of species, drop in productivity and growth, increased incidence of insects. To counter these problems geo-engineering can be put to use but the forests have the biggest opportunity as they absorb CO₂ and function as carbon sinks. The introduction of carbon credits is advocated, as an incentive.

0303-004. Chauhan Surendra Singh (Dept Environ Sci, IGC, HEEPS, Univ Rajasthan, Jaipur 302004). **The sources of environmental knowledge, perception and**

information of high school students: a case study of Jaipur area, Rajasthan. *Indian J Environ Sci*, 7(2)(2003), 93-100 [7 Ref].

Questionnaires were distributed to high schools across Jaipur in order to determine sources of environmental information and knowledge to consider how high school students perceive environmental issues. The TV and school were the most commonly used sources of environmental information and knowledge. Students were able to identify environmental impacts and were aware to the trade-offs between the benefits of some developments over others. The perceptions of students appeared biased toward their own experiences and extreme issues portrayed by the media.

0303-005. Chauhan Surendra Singh (Dept Environ Sci, Indira Gnadhi Cent HEEPS, Univ Rajasthan, Jaipur 302004). **Environmental awareness among senior secondary school students of Jaipur area, Rajasthan.** *J Ecotoxic Environ Monit*, 12(4)(2002), 263-270 [8 Ref].

Study assesses the skills and understanding by a specific group of students for responsible citizenship. The results suggests that the students were familiar with a wide variety of environmental issues: however; their understanding of these issues was shallow. Statistical analyses found no differences or negligible in the performances on these various issues related to the gender, age and urban-rural background of the students.

0303-006. Deka PK, Paul SK, Bohar A (Krishi Vigyan Kendra, Assam Agricul Univ, Gossaigaon 783360, Assam). **Vermitechnology for economic use and control of water hyacinth.** *Polln Res*, 22(3)(2003), 385-387 [9 Ref].

Water hyacinth the factor for eco-degradation of wetlands can be converted to nutritive value based product for agricultural use through composting. It was found that the both macro and micro nutrients status of the raw material can be improved through vermitechnology besides reducing the days for maturation of the compost. Thus, the eco degrading water hyacinth has its use as organic soil ameliorant if managed properly.

0303-007. Deshpande Ajay S, Mohabey NK (Maharashtra Remote Sensing Application Cent, VRCE Campus, SA Rd, Nagpur 440011). **A geomatics approach in**

establishment of methodology for watershed ecosystem development. *Eco Env Conserv*, 9(1)(2003), 91-94 [5 Ref].

The tools in earth science discipline, that have assembled most of our knowledge about the earth, have now reached a stage of maturity. Now newer and powerful tools, of geomatics, have emerged to facilitate the study of earth as an integrated system of interacting components. Study of the Geo-factors, with the help of various tools of geomatics, is inevitable in the present context and it forms a base, above which all the interdisciplinary analysis is performed.

0303-008. Doharey RK, Sujan DK, Mishra SK (Krishi Vigyan Kendra, Bharari, Jhansi, UP) **Awareness of environmental pollution among the rural and urban school children in Varanasi district.** *Progressive Agricul*, 2(1)(2002), 49-53 [8 Ref].

The study on the awareness of environmental pollution, rural and urban school children in Varanasi district was conducted at Institute of Agricultural Sciences, Banaras Hindu University, Varanasi. The response of awareness of environmental pollution among rural and urban school children, rural population and the urban population is responsible for environmental degradation. Their lack of awareness is the main cause for exploitation of the environment.

0303-009. Dubey Sharaddha, Dubey PS (Inst Env Manag Plant Sci, Vikram Univ, Ujjain 456010, MP). **Environmental auditing – a successful ecotechnological tool.** *J Indl Polln Contl*, 18(2)(2002), 201-212 [10 Ref].

An environmental audit is a management tool taking inventory of a company's environmental assets and liabilities. Paper summarizes the data of last ten years study, after environmental auditing the overall picture of environmental care i.e. right from mine management to energy saving, comes as realistic. In this study environmental components are also covered, because it is also a part of advance environment audit.

0303-010. Gera Mohit, Bisht NS, Gera Neelu (Resource Surv Manag Div, Forest Res Inst, Dehra Dun, Uttaranchal). **Carbon sequestration through community based forest management – a case study from Sambalpur forest division, Orissa.** *Indian Forester*, 129(6)((2002), 735-740 [8 Ref].

A study was carried out to estimate the creation of carbon sinks and sequestration achieved in community-projected forests of Sambalpur Forest Division, Orissa. The results have shown that 1.53 to 3.01 tonnes of carbon is being sequestered per ha per year with only protection, which can be enhanced through proper implementation of the management prescriptions.

0303-011. Gunasekaran S, Mutunayagam Sheila (PG Res, Dept Phys, Pachaiyappa's Coll, Chennai). **Investigation of hydrocarbon pollutants resulting from oil spills using FTIR finger printing technique.** *Polln Res*, 22(2)(2003), 169-177 [11 Ref].

Infrared spectroscopy is an excellent technique that has been used to fingerprint mostly crude oils. The spilled oil has been collected from the surface of water using a polished aluminium foil dipped in carbon tetrachloride and the FTIR spectra taken with the same instrument. Using the method due to Kawahara, a fingerprinting technique has been developed forming internal standards among the fundamental modes of vibration for the different samples.

0303-012. Gupta AK (Dept Bot, SB PG Coll, Baragaon, Varanasi 221204, UP). **Role of pollutants and corridor vegetation in composting at Varuna river corridor.** *Nature Env Polln Techno*, 2(3)(2003), 317-321 [16 Ref].

Attempt has been made for composting the pollutants and corridor vegetation and its use for improving soil characteristics around the Varuna river corridor. The results indicate the pollutants and riparian herbs after composting are very good sources of nutrients like nitrogen, phosphorus and potassium. The chloride content in water and organic carbon in soil increases with the addition of pollutants and composting.

0303-013. Jeeva V, Hooda N, Singsit S (Dte Res, Indian Coun Forestry Res Edn, Dehra Dun, Uttaranchal). **Clean development mechanism and forestry sector: challenge, opportunities and issues.** *Indian Forester*, 129(7)(2003), 826-838 [22 Ref].

Keeping in view the global growth and demand the initiatives under UNFCCC are addressing the issues related to climate change. The Clean Development Mechanism (CDM) a provision within Kyoto Protocol and Marrakech Accords offer an excellent opportunity for land-use and forestry sector within addressing the global negotiation on

carbon sequestration. The article gives recommendations on negotiations, which may be useful for climate negotiators for implementing forestry related CDM projects nationally.

0303-014. Kant Promode, Katwal RPS* (*Indian Coun Forestry Res Edn, Dehra Dun, Uttaranchal). **Redefining baseline for forestry projects under Clean Development Mechanism.** *Indian Forester*, 129(6)(2003), 682-690 [8 Ref].

Inclusion of afforestation and reforestation as eligible activities in Clean Development Mechanism (CDM) under the Kyoto Protocol has necessitated change in the existing definition of the baselines. The Subsidiary Body for Scientific and Technical Advice (SBSTA) constituted under the United Nations Framework Convention on Climate Change (UNFCCC) has suggested five options for this purpose for discussion and adoption at ninth Conference of Parties to UNFCCC. Paper analyzes the relative merits of these options.

0303-015. Nanoty VD, Garode AM (Dept Microbio, RLT Coll Sci, Akola 444001, Maharashtra). **Watershed management through mass awareness for sustainable development.** *Nature Env Polln Techno*, 2(3)(2003), 369-371 [2 Ref].

This project on watershed management was undertaken to include tree plantation, people's awareness, street plays and programme like construction of small bunds. An attempt is made to explain the role of youth in watershed management which increases their self reliance and confidence in eco-friendly and sustainable development.

0303-016. Nikhil Kumar (Environ Manag Gr, Centl Mining Res Inst, Barwa Rd, Dhanbad 826001, Jharkhand). **Suitable fillers for the overburden dumps plantation pits to achieve better and economical revegetation.** *Eco Env Conserv*, 9(1)(2003), 35-37 [7 Ref].

New filling material (filler) has been developed for the substitute of soil where it is difficult to get for filling the pit used for the re-vegetation on overburden dumps. This will not only support initial growth by providing sufficient nutrients and moisture to get more survival percentage but also avoid re-vegetation failure. Moreover, this filler utilizes the waste material avoiding pollution and creating opportunities for the self-employment in remote rural areas.

0303-017. Pandya GH (Natl Environ Engng Res Inst, Nehru Marg, Nagpur 440020). **Investigation of GC detectors performance and validators.** *Indian J Environ Hlth*, 45(2)(2003), 139-142 [2 Ref].

Paper reports the study carried out with a Gas Chromatographs system equipped with detectors like Flame Ionization Detector (FID) and Electron Capture Detector (ECD) The FID sensitivity obtained is 1.14 coulombs/g C. The FID could minimum detect 2.65×10^{-12} gram carbon per sec and ECD could minimum detect pesticides (Lindane) less than 1 femtogram. Such a procedure is useful for all those engaged in analysis with GC or are in the process of procuring good reliable GC system.

0303-018. Prasad Basudeo, Garg Sangeeta (Environ Monit Instrumentation Div, CSIO, Chandigarh 160020). **The plastic challenge and management – a review.** *Eco Env Conserv*, 9(3)(2003), 351-356 [4 Ref].

Paper describes the types of plastic waste generated in India and their present status. It also touches briefly the various stages of waste management and its regulatory acts in India. The management and control techniques along with various recyclable utility products have also been discussed to have optimum utilization of plastic waste with the help of optimization model, available and adoptable techno-economical European technology.

0303-019. Rai SC, Sharma P (GB Pant Inst Himalayan Env Div, NE Unit Itanagar, Arunachal Pradesh). **Carbon sequestration with forestry and land use/cover change : an overview.** *Indian Forester*, 129(6)(2003), 776-786 [55 Ref].

Land-use/cover changes have caused a significant release of CO₂ to the atmosphere from the terrestrial biota and soils. Soil is a major source of atmospheric CO₂. Adoption of C sequestration measures in the soil can considerably reduce the rise in atmospheric CO₂ level. Paper presents the measured rates of soil respiration from land-use/cover change to define the annual global CO₂ flux.

0303-020. Rana AK, Tripathi Sadhna, Dev Indra (Forest Res Inst, Dehra Dun, Uttaranchal). **Role of wood preservation in carbon locking.** *Indian Forester*, 129(6)(2003), 707-713 [12 Ref].

Human activities like burning of forest fuel, destruction of forests add CO₂ to the atmosphere, which enhance the global temperature. Paper deals with the different aspects of carbon increase, and measures to control it. Carbon storage in wood products may be one of the potential way, which can be achieved by prolonging the life of wood and wood products through adopting wood preservation.

0303-021. Rao B, Padma S, Hasan MZ (APC Div, Natl Environ Engng Res Inst, Nagpur 440020). **Impact of agricultural development on biodiversity.** *Cheml Environ Res*, 11(3&4)(2002), 207-217 [7 Ref].

The links between agriculture and biodiversity have changed over time due to change in demographic pressure leading to imbalances in population distribution and predominant paradigms of industrial agriculture and the green revolution. Paper highlights the strategy that can have multiple ecological and socioeconomic benefits as well as ensure food security as the sustainable use of rich biological resources is critical for food production, health and life support systems.

0303-022. Ravindranath NH, Murthy Indu K (Indian Inst Sci, Bangalore, Karnataka). **Clean development mechanism and forestry projects : strategy for operationalization in India.** *Indian Forester*, 129(6)(2003), 691-706 [15 Ref].

Forestry projects have been included under the Climate Change Convention for operationalisation in appropriate areas. Paper discusses the various issues involved in operationalisation such forestry activities in India after giving definition of the related concepts and an estimate of the area which could be taken up for such schemes in India. The CDM strategy is likely to provide allround benefits, it has been concluded.

0303-023. Ravindranath NH, Murthy Indu K, Sudha P, Sahana CA (Cent Ecol Sci, Indian Inst Sci, Bangalore, Karnataka). **Clean Development Mechanism and Joint Forest Management programme in India.** *Indian Forester*, 129(7)(2003), 815-825 [15 Ref].

There is a large potential for reforestation under Joint Forest Management in India. Clean Development Mechanism provides opportunity to expand JFM in India. JFM is an eligible activity for CDM, if it is in non-forest area. The issues such as developing a baseline, demonstrating additionality, measuring and monitoring of carbon benefits and

non-permanence can be easily addressed for a JFM project. India should create the necessary institutional arrangements, which are simple and transparent to attract CDM projects.

0303-024. Rawat Vijay, Singh Dhan, Kumar Pankaj (Plant Physiology, Bot Div, Forest Res Inst, Dehra Dun, Uttaranchal). **Climate change and its impact on forest biodiversity.** *Indian Forester*, 129(6)(2003), 787-798 [26 Ref].

Global warming have serious implications for forest ecosystems, especially for plantations and the matching of tree species with sites, which may be affected by changed climatic conditions. The study of potential impact of climate change on existing forest ecosystem is inevitably required for the further mitigation to the problem. The paper examines the impact of global climate change on forest biodiversity.

0303-025. Sharma Subodh K, Bhattacharya Sumana, Garg Amit (Min Env Forests, CGO Complex, Lodi Rd, New Delhi 110003). **India's initial national communication (NATCOM) to United Nations Framework Convention on Climate Change and the forestry sectors.** *Indian Forester*, 129(6)(2003), 673-681 [5 Ref].

United Nations established the United Nations Framework Convention on Climate Change (UNFCCC) in 1992 to stabilise the Green House Gases (GHGs) concentrations in the atmosphere. India has initiated preparations of its Initial National communications to the UNFCCC in November 2001 in the form of Project NATCOM. Paper examines the experiences of the project to respond to the likely adverse impacts of climate change and also to improve the quality of future National Communications to the UNFCCC.

0303-026. Siddharth S, Jamal A, Shukla R Rakesh (Dept Mining Engng, Inst Techno, Benaras Hindu Univ, Varanasi 221005, UP). **Acid mine drainage and its management in Indian coal mines, a status report.** *Dimensions Polln*, 2(2003), 95-107 [22 Ref].

Acid Mine Drainage (AMD) is one of the most intractable problems all over the world related with coal and metallic sulphide deposits. Paper focuses on the various aspects of AMD, its formation, factors responsible for AMD generation, impact on water quality and the application of overburden geochemical information in formulation of a field applicable management plan for its mitigation.

0303-027. Sikka AK, Selvi V, Singh DV, Madhu M, Mohanraj R, Krishnan P, Srinivas S, Ramesh M, Nair KM (Centl Soil Water Conserv, Res Trng Inst, Res Cent, Udthagamandalam, **Tamil Nadu**). **Soil erosion map of Kerala state, India**. *Indian J Soil Conserv*, 31(2)(2003), 127-130 [11 Ref].

Universal Soil Loss Equation (USLE) was used to estimate soil loss from 338 point on 10 km x 10 km grid distributed over entire state of Kerala in India. The results showed that major portion of Kerala (51.98 per cent) falls in 0-5 t ha⁻¹ yr⁻¹ soil loss category while less than 5 per cent of the area is subjected to severe form of soil erosion. High intensity rainfall and steepness of slope have contributed in general to the higher soil loss in certain pockets of the state.

0303-028. Singh HS (Conservator Forests Office, Vadodara Circle, Raopura, Gujarat). **Vulnerability and adaptability of tidal forests in response to climate change in India**. *Indian Forester*, 129(6)(2003), 749-756 [14 Ref].

Due to climate change ecological productivity and biodiversity will altered and marine ecosystems, especially mangroves will be disrupted significantly. Large area of mangroves (4,871 km²) in India is expected to go under major transformation, depending on the rate of climate change and anthropogenic activities. The response of mangroves to sea level rise have been assessed and projected that the diversity in mangrove communities may improve at higher latitudes in some areas under low to medium level of sea level rise.

0303-029. Singh HS (Office Conservator Forests, Vadodara Circle, Kothi Bldg, Raopura, Vadodara 390001, Gujarat). **Marine protected areas in India**. *Indian J Marine Sci*, 32(3)(2003), 226-233 [14 Ref].

Among various types of marine ecosystems, tidal mudflats, mangroves, estuaries, lagoons, beaches, marshes, vegetated wetlands and coral reefs have a major share. A total of 97 major estuaries, 34 major lagoons, 31 mangroves areas and 5 coral reef areas have been mapped and identified in India for conservation and sustainable use. Although, India has a very long coastline and varied coastal habitats, contribution of the MPAs of the country are discussed.

0303-030. Singh SN, Verma Amitosh, Tyagi Larisha (Environ Sci Div, Natl Botl Res Inst, Lucknow 226001). **Investigating options for attenuating methane emission from Indian rice fields.** *Env Int*, 29(5)(2003), 547-553 [48 Ref].

Paper investigates that there can be more than one strategy to contain methane emission from paddy fields, which are thought to be major source of methane emission in tropical Asia. Among these strategies, water management, which appears to be the best cost-effective and eco-friendly way for methane mitigation, is only possible when excess water is available for reflooding after short soil drying at the right timing and stage.

0303-031. Soni Prafulla (Eco Env Div, Forest Res Inst, Dehra Dun). **Climate change and restoration of tropical forests.** *Indian Forester*, 129(7)(2003), 865-873 [18 Ref].

Fossil fuel consumption and global deforestation are the two major sources of rising carbon dioxide concentration and this is an important cause of enhanced greenhouse effect with implication on Global Climate Change. The paper reviews the crucial role global forests play in initiating the atmosphere carbon dioxide increase and highlight the potential to mitigate approximately 15% of the world's Green House Gas emission.

0303-032. Soni PL, Rameshwar Dayal, Kumar Vinet (Cheml Div, Forest Res Inst, Dehra Dun). **Environment friendly technologies for sustainable utilization of NWFPs.** *Indian Forester*, 129(7)(2003), 853-858 [24 Ref].

Harvesting non wood forest products from threatened and endangered species has led to search of new alternatives. Paper describes some of the eco-friendly technologies/processes developed by Forest Research Institute, Dehra Dun in recent years from abundantly available forest/agro biomass. The new technologies will go a long way in saving the fragile ecosystem of the country.

0303-033. Srivastava Rajiv K, Singh Dhan (Monitoring Evaluation Div, Indian Coun Forestry Res Edn, Dehra Dun, Uttaranchal). **Forest fire, haze pollution and climate change.** *Indian Forester*, 129(6)(2003), 725-734 [19 Ref].

Forest ecosystems are influenced by a variety of factors, both natural and human induced, which ultimately led to change in biodiversity and consequently changes the climate of existing system. The study of impact of forest fire on existing forest ecosystem is inevitably required for the further mitigation to the problem. Paper examines the impact of forest fire on climate change and forest biodiversity.

0303-034. Swaminathan MS (MS Swaminathan Res Foundation, Taramani Institutional Area, Chennai 600113). **Bio-diversity: an effective safety net against environmental pollution.** *Environ Polln*, 126(3)(2003), 282-291 [1 Ref].

Conservation, enhancement and sustainable and equitable use of biodiversity should be accorded high priority in all national environment protection programmes. There is need for the more widespread use of such biomonitoring and bioremediation agents. Bioprospecting research designed to identify novel metabolites must be rooted in the principle of equity in sharing benefits with the holders of traditional knowledge.

0303-035. Thakur RK, Hooda N, Jeeva V (Forest Entomology Div, Forest Res Inst, Dehra Dun, Uttaranchal). **Termites and global warming – a review.** *Indian Forester*, 129(7)(2003), 923-930 [61 Ref].

Attempt has been made to focus the importance of termites and their global contribution in GHG and need for detailed study in India for abatement of termites to reduce the GHG emission from termite source, as termites also to some extent contribute to land degradation and have serious implications for desertification.

0303-036. Virk MK, Sangla Vandana, Sandhu P (Dept Family Resource Manag, Punjab Agricul Univ, Ludhiana 141004, Punjab). **Waste management practices among urban inhabitants of Punjab and their impact on environment.** *Nature Env Polln Techno*, 2(2)(2003), 195-199 [7 Ref].

Study was conducted in two cities, Barnala and Ludhiana of Punjab state. Results of the investigation revealed that 56.6 percent respondents in both the cities were satisfied with the existing waste disposal practices inside the home. Almost half the sample had the knowledge about composting. Incineration and process of pyrolysis is not known to anyone.

Air Pollution

0303-037. Agrawal M, Singh B, Rajput M, Marshall F, Bell JNB (Dept Bot, Banaras Hindu Univ, Varanasi 221005). **Effect of air pollution on peri-urban agriculture: a case study.** *Environ Polln*, 126(3)(2003), 323-329 [25 Ref].

Six hour mean concentrations were monitored for SO₂, NO₂ and O₃ and plant responses were measured in terms of physiological characteristics, pigment, biomass and yield. Parameter reductions in mung bean (*Vigna radiata*), palak (*Beta vulgaris*), wheat (*Triticum aestivum*) and mustard (*Brassica campestris*) grown within the urban fringes of Varanasi, India correlated directly with the gaseous pollutants levels. The magnitude of response involved all three gaseous pollutants at peri-urban sites; O₃ had more influence at a rural site.

0303-038. Das SK, Tripathy JK, Nayak MM (Dept Computer Sci, Berhampur Univ, Bhanja Bihar, Berhampur 760007). **Ambient air quality at a mine site in Joda-Barbil mineral belt in Orissa: a case study.** *Polln Res*, 22(2)(2003), 265-267 [4 Ref].

Study deals with the ambient air quality of Tantra-Raikela-Bandhal iron ore mines with respect to suspended particulate matter, sulphur dioxide (SO₂) and oxides of nitrogen (NO_x) and their level of concentration in different seasons of the year. Though the concentration of SO₂ and NO_x remained below the prescribed limits, it exceeded the limit at few places of the study area.

0303-039. Ghose Mrinal K, Majee SR (Cent Mining Env, Indian Sch Mines, Dhanbad 826004). **Status of air pollution due to opencast coal mining and its control in Indian context.** *J Scient Indl Res*, 62(9)(2003), 892-902 [21 Ref].

Paper discusses the justification of selecting air-monitoring stations and focuses on the methodology adopted for sampling and analysis to evaluate status of air pollution due to OC mines. Four seasons monitoring data revealed that SPM, RPM, SO₂ and NO_x concentrations at different locations (industrial, residential and sensitive exceeded the permissible limit. The study reveals that high coal production associated with heavy mechanization led to more air pollution problem in areas. Methodologies for the control of air pollution are also discussed.

0303-040. Gokhale S, Khare M (Dept Civil Engng, Indian Inst Techno, New Delhi 110016). **Statistical methodologies and modelling in air pollution.** *J Inst Engrs India (Environ Engng Div)*, 83(March)(2003), 46-53 [10 Ref].

The procedure and methodologies to deal with statistical modeling in predicting the distribution of air pollutant concentrations have been reviewed. There are distributional model, namely, exponential, lognormal, gamma and Weibull, which could be fitted to the air quality data. The procedure to the identification of best model from the available parametric range of model and their parameter estimation which have been developed by Taylor and Jakeman is reviewed.

0303-041. Goyal SK (Natl Environ Engng Res Inst, Nehru Marg, Nagpur). **Comparison of two manual methods of nitrogen dioxide determination in ambient air.** *Environ Monit Assess*, 89(3)(2003), 305-314 [13 Ref].

Sodium arsenite (SA) method for determination of nitrogen dioxide (NO₂) in ambient air, has been evaluated and compared with US EPA recommended equivalent method of TGS-ANSA (ANSA). Laboratory evaluations showed that SA method was high sensitivity to different sampling conditions, which normally vary during actual field monitoring. Absorption efficiency of NO₂ in SA method was found to be much lower (64%) as against the reported value of 82% at the method recommended sampling conditions, whereas for ANSA method, it was found 1.0 as against the reported value of 0.93.

0303-042. Joseph AE, Sawant AD, Srivastava A, Gawane AG, Joshi SD, Phadke KM (Natl Environ Engng Res Inst, 89-B, Dr. AB Rd, Worli, Mumbai 400018). **Anions in PM₁₀ aerosol in a commercial area of Mumbai city.** *Cheml Env Res*, 12(1&2)(2003), 25-29 [4 Ref].

Anionic composition of ambient aerosols of size = 10 microns (PM₁₀) in the commercial area of Mumbai city is reported. It was observed that sulphate concentration was higher compared to the concentrations of chlorides and nitrates. The percentage of chlorides was between 5-15%. The correlation coefficient of sulphate was 0.6276 which shows the variation in the sulphate content in the ambient air is large and the correlation

coefficient of chloride was 0.9763 which shows the good correlation as Mumbai being a coastal city.

0303-043. Kulshrestha Monika J, Kulshrestha Umesh C, Parashar DC, Vairamani M (Regl Res Lab, Jorhat 785006, Assam). **Estimation of SO₄ contribution by dry deposition of SO₂ onto the dust particles in India.** *Atmos Env*, 37(22)(2003), 3057-3063 [31 Ref].

Dustfall deposition fluxes of major water-soluble components were estimated at five different sites of Delhi. The high values of pH of dustfall deposition suggest the dominance of crustal components that add higher alkalinity due to presence of components like Ca, Mg, etc. Dustfall fluxes were observed highest for Ca. considering the importance of alkaline nature of dust particles; the fraction of SO₄ contributed by dry deposition of SO₂ on the dust particles was estimated.

0303-044. Kumar AV, Singh B, Bhalke S, Suseela B, Tripathi RM (Environ Assess Div, Bhabha Atom Res Cent, Trombay, Mumbai 400085). **Trace metal levels in ambient air of a residential township in Mumbai, India.** *J Inst Engrs India (Environ Engng Div)*, 83(March)(2003), 54-59 [7 Ref].

Levels of fifteen trace metals in suspended air particulates monitored at a residential township in Mumbai are studied. Percentage distribution of the measured elements showed a dominant fraction of Na (47.1%) and Ca (27.8%) followed by Fe (8.1%), Zn (7.7%), Mg (5.8%) and K (2.8%). The remaining nine metals (As, Cd, Li, Co, Ni, Cr, Cu, Mn and Pb) altogether formed less than 1% in this distribution. Analysis of monthly average concentrations showed a higher concentration of trace metals in the winter month of December.

0303-045. Mahendra SP, Krishnamurthy (Cent Transportation Engng, Fac Civil Engng, Bangalore Univ, Bangalore 560056, Karnataka). **Vehicular air pollution at some intersections in Bangalore city : a case study.** *Nature Env Polln Techno*, 2(2)(2003), 187-191 [10 Ref].

Paper assesses the air pollution concentration from road traffic in Bangalore. Traffic flows and air pollution concentrations of CO, NO_x, SO₂ and SPM were measured simultaneously. It is evident that the traffic generated CO concentrations in the study

intersections were high and exceeding the permissible standards prescribed by the CPCB. This may be attributed to the interrupted flow of traffic near the intersection due to frequent 'stop' and 'go' situations. Measures to reduce vehicular pollution are also discussed.

0303-046. Mehta UK (Env Safety Dept, SIEL Cheml Complex, P.B. No. 52, P.O. Rajpura 140401, Dist Patiala, Punjab). **Study on ambient air quality around SIEL chemical complex near Rajpura, District Patiala, Punjab.** *Environ Polln Contl J*, 5(5)(2002), 19-25 [13 Ref].

The impact zone for ambient air quality around SIEL chemical complex were studied by selecting five ambient air-monitoring stations in this area. On the basis of manufacturing process and type of fuel used, sulphur dioxide is identified as significant pollutant within the study region. Methodology adopted for the collection of sample and analysis has been described. The results obtained at different seasons have been discussed to assess the impact on air environment.

0303-047. Naja M, Lal S, Chand D (Phyl Res Lab, Navarangpura, Ahmedabad 380009). **Diurnal and seasonal variabilities in surface ozone at a high altitude site Mt Abu (24.6°N, 72.7°E, 1680m asl) in India.** *Atmos Env*, 37(30)(2003), 4205-4215 [41 Ref].

The unique meteorology over this region seems to play an important role in seasonal as well as in diurnal variations in ozone. Background and continental ozone levels estimated to be 33.4 ± 13.3 and 48.1 ± 9 ppbv, respectively, over this region of India. A correlation study between ozone and CO indicates possibility of incomplete photochemical processes over Asia.

0303-048. Pathak H, Prasad S, Bhatia Arti, Singh Shalini, Kumar S, Singh J, Jain MC (Div Environ Sci, Nuclear Res Lab Bldg, Indian Agricl Res Inst, New Delhi 110012). **Methane emission from rice-wheat cropping system in the Indo-Gangetic plain in relation to irrigation, farmyard manure and dicyandiamide application.** *Agricl Ecosyst Env*. 97(1-3)(2003), 309-316 [26 Ref].

Total emission of CH₄ from the rice-wheat systems ranged from 16.2 kg ha⁻¹ in the control treatment to 36.5 kg ha⁻¹ in urea plus FYM treatment with an average emission of 20.8 kg CH₄ ha⁻¹. Continuously saturated soil in rice gave higher CH₄

emission compared to intermittent wetting and drying soil condition but the yields were lowered. Application of DCD with urea reduced emission of CH₄ in rice-wheat system to 70%, while substituting 50% of inorganic N with FYM increased emission to 172% compared to application of entire amount of N through urea.

0303-049. Ravindra Khaiwal, Mor Suman, Aameena, Kamyotra JS, Kaushik CP (Dept Environ Sci Engng, Guru Jambheshwar Univ, Hisar). **Variation in spatial pattern of criteria air pollutants before and during initial rain of monsoon.** *Environ Monit Assess*, 87(2)(2003), 145-153 [23 Ref].

Spatial patterns of various criteria air pollutants, were studied at Shahdara National Ambient Air Quality Monitoring station in Delhi (India). These spatial patterns were found to be essentially the same before and during rain, however a significant decrease in SO₂, NO₂ and TSP concentrations (40-45%) was observed after initial and subsequent rains of the monsoon, demonstrating the importance of rainfall in the scavenging of these criteria air pollutants.

0303-050. Reddy GS, Ruj Biswajit (Centl Mechanical Engng Res Inst, Mahatma Gandhi Avenue, Durgapur, West Bengal). **Ambient air quality status in Raniganj-Asansol area, India.** *Environ Monit Assess*, 89(2)(2003), 153-163 [3 Ref].

This investigation presents the assessment of ambient air quality with respect to suspended particulate matter (SPM), sulphur dioxide (SO₂) and oxide of nitrogen (NO_x) at four sites in the Raniganj-Asansol area in West Bengal, India. It has been observed that the concentrations of the pollutants are high in winter in comparison to the summer or the monsoon seasons. Results indicates that industrial activities, indiscriminate open air burning of coal by the local inhabitants for cooking as well as coking purposes, vehicular traffic, etc. are responsible for the high concentration of pollutants in this area.

0303-051. Senthilnathan T, Rajan RD (51, Lakshmi Hayagriva Nagar, Second Layout, 5th Cross Street, Adambakkam, Chennai 600088). **PM-10 concentration in the ambient air in Chennai city.** *J Instn Engrs India (Environ Engng Div)*, 83(March)(2003), 34-35 [4 Ref].

Particulate matter having size less than 10 microns (PM-10) has been identified as critical pollutants causing potential health hazard for human beings. A study was

carried out to assess the concentration of PM-10 present in the ambient air in Chennai city during the summer season of the year 2000. The monthly mean concentration of PM-10 concentration was found to lie above the National Ambient Air Quality Standards values.

0303-052. Sharma Dhruv N, Sawant Aniket A, Uma R, David R Cocker III* (*Bourns Coll Engng, Cent Environ Res Techno, Univ California, Riverside CA 92521, USA). **Preliminary chemical characterization of particle-phase organic compounds in New Delhi, India.** *Atmos Env*, 37(30)(2003), 4317-4323 [31 Ref].

Work describes a study for the investigation of the chemical composition of organic species present in PM₁₀ collected at a residential site in New Delhi and in TSP emissions from in-use two-stroke vehicles. Preliminary findings suggest that vehicular emissions and biomass and/or refuse burning are significant contributors to the organic fraction of PM₁₀ in the New Delhi atmosphere.

0303-053. Shrivastava KL, Ojha Shrikant (Dept Geo, JNV Univ, Jodhpur 342005). **Commercial and mixed zone's of Jodhpur city - a comprehensive survey of ambient air.** *Oikoassay*, 16(1)(2003), 23-28 [1 Ref].

The study presents an account of ambient air quality survey in the commercial and mixed zones of the city of Jodhpur, Rajasthan. Respirable Dust High Volume Air Sampler (APM-451, APM-411) was employed for the purpose. SPM concentration along with NO₂ and SO₂ contents in the air were determined and were found to be crossing the permissible limits at some spots.

Water Pollution

0303-054. Ahmad A, Alam M* (*Environ Sci Lab, Dept Appl Sci Humanities, Fac Engng Techno, Jamia Millia Islamia, New Delhi 110025). **Physico-chemical and toxicological studies of industrial effluents in and around Delhi and ground water quality of some areas in Delhi city.** *Cheml Environ Res*, 12(1&2)(2003), 5-13 [25 Ref].

The analyses and monitoring were conducted to evaluate the impact of different types of chemical, electroplating, textile and dyeing industry waste water on the river and

ground water. Water samples from the localities located on the side of Yamuna river and other areas in Delhi and industrial effluents of different types of industries were collected and analysed. Water quality parameters were very poor, except the samples collected from upstream.

0303-055. Amathussalam A, Abubacker MN, Jayabal N (PG Res Dev Chem, Natl Coll, Tiruchirapalli 620001, TN). **Impact of sugar mill effluent on ground water - a case study.** *J Indl Polln Contl*, 18(2)(2002), 119-124 [12 Ref].

Physico-chemical and micro-biological studies of sugar mill effluent polluted ground water in Eraiyur area of Permbalur District, Tamil Nadu indicated that EC, TDS, total hardness in terms of CaCO₃, BOD, COD ions level values are on the higher side of permissible limits of WHO standards. Microbiological studies revealed the presence of specific fungal species which are capable of growing in higher concentrations of bicarbonate and nitrates which in turn serve as indicator organism of such pollutants.

0303-056. Ao Meren, Bordoloi Sabitry (Kohima Sci Coll, Kohima 797002, Nagaland). **Amphibian distribution with respect to water chemistry in the wetlands of Kohima district, Nagaland, India.** *Aquacult*, 4(2)(2003), 259-263 [21 Ref].

The chemical characteristics of the breeding habitat of amphibia in Nagaland were analysed to see the possible role of water chemistry in the distribution pattern of amphibian fauna. Early life history stages of amphibian are vulnerable to various contaminants that accumulate in the water body. Samples of 100 potential amphibian habitats were analysed and distribution pattern of 24 species of amphibian has been discussed.

0303-057. Basu Arindam, Kumar Sunil, Mukherjee Somnath (Dept Civil Engng, Jadavpur Univ, Kolkata 700032). **Arsenic reduction from aqueous environment by water lettuce (*Pistia stratiotes* L.).** *Indian J Environ Hlth*, 45(2)(2003), 143-150 [17 Ref].

Arsenate uptake of aquatic plant water lettuce (*Pistia stratiotes* L.) was studied in the laboratory condition to investigate a low cost natural aquatic treatment system for pollutant removal. Bioaccumulation was noticed to be both concentration and duration dependent. The results show that the plant could effectively absorb arsenic between a

range of 0.25 to 5.0 mg/l to the extent of 82.0 to 22.8% for a biomass of 20g/l at pH 7.0 after 144 hours. The effect of biomass quantity has also been investigated along with some metabolic parameters.

0303-058. Chandrasekhar JS, Lenin Babu K, Somasekhar RK (Dept Environ Sci, Bangalore Univ, Jnanabharati, Bangalore 560056). **Impact of urbanization on Bellandur Lake, Bangalore – a case study.** *J Environ Bio*, 24(3)(2003), 223-227 [8 Ref].

The addition of effluents from urbanized Bangalore city has changed the characteristics of the Bellandur Lake from being a natural ecologically healthy lake to an artificial reservoir of domestic sewage and industrial effluents. The DO of the Bellandur Lake water ranged from 3.8-6.3 mg/l. The Bellandur Lake water BOD ranged from 89-99 mg/l due to absorption of pollutants by aquatic flora in lake system.

0303-059. Chatterjee Pinaki Ranjan, Raziuddin M (Dept Zoo, Kabi Nazrul Coll, Murarai, Birbhum 731219, West Bengal). **Analysis of physico-chemical parameters of Loco tank, a reservoir in Asansol town, West Bengal.** *Nature Env Polln Techno*, 2(2)(2003), 171-172 [5 Ref].

Paper deals with the analysis of physico-chemical parameters of a reservoir, called Loco tank in Asansol. The sewage from the surrounding areas continuously mixes with the waterbody. The effluents from various small-scale industries are also dumped into this reservoir. A significant level of variation was found in respect to these parameters. The results clearly indicate that the water of the reservoir is severely degraded.

0303-060. De AK (Raja Peary Mohan Coll, Uttarpara 712258, West Bengal). **Removal of lead and cadmium from water by adsorption on coal fly ash.** *Cheml Env Res*, 12(1&2)(2003), 31-36 [10 Ref].

Adsorption of Pb and Cd individually as well as from mixture of metal ions in aqueous medium on coal fly ash has been investigated. Column studies were conducted and the effect of various parameters affecting the adsorption has been determined. The maximum adsorption took place at pH 4.5-5.0 for Pb and at pH 3.1 for Cd. Among Pb and Cd, coal fly ash has higher affinity to adsorb Pb.

0303-061. Desai Anil, Mehta Mukesh K, Dwivedi VR (Dept Chem, Univ Coll Sci, ML Sukhadia Univ, Udaipur, Rajasthan). **Photocatalytic reduction of lead (II) over semiconducting powder.** *Polln Res*, 22(3)(2003), 397-401 [22 Ref].

Photocatalytic reduction of Pb(II) over semiconducting manganese dioxide was carried out. The progress of reaction was observed spectrophotometrically. The effect of variation of different parameters like pH, concentration of Pb(II), amount of photocatalyst, particle size, light intensity, etc. on the rate of photocatalytic reduction was observed. A tentative mechanism for this reaction has been proposed.

0303-062. Dixit RC, Verma SR, Nitnaware V, Thacker NP (Natl Environ Engng Res Inst, Nehru Marg, Nagpur 440020). **Heavy metals contamination in surface and groundwater supply of an urban city.** *Indian J Environ Hlth*, 45(2)(2003), 107-112 [4 Ref].

To ensure that the intake water derived from surface and ground water is clear and suitable for drinking the final water quality at Delhi have been evaluated. The final water supply of four treatment plants and 80 tubewells at Delhi were surveyed for heavy metals. The levels of manganese, copper, selenium and cadmium were found marginally above the Indian Standards (IS) specification regulated for drinking water. The data was used to assess the final water quality supplied at Delhi.

0303-063. Dwivedi BK, Pandey GC (Dept Environ Sci, Dr. RML Avadh Univ, Faizabad, 224001, UP). **An approach to improve water quality through photosynthetic bacteria.** *Nature Env Polln Techno*, 2(2)(2003), 145-152 [28 Ref].

The photosynthetic bacteria and cyanobacteria (*Pseudomonas*, *Oscillatoria rubescens*) were utilized for water quality improvement and detoxication of cyanotoxin, microcystin (MC) level for eutrophicated Maqubara pond under laboratory conditions. The mixed cultured bacteria were found to be more efficient in reducing MC level, pH, DO, BOD, free-CO₂ and sulphate than single cultured bacteria. *Oscillatoria rubescens* was found better in reducing the level of N, P and N/P ratio as compared to *Pseudomonas* singly and also in combination with *Pseudomonas*.

0303-064. Fokmare Anil K, Musadiq Mohammad (PG Dept Microbio, Shri Shivaji Coll, Akola 444001, MS). **Physiological responses of some bacteria to chromium from water bodies.** *Eco Env Conserv*, 9(1)(2003), 85-89 [19 Ref].

Physiological responses of some bacteria to chromium from water bodies has been worked out by using various parameters by micrometry, putrefaction and total viable count. Response of few bacteria to selected concentration of chromium varied. High concentration of chromium inhibited growth rate bio-chemical characteristics, enzyme activity and total viable count.

0303-065. Gandhirajan M, Selvi A (Tech Sharp Enviro Systems Pvt Ltd,, C-39, II Avenue, Anna Nagar, Chennai 600040). **Characterization and treatment of lead acid storage battery industry wastewater – a case study.** *J Indl Polln Contl*, 18(2)(2002), 183-190 [7 Ref].

A study on precipitation of lead acid storage battery industry wastewater was conducted. Results show that precipitation of lead as carbonate is more effective as compared to sulphide and hydroxide precipitations.

0303-066. Gangal Rajesh Kumar (Dept Chem, MLV Govt Coll, Bhilwara 311001, Rajasthan). **Phenomenal changes in ground water pollution caused by copper smelter at Khetri Zone (India) Part II.** *Int J Cheml Sci*, 1(2)(2003), 83-92 [9 Ref].

Comparative study of various ground water samples taken from Khetri copper smelter zone show an increasing and very conclusive postulate in regards to the increase in conductivity, chloride, and sulphate. Total hardness and decrease in pH causing pollution, due to seepage of effluent or other relevant causes. Even recycling process is unable to check the increasing trends of above parameters.

0303-067. Garg Jaya, Garg HK (HIG-50, A-Sec, Sonagiri, Bhopal 462021). **Bioassay response to additions of urea in simulated lake environments.** *Polln Res*, 22(3)(2003), 423-426 [21 Ref].

Three lentic water resources of Bhopal viz. Upper lake, Lower lake and Shahpura lake were studied for their limnochemical and biological characteristics. By adding different concentrations of urea, in microcosms developed from these reservoirs, an

effort has been made to evaluate the effect of nitrogen on hydrobiological parameters. On treatment with urea, microcosmal waters exhibited erratic fluctuations in the amount of total kjeldahl nitrogen. Concentration of nitrate was more in treated microcosms than the controlled ones.

0303-068. Garode AM, Bodhankar MG (Dept Microbio, Shri Shivaji Sci Coll, Chikhli 443201, Maharashtra). **Water pollution, health-hygiene and sanitation : rural awareness for improved environmental status of life.** *Nature Env Polln Techno*, 2(2)(2003), 167-169 [2 Ref].

The modern approach to improved water supply is to offer drinking water facilities together with sanitation facilities like latrines, drainage and hygiene education. Even simple messages of hand washing, disinfection of water, proper storage and withdrawal from container of drinking water and maintenance of water source and latrines and good street sanitation communicated with proper spirit have positive impact on health status.

0303-069. Guru Prasad B (Environ Engng Lab, Dept Civil Engng, KL Coll Engng, Guntur 522502, Andhra Pradesh). **Evaluation of water quality in Tadepalli mandal of Guntur district, AP.** *Nature Env Polln Techno*, 2(3)(2003), 273-276 [3 Ref].

Investigation is aimed to calculate Water Quality Index (WQI) of ground water and to assess the impact of pollutants due to agriculture and human activities on its quality. Ten physico-chemical parameters were monitored for calculation of WQI. The results varied from 35.338-224.358 mg/L indicating level of nutrient load and pollution in the hand pumps. The existing results revealed that waters of the study area was not safe for human use.

0303-070. Halder S, Dasgupta M, Ghosh UC (Dept Chem, Presidency Coll, Kolkata 700073). **Studies on management of arsenic contaminated waste Part-I : application of leaching and precipitation.** *J Indl Polln Contl*, 18(2)(2002), 213-221 [4 Ref].

Arsenic-rich waste is forming constantly due to decontamination of arsenic from the contaminated groundwater using coagulation-filtration and surface adsorption techniques. In order to manage the waste, an attempt has been taken on applying the chemical leaching followed by precipitation methods. It has been found that 0.5 (M)

solution of either NaOH or KOH is sufficient to leach arsenic to the maximum extent from the wastes.

0303-071. Hemasundaram A, Dhanalakshmi K, Prasad B, Naidu NVS (Dept Chem, SV Univ, Tirupati 517002). **Assessment of water quality with regard to surfactants in pilgrim town – a case study of Tirupati.** *Ultra Scient Phyl Sci*, 15(2)(2003), 189-194 [6 Ref].

Water pollution by surfactants in detergent formulation has become an environmental problem. Surfactant levels in waste water, surface water and subsurface water in and the surrounding areas of Tirupati, a famous pilgrim town in South India, has been studied. Results showed the presence of anionic alkylbenzene sulfonate (LAS) surfactants in appreciable amount in sub-surface water.

0303-072. Ingole NW, Bhole AG (Dept Civil Engng, Coll Engng, Badnera, Amravati 444701). **Study on nutrient removal potential of selected aquatic macrophyte.** *J Inst Engrs India (Environ Engng Div)*, 83(Sept)(2002), 1-6 [11 Ref].

The treatment efficiency of four aquatic plants, namely, water hyacinth, cattail, hydrilla and algae, for treatment of domestic wastewater has been compared. A batch study was conducted to determine the nutrient removal capacity of aquatic plants and to elucidate the uptake rate constants for four aquatic plants. It is concluded that water hyacinth has the highest treatment efficiency of domestic wastewater and has nutrient removal efficiency greater than the other aquatic plants tested.

0303-073. Isaiah S, Raja Edison, Kavitha B, Sivaraj C, Suganthi M (PG Res Dept Chem, Bishop Heber Coll, Tiruchirapalli 620017, Tamil Nadu). **Study of fluoride content in ground water, survey of dental fluorosis in Salem district.** *Eco Env Conserv*, 9(3)(2003), 297-300 [9 Ref].

Paper studies the level of fluoride in bore well, open well and in hand pump water of different places of Salem district and also to analyse other water quality parameters like alkalinity, electrical conductivity, hardness, pH, phosphate, solids, temperature and turbidity. The analysis shows a low fluoride level of 0.46 mg/l and high level of 1.52 mg/l in Salem district.

0303-074. Islam SR, Gyananath G (Sch Cheml Sci, Swami Ramanand Teerth Marathwada Univ, Vishnupuri, Nanded 431606). **Contamination of chemical fertilizers in groundwater.** *J Ecotoxicol Environ Monit*, 12(4)(2002), 285-290 [18 Ref].

Attempt is made to understand the implications of chemical fertilizers on ground water quality of Nanded. The mean sulphate, phosphate and nitrate concentration were studied. The mean recorded values of sulphate, phosphate and nitrate levels were found 10.26 – 34.83 mg/l, 0.052 – 0.194 mg/l and 3.43 – 11.37 mg/l, respectively. Sulphate and nitrate levels were within permissible limits but phosphate levels higher than the permissible limits.

0303-075. Jakher Ganga Ram, Rawat Mamta (Dept Zoo, Jai Narain Vyas Univ, Jodhpur 342005). **Correlation of nitrate and most probable number for a sewage fed pond, Gulab Sagar at Jodhpur city.** *Oikoassay*, 16(1)(2003), 13-14 [11 Ref].

Gulab Sagar, a sewage polluted pond at the mid of Jodhpur city was studied for two parameters – nitrate and most probable number (MPN). The relationship between both the parameters was noted as highly significant. The correlation co-efficient for nitrate and MPN was found to be 0.91 and the empirical parameters were determined to be $a = 46.25$ and $b = 12.48$.

0303-076. Jena B, Sudarshana R, Chaudhury SB, (Oceanogr Div, Natl Remote Sensing Agency, Hyderabad 500037, AP). **Studies on water quality parameters around Sagar Island, Sundarbans.** *Nature Env Polln Techno*, 2(3)(2003), 329-332 [2 Ref].

A field survey was conducted to study the coastal water quality of the Sagar Island, which plays a decisive role in coastal resource management. Some physico-chemical parameters and nutrients of the coastal water during the postmonsoon season were studied. Coastal waters associated with mangroves represented salinity range of 4 to 7 ‰. More than average values of dissolved oxygen (5.84 mg/l) are observed in the mangrove patches. In the mangrove regions, high nitrate concentration is related to the decomposition of mangrove leaf litter.

0303-077. Jothimani P, Bhaskaran A (Dept Environ Sci, Tamil Nadu Agricul Univ, Coimbatore 641003, Tamil Nadu). **Effects of dilution and dynamics of physical**

factors during factory effluent irrigation. *J Ecotoxicol Environ Monit*, 12(4)(2002), 255-261 [8 Ref].

A pot culture experiment was carried out to elucidate an appropriate dilution of dyeing factory effluent for irrigating agricultural crops and to assess the changes in soil pH, electrical conductivity and organic carbon during dyeing factory irrigation. Results showed that the effluent could be safely used for irrigation at proper dilutions (25 and 50%) in combination with NPK.

0303-078. Kalita J, Baruah BK, Choudhury M, Saikia S, Choudhury SK, Das M (Dept Sci, BK Coll Teacher Edn, Guwahati 781007, Assam). **Study on the effect of water pollutants on carbohydrate profile in fish *Heteropneustes fossilis* (Bloch).** *Aquacult*, 4(2)(2003), 237-240 [17 Ref].

Fishes (*Heteropneustes fossilis*) were exposed to water pollutants of municipal sewage of Guwahati city for a period of 165 days. The muscle carbohydrate content was analysed at every 15 days interval and compared that with control. Data revealed decline in carbohydrate concentration during the study period influenced by adverse environment.

0303-079. Kaushik A, Jain S, Dawra J, Sharma P (Dept Environ Sci Engng, Guru Jambheshwar Univ, Hisar 125001). **Heavy metal pollution in various canals originating from river Yamuna in Haryana.** *J Environ Bio*, 24(3)(2003), 331-337 [16 Ref].

Heavy metal pollution in the water of major canals originating from the river Yamuna in Haryana was studied. All these metals except Zn were found to be present in the Western Yamuna Canal (WYC) exceeding the maximum permissible limits. Concentrations of the metals were, however, relatively less in the highly eutrophicated waters of Agra canal and Gurgaon canal as compared to that in WYC but Fe concentration were much higher.

0303-080. Khedkar DD, Dixit AJ (PG Dept Bot, Govt Vidarbha Inst Sci Humanities, Amravati 444604, Maharashtra). **Physico-chemical analysis of domestic wastewater of Amravati (Maharashtra).** *J Aquatic Bio*, 18(1)(2003), 69-72 [16 Ref].

The physico-chemical characteristics of the wastewater generated by the vast population of Amravati has been analyzed. Though, the majority of the parameters were found within permissible limits, the sodium concentration in the wastewater exceeded the standards recommended by CPCB or WHO. Potassium concentration was found to be present in investigated water, can to some extent nullify the hazardous effects of sodium.

0303-081. Kulkarni JR, Shrivastava US (Dept PG Std Res Chem, GTP Coll, Nandurbar 425412). **Use of different adsorbents for the removal of chromium (VI).** *Cheml Environ Res*, 11(3&4)(2002), 233-238 [13 Ref].

Removal of hexavalent chromium by adsorption technique from aqueous solution using neem bark (*Azadirachta indica*), subabul charcoal (SC, *Leucina leucocephala*) has been studied and the results are compared with powdered activated charcoal (PAC). The adsorption efficiency of PAC and SC for Cr(VI) was maximum at pH 2.0 and for NB it was maximum at pH 6.0.

0303-082. Kulshrestha UC, Kulshrestha Monika J, Sekar R, Sastry GSR, Vairamani M (Analyt Environ Chem Div, Indian Inst Cheml Techno, Hyderabad 500007). **Chemical characteristics of rainwater at an urban site of south-central India.** *Atmos Env*, 37(21)(2003), 3019-3026 [18 Ref].

The pH variation and the chemical characteristics of rainwater have been studied during monsoons at Hyderabad, a city in south-central India. The pH varied from 5.5 to 7.2 with an average of 6.4 which is in alkaline range considering 5.6 as the neutral pH of cloud water with atmospheric CO₂ equilibrium. Out of 28 rain events, only two events were observed in acidic range (<5.6) which occurred after continuous rains.

0303-083. Kumar R, Verma N, Rao ALJ* (*Dept Biotechno, Punjabi Univ, Patiala). **Characterisation and treatment of tannery effluent using batch or anaerobic baffled reactor.** *Cheml Environ Res*, 11(3&4)(2002), 255-260 [12 Ref].

The reduction of the level of chromium and chemical oxygen demand (COD) in waste chrome liquor from tannery industry has been investigated. The chromium reduction achieved by groundnut shell powder (GNSP) treatment is 63-66% at pH 7.70.

The total chromium and COD of the effluent after treatment with GNSP using batch reactor and anaerobic baffled reactor has been reduced to 99.9% and 93% respectively.

0303-084. Malik DS, Bhanot M, **Negi KS (Dept Zoo Environ Sci, Gurukul Kangri Univ, Hardwar 249404, Uttaranchal)**. **Impact of distillery effluent on the water quality and phytoplankton in river Saung**. *Indian J Environ Sci*, 7(2)(2003), 163-167 [23 Ref].

Distillery effluent contains a large amount of dissolved organic matter and causes a severe damage to the aquatic life. The abundance of phytoplankton has been affected by highly polluted condition of river water, as indicated by decreasing trends in phytoplankton population in the study area. Multiple regression analysis has been made to establish the inter-relationships between the physico-chemical and biological conditions in river waters.

0303-085. Manimozhi V, Saravanathamizhan R (Chennai Petroleum Corp Ltd, Manali, Chennai 600068). **Design of an adsorber for phenol in the refinery wastewater using granular activated carbon by BDST method**. *J Indl Polln Contl*, 18(2)(2003), 191-199 [18 Ref].

Adsorbing of phenol on granulated activated carbon, based on Bed depth and Service time as principle methods has been investigated. In pilot column studies, granular activated carbon beds are fixed in the columns and used for trickling (in trickle bed reactor) flows continuously under defined conditions. The exhaustion of granulated activated carbon is measured as a function of treated phenolic wastewater.

0303-086. Manjapa S, Basavarajappa BE, Desai GP, Hotanahalli SS, Aravinda HB (Environ Sci Techno Std Cent, Bapuji Inst Engng Techno, Davanagere 577004, Karnataka). **Nitrate and fluoride levels in ground waters of Davanagere taluka in Karnataka**. *Indian J Environ Hlth*, 45(2)(2003), 155-160 [8 Ref].

Out of the 61 different borewell samples analysed, selected from different areas of Davanagere taluk, 26% of the samples are found to contain fluorides less than 0.50 PPM (lower safe limit prescribed by BIS) and 11.5% of the samples are found to contain more than 1.5 PM of fluorides (higher safe limit prescribed by BIS). Further, 16.00% of the borewell samples analyzed were found to contain more than 100.00 PPM of nitrates

(measured as NO₃ mg/L, safe limit prescribed by BIS). The values of fluorides and nitrates observed in different samples were in the range of 0.19-2.06 PPM and 0.08-308 PPM, respectively.

0303-087. Matkar LS, Gangotri MS (Dept Zoo, Fergusson Coll, Pune, MS). **Physico-chemical analysis of sugar industrial effluents.** *J Indl Polln Contl*, 18(2)(2002), 139-144 [12 Ref].

Paper studies the sugar industrial effluents toxicity to aquatic fauna and human health. The pH of the effluent is 4.00 and the observed concentration is 43000 mg/l for B.O.D. and 89760 mg/l for C.O.D. These are beyond the tolerance limit of the water causing shifting of the algal forms towards more tolerant zone leading to decrease in biodiversity. Total solids, total dissolved solids and suspended solids were also considerably high.

0303-088. Matkar LS, Gangotri MS* (*Dept Zoo, New Arts Comm Sci Coll, Ahmednagar 414001, M.S.). **Acute toxicity tests of sugar industrial effluents on the freshwater crabs, *Barytelphusa guerini* (H. Milne Edwards) (Decapoda, Potamidea).** *Polln Res*, 22(2)(2003), 269-276 [12 Ref].

It was observed that the test individuals died more rapidly at 45% and 50% of the effluent solution. The sugar industrial effluents was found to be highly toxic to the freshwater crabs, as the Lc 50 values for 24, 48, 72 and 96 hours are 6.784%, 5.709%, 5.257% and 4.845% respectively. The direct co-relation of toxicity to the concentration of the effluent was observed. It was also found that more than 0.5% of the effluents concentration is hazardous to the normal life and growth of these animals.

0303-089. Maya S (Trop Botanic Garden Res Inst, Pacha Palode, Thiruvananthapuram 695562, Kerala). **Pollution assessment of selected temple tanks of Kerala.** *Nature Env Polln Techno*, 2(3)(2003), 289-294 [15 Ref].

A study on the bacterial quality of water along with seasonal analysis of certain important physico-chemical parameters of some temple tanks in Kerala were done. The overall analysis indicates poor quality of water of temple tanks with organic pollution of faecal contamination. The details of the findings are enumerated.

0303-090. Meenakumari HR, Hosmani SP (Dept Std Environ Sci, Univ Mysore, Mysore 570006). **Bacteriological examination of ground water samples in and around Mysore city, Karnataka, India.** *Nature Env Polln Techno*, 2(2)(2003), 213-215 [8 Ref].

Study was aimed at assessing the coliform MPN/100 mL and *E. coli* level of ground water (open wells, bore wells) in various parts of Mysore city. The values of MPN/100 mL were found to vary from 3 to = 2400/100 mL. The high values of *E. coli* were observed in north and east parts of city. The large amount of unplanned release of sewage water into subsurface water is largely responsible for bacteriological pollution of ground water in area.

0303-091. Murali Krishna BC, Umashankar Shetty Y, Jayaprakash Narain KS (NMAM Inst Techno, Nitte, Karkala 574110). **Effect of contact time and stirring rate of fluoride removal by burnt brick clay powder.** *Polln Res*, 22(3)(2003), 365-367.

Batch adsorption studies were conducted to determine the effects of contact time and stirring rate on fluoride removal by burnt brick clay powder as an adsorbent. The fluoride removal by burnt brick clay powder was found to be function of contact time, stirring rate and dosage of adsorbent. The fluoride removal increased with increase in contact time, with increase in stirring rate and with increase in dosage of adsorbent.

0303-092. Muralidhar M, Gupta BP, Krishnani KK, Nagavel A (Centl Inst Brackishwater Aquacult, 75, Santhome High Rd, RA Puram, Chennai 600028). **Heavy metal and pesticide levels in shrimp culture areas of Nellore (Andhra Pradesh) and Tuticorin (Tamil Nadu).** *Aquacult*, 4(2)(2003), 153-159 [29 Ref].

In order to assess the levels of heavy metals and pesticides in shrimp farms, water samples were collected from commercial shrimp ponds and sea in Tuticorin area of Tamil Nadu. The concentration of heavy metals and pesticides in water were below detection level except for zinc, mercury and hexachloro cyclohexane (HCH). Low level of mercury concentration was noted in sea water at Tuticorin shrimp farm and Krishnapatnam creek water.

0303-093. Nath A (Cell Bio Toxic Lab, Dept Zoo, Patna Univ, Patna, Bihar). **Serum hormonal imbalance and altered reproductive physiology in fish due to aquatic**

ecotoxicity : a preventive approach. *J Ecophysio Occupl Hlth*, 3(1&2)(2003), 37-40 [26 Ref].

A number of selected wetlands of Patna, Vaishali and Muzaffarpur district of North Bihar were surveyed. Fishes, soil and water samples were collected from the various test zones for the assessment of pesticidal accumulation in water, soil and fish muscles respectively. A comparative analysis of the toxic status of different selected wetlands based on pesticidal accumulation were done. Various organochlorine group of pesticides incurred were α HCH, β HCH, γ HCH, aldrin, endosulfan, DDE, DDT etc.

0303-094. Pandey Suwarna, Parvej Suhel, Sayeed Iqbal, Haque Rizwanul, Bin-Hafeez Bilal, Raisuddin Sheikh (Ecotoxic Lab, Dept Medl Elementology Toxicol, Jamia Hamdard, New Delhi 110062). **Biomarkers of oxidative stress: a comparative study of river Yamuna fish *Wallago attu* (Bl. & Schn.).** *Sci Total Env*, 309(1-3)(2003), 105-115 [47 Ref].

Various oxidative stress biomarkers in gill, kidney and liver tissues in the Indian freshwater fish *Wallago attu* (Bl. & Schn.) were investigated. Fish were collected from two sites along the river Yamuna, which differ in their extent and type of pollution load. A comparison was made between the biomarker responses and general water chemistry at the two sites. The findings of the present investigation provide a rational use of oxidative stress biomarkers in aquatic ecosystem pollution biomonitoring.

0303-095. Pandit BR, Prajapati Sailesh (Dept Life Sci, Bhavnagar Univ, Bhavnagar 364002, Gujarat). **Physico-chemical property of chemical and dairy effluents near Bhavnagar, Gujarat.** *Nature Env Polln Techno*, 2(3)(2003), 341-344 [16 Ref].

Paper deals with study of some physico-chemical parameters of chemical and dairy effluents, which were dumped near agriculture fields of Bhavnagar. These effluents contain number of elements, which were useful for crops. Chemical effluent contains high amount of metals like Fe, Cu, Zn, Mn, Pb, Cd, Cr and Se, while they were absent in dairy effluents. It is suggested that the dairy effluent is not hazardous for using in irrigation after proper dilution.

0303-096. Patel KP, Pandya RR, Maliwal GL, Patel KC, Ramani VP (Micronutrient Proj, ICAR), Gujarat Agricul Univ, Anand Campus, Anand 388110). **Suitability of industrial**

effluents for irrigation around Bharuch and Ankleshwar industrial zone in Gujarat.
Polln Res, 22(2)(2003), 241-245 [6 Ref].

A survey was carried out around major industrial cities to study the level of contamination of different polluting elements in water-soil-plant system. The industrial effluents collected from different cities were found contaminated with all major polluting element. It contained TSS, COD, BOD above standard permissible limits for irrigation. The well water from Bharuch site was mainly contaminated with Cr and Mn whereas these from Ankleshwar site contained Fe above the standard limit for irrigation. The well water have shown salinity and alkalinity hazards.

0303-097. Pathade GR, Molleti VE, Deshmukh AM (PG Dept Microbio, YC Coll Sci, Vidyanagar, Karad 415124, Maharashtra). **Enteropathogenic bacterial studies on drinking water in Karad city with reference to drug sensitivity of the isolates.**
Nature Env Polln Techno, 2(2)(2003), 157-162 [9 Ref].

Studies were undertaken for microbiological analysis of drinking water samples from some hotels and schools in Karad, Maharashtra for 'Most Probable Number' (MPN) for coliforms and water borne enteropathogenic bacteria. Enteropathogenic bacteria like *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*, *Staphylococcus aureus*, *Shigella* species and *E.coli* were commonly found in school and hotel drinking water samples. More than 40% samples showed MPN more than 240 coliforms/100 mL and pathogenic isolates showed resistance to many antibiotics of common use.

0303-098. Pejaver Madhuri, Somani Vaishali, Borker Mangala (Zoo Dept, BN Bandodkar Coll Sci, Thane 400601). **Physicochemical studies of lake Ambegosale, Thane, India.** *J Ecobio*, 14(4)(2002), 277-281 [18 Ref].

Lake Ambegosale shows periodic infestation by *Pistia* sp. for last two-three years. The phosphates were always to be higher (0.0476 mg/l to 0.264 mg/l). Lower values of phosphates coincided with full growth of *Pistia* sp. while higher values coincided with decaying of *Pistia* sp. and its sinking with rainfall. Dissolved oxygen drops down to zero with full growth of *Pistia* sp. but calcium, silicates and hardness do not show any relation with growth of *Pistia* sp. in the lake.

0303-099. Prajapati R, Mathur R (Dept Zoo, Govt PG Coll, Mhow 453441, MP). **Statistical studies on the quality of ground water of Sheopurkalan town, M.P.** *Nature Env Polln Techno*, 2(2)(2003), 201-204 [5 Ref].

The water quality of different water resources at Sheopurkalan was studied for the assessment of its suitability for drinking purpose. Water samples, collected in rainy, winter and summer seasons, were analysed for various water quality parameters. In urban areas, people mainly depend upon municipal water supply, which often gets contaminated with domestic sewage, resulting in the outbreak of serious waterborne diseases.

0303-100. Purandara BK, Varadarajan N, Jayashree K (Natl Inst Hydro, Belgaum 590001). **Impact of sewage on ground water quality – case study.** *Polln Res*, 22(2)(2003), 189-197 [9 Ref].

Bellary nala which flows through Belgaum city carrying sewage and effluent water of Belgaum which was once a freshwater stream and now turned into a waste stream has been selected for detailed water quality analysis. The study revealed that the surface water flowing through the Bellary nala is completely deteriorated as indicated through dissolved oxygen concentration. It is observed that in industrial patches and adjoining areas of nala flows, there is an increase in salinity content that may turn into saline water in years to come if proper measures are not taken.

0303-101. Raghuraman V, Dawood Sharif S, Jamal Mohamed M, Dawood Nausheen*, Noojahan CM, Anbuganapathi G (*Dept Zoo, JVAS Coll, Chennai 600014). **Effects of tannery effluent on the oxygen consumption of larvivorous fish *Poecilia reticulata*.** *Indian J Environ Toxicol*, 12(2)(2002), 87-89 [10 Ref].

The effects of chrome liquor from tannery effluents on the oxygen consumption of the larvivorous fish, *Poecilia reticulata* was studied. Results showed that maximum reduction of oxygen consumption was observed in 60% concentration of the tannery effluent. Further a decrease occurred in oxygen uptake as the concentration of tannery effluent increased.

0303-102. Ravichandran S (Cent Water Resources, Anna Univ, Chennai 600025). **Hydrological influences on the water quality trends in Tamiraparani basin, south India.** *Environ Monit Assess*, 87(3)(2003), 293-309 [15 Ref].

Water quality variables were monitored at a downstream location in the Tamiraparani river. The presence of monotonic trend in all the water quality variables was confirmed, however, with independent direction of change. The changes induced in river flow by the addition of a stabilizing reservoir, the influence of seasonal and spatial pattern of monsoon rainfall across the river basin and the increased agriculture appear causative factors for the water quality trends seen in the Tamiraparani River system.

0303-103. Rawat Mamta (Dept Zoo, Jai Narayan Vyas Univ, Jodhpur 342005, Rajasthan). **Presumptive coliform count test for the assessment of faecal contamination of two water reservoir of Jodhpur region.** *Eco Env Conserv*, 9(1)(2003), 51-53 [14 Ref].

Paper discusses the direct and indirect factors affecting microbial fauna of the two water bodies of Jodhpur region. On the basis of the results, interpretation was made that the waters were considered to be unsatisfactory for drinking and other purposes throughout the year. The coliform number was maximum in June and July at Gulab Sagar and Takhat Sagar respectively, Also a tend of the fall of coliform number in winters, rise in summers and again maximum in rains were observed at both the reservoirs.

0303-104. Reddy RC, Kelkar PS, Rao RR, Pande SP (Natl Environ Engng Res Inst, Hyderabad Zonal Lab, IICT Campus, Hyderabad 500007). **Eutrophic status of Hussainsagar Lake in Hyderabad.** *J Inst Engrs India (Environ Engng Div)*, 83(Sept)(2002), 14-19 [12 Ref].

The studies conducted by NEERI revealed that the condition of the lake is hypereutrophic and the various human activities continue to pollute the lake. Paper describes the status of lake based on the water quality assessment carried out for a period of one year. The condition of the lake is observed to be hypereutrophic and its restoration may take long time because of accumulated nutrients in bottom sediments and continued addition of pollution load.

0303-105. Revathi K, Sharmili R, Sangeetha Usha (Dept Zoo, Ethiraj Coll Women, Chennai 600108). **Biochemical studies on the effect of organophosphorous compound on *Sarotherodon mossambicus* (Trewas).** *J Exptl Zoo India*, 6(2)(2003), 365-368 [4 Ref].

The presence of acute and prolonged toxicity is inclusive of all the biochemical changes in *Sarotherodon mossambicus* conducted to assess the precise mechanism of mode and action of Temephos. The LC₅₀ value of Temephos was determined and the biochemical parameters such as SGOT, SGPT, LDH and ACHE has been studied as diagnostic tools. Dose dependent increase in SGOT, SGPT and LDH was noticed in the results obtained. ACHE was inhibited by Temephos.

0303-106. Saigal Deepak, Saxena MM (Dept Zoo, Dungar Coll, Bikaner 334001). **Assessment of some hydrophytes in desalination of desert waters.** *Eco Env Conserv*, 9(3)(2003), 327-330 [7 Ref].

The application of three hydrophytes, *Elchornia*, *Hydrilla* and *Vallisnaria*, is explored in desalination of desert water as a cheap biotechnological solution to improve the quality of the resource. *Hydrilla* is found to efficiently reduce the salinity (EC, TDS) by bringing down Na⁺, K⁺, Ca⁺ and SO₄⁻. *Vallisnaria* too was effective by bringing down Ca⁺, Mg⁺ and Cl⁻. The role of *Eichornia* in reducing the salinity of water was very efficient through uptake of Na⁺, K⁺, Cl⁻ and SO₄⁻.

0303-107. Saxena KK, Chauhan RRS (Dept Zoo, JMV Ajitmal, Etawah, UP). **Oxygen consumption in fish, *Labeo rohita* (Ham.) caused by distillery effluent.** *Eco Env, Conserv*, 9(3)(2003), 357-360 [7 Ref].

The depletion of dissolved oxygen content in tap water and in effluent concentrations caused a stress and altered the normal oxygen consumption. The increase in the rate of oxygen consumption due to depletion of dissolved oxygen was statistically significant (P<0.05). With the increase in effluent concentration, a decrease in oxygen consumption by *Labeo rohita* was observed but this decrease was not statistically significant (P>0.05).

0303-108. Saxena VK, Singh VS, Mondal NC, Jain SC (Natl Geophysl Res Inst, Uppal Rd, Hyderabad 500007). **Use of hydrochemical parameters for the identification of**

fresh groundwater resources, Potharlanka Island, India. *Environ Geo*, 44(5)(2003), 516-521 [12 Ref].

A hydrochemical study has been carried out on the fresh groundwater resources of Potharlanka, Krishna Delta, India. Extremely low HCO_3/Cl and variable high Mg/Ca (molar ratios) indicated the transformation of the fresh groundwater aquifer systems to saline. A high percentage of the mixed water types indicates the possibility of simultaneous fresh groundwater dilution activity along with a seawater ingress/intrusion process. Low rainfall and excessive withdrawal of groundwater has caused the increase the saline water intrusion.

0303-109. Sharma Moti R, Bassin JK, Gupta AB (IPH Dept, M-26, HB Colony, Hamirpur 177001, HP). **A pollutional profile of Hathli stream in lower Himalayas.** *Polln Res*, 22(2)(2003), 237-240 [2 Ref].

Water quality of Hathli stream in Hamirpur district of Himachal Pradesh in lower Himalayan region was monitored. The study reveals that the water in the stream is heavily polluted. The major water quality parameters that exceed the permissible limits are BOD, TDS, hardness and alkalinity. The presence of coliforms is in excessive numbers.

0303-110. Sharma Moti Ram, Verma PS (Irrigation Publ Hlth Dept, M-26, Housing Bd Colony, Hamirpur 177001, Himachal Pradesh). **Water quality of springs in Hamirpur area of outer Himalayas.** *Polln Res*, 22(3)(2003), 369-372 [4 Ref].

From the analysis of water samples collected from natural springs in Hamirpur area of Himachal Pradesh, it is found that the physicochemical parameters are within the maximum permissible limits of drinking water standards. However, low fluoride and iron is observed in all the spring water samples. The study also reveals that water of the area is very hard and highly alkaline and is dominated by bicarbonate anion with calcium and magnesium cations.

0303-111. Shugi K, Singh Tony Sarvinder, Pant KK* (*Dept Cheml Engng, Indian Inst Techno, Hauz Khas, New Delhi 110016). **Equilibrium and kinetic studies on removal of arsenite by iron oxide coated activated alumina.** *Indian J Environ Hlth*, 45(2)(2003), 151-154 [12 Ref].

Iron oxide coated activated alumina was tested for its effectiveness as an adsorbent for As(III). The As (III) adsorption was strongly dependent on pH and a maximum removal of 98% was observed at a pH of 12. It was observed that time taken to attain equilibrium was independent of initial concentration but percentage removal decreased with increasing initial concentration.

0303-112. Sikdar PK, Banerjee S (Dept Env Manag, Indian Inst Socl Welfare Business Manag, Kolkata 700073). **Genesis of arsenic in groundwater of Ganga Delta – an anthropogenic model.** *ENVIS J Human Settlements*, April 2003, 10-24 [16 Ref].

In parts of seventy-three blocks and eleven municipalities of eight districts of West Bengal, arsenic has been found to occur in groundwater above permissible limit of 0.05 mg/l. The scientific community is of the opinion that the source of arsenic in groundwater is geological, being derived from various sources within the Bengal Basin both in the Himalayas and in the Peninsular India. But the hypothesis of geological source of arsenic has certain drawbacks, which have been highlighted and an alternative anthropogenic source of arsenic has been discussed.

0303-113. Singh Anil Pratap, Singh Jaswant (Global Sci Acad, Malviya Rd, Basti 272001). **Physico-chemical characteristics of river Ami in relation to discharge of paper mill effluent.** *Indian J Environ Hlth*, 45(2)(2003), 93-96 [10 Ref].

Attempt has been made to ascertain the present water quality condition of river Ami in relation to paper mill effluent discharge. The samples were collected from the upstream and downstream of the flow-path of the river from point source of pollution by the mill. The high degree of water quality degradation is reflected by the changes in values of BOD, COD, DO, nitrogen contents and chlorides etc in downstream.

0303-114. Sivakumar AA, Arunadevi P, Aruchami M (PG Res Dept Zoo, Kongunadu Arts Sci Coll, Coimbatore 641029, Tamil Nadu). **Studies on water quality of the river Ambarampalayam, Coimbatore district, Tamil Nadu.** *Nature Env Polln Techno*, 2(3)(2003), 305-308 [14 Ref].

Water quality of the river Ambarampalayam has been studied for physical qualities including suspended solids, dissolved solids and electrical conductivity and chemical qualities including the study of pH, carbonates, bicarbonates, alkalinity, etc. In

addition, nutrient content of the river was also determined and correlated with the physico-chemical parameters.

0303-115. Somanath Viswaranjan (PG Dept Environ Manag, Chhatrapati Shahu Centl Inst Business Edn Res, Shivaji Univ Rd, Kothapur 416004, Maharashtra). **Toxicity of tannery effluent to some aquatic animals.** *J Ecotoxicol Environ Monit*, 12(4)(2002), 277-284 [21 Ref].

Toxicity of tannery effluent to aquatic animals was studied by the standard static bioassay procedure. *Cyprinus carpio* (1 g) is the most sensitive and the hindlimb stage *Rana tigrina* is the most tolerant of all the tested animals. Eggs of *Mesogomphous lineatus* and *Culex pipiens quinquefasciatus* were equally sensitive to the effluent. The air-breathing fish *Channa striatus* was the least sensitive among the tested fishes. Sensitivity of the fish to effluent decreased with increasing body weight.

0303-116. Srinivas Tanuka, Kasim M Shaikh, Srinivasa Rao M (Dept Environ Std, Coll Engng GITAM, Visakhapatnam). **Study of water quality at solid waste dumping yards in Visakhapatnam.** *J Indl Polln Contl*, 18(2)(2002), 253-265 [11 Ref].

Sanitary land filling, composting and incineration are few of the best-known disposal methods for solid waste. Various physico-chemical characteristics of water collected from in and around dumping yards in the Visakhapatnam city are analysed. The results obtained from the analysis show a significant increase in iron concentration.

0303-117. Srivastava AK (Dept Appl Chem, UNS Inst Engng Techno, VBS Purvanchal Univ, Jaunpur). **A study on effects of toxic elements in Gomti river at Jaunpur.** *Eco Env Conserv*, 9(3)(2003), 375-377 [4 Ref].

The enormous quantity of domestic sewage waste water are continuously being added into Gomti river causing changes in the composition of water and ultimately life form of water bodies. This has been indicated by various parameters discussed in this paper. The problem can be controlled by using various mechanical treatments and by product of this treatment can be used to manufacture fertilizer.

0303-118. Sudha Rani P, Manikya Reddy P (Dept Environ Sci, Osmania Univ, Hyderabad 500007). **Preliminary studies on metal concentration on Hussain Sagar Lake.** *Polln Res*, 22(3)(2003), 377-380 [21 Ref].

Paper deals with the concentration of heavy metals in the highly polluted Hussainsagar Lake. Surface water samples from six spots were collected throughout the lake and heavy metals analysed were manganese, chromium, zinc, molybdenum, lead, cobalt, cadmium and iron. The results have shown that the concentration of iron, zinc, and cobalt is high as compared to WHO and ICMR. The values of other heavy metals are found within permissible limits.

0303-119. Sudha Rani P, Manikya Reddy P, Reddy RC (Div Environ Sci, Osmania Univ, Hyderabad 7). **Acute toxicity to lake waters to fishes.** *Indian J Environ Hlth*, 45(2)(2003), 133-138 [7 Ref].

Experiments were conducted on three species of fishes using 5, 10 and 20% volume of Jeedimetla nallah wastewater and were observed for the signs of survival within the specified period of time. The TLm value for 96 hours test period was found to be 17%. Similarly toxicity studies were carried out on Hussainsagar lake water with dilution varying from 10-100%. Absence of mortality during 96 hours of test period indicates that there is no acute toxicity of Hussainsagar lake water to fishes.

0303-120. Sujatha D (Natl Geophysl Res Inst, Uppal Rd, Hyderabad 500007). **Fluoride levels in the groundwater of south-eastern part of Ranga Reddy district, Andhra Pradesh, India.** *Environ Geo*, 44(5)(2003), 587-591 [9 Ref].

In the study area, situated in the Ranga Reddy district, Andhra Pradesh, the concentrations of fluoride in the groundwater vary from 0.7 to 4.80 mg/l and from 0.4 to 4.20 mg/l during the pre and post-monsoon seasons respectively. By contrast, the fluoride concentration in many places was relatively high during the post-monsoon period. This indicates contamination of groundwater from surface pollutants.

0303-121. Sujatha D, Rajeswara Reddy B (Dept Appl Geochem, Osmania Univ, Hyderabad 500007). **Quality characterization of groundwater in the south-eastern part of the Ranga Reddy district, Andhra Pradesh, India.** *Environ Geo*, 44(5)(2003), 579-586 [19 Ref].

Hydrogeochemical investigation were carried out in the south-eastern part of the Ranga Reddy district, Hyderabad, India, to assess the quality of groundwater for its suitability for domestic and irrigation purposes. The results showed that the concentrations of these ions are above the permissible limits for drinking and irrigation purposes. The pollution with respect to NO_3^- , Cl^- , and F^- is mainly attributed to the extensive use of fertilizers and large-scale discharge of municipal wastes into the open drainage system of the area.

0303-122. Swami A, Ramteke DS*, Sarin R (*Natl Environ Engng Res Inst, Nehru Marg 440020). **Use of modified bark (*Artocarpus heterophyllus*) for the removal of cadmium from aqueous phase.** *Cheml Environ Res*, 11(3&4)(2002), 339-343 [12 Ref].

Among the environmental pollutants, cadmium merits a special reference as a potentially toxic element. This leads to potential health hazard to men and animals. Several techniques are available for the removal of heavy metals from aqueous medium. Paper deals with the investigation on the use of *Artocarpus heterophyllus* (jack fruit) bark for the removal of heavy metals.

0303-123. Tharavaty NC, Hosetti BB, Krishnamoorthy M (PG Dept Bio Sci, Mangalore Univ, Mangalore 514199). **Model waste stabilization ponds for assessing copper toxicity to algae and protozoa.** *Int J Mendel*, 20(1-2)(2003), 51-52 [11 Ref].

Municipal wastes and industrial effluents contribute number of heavy metals to the aquatic environment. Heavy metals and persistent chemicals and survival of aquatic organisms exposed to heavy metals depends upon their tolerance capacity. The work investigates the effects of copper sulphate on physico-chemical and biological parameters and also on the diversity of algae and protozoa of sewage stabilization ponds under laboratory conditions.

0303-124. Tripathy JK (Ocean Sci Techno Cell Marine Coastal Eco, Berhampur Univ, Bhanja Bihar, Berhampur 760007). **Groundwater hydrochemistry in and around Bhanja Bihar, Ganjam district, Orissa.** *Polln Res*, 22(2)(2003), 185-188 [9 Ref].

Groundwater samples in and around Bhanja Bihar were analysed to determine their total dissolved solids as well as the concentration of major ions. Analysis results show that the groundwater is fit for human consumption as far as their major ions are

concerned and the said ions are within the permissible limits, set by ISI, ICMR and WHO. The $\text{Cl}^-/\text{HCO}_3^-$, and $\text{Mg}^{++} / \text{Ca}^{++}$ values clearly indicate that the aquifers are free from any salt water ingress from the sea as is the case with several localities along the coast.

0303-125. Umar R, Absar A (Dept Geo, Aligarh Muslim Univ, Aligarh 202002). **Chemical characteristics of groundwater in parts of the Gambhir River basin, Bharatpur District, Rajasthan, India.** *Environ Geo*, 44(5)(2003), 533-545 [17 Ref].

Twenty-nine dug well samples have been collected from the Gambhir River basin in the Bharatpur District of Rajasthan State in India for hydrogeochemical study to understand the sources of dissolved ions and assess the chemical quality of the water. The groundwaters have a chemical composition within the permissible limits suggested for drinking water. Nitrate is higher than the acceptable limit in some samples, due to the use of fertilizers.

0303-126. Usha Madhuri T, Deepthi A (Dept Environ Std, Coll Engng, GITAM, Visakhapatnam 530045, AP). A study of salinity intrusion in coastal aquifers of Visakhapatnam. *Nature Env Polln Techno*, 2(3)(2003), 315-316 [1 Ref].

Salinity is the most common pollutant in groundwaters near coastal areas. Intrusion of saline water occurs where it displaces or mixes with freshwater in an aquifer. The phenomenon can occur in deep aquifers with the upward advance of saline waters of geologic origin. The possibility of encroachment of seawater in coastal areas of Visakhapatnam has been studied.

0303-127. Usha Madhurai T, Suseela SV (Dept Environ Std, Coll Engng GITAM, Visakhapatnam 530045, A.P.). **A study of groundwater pollution at Shivajipalem, a solid waste dumping station in Visakhapatnam.** *Nature Env Polln Techno*, 2(2)(2003), 245-246 [1 Ref].

Water is a natural resource of fundamental importance. The quality of water depends upon the location of the source and the state of environmental protection in a given area. For water to be potable it should be of right quality, i.e. safe and wholesome. A ground water quality survey has been carried out in and around Shivajipalem, a solid

waste dump yard to assess the extent of ground water pollution and the suitability of water for use.

0303-128. Varadarajan N, Purandara BK (Natl Inst Hydro, Regl Cent, Hanuman Nagar, Belgaum 590001, Karnataka). **Hydrochemical characteristics of groundwater : a case study.** *Eco Env Conserv*, 9(3)(2003), 253-262 [8 Ref].

The chemical characteristics of groundwater in Malaprabha Sub-basin of Belgaum District, Karnataka have been studied during the pre-monsoon and post-monsoon seasons to evaluate the suitability of water for domestic and irrigation purpose. The quality of groundwater in the upstream region of the sub basin is quite acceptable for both the uses, whereas in the downstream region various parameters exceeds the acceptable limits due to excessive irrigation by excess application of fertilizers and pesticides. In addition to this fluoride is observed in excess along the downstream region of the sub basin.

0303-129. Vasanth Kumar K (Dept Environ Engng, Vellore Inst Techno, Vellore 632014, Tamil Nadu). **Treatment of dye bearing wastewater by adsorption technique using boiler bottom ash as an adsorbent.** *Nature Env Polln Techno*, 2(2)(2003), 225-228 [7 Ref].

Experiments were carried out in a batch process for removing color of methylene blue, a basic dye, from its aqueous solution by adsorption technique using boiler bottom ash as an adsorbent. The operating variable studied were initial concentration and adsorbent dosage. Up to 100% color removal was obtained at lower initial concentration of less than 15 mg/l.

0303-130. Veera Bhadrani K (Dept Environ Std, Coll Engng, GITAM, Visakhapatnam 530045). **Quality evaluation of ground water pollution through modelling technique.** *Ultra Scient Phyl Sci*, 15(2)(2003), 285-288 [5 Ref].

Due to industrial belt in prominent pockets of the city Visakhapatnam the ground water quality is depleted. Finally the effluent are reaching the ground water table. The quality of the water can be modified, due to mixing of effluents, which can modify the water quality in the surrounding areas. Attempt has been done to identify the sources using modeling techniques.

0303-131. Verma HK, Tenguria RK, Saluja DS (Dept Bot, JH Govt PG Coll, Betul 460001, MP). **Characterization of effluent from a soybean processing oil mill at Kosmi industrial area of district Betul, M.P.** *Nature Env Polln Techno*, 2(2)(2003), 221-223 [3 Ref].

Paper deals with pollution of water from an oil mill processing soybean seeds for production of refined soya oil. The effluent samples were analyzed for several physico-chemical characteristics to analyze the extent of water pollution. The results show that the effluent coming out of oil processing is heavily polluted and required proper treatment before it is discharged on land or utilized in horticulture and agriculture.

0303-132. Yadav Anil Kumar, Jain PK, Sharma Jyoti (Dept Chem, MLV Govt PH Coll, Bhilwara, Rajasthan). **Assessment of ground water quality of Behror tehsil of Alwar District (Rajasthan).** *Aquacult*, 4(2)(2003), 265-270 [10 Ref].

Physico-chemical studies regarding the water quality assessment of some villages of Behror Tehsil was conducted. The value of these parameters shows the water quality is totally unfit for drinking purpose because all the water bodies were found to contain high levels of inorganic salts, nitrate, fluoride and hardness which is harmful for the health of the consumer.

Noise Pollution

0303-133. Bhattacharya CC, Jain SS*, Singh SP, Parida M (*Dept Civil Engng, Indian Inst Techno, Roorkee). **R&D efforts in prediction of highway traffic noise.** *J Inst Engrs India (Environ Engng Div)*, 83(Sept)(2002), 7-13 [24 Ref].

The noise impact analysis is carried out as a part of the environmental impact analysis for any highway improvement. The review of the research and development efforts made in highway traffic noise prediction reveals that the traffic noise prediction is done using mathematical modeling. The paper describes the details of various noise prediction models adopted for the prediction of highway traffic noise around the world.

0303-134. Naik Shrikanta, Purohit KM* (*Dept Chem, Regl Engng Coll, Rourkele 769008). **Studies on noise pollution levels in residential areas at Bondamumba of Rourkela industrial complex.** *Polln Res*, 22(3)(2003), 433-438 [6 Ref].

Noise levels were measured at ten residential locations at Bondamunda both during day and night time. The noise levels varied from 42.5 to 75.6 dB (A) during day time and 41.3 to 64.7 dB (A) during the night time. The average Leq values at individual locations varies from 55.03 to 67.15 dB(A) and 45.6 to 56.81 dB(A) in day time and night time respectively, while other parameters like 1_{10} , 1_{50} , 1_{90} , 1_{np} and TNI were also computed for that hour. The implications of these results are discussed.

0303-135. Usha Madhuri T, Amruthavalli, Shivakumar (Dept Environ Std, Coll Engng, GITAM, Visakhapatnam 530045, Andhra Pradesh). **A study on noise pollution in some silence zones of Visakhapatnam, Andhra Pradesh.** *Nature Env Polln Techno*, 2(2)(2003), 163-165.

Noise pollution affects human health, comfort and efficiency. The effects of noise pollution on human beings may be auditory or non-auditory, psychological or pathological. A noise survey was carried out in some silence zones in Visakhapatnam, noise pollution levels calculated and compared with standards and the necessary control measures suggested.

0303-136. Vardhan Harsha, Karmakar NC, Rao YV (Dept Mining Engng, Natl Inst Techno, Surathkal 575025, Karnataka). **Impact of noise on miners – a critical review.** *Polln Res*, 22(3)(2003), 311-325 [49 Ref].

Acoustic pollution is a significant mine environmental system problem. It can be defined as a sound without agreeable quality or as unwanted sound. The noise of the levels higher than the standards laid down by the Ministry of Environment and Forest must be abated not only to achieve greater percentage of production, but also to restore physical health of workers at work place. Paper focuses on the adverse effects of noise on workers in mining industry.

0303-137. Veera Bhadrani K (Dept Environ Std, Coll Engng, GITAM, Rushi Konda, Visakhapatnam 530045, A.P.). **Noise pollution status in Visakhapatnam city.** *Nature Env Polln Techno*, 2(2)(2003), 217-219.

A study was carried out to know the noise levels in different parts of Visakhapatnam city with heavy traffic. The data were compared with standards and recommendations made to overcome the noise pollution in urban areas. The traffic noise indicator due to traffic flow is also calculated. Among all the source, the motor vehicle noise constitute the single biggest source of noise pollution.

Ecology

0303-138. Anandapandian KTK, Rajendran K (Dept Microbio, Thiagarajar Coll, Madurai 625009, Tamil Nadu). **Assessment of microbial diversity in rhizosphere of tree species in south Tamil Nadu.** *Nature Env Polln Techno*, 2(2)(2003), 153-156 [15 Ref].

The study was undertaken to know the microbial diversity and population in rhizosphere and non-rhizosphere soil of forestry species such as teak, neem, casurina and prosopis trees in south part of Tamil Nadu. The analysis of rhizosphere and non-rhizosphere soil samples showed that both the soil samples contain representative groups of microbial population such as bacteria and fungi having *Azotobacter*, *Beijerinckia* and VAM fungal spores.

0303-139. Ansari AH, Sunil Kumar S (Dept Chem, Saifia PG Coll Sci Edn, Bhopal 462001). **Effect of nitrate input on the release of phosphorus from a tropical lake sediment.** *Dimensions Polln*, 2(2003), 120-126 [10 Ref].

Study determines the effect of nitrate input on the phosphorous exchange across the sediment water interface of a tropical lake. Aerobic, undisturbed and resuspended sediment cores showed increased release of total phosphorus (TP) and SRP with increases in the addition of nitrate, while anaerobic, undistributed and resuspended sediment cores showed a decreasing trend in the release of TP and SRP with increased concentration of nitrate.

0303-140. Arjariya Amita (Dept Bot, Govt Maharaja Coll, Chhatarpur 471001, MP). **Physico-chemical profile and plankton diversity of Ranital lake, Chhatarpur, M.P.** *Nature Env Polln Techno*, 2(3)(2003), 327-328 [4 Ref].

Paper presents the results of the physico-chemical and plankton characteristics of Ranital lake in Chhatarpur (M.P.). The data indicate that the lake has a pH in the alkaline range between 7.3 and 8.9. The phytoplankton is dominated mainly by the species of Cyanophyceae, Chlorophyceae and diatoms, which belong to the tolerant species. Zooplankton was represented by 10 genera covering different groups.

0303-141. Borse SK, Lohar PS, Bhave PV (Dept Zoo, Art Sci Comm Coll, Chopda 425107, Maharashtra). **Hydrobiological study of algae of Aner river, Jalgaon (Maharashtra).** *J Aquat Bio*, 18(1)(2003), 15-18 [16 Ref].

Water and algal samples were collected fortnightly over a period of one year from two sampling stations. Three groups of algae were recorded from two stations of the river. Algae are pollution indicators, so these can be used for assessing the water quality of the river. The pollution indicating algae were not observed in the river water, so the water can be utilized for drinking and domestic purposes.

0303-142. Chari KB, Abbasi SA* (Cent Polln Contl Energy Techno, Pondicherry Univ, Kalapat, Pondicherry 605014). **Assessment of impact of land use charges as on the plankton community of a shallow fresh water lake in south India by GIS and remote sensing.** *Cheml Environ Res*, 12(1&2)(2003), 93-112 [38 Ref].

Efforts are made to delineate the land-use and land-cover of Oussudu catchment (Pondicherry, India) using remote sensing, GIS and ground-truth survey and associate the likely implications of land-use on the plankton community during the years 1997, 1999 and 2000. Paper investigates the detailed quantitative and qualitative characteristics of the plankton population during 1999 and 2000. Based on the study some specific recommendations have been made.

0303-143. Das SK (Dept Fishery Bio, WBUAFS, Mohanpur Campus, Nadia 7411252, West Bengal). **Primary production and zooplankton biodiversity in brackish water shrimp culture pond.** *J Ecobio*, 14(4)(2002), 267-271 [16 Ref].

Dynamics of net primary production of zooplankton biodiversity was monitored at fortnightly intervals for two years in a traditional shrimp culture pond located in northern part of Ganjam district in Orissa. The primary peak of net primary production was during September and other peaks were during late December – early January and April

respectively. A significant negative correlation ($P= 0.01$) between net primary production and zooplankton population might be due to grazing.

0303-144. Jha Mohan (Indian Coun Forests Res Edn, Dehra Dun, Uttaranchal). **The preliminary study of ecosystems and biodiversity in Lonar crater.** *Indian Forester*, 129(10)(2003). 1192-1200 [11 Ref].

The Lonar crater, situated in Buldhana Forest Division in Maharashtra is having many micro ecosystems with fascinating biodiversity. Some preliminary observations in this regard indicate that there exist about nine micro-ecosystems, about fourteen types of blue green algae, five types of alkaliphilic bacteria, 57 birds species, and variety of reptiles, mammals, snakes, bats and colourful butterflies. About 237 plant species belonging to 153 genera and representing 70 families have been recorded in the Lonar crater.

0303-145. Kadam TA, Jadhav VD, Gyananath G (Sch Life Sci, SRTM Univ, Nanded 431606, Maharashtra). **Microbial degradation of dimethoate by gram negative soil isolates from cotton field.** *Polln Res*, 22(3)(2003), 443-445 [13 Ref].

Dimethoate degrading mixed bacterial culture was enriched from soil with history of dimethoate exposure. Enrichment was obtained by using the insecticide as the sole source of carbon. Chemical hydrolysis was minimized by using strongly buffered culture medium pH (6.8). No growth occurred in control cultures in the absence of dimethoate. Degradation of the insecticide occurred concomitantly with bacterial growth.

0303-146. Kalra Naveen, Jain MC, Joshi HC, Chaudhary R, Kumar Sushil, Pathak H, Sharma SK, Kumar Vinod, Kumar Ravindra, Harit RC, Khan SA, Hussain MZ (Div Environ Sci, Indian Agricl Res Inst, New Delhi 110012). **Soil properties and crop productivity as influenced by flyash incorporation in soil.** *Environ Monit Assess*, 87(1)(2003), 93-109 [13 Ref].

Field experiments were carried out to evaluate changes in soil characteristics and growth of crops by varying amounts of flyash addition in soils at sowing/transplanting time of crops. Shoot and root growth and yield of test crops at different locations after flyash incorporation resulted in beneficial effects of flyash

addition in most cases. The silt dominant texture of flyash improved loamy and to sandy loam textures of the surface soils at the farmers' fields.

0303-147. Kamat Sima V (Dept Bot, PES Coll, Farmagudi, Ponda, Goa 403401). **Bioecological observations of the aquatic macrophytes of the wetlands of Goa.** *Eco Env Conserv*, 9(3)(2003), 385-390 [13 Ref].

Wetlands are transitional systems. Wetlands in Goa are used for paddy cultivation. Macrophytes growing in these wetlands have different uses, one of them being they form fertilizers for the rice cultivated there in. Maximum growth of macrophytes is noticed in winter season.

0303-148. More YS, Nandan SN (Dept Bot, Kr AMP, Kai NKP Sci Coll, Pimpalner, Dist Dhule 424306). **Hydrobiological study of algae of Panzara Dam (Maharashtra).** *Eco Env Conserv*, 9(3)(2003), 367-369 [10 Ref].

The Panzara dam water was analysed for its water quality and biological aspects in relation to algae. The dam is situated on Panzara river of Khandesh area of Maharashtra. The most pollution tolerant genera and species of four groups of algae were recorded from three stations of dam were assessed for.

0303-149. Nandan SN, Kumavat MR (PG Dept Bot, SSVPS's LK Dr PR Ghogrey Sci Coll, Dhule 424005, MS). **Limnological study of algae of Aner river of Dhule (Maharashtra), India.** *Eco Env Conserv*, 9(1)(2003), 105-107 [14 Ref].

Paper studies the limnological aspects of algae of Aner river of Dhule district. The density of population of four groups of algae viz. *Bacillariophyceae*, *Cyanophyceae*, *Chlorophyceae* and *Euglenineae* was estimated at every month. The correlation of physico-chemical parameters with algal composition of four groups was made.

0303-150. Nandi NC, Das SR (Zool Surv India, M Block, New Alipore, Kolkata 700053). **Diversity and population density of macrozoobenthos and zooplankton of south 24-Parganas district, West Bengal.** *J Aquacult Bio*, 18(1)(2003), 41-46 [15 Ref].

Six man-made brackishwater wetlands (*bheries*) and four natural estuarine wetlands (creek) and adjoining mudflats have been surveyed for diversity and population

density of macrozoobenthos and zooplankton of South 24-Parganas district, West Bengal. The population density of zooplankton represents higher values in man-made *bheries* than natural estuarine creeks. In general, there is a tendency of diminishing overall population density of zooplankton with the increase in salinity in the man-made *bheri* systems.

0303-151. Nath A, Verma Prakriti, Chand GB, Sinha Anuja (Cell Bio Toxico Lab, Dept Zoo, Patna Univ, Patna 800005). **Degenerative changes in the ovarian cells of *Clarias batrachus* due to altered physico chemical parameter of wetlands.** *J Ecophysio Occupl Hlth*, 3(1&2)(2003), 153-159 [12 Ref].

Various ovarian changes have been encountered in *Clarias batrachus* of a pond near R. N. College, Hazipur (pond B) and compared with the fish of Mithapur Fisheries Research Institute, Patna (pond A) which is free from any anthropogenic pollution. A comparative study of various physico-chemical parameter of both the ponds have clearly shown the altered physico-chemical condition of pond (B). The abnormalities observed have been correlated with the low level of Ca^{++} and DO and enhanced level of BOD, COD and SO_4 .

0303-152. Piska Ravishankar, Venkateshwar C (Dept Zoo, Univ Coll Sci, Osmania Univ, Hyderabad 500007). **Cyanobacterial blooms and their effect on tilapia, *Oreochromis mossambicus*.** *Polln Res*, 22(3)(2003), 447-449 [14 Ref].

Study deals with the formation of cyanobacterial blooms in eutrophicated waterbodies and their effect on tilapia, *Oreochromis mossambicus*. The size of the waterbody has no impact on incidence of cyanobacterial blooming. The bioassay experiments on tilapia indicate that fish death occurs in between 18-20 hours after toxin administration. The fish died due to respiratory failure, liver damage and haemorrhages, which indicates neurotoxic and hepatotoxic nature of toxins.

0303-153. Prasad Bijay Bhusan, Singh RB (Aquatoxicol Lab, SNS Coll, Motihari 845401, Bihar). **Composition abundance and distribution of phytoplankton and zoobenthos in a tropical water body.** *Nature Env Polln Techno*, 2(3)(2003), 255-258 [15 Ref].

Among algae, six taxa were pollution tolerant, five moderate to pollution and remaining clear water forms. Zoobenthos showed distinct quantitative variations.

Number of zoobenthos increased in the summer months while decreased in the winter months. Different groups of zoobenthos exhibited their distinct peaks in different months of the year.

0303-154. Prasad NV (Dept Zoo, Andhra Univ, Visakhapatnam 530003, AP). **Composition and abundance of meroplankton in Coringa mangrove ecosystem, Kakinada, Andhra Pradesh with special reference to aquaculture.** *J Aquat Bio*, 18(1)(2003), 29-34 [30 Ref].

During the period of investigation on hydrographical and planktonological studies, the meroplanktonic population were encountered in considerable numbers throughout the year. The highly fluctuating hydrographical parameters and tidal circulation play an important role in maintaining the endemic population of these larvae. The post larvae of prawn and crabs shows direct relationship with the abundance of phytoplankton and detritus.

0303-155. Pulle JS, Khan AM (Dept Chem, SGB Coll, Purna, Jn.). **Phytoplanktonic study of Isapur dam water.** *Eco Env Conserv*, 9(3)(2003), 403-406 [15 Ref].

Paper deals with the study of the seasonal changes in phytoplankton population in Isapur dam. Qualitative and quantitative analysis of phytoplanktons were carried out. Forty three phytoplankton species were recorded out of which the chlorophyceae was represented by 18 species, bacillariophyceae by 10, cyanophyceae by 10 and euglenophyceae by five.

0303-156. Ratha SK, Naik K, Padhi SB (Algal Res Lab, Dept Bot, Berhampur Univ, Berhampur 760007). **Epiphytic algal diversity associated with different aquatic macrophytes of freshwater ponds in and around Berhampur University campus, Orissa.** *Nature Env Polln Techno*, 2(2)(2003), 205-208 [8 Ref].

The study to search for epiphytic algal diversity associated with aquatic plants from 10 different sites in and around the Berhampur University campus revealed the strong potential epiphytic association in spite of the unfavourable ecological conditions. However, significantly greater number of blue green algae (BGA) with a very marked degree of adaptation to the condition of an aquatic environment have been reported.

0303-157. Raut Narayana S, Pejaver Madhuri K (Dept Zoo, BN Bandodkar Coll Sci, Thane 400601, Maharashtra). **Study on biodiversity of some macrophyte infested lakes from Thane city.** Maharashtra. *Nature Env Polln Techno*, 2(3)(2003), 277-281 [15 Ref].

The three lakes studied showed abundance of three different species of macrophytes namely *Lemna minor*, *Pistia stratiotes* and *Eichhornia crassipes*. Similarly, from total 35 species of phytoplankton observed, 19 were common to uninfested and infested lakes but 16 species were seen only in infested lakes and 12 only in uninfested lakes. Similarly, among the zooplanktons rotifers, which are considered the pollution indicators, 10 species were found in infested lakes out of which 4 were common to infested and uninfested lakes, proving the change in biodiversity.

0303-158. Reddi EUB (Dept Environ Sci, Andhra Univ, Visakhapatnam 530003). **A study on impact of hinterland farm practices on Coringa mangroves with some eco-economic and sustainable solutions.** *Eco Env Conserv*, 9(3)(2003), 249-251 [4 Ref].

To identify reasons for the degradation of Coringa mangrove ecosystem, the impacts of changed land use pattern, such as cropping composition in the agriculture and the consequential imbalances and acute shortages in the societal basic resources base viz., fodder, fuel wood and timber in the hinterland area, over mangroves are analysed and some eco-economic and sustainable solutions are offered.

0303-159. Salaskar PB, Yeragi SG (Maharashtra State Angling Assoc, Powai Lake, Powai, Mumbai). **Seasonal fluctuations of plankton population correlated with physico-chemical factors in Powai lake, Mumbai, Maharashtra.** *J Aquat Bio*, 18(1)(2003), 19-22 [33 Ref].

Limnological survey of Powai lake, Mumbai was undertaken to investigate the various changes in its hydrobiological features during the pre-monsoon, monsoon and post-monsoon seasons and co-related the same with the plankton productivity. The present investigation showed an inverse relationship between pH and free carbon dioxide content, which also appeared to be seasonal. There was also a direct relationship between dissolved oxygen and phytoplankton bloom.

0303-160. Sedamkar Eshwarlal, Angadi SB (Phyco Lab, Dept Bot, Gulbarga Univ, Gulbarga 585106, Karnataka). **Physico-chemical parameters of two fresh waterbodies of Gulbarga-India, with special reference to phytoplankton.** *Polln Res*, 22(3)(2003), 411-422 [19 Ref].

The physico-chemical parameters with special references to phytoplanktons in two standing fresh waterbodies of Gulbarga were investigated. The observations indicate that high levels of physico-chemical parameters influence the growth of phytoplanktonic groups in Jagat tank. While comparatively low productivity was noticed in mesotrophic Pala tank due to lesser quantity of nutrients. The correlation and inter-correlation among the physico-chemical parameters and phytoplanktonic groups have also been made.

0303-161. Sinha Bikramjit, Islam MR (Eco Lab, Dept Zoo, Cotton Coll, Guwahati 781001, Assam). **Seasonal variation in zooplankton population of two lentic bodies at Assam State Zoo cum Botanical Garden, Guwahati, Assam.** *Eco Env Conserv*, 9(3)(2003), 391-397 [18 Ref].

Paper presents the result of study on seasonal variation in composition and abundance of zooplankton in relation to temperature and transparency of one fenced and another open pond of Assam State Zoo cum Botanical Garden, Guwahati. The results revealed that the fenced pond is less diverse but more dense than the latter. Both the ponds recorded higher density during autumn. The possible role of temperature and transparency in controlling the zooplankton dynamics is outlined.

0303-162. Sinha RK, Sharma G (Environ Bio Lab, Dept Zoo, Patna Univ, Patna 800005). **Faunal diversity of the river Sarda, Uttar Pradesh, India.** *J Ecophysio Occupl Hlth*, 3(1&2)(2003), 103-116 [25 Ref].

A survey was conducted in the River Sarda between Sardanagar and Palia to assess the status of faunal diversity of the river during low water season. A total of 33 species of zooplankton were recorded during the survey. Besides, 55 species of fishes, a very rich and diversified turtle fauna (8 species), 44 species of avifauna were recorded during the survey.

0303-163. Suma KP, Joy CM (Dept Bot, SNM Coll, Moliankara 683516, Kerala). **Hydrobiological studies on mangrove flora and associated algae in Vypeen, Kerala.** *Nature Env Polln Techno*, 2(3)(2003), 269-272 [15 Ref].

Work deals with the distribution and abundance of the mangrove vegetation and mangrove algae at Vypeen (Kerala), under varying hydrographic conditions. The distribution of these species is related to the salinity, pH and tidal action. The study revealed that the mangrove rhizosphere algae were mainly composed of blue greens. The main reason for this may be eutrophication and warmer climate.

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0303-164. Bhupathy S, Karunakaran R (Salim Ali Cent Ornithology Natural Hist, Anaikatti (PO), Coimbatore 641108, Tamil Nadu). **Conservation of olive ridley sea turtle *Lepidochelys olivacea* (Reptilia/Chelonia) along the Nagapattinam coast, southeast of India.** *Indian J Marine Sci*, 32(2)(2003), 168-171 [15 Ref].

Nesting and mortality of *Lepidochelys olivacea* was studied in 50 km beach stretch along the Nagapattinam coast. This species emerged from sea for nesting during December and continued till April. The poor nesting (20 nests/km) in the area could be due to high adult mortality (12% females) due to incidental catch in the gill nets, and nest predation (>90%) by human. The Nagapatnam coast will not sustain the nesting population of *Lepidochelys olivacea* longer, if immediate conservation measures are not undertaken.

0303-165. Chandola S, Singh SK (Office Conservator Forests, Bhagirathi Circle, Muni-ki-Reti, Tehri Garhwal, Uttaranchal). **Status and scope of medicinal plants in Bhagirathi valley of Garhwal, Uttaranchal - conservation strategy.** *Indian Forester*, 129(8)(2003), 950-963 [3 Ref].

The Bhagirathi valley is endowed with a rich wealth of medicinal and aromatic plants ranging from sub tropical to alpine species. This invaluable resource is, however, under serious threat from severe depletion due to grazing, pilferage, fire and social indiscretions in utilization. Eight mega centers for the conservation of medicinal plants have been suggested which need to be protected by establishment of MPCAs. This

insitu intervention needs to be closely dovetailed with *ex-situ* cultivation and conservation along with eco tourism as a major part of the strategy.

0303-166. Chauhan NS (Dept Forest Products, Dr YS Parmar Univ Hort Forestry, Nauni-Solan, Himachal Pradesh). **Important medicinal and aromatic plants of Himachal Pradesh.** *Indian Forester*, 129(8)(2003), 979-997 [35 Ref].

Himachal Pradesh, situated in the lap of the Western Himalayas, is considered a veritable emporium of medicinal and aromatic plants having diverse agro-climatic conditions. Out of around 3,500 species more than 1,000 species have been documented as medicinal and aromatic for the State. Paper suggests that the herbal resources of the State should be scientifically documented, commercial cultivation initiated compiled with value addition for ushering in economic prosperity to the people of this hill state.

0303-167. Kumar Dinesh, Singh Baldev (Dept Soil Water Engng, Punjab Agricul Univ Ludhiana 141004). **Reclaiming effect of coal fly ash from thermal power plants in sodic soils.** *Polln Res*, 22(3)(2003), 403-410 [34 Ref].

An experiment was conducted in north-west India to explore the feasibility of using coal fly ash for reclamation of waterlogged sodic soils under paddy-wheat system. The initial pH, electrical conductivity, exchangeable sodium percentage and sodium adsorption ratio of the experimental soil were 9.07, 3.87 dS m⁻¹, 26.0 and 4.77, respectively. Application of fly ash up to 4.5 per cent level increased the straw and grain yield of paddy and wheat crops significantly in both years.

0303-168. Nagendra Harini, Utkarsh Ghate (Cent Ecol Sci, Indian Inst Sci, Bangalore). **Landscape ecological planning through a multi-scale characterization of pattern : studies in the Western Ghats, south India.** *Environ Monit Assess*, 87(3)(2003), 215-233 [34 Ref].

Article analyzes landscape pattern in the Western Ghats mountain ranges in south-western India at two scales, comparing small-scale, detailed studies of landscape pattern, with broader, regional-scale assessments of the Western Ghats. Northern and eastern landscapes are more fragmented compared to the southern and western slopes. Western slopes also have greater landscape diversity with land cover types more

interspersed compared to the eastern slopes. Results suggest a hierarchical stratified approach for monitoring land cover and biodiversity in the region.

0303-169. Pani S, Misra SM (Environ Res Lab, Environ Plang Co-ordination Org, Paryavaran Parisar, E-5 Arera Colony, Bhopal 462016). **Impact of artificial aeration / ozonisation on algal community structure of a tropical eutrophic lake.** *Eco Env Conserv*, 9(1)(2003), 31-34 [5 Ref].

The lower lake of Bhopal, which is one of the urban eutrophic lakes is undertaken for conservation. Three aeration units have been installed to restore the water quality of this degraded lake and to increase the dissolved oxygen concentration of the lake water. The observation confirms that artificial aeration and ozonization could be use as an effective tool in improving the water quality of a degraded ecosystem.

0303-170. Samant SS, Pal Mohinder (GB Pant Inst Himalayan Env Dev, Kosi Katarmal, Almora, Uttaranchal). **Diversity and conservation status of medicinal plants in Uttaranchal State.** *Indian Forester*, 129(9)(2003), 1090-1108 [73 Ref].

Paper reviews the diversity and conservation status of medicinal plants of Uttaranchal State. Maximum diversity of medicinal plants was distributed in the zone of < 1800 m and gradually decreased with the increasing altitude. 178 species were native to the Himalayan region, 9 species were endemic and 104 species were near endemic. Appropriate action plan for the conservation and management of medicinal plants has been suggested.

0303-171. Shankar Kartik (H-VI/2, Habib Complex, Durgabai Deshmukh Rd, RA Puram, Chennai 600028). **Small mammals in montane ecosystems of the Nilgiris, southern India: their ecology and natural history.** *J Bombay Natural Hist Soc*, 100(1)(2003), 46-57 [70 Ref].

Small mammals were studied in the montane ecosystems of the Nilgiris in the Western Ghats southern India. *Rattus rattus* was dominant in the montane forests, while *Millardia meltada* was dominant in the grasslands. Both species were found in plantations. The occurrence of *M. meltada* in the high altitude grassland is remarkable, as it is not found in such habitats elsewhere, nor is it found in intermediate habitats in the Nilgiris.

0303-172. Sharma Seema, Kumar Ashwani (Biotechno Lab, Dept Bot, Univ Rajasthan, Jaipur 302004). **Greening of wastelands using laticiferous plants.** *Nature Env Polln Techno*, 2(3)(2003), 333-336 [17 Ref].

A large number of laticiferous plants like *Euphorbia neerifolia*, *E. caducifoli*, *E. tirucalli* and *C. procera* are able to grow and produce biomass. Such plants can also be utilized for production of biofuel. Attempts are made to characterize biofuel plants commonly grown in Rajasthan and their growth and biofuel contents production.

0303-173. Singh HS (Office Conservator Forests Vadodara Circle, Kothi Bldg, Raopura, Vadodara 390001, Gujarat). **Sea mammals in marine protected area in the Gulf of Kachchh, Gujarat State, India.** *Indian J Marine Sci*, 32(3)(2003), 258-262 [11 Ref].

Marine National Park and Sanctuary in the Gulf of Kachchh in Gujarat State supports rich marine life. Three marine mammals-common dolphin (*Delphinus delphinus*), porpoise (*Neophocaena phocaenoides*) and dugong (*Dugon dugon*) were counted. The study reveals that about one third of the total area of the MPA in this zone support about 80% of the marine mammals which visit the area during high-tides. Thus, this part of the MPA is a key habitat for dwindling population of the marine mammals.

0303-174. Sinha RK, Sharma Gopal (Environ Bio Lab, Dept Zoo, Patna Univ, Patna 800005, Bihar). **Current status of the Ganges river dolphin *Platanista gangetica* in the rivers Kosi and Son, Bihar, India.** *J Bombay Natural Hist Soc*, 100(1)(2003), 27-37 [20 Ref].

Surveys were conducted to assess the current status of the Ganges river dolphin in the rivers Son and the Kosi. No dolphin was sighted in the entire stretch of about 300 km of the Son, in Bihar. A total of 87 dolphins were sighted in the Kosi during the survey, however, many have been missed due to the highly braided channel of the river. In both the rivers, no apparent source of pollution was found. Siltation and construction of the barrage were observed to be the main cause of habitat degradation in both the rivers.

0303-175. Vinod VR, Syed Anwarulla M, Vishwanth DP (Univ Agricl Sci, Bangalore 577132, Karnataka). **Run off and soil loss under different land use systems in the Western Ghats of Karnataka.** *Indian J Soil Conserv*, 31(2)(2003), 131-138 [8 Ref].

The studies on runoff, soil and nutrient losses were conducted on five land use systems prevailing in the Western ghats of Karnataka at the Regional Research Station, Mudigere. The results revealed that the development of natural vegetation in the natural land use system had reduced the runoff from 23 mm to 12.2 mm and soil loss from 79.8 kg ha⁻¹ to 22.5 ha⁻¹, in cardamom land use system.

Toxicology

0303-176. Agarwal Asha, Kalra Kuntal (Dept Zoo, Sch Life Sci, Khandari Campus, Dr BR Ambedkar Univ, Agra 282002). **Effect of nitrogen dioxide inhalation on certain haematological parameters in albino rat.** *Polln Res*, 22(2)(2003), 217-219 [17 Ref].

Male albino rats, *Rattus norvegicus* (Berkehout) were exposed to 30 ppm and 60 ppm nitrogen dioxide for one hour per day for 15 and 30 days. Six haematological parameters, including total RBC count, haemoglobin concentration, haematocrit value, mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH) and mean corpuscular haemoglobin concentration (MCHC) were measured. A significant increase in total RBC count, haemoglobin concentration and hematocrit value was noted, which reflected red cell indices due to hypoxic polycythaemia.

0303-177. Awasthi JK, Kumar Anil, Sharma Dushyant Kumar (Dept Zoo, Narain Coll, Shikohabad 205135). **Effect of an organophosphorus on some blood parameters of *Columba livia* Gmelin.** *J Exptl Zoo India*, 6(2)(2003), 221-228 [24 Ref].

The pigeons were subjected to sublethal dose of malathion (30mg/Kg) on alternate days for 30, 60, 90, 120, 150 and 180 days to study the chronic toxicity effect. The study revealed that malathion caused an increase in size of RBC as well as their nuclei. Total erythrocyte count (TEC) decreased with the period of treatment beyond 90 days. Haemoglobin concentration and packed cell volume (PCV) were also found to be decreased in the intoxicated animals.

0303-178. Bhatnagar MC, Laxmi Raj, Sharma Vandana, Sharma Indu (Dept Zoo, Meerut Coll, Meerut 250001). **Toxicity of valour and match to common carp, *Cyprinus carpio* (Linn).** *J Ecophysio Occupl Hlth*, 3(1&2)(2003), 85-92 [36 Ref].

The toxicity of two broadly used agricultural pesticides, Valour (Fenvalerate-20%EC), an organochlorine and Match (Ethion – 50% EC), an organophosphate pesticide has been studied with the fries of common carp, *Cyprinus carpio* (Linn.). The TLm values for 24, 48, 72 and 96 h. of Valour were found to be 0.0044, 0.0039, 0.0033 and 0.0027 ppm and for Match, these were 0.57, 0.53, 0.48 and 0.43 ppm, respectively. Valour was found more toxic comparison to match as evident from their TLm values.

0303-179. Bhatnagar VK, Zaidi SSA, Kashyap R, Karnik AB, Kulkarni PK, Venkaish K, Shah MP, Saiyed HN (Natl Inst Occupl Hlth, Meghani Nagar, Ahmedabad 380016). **Pesticide residues in formulators and their relevance to certain biological indices.** *Toxico Int*, 10(1)(2003), 47-50 [14 Ref].

Study on the biological monitoring of the residues of persistent pesticides in formulators engaged in formulation of various pesticides in an industrial setting was conducted. Total hexachlorocyclohexane (HCH) and its residues were significantly higher ($p < 0.005$) in formulators. -HCH was the chief contaminant and it accounts for about 93% of the total HCH content. A total of four residues of DDT were also detected. However, significant elevation ($p < 0.01$) was noticed in the level of pp' –DDE and total DDT in formulators.

0303-180. Bhavani G, Dawood Shareif S (Sch Environ Sci, PG Res Dept Zoo, **The New College, Chennai 600014**). **Bioabsorption of cadmium and mercury by mussel – *Perna viridis*.** *Eco Env Conserv*, 9(3)(2003), 285-289 [29 Ref].

LC₅₀ was calculated and acute toxicity studies were carried out on marine bivalve, and the concentration of cadmium and mercury absorbed were determined in the shell and in tissue. In addition to the absorption of metals biochemical components like protein, carbohydrate and lipid were studied. The results reveal the bioabsorption capacity of the bivalve, and the decrease of proteins, carbohydrates and lipids in the body tissue of *Perna viridis*, due to metal toxicity.

0303-181. Chakraborty Rahul, Dey Sudip, Dkhar PS, Ghosh D, Singh S, Sharma DK, Myrboh B (Regl Sophisticated Instrumentation Cent, North Eastern Hill Univ, Bijiini Complex, Laithumkhrah, Shillong 793003). **Accumulation of heavy metals in some**

fresh water fishes from eastern India and its possible impact on human health. *Polln Res*, 22(3)(2003), 353-358 [20 Ref].

The level of accumulation of some heavy metals in most of the fish species was not so high to have immediate adverse effect on human health, the level of lead and mercury was alarmingly high in certain body parts of some fish species. The possibility of long term deleterious effects of this on human health is discussed. The probable source of these contaminations have also been tried to be identified and remedial measures to be adopted are suggested.

0303-182. Chandra Sekhar K, Chary NS, Kamala CT, Venkatesware Rao J, Balaram V, Anjaneya Y, (Indian Inst Cheml Techno, Hyderabad 500007). **Risk assessment and pathway study of arsenic in industrially contaminated sites of Hyderabad: a case study.** *Env Int*, 29(5)(2003), 601-611 [43 Ref].

Fourteen villages of the area of Patancheru near Hyderabad were assessed for arsenic contaminated by collecting samples of water (surface and ground), soil, fodder, milk and vegetables. The total arsenic content in the whole blood, urine, hair, and nails of the residents showing arsenial skin lesions and other clinical manifestations were also studied. To understand the bioavailability of arsenic in this environment and its possible entry into human food chain, speciation studies of arsenic was carried out and the results are presented.

0303-183. Chandra Smita, Ram RN, Singh IJ (Dept Fishery Bio, Coll Fishery Sci, GB Pant Univ Agricl Techno, Pantnagar 263145, Uttaranchal). **Testicular recrudescence and recovery response in *Cyprinus carpio* after long-term exposure to a carbamate pesticide.** *J Ecophysio Occupl Hlth*, 3(1&2)(2003), 15-36 [29 Ref].

Gonado Somatic Indices exhibited significant reduction after 45 and 105 days exposure but insignificant change after 75 days. Hepato-somatic indices reduced in all exposure groups but increased in recovery group in comparison of group treated for 105 days. Condition and somatic condition were not significantly affected in any of the experimental or recovery groups.

0303-184. Chaudhari RT, Lomte VS, Sultana Masarrat (Dept Environ Sci, Dr. Babasaheb Ambedkar Marathwada Univ, Aurangabad 431004). **Impact of heavy metal,**

nickel chloride on glycogen content of the freshwater bivalve *Parreysia cylindrical*. *J Indl Polln Contl* 18(2)(2002) 145-149 [15 Ref].

The effect of heavy metal, nickel chloride, on the biochemical component like glycogen of gill, foot, mantle, digestive gland and whole body of freshwater bivalve, *Parreysia cylindrical* was studied. The significant decrease in total glycogen content of gill, food mantle, digestive gland and whole body was observed due to pollution stress caused by nickel chloride.

0303-185. Chaudhary Nisha, Sharma Meenakshi, Verma Pramod, Joshi SC (A-2 Krisha Nagar, 11, Lalkothi, Tonk Rd, Jaipur 302015, Rajasthan). **Hepato and nephrotoxicity in rat exposed to endosulfan. *J Environ Bio*, 24(3)(2003), 305-308 [22 Ref].**

Paper evaluates the toxic effect of endosulfan on the vital organs of rat. Oral administration of endosulfan at the dose level of 10 mg/kg b.wt./day for two and four weeks showed toxic interference with the biochemistry and histology of rat liver and kidney. Similarly pathological alterations were observed in the kidney.

0303-186. David M, Mushigeri SB, Philip GH (Dept Toxicology Div, Karnataka Sci Coll, Dharwad 580001, Karnataka). **Alterations in the levels of ions in tissues of freshwater fish *Labeo rohita* exposed to fenvalerate. *Polln Res*, 22(3)(2003), 359-363 [25 Ref].**

The fingerlings of *Labeo rohita* were exposed to lethal concentration (7.5 g/L) of fenvalerate to know the levels of different ions. All the ions were found to decrease consistently under fenvalerate stress in lethal concentration. In sub lethal concentration the ionic levels decreased up to 10 days and in 15 days exposure period an elevation in their level was observed indicating a greater efficiency to resist the sub-lethal concentration of fenvalerate.

0303-187. David M, Mushigeri SB, Prashant MS, Mathad SG (Dept Zoo, Toxicology Div, Karnataka Sci Coll, Dharwad 580001). **Role of phosphatases during blood transport and energy metabolism in freshwater fish, *Cyprinus carpio* exposed to cypermethrin. *Polln Res*, 22(2)(2003), 277-281 [27 Ref].**

Freshwater fish, *Cyprinus carpio* were exposed to sublethal concentration (0.5 g l^{-1}) of cypermethrin for 7 and 15 days to examine the bioenergetics in functionally four different tissues namely gill, liver, brain and muscle. Ionic regulation and energy requirements were also found to be altered under stress, as observed by the inhibition of both Na^+/K^+ and M^+ and Mg^{2+} ATPases at 7d exposure and elevation at 15d exposure.

0303-188. Hemalatha S, Banerjee TK (Histopatho Lab, Dept Zoo, Banaras Hindu Univ, Varanasi 221005). **Estimation of acute toxicity of zinc chloride by histopathological analysis of the epidermal linings of operculum of the catfish *Heteropneustes fossilis* (Bloch).** *Toxico Int*, 10(1)(2003), 11-22 [32 Ref].

Acute toxicity (75 ppm; 96h LC50 value) of the trace metal salt zinc chloride on the outer and inner opercular epidermal linings of *Heteropneustes fossilis* has been analysed histopathologically. The mucous cells of both the epithelial linings show periodic fluctuations in their density and staining properties at different exposure time. The outer opercular lining shows more extensive damage than the inner one which is having better mucogenic potentiality.

0303-189. Joshi GS, Verma RJ, (Dept Toxicology, Jai Res Foundation, Valvada 396108, Dist Valsad, Gujarat). **Gasoline, methanol and gasoline : methanol blend exposure-induced nephropathy in male rats.** *Toxico Int*, 10(1)(2003), 61-66 [16 Ref].

Study was designed to evaluate the effect of repeated inhalation exposure of gasoline, methanol and gasoline: methanol (90:10) vapours (20 ml/h; 6 h/day for 28 days) on kidneys of rats. Results revealed significant ($p < 0.05$) increase in absolute and relative kidney weight in male rats exposed to gasoline and gasoline: methanol vapours. Study indicates that the addition of 10% methanol to gasoline did not cause any rise in toxicity and the effect of the treatment are transient and reversible.

0303-190. Kadam RG (Dept Microbio, LBS Coll, Satara 415002, Maharashtra). **Effect of some pesticides on actinomycetal population of a pond.** *Nature Env Polln Techno*, 2(3)(2003), 263-264 [4 Ref].

Water samples from a local pond, adjoining agricultural fields, were used for source of actinomycetes to study the effect of three pesticides, monocrotophos,

chlorpyrifos and dichlorvos. The toxicity of the pesticides was found in the order of chlorpyrifos > monocrotophos > dichlorvos.

0303-191. Kale Monica K, Kulkarni GD (Dept Zoo, Dr. Babasaheb Ambedkar Univ, Aurangabad 431004, Maharashtra). **Correlative changes in the cadmium bioaccumulation and oxygen consumption in a freshwater fish, *Rasbora daniconius*.** *J Aquat Bio*, 18(1)(2003), 97-102 [30 Ref].

The rate of oxygen consumption increased in the initial period of analysis (6 through 24 hr.), and thereafter started decreasing, almost attaining normalcy after 60 through 72 h of analysis. The results indicate that these fishes have high tolerance for cadmium toxicity and appear to possess very efficient mechanism of depuration and detoxification.

0303-192. Kalita B, Acharya B, Dutta NK, Sharma DK (Dept Zoo, Morigaon Coll, Morigaon 782105). **Impact of paper mill effluent on the behavioural pattern and histopathological changes in the gills of freshwater crab *Paratelphusa spinigera*.** *J Ecobio*, 14(4)(2002), 299-305 [18 Ref].

Paper mill effluent (PME) even at dilute concentrations were found to be toxic to crab and able to initiate behavioural changes and histopathological changes of gill. Toxicity exhibited a gradually increasing trend with the advancing number of days. Thus a correlation between the very dilute PME and the changes in the gill structure of *P. spinigera* has been confirmed.

0303-193. Kamalaveni K, Gopal V, Sampson Ursula, Aruna D (Dept Zoo, Kongunadu Arts Sci Coll, Coimbatore, Tamil Nadu). **Recycling and utilization of metabolic wastes for energy production is an index of biochemical adaptation of fish under environmental pollution stress.** *Environ Monit Assess*, 86(2)(2003), 255-264 [51 Ref].

The activity levels of lactate dehydrogenase and lactic acid were assessed in various tissues of the fish during exposure to lethal concentration of group-II pyrethroids for a period of 72 hours. The results showed steady increased levels in all the tissues with response pattern characteristic of their own. The increased LDH activity and lactic acid levels indicate the shifting of aerobic glycolysis to anaerobiosis and its further utilization of energy production during adaptation to toxic stress.

0303-194. Kavitha AV, Jagadessan G (Dept Zoo, Annamalai Univ, Annamalai Nagar 608002). **Histopathological alterations in small intestine of mercury intoxicated mice, *Mus musculus* (linn.) in response to *Tribulus terrestris* (Zygophyllaceae) extract.** *Polln Res*, 22(3)(2003), 343-347 [16 Ref].

Light microscopic studies after 45 days of mercury administration the small intestine showed damaged blood capillaries, swelling and vacuolisation of the columnar epithelial. After the mercury administration the mice were again dosed with *Tribulus terrestris*. Extract of different solvent fraction showed the complete regeneration of the small intestine from the mercury toxicity.

0303-195. Kavitha AV, Jagadessan G (Dept Zoo, Annamalai Univ, Annamalainagar 608002). ***In vivo* studies on the role of *Tribulus terrestris* extract on mercury intoxicated mice, *Mus musculus* – large intestine – a histological survey.** *J Exptl Zoo India*, 6(2)(2002), 213-219 [18 Ref].

Median-lethal dose of mercuric chloride (1.2 mg/kg body weight of animal) was administered through the drinking water to the female mice, every day for 45 days. Its toxicity alter the histoarchitecture of the large intestine. During the recovery period, the mice were again dosed with *Tribulus terrestris* extract of different solvent fractions for another 15 days. It showed the complete regeneration of large intestine from the mercury toxic effect.

0303-196. Kothari Suresh, Bhalerao Sangeeta, Jat Deepali (Sch Std Zoo, Vikram Univ, Ujjain 456010, MP). **Protection by herbal compound against toxic effects of mercuric chloride in fish intestine.** *J Ecophysio Occupl Hlth*, 3(1&2)(2003), 51-58 [21 Ref].

Exposure to HgCl₂ (0.1 mg/l) caused significant alteration in protein and alkaline phosphatase (ALP) and alanine transaminase (ALT) in the intestine of a freshwater catfish *Heteropneustes fossilis* (Bloch) exposed for 3, 15 and 30 days durations. The protein and enzymes were maintained near normal values, when the hepatoprotective drug Liv₅₂ (manufactured by The Himalaya Drug Co, Mumbai) was simultaneously fed to the Hg exposed catfishes.

0303-197. Kumar Kaushalendra, Saxena Prabhu N (Dept Zoo, Sch Life Sci, Inst Basic Sci, Dr. BR Ambedkar Univ, Khandari Campus, Agra 282004, UP). **Effect of diazol on certain liver biochemical parameters of female albino rats.** *J Ecophysio Occupl Hlth*, 3(1&2)(2003), 143-147 [26 Ref].

Diazol toxicity was studied in female albino rat, *Rattus norvegicus* of wister strain by administering a dose of 6 mg/kg body wt. A significant decline in hepatic glycogen and increase in cholesterol, alkaline phosphatase and acid phosphatase indicate liver dysfunction, which has been considered to be due to the disturbed glycogenesis, cholesterol metabolism, biliary secretion and lysosomal activity respectively.

0303-198. Kumar Kaushalendra, Saxena Prabhu N (Toxico Lab, Dept Zoo, Sch Life Sci, Inst Basic Sci, Dr. BR Ambedkar Univ, Khandari Campus, Agra 282004). **Serum transaminases and lactate dehydrogenase activity in female wistar rats in diazol stress.** *Indian J Environ Toxico*, 12(2)(2002), 63-64 [16 Ref].

Serum transaminases and lactate dehydrogenase activity in acute (6.0 mg/kg, b. wt.) and subacute (0.3 mg/kg. b. wt.) diazol parental (i/m) toxicity was studied. The activity in respect of both the enzymes in serum significantly increased in comparison to control, suggesting hepatotoxic nature of diazol.

0303-199. Kumari Beena, Kumar R, Madan VK, Singh Rajvir, Singh Jagdeep, Kathpal TS (Dept Entomo, CCS Haryana Agricl Univ, Hisar, Haryana). **Magnitude of pesticidal contamination in winter vegetables from Hisar, Haryana.** *Environ Monit Assess*, 87(3)(2003), 311-318 [8 Ref].

The tested samples were found 100% contaminated with low but measurable amounts of pesticide residues. Among the four major chemical groups, residue levels of organophosphorous insecticides were highest followed by carbamates, synthetic pyrethroids and organochlorines. About 32% of the samples showed contamination with organophosphorous and carbamate insecticides above their respective MRL values.

0303-200. Malik Abdul, Ahmad Masood (Dept Agricl Microbio, Inst Agricl, Aligarh Muslim Univ, Aligarh 202002). **Incidence of metal resistance plasmids and their transmissibility among *E.coli* strains in the industrial sewage.** *Polln Res*, 22(3)(2003), 327-333 [36 Ref].

A total of 150 *E.coli* isolates from sewage water were examined for the presence of plasmid DNA. MICs of Pb⁺⁺, Cd⁺⁺, Ni⁺⁺ and Zn⁺⁺ for each isolate were also determined. A maximum MIC of 3200 g/ml was observed for these metals. 70.5% of the strains were resistant to Pb⁺⁺, 63.2% to Ni⁺⁺ and 75.3% to Zn⁺⁺.

0303-201. Mandal A, Sengupta D (Dept Geo Geophys, Indian Inst Techno Kharagpur, Kharagpur 721302, West Bengal). **Radioelemental study of Kolaghat thermal power plant, West Bengal, India: possible environmental hazards.** *Environ Geo*, 44(2)(2003), 180-186 [18 Ref].

Attempt has been made to assess the radiological impact of the Kolaghat thermal power plant in West Bengal. The results show that ²²⁶Ra and ²³²Th range from 81.9-126 and 132-169 Bq/kg in coal. These results are high compared to those of other thermal power plants of India. Hence, the Kolaghat fly ash has a significant amount of radioactivity which, if not properly disposed, will be a serious threat to the ambient environment.

0303-202. Masud Sahar, Singh IJ, Ram RN (Dept Fishery Bio, Coll Fishery Sci, GB Pant Univ Agricl Techno, Pantnagar 263145, Uttaranchal). **First maturity and related changes in female *Cyprinus carpio* in response to long term exposure to a mercurial compound.** *J Ecophysio Occupl Hlth*, 3(1&2)(2003), 1-14 [26 Ref].

Article incorporates the changes in certain biological indices, water and lipid contents in ovary and muscle, lipid content in liver and histopathological changes in ovary and liver of female *C. carpio* after prolonged to safe concentration (0.5 ppm) of mercuric chloride (HgCl₂) for 45 days and its below safe concentration (0.1 ppm) for 45 and 60 days. There was complete mortality of fish treated with 0.5 ppm HgCl₂ for 45 days and 0.1 ppm for both the durations of 45 and 60 days.

0303-203. Mathivanan R, Bhaskaran R (197-C, Palaniandavare Nagar, Palani, Dt Dindigul, Tamil Nadu). **AchE activity in brain tissue of *Labeo rohita* (Ham) and *Tilapia mossambica* (Peters) in malathion toxicity: *in vitro* and *in vivo* studies.** *Indian J Environ Toxicol*, 12(2)(2002), 70-72 [11 Ref].

Under optimal conditions, Acetylcholinesterase (AchE) activity in brain homogenates of *L.rohita* and *T.mossambica* was estimated at different concentrations

(0,3,6,9,12,15 ppm) of malathion *in vitro*. Using regression equation, the I_{50} value was obtained as 6.5 ppm and 6.8 ppm for *Labeo rohita* and *T.mossambica*, respectively.

0303-204. Mathur R, Bharadwaj Shakti, Shrivastava Sadhana, Mathur Asha (Sch Std Zoo, Jiwaji Univ, Gwalior). **Effectiveness of calcium EDTA/DTPA as chelating agent against vanadium toxicity in rats.** *Indian J Environ Toxicol*, 12(2)(2002), 59-62[23 Ref].

Chelating efficacy of calcium disodium ethylenediamine tetraacetic acid (EDTA) and calcium trisodium diethylene triamine pentaacetic acid (DTPA) have been studied against vanadium induced toxicity in male rats. The protective effects of EDTA and DTPA was supposed to be due to intercepting vanadium from reaching the intracellular elements by the chelats used.

0303-205. Mishra Shailesh Kumar, Upreti DK, Pandey Vivek, Bajpai R (Sch Environ Sci, Babasaheb Bhimrao Ambedkar Univ, Lucknow). **Pollution monitoring with the help of lichen transplant technique in some commercial and industrial areas of Lucknow city.** *Polln Res*, 22(2)(2003), 221-225 [6 Ref].

Lichen samples were transplanted at five commercial and industrial sites of Lucknow city for analysis of Cr, Zn, Cu, Cd and Pb. The metal concentration for pollution monitoring of samples toward and leeward the source of pollution were compared at each site. All the samples facing towards the source of pollution have higher concentration of metals than the leeward one.

0303-206. Mishra Vinit Kumar, Padmanabhamurthy B, (Sch Environ Sci, Jawaharlal Nehru Univ, New Delhi 110067). **Performance evaluation of CALINE3, CAL3QHC and PART5 in predicting lead concentration in the atmosphere over Delhi.** *Atmos Env*, 37(22)(2003), 3077-3089 [56 Ref].

Prediction of ground level lead concentration was made at five traffic intersections in Delhi, India, by the two highway models, viz., CALINE3, CAL3QHC and one particulate emission factor model PART5, where lead was actually monitored. The predicted values were compared with the monitored data at all the five monitoring sites. The CAL3QHC was found to be most suitable for the predictions at the signalized intersections.

0303-207. Mukherjee Irani (Div Agricl Cheml, Indian Agricl Res Inst, New Delhi). **Pesticides residues in vegetables in and around Delhi.** *Environ Monit Assess*, 86(3)(2003), 265-271 [15 Ref].

Article presents the development of a multiresidue method for the estimation of 30 insecticides, 15 organochlorine insecticides and six organophosphorus insecticides, nine synthetic pyrethroids and two herbicides and their quantification in vegetables. The monitoring study indicates that though all the vegetable samples were contaminated with pesticides, only 31% of the samples contained pesticides above the prescribed tolerance limit.

0303-208. Palaniappan PLRM, Kathikeyan S, Sabhanayakam Selvi (Dept Phys, Annamalai Univ, Annamalainagar 608002). **Studies on the effects of heavy metal nickel on gills of fingerlings of an edible fish *Cirrhinus mrigala*.** *Polln Res*, 22(2)(2003), 247-250 [13 Ref].

Studies on the histopathological effect of the two different sub-lethal concentrations of nickel on *Cirrhinus mrigala* fingerlings revealed that these metallic salt is capable of producing severe damage and changes in its cellular levels in gills leading to the death of fish. All these changes finally caused the failure of the respiratory mechanism which resulted in mortality of the test fish.

0303-209. Parate SK, Kulkarni KM (BP Sci Coll, Digras 445203, Maharashtra). **Toxic influence on the total protein contents in the muscle and gill of the freshwater crab, *Paratelphusa jacquimontii* (Rathbun) exposed to cypermethrin.** *J Aquat Bio*, 18(1)(2003), 111-113 [15 Ref].

Changes involved in total protein profile in the muscles and gills of the crab, *Paratelphusa jacquimontii*, exposed to the pyrethroid pesticide cypermethrin at different experimental conditions was studied. Total protein contents showed decreasing trend over the period of four days.

0303-210. Prashanti Sam R, Rajeswari CV (STBC Degree Coll, Kurnool). **Effect of vehicular pollution on health of traffic policemen in Kurnool town.** *Polln Res*, 22(3)(2002), 373-375 [9 Ref].

A survey was conducted at major traffic points in Kurnool town to investigate the effect of vehicular emissions on the health of traffic policemen. The main symptoms observed were cough 80%, eye irritation 80%, throat irritation 80% breathlessness 20%, headache and dizziness 30% and passage of black sputum in the morning 3%. It is concluded that traffic policemen are suffering from respiratory disorders due to exposure to vehicular pollution.

0303-211. Rai Rubi, Srivastava Ajai K (Dept Zoo, DDV, Gorakhpur Univ, Gorakhpur 273009). **Effects of cadmium on the plasma electrolytes of a freshwater fish *Heteropneustes fossilis***. *J Ecophysio Occupl Hlth*, 3(1&2)(2003), 63-70 [42 Ref].

The plasma calcium levels of short-term cadmium exposed fish remain unchanged after 24 h. The levels exhibit a progressive decrease from 48 h onwards. The plasma phosphate levels record a decrease at 72 and 96 h following the cadmium treatment. The fish exposed to cadmium for 7 days exhibit a decrease in the plasma calcium level. The plasma phosphate levels of cadmium exposed fish decrease progressively from 14 days onwards.

0303-212. Ramesh Babu C, Jayaveera KN (Oil Technol Res Inst, Anantapur 515001, AP). **Pollution in oil and oil based industries and remedial measures**. *Nature Env Polln Techno*, 2(3)(2003), 283-288.

Paper deals with the sources and effects vis-à-vis remedial measures of various types of pollution associated with oil and allied industry. Occupationally, workers can suffer a lot, so proper steps should be taken to combat these pollution problems. Some important suggestions have also been given in the paper for keeping the pollution hazards to minimum.

0303-213. Rao Ch B, Nair AR, Sharma VGS, Desai NB, Mathai AT (Dept Ecotoxicology, Jai Res Foundation, Valvada 396108, Gujarat). **Behavioural responses of *Daphnia* in induced chromium toxicity**. *Indian J Environ Toxicol*, 12(2)(2002), 80-83 [12 Ref].

Daphnia was exposed to five different concentrations of chromium in a geometric series for a period of 48 h under laboratory condition to study its effects. The per cent immobilization in different concentrations was recorded at 24 and 48 h, and the EC₅₀

values were calculated. The EC₅₀ value for 24 h was 0.20 mg chromium/L and was doubled for 48 h.

0303-214. Roy B, Gupta S (Dept Zoo, Pachunga Univ Coll, Aizawl 796001). **Impact of paper mill waste on *Channa punctatus***. *J Indl Polln Contl*, 18(2)(2002), 231-235 [16 Ref].

Impact of lime sludge waste of Panchgram Paper Mill, Hailakandi, Assam on fish *Channa punctatus*, was investigated by Scanning Electron Microscopy (SEM). The surface topography of the RBC of fish collected from paper mill waste contaminated water showed change in shape with total deformation of surface. The heavy metals present in the disposed waste are responsible for erythrocyte deformities which may lead to anaemia affecting fish health and finally fish population.

0303-215. Roychowdhury Tarit, Tokunaga, Ando Masanori (Div Environ Chem Exposure Assess, Natl Inst Hlth Sci, 1-18-1 Kamiyoga, Setagaya Ku, Tokyo 158-8501, Japan). **Survey of arsenic and other heavy metals in food composites and drinking water and estimation of dietary intake by the villagers from an arsenic-affected area of West Bengal, India**. *Sci Total Env*, 308(1-3), 15-35 [59 Ref].

An investigation of arsenic, copper, nickel, manganese, zinc and selenium concentration in foodstuffs and drinking water were carried out in the arsenic affected areas of the Jalangi and Domkal blocks, Murshidabad district, West Bengal where arsenic-contaminated groundwater is the main source for drinking. For all other heavy metals the observed mean concentration values are mostly in good agreement with the reported values around the world.

0303-216. Sadhu Sukant, Noor Alam Md, Sadhu DN (Dept Zoo, Giridih Coll, Giridih 815301, Jharkhand). **Toxicity of an organophosphorus insecticide. Dhanusan-50 to an air breathing fish, *Channa gachua***. *Nature Env Polln Techno*, 2(3)(2003), 295-297 [15 Ref].

The LC-50 96hr dose of the pesticide was 34.5 ppm whereas 36.5 ppm represented LC-100 96 hr concentration. The pesticide also caused remarkable changes in the physico-chemical characteristics of the aquatic media and change in haemoglobin

concentration of the fish and consequent change in its oxygen-carrying capacity leading to death of the fish.

0303-217. Shailaja Patil (Dept Environ Sci, SBES Coll Sci, Aurangabad 431004). **Impact of heavy metal salts on osmoregulation of freshwater bivalve, *Lamellidens corrianus***. *J Aquat Bio*, 18(1)(2003), 103-104 [9 Ref].

For control and heavy metal exposed bivalves, the percent survival was calculated in media with salinity ranging between 0.2 to 1.6‰. The decreased rate of survival at varying salinity was caused due to reduced osmoregulatory response in metal exposed bivalves. Among the three heavy metal salts tested, HgCl₂ was the most toxic to be followed by ZnSO₄ and CuSO₄.

0303-218. Shrivastava Sapna, Singh Sudha (Dept Zoo, Sarojini Naidu Govt Girls' PG Coll, Shivaji Nagar, Bhopal 462023, MP). **Toxic effects of carbaryl on glucose level in the muscles of *Heteropneustes fossilis***. *Nature Env Polln Techno*, 2(2)(2003), 133-135 [8 Ref].

Glucose content in the muscle of *Heteropneustes fossilis*, exposed to sublethal concentration of carbaryl (0.04 ppm) for a period of one month, has been studied. The muscle showed significant decrease in glucose content from first week of treatment onwards.

0303-219. Shrivastava VS, Bhadane BS (Dept PG Std Res Chem, GTP Coll, Nandurbar 425412). **Effect of industrial waste on the concentration of trace metals in milk of sheep and buffalo**. *Cheml Environ Res*, 11(3&4)(2002), 293-296 [12 Ref].

Attempt has been made to study the concentration of trace metals in the milk of sheep and buffalo in Lonkheda, Shahada distillery industrial area. The concentration of Cd, Hg, Mn, Ni and Cr in sheep and buffalo milk was found below the detection level. Mercury and iodine in other samples were also found below the detection level.

0303-220. Singhvi R, Rathore NS, Nandwana G, (Dept Family Resource Manag, Coll Home Sci, Maharana Pratap Univ Agricl Techno, Udaipur 313001). **Household energy status and indoor air pollution in rural kitchens : a case study**. *J Inst Engrs India (Environ Engng Div)*, 83(March)(2003), 29-33 [6 Ref].

The major problems of kitchen are air pollution as the rural households use solid biomass fuels, in traditional inefficient cook stoves, which results in large-scale emission of pollutants. Study on household energy status and indoor air pollution in rural kitchen with special reference to assessment of health aspect of rural households in the context of Udaipur region has been described.

0303-221. Siraj Basha P, Usha Rani A (Dept Zoo, Div Environ Bio, SV Univ, Tirupati, Chittoor District, 517502, Andhra Pradesh). **Cadmium-induced antioxidant defense mechanism in freshwater teleost *Oreochromis mossambicus* (Tilapia).** *Ecotoxicol Environ Safety*, 56(2)(2003), 218-221 [13 Ref].

Paper evaluates the role of antioxidant defenses during cadmium-induced oxidative stress. The findings indicate that tissue glutathione-dependent enzymes as well as other antioxidant enzymes function in protection against Cd²⁺ toxicity and that these antioxidants provide a first line of defense against Cd²⁺ before the induction of any metallothionein synthesis occurs.

0303-222. Srivastwa VMS, Maurya JP, Srivastava DK, Kumar R, Verma SC (Dept Zoo, KN Govt PG Coll, Gyanpur 221304). **Long term effects of sublethal urea stress on the ovarian cycle of *Mystus vittatus* (Bloch).** *J Ecobio*, 14(4)(2002), 253-260 [16 Ref].

Effects of urea (10 ppm sublethal concentration) was investigated on the ovarian cycle of *Mystus vittatus* over a long period. The urea stress showed an increase in GSI by weight and volume in pre-spawning and post-spawning periods except in September by volume. The volume of ova increased in pre and post spawning periods (except April and September) and decrease in spawning period.

0303-223. Subathra S, Karuppasamy R (Dept Zoo, Annamalai Univ, Annamalainagar 608002). **Bioassay evaluation of acute toxicity levels of cadmium on mortality and behavioural responses of an air-breathing fish, *Channa punctatus* (Bloch).** *J Exptl Zoo India*, 6(2)(2003), 245-250 [21 Ref].

The static acute toxicity of cadmium on the mortality and behaviour of *Channa punctatus* has been studied. The LC₅₀ values are 158.49, 125.89, 110.92, 102.00 and 89.13 mg/lit for 24, 48, 72, 96 and 120 hrs, respectively. The observed result indicates that the mortality of the test fish to Cd was dose-time dependent. The altered

behavioural responses were also observed under investigations in the test organism exposed to Cd.

0303-224. Susan Anita, Tilak KS* (*Dept Zoo, Nagarjuna Univ, Nagarjuna Nagar 522510, AP). **Histopathological changes in the vital tissues of the fish *Cirrhinus mrigala* exposed to fenvalerate technical grade.** *Polln Res*, 22(2)(2003), 179-184 [11 Ref].

The toxic sublethal concentration of fenvalerate technical grade in the gill, liver and kidney of one of the Indian major carps *Cirrhinus mrigala* is evaluated. There were marked pathological changes like necrosis, progressive degeneration in the gill tissue. Liver tissue revealed atrophy, appearance of blood streaks among hepatocytes, changes in the haemopoietic tissue. All these pathological changes makes the fish less fit for survival.

0303-225. Tilak KS, Veeraiah K, Sastry LVM (Dept Zoo, Nagarjuna Univ, Nagarjuna Nagar 522510). **Bioaccumulation of fenvalerate technical grade in different organs of the frog *Haplobatrachus tigrinus* (Daudin).** *J Environ Bio*, 24(3)(2003), 261-264 [20 Ref].

Bioaccumulation studies of fenvalerate were conducted on Indian bullfrog *Haplobatrachus tigrinus* (Daudin) after exposure to sublethal intraperitoneal dose of technical grade fenvalerate. In all the tissues, analysed, maximum residue was recovered in the initial stages of exposure (3 and 6 hours). The decline in residue levels along with the period of exposure indicates the fast acting nature of fenvalerate and metabolites.

0303-226. Umamaheswari A, Venkateswarlu K (Dept Microbio, Sri Krishnadevaraya Univ, Anantapur 515003). **Effect of three nitrophenols on carbon metabolism in *Nostoc muscorum* and *Chlorella vulgaris*.** *Ecotoxicol Environ Safety*, 55(2)(2003), 184-186 [22 Ref].

Carbon metabolism in selected strains of *Nostoc muscorum* and *Chlorella vulgaris* grown in the presence of three nitrophenols was assessed by examining activities of the enzymes. Marked alterations were observed in activities of the enzymes involved in starch metabolism. The cellular content of starch in nitrophenol-grown

cultures was significantly reduced, whereas the levels of nonreducing and reducing sugars significantly increased.

0303-227. Venkateswara Rao J, Kavitha P, Padmanabha Rao A (Toxico Unit, Bio Div, Indian Inst Cheml Techno, Hyderabad 500007). **Comparative toxicity of tetra ethyl lead and lead oxide to earthworms, *Eisenia fetida* (Savigny).** *Environ Res*, 92(3)(2001), 271-276 [17 Ref].

Study was carried out to monitor lead toxicity in soil, using adult earthworms. Leaded gasoline (TEL) and lead oxide are 383- and 211- fold more toxic than unleaded gasoline (MTBE) in 7 days of exposure and 627- and 290- fold more toxic in 14 days, respectively. Results indicate that the presence of tetra ethyl lead (TEL) in leaded gasoline and lead oxide has a significant effect on behaviour, morphology, and histopathology of earthworms.

0303-228. Vinaya Kumari VH (Dept Zoo, Bhavan's New Sci Coll, Narayanguda, Hyderabad 500016). **Induced toxicology of two heavy metal, cadmium and mercury on marine biofouler, *Mytilopsis sallei* (recluz) Dreissinacea : Pelecypoda.** *J Aquat Bio*, 18(1)(2003), 115-118 [13 Ref].

The LC₅₀ values were statistically calculated using both graphical and empirical methods. Probit analysis indicated a value of 0.0001157 ppm (972 hours) and 0.000139 ppm [96 hours] for HgCl₂ and 0.4827 and 0.5198 ppm for CdCl₂. The values obtained were found to be well within the fiducial limits.

0303-229. Zutshi Bela (Dept Zoo, Jnana Bharathi, Bangalore Univ, Bangalore 560056). **Effect of fenthion on the testis of freshwater fish, *G.giuris* (histochemical and biochemical).** *Polln Res*, 22(2)(2003), 231-236 [15 Ref].

Histochemical studies of testis showed the depletion of the sudanophilic granules in the interstitial gland of the fish exposed to sub-lethal concentration of fenthion (0.05, 0.25, and 0.5 ppm) for 24, 48, 72 and 96 hours. At higher concentration (0.5 ppm) the interstitial cells were found to be degranulated, accompanied by weak sudanophilia, chromophobia and vacuolization in the cytoplasm.

Waste

0303-230. Anjaneyulu Y, Khan Zareen, Hari Krishna KA (Cent Env, IPGSR, JNT Univ, Masabtank, Hyderabad 500028). **Adsorption of phenol and substituted phenols on soils and their constituents – a study taken up for the selection of hazardous waste dumpsites.** *Cheml Environ Res*, 11(3&4)(2002), 297-307 [16 Ref].

Adsorption studies of widely used industrial hazardous organics like phenols and substituted phenols were carried out on typical soils of Patancheru Industrial Area. Soil characteristics which are considered to influence the adsorption process are studied. The organic matter destroyed soils showed significant reduction in the adsorption capacity when compared to untreated soils indicating that soil organic matter plays a major role in adsorption process of hazardous organics.

0303-231. Ansari IA, Jogi MM (Universal Starch Cheml Allied Ltd, Rawal Indl Estate, Dondaicha 425408). **Sludge granulation in lab scale UASB reactor based on starch effluent.** *Dimensions Polln*, 2(2003), 117-119 [5 Ref].

Study describes the granulation of sludge during treatment of starch based effluent in lab scale USAB reactor and at plant level. A recognizable and substantial granulation could be achieved in lab scale model with significant removal of BOD. At a specific loading of 4 kg COD/m³/d, 70-74% of influent COD and 80-85% of BOD were removed with a specific yield of biogas being 0.44 m³/kg COD removed.

0303-232. Bala Renu, Verma PS, Sharma IK (Dept Chem, Univ Rajasthan, Jaipur 302004, Rajasthan). **Electrochemical treatment of dye effluent with neem (*Azadirachta indica*).** *Nature Env Polln Techno*, 2(2)(2003), 235-236 [1 Ref].

A study was conducted to treat the textile dye effluent by electrochemical method using neem (*Azadirachta indica*) leaf powder as an additive to the dye waste. The addition of the neem leaf has brought significant reduction in the strength of the waste. BOD and COD values became almost nil from the initial values of 1624 mg/L and 312 mg/L respectively. The green colour of the waste also turned totally colourless. The method shows a great potential for treatment of dye effluents.

0303-233. Balarama Krishna MV, Karunasagar D, Arunachalam J* (*Natl Cent Compositional Characterization Materials, Dept Atom Energy, ECIL Post, Hyderabad 500062). **Study of mercury pollution near a thermometer factory using lichens and mosses.** *Environ Polln*, 124(3)(2003), 357-360 [8 Ref].

Mercury contamination due to a mercury thermometer-making factory situated in the hill station Kodaikkanal in a southern state of India, was investigated using lichen (*Parmelia sulcata*) and moss (*Funaria hygrometrica*) samples. As mercury undergoes extensive transformation into various forms as it cycles among the atmosphere, land and water, paper attempts to establish the chemical form of mercury—elemental (Hg^0), inorganic (Hg^{2+}) or organic—in these chosen biomonitors.

0303-234. Bandyopadhyay S, Chaudhuri B, Bhattacharjee S (Dept Chem Engng, Univ Calcutta, Kolkata 700009). **Recovery of mercury from waste brine sludge of a chlor-alkali plant.** *J Inst Engrs India (Environ Engng Div)*, 83(March)(2003), 36-40 [24 Ref].

Detailed experimental studies were performed using free chlorine gas, sodium hypochlorite and hydrochloric acid as reagents for recovery of mercury from the sludge. Under optimal experimental conditions, bubbling chlorine gas recovered 89.0% of mercury leaving only 14.22 mg/kg of mercury in the brine sludge. With sodium hypochlorite, the recovery was 84.9%, the treated sludge containing 20.00 mg/kg of mercury. Hydrochloric acid treatment achieved 85.5% recovery with only 18.80 mg/kg of mercury remaining in the sludge.

0303-235. Bhavani T, Sarma PN, Vairamani M, Hussain Sajid (Analyt Chem Div, Indian Inst Cheml Techno, Hyderabad 500007). **Treatment of effluents from a drug and pesticide manufacturing industry and identification of the organic constituents by GC-MS.** *J Indl Polln Contl*, 18(2)(2002), 167-174 [9 Ref].

The effluents when treated using powdered activated coconut shell carbon after treatment showed considerable reduction in COD and BOD. The treatment efficiencies of both powder and granular forms of carbon have been evaluated. Role of Gas Chromatography – Mass Spectrometry as a tool in monitoring pollution levels is emphasized.

0303-236. Chai Sisir Kumar, Bhaumik GC (Cheml Lab, Lab Bldg, Durgapur Proj Ltd, Durgapur 713201, West Bengal). **Development of a method for removing pollutants from effluents of phenol based industry.** *Nature Env Polln Techno*, 2(3)(2003), 249-253 [7 Ref].

Characteristics of the effluent of a phenol based industry were studied. The ideal conditions of effluent which are more suitable for growth as well as pollutant degradation efficiency of microorganisms were found out. The pretreated effluent was then used in the experiment to study before biological treatment. The pretreated effluent was then used in the experiment to study the phenol removal efficiency of the microorganisms along with removal of other pollutants.

0303-237. Chaudhary Ganesh R, Shrivastava VS (Dept Chem, MJ Coll, Jalgaon 425001, MS). **De-ionisation process of Zn²⁺ and Pb²⁺ ions in industrial waste environment.** *J Indl Polln Contl*, 18(2)(2002), 133-137 [10 Ref].

A self regulated process of deionisation of metal ions such as Zn²⁺ in the industrial waste sludge has been studied by equilibrating the sludge with respective metal ions and determining their concentrations after specific intervals of time. While total elimination was observed in case of Zn²⁺ ions, a substantial decrease was obtained in case of Pb²⁺ ions.

0303-238. Devika R (PG Dept Microbio Res Cent, Ponnaiyah Ramajayam Coll, Thanjavur 616904). **Phosphorus dynamics in model waste stabilization tanks.** *Geobios*, 30(4)(2003), 249-252 [17 Ref].

The dynamics of phosphorus in model stabilization tanks carried out with a view of developing a mathematical model indicated that the transformation rates in the field tank were slightly higher than the laboratory tank. The rate of mineralization of organic to inorganic phosphorus in the field and laboratory tanks was 1.9 and 1.1, respectively.

0303-239. Dutta Amit, Dikshit AK, Ray S, Bandyopadhyay M (Indian Inst Techno, Kharagpur, West Bengal). **Impact of SO₂ emission limits on petroleum refinery operations II: minimizing emissions.** *J Environ Syst*, 29(2)(2002-03), 173-190 [10 Ref].

Study presents two-step solution methodology designed to minimize SO₂ emission rates while preserving refinery profit. The proposed two-step procedure identifies an alternate solution of the LP model leading to an operating plan with maximized profit and minimized SO₂ emission rates. Study also shows that the total SO₂ emission rate may be effective only up to a certain proportion of the low-sulfur crude.

0303-240. Ghangrekar MM, Kahalekar UJ, Takalkar SV (Dept Civil Engng , Govt Coll Engng, Aurangabad 431005). **Design of upflow anaerobic sludge blanket reactor for treatment of organic wastewaters.** *Indian J Environ Hlth*, 45(2)(2003), 121-132 [27 Ref].

The design procedure for upflow anaerobic sludge blanket (UASB) reactor taking due consideration to the Gas-Liquid-Solid design and design of inlet arrangement is discussed for various wastewater strength and flow rates. A software is developed to make economical design of UASB reactor for different type of wastewater by adopting maximum loading conditions, based on literature recommendations, and at the same time to satisfy all design recommendation, as far as possible.

0303-241. Goyal Radha R, Krishna Mohan M, Kansal Arun (Sch Environ Manag, GGS Indraprastha Univ, Kashmere Gate, Delhi 110006). **Treatment of dyeing and printing effluent using photo-assisted fenton reaction.** *Nature Env Polln Techno*, 2(2)(2003), 179-182 [7 Ref].

Photo-Fenton process (H₂O₂/Fe/Sunlight) was studied for treatment of dyeing and printing effluent. The treatment efficiency of the process was assessed in terms of percentage decolorization and COD reduction. Effect of various operating parameters were experimentally investigated. The optimum conditions were obtained with 12.25 percent dosage of H₂O₂ and FeSO₄ at their molar ratio of 10:1 with pH value ranging from acidic to neutral (3-7).

0303-242. Gulati Seema, Heeta Wala Farzana, Sharma VK, Ameta Suresh C (Dept Chem, Coll Sci, Sukhadia Univ, Udaipur 313001). **Use of zinc oxide particulate system as a photocatalyst: photobleaching of toluidine blue.** *Polln Res*, 22(2)(2003), 213-216 [15 Ref].

The photocatalytic reaction of toluidine blue on zinc oxide powder has been carried out in presence of light. The photocatalytic bleaching of dye was observed spectrophotometrically. The effects of variation of different parameters like concentration of toluidine blue, pH, amount of semiconductor and light intensity on the rate of photocatalytic bleaching was observed. A tentative mechanism for the photocatalytic bleaching of toluidine blue has been proposed.

0303-243. Jain Rajeev, Sharma Nidhi, Bhargava Meenakshi (Dept Environ Chem, Jiwaji Univ, Gwalior 474011). **Electrochemical degradation of rhodamine B dye in textile and paper industries effluent.** *J Scient Indl Res*, 62(12)(2003), 1138-1144 [7 Ref].

Electrochemical behaviour of rhodamine B has been studied voltammetrically using platinum and steel foil as working electrodes. The controlled potential electrolysis is carried out at electrolysis potential of -1.20 V. The complete decolourisation results within 1 to 2 h of electrolysis.

0303-244. Javid Sheikh, Akhtar Afroza, Inam Arif*, Khan Nafees A, Sheikh Fayez A, Shah Shaukat H (*Plant Physio Lab, Dept Bot, Aligarh Muslim Univ, Aligarh 202002). **Impact of sewage wastewater on physiomorphology and grain quality of wheat cv. HD-2329.** *Polln Res*, 22(3)(2003), 381-384 [17 Ref].

A pot experiment was conducted to study the effect of sewage wastewater on growth, NPK content, yield and grain quality of wheat (*Triticum aestivum* L.) cv. HD-2329. It's application promoted the growth and also enhanced the yield. Sewage wastewater met the irrigational quality requirements as its physico-chemical characteristics were within the permissible limits.

0303-245. Jha Prithwiraj, Barat Sudip (Aquacult Limino Lab, Dept zoo, Univ North Bengal, Darjeeling 734430). **Hydrobiological study of lake Mirik in Darjeeling Himalayas.** *J Environ Bio*, 24(3)(2003), 339-344 [30 Ref].

Some hydrobiological features of lake Mirik, situated in the Darjeeling Himalayas were studied. Water temperature showed abrupt fluctuations. The pH was generally acidic. Dissolved oxygen increased steadily with increasing rainfall. The study revealed higher concentration of nutrients at certain pockets of the lake, which points to

increasing human influences in the system, and the water cannot serve as a scarcity alternative for drinking purpose.

0303-246. Kanmani S, Thanesekaran K (Cent Environ Std, Anna Univ, Chennai 600025). **Effect of inorganic ions, solar light intensity and catalyst reuse on photocatalytic decolourisation of textile dyeing wastewaters.** *J Indl Polln Contl*, 18(2)(2002), 237-252 [35 Ref].

Effects of inorganic ions, solar ultraviolet (UV) light intensity and catalyst reuse on the rate of decolourisation of simulated low salt cotton textile dyeing rinse wastewaters were studied with Degussa P25 and indigenous IS grade titanium dioxide catalysts. It was observed that the rate of decolourisation increased with increase of solar UV light intensity. It is concluded that solar UV light intensity of 20 W/m² was necessary for photocatalytic decolourisation of the dyes.

0303-247. Khan Abid Ali, Ashhar MM, Siddiqui Asif A, Farooq IH (Univ Polytechnic, Aligarh Muslim Univ, Aligarh). **Sewage treatment by anaerobic hybrid reactor.** *Indian J Environ Hlth*, 45(2)(2003), 97-100 [4 Ref].

Attempts were made to utilize anaerobic hybrid reactor for sewage treatment. The reactor was seeded with digested sewage sludge and a HRT of 24 hrs was kept in the start up. The HRT was subsequently decreased to 20, 16, 12, 8 and 4 hrs. A maximum COD removal efficiency of 74% was achieved at minimum HRT. The pH, alkalinity, solids and VFA of the effluent were within the permissible limits.

0303-248. Kumar Sunil, Nemade PD, Singh Gaurav (Solid Waste Manag Div, Natl Environ Engng Res Inst, Nehru Marg, Nagpur 440020). **Anaerobic batch digestion of vegetable market waste.** *Nature Env Polln Techno*, 2(2)(2003), 229-234 [14 Ref].

Anaerobic batch digestion of mixed vegetable market waste composed of carrot, cabbage, cauliflower and spinach was carried out at 5% total solid (TS) concentration in a 10 litre capacity digester. Anaerobic digestion of the waste after 41 days resulted in 0.15 m³ of biogas per kg of TS added (CH₄ content of 68.4%) with a maximum gas production rate of 650 mL/hr on day 25.

0303-249. Masud Hussain SK, Ibrahim SH, Anantharaman N, Sheriffa Begum KMM (Dept Chem Engng, Regl Engng Coll, Tiruchirapalli 620015, Tamil Nadu). **Degradation of lignin by white-rot fungus.** *Eco Env Conserv*, 9(1)(2003), 7-14 [26 Ref].

White-rot fungus *Phanerochacte chrysosporium* degrades lignin of lignin of lignocellulosic material bamboo. It can degrade lignin maximum to 42.43 per cent after 24 days of digestion with optimum parameters. Kappa number which measures the degree of delignification is least value at optimum conditions.

0303-250. Mazumdar B (Regl Res Lab, Bhubaneswar 751013). **Chemical oxidation of spent cathode carbon blocks of aluminium smelter plants for removal of contaminants and recovery of graphite value.** *J Scient Indl Res*, 62(12)(2003), 1181-1183 [5 Ref].

Used carbon cathode blocks are discarded by aluminium smelting plants in large quantities and because of their high contamination of fluoride, its disposal to open ground pose considerable health risk. Paper elucidates a simple oxidation process whereby the contaminants like fluoride are removed and many down stream industries for making various industrial graphite products can use the recovered carbon.

0303-251. Mogra Deepika, Ameta Rajat, Chhabra Neeru, Ameta Suresh C (Photochem Lab, Dept Chem, ML Sukhadia Univ, Udaipur 313002). **Photochemical degradation of chlorobenzene by photo-fentons reagent.** *Int J Cheml Sci*, 1(1)(2003), 41-48 [16 Ref].

The photochemical degradation of chlorobenzene on titanium dioxide was carried out in the presence of Fenton's reagent and the progress of the reaction was observed spectrophotometrically. The effect of variation of various parameters on the photodegradation of chlorobenzene was observed. A tentative mechanism for this degradation has also been proposed.

0303-252. Murugan M, Subramanian E (Dept Chem, Manonmanian Sundaranar Univ, Abisekhapatti, Triunelveli 627012, TN). **Biosorbent, *Cupressus female cone* in the efficient treatment of effluent containing Cr(VI).** *J Scient Indl Res*, 62(11)(2003), 1071-1078 [24 Ref].

Cupressus female cone (CFC), an inexpensive plant material is investigated as an adsorbent for the removal of Cr(VI) from synthetic solution as well as from industrial wastewater so as to help its safe disposal. Maximum sorption occurs at the acidic pH range of 0.2-0.5 but it decreases on increasing the pH. Increase in initial concentration of Cr(VI) and sorbent particle size are found to reduce the amount of sorption, demonstrating the role of surface effects on sorption.

0303-253. Nanda SN, Mishra B, Tiwari TN (Regl Office, Orissa Polln Contl Bd, 1070, Hospital Rd, Modipara, Sambalpur 768002). **Municipal solid wastes in Hirakud town (Orissa): physico-chemical characteristics.** *Polln Res*, 22(2)(2003), 289-292 [5 Ref].

Paper presents the results of a preliminary survey of the municipal solid wastes in Hirakud. For the quantitative physico-chemical analysis, a total of 14 samples of municipal solid wastes were collected from representative collection points scattered all over town. Standard procedures were followed to analyse the chemical characteristics of these 14 samples, and overall average result for various physico-chemical parameters are discussed.

0303-254. Nanda SN, Mishra B, Tiwari TN (Regl Office, Orissa Polln Contl Bd, 1070, Hospital Rd, Modipara, Sambalpur 768002). **Municipal solid wastes in Hirakud town (Orissa) : (1) Preliminary Survey.** *Polln Res*, 22(2)(2003), 287-288 [3 Ref].

Paper presents the results of a preliminary survey of the municipal solid wastes of Hirakud town. The growth of population in Hirakud, total yearly collection of its municipal solid wastes and their nature and the methods adopted for their disposal are discussed. Result shows that the generation of municipal solid wastes in Hirakud amounts to 0.416 kg per person per day, which is fairly low compared to other large cities in India and abroad.

0303-255. Pawar CT, Joshi MV (Dept Geo, Shivaji Univ, Kolhapur 416004, Maharashtra). **Solid waste and its environmental impact in Ichalkaranji city, Maharashtra.** *Nature Env Polln Techno*, 2(2)(2003), 237-240 [3 Ref].

Attempt is made to analyze the impact of the solid waste on the environment and health of the people of Ichalkaranji city through the method of Leopold Matrix. The analysis reveals that the worst impact maker factor is the mutton market waste followed

by plastic waste, cotton waste, vegetable remains and so on. The biodegradable waste can be converted into manure and can become a source of revenue.

0303-256. Rahman Atiqur (Dept Geo, Fac Natural Sci, Jamia Millia Islamia, Jamia Nagar, New Delhi 110025). **Assessing water quality from Jal Nigam hand pumps in Aligarh city**, India. *Nature Env Polln Techno*, 2(2)(2003), 241-244 [7 Ref].

The study shows that the water quality in most of the samples is within the permissible limit but at the same time in some samples it exceeds the permissible limit. The concentration of trace elements like Cu, Pb and Cd in more than 40 per cent of water samples is above the standard limit set for drinking water especially in the old parts of the city.

0303-257. Rayalu SS, Udhoji JS, Kumar P, Munshi KN, Muthal PI, Hasan MZ (Nat'l Environ Engng Res Inst, Nagpur 440020). **Evaluation of chemical toxicity of flyash based zeolite-A**. *Cheml Environ Res*, 11(3&4)(2002), 267-273 [6 Ref].

Fly ash based zeolite A has been synthesized from flyash, which is known to have certain toxic elements with it. Paper studies the toxic nature of FAZ-A in comparison with flyash. The results show that flyash based zeolite-A do not contain any of the toxic element beyond the prescribed limits, thus classifying it as a non-toxic material.

0303-258. Sarayu G, Kanmani S (Cent Environ Std, Anna Univ, Chennai 600025). **Treatment of textile dyeing wastewater using UV/solar photofenton oxidation processes**. *Indian J Environ Hlth*, 45(2)(2003), 113-120 [12 Ref].

Photofenton oxidation process was used to treat textile dyeing wastewater and the study was carried out at different Fenton molar ratio's (H_2O_2/Fe^{2+}) like 25:1, 50:1, 75:1, 100:1. It was found that maximum decolourisation occurred at a fenton molar ration of 50:1 and pH 3. A maximum colour removal of 97% was achieved after a contact time of 30 minutes and 70% COD reduction was observed after a contact time of 60 minutes in UV photofenton oxidation process.

0303-259. Sayed Saroj, Patra HK, Rohella RS (Environ Lab, Dept Bot, Utkal Univ, Bhubaneswar 751004, Orissa). **Dairy waste treatment with upflow anaerobic sludge**

bed (USAB) proces-performance of reactors by start-up at two different HRT with different seed sludge. *J Indl Polln Cont*, 18(2)(2002), 267-274 [18 Ref].

In order to develop a proper start-up strategy for USAB reactors treating dairy wastewater, the effect of two different hydraulic retention time (HRT) and seed sludge (inocula) was studied. The organic loading rate was same for all the reactors in the initial stage. Results indicated good performance in terms of chemical oxygen demand (COD) reduction by the reactors maintained at three hrs HRT with both type of sludge.

0303-260. Singh K, Siddiqui NA, Jena BK, Mohindru VK (Cent Pulp Paper Res Inst, Asharnour, UP). **A study of toxicity of zinc in sludge from two paper mills.** *J Indl Polln Contl*, 18(2)(2002), 159-166 [6 Ref].

Bioavailability of zinc in the sludge of small and a large paper mill have been compared. Marked difference has been observed between the chemical forms of zinc from the said sources. The results give a holistic picture on the environmental impacts of land filling and land applications of sludge generated form the pulp and paper industry.

0303-261. Sridevi B, Dawood Shareif S, Dawood Nausheen, Noorjahan CM, Prabakar K (Sch Environ Sci, PG Res Dept Zoo, The New Coll, Chennai 600014). **Bioabsorption of nickel and zinc by water hyacinth – *Eichhorinia* sp.** *Eco Env Conserv*, 9(3)(2003), 361-365 [26 Ref].

Results showed an active uptake of both the metals by the plants upto 40% concentration of the effluent. Absorption capacity by the plants gradually declined in 80% and 100% effluent concentration, indicating that higher concentration of effluent curtails the growth and development of plants. The efficiency of the plants to absorb nickel and zinc are discussed.

0303-262. Srivastava NK, Ram LC, Jha SK, Tripathi RC, Singh G (Environ Manag Div, Centl Fuel Res Inst, Dhanbad, Jharkhand). **Role of CFRI's flyash soil amendment technology (FASAT) in improving the socio-economic condition of farmers or improvement in soil fertility and crop productivity.** *J Ecophysio Occupl Hlth*, 3(1&2)(2003), 127-142 [35 Ref].

Central Fuel Research Institute has developed fly ash soil amendment technology (FASAT) through which it is now possible to use fly ash / pond ash in bulk quantities on sustainable basis and increasing the yield (20-60%) of different crops. Significant residual effect of pond ash on the yield of succeeding crops at least for a period of six years without any adverse effect due to carry over / uptake of trace heavy metal / radioactivity has also been observed.

0303-263. Thangavel P, Rajannan G, Ramasamy K (Dept Environ Sci, Tamil Nadu Agricul Univ, Coimbatore 641003). **Evidence of hexavalent chromium in tannery waste contaminated soil.** *J Ecotoxicol Environ Monit*, 12(4)(2002), 291-297 [7 Ref].

In order to assess the transformation process involved in the chemistry of chromium, studies on adsorption kinetics and sequential extraction were conducted on oxisol, andept and alfisol soils using $K_2Cr_2O_7$ as source of hexavalent Cr and indicated more adsorption in oxisol due to its high kaolinite clay content and also due to its acidic nature (pH : 4.2). Besides adsorption, the added, Cr(VI) was considerably reduced by the presence of organic matter.

0303-264. Umamaheswari S, Vijayalakshmi GS (Muthayammal Coll Arts Sci, Rasipuram 627408). **Vermicomposting of paper mill sludge using an African earthworm species *Eudrilus eugeniae* (Kinberg) with a note on its physico-chemical features.** *Polln Res*, 22(3)(2003), 339-341 [17 Ref].

Paper mill sludge collected from the local paper factory premises was vermicomposted using an African species of earthworm *Eudrilus eugeniae* and physico-chemical features of paper mil sludge before and after composting was analysed which showed that macro and micro nutrients as well as physico-chemical features such as pH, pore space increased after vermicomposting.

0303-265. Vasanth Kumar K, Bhagavanulu DVS (Dept Environ Civil Engng, Vellore Inst Techno, Vellore 632014, Tamil Nadu). **Adsorption dynamics of methylene blue onto flyash.** *Nature Env Polln Techno*, 12(3)(2003), 299-304 [15 Ref].

Experiments were carried out in batch process for removing methylene blue, a basic dye, from its aqueous solution by adsorption technique using fly ash as an adsorbent. Linear regression correlation coefficient values showed that the sorption

behaviour was better represented by pseudo first order rate kinetics. The rate constant, equilibrium capacity and the initial sorption capacity were also predicted.

0303-266. Vasantha WB, Neelakantan NR*, Ramathilagam S (*Dept Maths Cheml Engng, Indian Inst Techno, Madras). **Minimisation of pollution by CKD in cement industries using Fuzzy theory.** *Dimensions Polln*, 2(2003), 12-42 [8 Ref].

The control of the waste cement kiln dust (CKD) in kiln is a major problem for this alone can lead to the minimization of atmospheric pollution by the cement industry. Paper discusses to minimize the waste CKD in kiln and account for the waste CKD in kiln using fuzzy control theory and fuzzy neural networks.

0303-267. Veeresh H, Tripathy S, Chaudhuri D, Hart BR, Powell MA (Dept Geo Geophys, Indian Inst Techno, Kharagpur 721302). **Competitive adsorption behavior of selected heavy metals in three soil types of India amended with fly ash and sewage sludge.** *Environ Geo*, 44(3)(2003), 363-370 [39 Ref].

Laboratory batch experiments were carried out to study the competitive sorption behavior of metals in three types of Indian soils, differing in their physicochemical properties treated with different proportions of fly ash and sewage sludge mixture. In most of the cases the affinity sequence of metals was Pb>Cu>Zn>Ni>Cd based on their amount of sorption, which varied little with either metal equilibrating concentrations or the soil/mixture type.

0303-268. Vishwanath G, Anantha Murthy KS (Dept Environ Sci, Bangalore Univ, Bangalore 560056, Karnataka). **Municipal waste management in Tumkur town – an environmental perspective.** *Nature Env Polln Techno*, 2(2)(2003), 209-212 [4 Ref].

The study reveals that the liquid waste generated in the Tumkur town is of weak type with a BOD of 89.34 mg/L. The total solid waste generated in the town is around 32 metric tons with a per capita generation of 129 g. About 70 to 80 percent of the waste generated contains recyclable waste.

Forestry and Environment

0303-269. Chand Khem, Jangid BL, Gajja BL (Centl Arid Zone Res Inst, Regl Res Stn, Pali-Marwar, Rajasthan). **Forest and land use pattern trend in arid Rajasthan.** *Indian Forester*, 129(4)(2003), 495-509 [7 Ref].

The data on the land use pattern and forest area indicate that in the past 37 years arid region recorded an increase in area under forest as well as that under non agricultural uses and net area sown, whereas that under barren land, old fallow, and culturable waste declined considerably. The forest area increased from 0.81% in 1960-1961 to 2.01 % in 1997-1998 recording and ACGR of 3.66 % as compared to the State as a whole (3.04%).

0303-270. Chandrashekhara UM, Sreejith KA (Kerala Forest Res Inst, Sub Cent Nilambur, Kerala). **Possible impact of climate change on tree species composition and diversity in lowland evergreen forests of Kerala, Western Ghats.** *Indian Forester*, 129(6)(2003), 770-775 [4 Ref].

A comparative study for the phytosociological features was carried out to predict the possible impact of climate change by selecting a swamp forest (altitude 76m above msl) and a forest patch located at an altitude 372m above msl. It is predicted that due to increase in water table, the vegetation structure and composition in relatively higher altitude plots of lowland forests may simulate those of *Myristica* swamp forest.

0303-271. Dubey B, Upadhyay RK, Hussain J (Math Gr, Birla Inst Techno Sci, Pilani 333031). **Effects of industrialization and pollution on resource biomass: a mathematical model.** *Ecol Modelling*, 167(1-2)(2003), 83-95 [31 Ref].

A mathematical model is proposed and analyzed to study the depletion of resource biomass (plant/tree) due to industrialization and pollution. It is found that in the case of small periodic influx of pollutant into the environment, the resource biomass has a periodic behaviour if the depletion rate coefficient of environment pollutant is small.

However, if this coefficient increases beyond a threshold value, then resource biomass converges towards its equilibrium.

0303-272. Gupta Sangeeta, Uniyal BM (Wood Anatomy Discipline Forest Res Inst, Dehra Dun). **Indian-woods – their medicinal importance and identification.** *Indian Forester*, 129(10)(2003), 1225-1240 [10 Ref].

Article deals with the anatomy and medicinal value of the 25 Indian woods that are well known for their medicinal properties and are also useful timber. Images of transverse section have been added to show their gross structure.

0303-273. Jha MN, Gupta ML, Saxena Alok, Kumar Rajesh (Forest Soil Land Reclamation Div, Forest Res Inst, Dehra Dun, Uttaranchal). **Soil organic carbon store in different forests of India.** *Indian Forester*, 129(6)(2003), 714-724 [9 Ref].

Soil is a major sink of carbon. 9815.95 million tones of Soil Organic Carbon (SOC) store was estimated in total forest soils under 19 species in India. Spruce forest soil has maximum SOC store (386.0 t/ha) while Khair has minimum (51.93 t/ha). Soil conservation practices should be strengthened to conserve these natural resources so that carbon store may not deplete especially from hilly terrain.

0303-274. John Britto S, Soosairaj S, Balaguru B, Arockiasamy DI (Cent Natural Resources Std, Dept Bot, St Joseph's Coll, Tiruchirapalli, Tamil Nadu). **Quantitative analysis of non-timber forest products in four forest types of Pacchaimalai hills, Eastern Ghats, Tamil Nadu.** *Indian Forester*, 129(4)(2003), 489-494 [23 Ref].

Study aims at a quantitative analysis of NTFPs in 0.12 ha area of four forest types of Pacchaimalai Hills, Eastern Ghats (Tamil Nadu). A total of 5,760 ha⁻¹ individuals of NTFPs plants from 86 species of 80 genera and 40 families have been recorded. The result indicates that the diversity of NTFPs plants is higher in the semi-evergreen forest type followed by the dry deciduous type.

0303-275. Kotwal PC, Chandurkar Dharmendra (Indian Inst Forest Manag, Bhopal, MP). **Towards sustainable management of forests in India.** *Indian Forester*, 129(5)(2003), 551-563 [10 Ref].

Following the Rio Summit, countries took various initiatives to develop comprehensive guidelines for achieving the objectives of Sustainable Forest Management (SFM) and followed the approach of establishment of Criteria and Indicators (C&I). Criteria & Indicators in this regard were developed as an accepted framework for assessing sustainability of forest management systems and practices. Paper discusses the concepts of SFM and C&I.

0303-276. Negi JDS, Chauhan PS, Negi Mridula (Forest Eco Env Div, Forest Res Inst, Dehra Dun, Uttaranchal). **Evidences of climate change and its impact on structure and function of forest ecosystems in and around Doon Valley.** *Indian Forester*, 129(6)(2003), 757-769 [30 Ref].

Available data on meteorological observation, phytosociological studies, population dynamics and biomass in moist Sal (*Shorea robusta* Gaertn. f.) forest of Doon Valley and adjacent dry deciduous forest are utilized to understand the structure and functioning of ecosystem. Fluctuations in temperature and rainfall have pronounced effect on the distribution of evergreen and deciduous tree species. Further, change in climatic pattern and microclimatic conditions as a results of deforestation have noticeable impact on forest decline.

0303-277. Rawat Vijay, Rawat Laxmi (Plant Physio, Discipline, Bot Div, Forest Res Inst, Dehra Dun). **Climate change mitigation approach through plantation forestry in India.** *Indian Forester*, 129(7)(2003), 895-904.

Plantation forestry and trees out side forest offers enormous opportunity for carbon capture in India. Assuming that the present forest cover of the country will sustain itself with annual increase in area of plantation, regeneration of degraded forests and afforestation programmes and it is expected that Indian forests will continue to act as net C sink in future.

0303-278. Saxena Alok, Jha MN, Rawat JK (Forest Surv India, Dehra Dun, Uttaranchal). **Forests as carbon sink – the Indian scenario.** *Indian Forester*, 129(7)(2003), 807-814 [10 Ref].

The Forest Survey of India (FSI) developed a methodology in 1995 to assess the above ground growing stock of the forested areas of the country for integrating remote

sensing data with the field inventory at national level. Growing stock for the year 1994 is estimated to be 4340.0 million m³, while the above ground woody biomass and carbon were estimated to be 2395.4 million tones and 1083.8 million tones respectively.

0303-279. Srivastava Rajiv K, Singh Dhar, Khanduri VP (Monit Evaluation Div, Indian Coun Forestry Res, Edn, Dehra Dun, Uttaranchal). **Carbon sequestration and role of carbon emission from forest fire on climate change.** *Indian Forester*, 129(7)(2003), 844-852 [17 Ref].

Standing stock of vegetation plays a major role in carbon sequestration at present as well as in the future This biospheric carbon sequestration is essentially a huge natural biological scrubber for all emission sources of carbon. An estimated value of 2GtC is removed from the atmosphere each year by the earth's mantle of vegetation. Paper examines the carbon sequestration and consequences of forest fire carbon emission to the climate.

Wildlife

0303-280. Gokhale MV, Chavan NS (Dept Bot, Shivaji Univ, Kolhapur 416004, MS). Degradation of mangrove habitat of Achara – a need of rescuing. *Eco Env conserv*, 9(1)(2003), 15-23 [20 Ref].

Achara estuary is located in Sindhudurga District of Maharashtra inhabited by some critically endangered mangrove species. These species require rescuing of habitat to flourish. In the present work the altered geomorphological features have been identified to know the overall habitat status.

0303-281. Jeyasingh Punidan D, Davidar Priya (Dept Zoo, Univ Oklahoma, 730, Van Vleet Oval, Room No.314, Norman, OK 73019-0235, USA). **Crop predation by wildlife along the eastern boundary of the Kalakad – Mundanthurai Tiger Reserve, Southern India.** *J Bombay Natural Hist Soc*, 100(1)(2003), 38-45 [18 Ref].

Crop raiding patterns by wildlife at ten villages along the eastern boundary of the Kalakad-Mundanthurai Tiger Reserve (KMTR), southern India were studied. The Indian wild pig (*Sus scrofa cristatus*) was identified as the major crop pest in this area and the crop loss caused by it was quantified. The electric fence was not effective in preventing crop raiding by the wild pig.

0303-282. Johnsingh AJT, Negi AS (Wildlife Inst India, PB18, Chandrabani, Dehra Dun 248001). **Status of tiger and leopard in Rajaji – Corbett Conservation Unit, northern India.** *Biol Conserv*, 111(3)(2003), 385-393 [29 Ref].

Paper evaluates the status of tiger and leopard in Rajaji-Corbett Tiger Conservation Unit by counting the number of different pug marks on 3-5 km transect walks along 52 dry stream beds ('raus'). Owing to increasing biotic pressures, the tiger has become rare in Rajaji-Corbett corridor and has become extinct in four divisions. There is a growing threat of further degradation and fragmentation of its habitat. To implement a recovery programme, paper suggests several management measures.

Energy and Environment

0303-283. Katwal RPS, Soni PL (Indian Coun Forestry Res Edn, Dehra Dun, Uttaranchal). Biofuels: **An opportunity for socio-economic development and cleaner environment.** *Indian Forester*, 129(8)(2003), 938-949 [17 Ref].

Biofuels (plant based fuel) can supplement or replace fossil fuels as they are renewable and environmentally safe. The most common type of biofuels that are being developed and used at present are bioethanol and biodiesel. The fatty oil derived from *Jatropha curcas* (Ratanjyot) and *Pongamia pinnata* (Karanj) are the excellent feed stock for biodiesel production. Paper presents on overview of biodiesel production using these species in Indian context and socio-economic development likely to occur.

0303-284. Nath Kaushik, Das Debabrata (Dept Biotechno, Indian Inst Techno, Kharagpur 721302, West Bengal). **Hydrogen from biomass.** *Curr Sci*, 85(3)(2003), 265-271 [59 Ref].

Article updates the developments of various hydrogen-production processes from biomass. Several developmental works are discussed, with a brief outline of different technologies employed therein. A comparative study of existing processes is given on the basis of their relative merits and demerits. In addition, some techno-economic considerations of hydrogen-production processes from biomass are also highlighted.

Plant and Pollution

0303-285. Abubacker MN, Ramanathan R, Varadraj N (PG Res Dept Bot, Natl Coll, Tiruchirapalli 620001, TN). **Physico-chemical and microbiological studies of sago effluent polluted soil.** *J Indl Polln Contl*, 18(2)(2002), 125-131 [7 Ref].

Physico-chemical and micro-biological studies of sago effluent polluted soil in Attur, Salem District, Tamil Nadu indicated that the concentration of nitrogen, phosphorus, potassium, calcium, zinc, copper, iron and manganese are higher due to the heavy load of pollution. The presence of such pollutants have strong impact in fungal

metabolism which result in the colonization of specific indicator fungi. These fungus isolates can be exploited to develop a bioremediation process to reduce soil pollution.

0303-286. Ahmad Aftab, Ahmad Sakil (Dept Bot, Coll Comm, Patna 800020). **Study of sulphur accumulation in plant foliage due to coal smoke pollution.** *Geobios*, 30(4)(2003), 284-285 [8 Ref].

The effects of coal smoke from Muzaffarpur Thermal Power Station (M.T.P.S.) on some economically important tree species show a significant higher amount of inorganic sulphur in their foliage in all the seasons in SO₂ enriched atmosphere. The sulphur accumulation in leaves can be used as an index to the level of SO₂ pollution.

0303-287. Ameta Suresh C, Punjabi Pinki Bala*, Kothari Shilpa, Sancheti Anjali (*113, Vidhya Nagar, Hiran Magri, Sec 4, Udaipur 313002, Rajasthan). **Effect of untreated and photocatalytically treated dyeing industry effluent on growth and biochemical parameters of *Allium cepa* (onion).** *Polln Res*, 22(3)(2003), 389-392 [20 Ref].

It was observed that there was a prominent growth and increased sugar and protein percentage and chlorophyll content in onion grown in photocatalytically treated effluent. Based on the above results, photocatalytic treatment of wastewater can be considered as an effective method, which will help in reusing the effluent from dye industry for irrigation purposes.

0303-288. Banerjee Saikat, Singh AK, Banerjee SK (Eco Rehabilitation Div, Trop Forest Res Inst, Jabalpur, MP). **Impact of flyash on foliar chemical and biochemical composition of naturally occurring ground flora and its possible utilization for growing tree crops.** *Indian Forester*, 129(8)(2003), 964-977 [37 Ref].

Paper studies the impact of flyash generated from Shaktinagar (UP) Thermal Power Plant on foliar chemical and biochemical parameters of *Ipomea cornes*, *Cassia tora* and *Acacia nilotica* naturally growing on flyash dyke. It is apparent that flyash severely affects the plants by changing the chemical and biochemical compositions. Protein, carbohydrates, chlorophyll and ascorbic acid decrease significantly with a significant increase of phenols of the plant species grown on flyash.

0303-289. Bhargava AK, Gupta Richa, Bhargava Sonali, Paridhi (Bot Dept, MS Coll, Saharanpur, UP). **Effect of automobile exhausts on total N, P and total heavy metal of road side sugarcane at district Saharanpur, U.P.** *Adv Plant Sci*, 16(2)(2003), 557-560 [22 Ref].

High soil contents of toxic or total heavy metals have been observed in the proximity of road side grown sugarcane as compared to plant grown at 100 mt. distance away from road side. Like wise, level of total nitrogen and phosphorous also showed variations in different plant samples depending upon the extent of automobile exhaust released along road side.

0303-290. Bhattacharya Badal, Sarkar Santosh Kumar, Mukherjee Nilanjana (Dept Metallurgical Engng, Jadavpur Univ, Calcutta 700032). **Organochlorine pesticide residues in sediments of a tropical mangrove estuary, India: implications for monitoring.** *Env Int*, 29(5)(2003), 587-592 [42 Ref].

Paper examines the concentration of isomers of hexachlorocyclohexane (HCHs), dichlorodiphenyl trichloroethane and its metabolites (DDTs), -endosulfan and endosulfan sulfate in surface sediment samples collected from the mouth of Hugli estuary in the vicinity of Sundarban mangrove environment, eastern parts of India. An overall pattern of accumulation of these pesticides was in the order of HCH> endosulfan sulfate> DDT> -endosulfan. The study is compared to other estuarine environment in India and abroad.

0303-291. Chaudhary Meenakshi, Praksh G, Rana Pranav (SVBP Univ Agricl Techno, Modipuram, Meerut 250110). **Effect of sulphur dioxide pollution on ornamental species of cacti.** *Progressive Agricl*, 2(1)(2002), 41-43 [4 Ref].

The group of plants were exposed to different concentration of sulphur dioxide which at 1306 gm^{-3} , 2612 gm^{-3} and 5224 gm^{-3} concentration reduced the growth rate of cacti. The maximum reduction recorded in shoot length was 12.65 cm at 5224 gm^{-3} SO_2 concentration. Significant reduction in fresh and dry weight of roots and shoot-root ratio was also observed.

0303-292. Chaudhuri D, Tripathy S, Veeresh H, Powell MA, Hart BR (Dept Geo Geophys, Indian Inst Techno, Kharagpur 721302, West Bengal). **Mobility and**

bioavailability of selected heavy metals in coal ash- and sewage sludge-amended acid soil. *Environ Geo*, 44(4)(2003), 419-432 [52 Ref].

A sequential extraction procedure has been used to study the changes in the distribution and mobility of Cd, Cr, Cu, Ni, Pb and Zn in an acid lateritic soil amended with alkaline coal ash and neutral sludge individually and with their mixture of equal proportions at 25, 50 and 75 Mg/ha application rates and grown in a crop with peanuts. The vegetative plant parts showed maximum accumulation of metals indicating a physiological barrier in the transfer of metals from the root to the kernel. Linear relationships of total concentrations of heavy metals in soil with that in the crop were observed.

0303-293. Devpura Shikha, Khan TI (Indira Gandhi Cent HEEPS, Univ Rajasthan, Jaipur 302004, Rajasthan). **Effect of simulated acid rain on germination and seedlings of *Phaseolus aureus* Var, RMG-62.** *Nature Env Polln Techno*, 2(3)(2003), 337-339[15 Ref].

Acid rain showed an adverse effect on the seedlings of *Phaseolus aureus* var. RMG-62. The seedlings tolerated exposure to acid rain down to pH 3.1. Below this pH level seedlings succumbed. With the decrease in pH level, different growth parameters and chlorophyll content showed a decreasing trend.

0303-294. Dube BK, Pandey VN, Sinha Pratima, Chatterjee C (Bot Dept, Lucknow Univ, Lucknow 226007, UP). **Cadmium phytotoxicity and disturbances in cow pea physiology.** *Polln Res*, 22(2)(2003), 251-257 [33 Ref].

Cowpea (*Vigna uniculata* L.) cv. Pusa Komal, plants were grown in refined sand at variable levels of excess Cd applied as cadmium sulphate. In addition to growth depression at 0.5 and 0.4 mM Cd (10 days after initially supplying Cd), the visible effects of excess Cd were observed as yellowing of old leaves marginal chlorosis of young and middle leaves, reduction in size and number of leaves, inflorescences, dwarfism and bushy appearance, early defoliation, wiltin and necrosis of affected leaves.

0303-295. Gopal Rajeev, Dube BK, Chatterjee C (Dept Bot, Lucknow Univ, Lucknow 226007). **Phyto-availability and toxicity of cobalt in *Citrullus*.** *Polln Res*, 22(2)(2003), 259-264 [29 Ref].

To observe the ill effect of excess cobalt and the tolerance limit of Co by *Citrullus vulgaris* cv. Lundhiana, plants were grown in refined sand at variable levels of excess Co as cobalt sulphate. At excess (0.5mM) Co, in addition to growth depression of citrullus, the young leaves developed interveinal chlorosis (4 days after metal supply), initiating from apex, gradually spreading downward covering the entire lamina.

0303-296. Khan TI, Marwari Richa, Singh N (Indira Gandhi Cent Human Eco, Environ Population Std, Univ Rajasthan, Jaipur 302004). **Impact of textile wastewater on *Solanum melongena* var-FI- Hybrid Kanhaiya in pot experiment with special emphasis on analysis of heavy metals.** *Dimensions Polln*, 2(2003), 108-116 [19 Ref].

Solanum melongena plant material harvested in a laboratory experiment using five different levels of textile waste water. After the crop harvesting the soil was found to contain 1.417 mg/g of Zn, 1.003 mg/g of Cu, 0.378 mg/g of Ni, 0.378 mg/g of Cd, 0.773 mg/g of Cr, 1.139 mg/g of Pb and 0.427 mg/g of Co in the soil of pots treated with highest ratio of distilled water and waste water.

0303-297. Kumar A, Singhal V, Joshi BD, Rai JPN (Dept Environ Sci, GBP Univ Agricul Techno, Patnagar 263145, Uttaranchal). **Impact of pulp and paper mill effluent on lysimetric soil and vegetation used for land treatment.** *J Scient Indl Res*, 62(9)(2003), 883-891 [32 Ref].

Paper reports on N-mineralization, microbial biomass C and N and microbial respiration of the pulp and paper mill effluent lysimetric soils. The experiment showed that the minimum microbial characteristics were recorded in normal soil at 25 per cent effluent concentration, while their maximum values were recorded in soil mixed clay at 100 per cent effluent concentration. Based on the above findings, application of normal soil for land treatment of pulp and paper mill effluent at 25 per cent concentration is recommended.

0303-298. Lal Nanda, Mishra Richa (Fac Life Sci., CSJM Univ, Kanpur 208024). **Effect of synthetic detergent on germination parameters, seedling growth and photosynthetic pigments in Mungbean (*Vigna radiata*) seedlings.** *Polln Res*, 22(3)(2003), 335-337 [4 Ref].

The study was undertaken to investigate the effects of synthetic detergents (Surf Excel) on germination parameters, seedling growth and photosynthetic pigments in Mungbean (*Vigna radiata*). Mungbean seeds failed to germinate at detergent levels beyond 0.1%. The presence of detergent did not affect germination % and emergence % upto 0.5% but showed marked decrease in emergence rate and vigour index.

0303-299. Lal Nand, Mishra Richa (Fac Life Sci, CSJM Univ, Kanpur 208024, UP). **Synthetic detergent induced changes in the seed imbibition pattern and dehydrogenase activity in mungbean (*Vigna radiata*).** *Eco Env Conserv*, 9(3)(2003), 379-383 [5 Ref].

Mungbean (*Vigna radiata*) seeds failed to germinate above 0.1% (w/v) detergent (Surf Excel) level. The water imbibition in seeds was accelerated by 0.025% detergent over control whereas other detergent concentrations retarded it. The dehydrogenase activity showed reduction with increase in detergent concentration and was significantly lower at 0.15% and above levels leading to failure of germination.

0303-300. Mariappan V, Rajan MR (Dept Bio, Gandhigram Rural Inst, Deemed Univ, Gandhigram 624302, Tamil Nadu). **Effect of tannery effluent on seed germination and seedling growth of *Parkinsonia aculeata* and *Caesalpinia coriaria*.** *J Ecobio*, 14(4)(2002), 241-246 [24 Ref].

A gradual decrease in the germination of seeds was observed and the minimum percentage germination was 71.2 in *Parkinsonia aculeata* and 76.9 in *Caesalpinia coriaria*. Maximum seedling growth was observed in 10% effluent. It was observed that even at 10% concentration of effluent, plants showed inhibition of growth. Hence more dilution is required for the utilization of effluent in a beneficial way.

0303-301. Meriga Balaji, Krishna Reddy B, Jogeswar G, Reddy LA, Kavi Kishore PB (Dept Genetics, Osmania Univ, Hyderabad 500007). Alleviating effect of citrate on aluminium toxicity of rice (*Oryza sativa* L.) seedlings. *Curr Sci*, 85(3)(2003), 383-386 [23 Ref].

Seedlings of two Indian rice cultivars (Suraksha and Vikas) differing in aluminium sensitivity were grown in Yoshida's culture solution containing 80 μ mol aluminium. High callose accumulation seems to be a good marker for screening the cultivars of rice for

aluminium sensitivity. Citrate at a concentration of 200 M alleviated the toxic effects of aluminium in both cultivars of rice, mostly by chelating with the metal.

0303-302. Naidu K Chandrasekharan (Dept Water Affairs, P Bag 002, Maun, Botswana). **Influence of experimental crude oil spills on germination and primary growth features in certain commercial plants.** *J Ecotoxicol Environ Monit*, 12(4)(2002), 241-253 [36 Ref].

The LC₅₀ values at the 7th day of germination were determined as 0.039, 1.63 and 2.56 lit.m⁻² for paddy, greengram and groundnut respectively. The oil mobility was found to be more in well drained soils of greengram and groundnut than in water submerged soil of paddy. Although some oil components showed immediate mobility into the soil column, most of the oil remained in the top 2 cm soil. Rice seedlings were the most susceptible to crude oil followed by green gram and groundnut.

0303-303. Pandey AK, Pandey GC (Dept Environ Sci, Dr. RML Avadh Univ, Faizabad 224001). **Impact of coal washery effluent on seed germination, seedling growth and chlorophyll content of *Oryza sativum*.** *J Indl Polln Contl*, 18(2)(2002), 175-181 [15 Ref].

The impact of coal-washery effluents (CWE) have been studied on seed germination, shoot length, root length, chlorophyll contents and percent phytotoxicity at different concentrations and time intervals on *Oryza sativum*. At higher concentrations of CWE (10 and 100%) a marked decrease in seed germination (3 - 29%), shoot length (9-51%), root length (8-32%) chlorophyll contents (12-31%) for 7, 14, 21, 28 and 35 days respectively was recorded.

0303-304. Pandit BR, Prajapati Sailesh (Dept Life Sci, Bhavnagar Univ, Bhavnagar 364002). **Accumulation of some trace elements in different species of Acacia in reserved forests near Bhavnagar, Gujarat, India.** *Eco Env Conserv*, 9(3)(2003), 371-373 [8 Ref].

The content of some trace elements like Fe, Cu, Zn and Mn were analysed seasonally in three species of Acacia like *A. nilotica*, *A. leucophloea* and *A. senegal* in the reserved forest near Bhavnagar. The study recorded higher accumulation of Fe then

other elements. Fe (8.02 to 83.42 g/ml) was followed by Cu (1.17 to 6.70 g/ml) and Zn (0.98 to 32.68 g/ml).

0303-305. Raj Sonia, Devpura Shikha, Solomon Deepika M, Khan TI (Indira Gandhi Cent Human Eco, Environ Population Stud, Univ Rajasthan, Jaipur 302004). **Simulated acid rain exposure on *Triticum aestivum* var Raj. 3077 and its impact on growth and physiological parameters.** *Dimensions Polln*, 2(2003), 87-94 [23 Ref].

The plants of *Triticum aestivum* var. Raj. 3077 tolerated the simulated acid rain exposure down to pH 1. Below this pH level plants succumbed at pH 0.5. Root and shoot lengths and dry weights were reduced due to lowering in pH level. Chlorophyll content, carbohydrate, protein and nitrogen content were also significantly affected.

0303-306. Ramakrishnaiah H, Somasekhar RK* (*Dept Environ Sci, Bangalore Univ, Bangalore 560056). **Higher plants as biomonitors of automobile pollution.** *Eco Env Conserv*, 9(3)(2003), 337-343 [34 Ref].

Paper describes air pollution tolerance among roadside plants exposed to varying degrees of traffic pollution. The observed significant reduction in total chlorophyll, ascorbic acid and relative water content showed inverse relationship with traffic density. Similarly, the pH followed an exponential decrease with increase in traffic pollution and drifted towards the acidic range. The utility of Air Pollution Tolerance Index bio analysis is discussed.

0303-307. Shrivastava VS, Patil BH (Cent PG Res Chem, GTP Coll, Nandurbar 425412). **Metallic and some physico-chemical studies of soil and aquatic sediments.** *Eco Env Conserv*, 9(1)(2003), 75-77 [9 Ref].

The soil samples were collected from surface of the soil from different agriculture fields in the Khandesh region where wheat, jawar, cotton, sugar cane and groundnut crops were cultivated. Tapi River sediment samples were also collected from five different stations which were 7-8 km away from each other. The concentration of heavy metals have been determined by ICP-AES and physico-chemical characteristics have been detected by following standard methods.

0303-308. Vijaywargiya Anjali, Pandey GP (Sch Life Sci, Devi Ahilya Vishwavidhyalaya, Vigyan Bhawan, Khandwa Rd, Indore 452017). **Effect of cement dust on soybean, *Glycine max* (L.) merr. and maize, *Zea mays* Linn. : in fluorescence studies.** *Geobios*, 30(4)(2003), 209-212 [9 Ref].

Due to cumulative encrustation of cement dust on the leaves of soybean and maize, a quantitative reduction in the absorption of light by these plants was observed, which affected fluorescence yield. The values of fluorescence were lower in dusted as compared to control and this difference gradually increased as the crop advanced in age.