

Environmental Management

0001-001. Anil Kumar A, Babu B, Ramachandarn U (Regl Agricl Res Stn, Pilicode, Kasaragod, Kerala). **Attitude of farmers towards agro-forestry programme in Kerala.** *Indian J Forestry*, **22**(2) (1999), 155-159 [7 Ref].

Communication records the attitude of farmers towards agro-forestry programme in Kerala. The most important finding of the study is that many of the farmers are neutral or undecided in their attitude towards the agro-forestry programme. Present study also indicates that the important constraints perceived by farmers are, viz., the unavailability of water, unavailability of desired plant species, and smaller size of land holdings. The agro-forestry programme can be a success in Kerala if steps are taken to overcome these constraints.

0001-002. Chakraborty PB (Regl Res Stn, (Coastal Saline Zone) BCKV, Kakdwip 743347). **Water resource of Sundarban Delta - problems and potentialities.** *Env Eco*, **18**(1) (2000), 175-176 [7 Ref].

Sundarban delta suffers from several agro-climatic limitations in utilizing its bountiful surface and subsurface water resources. Rainfall is, therefore, the only available and utilizable water resource that needs efficient planning and management. Rainfall yields a good amount of run-off which can be re-cycled through harvesting in well designed and maintained ponds and other structures for sustainable production.

0001-003. Chaphekar SB, Madav RP (Laxmi Niketan, 1st floor, Dhas Wadi, Thakurdwar, Mumbai 400002). **Thermal power plants and environmental management.** *J Indian Assoc Environ Manag*, **26**(1) (1999), 48-53 [10 Ref] (Late Recd).

Air pollution by sulphur dioxide and fly ash due to burning of coal, thermal pollution caused by coolant water and disposal of ash, are the points on environmental concern due to coal-based TPPs. Paper discusses measures for improvement of environment of power projects by cultivating green plants to scavenge air pollutants, to stabilize ash ponds and to enrich banks of creeks carrying coolant waters, through cultivation of mangroves.

0001-004. Daryapurkar Ramesh, Chakrapani D (Lars Enviro Pvt Ltd, 218, Bajaj Nagar, South Ambazari Rd, Nagpur 400010). **Challenging problems in distillery waste treatment-Indian scenario.** *J Indian Assoc Environ Manag*, **26**(3) (1999), 141-149.

Distillery spent wash is one of the most obnoxious industrial wastes, as it is highly coloured and has very high COD and BOD concentrations with high concentration of non-biodegradable fraction. Paper highlights various problems being faced by the industry in handling this waste. Possible solutions available as on date are discussed.

0001-005. De Souza SN (Natl Inst Oceanogr, Dona Paula, Goa, 403004). **Effect of mining rejects on the nutrient chemistry of Mandovi estuary, Goa.** *Indian J Marine Sci*, **28**(4) (1999), 355-359 [20 Ref].

Nutrient chemistry in Mandovi estuary during premonsoon is affected by the discharge of mining rejects. Concentrations of nitrate and phosphate, in general, show low levels in this season while silicate show wide range in concentration. Elevated concentrations of nitrate (6.1-9.1 mM) associated with reduced levels of phosphate (<0.1 mM) and silicate (50-60 mM) in the mid-estuary, near the discharge point of mining rejects, suggest that the suspended sediments derived from the mining rejects adsorb phosphate and silicate, and remove them from the water column while the mining rejects act as a source of nitrate to the estuary.

0001-006. Deshpande VP, Gadkari SK, Kaul SN (Natl Environ Engng Res Inst, Nagpur 440020). **Industrial wastewater management.** *J Indian Assoc Environ Manag*, **27**(2) (1999), 119-136 [6 Ref].

Attempt has been made to describe volumes and characteristics of wastewaters and the available methods of treatment for selected industries in India.

0001-007. Fulekar MH (Centl Labour Inst, DGFASLI, Sion, Mumbai 400022). **Chemical pollution - a threat to human life.** *Indian J Environ Prot*, **19**(5) (1999), 353-359 [8 Ref].

The modern technological innovation in chemical processes has increased the pollution level above the self cleaning capacities of environment. Article deals with

industrial pollution, in particular chemical pollution and its effect on human beings as well as impact on environment.

0001-008. Gadgil K (Indian Inst Techno, Cent Energy Std. Hauzkhas, New Delhi 110016). **Gasifications for clean combustion in highly polluting furnaces.** *Indian J Environ Prot*, **19**(5) (1999), 360-362 [5 Ref].

There are number of furnaces belonging particularly to small scale operations which are highly polluting. Low grade coal and other carbonaceous materials could be gasified to produce gas at high temperature which could be burnt in a pollution free manner in these furnaces. For this purpose some development on both gasifier and burner has to be done. Paper deals with some of these developmental work carried out in the laboratory.

0001-009. Ghose MK, Kundu NK (Cent Mining Env, Indian Sch Mines, Dhanbad 826004, Bihar). **Probable impact on land due to open-cast coal mining.** *J Environ Std Policy*, **2**(2) (1999), 87-96 [16 Ref].

A survey was conducted at a virgin open-cast coal project to assess the impact to mining of land. The field capacity, wilting coefficient, bulk density, moisture content, moisture retention capacity, pH, and fertility status of the area were studied, and the results have been discussed to evaluate the impact of proposed mining project on land.

0001-010. Ghose MK Magee SR (Cent Mining Env, Indian Sch Mines, Dhanbad 826004). **Assessment of dust generation due to opencast coal mining-an Indian case study.** *Environ Monit Assess*, **61**(2) (2000), 255-263 [15 Ref].

Increasing trend of opencast mining leads to production of huge quantities of dust. Emission factor data have been utilised to quantify the generation of dust. The main sources of air pollution have been identified. The rate of emission per unit of a given activity known as an emission factor has been utilised, taking local factors into account. The methodology adopted may be used to quantify generation for other projects also.

0001-011. Ghosh Rekha (Cent Mining Env, Indian Sch Mines, Dhanbad 826004, Bihar). **Soil degradation due to mining, its rehabilitation: case in a coalfield in India.** *J Environ Std Policy*, **2**(2) (1999), 97-103 [7 Ref].

Paper establishes some innovative low-cost technology to green some lands degraded by mining, which had a quarry backfilled by overburden materials and a subsided land, both without any soil cover due to mining. Addition to soil was not required; on the contrary, some soil cover could be generated on the plots concurrently with greening.

0001-012. Ghosh S, Rana U, Rao KS, Sen KK (GB Pant Inst Himalayan Env Dev, Kosi Katarmal, Almora 263643). **GIS application for mountainous terrains: some considerations and options.** *ENVIS Bull-Himalayan Eco Dev*, **8**(1) (2000), 1-8 [27 Red].

Mountains are areas of high relief having distinct changes in terrain slope and thus require a three-dimensional representation for spatial modeling. Mountains have some very specific features that need to be considered during spatial analyses. The study illustrates integration of such factors in ecological zoning, land suitability classification and probability mapping, such as for land erosion. 'Agricultural suitability' and 'Vulnerability to land erosion' maps of Pranmati watershed are also discussed.

0001-013. Ghosh Santanu, Chattopadhyay GN, Vass KK (Soil Testing Lab, Inst Agric, Visva-Bharati, Sriniketan 731236). **Environmental impact assessment of lower Ganga system.** *Env Eco*, **18**(1) (2000), 126-129 [8 Ref].

A survey was carried out to study the environmental impact of this river system with relation to pollution. The study revealed water pollution in lower Ganga river to be largely inorganic on nature. It further showed Berhampore belt of the river system to be the least polluted one among all the stretches surveyed while water pollution at Dakshineswar zone appeared to be the highest.

0001-014. Jain CK, Ali Imran, Sharma MK (Natl Inst Hydro, Jalvigyan Bhawan, Roorkee 247667). **Fluoride contamination in ground water-Indian scenario.** *Indian J Environ Prot*, **19**(4) (1999), 260-266 [48 Ref].

Attempt has been made to highlight the problem of fluorosis, by compiling the work carried out by various researchers in fluoride affected areas, against the background of present day developments.

0001-015. Khan RR (Ministry Env Forests, Paryavaran Bhawan, CGO Complex, Lodhi Rd, New Delhi 110003). **Preparedness for emergency response to major chemical accidents.** *J Env Polln*, **6**(4) (1999), 225-230 [3 Ref].

Recent events in both developed and developing countries have revealed that preparedness for the right response to chemical emergencies is either non-existent or consists of uncoordinated frantic efforts without proper plans or structure. This paper presents an overview on the preparedness and response to major chemical accidents.

0001-016. Muruganadam M (Centl Soil Water Conserv Res Trng Inst, Dehradun 248195, UP). **Agriculture potential for integrated watershed development in Shiwalik and North Western Himalayas: Problems and prospects.** *Indian J Soil Conserv*, **27**(3) (1999), 234-242 [17 Ref].

To conceptualise Himalayan aquaculture and develop an organised fish farming and improve watershed management in foot hills of Shiwalik and other North Western Himalayan tracts, a field study comprising a regional survey in three representative blocks was initiated. The survey indicated that, conceivably, aquaculture development in Himalayas can take pressure off the fragile ecosystem, where the existing agriculture suffers from on-site and off-site effects of deforestation, soil erosion and nutrient loss, especially in monsoon and unsustainable farming practices such as cultivation along the slope and extensive monoculture.

0001-017. Ninawe AS (Dept Biotechno, CGO Complex, Lodhi Rood, New Delhi - 110003). **Need to promote sewage fed fish culture as ecofriendly production technology.** *Indian Env Ecoplant*, **2**(1) (1999), 75-82 [25 Ref].

Fish and other organisms can be successfully raised in wastewater fed systems and can provide an important source of food and employment in south-east Asia. These days the efforts are being made to treat domestic sewage suitable for aqua-farming.

0001-018. Pal AK, Saxena NC (Cent Mining Env, India Sch Mines Dhanbad 826004). **Assessment of quality of life in mining complexes.** *J Environ Std Policy*, **2**(2) [1999], 61-69 [8 Ref].

Paper develops a methodology based on value functions of 13 societal indicators for assessing the QoL (quality of life) in mining complexes in the India context. The methodology can be used in environmental management plans of mining projects to outline the various actions required for achieving the desired results at different stages.

0001-019. Rangaraju G, Mohamed Ali A, Rajagopal Aruna (Water Techno Cent, Tamil Nadu Agricul Univ, Coimbatore 641003). **Impact of soil and water conservation measures on irrigation water and agricultural production in Vellar watershed.** *Indian J Forestry*, **22**(3) (1999), 191-193 [2 Ref].

In order to control the runoff water and soil erosion and to protect the lower agricultural lands in the plains of Vellar watershed Tamil Nadu, land developmental activities such as "V" trenches, afforestation, construction of check dams were taken up in the upper non-arable areas. These measures besides conserving the soil and rain water, enhanced the agricultural productivity, the cropping intensity and consequently the production and net income of the farming community substantially.

0001-020. Ravichandran M, Balasundaram C (Dept Eco, Bharathidasan Univ, Tiruchirapalli, Tamil Nadu 620024). **Economics of drinking water supply in rural Tamil Nadu - a case study.** *India J Environ Sci*, **4**(1) (2000), 1-9 [4 Ref].

Access to drinking water is one of the basic necessities of mankind which will be a crucial issue in the coming year in the developing countries. This paper reports the economic issues in the backdrop of environmental problems associated with drinking water supply in a village in Tamilnadu.

0001-021. Sarin SM, Suri BL, Singh Anil, Sharma Niraj, Shanmugam P, Sharma Kirti (Env Rd Traffic Safety Div, Centl Rd Res Inst, New Delhi 110020). **Efficacy and financial viability of vehicular pollution checking in Delhi.** *J Indian Assoc Environ Manag*, **26**(3) (1999), 154-162 [13 Ref].

The Department of Transport, Delhi is one of the nodal agencies responsible for enforcing various vehicular pollution-related provisions in Delhi. Recently, the (non) performance of DoT with regard to its efforts in pollution checking and enforcement has come under severe criticism. This paper makes an attempt to critically evaluate the performance of DoT and efficacy of the existing pollution checking system in Delhi.

0001-022. Satapathy KK, Dutta KK (Indian Coun Agricul Res Complex, NEH Region, Umiam 793103, Meghalaya). **Revegetation of eroded hill slopes - an experience with geojute in Arunachal Pradesh.** *Indian J Soil Conserv*, **27**(3) (1999), 227-233 [2 Ref].

Landslides in road risers, agricultural land, stream lines in the hill areas of Arunachal Pradesh is a common but destructive phenomenon specially during the rainy season. The effect of Geojute materials in stabilizing and revegetation of the badly eroded lands were evaluated. Geojute nets were used to cover the eroded surface, over which different plant species were planted in different treatments. The material was found suitable in areas with low and medium slopes where erosion is caused mainly by surface runoff.

0001-023. Sharma Vinod K (Indira Gandhi Inst Dev Res, General Vaidya Marg, Goregaon (E), Mumbai 400065). **Problems of marine ecosystems and sustainability of coastal cities : a focus on Mumbai, India.** *Indian J Environ Hlth*, **42**(2) (2000), 82-91[32 Ref].

Ecological damage due to anthropogenic activities is threatening marine ecosystems and coastal resources in India. The city like Mumbai is under the pressure of heavy pollution loads and associated health hazards, lack of civic amenities and vulnerable to the effects of sea level rise due to the global warming. Sustainable development and eco-management of Mumbai and other coastal cities in India requires urgent measures.

0001-024. Sharmila Devi T, Selvaraj Pandian R (PG Res Dept Zoo, The American Coll, Madurai 625002). **Repellant property of plant oils against a crepuscular mosquito, *Armigeres subalabatus* (Coquillett).** *Indian J Environ Sci*, **3**(2) (1999), 225-230 [13 Ref].

The efficacy of the plant oils such as citronella oil, lemon grass oil, tulsi oil, eucalyptus oil, neem oil and neem oil mixed with coconut oil is reported against a crepuscular mosquito, *Armigeres subalabatus*. All these oils exhibited a reasonable protection time similar to synthetic repellents available in the market, and therefore these oils are recommended as mosquito repellents.

0001-025. Singh SV (Centl Soil Water Conserv Res Trng Inst, Res Cent, Kota 324002, Rajasthan). **Watershed management - a holistic approach to improve socio-economic status of the farmers.** *Indian J Soil Conserv*, **27**(3) (1999), 243-245.

Study highlights that the average family income of farmers living inside watershed are significantly more in comparison with outside watershed due to integrated watershed management approach. Hence, efforts should be made to bring more and more area under such programmes to improve socio-economic status of the farmers.

0001-026. Singhal RM, Singh Dhan (Indian Coun Forestry Res Edn, New Forest, Dehradun). **Integrated watershed management for sustainable development of Himalayan with special reference to mined lands.** *Indian J Forestry*, **22**(4) (1999), 375-380 [9 Ref].

There exists a lot of water potential in the Garhwal Himalaya, for which some appropriate eco-based technologies (ebt) are required to be developed for their sustainable use. The natural calamities like floods, which occurred in Tehri and earthquake tremors in Utrakashi and Chamoli could be well mitigated and managed to lesser degree of losses by proper management of their watersheds.

0001-027. Srinivas DSRK (Cent Environ Std, Tata Energy Res Inst, Habitat Place, Lodhi Rd, New Delhi - 110003). **Environmental problems in large cities: need for effective industrial siting policies and planning.** *J Indian Assoc Environ Manag*, **26**(1) (1999), 8-17 [12 Ref] (Late Recd).

Attempt has been made to study the industrial siting policies in large Indian cities. The growth of industrial activities and associated environmental problems, and the existing industrial siting policies in Delhi, Mumbai, Calcutta and Bangalore cities are reviewed. A detailed study of industrial siting policies for Delhi has been carried out and issues associated with planning for industrial development, including industrial relocation, are discussed.

0001-028. Srivastava VK, Singh BB, Gupta R Prasad (Environ Res Lab, Chem Dept, Gorakhpur Univ, Gorakhpur). **Social dynamics of environmental protection - perspectives and prospects.** *J Environ Res*, **9**(1) (1999), 25-30.

Paper discusses the onslaught of pollution from many sources and from many types on the natural ecosystem. Combined with the ever exploding population and ever increasing consumption, pollution has become a threat to the fragile life support systems of the earth.

0001-029. Suresesh Kumar R, Fating JS, Vaidya AN, Bal AS (Natl Environ Engng Res Inst, Nagpur 440020). **Wastewater management.** *J Indian Assoc Environ Manag*, **27**(2) (1999), 109-116 [3 Ref].

Paper deals with available wastewater management approaches and their utilisation in India, essentials of wastewater management relevant under Indian conditions and specific water pollution control requirements warranting technology development or adoption. Apart from generalized areas for technology development and adoption other areas warranting urgent attention are also identified.

0001-030. Surya Prakash PV, Alappat BJ (Indian Inst Techno, Dept Civil Engng, Kharagpur 721302). **Control strategies for automobile pollution.** *Indian J Environ Prot*, **19**(3) (1999), 185-192 [27 Ref].

There are many ways to minimise the automobile pollution. Use of catalytic converters, oxygenated fuels or electric vehicles has the potential to reduce pollution substantially. It is possible to effectively fight against the automobile pollution. Of course, it is only possible with the wholehearted participation and cooperation of the public.

0001-031. Tripathi YC, Tripathi G (Non-wood Forest Products Div, Arid Forest Res Inst, Jodhpur 342005, Rajasthan). **Some important environmental problems in India and their remedies.** *Indian J Env Ecoplang*, **2**(1) (1999), 89-96 [16 Ref].

Paper deals with the threat of environmental degradation and suggests some possible remedial measures for eco-conservation in India. It suggests to become protector, producer and caretaker of natural resources and not the predator, polluter and consumer of earth.

Air Pollution

0001-032. Bandyopadhyaya S, Bandyopadhyay A, Biswas MN (Dept Instrumentation Engnr, Jadavpur Univ, Salt Lake Campus, Sector III, Block LB, Plot No 8, Calcutta 7000091). **Micoprocessor based on-line aerosol analyser.** *J Indian Assoc Environ Manag*, **27**(2) (1999), 65-73 [12 Ref].

Paper describes a microprocessor based on-line system for analysing aerosol particles, which does not suffer from the shortcomings associated with the existing systems. The performance achievable in this system has been found to be revealing. The use of this system as aerosol-collecting device which could perhaps make the system more effective for widespread commercial deployment is proposed.

0001-033. Dambal Aditi, Garbhe Shilpa, Zinjarde Smita, Gunale Venkat, Patwardhan Bhushan (Environ Hlth Lab, Sch Hlth Sci, Univ Pune, Pune 411007). **A study on the ambient air lead levels in Pune city, Maharashtra.** *J Env Polln*, **6**(4) (1999), 295-299 [9 Ref].

The lead in gasoline is emitted into the environment through the exhaust gases of automobiles. Pune is one of the fast developing cities in India with an increasing number of vehicles. Paper deals with the determination of SPM, PMIO, TSPM and lead levels at selected sites in Pune city.

0001-034. Devara PCS (Indian Inst Trop Meteo, Pune 411008). **Study of physico-chemical and optical properties of atmospheric constituents under different environmental and meteorological conditions in India - Part I : aerosols.** *Indian J Environ Prot*, **19**(3) (1999), 200-209 [19 Ref].

Paper present the experimental techniques developed and extensive studies that have been carried out, so far, under the research programme of atmospheric chemistry at the Indian Institute of Tropical Meteorology (IITM), Pune, a low - latitude urban station in India. Paper focuses on physical, chemical and optical characteristics of atmospheric aerosols.

0001-035. Goyal SK (Natl Environ Engng Res Inst, Nehru Marg, Nagpur 440020). **Measurement of NO₂ in ambient air-effect of bubbler type and sample flow rate in sodium arsenite method.** *Indian J Environ Prot*, **19**(3) (1999), 161-165 [3 Ref].

The sodium arsenite method gives a sampling efficiency of 82% in the concentration range 40 to 750 mg/m³, in case the sampling train consists only one bubbler (nozzle type) for a sample flow rate of 0.2 lpm and 24 hr sampling duration. The study concludes that the absorption efficiency of NO₂ is greatly influenced by the sample flow rate, and recommends that a correction factor should be applied according to the sampling device.

0001-036 Goyal SK, Gavane AG, Aggarwal AL (Natl Environ Engng Res Inst, Nehru Marg, Nagpur 440020). **Effect of temperature on absorption efficiency of NO₂ in arsenite method.** *Environ Monit Assess*, **61**(2) (2000), 283-289 [10 Ref].

The effect of temperature on absorption efficiency of NO₂ is studied employing four impinger tubes in series to collect the maximum NO₂ generated in the gas stream. The study conducted at 16, 26 and 36°C temperatures shows maximum absorption efficiency (average) of 87.8% at 26°C in 1st impinger tube. At lower and higher temperatures, it is found considerably less.

0001-037 Khare Mukesh (India Inst Techno, Dept Civil Engng, Hauz Khas, New Delhi 110016). **Dispersion of coke oven emissions.** *India J Environ Prot*, **19**(3) (1999), 166-171 [8 Ref].

A puff dispersion model that includes wind shear and dynamic puff rise, has been developed to simulate the behaviour of coke oven emissions under unsteady and non uniform atmospheric conditions. Each emission from the coke pushing process is treated as a single puff. A good agreement between the predicted and observed puff trajectory and temperature was obtained when the 'optimized' values of these coefficients were used in the calculations.

0001-038 Mohanty SK (Orissa Polln Contl Bd, A/118, Nilakantha Nagar, Bhubaneswar 751012). **Ambient air quality status in Koraput.** *Indian J Environ Prot*, **19**(3) (1999), 193-199 [5 Ref].

The ambient air quality was monitored at 11 monitoring stations in and around Koraput district at monthly intervals. Air quality index and standard deviation at different sampling points were calculated. The results show a comparative study of the air quality in different areas of Koraput. The study identifies the potential sources for effective pollution control measures to improve the air quality in Koraput district in future.

0001-039 Mondal R, Sen GK, Chatterjee M, Sen BK, Sen S (Dept Chem, Univ Calcutta, 92, APC Rd, Calcutta 700009). **Ground level concentration of nitrogen oxides (NO_x) at some traffic intersection points in Calcutta.** *Atmos Env*, **34**(4) (2000), 629-633 [13 Ref].

Results from a year long programme of measuring ground-level concentration of NO_x at 19 important traffic intersection points within the city of Calcutta have been presented. Results indicate that the NO_x concentration level has a seasonal variation. Maximum average concentration of 222 µg m⁻³ was observed during winter and minimum average concentration of 55 µg m⁻³ was observed during peak monsoon.

0001-040. Padhy Pratap Kumar, Varshney CK (Sch Environ Sci, Jawaharlal Nehru Univ, New Delhi 110067). **Total non-methane volatile organic compounds (TNMVOC) in the atmosphere of Delhi.** *Atmos Env*, **34**(4) (2000), 577-584 [15 Ref].

Volatile organic compounds (VOC), more specifically non-methane volatile organic compounds (NMVOC) play a critical role in the atmospheric chemistry. Paper deals with the estimation of total NMVOC at 13 sites in the urban environment of Delhi. The results show that the amount of NMVOC in the ambient environment of Delhi varied between 1.3 and 32.5 ppmv exhibiting wide temporal and seasonal variation. NMVOC levels mostly peaked at 0900, which coincide with peak traffic hour.

0001-041. Pandey V, Kumar A, Pal A, Singh N, Yunus M (Natl Botl Res Inst, Environ Bot Lab, Lucknow 226001). **Status of ambient air quality in Lucknow city.** *Indian J Environ Prot*, **19**(3) (1999), 181-184 [3 Ref].

The Lucknow city has witnessed a tremendous increase in two wheeler and three wheeler populations. They are the main source of visible pollution because they emit a lot of black soot from the exhaust. This black soot creates eye irritation, breathing trouble and is deposited on clothes. The study was initiated to monitor air quality status of different sites in Lucknow city.

0001-042. Patnaik KN, Satyanarayana SV, Patnaik D, Rout SP (Utkal Univ, Dept Chem, Vani Vihar, Bhubaneswar 751004). **Air quality index and its variations in Paradip area.** *Indian J Environ Prot*, **18**(12) (1998), 913-916 [4 Ref] (Late Recd).

The general features of the air quality index are described and then a case study of Paradip area is considered to illustrate the computation of an air quality index for that locality. The annual average of the indices for Paradip area indicates a clear increasing trend in the values which reflects the deterioration of the air quality in the area over the years.

0001-043. Sahn DK, Srinivas P, Satpathy KC (Tata Refractories Ltd, Scient Ser Div, Belpahar 768218, Jharsuguda). **Study of air quality of industrial area surrounded by coalmines.** *Indian J Environ Prot*, **19**(3) (1999), 210-214.

Ib valley area is situated in the south west part of river Ib in Jharsuguda districts of Orissa. Paper assess the air pollution levels due to industrial and mining activity of Ib valley area. The details of ambient air quality of three seasons that is summer, post-rainy and winter are presented.

0001-044. Sharma Amit, Dubey PS (Sch Std Bot, Vikram Univ, Ujjain MP). **A study on phylloplane micro flora under air pollution stress.** *Acta Ecologica*, **21**(1) (1999), 1-7 [17 Ref].

Paper deals with the effect of air pollution stress on phylloplane mycoflora of few tropical tree species around Nagda Industrial area, with respect to their occurrence and frequency. At polluted site some fungal species were completely eliminated from the leaf surface while few species could thrive well in the stressed atmosphere. A significant decrease was observed in phylloplane mycoflora population on all the tree species studied.

0001-045. Sikdar PK, Mandal S (Cent Std Man Env, CK-11, Sector-2, Salt Lake City, Calcutta 700091). **Air pollution management programme of Calcutta.** *J Environ Std Policy*, **2**(2) (1999), 71-86 [12 Ref].

Calcutta is one of the large cities in India known to have severe air pollution problems with respect to suspended particulate matter, oxides of nitrogen, sulphur dioxide, carbon monoxide, and lead. The primary source of these pollutants is vehicular emission. An air quality management programme based on reducing stationary source and mobile source emissions will help to mitigate the air pollution and improve the quality of life.

0001-046. Sivacoumar R, Bhanarkar AD, Goyal SK, Gadkari SK (Natl Environ Engng Res Inst, CSIR complex, Taramani, Chennai 600113). **Air quality prediction and model performance evaluation.** *J Indian Assoc Environ Manag*, **26**(3) (1999), 163-167 [13 Ref].

Jamshedpur city located in the eastern part of India is severely affected by increasing air pollution levels as a result of concentrated industrial activities and rapid urbanization. A well designed ambient air quality network was operated to monitor SO₂ concentration continuously. These data were used in the Industrial Source Complex

Short Term (ISCST) dispersion model to predict SO₂ concentration profile over space and time.

0001-047. Sivacoumar R, Jayabalon R, Subramanyam YB, Jothi Kumar N (Natl Environ Engng Res Inst, CSIR complex, Taramani, Chennai 600113). **Size and distribution of dust particles: stone crushing industry.** *J Indian Assoc Environ Manag*, **26**(3) (1999), 172-176 [10 Ref].

A cluster of 48 stone crushers working at Pammal area, south west of Chennai generates dust pollution in and around the crushers. Laser diffraction technique was employed to analyse the size and distribution of dust particles in the air. The fine inhalable particulate matter concentration was found high in ambient air, indicating its potential to affect human health.

0001-048. Sreenivasa Rao A, Rama Mohan Rao P (Dept Inorganic Analyt Chem, Sch Chem, Andhra Univ, Visakhapatnam). **Pesticides in the ambient air of the Kolleru lake.** *Indian J Environ Hlth*, **42**(2) (2000), 70-74 [21 Ref].

Pesticides, suspended particulate matter, nitric oxide and sulphur dioxide were measured to assess the ambient air quality to Kolleru Lake. The maximum average concentrations of a- BHC, g- BHC and endosulfan were 3.2, 4.6 and 2.7 mg/m³ respectively. The maximum levels of suspended particulate matter, nitric oxide and sulfur dioxide were 291.4, 62.7 and 6.7 mg/m³.

0001-049. Srinivas DSRK (Tata Energy Res Inst, Cent Environ Std, Darbari Seth Block, India Habitat Cent, Lodhi Rd, New Delhi 110003). **Spatial patterns of air pollution in Delhi.** *Indian J Environ Prot*, **19**(3) (1999), 172-180.

Paper attempts to look at the spatial patterns of air pollution in Delhi, for sulphur dioxide (SO₂), oxides of nitrogen (NO_x), and suspended particulate matter (SPM). The SPM levels at a few places in Delhi often exceed national ambient air quality standards with the highest average values of SPM concentrations in various seasons in Delhi were always above 380 µg/m³. Some strategies to reduce air pollution in the city of Delhi have been suggested.

0001-050. Subramanyam YV, Subba Rao K, Jayabalon R, Jothi Kumar N (Natl Environ Engng Res Inst, Zonal Lab, CSIR Complex, Tharamani, Chennai 600113). **Diurnal variation of air microbes with respect to respirable particulate matter (PM10) in Chennai City.** *J Indian Assoc Environ Manag*, **26**(1) (1999), 54-63 [7 Ref] (Late Recd).

Studies were carried out at Chennai on ambient air with respect to respirable particulate matter (PM10) below 10 microns in size and the microbes-bacteria, fungi and actinomycetes. An attempt has been made to correlate the occurrence of different microbes with the PM10 concentrations. The study indicated definite positive correlations in all the areas during all the periods of the day.

0001-051. Venkatasubramanian R, Ravichandran C, Chandrasekaran GE (Bishop Heber Coll, PG Res Dept Environ Sci, Tiruchirapalli 620017). **Emissions of SPM, SO₂, NO₂ and particulate lead from petrol driven 2 and 3-wheelers.** *Indian J Environ Prot*, **19**(3) (1999), 215-216 [8 Ref].

Exhaust emission from petrol driven vehicles were collected using portable Air quality sampler Envirotech APM 414 of all 100 CC mobikes, Hero Honda was found to have the lowest concentration of SPM, NO₂ and particulate lead. The lowest concentration of SPM and SO₂ were found in exhaust emission of Kinetic Honda among all two wheelers. The mean emission of SPM, SO₂, NO₂ and particulate lead from petrol driven autorickshaws were found to be 788, 16.4, 5.2 and 93.03 µg/L of exhaust gas, respectively.

Water Pollution

0001-052. Aniruddhan TS, Sreedhar MK (Univ Kerala, Dept Chem, Kariavattom, Thiruvanthapuram 695581). **Mercury (II) adsorption and desorption characteristics of coconut husk based carbon: Kinetics of self diffusion.** *Indian J Environ Prot*, **19**(1) (1999), 6-10 [18 Ref].

The kinetics of self diffusion of Hg (II) ions in activated carbon prepared from bicarbonate treated coconut husk was carried out. All the plots obtained for self diffusion studies of Hg (II) ions show the linear relationship with passing through the origin. The sorption of Hg (II) onto carbon surface has been found to be, contact time, concentration, pH and temperature dependent.

0001-053. Bhuvaneshwaran N, Santhalakshmi G, Rajeswari S (Univ Madras, Dept Anlyt Chem, Guindy Campus, Chennai 600025). **Water quality of river Adyar in Chennai city—the river a boon or a bane.** *Indian J Environ Prot*, **19**(6) (1999), 412-415 [7Ref].

Physico-chemical analysis of Adyar river sampled at different points spanning about 13 km from the mouth, adjoining the sea Bay of Bengal is discussed. The results indicate that the river is highly polluted at certain stations. The pollution is likely to affect the ground-water table.

0001-054. Chauhan BS, Swaroop D, Singh RP (Dept Chem, St John's Coll, Agra 282002, UP). **Seasonal concentrations and speciation of heavy metals in groundwater of Agra city.** *J Ecotoxicol Environ Monit*, **9**(2) (1999), 143-148 [10Ref].

Seasonal concentration and speciation studies of heavy metals in groundwater of Agra city drawn from various areas was carried out. The results indicated that iron, zinc and lead was found maximum during winter, copper in rainy season and cadmium and nickel in summer.

0001-055. Dahiya Sudhir, Kaur Amarjeet* (*Indraprastha Univ, Delhi Coll Engng Bldg, Kashmere Gate, Delhi 110006). **Assessment of physico chemical characteristics of underground water in rural areas of Tosham subdivisions, Bhiwani district, Haryana.** *J Env Polln*, **6**(4) (1999), 281-288 [14 Ref].

Study on the physico-chemical characteristics of underground water of 32 samples, from seven villages of Tosham sub-division was done. A total of 13 various water quality parameters were evaluated. Study concluded that water from the studied underground water source should be treated for inorganic load prior to its use for domestic purposes.

0001-056. Das S, Mehta BC, Samanta SK, Das PK, Srivastava S (Centl Ground Water Bd, Bhubaneswar 751001). **Fluoride hazards in ground water of Orissa, India.** *Indian J Environ Hlth*, **42**(1) (2000), 40-46 [10 Ref].

It is observed that 81.3% samples of ground water from shallow aquifers contain less than 1.0 mg/L, 7.86% are within 1.5 mg/L and 10.83 are above 1.5 mg/L of fluoride. In some cases high fluoride contents have also been recorded in ground water of deeper aquifers. Studies point to a geological source of fluoride. Paper presents the results of the study in Orissa.

0001-057. Dash Deepak R, Sahu BK (Dept Marine Sci, Berhampur Univ, Berhampur, 760007, Orissa). **Speciation of copper in surface waters of the Rushikulya estuary east coast of India.** *India J Marine Sci*, **28** (4) (1999), 370-374 [22 Ref].

Speciation study on copper was carried out in Rushikulya estuary, east coast of India. Dissolved and particular species of copper were found to be high in the lower and upper reaches of the estuary. The percentage of dissolved and particulate species of copper showed significant variations in different seasons because of their involvement in biogeochemical cycles.

0001-058. Dash SK, Sahoo HK (Govt Coll, Dept Geo, Sundargarh 770002). **Quality assessment of groundwater in a part of Sundargarh district.** *Indian J Environ Prot*, **19**(4) (1999), 273-278 [9 Ref].

Physico-chemical characteristics of groundwater in the Hemgiri block of Sundargarh district have been studied to evaluate its suitability for domestic and irrigation use. It is observed that the quality of groundwater of the area is suitable for both domestic and irrigation use.

0001-059. Dey Sabita, Patke Deepa S (Div Microbiol Sci, Agharkar Res Inst, GG Agarkar Rd, Pune 411004). **Mercury biotransformation and its potential for remediation of mercury contamination in water.** *J Environ Bio*, **21**(1) (2000), 47-54 [41 Ref].

Bacterially mediated ionic mercury reduction to volatile Hg plays an important role in the biogeochemical cycling of mercury in contaminated freshwater hot spring. This process could be stimulated to reduce the concentration of inorganic mercury in the water. A study of the utility of this approach using a thermophilic *Streptomyces*, alongwith the mechanism is described.

0001-060. Dhopte SM, Muthal PL, Pandya GH, Kondawar VK (Natl Environ Engng Res Inst, Nagpur 440020). **Development of simple hydride generation technique for the atomic absorption determination of arsenic in environmental samples.** *J Indian Assoc Environ Manag*, **26**(3) (1999), 150-153 [6 Ref].

A method to determine arsenic at as low concentration as possible is attempted, in view of the low level of arsenic in drinking water and other environmental components. Continuous hydride generation technique in combination with flame AAS has shown promising results in 0-250 ppb range. Optimisation of fabrication of glass generator assembly and various steps involved in analysis have been carried out.

0001-061. Dikshit AK, Pallamreddy K, Praveen Reddy LV, Saha JC (Dept Civil Engng, Indian Inst Techno, Kharagpur 721302). **Arsenic in groundwater and its sorption by Kimberlite tailings.** *J Environ Sci Hlth, A* **35**(1) (2000), 65-85 [21 Ref].

The Kimberlite treatment methodology was applied to the groundwater samples collected from various places of north 24 Parganas district in West Bengal, India. The samples were analyzed for the presence of total arsenic. The treatment of arsenic contaminated water samples with Kimberlite tailings showed 90-94% removal in 12 hours. The present study can be used as a basis for designing and developing filter

columns, which can be attached to the tube wells for low cost and effective removal of arsenic.

0001-062. Elampooranan T, Rangaraj S (Govt Coll (Men), Dept Chem, Kumbakonam 612001). **Ground water quality in Nagapattinam and Thanjavur districts.** *Indian J Environ Prot*, **19**(4) (1999), 255-259 [12 Ref].

Attempt is made to assess the groundwater quality in the Thanjavur and Nagapattinam districts of Tamil Nadu. The pH of all the water samples were around 7 and occasional by alkaline. In about 20 wells the recommended limits for drinking water quality standard had exceeded in one or the other parameters. In general the groundwater of this area are suitable for irrigation.

0001-063. Garg VK, Chaudhary A, Deepshikha, Dahiya S (Guru Jambheshwar Univ, Dept Environ Sci, Hisar 125001). **An appraisal of groundwater quality in some village of district Jind.** *Indian J Environ Prot*, **19**(4) (1999), 267-272 [21 Ref].

Physico-chemical quality study of the underground water in some villages of Jind district, Haryana has been taken up to evaluate its suitability for domestic purposes. Results indicate that groundwater in the studied area is heavily loaded with inorganics and may pose serious health hazards if used for longer periods. A systematic calculation of the correlation coefficients has also been carried out between different analyzed quality parameters. The study showed positive and highly significant correlation of TDS with chloride, sulphate, sodium and magnesium.

0001-064. Ghosh Ashok K, Kumar Pankaj, Roy Narendra P (Dept Env Water Manag, AN Coll, Patna 13). **Quality of drinking water – a case study in Patna.** *Biojournal*, **11**(1&2) (1999), 123-128 [8 Ref].

Population pressure has put severe strain on the quality of the drinking water of Patna, which has deteriorated over the years. The paper analyses the present status of drinking water in different residential localities of Patna.

0001-065. Gonsalves DV, D'Souza J (Goa Univ, Dept Microbio, Taleigao Plateau, Goa 403206). **Impact of mining rejects on water quality at Selaulim Water Project Goa.** *Indian J Environ Prot*, **19**(6) (1999), 427-431 [7 Ref].

Water samples were collected from the Selaulim Dam, Goa. This dam is surrounded by a number of mines exploiting manganese ore in its vicinity, from which the mining tailings are washed off into the lake feeding the dam. The analysis and water quality characteristics as well as the trends of the manganese leaching by the filter bed microflux are discussed.

0001-066. Govindasamy C, Azariah J (Dept Zoo, Univ Madras, Guindy Campus, Madras 600025). **Seasonal variation of heavy metals in coastal water of the Coromandal coast, Bay of Bengal, India.** *Indian J Marine Sci*, **28**(3) (1999), 249-250 [23 Ref].

Report presents the dissolved heavy metals and associated hydrographic and nutrients data. Concentrations of heavy metals showed a rather homogeneous distribution (except Hg) within the coastal region, with high values of Cu (63.20 µg 11-) and Cd (66.80 µg 11-) at Mahabalipuram and Zn (130.20 µg 11-), Ni (14.60 µg 11-), Co (9.60 µg 111-) and Hg (0.12 µg 11-) at Pondicherry during the premonsoon and monsoon seasons respectively.

0001-067. Jain Rajeev, Padmaja P (Sch Std Chem, Jiwaji Univ, Gwalior). **Impact of fertilizer industry effluents on the water quality of Chopan river.** *J Env Polln*, **6**(4) (1999), 271-272 [3 Ref].

Study has been carried out to evaluate the physico-chemical characteristics of Chopan river water, a tributary of Chambal river situated in Dist. Guna, Madhya Pradesh. The water analysis was carried out as per standard procedures. The quantitative value of the various parameters analysed are presented. Certain parameters are not in agreement with the values prescribed by WHO for safe drinking water.

0001-068. Joshi VA, Nanoti MV (Natl Environ Engng Res Inst, Nehru Marg. Nagpur 440020). **Laboratory studies on Tarota as coagulant aid in water treatment.** *Indian J Environ Prot*, **19**(6) (1999), 451-455 [7 Ref].

Tarota (*Cassia tora*) occurs as common annual weed in tropical countries and especially throughout India. The jar tests are conducted at turbidities from 140 to 2900 NTU to study the effective doses of tarota as coagulant aid in combination with alum. Tarota is effective as coagulant at higher turbidities but more effective as coagulant aid.

0001-069. Kisku GC, Bhargava SK (Indl Toxicol Res Cent, Environ Monit Div, Mahatma Gandhi Marg, Lucknow 226001). **Water quality around Durgapur industrial belt and its impact on environment.** *Indian J Environ Prot*, **18**(12) (1998), 898-903 [33 Ref] (Late Recd).

Paper highlights the status of inorganic and metallic pollutants stress arising from steel plants, coke oven and chemical factories of Durgapur Industrial Belt situated on the bank of the river Damodar. The result will help in framing scientific view to irrigate the agricultural land with industrial effluents and contaminated water.

0001-070. Kumar Anil, Sharma RK (PG Dept Zoo, Janta Coll, Bakewar, Etawah 206001 UP), **Physico-chemical characteristics of river Sengar in district Etawah (UP).** *Indian J Environ Sci*, **3**(2) (1999), 201-203 [2 Ref].

Physico-chemical characteristics of river Sengar were studied from Dhanwa village to Dibiapur in district Etawah (UP). Present observations revealed that the river sengar water was less polluted at the point where it enters in Etawah district and becomes highly polluted at Chakwa and Dibiapur. It is because at Chakwa, Sengar river meets with Sirsa river containing effluents from paper mill located at Shikohabad (Firozabad) and at Dibiapur (Etawah) it receives effluents from N.T.P.C.

0001-071. Madhu G, George KE, Francis D Joseph (Process Engng Dept. Fact Engng Design Org, Udyogomandal 683501). **Oxidation pond for the treatment of natural rubber processing effluents.** *Indian J Environ Hlth*, **42**(2) (2000), 79-81 [4 Ref].

The feasibility of treating effluents from a natural rubber latex concentration unit alone and in admixture with domestic sewage in an oxidation pond was studied. The results clearly indicate that oxidation pond is very effective in treating the effluents from a latex concentration unit in combination with sewage.

0001-072. Majumdar Deepanjan, Gupta Narinder (Div Environ Sci, Indian Agricul Res Inst, New Delhi 110012). **Nitrate pollution of groundwater and associated human health disorders.** *Indian J Environ Hlth*, **42**(1) (2000), 28-39 [79 Ref].

Nitrate enters the human body through the use of groundwater for drinking and causes a number of health disorders, when present in high concentration in drinking water. With the increasing use of nitrogenous fertilizers in Indian agriculture and huge amount of organic waste generated by massive Indian population, groundwater nitrate pollution in many regions of India has assumed alarming proportions and may aggravate in the coming years.

0001-073. Malathi T, Princy Merlin J, Rajendran A, Jeyakar Chellaraj DA, Subramanian NS (Bishop Heber Coll. PG Res Dept Chem, Tiruchirapalli, 620017). **A study on the applicability of a new water quality index-HWQ1.** *Indian J Environ Prot*, **19**(1) (1999), 43-47.

Attempt had been made to formulate a new water quality index called Heber water quality index 1 (HWQI) in accordance with our climatic condition, industrialization, population pressure, etc. The National Sanitation Foundation (NSF) of USA has formulated a water quality index (WQI) based on the analysis of nine parameters. Water samples were collected from five different rivers around Trichy district and the water quality parameters suggested by NSF – WQI and HWQI1 were analysed to express the quality and quantity of pollution comparatively for each sample.

0001-074. Mariappan P, Vasudevan T, Yegnaraman (Alagappa Univ, Dept Indl Chem, Karaikudi). **Surveillance of ground water quality in Thiruppathur block of Sivagangai district.** *Indian J Environ Prot*, **19**(4) (1999), 250-254 [8 Ref].

Physico-chemical characteristics of observation of borewells located at Thiruppathur, Thirukostiyur and Sevoor in Thiruppathur Union of Sivagangai District, Tamil Nadu were studied. The water quality index value ranges from 50 to 92 in Thiruppathur, 31 to 65 Thirukostiyur and 25 to 86 in Sevoor. Quality variation pattern from the northern part of the union to the southern part is observed as a result of increasing thickness of over burden soil.

0001-075. Mishra Ravi, Richariya LK (Sch Std Geo, Vikram Univ, Ujjain 456010, MP). **Nitrate concentration in ground water of Beehar basin, Rewa (M.P) India.** *J Env Polln*, **6**(4) (1999), 261-264 [7 Ref].

The present study aimed at evaluating cause-effect phenomenon of nitrate concentration in aquifers of Vindhyan super group, situated in the Beehar basin around Rewa (M.P), especially with reference to drinking water. Nitrate concentration increases from 4 to 60 mg/L towards lower grounds of the basin, following the direction of groundwater flow. Water quality monitoring is essential for preventing the harmful concentration of nitrates in the area.

0001-076. Mustafa W, Somasundaram SSN, Shahut Hameed P, Palaniappan R (Jamal Mohamed Coll, Environ Res Lab, PG Dept Zoo, Tiruchirapalli 620020). **Evaluation of ground water quality in Tiruchirapalli city.** *Indian J Environ Prot*, **19**(4) (1999), 284-289 [17 Ref].

Water quality parameters were analysed in the water samples collected from eight different stations in and around Tiruchirapalli city. The results when compared with water quality standards of WHO, ICMR indicated that ground water of Tiruchirapalli is not suitable for the drinking and in certain cases for industrial use also.

0001-077. Nag A, Gupta N, Biswas MN (Indian Inst Techno, Dept Chem, Kharagpur 721302). **Removal of chromium (VI) and arsenic (III) by chemically treated saw-dust.** *Indian J Environ Prot*, **19**(1) (1999), 25-29 [11 Ref].

Chemically treated charred saw dust has been investigated for its suitability in the removal of arsenic (80%) and chromium (90%) from ground water. Mass transfer studies also revealed the detailed kinetics of the reactor and an effective filtration unit can be designed for simultaneous removal of both the heavy metals.

0001-078. Nagarajan Prabavathi, Priya GK (PG Res Dept Chem, Bishop Heber Coll, Tiruchirapalli 620017, Tamil Nadu). **Ground water quality deterioration in Tiruchirapalli, Tamil Nadu.** *J Ecotoxicol Environ Monit*, **9**(2) (1999), 155-159 [4 Ref].

Water samples were taken from ten different locations of Thiruverumbur village at random and the combination of sources were hand pump water, well water and pond

water. All the study areas showed T.S.S., iron and magnesium values beyond the permissible limits. The excessive solids may be due to insoluble organic matter in the domestic waste water and sewage which are disposed off in the open ground.

0001-079. Nanda SN, Tiwari TN (Orissa Polln Contl Bd, Regl Office, Sector 5, Rourkela 769002). **Effect of discharge of industrial effluents on the quality of river Brahmani at Rourkela.** *Indian J Environ Prot*, **19**(1) (1999), 52-55 [9 Ref].

Rourkela is the most important industrial city in the mineral rich state of Orissa while Brahmani is one of the 14 major river system in India. This paper presents a preliminary study of the effect of the discharge of effluents from the Rourkela Steel Plant on the quality of river Brahmani at Rourkela. Results show that the quality of water deteriorates significantly after the discharge of industrial effluents into the river.

0001-080. Panigrahy PK, Das J, Das JN, Sahoo RK (Regl Res Lab, Bhubaneswar 751003, Orissa). **Evaluation of the influence of various physico-chemical parameters on coastal water quality, around Orissa, by factor analysis.** *Indian J Marine Sci*, **28**(4) (1999), 360-364 [13 Ref].

Physico-chemical parameters were studied in the coastal waters off Orissa. Data comprising 13 variables obtained from 38 water samples have been subjected to R-mode factor analysis so as to understand the sources, the processes occurring and the influence of various physico chemical parameters on coastal water quality. About 67.8% of variance has accounted for three factors such as river run-off or terrestrial input, estuarine discharges and land drainage.

0001-081. Patel RK (Regl Engng Coll, Dept Chem, Rourkela 769008). **Assessment of water quality of Pitamahal Dam.** *Indian J Environ Prot*, **19**(6) (1999), 437-439 [5 Ref].

The Pitamahal Dam is constructed over the river Langimahal Pitamahal Nala in the year 1976 to use the water for irrigation purposes. Study deals with the quality of water during all the seasons of the year. The maximum tolerance limit for water intended to be used for irrigation are also calculated and found well below the limit and at present suitable for irrigation.

0001-082. Pathak MD, Badve Ranjana (Groundwater Surv Dev Agency, Pune). **Occurrence of fluoride in ground water of Maharashtra.** *J Indian Assoc Environ Manag*, **26**(3) (1999), 168-171 [11 Ref].

Urban and rural water supplies in Maharashtra state are dependent on surface and groundwater. Arid, semi-arid and drought-prone areas of the state are mainly dependent on the groundwater. Activity - detailed water quality assessment was carried out in Satara, Latur and Chandrapur districts of the state and the results are discussed.

0001-083. Prabhakara Murty PVS, Satyanarayana D (Sch Chem, Andhra Univ, Visakhapatnam 530003, AP). **A comparative study of atomic absorption spectrophotometry and anodic stripping voltammetry for the determination of trace metals Zn, Cd, Pb and Cu in coastal waters of Visakhapatnam, east coast of India.** *Indian J Marine Sci*, **28**(4) (1999), 365-369 [15 Ref].

Concentration levels of some of the dissolved trace metals like Zn, Cd, Pb and Cu have been determined in the coastal waters along three transects (Gangavaram, Harbour and Rushi hill) near Visakhapatnam, Estimations, made by anodic stripping voltammetry in the present study are in good agreement with the reported values by atomic absorption spectrophotometry. Vertical distribution of dissolved Zn, Cd and Cu showed an increasing trend from the surface waters to bottom.

0001-084. Prameela Devi Yalavarthy, Nanda Kumar NV, Chandra Mouli GV (Environ Bio Res Lab, Dept Zoo, Kakatiya Univ, Warangal 506009 A.P.). **Simple methods for determination of mercuric chloride and silver nitrate compounds in water sample.** *J Ecotoxicol Environ Monit*, **9**(2) (1999), 93-102 [9 Ref].

Simple colorimetric enzymatic methods are described for the determination of heavy metals in water samples. Mercuric chloride and silver nitrate are evaporated at 80°C in hot air oven or precipitated alkaline phosphate buffer (pH 8.2). 5-50 micrograms mercuric chloride and 1-100 micrograms of silver nitrate can be determined by using this method.

0001-085. Rai RK (Dept Civil Engng, Govt Coll Engng, Karad, Dist Satara, MS, 415124). **Iteration method for the analysis of BOD data.** *Indian J Environ Hlth*, **42**(1) (2000), 25-27 [1 Ref].

Analysis of biochemical oxygen demand data is usually carried out analytically using the most popular method of least-squares. This paper intends to provide an iteration method for the analysis of a time series of BOD data. The results of the proposed method are very close to that of the least-squares method.

0001-086. Sangolkar Lalita, Chaudhari PR, Shivaraman N (Natl Environ Engng Res Inst Nagpur 440020). **Cyanobacterial toxins in water environment - a review.** *J Indian Assoc Environ Manag*, **26**(1) (1999), 18-29 [94 Ref] (Late Recd).

A review on toxin-producing species of cyanobacteria, types of toxins produced and their health impacts, factors stimulating toxin production, methods for monitoring cyanobacterial toxins, measures for toxin control, and also some of the issues which need further insight and development are presented.

0001-087. Selvaraj K, Jonathan MP, Ram Mohan V, Thangaraj GS, Pugalendhi M, Jayaraman B (Dept Geo, Univ Madras, AC Coll Campus Chennai 600025). **Observations of petroleum hydrocarbons and some water quality parameters during oil spill, near Madras Harbour.** *Indian J Marine Sci*, **28**(3) (1999), 245-248 [27 Ref].

Status of water quality and accumulation of petroleum hydrocarbons (PHC) in intertidal sediment of the area affected by oil spill were studied. PHC concentration in water was 11-139 $\mu\text{g l}^{-1}$ with higher concentrations at southern stations, away from the actual location of the oil spill. Dissolved oxygen (DO) varied from 0.582-6.098 mg l^{-1} with higher concentrations at northern stations.

0001-088. Senthinathan S, Balasubramanian T (Environ Impact Assess Div, Salim Ali Cent Ornitho Natural Hist, Anaikatti Post, Coimbatore 641108). **Heavy metal distribution in Pondicherry harbour, southeast coast of India.** *Indian J Marine Sci*, **28**(4) (1999), 380-382 [18 Ref].

Attempt is made to evaluate the extent of distribution of selected heavy metals (Cu, Zn, Cd and Pb) in water, sediment and plankton over a period of two years from Pondicherry harbour. A distinct seasonal variation in the distribution of metals in the ambient water sediment and plankton was observed. The order of metal abundance in water, sediment and plankton was Zn>Cu>Pb>Cd.

0001-089. Sharma BS (Dr BR Ambedker Univ, Dept Environ Std. Inst Basic Sci, Khandari Campus, Agra 282002). **A study on water quality of river Yamuna at Agra.** *Indian J Environ Prot*, **19**(6) (1999), 440-441 [10 Ref].

The physico-chemical characteristics of Yamuna water at Agra have been studied in order to ascertain the viability of the water for domestic use. Based on temperature, pH, DO, BOD and COD, the river water was found unsuitable for domestic use and harmful for aquatic life.

0001-090. Sharma KK, Sivasankaravel M (Dept Appl Geo, Univ Madras, Guindy Campus, Chennai 600025). **Results of resistivity survey for demarcation of fluoride rich zones in Salem district, Tamil Nadu.** *Indian J Environ Sci*, **3**(2) (1999), 215-224.

The study of ground water carried out using geophysical method in Ayodhyapattinam of Salem district revealed the fluorine occurrence in the water. In parts of the study area electrical resistivity surveys were carried out. The fluorine is correlated positively with HCO₃ and NO₃ and negatively with CO₃ and the resistivities and the thickness of the respective layers.

0001-091. Siddiraju S, Kesava Raju K, Srinivasulu S (Sri Venkateswar Univ, Dept Geo, Tirupati 517502). **Hydrochemistry of groundwaters in the Pulang river basin, AP.** *Indian J Environ Prot*, **19**(4) (1999), 245-249 [10 Ref].

Attempt is made to bring out the relationship between the quality of groundwater and lithological characteristics of different rocks present in the Pulang river basin, Cuddapah district, Andhra Pradesh. Water samples have been classified for their suitability to different types of crops that are grown in the basin area.

0001-092. Singh AK, Hasnain SI, Banerjee DK (Sch Environ Sci, Jawaharlal Nehru Univ, New Delhi 110067). **Grain size geochemical partitioning of heavy metals in sediments of the Damodar River - a tributary of the lower Ganga, India.** *Environ Geo*, **39**(1) (1999), 90-98 [14 Ref].

The distribution of Si, Al, Fe, Mn, Cu, An, Ni and Cr in different grain-size fractions and geochemical association of Fe, Mn, Cu and Zn with >63 µm size fraction of bed sediments of Damodar river has been studied. In general, concentrations of heavy metals tend to increase as the size fractions get finer. However at two sites, near mining areas, the coarser particles show similar or even higher heavy metal concentrations than finer ones.

0001-093. Singh NK, Kumar B, Singh SK (Magadh Univ, Dept Environ Sci, Bodh-Gaya). **Physico Chemical characteristics of water in the upper stretch of Damodar river.** *Indian J Environ Prot*, **19**(1) (1999), 48-57 [9 Ref].

Damodar river water was analysed at different locations from Patratu to Rajrappa. River water upstream of Nalkari confluence is clean when compared with IS 2496, Class "C" (Inland Surface Water Norms, 1982). But after joining Nalkari and running further through the urban-industrial areas, the water quality gradually deteriorates.

0001-094. Singh KP, Parwana HK (Punjab State Coun Sci Techno, SCO 2935-36, Sector 22-C, Chandigarh 160022), **Ground water pollution due to industrial wastewater in Punjab state and strategies for its control.** *Indian J Environ Prot*, **19**(4) (1999), 241-244 [8 Ref].

Due to rapid industrialisation and urbanisation in Punjab state, large industrial cities face the problem of contamination of groundwater from industrial effluents which are disposed off largely in open without proper treatment. Studies reveal the presence of chromium (hexavalent) and cyanide in groundwater beyond permissible limits of drinking water standards.

0001-095. Singh SP, Satsangi GS, Khare P, Lakshmi A, Kumari Maharaja K, Srivastava SS (Dept Chem, Fac Sci, Dayalbagh Edn Inst, Dayalbagh, Agra 282005). **Dry deposition in a rural site of north India.** *J Environ Std Policy*, **2**(2) (1998) 143-149 [19 Ref].

Dry deposition rates of major water soluble components were estimated in Kamar, a rural site located near Mathura city. All the samples are basic in nature and pH values range between 6.9 and 8.33. Strong correlation between Na and K, Ca and Mg and K and Cl indicates that these ions originate from soil.

0001-096. Somasekhar RK, Rameshaiah V, Chetna Suvarna A (Dept Environ Sci, Bangalore Univ, Jnana Bharati, Bangalore 560056). **Ground water chemistry of Channapatana taluk (Bangalore rural district) - Regression and cluster analysis.** *J Env Polln*, **7**(2) (2000), 101-109 [18 Ref].

Data on the chemistry of fortyeight tube wells water collected from Channapatana town and surroundings are presented. Quality of 80% of wells is unsuitable for drinking in terms of hardness, 50% in terms of magnesium and 20% in terms of nitrates and calcium. Correlation between 16 pairs of parameters has been calculated and regression analysis carried out.

0001-097. Sulochana N, Stephen Inbaraj B, Selvarani K, Thirumuragan V (Regl Engng Coll, Dept Chem, Tiruchirapalli 620015). **Monitoring, correlation and possibilities of contamination of ground water in Thuvakudi village, Tiruchirapalli district.** *Indian J Environ Prot*, **19**(4) (1999), 290-295 [8 Ref].

Study reports the systematic calculation of correlation co-efficient, r , for 17 water quality parameters of ground water from a village panchayat, Thuvakudi in Tiruchirapalli district, a historic pilgrim place in South India. There was a very good correlation between the parameters with 'r' values ranging from 0.74 to 0.99.

0001-098. Varghava Nandan, Mehta Vinod (Chem Dept, Govt Coll, Kota, Rajasthan). **Periodic variation in the physico-chemical characteristics of river Ahu of Jhalawar.** *Acta Ecologica*, **21**(1) (1999), 17-18 [4 Ref].

Variation in physicochemical characteristics of water of Ahu River at Jhalawar, Rajasthan have been studied from November's 97 to October 98. It has been revealed that water quality remains constant except seasonal variations in turbidity and temperature.

0001-099. Venkatasubramaniam R, Ravichandran C, Chandrasekaran GE, Chandramohan A (Bishop Heber Coll, PG Res Dept Environ Sci, Tiruchirapalli 620017). **Chemical composition of rain water in Tiruchirapalli city.** *Indian J Environ Prot*, **19**(5) (1999), 333-336 [21 Ref].

Precipitation samples were collected on event basis at Bishop Heber College, Tiruchirapalli. The pH, electrical conductivity, major cations and anions of samples were determined and the ionic balance was calculated. The rainfall was found to be alkaline most of the time. This is due to the absence of large scale emissions from anthropogenic sources to acidify the rainfall in Tiruchirapalli.

0001-100. Vetha Roy D, Chandrasekar N, Kumaresan S, Udayanapillai AV, Rajamanickam GV (Dept Chem, Scott Christian Coll, Nagercoil 629003). **Distribution of carbonate and organic carbon in the sediments of Tambraparani delta, Tamil Nadu.** *Env Eco*, **17**(4) (1999), 879-885 [16 Ref].

The contents of organic carbon and calcium carbonate were estimated from the surface sediment of Tambraparani delta, Sediment samples located near the river mouth showed high carbonate content and low organic carbon. The sediments around the zone of mangrove vegetation and industrial waste disposal area showed high value of organic carbon.

Noise Pollution

0001-101. Dharwadkar MM, Patil SN, Kurmude DV, Patange KB (Appl Sci Dept, Marathwada Inst Techno, PB No 327. Aurangabad 431005). **Noise levels: a case study of Aurangabad city.** *Proc Acad Environ Bio*, **8**(1) (1999), 95-97 [2 Ref].

Aurangabad is the fastest growing industrial township in Asia. The growth factor has changed the intensity of sound levels, culminating into a noise. Transport system,

public address system, entertainment gadgets mainly contribute to the noise in the area. Statistical data of noise levels in various parts of Aurangabad and its impact on the person immediately in the vicinity has been discussed.

0001-102. Dhembare AJ, Pondhe GM, Singh Bhal (Dept Zoo, PVP Coll, Pravaranagar 41371, Ahmednagar, Maharashtra). **Assessment of noise level due to vehicular traffic at Nasik Road, Nasik, Maharashtra.** *Indian J Env Ecoplang*, **2**(2) (1999), 187-189 [8 Ref].

Paper deals with the assessment of noise on the basis of traffic and vehicular activity in Nasik city. The various sites have been monitored for the noise load and the results were compared with standard prescribed by vehicles too. The study revealed that vehicles assure free than traffic.

0001-103. Pandya Monica, Shrivastava RK (Dept Bot Environ Sci, Govt Autonomous Coll, Jabalpur MP 482001). **Analysis of noise levels and its health effects in commercial areas of Jabalpur city: Part I – analysis of health effects.** *Indian J Environ Sci*, **3**(2) (1999), 197-200 [3 Ref].

The noise levels prevailing in commercial areas of Jabalpur city have been investigated in detail. It is found that the noise levels data in commercial locations observed normal distributions with tan average value of 75, 74, 88 dB (A) in morning, afternoon and evening respectively. The high noise levels are associated with higher population density, increased human activities and high density of traffic and lack of greenery.

0001-104. Pandya Monica, Shrivastava RK (Dept Bot Environ Sci, Govt Autonomous Coll, Jabalpur MP 482001). **Analysis of noise levels and its health effects in commercial areas of Jabalpur city: Part II- analysis of health effects.** *Indian J Environ Sci*, **4**(1) (2000), 25-28 [8 Ref].

The health effects of noise pollution in commercial areas are analysed with the help of questionnaire survey. The analysis of returned questionnaire revealed that the persons in commercial areas are facing different types of health problems and persons above forty years of age were greatly affected due to noise pollution.

0001-105. Pandya Monica, Shrivastava RK (Dept Bot Environ Sci, Govt Autonomous Coll, Jabalpur MP). **Status of noise pollution and effects around industrial areas of Jabalpur city: Part I- analysis of noise levels.** *Acta Ecologica*, **21**(1) (1999), 8-11 [14 Ref].

Noise pollution levels prevailing around industrial areas have been investigated in detail. The noise level value have been reduced from out side/ around the factories Average noise level around industrial area is 69 dB (A). Around industrial areas, are either commercial area or residential areas, so in this context the noise level of 69 dB (A) is on higher side.

0001-106. Pandya Monica, Shrivastava RK (Dept Bot Environ Sci, Govt Autonomous Coll, Jabalpur MP). **Status of noise pollution and effects around industrial areas of Jabalpur city: Part II- analysis of health effects.** *Acta Ecologica*, **21**(1) (1999), 12-16 [9 Ref].

The health effect of noise pollution around industrial areas of Jabalpur were analysed with the help of questionnaire survey. The analysis of returned questionnaire revealed that the people of higher age group were mostly affected due to noise level around industrial areas. The results are also statistically analysed.

0001-107. Sinha Subrata, Sridharan PV (Tata Energy Res Inst, Darbari Seth Block, Habitat Place, Lodhi Rd, New Delhi 110003). **Present and future assessment of noise levels in the Neyveli region.** *J Environ Std Policy*, **2**(1) (1999) 1-13 [4 Ref].

Industrial activity and vehicular movement are the two major sources of noise in the Neyveli region. A study was carried out to assess the existing status of noise level and impacts on the environment due to proposed expansion activities in the region. Various mitigation measures have been suggested to keep the noise level within the prescribed standards.

Ecology

0001-108. Agarkar SV, Garode AM (Dept Chem, Anuradha Coll Engng, Chikhli 443201, Dist Buldana). **Studies on reasonal variations of physico chemical and**

microbiological parameters of Yelegaon reservoir. *Asian J Microbio Biotech Env Sci*, **1**(1 &2) (1999), 127-129 [4 Ref].

The physico-chemical and microbiological characteristics of Yelegaon reservoir of Buldana district have been studied to examine the suitability of water for domestic application. The physico chemical parameters fall within the limit, but microbiological parameters exceed the limit as laid by WHO, ISI & ICMR. This indicates that water is not suitable for domestic application.

Nature and Natural Resources Conservation

0001-154. Awasthi Alka (World Wildlife Fund-India, 172-B Lodhi Estate, New Delhi-110003). **Plant diversity of Meghalaya and some issues for concern.** *Indian J Forestry*, **22**(1) (1999), 14-21 [20 Ref].

The diversity of vegetation types, wild species, agricultural farms and their wild relatives in Meghalaya have been described. Various issues affecting plant diversity in this region and the need for inter-institutional linkage have been discussed. This paper presents the different viewpoints held by groups involved in research, utilization and management of plant diversity, and also attempts to present the problems faced by them in their conservation effort.

0001-155. Chauhan Rajeev, Narain S (Dept Zoo, Janta PG Coll, Bakewar (Etawah) 206124). **Conservation of biodiversity of Panchnada.** *Proc Acad Environ Bio*, **8**(1) (1999), 25-35 [25 Ref].

Panchnada is a unique fresh water natural habitat of the world, where biodiversity conservation studies were undertaken in detail. It was found to be one of the richest ecological niches of the world so far as the biodiversity is concerned. There is great and immediate need to conserve and protect this rich natural habitat for understanding of the biodiversity prioritisation programmes and conservation of biodiversity.

0001-156. Dagar JC (Centl Soil Salinity Res Inst, Karnal 132001). **Soil erosion parameters with special reference to Kshipra ravines in Madhya Pradesh.** *Indian J Forestry*, **22**(3) (1999), 210-221 [22 Ref].

The soil erosion by water is a complex process of detaching soil particles and transporting them down slope. Erosion index and precipitation index were calculated which showed a straight line relationship. Soil splashed under plant cover and bare slopes were compared. Various processes of soil erosion and classification, structure, extent and formation of ravines along the banks of river Kshipra and its tributaries have been dealt with.

0001-157. Das SK, Roy SK, Ghosh LK (Centl Water Power Res Stn, Khadakwasla, Pune 411024), **Mixing of salinity in the Chilka lake: a mathematical modelling approach.** *J Env Polln*, **7**(2) (1999), 89-96 [5 Ref].

Paper deals with the transport and mixing of salinity in the Chilka Lake under weakly driven tidal condition. To understand the salinity mixing, a two-dimensional mathematical modelling approach has been developed to predict the salinity for non-monsoon period. Numerical simulations indicate that the improvement of salinity in the main lake takes place mainly due to concentration gradient. The mathematical model result shows good agreement with the field observations.

0001-158. Deotare PW (Myco Fungal Biotechno Lab, Dept Bot, Shri Shivaji Sci Coll, Amravati 444603). **Vesicular-arbuscular mycorrhizal studies of ethnomedicinal genus *Indigofera* from natural grassland ecosystem.** *Biojournal*, **11**(1&2) (1999), 57-58 [22 Ref].

Information from the local rural people about the *Indigofera* plant parts used and method of treatment for each species of *Indigofera* was collected. Studies were made on VAM fungal percent colonization, structure, density, dominance, isolation and identification. Four genera of VAM fungi with its twelve species were recovered, isolated and identified.

0001-159. Giri TK, Agrawal KM, Roy M (Indian Inst Socl Welfare Business Manag, Env Manag Dept, Manag House, College Square West, Calcutta 700073). **Strategies for**

ecorestitution of coal mine overburden dumps. *Indian J Environ Prot*, **18**(12) (1998), 904-912 [17 Ref] (Late Recd).

Paper identifies the different problems caused by open cast overburden dump through physical, chemical and biological analysis. The importances and objectives of the reclamation has been indicated and the various physical, chemical and biological strategies for reclamation has been discussed.

0001-160. Ilorkar Vijay M, Totey NG (Dept Foresty, Dr Pangabra Deshmukh Krishi Vidyapeeth, Akola (MS), 444104). **Regeneration status of Navegaon National Park (Maharashtra).** *Indian J Forestry*, **22**(3) (1999), 203-209 [9 Ref].

There are about 22 plant species in seedling stage at 300-400 m, 26 at 400-500 m and 33 at 500-600 m elevation where per cent contribution of seedlings to that of total enumerated varies from 27 to 96%, 28 to 100% and 37 to 100% respectively. The distribution pattern of natural regeneration is characterised by contagious distribution.

0001-161. Khan MA (Div Environ Sci, SK Univ Agricl Sci Techno, Shalimar Campus, GPO Box 726, Srinagar 190001, Kashmir). ***Euryale ferox* Salisb-a threatened aquatic plant species in the Kashmir Himalaya.** *Indian J Environ Sci*, **4**(1) (2000), 83-87 [17 Ref].

Paper deals with the ecological status of a threatened aquatic plant *Euryale ferox* Salisb in the Kashmir Himalaya. This aquatic plant, though declining rapidly in population, still occurs sparsely as a 'floating-leaf' type in the Lake Manasbal, Kashmir, in close association with a dominant macrophyte, *Nelumbo nucifera* Gaertn. The high economic importance of the aquatic plant calls for urgent conservation to avert its probable extinction.

0001-162. Khandelwal Sitaram, Shrivastava Yogesh (Dept Bot, Univ Rajasthan, Jaipur 302004). **Folk beliefs and practices related to plants conservation.** *Indian J Environ Sci*, **3**(2) (1999), 165- 170 [12 Ref].

Nowadays plant or tree cover in tribal and rural areas is diminishing fast due to developmental activities which has adversely affected their customs, cultures, occupations and environmental relationships. But even today aboriginal and rural folk

make use of available plant resources for their well being. They preserve particular plant species or patches of plants traditionally on religious grounds.

0001-163. Maliwal GL (Gujarat Agricul Univ, Arnei). **Reclamation of saline and sodic soils through *Prosopis juliflora*.** *Indian J Forestry*, **22**(2) (1999), 132-135 [7 Ref].

An experiment was conducted to find out the effect of *Prosopis juliflora* plantation on reclamation of saline-sodic soils. The infiltration rate increased by 100% under *Prosopis* plantation as compared to fallow barren land. The total biomass production was 17,459 kg/ha in the period of 7 years which gave net profit of Rs. 5170/ha and soils become normal for agricultural production.

0001-164. Masoodi TH, Soni P (Div Forestry, FOA, Wadura SKUAST, Srinagar, Kashmir). **Physical properties of line stone mine soil restored for forest land use.** *Indian J Forestry*, **22**(1) (1999), 30-36 [35 Ref].

The evolution of some physical properties was studied at various stages of development on restored soils developed from spoil materials of the open cast limestone mine in Dehra Dun (UP, India). The properties of the reconstructed mine soils were compared with the unmined reference soils so as to assess their rejuvenation in physical fertility.

0001-165. Rodrigues BF (Dept Bot, Goa Univ, Taleigao Plateau, Goa 403205). **VAM association in seedlings of some plant species growing on iron ore mine spoils in Goa (India).** *Indian J Forestry*, **22**(2) (1999), 136-140 [23 Ref].

As assessment of VA mycorrhizal association in 21 naturally occurring seedlings of shrub and tree species belonging to 19 genera and distributed among 16 families collected from a 12 years old iron ore mine reject dump was made. Spore densities of iron ore mine rejects and adjacent undisturbed site were also studied. It was observed that the seedlings of all the species studied, showed mycorrhizal infection.

0001-166 Singh Dhan, Goel Ruchi. (Bot Dept, DBS Coll, Dehra Dun 248001, UP). ***Pittosporum eriocarpum* (Pittosporaceae)-an endangered species with its new distribution record from Tehri district.** *Annals Forestry*, **7**(2) (1999), 185-191 [12 Ref].

Study reports the occurrence of an endangered species *Pittosporum eriocarpum* mostly on some rocky habitat around lower Mussoorie hills in Dehra Dun around Kempty falls; Dhaulagiri and Chamba hills at Nagli in Tehri and around Kurakhad and Jeullikot in Nainital district of Uttar Pradesh. It is a new record of distribution of this plant species from Tehri district, since this species was not known earlier from here.

0001-167. Sinha JP, Sinha KMP, Singh SP, Niranjain A, Singh PK (Dept Bot, NLS Coll, Jaitpur-Dandpur (Saran), Jay Prakash Univ, Chopra. Bihar). **Phytochemical studies of ethnobotanically significant plant *Tridax procumbens* L. of Koshi belt of Bihar.** *Biojournal*, **11**(1&2) (1999), 137-139 [8Ref].

The plant *Tridax procumbens* L. is commonly known to tribal people of Koshi belt of Bihar as 'Laghu Surajmukhi'. Three free amino acids have been detected from leaves of plant. Out of these three, L-arginine HCl is semi-essential amino acid and rest two are non-essential aminoacids. This plant is used in headache and leprosy.

0001-168. Srivastava Pushpa (Dept Bot, Univ Rajasthan, Jaipur 302004, Rajasthan). **Phycodiversity of Rajasthan- algae from arid and semiarid soils.** *Indian J Environ Sci*, **3**(2) (1999), 145-150 [15 Ref].

Most part of Rajasthan state falls under arid and semi arid zones. Phycoflora is unique of its kinds. Blue green algae predominated the soils with only exception of *Chlorococcum* of green algae (Chlorophyceae). There were 114 species spread over 29 genera, mostly belonging to the order Nostocales of class Cyanophyceae.

0001-169. Tripathi YC (Non-Wood Forest Products Div, Arid Forest Res Inst, Jodhpur 342005, Rajasthan). **Folk medicinal claim of Indian Desert flora.** *Annals Forestry*, **7**(2) (1999), 177-184 [20 Ref].

The western part of Rajasthan forming the major part of the Indian Desert is admittedly arid and poor in vegetation. However, the flora of this region consists of a number of medicinally important species. Based on field surveys, knowledge obtained

from villagers and tribals and literature which is fragmentary and scattered, medicinal plants used for the treatment of various diseases in folk tradition of this area have been enumerated.

Health and Toxicology

0001-170. Aditya Ajit Kumar, Chattopadhyay Sanjib (Dept Zoo, Visva-Bharti Univ, Shantiniketan 731235). **Accumulation of methyl parathion in the muscle and gonad of *Labeo rohita*.** *J Environ Bio*, **21**(1) (2000), 55-57 [9 Ref].

Adult prespawning, spawning and post-spawning fish *Labeo rohita* were sublethally (1/5th 96 h LC50) exposed to methyl parathion. Accumulation of methyl parathion in the fish muscle and gonad were studied by GC. The accumulation of the pesticide residue occurred in the order muscle < testes < ovary. The trend of accumulation suggests that the pre spawning and spawning ovary appears to be the important target organ of methyl parathion.

0001-171. Agarwal Asha, Pandey Arun Kumar (Dept Zoo, Sch Life Sci, Inst Basic Sci, Dr BR Ambedker Univ, Agra). **Effect of sulphur dioxide toxicity on the brain total lipid and cholesterol level of *Rattus norvegicus* (Berkenhout).** *Proc Acad Environ Bio*, **8**(1) (1999), 87-90 [17 Ref].

The effects of sulphur dioxide were noted on the brain total lipid and cholesterol level on albino rats. A significant decrease in brain total lipid level, while increase in cholesterol level have been reported after 30 days exposure to 60 and 120 ppm sulphur dioxide.

0001-172. Agrawal A, Sharma B S (Dept Zoo, Sch Life Sci, Inst Basic Sci, Dr BR Ambedker Univ, Khandari Campus, Agra 282002). **Sulphur dioxide impact assessment of serum proteins in albino rats.** *Indian J Environ Prot*, **19**(5) (1999), 337-339 [16 Ref].

Effect of S₀₂ on the serum total protein, albumin and globulin of albino rats have been studied after inhalation of 60 ppm and 120 ppm of SO₂ gas for one hr per day after 15 and 30 day. The serum total protein increases significantly after 30 days exposure to

120 ppm SO₂, serum albumin increases significantly after 15 and 30 day exposure to both the concentrations, while serum globulin values decrease significantly after 30 day exposure to 60 ppm and 120 ppm of SO₂ gas.

0001-173. Amita Susan T, Veeraiah K, Tilak KS (Nagarjuna Univ, Nagarjuna Nagar, 522570 AP). **Biochemical and enzymatic changes in the tissues of *Catla catla* exposed to the pyrethroid fenvalerate.** *J Ecobio*, **11**(2) (12999), 109-116 [27 Ref].

Fenvalerate, a synthetic pyrethroid was tested against the freshwater fish *Catla catla*, exposing them to sublethal concentration 1/10 of 24 h LC₅₀ (0.016 mg/l) for 1 day. During the period of exposure, levels of glycogen and protein were decreased. GDH levels were highly elevated. A decrease in AAT and AIAT enzymatic activity was also observed.

0001-174. Avasn Maruthi Y, Subba Rao MV (Dept Environ Sci, Andhra Univ, Visakhapatnam 530003, A P). **Effect of distillery effluent on biochemical parameters of fish *Channa punctatus* (Bloch).** *J Env Polln*, **7**(2) (2000), 111-113 [13 Ref].

A significant decrease in glycogen, total proteins and lipids in both liver and muscle tissues of fish with an increase in effluent concentration was noticed. The changes in the levels of glycogen, total proteins and total lipids indicate a decrease in energy supply metabolism through oxidative pathways.

0001-175. Bhargava S, Dixit RS. Rawat M (Dept Zoo, Dr HS Gour Vishwavidyalaya, Sagar 470003). **BHC and malathion induced changes in TLC and DLC of *Channa striatus*.** *Proc Acad Environ Bio*, **8**(1) (1999), 91-94 [16 Ref].

Adult *Channa striatus* were exposed to sublethal concentrations of BHC and malathion for a period of 96 hours. Malathion caused a small increase in Total Leucocyte Count but no significant effect was observed in BHC treated cases. Differential Leucocyte Count was, however affected significantly by both the pesticides.

0001-176. Dahiya Anju, Saxena Prabhu N (Sch Life Sci, Jawaharlal Nehru Univ, New Delhi 110067). **Effect of nitric oxide on lung nucleic acids of *Sciurus palmarum* Linn.** *J Environ Bio*, **21**(1) (2000), 69-74 [18 Ref].

DNA, RNA and total proteins, also with their respective ratios have been examined in the lungs of squirrels exposed to fresh air (control); 25 ppm and 35 ppm nitric oxide for 5, 10 and 20 days at one hour/day. There was a parallel decrease in contents of total protein and DNA below control values at 25 ppm and 35 ppm respectively, whereas RNA content showed an elevation on day 5 at 25 ppm and decline at 35 ppm on day 5, 10 and 20.

0001-177. Gautam R K, Khan Ruby (Dept Zoo, St John's Coll, Agra 282002, UP). **Heavy metals alters biochemical toxicity in albino rats.** *Indian J Env Eco Plang*, **2**(2) (1999), 155-158 [12 Ref].

Fate of carbohydrates, proteins lipids and moisture contents in the liver and kidney of albino rats have been determined after exposure of copper sulphate and zinc acetate separately. Lipid contents in the liver and kidney after zinc acetate-treatments were observed as stimulated while proteins and carbohydrate contents showed adverse effects of these toxic metals.

0001-178. Guha A, Kumari B, Bora TC, Deka PC, Roy MK (Biochem Div, Regl Res Leb, Jorhat 785006, Assam). **Bioremediation of endosulfan by *Micrococcus* sp.** *Indian J Environ Hlth*, **42**(1) (2000), 9-12 [10 Ref].

Degradation of endosulfan and its utilization as sole carbon and energy source by plasmid harboring and cured strains of two different *Micrococcus* sp. was studied. Plasmid cured strains in comparison to harboring ones utilized endosulfan more efficiently as evident from increase biomass accumulation in culture broth with concomitant decrease in residual endosulfan.

0001-179. Gupta JP (Bhabha Atom Res Cent, Environ Assess Div, Trombay Mumbai 400085). **Room aerosal concentrations during the operation of vacuum pump.** *Indian J Environ Prot*, **18**(12) (1998), 917-920 [8 Ref] (Late Recd).

Size distribution and mass concentration of the aerosols generated during the operation of rotary vacuum oil pumps have been studied near the source and at different places in the working room environment and the process of coagulation has been discussed.

0001-180. Gupta P, Jagawat S, Sharma CS (Dept Physio, USMS >B Hosp, Delhi 110095). **A study of ventilatory lung functions and cognitive responses in electroplaters.** *Indian J Occupl Environ Med*, **3**(3) (1999), 115-118 [22 Ref].

Pulmonary function tests consisting of FVC, FEV1%, PEFr, FEF25-75 and MW measured by using Spiro-232 P.K. Morgan and MMSE test carried out for screening the cognitive responses in 42 asymptomatic non smoker male electroplaters belonging to East Delhi. Results of majority of ventilatory parameters were found to be statistically decreased when compared with healthy controls at $p < 0.5$ level.

0001-181. Jeevan Rao K (Dept Soil Sci Agricl Chem, Agricl Coll, Acharya NG Ranga Agricl Univ, Mahanandi, Nandyal 518 502, AP). **Environmental significance of adsorption-desorption of trace elements in soils-a review.** *Asian J Microbio Biotech Env Sci*, **1**(1&2) (1999), 107-113 [21 Ref].

Absorption-desorption reactions play an important role in controlling the concentrations of metal contaminants in the soil solution. The accumulation of trace elements in carbonates can be a significant immobilization process in some soils. The process of Se accumulation in carbonates may be used to reduce trace elements availability, and, therefore, toxicity in natural systems.

0001-182. Kaladharan P, Pillai VK, Nandakumar A, Krishnakumar PK (Centl Marine Fisheries Res Inst, Cochin 682014). **Mercury in seawater along the west coast of India.** *Indian J Marine Sci*, **28**(3) (1999), 338-340 [8 Ref].

The distribution of mercury showed a conspicuous pattern showing low levels ranging up to 0.058 $\mu\text{g}/\text{l}$ during premonsoon and monsoon seasons and an increase of 100% during the postmonsoon season. The higher levels of mercury, although observed stray during the southwest monsoon as well as postmonsoon period from Veraval coast and from the Wadge Bank, stress the need for close monitoring.

0001-183. Kamble GB, Muley DV* (*Dept Zoo, Shivaji Univ, Kolhapur 416004). **Effect of acute exposure of endosulfan and chlorpyrifos on the biochemical composition of the fresh water fish *Sarotherodon mossambicus*.** *Indian J Environ Sci*, **4**(1) (2000), 97-102 [19 Ref].

Static bioassay tests were performed using sublethal and lethal concentrations of an organophorus pesticide respectively on the freshwater fish *Sarotherodon mossambicus*. The results showed marked alterations in experimental fishes due to pesticidal stress when compared with control groups.

0001-184. Kamble GB, Muley DV, Deshpande VY (Dept Zoo, Shivaji Univ, Kolhapur 416004). **Enzymatic changes due to pesticidal stress in a freshwater fish *Sarotherodon mossambicus*.** *Indian J Env Eco Plang*, **2**(1) (1999), 27-31 [17 Ref].

Effects of chlorpyrifos 20% EC and endosulphan 35% EC on alkaline and acid phosphatases in intestine and liver of a freshwater fish *Sarotherodon mossambicus* after acute (96 h) exposure has been studied by a static bioassay method. The sublethal concentrations of chlorpyrifos and endosulfan were 0.1 and 0.0014 ppm, while lethal concentrations were 0.14 and 0.0042 ppm respectively.

0001-185. Kumar Kuldeep, Patri Priyambada (Centl Inst Freshwater Aquacult, Kausalyaganga, Bhubeneshwar 751002, Orissa). **Variations in biochemical composition of climbing perch *Anabas testudineus* (Bloch) in response to endosulfan toxicity.** *J Env Polln*, **7**(2) (2000), 135-141 [31 Ref].

Endosulfan induced biochemical changes in the blood and liver of *Anabas testudineus* (Bloch.) was evaluated during 30 days exposure period at different concentrations of the chemicals calculated on the basis of LC50 value at 96 hours. While the blood glucose levels (78.67 mg/dl) increased on exposure to endosulfan, the liver glycogen (13.64mg/g) reduced to a greater extent.

0001-186. Kumar Ravindar (PG Dept Zoo, SSV Coll, Hapur 245101, UP). **Effect of ammonia stress on protein of Indian murrel *Channa punctatus* (Bloch).** *J Env Polln*, **6**(4) (1999), 273-275 [23 Ref].

Agricultural, industrial and domestic wastes containing ammonia bring about major changes in aquatic ecosystems. It is a menace directed essentially to freshwater fishes. Study determines the toxic effect of ammonia on protein content of *Channa punctatus*.

0001-187. Kumar Ravindar, Sharma RC (Environ Res Lab, PG Dept Zoo, SSV (PG) College, Hapur 245101) **Effects of ammonium compounds on growth and survival of *Chlorella vulgaris*.** *Indian J Environ Sci*, **4**(1) (2000), 21-24 [12 Ref].

The influences of two ammonium compounds, ammonium carbonate (NH₄)₂CO₃ and ammonium chloride (NH₄Cl) were studied on green algae *Chlorella vulgaris*. The observations on growth and survival of *Chlorella* suggested that NH₄Cl is more toxic than (NH₄)₂CO₃. However, at low concentrations these substances show an exponential increase on growth and reproduction.

0001-188. Kumar Sunil, Singh Anita (Dept Zoo, DAV (PG) Coll, Dehradun 248001). **Biological monitoring of industrial solvent workers exposed to toluene and xylene.** *J Environ Bio*, **21**(1) (2000), 79-84 [19 Ref].

Biological monitoring of industrial workers exposed to toluene and xylene has been performed by the estimation of hippuric acid (H.A.) and methyl hippuric acid (M.H.A.) in urine. The H.A. and M.H.A level was found elevated in all the exposed workers. The exposure to toluene was found more than xylene in the workers as evident by the percentage increase in the excretion of H.A. and M.H.A. level.

0001-189. Kumar Suresh, Lata Swarn, Gopal Krishna (Aquatic Toxic Res Cent, MG Marg, P.B. 80, Lucknow 226022). **Acute toxicity of deltamethrin to the freshwater teleosts *Heteropneustes fossilis* and *Channa punctatus*.** *Proc Acad Environ Bio*, **8**(1) (1999), 83-85 [14 Ref].

Static bioassay were performed for evaluation of short term (96 hrs) acute toxicity of deltamethrin to freshwater teleosts *H. fossilis* and *C. punctatus*. Visible sign of

poisoning were expressed as frequent jumping, erratic movement followed by convulsions. Sensitivity factor showed that *C. punctatus* is more sensitive to pesticide stress than to *H. fossilis*.

0001-190. Mahadeva M, Sreedhar Reddy N, Kunhi AAM, Halappa Gowda TP (Dept Environ Engng, SJ Coll Engng, Mysore 570006). **Kinetics and biodegradation of hexa chlorocycle hexane isomers by mixed bacterial cultures.** *J Env Polln*, **7(2)** (2000), 115-126 [22 Ref].

Effect of temperature on the growth of consortia AHR and GHR as alpha-HCH was studied. Both the consortia showed growth at all temperatures, the maximum growth being at 30°C. Acidic pH reduced the alpha-HCH degradation more drastically than by alkaline pH with the addition of auxilliary co-substrates such as glucose. It was found that the degradation rate of alpha-HCH was faster than that without glucose.

0001-191. Maiti Paulami, Banerjee Samir (Aquacult Res Unit, Dept Zoo, Calcutta Univ, Calcutta 700019). **Accumulation of heavy metals in different tissues of the fish *Oreochromis nilotica* exposed to waste water.** *Env Eco*, **17(4)** (1999), 895-898 [10 Ref].

Investigation records quantitative accumulation of heavy metals in the fish *Oreochromis nilotica* exposed to waste water. Analysis were carried out by atomic absorption spectrophotometric method. Lead and cadmium showed nearly equal pattern of accumulation in all the organs: copper accumulated more in liver and ovary.

0001-192. Misra Virendra, Pandey Shri Dhar, Vishwanathan PN (Ecotoxic Sec, Indl Toxic Res Cent, PB No 80, MG Marg, Lucknow 226001). **Effect of humic acid on the bioavailability of g-hexachlorocyclohexane in *Marsilea minuta* (L.).** *Environ Monit Assess*, **60(2)** (2000), 229-235 [30 Ref].

Effect of various concentrations of humic acid (0.2%) on the bioavailability of g-HCH in vegetative clones of the aquatic fern *Marsilea minuta* was studied in a static experimental bioassay system on different photoperiods. Addition of humic acid showed the reduction in the bioavailability of g-HCH in all the photoperiods in both serial and submerged portion as compared to control indicating its protective role in toxicity.

0001-193. Nanda P, Panigrahi S, Nanda B, Behera MK (Fisheries Toxicology Lab, PG Dept Zoo, GM Coll, Sambalpur 768004). **Toxicity of paper mill effluent to fishes.** *Env Eco*, **18**(1) (2000), 220-222 [9 Ref].

Air-breathing fishes were exposed to paper mill effluent to study the toxicity level. The 96-hour LC₃₀ values were found to be 6.09, 80.35 and 81.28% in *Anabas testudineus*, *Channa punctatus* and *Clarias batrachus* respectively.

0001-194. Nath Ravindra, Banerjee V (Hematology Lab, Dept Zoo, Patna Univ, Patna 800005). **Influence of lethal and sublethal toxicity of rogor on the blood parameters of fresh water fish *Heteropneustes fossilis*.** *Env Eco*, **17**(4) (1999), 940-944 [20 Ref].

Study was undertaken to find out the variation in blood parameters due to exposure of rogor in 96-hour LC₃₀ (0.8 ml/10 liter) and sublethal (0.1ml/10 liter) concentrations after 24 and 96 hours and 7 days. The significant decrease in TEC, Hb, PCV% and increase in ESR, THC and hypercoagulability of the blood were noted.

0001-195. Pandey BN, Mishra SK, Yadav Sobha (PG Dept Zoo, Purnia Coll, Purnia 854301, Bihar). **An epidemiological study of diarrhoea among children under age of five years in Purnia district, Bihar.** *J Env Polln*, **7**(2) (1999), 149-153 [11 Ref].

A community based longitudinal study has been undertaken to understand the effect of social and environmental factors on the incidence of childhood diarrhoea. Among the social factors, education of parents, family size and income have significant bearing on the incidence of diarrhoea. The influence of chemical and biological nature of water was also analysed.

0001-196. Panday Usha (Dept Bot, GN Girls Coll, Sec 4, Hiran Magri, Udaipur 313002). **Effect of heavy metals on growth and b-amylase activity of *Bacillus megaterium*.** *Indian J Environ Sci*, **4**(1) (2000), 49-52 [11 Ref].

Study was conducted to investigate the growth potential and b-amylase activity of *Bacillus megaterium* NCIM 2670 under certain defined stress environment. The chosen

determinants were copper and cadmium. The observations on growth and b-amylase activity suggested that both the metals were toxic to *B-megaterium*. The bacterium was found to be more sensitive to Cd in comparison to Cu.

0001-197. Pant Anjana (Wildlife Inst India, Dehradun 248001). **Methyl mercury uptake by permeaplasts of a cyanobacterium.** *Env Eco*, **17**(4) (1999), 858-861 [15 Ref].

A comparison has been made to account for the uptake of methyl mercury by permeaplasts of the cyanobacterium *Nostoc calcicola*. Methyl mercury uptake monitored for untreated (control) cells and the permeaplasts revealed that the former accumulated methyl mercury to maximum bioconcentration factor of 2.7×10^8 .

0001-198. Paul Ravindra, Jabeen Zohra (Dept Zoo, Gulbarga Univ, Gulbarga 585106). **Influence of three pesticides on the primary productivity of a fresh water ecosystem.** *Env Eco*, **18**(1) (2000), 81-84 [10 Ref].

Comparative toxicity of three pesticides, namely, endosulfan, monocrotophos and cuman-L was observed on the primary productivity of a tropical limnetic ecosystem. Observations revealed a gradual reduction in gross primary productivity and net primary productivity under the influence of low concentrations (0.25 ppm) while there was noticeable reduction at higher concentrations (beyond 50 ppm) for all three pesticides.

0001-199. Prameela K, Singara Charya MA (Dept Bot, Govt Coll Women, Khammam 507001). **Impact of coal dust on microbial populations in the soil around Jawahar Khani-5 incline coal mine Yellandu, Khammam district, Andhra Pradesh.** *Indian J Environ Eco Plang*, **2**(2) (1999), 119-126 [14 Ref].

The impact of coal dust on microbial populations in soils at and around coal mines Yellandu was undertaken. The number of fungal colonies increased in polluted study sites. Gradual increasing trend was noticed in actinomycetes numbers from control to polluted sites. The variations in bacterial populations were not significant between polluted and unpolluted sites.

0001-200. Rajmohan HR, Krishna Murthy V, Rajan BK, Ravi Babu K, Sehar V (Regl Occupl Hlth Cent (South), Indian Coun Med Res, Lib Infm Cent Block, Bangalore Medl Coll Campus, Bangalore 560002). **Biological monitoring of workers employed in electroplating section from a telephone manufacturing unit at Bangalore.** *India J Environ Prot*, **19**(5) (1999), 331-332 [1 Ref].

The result showed that there was no significant difference with respect to the urine chromium, zinc and nickel concentrations of the study and control groups indicating that there was no over exposure to the above metals in electroplating work. Periodic biological monitoring at regular intervals of time for these workers is suggested.

0001-201. Rathore Minakshi, Bhatnagar Pradeep, Mathur D, Saxena GN, Chaturvedi MK (Environ Toxicol lab, Zoo Dept, Univ Rajasthan, Jaipur 302004). **Contamination of human blood with organochlorine pesticides and its relations to thyroid function.** *Proc Acad Environ Bio*, **8**(1) (1999), 73-78 [18 Ref].

Paper evaluates the organochlorine pesticide contamination in male human population in relation to thyroid function. The pesticides detected in the samples were HCH and its isomers, dieldrin, heptachlor, and DDT and its metabolites. Attempt has been made to assess whether a correlation exists between the pesticide level and thyroid dysfunction in humans.

0001-202. Sabale Anjali, Misal BN (7, Shiv Apartments, Nagala park, Kolhapur 416003). **Effect of endosulfan and methylparathion on hydrolytic enzymes in germinating seeds of jowar.** *J Environ Bio*, **21**(1) (2000), 29-35 [20 Ref].

A varied response of jowar (*Sorghum bicolor* L.) seeds was recorded under the influence of endosulfan and methylparathion with respect to the level of some hydrolytic enzymes during germination. Lower doses of endosulfan (0.05.0.1% v/v) stimulated alpha amylase, Protease, acid phosphatase and alkaline phosphatase activities. Methylparathion treatment suppressed a-amylase activity but markedly increased protease level at lower concentrations.

0001-203. Sangli Asheera Banu, Kanabur V V (Environ Sci Lab, Dept Zoo, Karnataka Univ, Dharwad 580003). **Acute toxicity of chloroaniline and pentachlorophenol to a freshwater fish *Gambusia affinis*.** *Env Eco*, **18**(1) (2000), 78-80 [11 Ref].

Static renewal bioassay tests were conducted to determine the lethal toxicity of para-chloroaniline and pentachlorophenol to freshwater fish *Gambusia affinis*. The 24, 48, 72 and 96- hour LC50 values for para-chloroaniline were 34, 30, 26 and 21 mg/liter and for pentachlorophenol were 1.25, 1.17, 1.12 and 1.08 mg/liter, respectively. The oxygen consumption rate of the fish decreased significantly for both the toxicants at higher concentrations.

0001-204. Santha Kumar M, Balaji M, Saravanan KR, Soumady D, Ramudu K (Dept Zoo, KM Cent PG Std, Lawspet, Pondicherry 605008). **Effect of monocrotophos on the optomotor behaviour of an airbreathing fish *Anabas testudineus* (Bloch).** *J Environ Bio*, **21**(1) (2000), 65-68 [16 Ref].

Behavioural changes were studied by exposing fish *Anabas testudineus* for 21 days to three sublethal concentrations of monocrotophos 1.9, 4.75 and 9.5 mg/L. Alterations in behaviour due to an exposure to sublethal concentrations of monocrotophos were estimated by measuring two parameters namely following and reversal which involve two optomotor responses. Two major behavioral changes observed were hypoactive and lethargy in fish exposed to 4.75 and 9.5 mg/L.

0001-205. Saxena Prabhu N, Singh Vijay Kumar (Toxico Lab, Dept Zoo, Sch Life Sci, Inst Basic Sci, Khandari campus, Dr BR Ambedkar Univ, Agra 282002). **Impact assessment of synergised cybil on *Rattus norvegicus*.** *Proc Acad Environ Bio*, **8**(1) (1999), 55-59 [17 Ref].

Acute toxicity tests were carried out with pyrethroid (cybil) and synergised pyrethroid (with sevin) on *Rattus norvegicus* (Berkenhout). The resulting 96 hours LD50 values showed that magnitude of reduction in LD50 are 3.11 and 4.14 for synergised pyrethroid. Sevin behaves as competitive inhibitor for cybil.

0001-206. Singh Kaman, Varma RB, Agarwal DK (Govt PG Coll, Dept Chem, Tikamgarh, Sagar). **Physicochemical characteristics of well waters with respect to fluoride and prevalence of fluorosis in Farukhabad district.** *Indian J Environ Prot*, **19**(4) (1999), 278-283 [18 Ref].

Fluoride concentration in water samples is determined employing SPADNS method. Results indicate that fluorosis is directly related to fluoride in drinking water. As the fluoride concentration exceeds to 2.0 ppm fluorosis predominates and fluoride concentration above 3.0 ppm leads to cent percent probability of fluorosis.

0001-207. Singh RB (PG Dept Bot, MS Coll, Motihari 845401, Bihar). **Cytotoxic effect of synthetic 'blue dye' used by green grocer.** *J Env Polln*, **7**(2) (2000), 77-81 [12 Ref].

Green grocer use blue dye (synthetic) for colouring green vegetables to make them more green and attractive. This blue dye decreased percentage of seed germination, seedling growth and survival of seedlings with the increase in concentration and duration of treatment in *Vicia faba* L. It also showed positive cytotoxic effect on mitotic division.

0001-208. Singh R P, Swaroop Devendra, Annie K (Dept Chem, St John's Coll, Agra 282002, UP). **Surfactants and their toxicity to aquatic animals.** *J Ecotoxic Environ Monit*, **11**(2) (1999), 117-121 [9 Ref].

Several types of toxicity tests conducted on commercial surfactants indicate that chronic toxicity of anionic and non-ionic surfactants occur at concentrations greater than 0.1 mg/l. Their effects on several behavioural and physiological parameters range from 0.002 to 40.0 mg/l Effects of most surfactants on structural and functional aspects of animal communities in nature are unknown.

0001-209. Singh Sudha, Mehrotra Asha (Dept Zoo, SN Govt Girls Coll, Bhopal 462016, MP). **Histopathological changes induced by carbaryl in the intestine of fresh water fish *Nandus nandus*.** *J Ecotoxic Environ Monit*, **11**(2) (1999), 129-132 [13 Ref].

Freshwater fish *Nandus nandus* was exposed to 0.05 ppm of carbaryl for the period of one month. The outer most layer serosa and muscle layers were severely

damaged. Necrosis in intestinal villi and increase in the number and size of mucous cells were seen.

0001-210. Sinha GM (Fishery Lab, Dept Zoo, Burdwan Univ, Burdwan 713104). **Effect of cadmium on hematological parameters in young and adult fish *Labeo rohita* (Hamilton).** *Env Eco*, **17**(4) (1999), 999-1004 [18 Ref].

Different haematological parameters induced in both young and adult *Labeo rohita* (Ham.) due to long-term exposure (90 days) of cadmium (Cd) at various sublethal concentrations were studied. Decrease or increase of values of different parameters in both age groups of fish were recorded during different experimental periods. The possible cause of variations in these parameters has been discussed.

0001-211. Somalwar S, Chandurkar AA, Pandey JS, Joshi SR (Natl Environ Engng Res Inst, Nagpur 20). **Health risk assessment-a case study of Mumbai coast.** *J Indian Water Work Assoc*, **32**(2) (2000), 127-131 [9 Ref].

Mumbai coast receives both treated and untreated wastewater which contain enteric pathogenic microorganisms. Water samples collected from Thane, Gorai, Juhu, Dadar and Worli area were analysed for coliform group of organisms. The die-off rates decay coefficient of these organisms were worked out which is inversely proportional to health risk.

0001-212. Sridevi B, Reddy SLN (Dept Zoo, Osmania Univ, Hyderabad 500007). **Effect of trivalent and hexavalent chromium on carbohydrate metabolism of a freshwater field crab *Barytelphusa guerini*.** *Environ Monit Assess*, **61**(2) (2000), 291-300 [25 Ref].

The *in vivo* toxic impact of chromium in its two forms (trivalent and hexavalent) on glycogen metabolism in the tissues of freshwater field crab *Barytelphusa guerini* was studied. In a sublethal long-term exposure of 30-60 and 90 days, the depletion of glycogen and glucose levels reflected in the activity of glycogenphosphorylases 'a' and 'ab'. The magnitude of responses were found more in the hexavalent form than in trivalent form.

0001-213. Sudharsan R, Shobha Rani A, Reddy TN, Reddy PUM, Raju TN (Physio Sec, Dept Zoo, Osmania Univ, Hyderabad 500007). **Effect of nitrite toxicity on the dehydrogenases in the fish *Tilapia mossambica*.** *J Env Polln*, **7**(2) (2000), 127-130 [11 Ref].

Activity levels of dehydrogenase, LDH, SDH and GDH, were estimated in various tissues of the fish subjected to sublethal concentrations of nitrite for the periods 24, 48, 72 and 96 hours. A significant decrease in the activity levels of LDH occurred while SDH and GDH showed increase in their activity when compared to the control. These alterations were found to be tissue specific and time dependent.

0001-214. Verma AK, Saxena RK, Mahapatra JK, Swain SC (Natl OHS Cent, Bhilai Steel Plant, Bhilai 490001, MP). **Biological monitoring of benzol workers by urine phenol estimation.** *Indian J Occupl Environ Med*, **3**(3) (1999), 119-121 [9 Ref].

Biological monitoring of exposure of workers to benzene in Benzol Rectification Plant was performed by the measurement of urinary excretion of phenol. A significant difference ($P < 0.001$) was observed between the urine phenol concentration of exposed and control group. The study also suggests a causal relation between exposure to benzene and urine phenol concentration.

0001-215. Yazdandoost MY, Katdare MS (Dept Environ Sci Zoo, Univ Pune, Pune). **Study of the heavy metal accumulation in the tissues of fish from Pune-rivers-India.** *Asian J Microbio Biotech Env Sci*, **1**(1&2) (1999), 115-118 [11 Ref].

The adverse effect of heavy metals is due to the non-degradation of metals leading to accumulation in tissues and an interaction of the metal with a protein or enzyme leading to changes in physiologic and metabolic processes. The metalloids, and high concentrations of transitional metals, tend to accumulate in different tissues of body, and hence become bioaccumulated.

Wastes

0001-216. Abraham BT, Anirudhan TS (Univ Kerala, Dept Chem, Kariavattom, Trivandrum 695581). **Influence of humic acid and pH on cadmium (II) adsorption on montmorillonite.** *Indian J Environ Prot*, **19**(5) (1999). 363-366 [12 Ref].

Paper studies the influence of humic acid (HA) on Cd adsorption by montmorillonite at different pH levels, as a model of Cd sorption reactions in soils, and to evaluate the role of adsorption in partitioning Cd between solid and solution phases of soils. The Cd adsorption decreased with increase in initial concentration of HA and decrease in pH values.

0001-217. Annadurai G, Mathalai Balan S (Anna Univ, Dept Cheml Engng, Alagappa Coll Techno, Chennai 600025). **Use of factorial design of experiments in the determination of adsorption equilibrium constants: phenol on activated charcoals.** *Indian J Environ Prot*, **19**(6) (1999), 406-411 [17 Ref].

Factorial design and analysis of variance have been applied to the experimental determination of adsorption equilibrium constants. This methodology requires no assumption and identifies the principle experimental variables, and their interactions which have the greatest effect on the adsorption. The experimental values are in good agreement with the model predicted and has a correlation of 0.916.

0001-218. Bal AS (Natl Environ Engng Res Inst, Nehru Marg. Nagpur 440020). **Evaluation of inhibition characteristics and determination of inhibition co-efficient, K_i , for hexavalent chromium in activated sludge.** *Indian J Environ Hlth*, **42**(2) (2000), 52-58 [13 Ref].

A simple method based on chemical analysis, for evaluation of an inhibition coefficient (K_i) within a specific substrate mixed bacterial system was developed. Determination of the concentration of either single or mixture of toxicants can be carried out by chemical method. Assessment of inhibition due to toxicants at various

concentrations and development of simple correlations for evaluation of the inhibitory conditions were undertaken.

0001-219. Balasubramanian S, Pugalenth V (Centl Leather Res Inst, Edn Trng div, Adyar, Chennai 600020). **Determination of major inorganic pollutants in tannery effluents.** *Indian J Environ Prot*, **19**(1) (1999), 15-18 [18 Ref].

Determination of major inorganic pollutants, namely chromium and sulphide have been determined in the samples collected from various streams in the tanneries. The remedial measures to control these species have also been suggested.

0001-220. Banerjee SK, Kashyap MK (Forest Eco Rehabilitation Div, Trop Forest Res Inst, Jabalpur 482021). **Distribution of micro-organisms in different aged fly ash dykes in relation to vegetation development.** *J Environ Std Policy*, **2**(2) (1999), 117-124 [13 Ref].

The distribution of micro-organisms in fly ash dykes of different ages in Chachai district, Madhya Pradesh in relation to vegetation development was studied. The population of all the organisms increased with the increase of the age of the dykes. The results showed that with the progress of weathering, the characteristics of fly ash improved nutritionally allowing the plant species to invade, and microbial activity increased.

0001-221. Datar MT, Dubey DR, Singh Adityan (AICTE, Ujjain Engng Coll, Ujjain). **Suitability of tower packs as filter media for UAFFB reactors for treatment of high BOD wastewaters.** *Indian J Environ Hlth*, **42**(1) (2000), 123-124 [10 Ref].

Tower packs (pall rings, corrugated packs, etc.) are observed to have large surface areas per unit volume with high voidages and can be used as a very suitable filter media for UAFFB reactors, if anaerobic biomass is made to adhere and grow on these large surface areas. Studies describe a technique to achieve this objective and use aerobic biomass for creation of slime layer, to be subsequently used by anaerobic biomass for adherence and creation of biofilm.

0001-222. De DS, Basu JK (CITI Corp Overseas Software Ltd, 133/SDF-V, seep3, Andheri (E), Mumbai 400096). **Adsorption of methylene blue onto a low cost**

adsorbent developed from sawdust. *Indian J Environ Prot*, **19**(6) (1999), 416-421 [14 Ref].

The removal of methylene blue from aqueous solution has been studied by adsorption onto a cellulose based adsorbent prepared from sawdust. The adsorption equilibria has been found to follow the Langmuir Isotherm. The adsorption has been found to increase significantly with decreasing particle size of the adsorbent.

0001-223. Egbert Selwin Rose A (Dept Bot, Loyola Coll, Chennai 600034). **Studies on wastewater treatment by *Lemna minor*.** *J Environ Bio*, **21**(1) (2000), 43-46 [14 Ref].

The efficiency of *Lemna minor* for the treatment of synthetic wastewater was studied under lab condition. Influent and effluent samples were periodically collected from the model pond and analysed. It is inferred that *Lemna minor* is efficient in removing BOD, solids and nutrients from the wastewater and has high potential for treating organically rich wastewater and reuse possibilities.

0001-224. Ingole SA, Kadam AN (Dept Chem, Siddarth Coll, Mumbai 400001). **Distribution of phenols in sewage from Mumbai.** *J Indian Assoc Environ Manag*, **27**(2) (1999), 117-118 [5 Ref].

Phenols in sewage from Mumbai city originate through a variety of sources, Study deals with presence of phenols in sewage samples collected at several pumping and purification centres in Mumbai.

0001-225. Jain Ruby, Manoj SV, Gupta KS (Dept Home Sci, Univ Rajasthan, Jaipur 302004). **Removals of dyes from textile dyeing and printing industry effluent through charcoal as an adsorbent.** *Indian J Environ Prot*, **19**(1) (1999), 36-42 [19 Ref].

The kinetics of removal of Remazol Turquoise Blue and Direct Violet dyes from pure dye solutions and their effluents has been studied. In addition, the removal of dyes from two more effluents is also being reported. In each case, the dye removal in the first stage is rapid followed by a second slower stage. The results show the charcoal to be an effective adsorbent for the removal of dyes from effluents.

0001-226. Jindal Tanu, Singh Dileep K, Agarwal HC (Dept Zoo, Univ Delhi, Delhi 110007). **Persistence, degradation and leaching of coumaphos in soil.** *J Environ Sci Hlth*, **B35**(3) (2000), 309-320 [24 Ref].

Dissipation, degradation and leaching of fresh ¹⁴C coumaphos, alkylated ¹⁴C coumaphos and aged residues of ¹⁴C coumaphos from vats were studied in alkaline sandy loam soil in soil columns in the field under subtropical conditions in Delhi for a year. Dissipation, degradation and bound residue formation was more in case of alkali treated coumaphos than fresh coumaphos.

0001-227. Joshi PA, Desai CA, Patil SR (Dept Cheml Engng. Dharmsinh Desai Inst Techno, Nadiad 387001, Gujarat). **Removal of chromium from chrome-bearing waste water through application of ion exchange.** *J Environ Std Policy*, **2**(1) (1999), 39-44 [7 Ref].

Ion exchange process has been used for the removal of chromate from aqueous media. Experiments were conducted using batch stirred reactor and packed-bed column. Experimental results show that the process was dependent on the type of resin, initial solution concentration, and pH.

0001-228. Kaul SN, Mahajan AV, Nandy T (Natl Environ Engng Res Inst, Nagpur 440020). **Water and wastewater: treatment, recycle and reuse.** *J Indian Assoc Environ Manag*, **27**(2) (1999), 74-90.

Water pollution status in the country justifies the urgent and direct need to look for improved treatment methods and to develop new treatment approaches. This will not only help in meeting expected norms set by regulatory agencies but also promote implementation of cleaner saving technologies and support treatment to an extent that the reclaimed wastewater can be recycled or reused.

0001-229. Kennedy LJ, Sekaran G, Shanmuga Sunderam KA, Mariappan M (Centl Leather Res Inst, Dept Environ Tech, Adyar, Chennai 600020). **Oxidation of organics in wastewater from leather industries using activated carbon.** *Indian J Environ Prot*, **19**(6) (1999), 401-405 [16 Ref].

The spent chemicals from leather industries have very poor biodegradability index (0.2-0.3) and thus conventional biological wastewater treatment techniques fail to meet the discharging standard. The rice bran based activated carbon packed reactor of effective volume 5.2m³ (2.5x10³kg) removed dissolved organics estimated as COD 35 kg/day from wastewater of 14 m³ under air oxidation using oxygen 12.34 kg at pressure 3-5 kg/cm².

0001-230. Kishore ME (Dept Microbio, SGM Coll, Vidyanager 415124, Karad). **Biodegradation of cyanide by *Bacillus cereus* var *mycoides*.** *Asian J Microbio Biotech Env Sci*, **1**(1&2) (1999), 37-46 [16 Ref].

Cyanide one of the toxic industrial wastes was studied for microbial degradation in this investigation. Simulated synthetic cyanide wastes as well as industrial wastes were used for these studies. One of the isolates, identified as *Bacillus cereus* var *mycoides* showed almost a 100% cyanide degradation of 1500 ppm cyanide concentration within 10 days.

0001-231. Kowshik Meenal, Nazareth Sarita (Dept Microbio, Goa Univ, Taleigao Plateau, Goa 403206). **Biosorption of metals by *Fusarium solani*.** *Asian J Microbio, Biotechno Env Sci*, **1**(1&2) (1999), 57-61 [11 Ref].

Metal biosorption by *Fusarium solani* is shown to occur both during growth as well as by grown cells. The amount of metal sorbed increased with increasing concentration of the mycelial mass used. Most of the metal was removed immediately within 1-2 minutes after addition of the biomass, and the metal was found to be cell bound and also accumulated intracellularly.

0001-232. Krishnaswamy NR. Gopalakrishna K, Sheela Evangeline Y (Geotechnl Engng Div, Civil Engng Dept, Indian Inst Techno, Chennai 600036). **Effect of chrome tanning effluent on cohesive soils.** *J Indian Water Works Assoc*, **32**(2) (2000), 107-112 [7 Ref].

Different views have been expressed on the effect of chromium bearing tannery effluent and sludges on plant life and soil productivity. Concentration of chromium in tannery effluent varies from 150 to 220 ppm. Paper investigates the effects of chromium on soil taking Ca-bentonite, IIT soils and Manali soil as representative soils.

0001-233. Kshirsagar DG, Pandey RA, Shivaraman N, Chalpatirao CV, Kaul SN (Natl Environ Engng Res Inst, Nagpur 440020). **Aerobic biodegradation of cyanide bearing waste waters.** *Assam J Microbio Biotechno Env Sci*, **1**(1&2) (1999), 7-13 [13 Ref].

Alkaline chlorination of cyanide bearing wastewater is normally practiced to contain pollution. A two stages biological system comprising of activated sludge process followed by an oxidation pond on pilot scale has been investigated for the treatment of cyanide wastewater. The results of the performance of the system and some of the kinetic constants under pilot scale are presented.

0001-234. Maiti SK, Mannan SM (Indian Sch Mines, Cent Mining Env, Dhanbad 826004). **Treatment of synthetic phenolic waste through anaerobic filter technology.** *Indian J Environ Prot*, **19**(6) (1999), 422-426 [9 Ref].

A 5 L capacity laboratory scale upflow anaerobic filter (UAF) was used for treatment of phenolic waste for 8 month. The brick ballast was used as filter medium. The organic loading rate was varied from 0.27 to 0.92 kg COD/m³/d and corresponding COD removal efficiency was found to be in the range of 94 to 73%. The suspended solids in the effluent was found to be very low (0–7 mg/L).

0001-235. Mandal Sangeeta, Saxena Mohini (Bldg Material Div, Regl Res Lab, (CSIR), Hoshangabad Rd, Habibganj Naka, Bhopal 462026). **Flyash a boon for clay and sandy Soils.** *J Environ Res*, **9**(1) (1999), 12-24 [38 Ref].

Attempt has been made to study the mechanism of the chemical reaction taking place between the mineral constituents of soil and flyash. Study indicates that flyash addition to the soil had increased porosity from 45-52% in clay soil which, helped in increasing the infiltration rate of water which resulted in solving the problem of water logging.

0001-236. Manju GN, Anirudhan TS (Dept Chem, Univ Kerala, Kariavattom, Trivandrum 695581). **Treatment of arsenic (III) containing wastewater by adsorption of hydrotalcite.** *Indian J Environ Hlth*, **42**(1) (2000), 1-8 [26 Ref].

Removal of As (III) from water has been studied with hydrotalcite (HTCO₃) using the batch equilibrium method. The high As (III) adsorption capacity of HTCO₃ can be attributed to its carbonate group content and the surface area. The adsorption efficiency towards As (III) removal has been tested using synthetic and industrial wastewaters.

0001-237. Mishra VK, Nayak BK (Dept Silvicult Agroforestry, Coll Forestry, UHF Nauni, Solan 173230). **Biomass productivity of energy plantations on Himalayan foot hill.** *Env Eco*, **18**(1) (2000), 13-16 [14 Ref].

A nine year old energy plantation on Himalayan foot hill district Sirmour, Himachal Pradesh with degraded Bhabar land was studied for its biomass production. The experimental plot comprises three fast growing species, namely. *Eucalyptus tereticornis*, *Melia azedarach* and *Leucaenea leucocephala* planted at four different spacings. Result revealed highest biomass production by *Leucaenea leucocephala*.

0001-238. Mohite BS, Burungale S H, Thote L (Shivaji Univ, Environ Analyst Chem Lab, Dept Chem, Kolhapur 416004). **Separation studies of lead using benzo-18 – crown-6 and its applications to environmental and other samples.** *Indian J Environ Prot*, **19**(5) (1999), 321-325 [4 Ref].

Paper considers the separation studies of lead from associated elements using benzo-18-crown-6. The method developed is simple, elegant and has extraction capacity at trace level. Using the method, the lead can be separated very effectively from associated elements in multi-component mixtures.

0001-239. Nanda Prasanta, Panigrahi Sudarshan, Behera Milan K (Fisheries Toxic Res Lab, PG Dept Zoo, GM Coll, Sambalpur, 768004, Orissa). **Physico-chemical and microbial analysis of the Orient Paper Mill effluent.** *Env Eco*, **17**(4) (1999), 975-977 [19 Ref].

The Orient Paper Mill, releases its effluents into the Ib river, a tributary of river Mahanadi. All the physico-chemical parameters were found to be significant ($P < 0.05$) when compared with the ISI values. However, the heavy metals were noted to be below the permissible levels. The high organic content of the effluent is detrimental to aquatic fauna.

0001-240. Nanjundan S, Bala Subramanian VS, Arun Prasath R (Anna Univ, Dept Chem, Chennai 600025). **Removal of phenol from wastewater by electrochemical chlorination.** *Indian J Environ Prot*, **19**(1) (1999), 30-35 [23 Ref].

Phenolic compounds from aqueous solution are removed by precipitation with chlorine gas produced within the phenolic solution itself by the addition of common salt, providing NaCl salt-bridge and electrolysing it with 12 volts DC power source using graphite electrodes. Phenols from municipal wastewater are similarly removed when the 3:1 mixtures of municipal wastewater and salt water are electrolysed.

0001-241. Narashima G, Babu GVAK, Rajasekher Reddy B (Dept Microbio. Sri Krishnadevaraya Univ Anantapur 515003). **Effect of effluents of cotton ginning industry on physico chemical and biological properties of soil.** *Asian J Microbio Biotech Env Sci*, **1**(1&2) (1999), 89-91 [19 Ref].

Discharge of cotton ginning mill effluents into the soil caused changes in physico-chemical and biological properties of the soil. Three fold increase in fungal population and three fold decrease in bacterial population were recorded in polluted soil in comparison to control soil.

0001-242. Nemade PN, Shrivastava VS (North Maharashtra Univ, Environ Sci Res Lab, Dept PG Std Res Chem, GTP Coll, Nandurbar 425412). **The COD and BOD of industrial effluents: correlation and regression analysis.** *Indian J Environ Prot*, **18**(12) (1998), 881-883 [6 Ref] (Late Recd).

Attempt has been made for assessment of the relationship between COD and BOD for distillery effluent and pulp and paper mill effluents. A linear relation of the form $BOD = a + b (COD)$ has been proposed to predict the value of the BOD as a function of the COD.

0001-243. Padhan A, Sahu SK (Sambalpur Univ, PG Dept Environ Sci, Jyoti Vihar 768019 Sambalpur). **Growth and cast production of two tropical earthworms in soil irrigated with rice mill effluent.** *Indian J Environ Prot*, **18**(12) (1998), 924-927 [15 Ref] (Late Recd).

A work was undertaken to study the effect of rice mill effluent on the growth and cast production of two tropical earthworms (*Drawida willsi*, Mchaelsen and *Lampito-mauritii*, Kinberg), dominant in the paddy fields of India. The results indicated a positive effect upto 50% effluent irrigated soils. Decline in growth and cast production of both the worms were noticed at higher concentrations (75 and 100%).

0001-244. Panesar PS, Marwaha SS, Rai R (Dept Food Techno, Sant Longowal Inst Engng Techno, Longowal 148106). **Development of bench scale technology for the treatment of dairy waste water by *Candida haemulonii* MTCC 1964.** *Asian J Microbio Biotechno Env Sci*, **1**(1&2) (1999), 25-28 [14 Ref].

Investigation reports the use of *Candida haemulonii* MTCC 1964, isolated from dairy industry effluents to carry out the treatment of dairy wastewaters at a bench scale fermenter. The inoculum rate of 12.5% (v/v) and 24 h of treatment time at pH 5.5, and 300C, with agitation rate of 150 rpm, supported the maximum BOD₅ (71.1%) and COD (70.0%) reductions of dairy wastewaters.

0001-245. Panesar PS, Rai R, Marwaha SS (Dept Food Techno, Sant Longowal Inst Engng Techno, Longowal 148106). **Biological treatment of dairy industry effluents.** *Asian J Microbio Biotechno Env Sci*, **1**(1&2) (1999,) 67-72 [43 Ref].

Paper gives an account of the characteristics of dairy wastewater generated by the dairy industry, which indicate the need for its treatment. Thereafter, different biological treatment methods including the methods producing high value products are discussed, including their advantages and disadvantages.

0001-246. Pathade GR, Kale SC (Dept Microbio, YC Coll Sci, Karad 415124, Maharashtra). **Scale up studies on the aerobic treatment of previously anaerobically digested distillery waste using developed mixed microbial seed culture.** *Indian J Environ Sci*, **3**(2) (1999), 191-195 [6 Ref].

Initially bench level (1-L) studies were carried out with anaerobically digested distillery waste using mixed microbial seed at optimum inoculum does of 5, g/L, optimum HRT of 6 days and DO level 3.0 mg/L with percentage COD and BOD reductions of 87.6 and 98 percent respectively. Further scale up (6.9L) studies were made on initially anaerobically digested waste using optimum conditions regarding inoculum dose of

mixed seed, HRT and DO level optimised in the bench level (1L) studies. Scale up results also indicate that the conditions optimised at the bench level (1L) studies were thoroughly transformed in the scale up level (6.9 L) studies.

0001-247. Puri Balkrishnan, Balani Sanjay (Dept Chem, Indian Inst Techno, New Delhi 110016). **Trace determination of fluoride using lanthanum hydroxide supported on alumina.** *J Environ Sci Hlth, A 35*(1) (2000), 109-121 [11 Ref].

Lanthanum hydroxide supported on alumina has been studied to sorb fluoride ion from aqueous solutions. The adsorbent is effective in decreasing fluoride ion concentration from 7 mM to 0.003 mM in the pH range 5.7-8.0. The rate constant for sorption was found to be $6 \times 10^{-2} \text{ min}^{-1}$. The sorption of fluoride is Langmuir type and its capacity is 0.82 m M F/g of the adsorbent.

0001-248. Raymahashay BC, Praharaj T (Indian Inst Tech, Dept Civil Engng, Kanpur 208016). **Chromate uptake by lateritic soils: similarity with phosphate.** *Indian J Environ Prot, 18*(12) (1998), 933-936 [9 Ref] (Late Recd).

The groundwater seepage at Sukinda chromite mines in Orissa contains a significant level of hexavalent chromium. This has been acquired by oxyalteration of chromite which also gives rise to a lateritic overburden. Controlled laboratory experiments show that the mineral goethite adsorbs the chromate anion but in a manner similar to phosphate, this ion is easily desorbed into a chloride rich solution.

0001-249. Reni Prabha A, Muralidharan S, Subramanian MA (PG Res Dept Zoo, Chikkaiah Naicker Coll, Erode 638004). **Haemopoietic alterations in paper and pulp mill effluent treated *Oreochromis mossambicus* (Peters).** *Asian J Microbio Biotechno Env Sci, 1*(1&2) (1999), 77-80 [14 Ref].

The total number of RBCs and WBCs, Hb content and PCV and MCHC values are found to decrease in *Oreochromis mossambicus* on exposure to paper and pulp mill effluent. The reduction in number of PBCs and Hb content could be due to either inhibition of erythropoiesis as evidenced by the disruptive action of the effluent on the bonemarrow cells or destruction of RBCs as supported by decreased MCHC value.

0001-250. Mandal Sangeeta, Saxena Mohini (Regl Res Lab, Coun Scient Indl Res, Hoshangabad Rd, Habibganj Naka, Bhopal). **Role of fly ash in the improvement of black cotton soil.** *J Environ Std Policy*, **2**(1) (1999), 29-38 [38 Ref].

Pot experiments were conducted to evaluate the physicochemical changes in black cotton soil due to the addition of fly ash in different quantities. The results indicate that the texture of the control soil improved as it changed from silty loam to loam. There was a significant lowering in the percentage of clay, which changed the physical properties of the soil by improving the productivity.

0001-251. Saravanan P, Saravanan A, Elangovan N, Kalaichelvan PT (Univ Madras, Cent Adv Std Bot, Chennai 600025). **Decolourization of tannery effluent by *Flavobacterium* sp Ek1.** *Indian J Environ Prot*, **19**(1) (1999), 19-24 [18 Ref].

Decolourization of tannery effluent was tested with free and immobilized cells of *Flavobacterium* sp. EK1. A reduction in the intensity of colour and changes in the pH, TDS, COD, BOD, total phenol, total tannin was observed. The dark brown effluent changed to light brown or light yellow depending on whether the bacterium was in the free or immobilized cells.

0001-252. Sarkar A, Ram B, Mukherjee A (Indian Sch Mines, Dept Appl Chem, Dhanbad 826004, Bihar). **Scanning electron microphotographic studies of cation and anion exchange resins used in recovery of phenol from wastewater as acetates.** *Indian J Environ Prot*, **19**(1) (1999), 11-14.

Cation and anion exchange resins were used for adsorption of phenols from wastewater. Subsequently phenols (adsorbed on resins) were acetylated to phenol acetates. Scanning electron microscopic studies were carried out for the fresh resins and treated resins. Various morphological characteristics of the resin have been revealed.

0001-253. Sharma Alka, Kumar Rita*, Kumar Anil, Sangal SV (*Cent Biocheml Techno, Mall Rd, Delhi 110007). **Application of defined co-immobilized microbial consortium as a ready-to-use seed inoculum in BOD analysis.** *Environ Monit Assess*, **60**(3) (2000), 257-260 [27 Ref].

A number of microorganisms were isolated from sewage. Biochemical Oxygen Demand (BOD-5 day) analysis was carried out by individual pure cultures. The cultures giving higher or equal BOD values as compared to reference GGA solution were selected for the formulation of a defined mixed microbial consortium. This microbial consortium was co-immobilized on calcium-alginate beads. It is recommended that immobilized microbial beads can be used as a ready-to-use seeding material for BOD analysis.

0001-254. Sharma Pragya, Kaur Amerjeet, Markenday DK (Guru Jambheshwar Univ, Dept Environ Sci Engng, Hisar 125001). **Biosorption of the dye by various low cost adsorbent a lab scale investigation.** *Indian J Environ Prot*, **19**(6) (1999), 442-445 [16 Ref].

Laboratory investigations of the potential of non living dried roots, shoot of water hyacinth plant, orange peel, sawdust, sugarcane pith to remove dye colour acrylic red 2b from aqueous solution were conducted. The influence of these system variables is investigated to see how the rate of dye uptake is affected. *Eichhornia* plant has shown the 90% of removal efficiency for the dye studied.

0001-255. Shekdar AV (Solid Waste Manag Div, Natl Environ Engng Res Inst, Nagpur 440020). **Municipal solid waste management – the Indian perspective.** *J Indian Assoc Environ Manag*, **27**(2) (1999), 100-108 [5 Ref].

The critical assessment of the prevailing system indicates shortcomings like irregular removal of solid waste from collection area, under utilization of existing resources, degradation of environmental quality and poorly organised system at higher cost. Accordingly the improvements are proposed addressing the issues like delineation of national policy for waste management.

0001-256. Shrivastava AK, Swaroop Jyoti, Jain Neeraj (Dept Civil Engng, Univ Roorkee, Roorkee 247667). **Effect of seed on BOD exertion.** *Indian J Environ Hlth*, **42**(2) (2000), 75-78 [9 Ref].

The results show that with indigenous seed, the BOD values are observed more in case of both the industries on all the day of the experiment. Kinetic study reveals that

with indigenous seed, the ultimate BOD is more in each case by fitting first and second order equations.

0001-257. Shrivastava RK, Ayachi AK, Mishra Mona, Chapra Puneet, Sehgel Vandana (Dept Bot Environ Sci, Govt Autonomous, Sci Coll, Jabalpur 482001). **Removal of iron from industrial effluents by utilization of waste materials (bidi leaves).** *Indian J Environ Eco Plang*, **2**(2) (1999), 151-154 [5 Ref].

Dried and powdered bidi leaves (cut chips of bidi leaves, which is a waste material in bidi industry) are highly effective in removing iron from the solution. The absorption of metal ions increases with increasing pH value. It has also been observed that more than 75% of iron removed by substrate from solution.

0001-258. Singh G, Kumar S (Indian Sch Mines, Cent Mining Env, Dhanbad 826004). **Environmental evaluation of coal ash from Chandrapura thermal power station of Damodar Valley Corporation.** *Indian J Environ Prot*, **18**(12) (1998), 884-888 [12 Ref] (Late Recd).

Study envisages the environmental assessment of coal ash disposal from Chandrapura thermal power station. Environmental evaluation of coal ash is made through the analysis of leachates from open percolation leaching column experiments and also from the actual ash pond disposal site over a period of 10 months. Results of this study indicated that leachate analysis from open percolation column experiments closely resembles leachate analysis of actual ash pond disposal site.

0001-259. Singh Gurdeep, Kumar Sanjay (Cent Mining Env, Indian Sch Mines, Dhanbad 826004, Bihar). **Environmental evaluation on leaching of trace elements from coal ashes: a case study of Chandrapura thermal power station.** *J Environ Std Policy*, **2**(2) (1999), 135-142 [7 Ref].

Environment evaluation of coal ash has been made through the analysis of leaches from open percolation leaching column experiments and also from the actual ash pond disposal site. Results of this study indicated that leachate generated from open percolation column experiments closely resembles those of actual ash pond disposal site.

0001-260. Singh SN, Kumar Kaushlendra, Pandey DD (PG Dept Bot, ANS Coll, Barh, Patna 803213). **Biomass and net primary productivity of *Argemone mexicana L.* from wastelands of Barh, Bihar.** *Env Eco*, **17**(4) (1999), 912-914 [6 Ref].

The study area was confined to wastelands of Barh, Bihar to study the biomass and net primary productivity of *Argemone mexicana L.* Monthly variation in the standing crop biomass and primary productivity of the *Argemone mexicana* was evaluated by harvest method at two sites.

0001-261. Srivastava RK, Ayachi AK, Mishra Mona, Sehgal Vandana (Dept Environ Sci, Govt Autonomous, Sci Coll, Jabalpur 482001). **Use of saw dust (sagon) for removal of chromium.** *Env Eco*, **18**(1) (2000), 85-87 [3 Ref].

Saw dust (sagon) was utilized for the removal of Cr+6 ions from synthetic solution. The dried and powdered saw dust was contacted with acidified formaldehyde. Material obtained in this process was highly efficient in removing Cr+6 ions from the solution. It was observed that more than 95% of chromium ions were removed by substrate from the chromium solution.

0001-262. Subramanian E, Muthusamy M, Palanivel Rajan K (Manonmaniam Sundaranar Univ, Dept Chem, Abishekapatti, Tirunalveli 627012). **Adsorptive removal behaviours of cross linked polyvinylpyrrolidone and wood charcoal with blue 2B, a textile industry dye effluent.** *Indian J Environ Prot*, **19**(6) (1999), 446-450 [18 Ref].

Crosslinked polyvinylpyrrolidone exhibited higher removal capacity (97 mg/gm) with a possibility of multilayer sorption but had a declining effect with temperature. Wood charcoal showed a lesser capacity (9.4 mg/gm) and an inverse trend in all respects with monolayer formation; yet both the adsorbents followed a cooperative sorption behaviour.

0001-263. Sudhakar Y, Dikshit AK (Dept Environ Engng, Indian Inst Techno, Kharagpur 721302). **Removal of endosulfan from aqueous phase.** *J Indian Assoc Environ Manag*, **26**(1) (1999), 30-34 [17 Ref] (Late Recd).

Removal of endosulfan from aqueous phase, as a process of effluent management containing 5 mg/L of endosulfan was attempted using various methods. Mixed culture of aerobic bacteria with prior acclimatization showed an efficiency of 95%

in endosulfan removal. Sorption by the acclimatised biomass was found a suitable method for the removal of endosulfan at a concentration of 5 mg/L.

0001-264. Suresh Kumar M, Vaidya AN, Bal AS (Natl Environ Engng Res Inst, Nagpur 440020). **Treatment options for the management of waste pickling liquor.** *J Indian Assoc Environ Manag*, **26**(1) (1999), 35-39 [23 Ref] (Late Recd).

The corrosive character and high chloride ferrous ion concentrations in the waste pickling liquor (WPL) brings it under the hazardous waste category warranting priority for treatment and safe disposal. Three treatment options have been established for the management of WPL, viz, deep well disposal, neutralization and regeneration. Amongst all options, regeneration of valuable chemicals from WPL appears to be eco-friendly.

Forestry and Environment

0001-265. Banik S. Bhosale LJ (Dept Bot, Shivaji Univ, Kolhapur 416004). **Productivity and energy content of four exotic *Acacia* species at the young age.** *J Env Polln*, **6**(4) (1999), 289-293 [15 Ref].

Studies on biomass estimation are important from the point of view of forecasting productivity, nutrient budgeting and for maintaining proper felling-cycles in tree species. Thus biomass estimation in four exotic *Acacia* at the age of 3.5 yrs, reveals that *Acacia mangium* produces the highest biomass (127.4t/ha), while *A. ampliceps* produces the least (13.7t/ha).

0001-266. Joshi SP, Joshi Venita, Kumar Vinod, Manhas Rajesh, Verma Naresh K (Eco Res Lab, Dept Bot, DAV (PG) Coll Dehradun 2480001, UP). **Demographic analysis of a sub-tropical forest at Dehra Dun.** *Annals Forestry*, **7**(2) (1999), 235-242 [24 Ref].

Paper deals with the demographic analysis of undergrowth of sal forest located at Rajpur Forest Block, West Dehra Dun Forest division. The preponderance of various unpalatable species like *Carissa opaca*, *Eupatorium adenophorum*, etc. indicate severe biotic disturbances in the area. The high IVI value (25.41) of sal seedlings on site I indicates high regeneration potential. Protection to this site may therefore, result in high production of sal seedlings.

0001-267. Khan SN, Uniyal Kamla (Forest Patho Div, Forest Res Inst, Dehradun). **Association of arbuscular mycorrhizal fungi with different bamboo species at a reforested site.** *Indian J Forestry*, **22**(4) (1999), 405-408 [11 Ref].

Arbuscular mycorrhizal (AM) association was studied in bamboo species in a trial plantation at a reforested site. A total thirty six AM fungi belonging to six genera were isolated. Out of which, the genus *Glomus* was dominantly represented. Amongst the host species *Dendrocalamus straitens* and *Bambusa nutans* have the highest spore population of AM fungi.

0001-268. Lal M, Singh Roma (Cent Atmos Sci, Indian Inst Techno, New Delhi 110016). **Carbon sequestration potential of Indian forests.** *Environ Monit Assess*, **60**(3) (2000), 315-327 [26 Ref].

The forestry sector can not only sustain its carbon but also has the potential to absorb carbon from the atmosphere. Estimates of annual carbon uptake increment suggest that our forests and plantations have been able to remove at least 0.125 Gt of CO₂ from the atmosphere. Assuming that the present forest cover in India will sustain itself with a marginal annual increase by 0.5 Mha in area of plantations, we can expect our forests to continue to act as a net carbon sink in future.

0001-269. Nautiyal BP, Prakash V, Nautiyal MC (High Attitude Plant Physio Res Cent, P B NO 14, HNB Garhwal Univ, Srinagar (Garhwal), 246174). **Structure and diversity pattern along an altitudinal gradient in an alpine meadow of Madhyamaheshwar, Garhwal Himalaya, India.** *Indian J Environ Sci*, **4**(1) (2000), 39-48 [21 Ref].

Structure of an alpine meadow of Madhyamaheshwar (3000-4500m) in Garhwal Himalaya along the altitudinal gradient was analysed. The site, located near settlements, dominated by one or few species with large number of diversity indices were calculated for each species and site and compared by using ANOVA to determine degree of variation between these indices.

0001-270. Pant Kavita, Pandit Atul, Tewari Ashish, Koshyari RS (Dept Forestry, Kumaon Univ, Nainital, UP). **Agroforestry patterns in the Tarai region of central Himalaya.** *Indian J Forestry*, **22**(2) (1999), 123-128 [7 Ref].

Study deals with the status and patterns of agroforestry practices in Tarai region of Kumaun. Among the trees planted Poplar is most preferred species. Study of agroforestry patterns reveals that bund planting is predominant in the areas following with wayside and field plantations. In these villages 100% farmers have adopted agroforestry practices thereby reducing pressure on the surrounding natural forests.

0001-271. Pathak S, Saroj PJ (UP Land Dev Corp. Lucknow 226001, UP). **Using participatory approaches for rehabilitating salt affected lands by fruit based agroforestry systems.** *Indian J Soil Conserv*, **27**(3) (1999), 220-226 [10 Ref].

The suitable agrotechniques have been worked out by series of experimentation on farmers field in participatory mode. The site specific agrotechniques for establishment of various components. Management practices and extent of participation have been suggested for efficient utilization of salt affected lands through fruit based agroforestry systems.

0001-272. Rahangdale Ramesh, Gupta Nibha (Sch Life Sci, Pt. Ravishankar Shukla Univ, Raipur, MP). **Vesicular-Arbuscular mycorrhizal association of biomass tree species in the tropical forests of Madhya Pradesh.** *Indian J Forestry*, **22**(1) (1999), 62-65 [13 Ref].

Occurrences of the VA-mycorrhizal symbiosis in forest trees has been evaluated in 46 species selected for biomass energy plantation at Raipur. Seedlings were raised in nursery using both the nursery bed and poly pot methods having vertisol type of the indigenous soil. Occurrence of the VAM symbiosis in plants belonging to many families are well distributed in the tropical forest of India.

0001-273. Sharma Manoj Kumar, Kshetrapal Shashikala (Dept Bot, Univ Rajasthan, Jaipur, Rajasthan). **Phytosociological analysis of Jaigarh and Jhalana hill forests, Jaipur (Rajasthan).** *Indian J Environ Sci*, **3**(2) (1999), 137-143 [14 Ref].

Phytosociological investigations of two study sites showed that 40 and 35 species were associated with *Boswellia serrata* respectively in Jaigarh hill forest, Amer and Jhalana hill forest, Jhalana. In both the study sites, highest density and A/F ratio was of *Cynodon dactylon* and so, it was distributed frequently. Highest IVI was exhibited by *Boswellia serrata* in both the study sites and lowest by *Asparagus racemosus* and *Evolvulus alsinoides* in Jaigarh and Jhalana hill forests, respectively.

0001-274. Solanki GS, Chauhan CPS, Singh, RB (Fac Appl Sci (Forestry), NE Regl Inst Sci Techno, Nirjuli, Arunachal Pradesh 791109). **Performance of *Acacia nilotica* in different agroforestry systems grown in saline water.** *Indian J Forestry*, **22**(4) (1999), 295-298 [13 Ref].

Different agroforestry models were developed in the riverine type of land. These models were maintained with underground saline water of different salinity. The growth of *A. nilotica* in agrosilviculture system found better than other two. Nutritive value of top feed of *Acacia nilotica* maintained with saline water is better than the result reported elsewhere in various situation in India.

Wildlife

0001-275. Arunkumar Laifrakpam, Singh Hijam Tombi (Dept Life Sci, Manipur Univ, Canchipur 795003). **Fauna of the Yangoupokpi-Lokchao Wildlife Sanctuary, Manipur, India.** *Indian J Forestry*, **22**(4) (1999), 304-315 [30 Ref].

The Yangoupokpi-Lokchao Wildlife Sanctuary in Manipur is situated on the Indo-Myanmar border. The occurrence of 86 species of fish, 6 species of amphibia, 29 species of reptiles, 74 species of aves and 42 species of mammalia with their status have been reported in the present investigation. It has been reported to be an important wildlife sanctuary being the natural breeding and spawning ground, migratory centre and home of highly endangered animals.

0001-276. Sawarkar VB (Wildlife Inst India, Dehradun, UP). **Conserving biodiversity in Protected Areas and forested landscapes.** *Annals Forestry*, **7**(2) (1999), 163-176 [50 Ref].

Besides having been established within a matrix of often incompatible land uses, most Protected Areas (PA) have forest based economy oriented settled human habitations within. The issues in maintaining the patterns of biodiversity become more complex in the face of having to manage endangered, rare, endemic, threatened and wide ranging species under the ruling principles and influence of insular biogeography applicable to PAs as habitat islands. To redeem the situation a new approach of landscape level planning and management for maintenance of biological diversity is recommended.

Energy

0001-277. Abubacker MN, Rao GR (PG Res Dept Bot, National Coll, Tiruchirapalli 620001). **Four potential biofuel crops for tropics.** *J Environ Std Policy*, **2**(2) (1999), 125-133 [32 Ref].

Dodonea viscosa, *Fatropa gossypifolia*, *Lantana camera*, and *Prosopis juliflora* produce higher amount of biogas and are identified as biofuel crops. Through introduction of controlled forestry practices, biofuel crops can be planted and harvested for energy purposes. Hence these are best suited to be grown in tropical countries as promising biomass sources of non-conventional energy.

0001-278. Amathussalam A, Abubacker MN (Dept Chem, Mookambigan Coll Engng, Keeranur 622502, Tamil Nadu). **Effect of chemical pretreatment of market wastes in biogas production.** *Asian J Microbio Biotech Env Sci*, **1**(1&2) (1999), 93-93 [28 Ref].

Anaerobic fermentation of these market waste materials with effective chemical pre-treatment can serve the dual purpose of reducing environmental pollution as well as source of renewable energy.

0001-279. Bhole AG, Ingole NW* (*Dept Civil Engng, Coll Engng, Badnera, Amravati 444701). **Comparative study of production of biogas from water hyacinth by single phasic and diphasic digestion process.** *J Indian Water Work Assoc*, **32(2)** (2000), 137-140 [10 Ref].

The high productivity of water hyacinth (*Echhornia crassipes*) is used as weed as biomass for production of energy fuel. The concept of utilisation of water hyacinth not only brings the nuisance under control but also provides energy. Paper deals with comparative study of biogas production by using single phasic and diphasic digestion process.

0001-280. Das Leena, Bhattacharya Nandita (Dept Family Resource Manag, Coll Home Sci, Assam Agricl Univ, Jorhat 785013). **Household energy resources and technology for women.** *Indian J Environ Sci*, **4(1)** (2000), 79-82 [1 Ref].

The energy situation in India has reached a stage where it is not possible to sustain the biomass dominated consumption on account of environmental concern. Household is the largest consumer of energy. They use more than one device which implies more consumption. On the other hand, smokeless chulah apart from lowering the consumption of fuel, also improves the work environment.

0001-281. Mohanty PK, Choudhury AK (Orissa Renewable Energy Dev Agency, DRDA, Puri, Orissa). **Konark biogas plant- a user-friendly model.** *J Environ Std Policy*, **2(1)** (1999), 15-21 [6 Ref].

Paper discusses the Konark biogas plant, which is spherical in shape with a gas storage capacity of 50%. The study of gas consumption pattern shows the actual period for which maximum gas is used while cooking meals in most Indian families. The advantages of Konark model over the conventional fixed dome models have been discussed.

0001-282. Ramani MV, Veena BR, Guruprasad LR, Prakash P, Subbarao B V (Dept Cheml Engng, Dayananda Sagar Coll Engng, Kumaraswamy Layout, Bangalore). **Anaerobic digestion of *Parthenium hysterophorus*.** *J Environ Std Policy*, **2(1)** [1999], 23-28, [3 Ref].

Parthenium has been subjected to anaerobic digestion to produce biogas. The spent material after digestion in the reactor can be used as manure. Gas chromatography showed that the biogas produced contained 66% methane. It was observed that 1 kg of parthenium can produce approximately 35 liters of biogas.

0001-283. Sharma Babita, Borah Ruplekha (Dept Family Resource Manag, Coll Home Sci, AAU, Jorhat, Assam). **Biogas as an advantageous cooking fuel.** *Indian J Environ Sci*, **4**(1) (2000), 17-20 [2 Ref].

A study was undertaken in Nagaon sub-division to find out time-spent pattern in food preparation activities and difference in leisure time available to biogas owning and non-owning respondents. It was found that non-owning respondents spent more time in food preparation activities and arrangement of the fuel compared to biogas owning respondents and also found that adoption of biogas technology provided more leisure time to the owning respondents.

Plant and Pollution

0001-284. Agrawal Madhoolika, Singh Jyoti (Dept Bot, Banaras Hindu Univ, Varanasi 221005). **Impact of coal power plant emission on the foliar elemental concentrations in plants in a low rainfall tropical region.** *Environ Monit Assess*, **60**(3) (2000), 261-282 [32 Ref].

A field study was conducted around two thermal power plants of India to quantify the changes in foliar elemental concentrations due to emission in a low rainfall tropical area. Sulphur dioxide and particulates were at high levels which may cause serious ecological effects. Emission from the power plants have altered the elemental concentrations in the leaves of evergreen and deciduous plants.

0001-285. Bera AK, Bokaria Kanta (Dept Geneties Plant Breeding, Bidhan Ch Krishi Viswavidyalaya, Mohanpur 741252, Nadia, West Bengal). **Effect of tannery effluent on seed germination, seedling growth and chloroplast pigment content in mungbean (*Vigna radiata* L Wilezek).** *Env Eco*, **17**(4) (1999), 955-961 [9 Ref].

Effect of different concentrations of tannery effluent on seed germination, seedling growth and chloroplast pigments in mungbean (*Vigna radiata* L Wilczek) cv Pusa Baisakhi was studied. It is suggested that tannery effluent can never be employed in the field directly or at higher concentration but can be utilized as a liquid fertilizer only for certain crops at 2.5% dilution level.

0001-286. Bhattacharyya RN, Chakraborty B, Bhunia S, Mishra Mahua (PG Dept Bot, Darjeeling Govt Coll, Darjeeling 734101). **Effect of heavy metals on growth and IAA production of a *rhizobium* sp isolated from the root nodules of *Alysicarpus vaginalis* DC.** *Env Eco*, **17**(4) (1999), 873-878 [31 Ref].

The effect of three heavy metals (Hg²⁺ Pb²⁺ and Cd²⁺) on growth and indole acetic acid production by the *Rhizobium* was also tested and they showed the negative effect on growth and IAA production, specially at higher concentration.

0001-287. Chauhan SVS, Singh NK (Dept Bot, Sch Life Sci, Dr BR Ambedkar Univ, Agra 282002). **Furadan 3 G induced cytological changes in root tips of *Allium cepa*.** *J Env Polln*, **7**(2) (2000), 97-100 [11 Ref].

Effect of various concentrations of Furdan 3 G commonly known as carbofuran (2, 2-dimethyl 2,3 dihydro and 7 benzofuranyl-N-methylcarbamate) on cytological changes in *Allium cepa* root tips was studied. Treated root-tip cells showed reduction in cell length, width and diameter of nuclei. There was a reduction in the mitotic index in root tips treated with different concentrations of carbofuran.

0001-288. Dash AK, Mishra PC (Sambalpur Univ, Dept Environ Sci, Jyoti Vihar, 768019, Sambalpur). **Role of the blue-green alga, *Westiellopsis prolifica* in reducing pollution load from paper mill wastewater.** *Indian J Environ Prot*, **19**(1) (1999), 1-5 [22 Ref].

Results on the growth response of the cyanobacterium, *Westiellopsis prolifica* in paper mills wastewater show that the alga can grow well in the wastewater amended with basal nutrient medium. A significant reduction in the level of sodium, potassium, calcium, chloride, sulphate, phosphate and chemical oxygen demand was recorded.

0001-289. Husen Azamal, Ali ST, Mahmooduzzafar, Iqbal Muhammad, (Dept Bot, Hamdard Univ, New Delhi 110061). **Structural, functional and biochemical responses of *Datura innoxia* Mill to coal smoke pollution.** *Proc Acad Environ Bio*, **8**(1) (1999), 61-72 [60 Ref].

Study of the effects of coal-smoke pollution on *Datura innoxia* has shown that leaf length, single leaf area, total leaf area and leaves per plant decreased but leaf biomass increased under pollution stress. Epidermal features of upper and lower leaf surfaces responded to pollution stress differently.

0001-290. Jha Radha Krishna (Ranchi Univ, Ranchi, Bihar). **Effect of coal dust pollution on the vegetation around Dhanbad coalfield.** *Biojournal*, **11**(1&2) (1999), 59-61 [5 Ref].

The coalfield area of Dhanbad, Jharia and Bokaro are highly industrialised in Bihar, comprising the best coal producing seams underneath and associated with the coal washeries. The coal preparation plants, hard coke batteries and open stack burning of coal add a tremendous pollution to the atmosphere. It causes a very serious effect in growth of the plants.

0001-291. Kapoor K, Arora Leenta (Dept Bot, MLS Univ, Udaipur 313001, Rajasthan). **Comparative studies on the effect of pesticides on nitrogen-fixing *Cylindrospermum majus* Kutz.ex Born. et Flah.** *Indian J Environ Sci*, **4**(1) (2000), 89-96 [26 Ref].

Comparative tolerance studies on a heterocystous, nitrogen-fixing cyanobacterium *Cylindrospermum Majus* Kutz.ex Born. et Flah were conducted to observe effect of three pesticides commonly used in paddy fields. viz., isoproturon, saturn and BHC. The level of tolerance was upto 300 µg/ml for isoproturon and saturn, while it was 0.5 µg/ml for BHC.

0001-292. Mandal Madhumanjari, Mukherji S (Dept Bot, Univ Calcutta, Calcutta 700019). **Changes in chlorophyll content, chlorophyllase activity, Hill reaction, photosynthetic CO₂ uptake, sugar and starch contents in five dicotyledonous plants exposed to automobile exhaust pollution.** *J Environ Bio*, **21**(1) (2000), 37-41 [23 Ref].

The effects of long term exposure to automobile exhaust on chlorophyll content, chlorophyllase activity. Hill reaction, photosynthetic CO₂ uptake, sugar and starch contents have been observed in five plants growing on the edge of Delhi Road (NH 2) near Dankuni, West Bengal. The same plants collected from the nearby village at least 300 m away from the road served as control. The results are discussed.

0001-293. Masood Akbar, Seema A, Amin Shajrul, Farooq Mohd (PG Dept Biochem, Univ Kashmir, Srinagar). **Biochemical effects of aqueous sulfur dioxide in spinach leaf discs.** *Asian J Microbio Biotechno Env Sci*, **1**(1&2) (1999), 101-106 [58 Ref].

Spinach leaf discs were treated with aqueous SO₂ between 10-1000 ppm concentrations to study the biochemical reactions leading to tissue injury. A direct correlation between chlorophyll destruction and H₁₄ CO₃ fixation was seen. Similar parallelism could be drawn between Mg²⁺ leakage and the development of visible injury symptoms.

0001-294. Naik VB, Deshpande UP (Sch Life Sci, SRTM Univ, Nanded 431606). **An evaluation of the roadside plants as bioindicators of atmospheric lead pollution.** *Indian J Environ Hlth*, **42**(2) (2000), 92-93 [7 Ref].

Various plant leaf samples were collected from the plants near the densely populated high density automobile traffic roads of the Nanded city and were screened for the accumulation of lead. It was found that *Ployalthia longifolia* leaves showed maximum accumulation of lead. It reveals that *P. longifolia* is a sensitive plant and responds to atmospheric lead levels.

0001-295. Pal Amit, Kulshreshtha K, Ahmad KJ, Yunus M (Environ Sci Div, Natl Botl Res Inst, Rana Pratap Marg, Lucknow 226001). **Changes in leaf surface structures of two avenue tree species caused by autoexhaust pollution.** *J Environ Bio*, **21**(1) (2000), 15-21 [25 Ref].

Effect of automobile exhaust emissions on two common avenue trees, *Azadirachta indica* A. Juss. and *Polyalthia longifolia* Benth, & Hk. has been studied with special reference to their cuticular and epidermal characteristics. In plants collected from heavy traffic density areas (HTDA) the epicuticular wax was severely damaged and its morphology altered. Significant changes in cuticular and epidermal structures were also

observed in the two species and a two-fold increase in stomatal frequency was recorded.

0001-296. Panday DD, Nirala AK, Gautam RR (Eco Res Lab, PG Dept Bot, Nalanda Coll, Biharshariff 803101). **Impact of stone crusher dust pollution on maize crops.** *Indian J Env Eco Plang*, **2**(1) (1999), 43-46 [8 Ref].

The study area was confined to the maize crop situated in the prevailing wind direction of stone crusher, Karwandiya, Rohtas, Bihar to know the impact of dust on the biomass and chlorophyll content. The biomass was found to be higher at each sampling date of the control maize plant than the polluted ones.

0001-297. Panday Jitendra (Dept Environ Sci, ML Sukhadia Univ, Udaipur 313001). **Cadmium accumulation and its effects on tomato (*Lycopersicon esulentum* Mill cultivar 'Pus a ruby') growth and metabolism.** *Indian J Environ Sci*, **3**(2) (1999), 209-213 [17 Ref].

Cadmium accumulation was greater in root, followed in decreasing order by leaf, fruit and shoot. It is concluded that cadmium, in concentrations generally observed in the contaminated agricultural soils, is inhibitory to the growth and metabolism of tomato plants.

0001-298. Prasad BK, Banerjee SK, Roy H (Dept Bot, VB Univ, Hazaribagh, Bihar). **Effect of flyash ammended on germination behavior and seedling survival on certain cultivated legumes.** *Env Eco*, **18**(1) (2000), 210-216 [22 Ref].

Paper tries to establish the agriculture use of flyash by studying its effect on germination behavior and seedling survival of *Vigna radiata* and *Pisum sativum* in various grades of flyash amended acid loam soil and calcareous soil. Germination pattern was enhanced upto 60% wt/wt fly-ash amended soil for both types of soil whereas seedling survival was 100% for all grades of amendment in *V. radiata* and *P. sativum*.

0001-299. Prashanthi V, Jeevan Rao K (Acharya NG Ranga Agricl Univ, Dept Soil Sci Agricl Chem, Coll Agric, Rajendranagar Hyderabad 500030). **Effect of industrial**

effluents and polluted waters on germination of crops. *Indian J Environ Prot*, **18**(12) (1998), 921-923 [5 Ref] (Late Recd).

Studies were conducted to evaluate the effects of industrial effluents and polluted waters on seed germination of crops. Two effluent samples and two wastewater (polluted) samples were collected from Kattedan Industrial Development area, Hyderabad and a bioassay test was conducted. The effluents and wastewaters were unsuitable for irrigation and there is a need to treat and dispose of them scientifically.

0001-300. Sharma Reeta, Sindhu RS (Regl Inst Edn, Bhopal 462013). **Bioaccumulation of lead, cadmium and mercury by *Mussaenda luteola*.** *India J Forestry*, **22**(3) (1999), 226-227 [6 Ref].

Pot experiments were performed to evaluate the extent of accumulation of lead, cadmium and mercury under different concentrations. Plants did not survive if they was does with 800 µg/ml or more for mercury and 1000 ug/ml for lead and cadmium. The order of accumulation is lead>cadmium>mercury. Present studies suggest that *Mussaenda luteola* can be used to remove heavy metals from the polluted soils.

0001-301. Singh Shalini, Dureja Prem, Kumar Sushil* (*Div Environ Sci, Indian Agril Res Inst, New Delhi 110012). **Biodegradation of a and b isomers of endosulphan and endosulphan sulphate in Indian soils.** *J Environ Sci Hlth*, **B 35**(3) (2000), 337-346 [10 Ref].

The degradation of a and b isomers of endosulphan and endosulphan sulphate in four sterilized and non sterilized Indian soils under laboratory conditions was studied. Degradation was found to be more in non-sterilized as compared to the sterilized soil. Endosulphan degraded more readily that b-endosulphan and endosulphan sulphate under both sterilized and non-sterilized soil conditions.

0001-302. Srivastava PK, Pandey GS (Dept Environ Sci, Dr RML Avadh Univ, Faizabad 224001 UP). **Effect of fertilizer effluent on total chlorophyll content and biomass of some aquatic macrophytes.** *J Ecotoxic Environ Monit*, **11**(2) (1999), 123-127 [15 Ref].

The effect of a fertilizer factory effluent on total chlorophyll content and biomass of some aquatic macrophytes has been studied. The total chlorophyll content and biomass of *Eichhorma crassipes*, *Pistia stratiotes* and *Hydrilla vertillata* were reduced significantly with an increase in treatment durations from 7, 14 and 21 day of expose in different fertilizer effluent concentrations.

0001-303. Wilson MRE (Dept Environ Sci, St Joseph's Coll, Bangalore 560025). **Impact of asbestos mining on vegetation : a study on *Ricinus communis* L. and *Calotropis gigantea* L.** *Indian J Environ Sci*, 4(1) (2000), 35-38 [7 Ref].

The concentration of asbestos fibrils in the ambient air was quantified at ten sites of an asbestos mine in Pulivendla, Cuddappah district, Andhra Pradesh. The concentrations of suspended particulate matter (SPM) in eight sites are found to be high above the permissible limit of 500 µg/m³. The biochemical parameters of the affected plant species of *Ricinus communis* L. and *Calotropis gigantea* L. were lowered than that of unaffected ones due to visible as well as subtle injury caused by asbestos coating on the leaf laminae.