ABSTRACTS

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Characterization and Genetic Diversity Analysis of *Gossypium Hirsutum* L. Genotypes / Cultivars Using Microsatellites

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Abstract: Episodic infection of cotton leaf curl virus disease (CLCuD) was the compelling factor to devise new approaches for sustaining cotton production in Pakistan. Genetic similarity among cotton (*Gossypium hirsutum* L.) cultivars released prior to the first episode of the disease appeared in epidemic form in early 1990s was in the range of 75.45 to 94.54% Genetic similarity among the newly bred resistant cotton cultivars (developed by incorporating resistance from two genotypes LRA – 5166 and CP – 15/2 primary sources of resistance) was in the range of 77.27 to 96.36%, which was declared alarming. In the second episode, started in 2002, all the resistant cotton cultivars became susceptible to the newly emerged resistant breaking strain of virus. A study was designed to estimate genetic diversity and relationship among 90 cotton genotypes / cultivars released in pre and post-CLCuD era using SSR analysis. Out of 50 SSRs surveyed 24 (48%) were polymorphic and amplired 122 alleles with an average of 2.44 alleles per locus. Polymorphism information content (PIC) varied from 0.25 to 0.83 with an average of 0.39. The genetic similarity (GS) among all the genotypes was in the range of 74.46% to 97.20%, with an average of 86.55%. Average GS estimates among pre and post-CLCuD era cultivars were 86.40% and 87.69%, respectively. Clustering analysis based on GS coefficients grouped all cotton genotypes into two major clusters. Generally, the genotypes released in pre-CLCuD era were grouped together. Grouping based on clustering analysis corresponded well with their pedigree and genetic background information. It has been demonstrated that most of the genotypes except NIBGE-Int-1 possessed narrow genetic background. Our study demonstrated the need to breed for high genetic diversity to serve as a potential buffer to counteract any natural disaster in advance. Information cultivars and will supplement the future cotton breeding programs.

Binding of Allura with Food Proteins and its Pharmacological Impact on Protein Digestibility

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Abstract: Allura Red-40 is a safe color additive permissible by FDA and Health Canada and is used in a variety of foods to make them more attractive and appealing for the consumers. However, limited information is available about its binding to mactro-nutrients which is responsible for its uniform distribution in food products. In the present study, the binding capacity of Allura with food proteins was compared with Coomassie Brillant Blue R 250, which is an established staining agent for visualizing electrophoretically resolved proteins. The data have illustrated that Allura is a fast reacting dye and binds with a variety of food proteins including peanut, rice bran, garlic and mixture of proteins (Takadiastase, nisin, a microbial protein and BSA) etc. The Allura-bound proteins retained their colour at high and low temperatures and in a wide range of pH. The experiments on resolution of proteins and staining with Allura have shown that the dye is highly sensitive, rapid and lasting and gets easily linked with a variety of proteins. The binding of Allura to various proteins had almost no adverse effect on their protein digestibilities, as predicted by in vitro digestibility determinations.

Role of Aeroallergens in Asthma and Allergy

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Abstract: Allergic diseases are not only widespread in many parts of the world, but their incidence is continuously on the rise. These include allergic rhinitis, bronchial asthma, conjunctivitis and eczema. It is estimated that between 10-20% world's population suffers from different types of allergies. Among aeroallergens, Airborne fungi have a widespread and highly variable occurrence and are among the most common bioaerosols that human inhale. Interest in measuring exposure to airborne fungi has increased dramatically in recent years due to the complex and diverse associations suspected to occur between such exposure and adverse health effects, notably allergic rhinitis and asthma. Fungus is known to be one of the causative allergens inducing bronchial asthma as a re house dust mites, pollen and pet dander. This study aims to evaluate the role of outdoor airborne fungal allergens with respect to association with asthma and allergies. For the evaluation of environmental fungal flora, collection of the sample from out door environment of the airborne particles (fungal spore) is done by using Burkard's Seven Day Volumetric Spore Trap Sampler and analyzed by means of advance light microscopy. Results were correlated with the weather conditions (temperature, humidity, wind chill, wind speed, and rain fall). The fungal spores and found include *Agrocybe, Alternaria, Amphisphaeria, Arthrinium, Ascobolus, Bipolaris, Cercospora, Chaetoconis, Chatomium, Cladosporium, Coprinus, Curvularia, Exosporiella, Leptosphaeria Massarina, Monodictys, Myxomycetes, Oidium, Periconia, Torula, Uncinulla* and *Ustilaginalis* (*smut*). In correlating with weather conditions a great variation of their abundance were observed further work is in progress.

Mechanical Response of Esophageal Tissue in the Presence of Acetylcholine, Adrenaline and their Antagonist: A Study on Uromastix and Rabbit

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Background: Esophagus is a musculo-tubular structure that exhibits peristalsis with the help of both the striated and smooth muscles. However, mechanical response of smooth musculature is specific to various autonomic nerves and transmitters. It also shows versatility in different parts of alimentary tract. The esophageal musculature of reptile Uromastix *hardwickii* is never explored for the presence of autonomic receptors on its smooth muscle fiber membrane.

Objective: To identify the autonomic receptors in esophageal tissue of Uromastix and comparison with Rabbit.

Methodology: Isolated esophagus from both the animals was mounted in Organ bath assembly to record the effects of acetylcholine (Ach), adrenaline (Adr), and their antagonists, atropine (Atr) and atenolol (Ate), respectively. The obtained mechanical records on power lab have demonstrated change in basal tone (gm) and response time to its peak (sec), with the drugs used.

Results: Adr has reduced the Basal tone of esophagus obtained from both animals whilst, Ach increased it, in Uromastix, only. All of the responses observed with Ach and Adr were changed significantly in the presence of their antagonists, Atr and Ate respectively.

Conclusion: Autonomic receptors are available in the esophageal smooth muscles of Uromastix, like Rabbit. However, un-responsiveness of Rabbit's esophagus to Ach needs investigation with other concentrations of Ach.

Risk Estimation for Flood Peak Discharges in Different Barrages of Sindh Province

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Abstract: Annual Peak Discharges of dams or barrages are widely used in Flood Risk Assessment. In this paper Historical data of Maximum Peak Discharges in Sukkur Barrage and Guddu Barrage have been utilized to estimate the risk of flood in these barrages. This process is done using statistical approaches. In this communication we have compared the estimated values of annual peak discharges and drawn some inferences about the regional flood risks. Risk can also be assessed in terms of the expected loss, therefore historical data of losses in Sindh due to floods is also used to assess the risk of flood in the entire region of Sindh Province. This kind of study will be helpful for public, government and private sector organizations.

Network Usage Security Policies for Academic Institutions; Case Study: University of Karachi

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Abstract: Life with out networks would be considerably less convenient and many activities would be impossible. Network Security has become important due to the inter-connection of computers and the rise of the internet. This paper also discusses some of the popular network security threats like spoofing; masquerade; phishing attacks; session hijacking; man-in-the-middle attack; web site defacement; message confidentiality threats. This paper gives an explanation of several important security concepts and gives security policies guidelines for the educational network specially.

The network security policy is intended to protect the integrity of campus networks and to mitigate the risks and losses associated with security threats to campus networks and network resources. Attacks and security incidents constitute a risk to the University's academic mission. The loss of data or unauthorized disclosure of information on research and instructional computers, student records, and financial systems could greatly hinder the lawful activities of University staff, faculty and students. The University also has a legal responsibility to secure its computers and networks from misuse. Failure to exercise due diligence may lead to financial liability for damage done by persons accessing the network from or through the University. Moreover, an unprotected University network open to abuse might be shunned by parts of the larger network community. This paper will give guidelines that allow the universities to manage network security effectively.

Confidentiality and privacy, access, accountability, authentication, availability, and Information Technology system and network maintenance are components of a comprehensive security plan. This plan identifies key concerns and issued faced by the University community at the application, host, and network level, and strives for a balance between the University's desire to promote and enhance the free exchange of ideas and its need for security of critical information and systems.

Evaluation of Indigenous Product (Qts-24, Qts-10) Incomparason of Foreign Compatible Products Api-20e and Api-10s

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Abstract: The necessity of identifying clinically significant members of the family Enterobacteriaceae and other related genera has been complicated by the greatly increased number of genera and species as well as taxonomic changes in recent years. The need for microbiology to identify members of the family Enterobacteriaceae and related genera without the need for extended conventional testing has lead to the development many automated as well as non automated commercial available method. Some of these also identify the more commonly encounter species of oxidase - +ve and oxidase –ve gram –ve fermentors and non fermentors. These kits are very expensive and unaffordable for the suffering poor patient's population of Pakistan. Unfortunately these types of indigenous rapid diagnostic systems are not available in Pakistan. In search of more reliable diagnostic methods and self sufficiency, we initiated a research project to develop indigenous Rapid diagnostic systems. A team of researchers of DESTO KLC were engaged in R&D of QTS-24. This product has been successfully developed and inducted in Armed Forces Pathological hospitals / Labs in the year 1997. After very extensive collaborative trials and trainings of the very senior pathologist (Major to Brigadier rank) this product was produced and supplied to AFIP Rwp since 1998 till December 2006. Afterward another miniaturized version of QTS-24. S QTS-10 was developed which is cost effective in comparison and identifying all the important human pathogens which are included in identification of QTS-24. The scope of QTS-24 identification is elaborated upto 75 species of said groups of bacteria likewise the scope of identification of QTS-10 is upto 40 species of above groups of bacteria. The evaluation trials with the foreign compatible products have been conducted from time to time. This evaluation study showed the results of comparative trials by using local bacterial isolates of varied origin with some standard ATCC (USA) strains of these groups of bacteria.

We evaluated the ability of the indigenous product for the identification of local isolates which was found very efficient for the said purpose in comparison of foreign compatible product.

Mianserin at Doses that Attenuate Haloperidol-Induced Deficits of Motor Bheavior Potentiate Haloperidol-Induced Increases of Dopamine Metabolism in the Caudate but not in the Nucleus Accumbens

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Abstract: Although haloperidol is widely prescribed for the treatment of schizophrenia, its beneficial effects are accompanied by extrapyramidal side effects (EPS). Role of 5-HT-2A/2C receptors in the attenuation of acute Parkinsonian-like effects of typical antipsychotics is investigated by prior administration of mainserin to rats injected with haloperidol. In the first part of study effects of various doses of haloperidol (0.5, 1.0, 2.5 and 5.0 mg/kg) were determined on motor activity. Effects of mianserin at doses of 2.5 and 5.0 mg/kg were determined on the parkinsonian like effects produced by a selected dose of haloperidol. Effects of haloperidol, mianserin and haloperidol plus mianserin on the metabolism of dopamine (DA) is determinmed in the caudate and nucleus accumbens. Rats treated with haloperidol at doses of 0.5-5.0 mg/kg exhibited impaired motor coordination and a decrease in exploratory activity in an open field. The dose response curve showed that at a dose of 1 mg/kg significant and submaximal effects are produced on motor coordination and exploratory activity. Coadministration of mianserin attenuated and reversed haloperidol-induced motor deficits in a dose dependent manner. Administration of haloperidol increased the concentrations of DA and its metabolites dihydroxy phenylacetic acid (DOPAC) and homovanillic acid (HVA) in the caudate and nucleus accumbens. Stimulatory effects of haloperidol on DA metabolism were increased in the caudate of mianserin coinjected animals. Conversely, theses effects of haloperidol in the nucleus accumbens were attenuated in mianserin coinjected animals. Possible mechanism involved in the attenuation / reversal of haloperidol-induced parkinsonian like symptoms by mianserin is discussed. Prior administration of mianserin may be of use in the alleviation of EPS induced by conventional antipsychotic drugs. The findings have potential implication in the treatment of schizophrenia and motor disorders.

Burden and Determinants of Pregnancy Losses in a Rural Community of Gadap Town, Karachi (2006 – 2008): Challenges and Opportunities

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Abstract: The relationship between pregnancy losses and maternal malnutrition was studied during July 2006 – June 2008 in a rural community of Gadap Town, Karachi. This was a Iongitudinal observation in 19 villages, 1039 pregnancies were registered to observe for pregnancy wastage. The pregnancy outcome was correlated with various sociodemographic factors. There were 209 (20.1%) abortions and 95 (9.8%) still births. Women's income less than 3000/ Rupees per month in 727 (70%), 708 (68.1%) had no education and protein intake less than 50 g/day had significantly higher relative risks (RR) (4.1, 2.9 and 2.8, respectively) for abortions. Poor maternal nutrition was in additional important risk factor, for still births (RR 5.1 and 4.2 for maternal weight and height, respectively). Two WHO / UNICEF validated questionnaires 24 hours recall (Quantitative methods) and food frequency (Qualitative method) were used for evaluating gaps in food groups during pregnancy. Protein was found the most avoided food by the mothers. Low socioeconomic status, chronic under nutrition and illiteracy in rural community are associated with high pregnancy wastage.

Impacts of Sea Water Intrusion in the Vicinity of Tidal Link Drain, Lbod, District Badin, Sindh

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Abstract: The Tidal Link Drain is a man made drain which will deliver the drainage water across Pateji Dhand and cholri into the Arabian Sea via Shah Samando creek. The Tidal Link is 41 Km long from its point of juncture with Kaddan Pateji Out Fall Drain, KPOD in the North – East up to Shah Samando Creek in the South – West. The vertical tidal range in the area is about 5 m. The tidal link is designed to carry about 3,118 cusecs of drainage waters. Sea water intrusion and high erosion / sedimentation has been noticed at the tidal link and adjacent area due to changes in the hydraulic regime in the area. Further due the ravages of the tropical cyclone (cyclone "2A", 19 – 22nd May 1999) has caused some drastic morphological changes in the area. This physical process creates breaches in the Tidal link drain between RD-30 and RD-125. These breaches (openings) allow free exchange of water between the tidal link drain, Dhands and the rann of kutch.

The investigations was performed during 2007 to 2008 to collect the data and the study shows that a small tidal creek type system of drainage channels has now developed in cholri dhands, which is closest the tidal link. No tidal fluctuation are evident in sanhro and mehro dhands. It was observed that the LBOD can now be described as **"NEW RIVER"** that is forming and **"Estuary"** and is an integral part of creek formation into the coastal area. The tidal link has invited the sea to approach the land and now the tidal fluctuations are visible. The main problem concerning the LBOD outfall is the **"Hydraulic Gradient"** the LBOD run parallel to end at a lower level than the Indus river and has to discharge the saline water at the same level (Sea Level) in a active creek area (i.e. Shah Samanda Creek).

Cross-Sectional Analytical Epidemiological Study on Mastitis in Buffaloes and Cattle in Tehsil Gojra District Toba Tek Singh

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Abstract: A cross-sectional analytical epidemiological study was undertaken on mastitis in Tehsil Gojra of district Toba Tek Singh. Total of 1200 hand milked buffaloes and 300 cows were investigated. No mastitis control measures (e.g. teat dipping, dry period antibiotic therapy, etc.) were in place in the study area. Two types of determinants viz. host associated and management associated were studied. All information was collected on pre-designed proforma by structured questions and physical examination of udder. Diagnosis of mastitis was based on overt manifestations of the disease (clinical mastitis) and results of the Surf Field Mastitis Test for subclinical mastitis. To determine the nature of pathogens associated with mastitis in dairy buffaloes and cows, 100 quarter foremilk samples (clinically mastitic quarters n=25, subclinically matitic quarters n=75 were subjected to microbiological examination. The overall prevalence of mastitis (clinical and subclinical) was 13.17 in buffaloes and 18.33 in cows. In cattle highest prevalence was recorded in crossbred/exotic cows. The factors showing association with mastitis were age of the animal, lactation number, general physical condition, reproductive disorders, hard milking, udder oedema, teat oedema, blood in milk, teat injury and teat stenosis. The bacteria isolated from mastitic milk samples were *Staphylococcus aureous, Streptococcus agalactiae, Staphylococcus hycus hycus, Staphylococcus epidermidis, Staphylococcus homins, Staphylococcus xylosus 1, Undifferenti-able coagulase negative Staphylococcus species, Streptocossuc dysgalactiae, Eschrchia coli and bacillus species.*

Effect of Environmental Temperature on Feed Intake, Egg Production and Egg Weight of Commercial Layer

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Abstract: More than 90% of chickens are kept in the scattered open / windowed hourses with Asbestos, tin sheets and thatched / Straw roof, inspite of the fact that the climate is extremely hot or cold. Consequently their performance is greatly influenced by said factors. Because of this reason birds should be housed in such a place where environment will enable them to maintain their thermal balance and yield optimum production. The body temperature of the chickens rises as the ambient temperature rises but the environment helps the bird to loose body heat equal to the heat produced. Karachi has nearly 300 commercial egg layers poultry farms with a capacity variation of 3000 to 10000 layers kept in cages under the thatched roof and concrete buildings. A drop in egg production is a serious problem faced by most of the farmers who do not have any environmentally controlled houses except some having locally improved cooling systems. These systems are designed on the basis of evaporative cooling but Karachi being a sea port, has always a high humidity during summer. Consequently evaporative cooling systems do not provide any relief to the birds as excessive water vapors continue to cause distress to the birds. This study was carried out at a commercial farm having a flock of 3000 commercial layer under a roof with asbestos, automatic drinkers and manual feeders. The water was given at lib but feed was calculated on the basis of breed specified quantity once a day. Daily record was maintained of feed intake, egg production, egg weight and temperature since 21st week of age till 44th week. On the basis of statistical analysis it was concluded that the increase of house temperature significantly decreases the feed intake and egg production but increased house temperature showed non significant relationship with egg weight.

Pollen Germination Capacity of Three Mango Cultivars *Mangifera indica* L. (Anacardiaceae) from Pakistan

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Abstract: Pollen germination capacity and viability of 3-mango cultivars (Dashari, Langra and Chaunsa) were investigated up to 48 weeks. Pollen germination was made by hanging drop technique in different concentration of sucrose and boric acid solutions (10 – 100%). The stored conditions are refrigerator (+4°C), freezer (-20°C, -30°C), freeze drier (-60°C), in vacuum over silica gel and in organic solvents (acetone, benzene, chloroform). Pollen stored at low temperature showed better germination percentage compared to pollen stored at +4°C and fresh. Among three cultivars variety chaunsa showed above 70% germination after 4 weeks at all stored conditions but the viability decrease very rapidly, only freeze dried condition showed germination above 48 weeks. Variety Langra also showed good germination but the viability was not observed for a long period. Dashari showed lower germination comparatively among the three cultivars, after 4 weeks the germination scored was 69.10%. Freeze dried condition seems to have good potential for pollen conservation. In conditions like vacuum and organic solvents benzene showed reasonable germination. In benzene the germination was observed in those pollen which were soaked up to 18 hours so as the vacuum dried pollen over silica gel showed germination when the treatment period was 15 hours after that no germination was observed.

Calibration of Iridium-192 Sources used for High Dose Rate Remote after loading Brachytherapy

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Abstract: The effectiveness and safety of brachytherapy treatment is mainly concerned with the calibration of sources and their traceability to Internationally accepted Standards. This work has been carried out to calibrate the High Dose Rate (HDR) ^{192}Ir High Dose Rate source, an interpolation procedure is employed, using calibrations above (^{60}Co, 1.25 MeV) and below (135 kV X-rays. 61.1 keV) the exposure-weighted average energy (397 keV) of ^{192}Ir. Using this chamber HDR ^{192}Ir source has been calibrate by free in-air measurement technique and then this calibrated source has been used to calibrate well-type ionization chamber. For in-air measurement technique; scatter correction factor, non-uniformity correction factor, and correction for the attenuation of primary photons in air and for well-type chamber measurements; calibration factor, sweet point (point of maximum response), and recombination correction have been determined.

Difference between the successive measurements with in-air measurement technique remained within $\pm$ 1%, and that between in-air measurement and manufacturer remained within $\pm$ 3%, and the difference between in-air measurement and well-type chamber remained with $\pm$ 1%. Comparison between well-type measurements and manufacturer values shows differences less than $\pm$ 2%. All these differences are within the acceptable tolerance limits.

Neurotoxic Effects of Extreme Dieting: Brain Serotonin in Rat Model of Diet Restriction-Induced Anorexia Nervosa

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Abstract: Anorexia nervosa (AN) patients exhibit extreme dieting, body weight loss and hyperactivity. The 5-hydroxytryptamine (5-HT; serotonin) system involved in the regulation of appetite and mood is the major neurotransmitter system of interest in research on AN. Pharmacological studies show that manipulations that tend to increase brain serotonin functions are anorexiogenic. The hypothesis of suppression of appetite through excessive release of 5-HT to receptors is not supported by data on subjects with clinical symptoms of AN as cerebrospinal (CSF) levels of 5-hydroxyindoleacetic acid (5-HIAA), a major metabolite of 5-HT, are reduced in AN patients are returned to normal in recovered patients. Loss of appetite in AN may simply follow self imposed dieting and diet restriction (DR). The hypothalamus is believed to be the site of the brain transducing satiety signals of serotonin. Studies on animal models show that excessive DR decreases 5-HT metabolism and synthesis in the brain and hypothalamus. The present lecture explains mechanism involved in DR-incuded decreases of brain 5-HT. Possible role of regional 5-HT change in the elicitation of DR-induced deficits of behavior is discussed. Research on animal models of AN may help in developing strategies for the treatment of AN patients.

Prevalence and Importance of Hepatitis B & C Screening in Cases Undergoing Elective Eye Surgery

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Objective: To determine the seroprevalence of Hepatitis B & C Viral infection in the patients undergoing elective eye surgery. **Design**: A retrospective descriptive review. **Method**: A total of 1418 subjects undergoing major or minor eye surgery were screened for Hepatitis B, & 1158 patient were screen for Hepatitis C. Screening was done by one step test device that is a rapid chromatography immunoassay for the qualitative detection of antibodies to hepatitis C virus where as for Hepatitis B the qualitative detection of surface antigen of hepatitis B virus was performed.

Result: Out of 1418 subjects, 1.83% subjects were found to be Hepatitis B positive, out of these 61.5% were males and 38.4% were females. Out of 1158 subjects, 1.20% subjects were found to be Hepatitis C positive, out of these 50% were males and 50% were females. **Conclusion**: The prevalence of these two viral infections in eye patients poses risks and dangers for doctors, as well as other patients in hospitals and OPD. Transmission of infection occurs as a result of per cutaneous exposure to patients' blood through sharp knife and needle. In addition transmission may also occur through tears Gonio lens, and Applanation tonometer. Screening of these blood borne viral infections has great importance in minimizing the transmission of the virus. The alarming percentage of positive cases of Hepatitis B & C infection gives us an idea of the risks involved and emphasizes us to adopt such practices which ensure the infection control measures.

Role of Mathematics in the Sports Sciences and Technologies

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Abstract: With the competitive and the commercial nature of sports, as a means to promote international cooperation, collaboration and manage conflicts, the nations, having superiority in sciences and technologies, are investing in sports and health sciences and technologies. Mathematics plays a vital role in developing and improving sports activities. This paper shall discuss 3 areas of application (*sports medicine, kinesiology* and *sports-performance analysis*), for which the infrastructure, the facilities and the human resources are available at University of Karachi, and students are engaged in graduate course work and research. In the area of *sports medicine*, our group has developed indigenous instruments and methods for measurement of height, weight, mid-upper-arm circumstance and shoulder width, emplying ideas from mathematics, physics and civil engineering, with mathematical and statistical models for reliability of data. To test these instruments and techniques, our team collected data on over 2500 children between the ages of 5 – 11 years. Our height-measurement system was adapted by Tawana Pakistan team. Using techniques of numerical analysis, methods were developed to enerate detailed growth profile of an athletic child, indicating stunting and wasting/obesity as well as a prediction of adult height and weight, which becomes very important, when one selects athletes to train them as basketball players, wrestlers or gymnasts. Skeletal examination of school athlete, with a focus on detection of trunk deformities, in particular scoliosis, must be mandatory in the age range 9 – 11 years. In the Syed Firdous Growth and Imaging Laboratory a light-weight, full body moiré fringe topography, developed locally, is being used to screen for trunk deformities (scoliosis, kyphosis and lordosis). The author has developed methods to determine Cobb angle from measurements performed on moiré topographs (and its generalization in 3-D, the Asr Angle). Heart-size and condition could be determined, without expensive monitoring equipment, using geometric model of heart put forward by author in 2002. In the area of *kinesiology*, moiré fring topography and rasterstereography are used to study postures and gaits of athletes. Moire fringe topography and rasterstereography are (non-invasive) stereophotogrammteric techniques, which provide 3-D information in terms of height and curvature maps of the study surface. These techniques do not involve ionizing radiations, *e.g.*, X rays, posing no risk to atheltes. In the context of 3-D-static model of the human spinal column (put forward by author in 1982, complete version published in 1996), profile of spinal column in three dimensions was generated by moiré photograph of back. A simultaneous recording from moire and raster gave height and curvature maps of spinal column (thus generating 3-D profile of spinal column) in each phase of human gait (technique developed in 1996). A 3-D-dynamic model related spinal column in each phase to the next through edge-based algorithm. Edge-based more and edge-based raster allowed study of changes in height and curvature maps of human back during a gait cycle. In the area of *sports-performance analysis*, unwanted motion in the sagittal plane by a gymnast performing on vault may be monitored using edge-based more. There is a need for planning and implementing dynamical and robust *Sports Scienceand Technologies Departments of Health and Physical Education*. This is the only way for Pakistan to regain glory in hockey and cricket and follow a path leading to excellence in other events, *e.g.*, gymnastics and swimming.

Histopathology of Grape (*Vitis Vinifera*) Roots Infected with Root-Knto Nematode (*Meloidogyne Incognita*) (Kofoid and White, 1919) Chitwood, 1949

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Abstract: Histopathology of Grape (*Vitis vinifera*) roots naturally infected with *Meloidogyne incognita* revealed that the larve entered roots by puncturing action of the stylet and intercellular penetration reached to the stellar region where cells were extensively damaged. The changes recorded were erosion of outer surface of root; compression and hyaline degeneration of cortical cells loosing their normal shape, abscess formation in the cortical region and enlargement of cells in the medullary region specially those of the superficial tissue.

Simultaneous Removal of Arsenic, Fluoride and Nitrate from Drinking Water by Ion Exchange Technology

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Abstract: Excess Arsenic, Fluoride and Nitrate in drinking water causes health hazards to the natural as well as human environment. The removal of Arsenic, Fluoride and Nitrate ions from drinking water as attempted by using ion exchange resins as well as activated alumina i.e. integrated combined technique. Ion exchange resins and activated alumina was set up in a column for a known volume and the removing capacities of these materials were studied with respect to the volume and the removing capacities of these materials were studied with respect to the volume of sample. Water sample contain 50ug/l Arsenic, 10mg/l Fluoride and 50 mg/l Nitrate ions passed through these consecutive columns and the variation of arsenic, fluoride and nitrate removal for a known rate of flow was studied. Various water purification technologies were evaluated based on engineering, economics and regulatory criteria. Conclusively, ion exchange resins and activated alumina were deemed most feasible and will be pilot tested to verify arsenic, fluoride and nitrate removal efficiencies and to develop full-scale design data.

Application of Gamma and Neutron Wireline Logs for Mapping Subsurface Unconformities in Tharparkar Area, Sindh Pakistan

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Abstract: Thar Desert is located in the south-eastern part of Pakistan which is covered with sand dunes. The Geological Survey of Pakistan drilled test holes for exploration and assessment of coal potential. Geophysical logging technique was applied for identification of lithological units, coal zones and the events of non depositional environments specially in cases of non-cored drilling and evening cored drill holes where core losses encountered. Characteristic signatures on the neutron and natural gamma logs have been observed in the Tharparkar area. There are prominent baseline shifts on neutron logs and significant-spikes on natural gamma logs. Baseline behavior of neutron logs and spikes of natural gamma is used for identifying major lithological sequence and major unconformity in Tharparkar area respectively. The study shows a correlation between the baseline shift of logs and major depositional sequences. The study of geophysical logs using trend analysis shows changes in ligthological units. The baseline shifts on neutron log depicts three major lithological sequences i-e zone of dune sands, zone of sub-recent alluvium and coal zone above the basement rock. The high natural gamma spike delineates a major unconformity representing the contact between Sub-recent zone and the coal-bearing formation. This high natural gamma response also indicates radioactive enrichment particularly associated with this unconformable horizon.

Suppression of Plant Parasitic Nematodes in Grass by Application of Entomopathogenic Nematodes *Steinernema Pakistanense*

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Abstract: Efficacy of live and dead infective stage juveniles of *Steinernema pakistanense* Shahina *et al*., 2001 on population of grass were evaluated in field experiment 2007. Both living and dead IJs of *S. pakistanense* were equally toxic to plant parasitic nematodes causing more than 60% suppression in total population of PPN within 30 days of inoculation. The population of *Tylenchorhynchus, Pratylenchus* was significantly reduced in all treatments. Free living nematodes were not affected by this treatment.

Variation of Extract of Water Soluble Polysaccharide Alginic Acid Content from *Sargassum Boveanum* along the Different Sites of Karachi

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Abstract: Polysaccharides are a group of very important carbohydrates forming on the one hand structural element of cell wall whereas on the other hand storage forms of carbohydrates in plants. Division Phaeophyta (brown algae) is the largest and most diversified assemblage of marine plants. They are macroscopic and attached rock-covering plants. Alginic acid is a major polysaccharide present in brown seaweeds. It is also present in such sites as the salts of divalent metals. Alginic acid is a linear block-copolymer consists of two uronic acids D- mannuronic acid and L- gluluronic acid linked with 1-4 glycosidic linkage bonds. The monomeric composition and sequential structure of alginate vary widely between algal species and also between tissues within the same species. The extraction process is based on the conversion of mixed salts of Alginic acid in cell wall into soluble form. Processing involves leaching the seaweeds with aqueous calcium chloride.

In Pakistan seaweeds are found in great abundance (Qari and Qasim, 1988, Qari and Qasim 1994 and Shameel et al., 2000). Amongst Phaeophyceae *Sargassum boveanum* was the perennial species that was found approximately all year round at Karachi coast (Qari, 2002). The present study deals with the detail survey of brown seaweed *Sargassum boveanum* along the different site of Karachi.

The yield of alginic acid extracted from *Sargassum boveanum* collected from different sites (Hawkasbay, Buleji, Paradise Point, Manora) of Karachi coast. The present result show that maximum values (15.85 – 24.68 g %) of alginic acid were found in winter (December – February) and minimum values (11.12 – 17.63 g %) were found summer in (May to September) through out the study period.

Investigative Study on the Preparation and Processing of a Highly Conducting Polymer Polyaniline (PANI)

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Abstract: Polyaniline (PAni) was prepared by the oxidative polymerization of aniline in different acidic mediums, specifically hydrochloric acid (HCl) several concentrations of different acids were used to see the insight of electrical behavior of said polymer. With this approach different oxidizing agents were also used to follow the effect of changing the oxidizing agent. Standard samples of polyaniline-HCl were prepared using ammonium per oxy di-sulfate as an oxidizing agent. Standard samples were washed, filtered and palletized under 400 MPa pressure to observe the conductivity. Thermal (TGA, DSC) and spectral (IR, UV-VIS) analysis were also carried out to observe thermal behavior and structure respectively. The said polymer is in conducting state but it is highly insoluble in various tried medium, usually it forms dispersion. The deprotonated state of polyaniline is soluble but it is highly non-conducting in nature. Study was done to use the polymer in dyeing bath and print paste but was found poor in its dyeing and printing properties with many fabrics.

Physicochemical Assessment of Raw and Mechanical Thermal Expression Processed Low-rank Pakistani Lignite

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Abstract: Coal is a physically heterogeneous and chemically complex mixture of organic and inorganic species. Coal undergoes appreciable physiochemical changes during mechanical thermal expression (MTE) treatment. MTE is a developing non-evaporative lignite dewatering technology. This study assesses the physical and chemical properties of MTE product in comparison with raw coal (sonda-Jherruck Coalfield, Pakistan). Ignition and combustion of coal are influenced by the nature of coal, porosity, surface area, inorganic matter and mineral content. The MTE products were characterized by elemental analysis (both organic and inorganic components), volatile matter determination, moisture holding capacity, calorific value and mercury porosimetry. The total organic carbon (TOC) up to 51 ppm and the concentration of inorganic in the waste waters were also determined. The gross calorific values up to 6,547 kacl/kg (AR) was showed greater value than raw coal (5,732 kcal/kg). Overall, results indicated that the MTE technique is an effective way for lignite dewatering, however detailed study for variety of coal samples from different coalfields is utmost significant for future lignite utilization projects in Pakistan.

A Comparison of Cultural, Molecular and Histological Diagnosis of *Helicobacter pylori* Infection in Patients with Gastritis

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Introduction: The awareness of the crucial role played by *Helicobacter pyrlori* in the chronic gastric diseases (peptic ulcer, carcinoma and malignant lymphoma) is the most important achievement. *H. pylori* is a gram negative, curved spirochete-like bacterium, which colonizes the gastric mucosa (particularly the antrum and the cardia) in a variety of ways: free in mucus, surface adhesion and intracellularly and induces pathologic changes. These changes include disintegration and loss of apical mucus with formation of epithelial pits and less frequently erosions and ulcerations. The presumed main mechanisms for these alterations are motility and urease activity by the organism. There is also a relation between *H. pylori* infection, metaplasia and lymphoid follicle formation with subsequent lymphoma and carcinoma development, and the bacterium has been categorized as a group I carcinogen by the International Agency for Rsearch on Cancer (IARC). **Methods**: A total of our gastric mucosal biopsy specimens from the antral and corpus region were obtained from each of the 45 patients, who underwent upper gastrointestinal endoscopy. Two biopsies, each from antrum and corpus were collected in 10% formalin. Giemsa staining was performed for the histological detection of *H. pylori* infection, where as hematoxylin-eosin and AB-PAS+D staining was used for histological diagnosis of gastric mucosal inflammation, glandular atrophy and intestinal metaplasia by following Sydney reporting system. One antral biopsy specimen was collected in saline and another in 20% sugar solution for DNA extraction and culture respectively. Characteristic colonies of *H. pylori* were confirmed by gram staining, oxidase, catalase and urease test. DNA samples were tested for polymerase chain reaction (PCR) by targeting 16SrRNA gene to detect *H. pylori*. **Results**: The overall prevalence of *H. pylori* infection in gastritis was 40%. Moreover *H. pylori* infection in corpus (40%) was found more than in antrum (31.1%). Rate of *H. pylori* infection in different histological types of gastritis was: chronic superficial gastritis 8.8%, chronic atrophic gastritis 59.5%. PCR results not only confirmed the presence of *H. pylori* in all histologically found *H. pylori* positive specimens, but also in those antral biopsies 40%, which were found negative histologically. All antral biopsies were processed for culture and isolation rate of *H. pylori* was found to be 20%. **Conclusion**: Using PCR to detect *H. pylori* in gastric biopsy specimens is the most sensitive and specific technique and histopathology should be supported by PCR, which can further be used for *H. pylori* genotyping, as different genotypes of this organism are strongly related to different degrees of gastritis, intestinal metaplasia and gastric cancer.

Phase Dependent Invisibility Period of Lunar Crescent and its Affect on Actual Local Crescent Visibility

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Abstract: Since the time of Danjon the probem of length of new lunar crescent has been used to set the limit of minimum elongation for visible of new lunar crescent. Danjon himself set a limit of 7.5 degrees (Danjon, 1930) whereas Ilyas claims it to be 10.5 degrees (Ilyas, 1988) from a different perspective. This limit is referred to as Danjon Limit. In this work we use these conditions to study the period of complete invisibility of lunar crescent from last morning crescent to the first evening crescent from one lunation period to another from a geocentric view point. The period is found to be varying according to the periodic variations in the Earth-Moon distance. Danjon Limit is by no means gives an actual visibility criterion of new lunar crescent (or the last lunar crescent). A number of excellent ancient as well as modern criteria are cited in literature to determine local visibility of lunar crescent. These criteria are based on empirical models as well as advanced astrophysical models. In this work we have explored the actual period of complete invisibility of lunar crescent for a number of location using most accurate crescent visibility criteria and compared with the corresponding period based on Danjon Limit. There is no correlation found between complete invisibility period based on Danjon Limit and that based on actual local visibility criteria. Non-existence of such a correlation is a further proof of the fact that Danjon Limit can not be used as basis of observational lunar calendars.

Dental Hypersensitivity Associated With Take-Home Tooth Whitening (Bleaching) Treatment

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Introduction: A potential side effect of dentist-dispensed home tooth-whitening (bleaching) systems is transient tooth sensitivity. The authors conducted a randomized prospective double-blind study to determine the level of tooth sensitivity after home whitening treatment in population of Karachi. **Methods:** After convenient selection, fifty adult subjects used a gel containing 10 % carbamide peroxide and 0.11 % fluoride ion; an additional 50 adult subjects used a placebo gel daily for four weeks. Each subject's plaque index score, gingival recession status, caries status, current dentifrice and smoking history were recorded at baseline. The researchers evaluated dental sensitivity weekly by interview for four weeks. **Results:** Fifty-four percent (44 %) of subjects in both test and control groups reported mild sensitivity; 10 % of test subjects and 2 % of control subjects reported moderate sensitivity; 4 % of test subjects and no control subjects reported severe sensitivity. Sensitivity decreased with time; by the second week, no severe sensitivity was reported, and by the fourth week, no moderate sensitivity was reported. The authors found a statistically significant positive correlation between reported sensitivity and gingival recession. They found no statistically significant correlations between sensitivity and any of the other recorded parameters. **Conclusion:** Mild tooth sensitivity can be expected in approximately one-half of patients who undergo home whitening treatment using the gel studied. Approximately 10 % of patients may experience moderate sensitivity, and 4 % of patients may experience severe sensitivity for one to two weeks. Patients with gingival recession appear more likely to experience tooth sensitivity during home whitening treatment. **Suggestions:**Patients considering home whitening treatment should be advised that mild tooth sensitivity is a common side effect and that severe tooth sensitivity occasionally occurs. If gingival recession is present, the probability of tooth sensitivity increases, and tooth sensitivity tends to decrease as treatment progresses. An anti-sensitive medicated dentifrice or mouthwash may be advised conjunct to treatment in patients whose pain threshold is low.

Light and Scanning Electron Microscopic Study of *Rhabochona* Sp. (Spiruroidea: Rhabdochonidae) Parasitizing A Common Eidble Fish *Labeo Rohita* in Thatta

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Abstract: *Labeo rohita* is a common, edible, fresh water fish which has a comparatively larger consumption rate in Pakistan. More than a dozen fish were caught from Thatta district and brought to the Laboratory for examining parasitic infections. Five male and seven female nematodes were recovered from the small intestine of a fish. The nematodes were first studied alive/ in normal saline under a binocular. Later these were fixed in hot alcohol and stored in alcohol-glycerine mixture, (1part glycerine: 9 parts 70% ethanol). The nematodes were thin, slender and creamy white when recovered, with males having a tightly coiled caudal region. These are medium sized nematodes with cuticle transversely striated. Prostom is thick walled, funnel shaped with basal teeth are evident. Vestibule is straight and medium in length. Derides are not present. Tail in both sexes ends in blunt point. Most of the portions such as the cephalic, cervical, caudal including the posterior most portions and the caudal tip have been examined with a scanning electron microscope. One of the unique characters which have not been reported in species of the genus world wide and also in Pakistan is the presence of cephalic alae. This covers the cervical portion also.

Problems of Fresh Water Resources and Management in Sindh

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Abstract: Water stress is a growing concern all over the world. The amount of water available per person is decreasing, whereas the ratio of volume of water withdrawn to volume of water potentially available is increasing. The natural phenomenon of climate like long spell of drought further aggravates the problem. This problem is extremely serious in the arid areas where amount of rainfall is low and highly variable. The problem of fresh water resources is a serious concern in Pakistan. The amount of per capita water availability significantly decreased from 5300 cubic metre in 1951 to 1200 cubic metre in 2001. The present study deals with the problem of fresh water resources and management in Sindh. The study examines the sources of freshwater in Sindh and difficulties of water management.

Effects of Vam and Nematode Interaction on Some Biochemical Parameters of Sunflower

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Abstract: Experiment was conducted to elicit biochemical substantiation for the observed differences in resistance to nematode infection in roots colonized by mycorrhiza. Sunflower roots were assayed for their biochemical profile with respect of total carbohydrates, total proteins, amino acids, chlorophyll a and chlorophyll b. Plants were treated with nematode inoculum before and after 7 days of AMF inoculation. Plants were also treated with AMF and nematode alone and were compared with plants with no inocula. Comparative assays indicated that amount of carbohydrates, amino acids and protein is greater in mycorrhizal plants than non mycorrhizal (control), while in roots that received AMF and juveniles of root-knot nematode after 7 days amount of all parameters was lower than the roots inoculated with AMF after 7 days of nematode inoculum. In roots which were with nematodes only show lesser amount than nematode plus AMF after 7 days.