ABSTRACTS

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Bacteriological Monitoring of Different Locations (Wards) of Public Sector Hospital (Teaching/Civil Hospital Sukkur) Through Active and Passive Air Sampling

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Bacteriological monitoring of different locations of Teaching/Civil Hospital Sukkur was carried out by two types of sampling procedures namely Active air sampling and Passive air sampling. According to these results Causality –A exhibited highest colony forming units (1020 CFU/dm^2/h) followed by, Children Ward (893 CFU/dm^2/h), Children Surgical Ward (893 CFU/dm^2/h) Neonatal ward (847 CFU/dm2/h) and Causality-B (613 CFU/dm^2/h) respectively in Passive sampling while in Active sampling Causality-A exhibited highest colony forming units (967 CFU/m^3) followed by Children Ward (857 CFU/m^3), Neonatal Ward (755 CFU/m^3), Children Surgical Ward (607 CFU/m^3) and Causality-B (508 CFU/m^3) correspondingly. All wards showed elevated colony forming units as compared to acceptable levels. The most common bacteria identified *Bacillus subtilis, Pseudomonas aeruginosa, Serratia mercescenes, Staphylococcus aureus, Staphylococcus saprophyticus, Staphylococcus epidermidis*. The antibiotic sensitivity tests were performed by Kirby Bauer methods. Antibiotics included in this study were ciproxin, augmentin, levofloxacin, velosef, avelox, cafaclor, clarithromycin and ofloxacin. Gram positive bacteria were found high in range as compared to gram negative bacteria

Cloning of a Cysteine Protease of Avian *Staphylococcus aureus* and its Expression in *E. coli*.

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Keeping in view the zoonotic risk of Staphylococcal infections to humans, present study was conducted to evaluate the virulence factors of *Staphylococcus aureus* (*S. aureus*) the causative agent of staphylococcosis. *S. aureus* infections are one of the major causes of economic loss in poultry industry and cysteine protease may be one of the major virulence factors of avian *S. aureus*. All avian species appear to be susceptible to staphylococosis, which is common worldwide wherever poultry are reared. There are zoonotic risks to humans that *S. a*ureus can cause food poisoning. In order to provide a rational research basis for detection of pathogenicity of *S. aureus* and study on the virulence factors and expression system, plasmid pET33b+ encoding protease gene was constructed and the related target protein was expressed in *Escherichia coli* (*E. coli* BL21/DE3). The fragment of protease gene of *S. aureus* from a standard avian strain was amplified by PCR and cloned into prokaryotic expression plasmid vector pET33b+ with restriction endonuclease to construct recombinant pET-protease, which was verified, by restriction endonuclease and DNA sequencing. The recombinant plasmid was transformed into *E. coli* BL21/ DE3 to express the protease gene. The results showed protease DNA fragment was proved correct through restriction endonuclease and DNA sequencing. Its nucleotide sequence was 99% homologous to that published in Gene Bank (gi:19570341). The Protein fingerprinting of expressed protein also showed 99 % similarity with cysteine protease from *S. aureus* proving that expressed protein was indeed Cysteine protease. A 40 kDa fusion protein, which was induced by IPTG, was detected by SDS-PAGE. In immunoblots, the recombinant protease reacted with 1/5000 to 1/10,000 dilution of the pooled polyclonal sera of chicken known to be infected with *S. aureus*. The protease also reacted with monoclonal anti his-tag antibodies at 1:20000 dilution that confirmed its high affinity and epitope exposure towards the antibodies used.

Rainfall Modeling Using Artificial Neural Networks: In Context of North-Eastern Part of Pakistan

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This study assesses the inter-annual variability of summer monsoon rainfall of North Eastern Part of Pakistan which includes Balakot, Kotli, Murree, Gilgit, Islamabad, Chitral, Muzaffarabad and Dir. The region receives a heavy rainfall, the total annual rainfall being 1000 mm or more. The dominating predictors for rainfall of the region include local and global parameters. We attempt to simulate and model the rainfall process of the data from 1961-2005 by using Artificial Neural Networks (ANN). For that purpose, we employed two different types of Networks viz., (*i*) Generalized Regression Neural Network (GRNN) and (*ii*) Feed forward Neural Network (FFNN) for modeling. Our result shows that FFNN yields better forecast than that of GRNN by minimizing the mean square error (MSE) of the forecast up to 4%. Since modeling is totally based upon selected predictors, we propose that long term as well as short term forecasts can be refined by using more sophisticated technique as canonical correlation and principal component analysis for the selection of predictors.

Survey and Systematic Census of Ethnobotanically Important Plants of Miandam Valley, District Swat

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The present study was carried out to assess, record and report the Ethnobotanical potential and conservation status of Miandam valley District Swat. The area has high potential regarding its biodiversity and its ethnobotanical utilization. Information collected from local masses regarding 117 ethnobotanically important species belong to 53 families, out of which 66 species were of medicinal importance. The rest of species have been described to be useful for fuel wood (09 species), fodder (09 species), wild fruits (08 species), Honey bee (05 species), Agricultural tools (07 species), fencing and Hedges (06 species), timber wood (07 species), ornamental (09 species), thatching and sheltering (07 species), vegetable (13 species), poisonous (05 species), veterinary medicines (10 species), Edible Fruits (9 species) and miscellaneous purposes (09 species). Cronquist (1981) system of classification has been followed to give the systematic position of all the species. Ethnobotanical information of each species is presented with local name, part used and traditional uses. The most important medicinal plants of the area are *Calotropis procera* (Willd). R. Br., *Cannabis sativa* L., *Olea ferruginea* Royle, *Punica granatum* L., *Arisaema jacquemontii*, *Hedera helix* L., *Periploca aphylla* Decne. *Artemisia scoparia* Waldst and Ket., *Berberis lycium* Royle, *Podophyllum hexandrum* Royle, *Onosma hispida* Wall. ex G. Don., *Sarcococca saligna* (D.Don) Muell. Arg., *Cannabis sativa* L., *Sambucus wightiana* L, *Hypericum perforatum* L., *Elaeagnus umbellata* Thunb., *Euphorbia wallichii* Hook. f., *Indigofera heterantha* L., *Aesculus indica* (Camb.) Hook. *Mentha longifolia* L. Huds. *Micromeria biflora* (Ham.) Bth., *Thymus linearis* Benth. *Ajuga bracteosa* Wall. ex Benth. *Colchicum luteum* Baker. *Polygonatum multiflorum* (L.) All, *Paeonia emodi* Wall. ex Hook. f. and *Skimmia laureola* Sieb. and Zucc. ex Walp. Many of the species are cut due to their multipurpose usage. Hence several species such as *Paeonia emodi* Wall. ex Hook. f., *Colchicum luteum* Baker and *Hypericum perforatum* L., are found as threatened species in the area. Vegetation of the area is under intense biotic pressure due to deforestation and overgrazing. The most serious threat to the vegetation is the use of plants as fuel wood. There is a dire need for taking urgent steps for conservation of indigenous vegetation since the use of plant resources dare unsustainable. So it requires in-situ conservation. Recommendations have been discussed for conserving flora and fauna of the area.

A New Method for Synthesis of Symmetrical 1,3-Disubstituted Urea' s

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Polyureas have tremendous biological importance as they can be used as Anti-HIV [1]. Polyurea are used as bed liners to form durable coatings to protect against rust and corrosion, it used as a multi-purpose joint fill, caulking and sealant material. It has significant application in race car body parts, mold making and artificial rock. It is resistant to many fuels and chemicals. Disubstituted ureas are essential components of drug candidates including HIV protease inhibitor, CCK-B receptor and endothelin antagonists. Recently oligoureas have also been introduced as scaffolds for the creation of artificial □-sheets and as peptide backbone mimetics. The traditional synthetic approaches to symmetrical ureas are well known [2, 3].

As polyureas have many uses, we try to substitute the N*H* of urea derivatives (*N*-aryl-*N'*,*N'*-dialkyl urea) or (*N*-aryl-*N'*-alkyl/aryl urea) by diethylcarbamyl group, instead of polyurea, a new reaction has been observed and a new product symmetrical 1,3-disubstituted ureas are formed.

Effect of Different Dietary Carbohydrates on Biofilm Production in Diabetic Foot Infections

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Background Biofilms are complex communities of surface attached microorganisms and exist in all settings where bacteria present in hydrated environment.. Different Dietary carbohydrates promote biofilm production and causes further antibiotic resistance.

Objective Effect of different dietary carbohydrates on biofilm formation capability of multidrug resistant bacteria isolated from diabetic foot infections.

Methodology 150 pus samples from diabetic patients having foot infections along with clinical history were collected from different hospitals of Karachi. Bacterial isolates were cultured on selective and differential media, identified by microbiological, biochemical and cultural characters. Quick test strip (QTS.) was used for further confirmation of isolates. Antimicrobial susceptibility testing was done by Disc diffusion method according to clinical and laboratory standards international (CLSI). Biofilm formation of 75 isolates was determined by simple flow tube and micro titer plates methods in tryptone soya broth (TSB). TSB were supplemented with 2% different dietary carbohydrates (Glucose, Sucrose, Maltose, Fructose, Cellulose, Sorbitol, Lactose and Manitol) to observe the effect of these sugars on biofilms formation. Optimal density of biofilms matrix material was measured by quantitative Spectrophotometer and ELISA plate reader.

Results 91% of diabetic foot infections were due to different pathogens. Major isolates were Staphylococcus aureus 22%, Strept pyogenes 10%, Pseudomonas aeruginosa.18%, Proteus mirabiliss 12%, Klebsiella spp,13%,, E.coli 12% Sarratia marscenses10% and Anaerobes 3%. Biofilm production capability of S. aureus was 35%, Streptococcci 7%, Pseudomonas aeruginosa 13%, Proteus mirabilis 2 %, Klebsiella spp.8% and E.coli 33%. Antibiotic sensitivity pattern of these isolates indicated multi drug resistance. Different carbohydrates (Sucrose, Sorbitol and Lactose) were involved in biofilm formation.

Conclusion Limb threatening infections which can cause major amputations were poly microbial. Isolates were multi drug resistant and having capability of biofilm production. Sucrose, Maltose and Sorbitol were important dietary carbohydrates involved in biofilm production.

Prevalence of HBV in Cardiac Patients of Allied Hospital Faisalabad

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Viral hepatitis is an infectious hepatic disease, associated with inflammation of liver. It is one of the commonest infectious disease worldwide. In the present study 100 cardiac patients were randomly selected from Allied Hospital Faisalabad. Patients were aged between 22-62 years, among them 36 were females and 64 were males. The cases were analyzed for different parameters like HbsAg, ALP, Bilirubin, SGPT, SGOT and PCR.

No subject was found to be in the age of 10 to 20 years. Sixteen percent patients were lying in the age of 21 to 30 year, 25 % in the age of 31 to 40 year, 35 % in the age of 41 to 50 year, 19 % in the age of 51 to 60 years and 5 % patients in the age of 61 to 70 years. Thirty five percent patients had the higher value of SGPT than normal and 26% had higher value of SGOT, 32% had the higher value of ALP and 24 % had higher value of Bilirubin. The higher value of Bilirubin indicates the Biliary inflammation, which may be Intrahepatic or extrahepatic biliary inflammation. Heart muscles are rich in SGOT whereas liver contains both but more of SGPT. Increase in both transaminases are found in liver diseases with SGPT much higher than SGOT. Both SGPT and SGOT are associated with liver diseases, liver damage, intraoprative hypotension, intraoprative blood loss, liver reseption significantly correlated with liver enzyme elevations. ALP level is increased with increasing age, body mass index, C-reactive protein, monocyte count, serum uric acid, lead, cadmium, hypercholesterolemia, diabetes, smoking, non-alcohol drinking, sex, age, liver diseases, lesion of liver and cardiovascular disease. The sera of the eight HbsAg positive cases were tested for the presence of HBV through PCR and no sample was found positive. **Conclusion:** The prevalence of HBsAg in cardiac patients was double than in the normal population which indicates that the cardiac patients are at higher risk of HBV. No carrier of HBV was indicated in 100 cardiac patients

Tolerable Analysis and Metal Biosorption of *Aspergillus Niger*

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Peri-urban refers to farm units close to town which operate intensive semi or fully commercial farms to grow vegetables and other horticulture, raise chickens and other livestock, and produce milk and eggs. The peri-urban agricultural areas are contaminated by industrial and sewage polluted water. In present study the soil samples were collected from peri-urban agricultural areas of Lahore (Hudiara drain) and Faisalabad (Chukarya Chack) and fungi were isolated and preserved. Common and major fungal strains (*Aspergillus niger)* were tested for heavy metal tolerance and metal biosorption against Cr. The tolerant fungal strains were selected by repeated sub culturing in Petri dishes with increasing metal concentration (0.05, 2, 4, 6, 8 and 10mg/ml), in the PDA (Potato Dextrose Agar medium). The degree of tolerance was measured by radial growth (cm) in the presence of various heavy metals salts and compared to a control, which contain no heavy metals. Tolerance was taken in terms of minimum inhibitory concentration. *Aspergillus niger* showed minimum growth at 6mg/ml against the tested heavy metal $Cr(NO_3)_3$ and exhibited radial growth 3-4.5cm. *Aspergillus niger* of Faisalabad soil samples showed maximum biosorption at 8mM while Lahore strain showed maximum biosorption at 10mM. The purpose of the present study was to see tolerance and biosorption of soil fungal population towards heavy metals present in the soil. The study focused on the fungal population which is tolerant to heavy metal salts and showed high biosorption potential. The knowledge of present study will be helpful for further research i.e. bioremediation of polluted soil.

Probiotic Potential of Lactobacilli for the Reduction of Hypercholesterolemia and Cardiovascular Diseases

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Cardiovascular disease is the commonest cause of death all over the world and hypercholesterolemia is one of the major causes of such diseases. Serum cholesterol is important from the public health stand-point because higher concentrations are often associated with a greater risk to cardiovascular diseases. Certain drugs have been used for the treatment of cholesterol; one of the biological drugs which have proved to be a promising tool is the use of probiotics. Probiotics are dietary supplements containing potentially beneficial bacteria. These are naturally occurring beneficial organisms that aid in reducing serum cholesterol. Among probiotics Lactic acid bacteria (LAB) are known to enhance the mechanism of lowering serum cholesterol either by deconjugation of bile salts or assimilation (up take) of cholesterol during the growth. The study also aimed to evaluate the potential hypocholesterolemic abilities of indigenous *lactobacillus* isolates.

Comparison of The Effects of Simple & Succussed Dilutions of Adrenaline & Atenolol on Ventricular Potentials Recorded from Rabbit's Perfused Heart

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Background: The pharmacological effects of Adrenaline (Ad) and Atenolol (Ate) are well established. However, the effects of drug dilutions made on homeopathic concept involving succussion (shaking) are yet controversial for potentization of these drugs and their reverse effects on both the animal and plant tissues. Earlier reports also indicated formation of their imprints especially at dilutions beyond Avogadro's number. Objective: To compare the pharmacological effects of simple (SD) and succussed (SUD) dilutions of Ad & Ate on isolated perfused heart and explore their potentization and reverse effects by testing from low (10^{-3}) towards high dilution ($10^{-36)}$, beyond Avagodro's number. Method: Both simple & succussed dilutions of Ad & Ate were prepared serially, ranging from 10^{-3} to 10^{-36}. Their effects were determined on various parameters of ventricular potentials recorded from isolated perfused Rabbit's heart, using Langendorff assembly. Results: Significant differences were observed between the effects of many simple and succussed dilutions of both Ad & Ate However, this significant difference was not consistent for each dilution & parameters measured. Conclusion: Both the simple and succussed dilutions of Ad & Ate differs in their effects on the parameters of ventricular potentials obtained from isolated perfused heart. However, their effects observed at high dilutions beyond Avagadro's number is still a mystery and can only be explained on the basis of imprints of original drug molecules that may develop on succussion and also these drugs indicates reported for other substances. Inconsistent potentization and reverse effects of the instability of change in the parent drug molecule.of Ad & Ate after succussion.

Quantitative Structure Activity Relationship of a Series of Ercaptoacyldi-peptides Implicated in Cardiovascular Diseases

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The physiological control of blood pressure and fluid homeostasis is mainly dependent on regulatory peptides: angiotensin II (Ang II) which induces vasoconstriction and atrial natriuretic peptide (ANP) which increases diuresis and natriuresis. The effects of dual inhibitors of two enzymes neutral endopeptidase NEP and angiotensin converting enzyme ACE appear superior to those observed with specific inhibitors in the treatment of severe cardiovascular diseases. Among these dual inhibitors, mercaptoacyldipeptides implicated in cardiovascular diseases, are of great interest. 3D-QSAR models were developed for mercaptoacyldipeptides, based on NEP enzyme-ligand interactions suggested by docking software GOLD, using CoMFA and CoMSIA techniques. Statistically significant 3D-QSAR CoMFA and CoMSIA models were obtained with corelation coeficients r^2 of 0.996 and 0.991, respectively. Both the models were validated by an external test set of nine compounds giving highly predictive corelation coeficients $r^2_{(pred)}$ of 0.929 and 0.928, respectively. Some important facts were established from derived CoMFA and CoMSIA models: (1) two bulky substituents at R_1' and R_2' positions of mercaptoacyldipeptides are necessary for better biological activity; (2) The P_1' and the P_2' carbonyl and amidic groups are essential for better biological activity by providing H-bonding interactions with enzyme; (3) the p-OH benzyl ring at the R_2' position requires more electrophilic groups, in order to maximize the bio-profile. The CoMFA and CoMSIA 3D-QSAR models may be used to design more potent mercaptoacyldipeptides for the treatment of cardiovascular diseases.

Baseline Studies on Fruit Quality and Shelf Life of Tomato and its Integrated Management

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Tomato (*Lycopersicon esculentum* Mill.*)* a member of the *Solanaceae* family famous for which drug, fruit, flowering, ornamental and horticulture crops like egg-plant, potato tubers and tomatoes, botanically this fruit is known as berry. In many countries tomato varieties are named on the basis of color, shape, size and appearance. High quality fruits have a firm, turgid appearance, uniform and shiny color, without signs of mechanical injuries, shriveling or decay. Consumers measure the quality of tomato fruit primarily by three factors: physical appearance (color, size, shape, defects, and decay), firmness, and flavor. Data on existing status and collection of testy material was made from three vegetable markets of Lahore i.e Badami Bagh, Allama Iqbal and Kot Lakhpat. Fruit sample was classified on the basis of 0-5 visual rating scale and tested on visual appearance, taste and aroma. The studies tested for various types of packing material showed that Packing material and cushion material are responsible for fruit decay. Extended shelf-life can be obtained by wrapping single pieces or by collective packing in inert atmosphere or mixture of gasses using appropriate combination of packaging. Permeability control of certain combinations of packaging materials for the packing of fresh vegetables is necessary to obtain favorable barrier characteristics.

Herbicidal Activity of Culture Filtrates of Phytopathogenic Fungi against Parthenium Weed

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Parthenium (*Parthenium hysteraphorus* L.), an alien invasive weed, is widely spreading throughout Pakistan. Worldwide it has been designated as one of the most troublesome weed species. Various synthetic herbicides are known to control this weed, however, health concern problems associated with these agrochemicals warrant alternative strategies which are based on biological products. In the present study metabolites of nine plant pathogenic fungi viz. *Alternaria alternata*, *Drechslera hawaiiensis, Fusarium solan., Drechslera biseptata, Fusarium oxysporum, Drechslera australiensis*, *Monilia stophila*, *Drechslera rostrata* and *Cladosporium* sp., were evaluated for their herbicidal potential against parthenium weed. These fungi were grown in 100 ml of 2% malt extract broth in 250 ml conical flasks for 15 days. The metabolites were passed through muslin cloth followed by filtration through fitter paper. In a laboratory bioassay, effect of original (100%) and well as lower concentrations (75%, 50% and 25%) of these metabolites was studied on germination and early seedling growth of parthenium. Metabolites of *A. alternata* were found most toxic resulting in 70-90% reduction in germination, 34-66% in shoot length, 60-80% in root length and 52-76 in phytomass of target weed. Metabolite of *F. solani* and *D. rostrata* were also found highly effective against parthenium weed. Metabolites of other fungal species generally showed variable effects. Foliar spray bioassay was performed using metabolites of three fungal species namely *A. alternata, F. solani* and *D. rostrata,* which exhibited significant herbicidal activity in laboratory bioassays. .In this experiment, 3-sprays of fungal metabolites, with 5 days intervals each, were carried out on one-week and two- weeks old pot grown seedlings of parthenium weed. Metabolites of *A. alternata* and *F. solani* markedly suppressed root and shoot growth of parthenium weed.

Thermal, Structural and Mechanical Behavioiur of Polymeric Composites of Polyvinyl Alcohol with Inorganic Salts

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During the recent years lot of research is being conducted in search more handy and cheaper materials. Polymer composites are adding a great deal of material which is more durable and useful as compared to the conventional material[1]. Mechanical and thermal properties of composite materials greatly depend on the nature, proportion and compatibility of the components of the composite materials[2]. In this paper we have tried to find the relationship of these properties i.e. thermal conductivity, tensile strength and Young's Modulus of the composite material. Two systems were selected; Poly vinyl alcohol/ Sodium sulphate composite, and Poly vinyl alcohol/ Lithium sulphate composite. Various concentrations of these salts were added to Poly vinyl alcohol, using triply distilled water as solvent. Films were casted, dried at room temperature and were subjected to mechanical, structural and thermal characterization. Thermal conductivity was found out at room temperature using Quick thermal conductivity meter. Polyethylene, silicon and quartz were used as reference. It was found out that the thermal conductivity of both the systems is highly dependent of the nature and the concentration of added salt in the polymeric composite. Thermal conductivity of the Poly vinyl alcohol/ Sodium sulphate composite, and Poly vinyl alcohol/ Lithium sulphate composite, decreased with concentration of the salts in the polymer composite[4]. These composites were also analyzed for their structure and the properties exhibited were explained on the bases of their structure. Similar trends were observed in mechanical properties of these composites, e.g. tensile strength elongation at break and Young's Modulus.

Beef Production through Cattle Cross Breeding

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A study under Beef production through cattle crossbreeding was conducted through A. D. P. Project for a period of three years from (July, 2003 to June, 2006) at Livestock Production Research Institute Bahadurnagar Okara. The frozen semen of four renowned exotic beef breeds namely Angus, Hereford, Charolais and Simmental was used for crossing with local Non-Descript (ND) cows. The traits studied for half cross bred of these breeds were birth weight, weaning weight, Average daily growth rate up to weaning, yearling weight, 18 months weight (slaughtering weight) , Age/weight at maturity, Age at Ist conception, Age/weight at Ist calving, Service period and Calving interval. The average mean values for Angus x ND crossbreds were 31.86.kg, 206.11kg, 829.00gm, 280.00kg, 390.00kg, 624.00days/330.00kg, 645.00days, 25.00days/410.00kg, 145.00 and 380.00 days. The average mean values for Hereford x ND crossbreds were 33.84 4kg, 210.00 kg, 838.00gm, 290.00kg, 400.00kg, 600.00days/350.00kg, 620.00days 900.00days/430.00kg , 142.00 and 375.00 days. The average means values for Charolais x ND crossbred were 31.54kg, 224.58kg, 919.00gm, 305.00kg, 415.00kg, 640.00days/360.00kg, 650.00days, 930.00days/450.00kg, 147 and 377 days. The average mean value for Simmental x ND crossbreds were 32.15kg, 212.00kg, 856.00gm, 295kg, 410.00kg, 608.00days/350.00kg, 630.00 days, 853.00 days/405.00 kg, ,143.00 and 372.00 days. A control group of ND animals was also maintained. The average mean values for control group were 19.34kg, 90.15kg, 337.00gm, 142.34kg, 204.00kg, 912.00days/264.00kg, 935.00 days 1187.00days/344.00kg, 185.00 and 468.00 days. The dressing percentage (52-56) was observed in beef crossbreds. Where as in non-descript the dressing percentage was 46 %. The chemical analysis of beef was made by the PCSIR labs Lahore. The average mean values in all beef cross bred were as Moisture 72.71%. Ash 0.98%, Fat 2.65%, Fiber 0 %, cooked weight loss 41.36 %, sheer force value 3.08 F/kg. It has been proved that charolais crossbreds are best among rest of all beef crossbreds.

ESAT6- and CFP10- Induced IFNγ And CXCL9 Can Differentiate Severity of Tuberculosis

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Objectives: Detection of tuberculosis especially in extrapulmonary sites remains a diagnostic dilemma. This study investigated mycobacterial antigen, ESAT6- and CFP10-stimulated responses in pulmonary (PTB) and extrapulmonary tuberculosis (EPulTB). Methods: *Ex vivo* whole blood assay, IFN□, IL10, CXCL9 and CCL2, responses to mycobacterial antigens and bacterial LPS were determined in PTB (n=24), and in EPulTB patients with limited (LNTB, n=20) or severe (SevTB, n=20) disease, and in healthy endemic controls (ECs, n=34). Results: ESAT6- and CFP10-induced IFN□ was comparable between ECs and TB patients. However, both ESAT6- and CFP10- induced IFN□ was greater in LNTB than PTB patients. ESAT6-induced CXCL9 was greater in EPul-TB groups as compared with PTB, with an increase in SevTB as compared with LNTB. LPS -stimulated CXCL9 was also greater in SevTB as compared with PTB and LNTB, but did not differ between EPulTB groups. ESAT6-induced CCL2 was comparable between TB groups, however, both CFP10- and LPS- induced CCL2 was increased in PTB than LNTB patients. A positive correlation between ESAT6-, and CFP10- induced IFN□ and CXCL9 present in PTB and LNTB was absent in SevTB, suggesting different regulation in limited and severe TB. Conclusions: ESAT6 induced IFN□ cannot distinguish between active TB patients and controls in endemic regions. However, IFN□ and CXCL9 can differentiate between limited and disseminated TB infections.

Artemia Culture – A Small Scale Bio-Industry

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Two strains of *Artemia* viz, native parthenogenetic and bisexual Vinhchau (VC) strain (Vietnam), were assessed under laboratory conditions for inoculation on the basis of their reproductive performance, life span characteristics and the cyst production capability. VC strain showed an over all better reproductive performance and cyst production than the native parthenogenetic strain, hence selected for inoculation. The paper presents comprehensive information on *Artemia* culture under the local climatic conditions, mainly the culture methodologies for *Artemia* cyst production: i) construction, preparation and management of ponds, ii) best micro-algae for feeding, iii) predator control, iv) trouble shooting, v) harvesting, processing and packing of cyst. It also outlines the suitable season and the environmental conditions for culture.

Chromosomal Abnormalities In Bovine, A Review

Muhammad Aslam, S. Andleeb, M. Mushtaq and M.Farooq

Chromosomes are thread like bodies within the nucleus of a cell. The chromosomes are responsible for transmitting hereditary material from parents to offspring's. The number of chromosomes in the body cells in any species is generally constant and characteristics of the species. Numerical chromosome abnormalities occur because of errors in cell division. Extra chromosomes are usually detrimental whereas missing chromosomes usually cause death shortly after conception or in early embryonic life especially if missing chromosome carries genes vital for life. Structural chromosomal abnormalities are of several types including translocation, duplication and deletion. A mixture of cell type in the same individual results in types of chromosomal abnormalities known as mosaicism or chimerism. These chromosomal aberrations may have cytologically and genetically detectable consequences. The normal chromosome complement of domestic cattle consists of 60, XY for a bull and 60, XX for a cow. A deviation from the normal 2n chromosome may cause some phenotypic defects such as freemartin condition (XX= XY chimerism), brachygnathia inferior (autosomal trysomy 61, XX or 61, XY). Some chromosomal aberrations (Robertsonian translocation, tandem fusion) and different forms of translocation have been reviewed in the literature have marked effect on cattle fertility. 1/29 tanslocation; 2/4 Translocation, 5/21 translocation,7/12 Translocation, 11/16 Translocation, 13/21 Translocation, 14/20 Translocation , 14/28 Dicentric Robertsonian Translocation, 21/27 and 25/27 Translocation, 3/27, 5/23, 11/21 Translocation, 12/27, 9/12, 17/27, 2/27, 9/17, 3/12 translocation, 11-12/15-16 Translocations, Reciprocal translocation. 60, XY, t (8:15) (21:24), Reciprocal translocation. 60, XY, t (10:11) (41:14) , Tandem fusion: Gaps and Secondary Constrictions, XX / XY Chimerism, Diploid- Triploid Chimerism.: Karyotype Mosaicism, Chromosome Polymorphism, Autosomal Trisomy 61, XX or 61, XY: and polyploidy. In modern breeds rapid spread of the translocation and other hereditary faults may be due to artificial insemination using semen of uncontrolled sires. There has been an increase in the introduction of new genetic material into national bovine gene pool through importation of frozen semen and breeding stock of Exotic breeds. chromosomal screening of breeding bulls to eliminate the adverse effects of chromosomal abnormalities will help in reducing infertility problems among cattle and buffaloes. However precise research for investigating the chromosomal changes and its causes in bovine to obtain better understanding of the reasons / remedies of chromosomal disorders.

Growth Stimulation of Chick Pea by Indigenous Phosphate Solubilizing and Auxin Producing Bacteria

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Solubilization of insoluble organic phosphate has been the focus of many studies as it increases the availability of phosphorus to vegetation and improves plant growth. The aim of this study was to study those bacterial strains which were positive for phosphate solubilization in plate assay as well as in liquid media. A total of 70 metal solubilizing indigenous bacterial strain were isolated. Ten efficient phosphate solubilizing bacterial stains were investigated for phosphate solubilization in liquid media. Growth substances produced by these ten bacterial stains were determined via bioassay. Three bacterial strainsCMG851,CMG857 and CMG860 which found positive to auxin production were further investigated for indole acetic acid and indole butyric acid production .It was found that Indole acetic acid , indole butyric acid were produced by these bacterial strains in varying concentration with and with out the addition of tryptophan. These bacterial strains showed stimulatory effects on the growth of root and shoot elongation of chick pea. Three promising bacterial strains CMG854, CMG857 and CMG860 were investigated to establish the effect on plant growth

Importance of Coagulase Negative Staphylococci in Karachi, Matiari and Khairpur Dairy Animal Mastitis

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Teat milk expressed using throwaway surgical gloves into sterile disposable specimen-collection containers from a total of 125 each of cow and buffalo dairy animals yielded 54 of 216 isolates (24%) that were Coagulase negative Staphylococci (CoNS). The study was conducted in an 18-month period ending October 2008 involving 5 dairy farms in Karachi and 2 each in Matiari and Khairpur, Sindh. Approximately 35% of CoNS were recovered mixed with *E.coli* (16%), Streptococci (12%), *Bacillus* spp (11%), Pseudomonas (9%) and Klebsiella (4%); *Staph aureus* appeared separate in 21% of inflamed teat milk. The majority of the 11 CoNS species identified using the Staph-API 20 system were *S.epidermidis*, *S.chromogenes*, *S.simulans*, *S.hyicus* and *S.haemolyticus*; these were also seen among 142 CoNS isolates in human clinical specimens cultured during the same study period in Karachi, but *S.caprae*, *S.sciuri*, *S.cohnii* which appeared in the latter samples, were not observed in animal ones. All inflamed teats were associated with high somatic cell counts; less than half of the mastitis cases (41%) were clinical but in the majority clinical signs were mild. The severity and persistence of intramammary infection were unaffected by strain of CoNS. Studies reported in Pakistan have highlighted the importance of "Staph" as a major cause of animal mastitis but have not touched upon CoNS; thus our study should dispel the misconception that only *Staph.aureus* was implicated, and that CoNS are not only contaminants, but also potential pathogens. Aside from speciation of isolates, their sensitivity profiles to 17 antibiotics were also recorded; while all were affected by Vancomycin and Linezolid, approximately 48% were resistant to Methicillin. The role of hygiene of handlers, climate in the region, herd size, etc will be discussed.

Antimicrobial Susceptibility Profile of Pseudomonas Isolated From Contact Lenses in Karachi-Pakistan

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Introduction: Pseudomonas infection of the cornea is potentially vision-threatening especially in wearing soft extended-wear contact lenses; using topical corticosteroid eye medications and requires prompt and aggressive treatment. They can cause ulcers of the cornea that may bring about rapid tissue destruction and eventual blindness. Pseudomonas infections maybe treated with combinations of ceftazidime (Ceftaz, Fortraz, Tazicef), ciprofloxacin (Cipro), imipenem (Primaxin), gentamicin (Garamycin), tobramycin (Nebcin), ticarcillin-clavulanate (Timentin), or piperacillin-tazobactam (Zosyn). Most antibiotics are administered intravenously or orally for two to six weeks. Treatment of an eye infection requires local application of antibioticdrops.

Material and Methods: In this study, a total of 36 pair of contact lenses (soft, extended wear, disposable, daily wear) as well as 14 contact lens cases were also collected for different microbiological analyses. Out of them, a dozen of lenses were taken from the patients who approached Akhtar Eye Hospital with severe eye complaints (irritation, ocular pain and redness etc), while the rest belong to other community wearers. All the lens wearers were also thoroughly interviewed with their complete clinical picture. These lenses were collected aseptically in disinfected lens kits and sterile vials and transported to Immunology and Infectious Disease Research Laboratory (IIDRL-KU) for processing. The lenses were processed and cultured on different microbiological media (Nutrient Agar, Blood agar, MacConkeys agar and others).All isolated pathogens were identified by conventional and rapid method (Quick Test Strip 10). The isolates were screened for their susceptibility against commonly prescribed antibiotics (Vancomycin, Erythromycin, Tetracyline, Chloramphenicol, Ampicillin, Ofloxacin, Ciprofloxocin Cephalexin and Gentamycin) Minimum inhibitory concentration (MIC) of sensitive antibiotics was also determined by Micro-broth dilution method.

Results: Out of 36 pair of soft contact lenses, *Pseudomonas aeruginosa* was isolated from 16 lenses and out of 14 contact lens cases, 6 showed he presence of *Pseudomonas* isolates. The rest of the isolates were found to be gram positive organisms. Moreover, none of the isolates of *Psudomonas* were obtained from the disposable lenses; however, the rate of isolation was found greater in case of extended and daily wear contact lenses. Antibiotic susceptibility studies indicated that majority of the isolates were resistant to one or more antibiotics particularly Erythromycin, Ampicillin, Vancomycin. 13 out of 16 *Pseudomonas* isolated from soft lenses and 4 out of 6 *Pseudomonas* isolated from contact lens cases, were resistant to Cephalexin, Tetracycline and Gentamycin however; these isolates showed great susceptibility towards fluoroquinolones category of antibiotics in the order of ofloxacin(87%) and ciprofloxacin (83%)with MIC of both these fluoroquinolones ranging from 2-4 μg/ml.

Conclusion: The current study reveals the fact that *Pseudomonas* infection today is most often associated with contact lens wear. Nonetheless, we have not been able to trace how and why were these lens contaminated, yet it is strongly speculated that they might have been contaminated with Pseudomonas while handling with hands, water and contaminated protein free solution. Moreover, it is suggested that such contact lens associated keratitis and corneal ulcers can be prevented, if patients contact to physicians when they develop the early signs like a red or irritated eye and follow the strict hygienic conditions. These studies also indicates the hiking résistance rate of these isolates towards commonly prescribed antibiotics and suggest strongly prescribing quonolones to treat microbial keratitis.

Identification of Kaolin Polytypes and Other Minerals in Sediments of Thar Coal Field, Sindh, Pakistan

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Study of the core samples of powder and clay (< 2 ⌈) fraction grain size from coal field of Thar, Sindh, Pakistan, for the mineral composition, kaolinization processes and environments of the deposition, indicated both types of kaolinite i.e. well crystalline and degraded, as the main constituents in both the samples. Quartz and anatase were in sub-ordinate amounts in random powder, and dickite in clay fraction. Authigenic and degraded, both types of kaolinite, were present in the sediment. Dickite showed its presence in restricted samples, whereas anatase (TiO2), detrital of authigenic origin, were present in the whole-rock samples. It is inferred that leaching of kaolinite and sufficient amount of titanium from the Tharparkar granite produced authigenic anatase and some amount of detrital anatase was contributed by the weathering of Nagarparkar granite. Presence of detrital minerals i.e. quartz, kaolinite, anatase and also the iron oxide, suggest a nearshore deposition, under reducing and micro-oxidizing environments.

Quality Retention of Red Chilli (Capsicum Frutescens L.) During Different Storage Conditions and Packaging Materials

Anwar, Abid Hasnain

Red Chilli is a spice used as natural flavoring and coloring agent. Its dark red color and pungent flavor reach at its maximum during ripening. The compounds mainly responsible for its color are called Carotenoids and the compounds responsible for its flavor are known to be Capsaicinoids. These compounds are highly unsaturated and start to degrade during processing and storage, resulting loss of the quality of red chilli. The main factors of chilli deterioration are greater temperature during its grinding, moisture content of the fruit, increase in surface area of ground chilli and storage in presence of air, light and high temperature. The natural antioxidants, vitamin C (Ascorbic Acid) and vitamin E (Tocopherol) are present in red chilli that prevents the quality degradation of chilli, but to a lower extent. The color content can be determined by various methods including different liquid chromatographic methods. The standard method for color measurement is ASTA method, which is a spectrophotometric method. This method is used in this experiment due to its greater reliability. Pungency of red chilli has been measured by Scoville Organoleptic Test, UV spectrometric methods, Gas chromatography and different liquid chromatographic methods, in which High Performance Liquid Chromatography is the most reliable method. The spectrophotometric method has been used in this experiment to measure the content of pungency in chilli samples. The greater the storage temperature of chilli, the faster will be the degradation of color and flavor components. In this experiment, chilli samples were stored at 10^{o}C, 30^{o}C and 50^{o}C in a dark place for eight weeks to study the effect of temperature. Refrigerated storage showed quality degradation with slower rate. Different types of packaging materials indicated different effects on quality retention of a product. During storage red chilli autoxidize in presence of light; to overcome this autoxidation chilli has been placed in dark and packed in aluminum coated packaging material which is a good barrier of oxygen transmission. Ground chilli samples were packed in Polyethylene but it has not shown heat and light resistant properties.

Management of Root-Knot Nematode *Meloidogyne Incognita* Infecting Brinjal (*Solanum Melongena* L.) by Use of Biopesticides, Chemicals, Organic Amendments and Biocontrol Agents

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The potential of different controlling agents' *viz.*, bio-pesticides, chemicals, organic amendments and a bio-control agent *Pastura penetrans* was studied in controlling the root knot nematode *Meloidogyne incognita* on Brinjal "cv" Dilnasheen in two Greenhouse experiments. The experiments were conducted in earthen pots containing 1 kg sterilized soil. Twenty days old seedlings of Brinjal were planted in each pot and ten days after transplanting, the plants were inoculated with freshly hatched J_2 of *M. incognita.* One thousand J_2 suspended in 9 ml of water were inoculated into 3-cm deep holes surrounding the root zone of each plant. In the first experiment bio-pesticide (Abamectin 1.8 EC @ 1.0 ml/pot) and chemicals Azadirachtin (0.3 EC @ 0.5 ml/pot) and Lorasban (40 EC @ 0.5 ml/pot) were tested alone and also in combination with bio-control agent *P. penetrans* @ 30 mg root powder/pot for the management of root-knot disease. The best control i.e., 61% reduction in root galling was observed in pots treated with Azadirachtin + *P. penetrans* followed by Abamectin + *P. penetrans* (52%), Abamectin + *P. penetrans* (48%), Lorsban + *P. penetrans* (42%), Azadirachtin (36%) and Lorsban (21%) as compared to untreated control. All the treatments showed significant reduction in egg masses compared to untreated control, however, maximum decrease (66%) in egg masses was recorded in Azadirachtin +*P. penetrans* treatment and lowest reduction (45%) was recorded where Lorsban was applied. In another experiments bio-pesticides (Abamectin 1.8 EC @ 1.0 ml/pot and Emamectin 1.9 EC @ 0.5 ml/pot), organic amendments (Saw dust and Kanair leaves @ 10 g/pot each) and chemical (Furadan 3 G @ 0.0123 g/pot) were evaluated for controlling root-knot disease. Maximum reduction (62%) in root-galling was observed where Abamectin was applied followed by Furadan (53%); Emamectin (44%); Saw dust; (41%) and Kanair Leaves (32%) as compared to untreated control. Greater reduction (79%) in egg masses was observed where Abamectin was applied while lowest decrease (42%) in egg masses was recorded in Saw Dust treatment in comparison to untreated inoculated plants.

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

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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.

Effect of Exposure to High Temperatures on the Hatch and Reproduction of *Globodera Rostochiensis*

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Potato cyst nematodes are problem in the northern areas of Pakistan that also serve as seed production areas. Potato production in the plains of Punjab especially in autumn crop grows in similar conditions as in summer of northern areas. The report, still to be verified, of *G. rostochiensis* in the plains of Pakistan led to this study. The effect of high temperature was studied to observe the survival of cyst and it's hatching abilities. The data indicates that eggs in cysts can survive for some time even at the high temperatures of 35° and 40°C, provided they are dry, but lose hatching ability at these temperatures when moist. However storage at low temperature has no effect on hatching ability. The mean monthly temperature in Plains during spring crop is similar to those in summer crop of northern areas. The findings of the present study suggest that the temperature in the Plains suits the production of cysts of *Globodera* species to some extent, particularly *G. rostochiensis*. As far as it survival during the next five months when the average air temperatures are around 30°C is important. Although the hatching as well as the production of the PCN with the cysts which were exposed for 8 weeks at high temperatures suggest no significant reduction as compare to the normal stored cysts, there is still a need to do more studies to test the ability of the cysts to survive in hot climatic conditions in the field for a longer period.

Cauases and Environmental Impacts of Flash Floods in the Hindukush Region: A Case Study of Sample Villages along the Buni-Chitral Road, Chitral, Pakistan

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The paper attempts to find out the causes, impacts and remedies of flash floods, in order to minimize flood damages in Chitral, Pakistan. In the study area, flash flood is a serious and recurrent natural phenomenon. The summer and autumn torrential rainfall associated with thunderstorm, causes severe flash floods. These flash floods play a great havoc and cause loss of life, disruption of human activities and damages to property and agricultural land. For an intensive study twelve sample villages namely Singore, Shiaqotake, Hone, Daneen, Kari, Kaghooze, Ragh, Asthangol, Moribala, Zaeet, Kuragh, and Charun were randomly selected along the Chitral-Buni road. These villages are situated on alluvial fans, which are formed by hill the torrents. These torrents bring a lot of debris, which often block the flow and divert the water flow. This diversion of water causes flash floods, which adversely affect the human and physical environment of the study area. This paper is divided into eight sections. Section one gives detailed introduction of the study. Section two deals with the methodology adopted to conduct this research work. Section three describes the concept and definitions of flash floods, while section four explains the global and historical perspectives of flash floods. Section five discusses the flash flood hazard in Pakistan. Sections six and seven deal with the causes and impacts of flash floods in the study area, respectively. Section eight is given to summary, findings and policy recommendations.

A Simple Technique for Rearing Wax Moth (Lepidoptera: Galleridae), Used for Isolation and Mass Production of Beneficial Organisms

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Simple and an improved method for mass rearing of healthy and active *Galleria mellonella* larvae is developed. A diet developed by Shahina *et al,* 1998 was selected for further improvement incorporating up-to 65 gm of maize and 10 gm of yeast in the diet had no significant influence on the weight of *G. mellonella* larvae. However, as little as 20 gm of yeast and 35 gm of chickpea added to diet, increase the weight and activeness of *G. mellonella* larvae. These larvae stored in dry oat at 12-15° C in plastic boxes. *Galleria mellonella* larvae used for isolation and mass production of entomopathogenic nematodes, which was a bio-control agent of more than 300 pests of different crops in the world including Pakistan.

Runoff Collection in Reducing Rural Poverty in Cholistan

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The proposed study strives to provide an overall picture to for establishing a relationship of indigenous rainwater harvesting technology and its impact in poverty alleviation. The topographic form and the soil characteristics of Cholistan is the best catchment area for rainwater harvesting. Different profiles point out that the area is very poorly drained, capable of generating maximum runoff after absorbing minimum water. Water intake characteristics of fine textured soils show that infiltration rate is low to very low. Findings show that there is direct relationship between water availability and poverty reduction. Study also sheds light on both strengths and limitations of the indigenous technology on reducing rural poverty and recommends using this technology along with modern water harvesting techniques.

Effects of Infectious Diseases on the Economic Growth of Pakistan: Case Study of HIV Infection

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Infectious diseases cause reduction in the quality and the quantity of work done by an employee, thus effecting production, marketing and proper decision-making. In this paper, the authors consider the impact of HIV infection on the health structure of the Pakistani population. Using a Solow Growth Model, the paper shall describe dynamics of this infection. A simple statistical model for this process shall be presented.

Computation of Catastrophe Collision of Comets and Prediction of the Comet's Orbit Using Gravity

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The earth lives in a cosmic shooting gallery of comets and asteroids. The threat impacts on earth of asteroids and comets have very low probability but it has the great potential to create the public panic. The consequences of such collision are so catastrophic that the international community is now being to track "Near Earth Object" NEOs. Comets could be significant part of the impact hazard normally we distribute the comets in to three parts, "coma, Nucleus and tail. The orbital parameter of thousand of comets have been calculated, we make it convenient to gathered the accurate data from different source (NASA) and can apply for the study of comets. So this paper has two main objectives, one is to utilize the orbital parameters such as eccentricity, major axis, time periods, right ascension, declination etc. collecting from the different source and compute the orbit of incoming comet (hale-bopp) by using a mathematical model for asteroids and comets. Secondly, predict the comet (hale-bopp) trajectory under the influence of gravity for accurate measurement. Finally from the bases of result, analysis that "how close they will come to colliding with the earth and prediction from the bases of the result say earth is safe or not.

Challenging Assumptions of Poverty in Immigrant Communities (Sheffield, South Yorkshire): The Reverse Economy of Assets Investment in 'Home Country'

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Historical pattern of Pakistani migration to UK and settlement in cities like Sheffield indicates a successful social, cultural and economic conditions for families. This study aims to examine the much researched phenomenon of poverty among immigrants in UK applied to the Pakistani community living in Sheffield .The study focuses on the socio economic situations of Pakistani immigrant families in a specific geographical area, which was a magnet for these immigrants and also examines the ways in which that population continued to invest in its links in the family home country. By challenging the UK and local assumptions of poverty, this study aims to contribute to filling a gap in knowledge arising from the UK research and in the literature. Many people have examined this phenomenon from as many standpoints, but no significant material exists which looks at the experiences and living conditions of first generation Pakistani who arrived in UK to work as labourers, lived in a poor conditions to save money and make investment in their home country by specific patterns and type of housing construction. This study will also examine the local personal social economy of the population in the UK and families in Pakistan using accepted poverty markers of these immigrants with a focus on benefits data related to receipts per family unit. To put the present experiences into context, it is necessary to compare the assets at their places of origin and how these families are living in the areas of Sheffield today. Qualitative methodology is found to be appropriate for the study of these immigrants. We will investigate the background and pre-arrival life styles, culture and marriages followed by post-arrival early period of settlement of families. The study will develop algorithms for changes in family socio economic and cultural lives, economic conditions and investments. Further to the study there will be a focus on the changing attitude of the immigrant family towards the host and immigrant wider society and investigate the extent the impact of religion, children's education, marriages and kinship have on people's lives The study will use validated survey instruments such as the SF 36 to examine the population's health status and apply modelling techniques to predict the impact of continuous receipt of benefits on their personal health and socio economic status, acknowledging their economic independence, prior to and after migration.

New Trends in Chemical Approaches to Clean and Renewable Energy Sources

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During the coming century, the increasing population of the world and the ever improving standards of living of the vast majority of the world's population will bring the world's traditional energy resources under tremendous pressure. On one hand, these resources are not sufficient to meet the needs of the world and they are distributed unevenly. As a result, conflict and war over the world energy resources will be inevitable unless other sources are tapped. On the other hand, the use of these traditional energy sources are damaging the environment in an irreversible manner. Many alternatives to these fuels have been suggested. In this presentation the potential use of solar energy with help of suitably crafted photocatalysts and electron transfer agents to split water into hydrogen and oxygen will be surveyed. The hydrogen thus produced can be used as a fuel.

H_2O + *sunshine* = $H_2 + 1/2O_2$ (Photocatalysts, ET agents) $H_2 + 1/2O_2 \rightarrow H_2O$ + Energy

Practical and theoretical challenges and attempts to design photocatalysts and Electron transfer agents made so far and the degree of success achieved will be reviewed.

Comparison of Mean Platelet Volume in Patients with Diabetes Mellitus, Impaired Fasting Glucose and Non-Diabetic Subjects.

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Introduction: Large platelets are more thrombogenic and thus put the patient at a higher risk status. Mean platelet volume (MPV) is a determinant of platelet functionality and increased MPV is associated with increased risk for myocardial infarction, stroke and transient ischaemic attacks. The objective of this study is to compare the MPV in patients with diabetes mellitus (DM), impaired fasting glucose (IFG), and non-diabetic controls.

Methods: This cross-sectional study was conducted at Dow University of Health Sciences, Karachi, Pakistan between the period of September 2006 and May 2007. Sample size of 204 in each group was calculated using power (1-beta) of 90 percent and level of significance (alpha) at five percent. Confirmed patients with DM, IFG and non-diabetic controls were selected and allocated to respective groups. A total of 612 patients were selected and allocated to three groups of 204 patients each, referred to as DM group, IFG group and non-DM group. Fasting blood glucose, platelet counts and MPV were done.

Results: Mean MPV in the DM group was 9.34 fl, in the IFG Group 8.98 fl, and in the non-DM group 8.63 fl. Comparison of MPV values for the three groups showed statistically significant intergroup and intragroup differences, with a p-value of 0.00.

Conclusion: MPV was significantly increased in the IFG group, as compared to the non-DM group, and it increased further when compared to the DM and IFG groups.

A study of fMRI and its associated problems

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For patients with brain tumors, surgical resection is often the ideal first treatment; in some tumor types, such as meningiomas, surgery may be curative. However, the proximity of vital brain structures may limit the ideal goal of complete tumor removal with preservation of function. Surgery may not be offered to patients who might benefit from it on the assumption that their tumor is too close to so-called "eloquent" brain, such as the areas responsible for controlling movement or speech. Recent advances in imaging techniques allow for nonivasive brain "mapping", by which the precise relationship of areas controlling brain function to a nearby tumor can be determined. One such method is functional MRI, or fMRI. However, it has some inherent problems like low SNR (signal to noise ratio) and the consequences lead to the low temporal density. The solutions to these problems must be investigated for the efficient results to be obtained from this technology.

Nematode Ova as a Source of Intestinal Infection in Different Occupational and Age Groups in Human Population of Swat, Pakistan

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The district Swat is considered to be one of the districts of Pakistan with proximately 1.2 million populations. The importance of this study lays in its approach to tackle a significant issue, which is the health of the human population of the region who are Farmers, Education community and shepherds. This study was aimed at determining the prevalence of intestinal parasites among the above mentioned communities. Observations were made on 403 faecal samples collected from above mentioned occupational categories visiting different sites and locations as well as from Basic Health Units (BHU) and Hospitals and Schools of the region from November 2007 – November 2008. This study was conducted at Medical Zoology Laboratory Vertebrate Pest Control Institute (VPCI), Pakistan Agricultural Research Council (PARC), Southern Zone of Agricultural Research Centre (SARC) Karachi. The samples were examined using Wet Mount Techniques (WMT) in normal saline and iodine solution. The Sedimentation, Floatation and Centrifugation procedures and techniques were applied to confirm the negative cases. The Research findings are represented by nematode ovae as well as in hatching condition, the rhabditiform larvae were also observed. The over all prevalence of intestinal parasitic infections were 208(51.6%) including 101(25.6%) single infections, 62(15.3%) double infections, 30(7.44%) triple infections and 15(3.72%) quadruple infections. The prevalence rate of *Ascaris lumbricoides* 121(30.0%), and *Tricuris trichura* 62(15.3%) were relatively high. *Enterobius vrmicularis* 40(9.92%), *Encylostoma duedenale* 32(7.94%). The other helminthes as well as protozoal parasites found during the investigations. Conclusively, shepherds is one of the highest infected community of all the studied communities. The intestinal parasitic infections were higher in prevalence under 15-years of age than above 15-years. The present study significantly shows higher intestinal parasitic infections in males than in females. It is therefore necessary that emphasis must be laid on improvement of the existing hygiene and living standard of the people in this area. It is suggested that a wide range campaign should be launched by physicians, educationists and mass media to educate the people so as to make them aware of the hazards of these parasitic diseass and advantages of the hygienic living. A concrete effort in this regard may bring fruitful results to improve health of the inhabitants of this region in particular and of Pakistan in general.

Comparative study of Voluntary intake, digestibility and production performance of Rye grass and Berseem fodders in Nili-Ravi buffaloes

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A comparative study of voluntary intake, digestibility and production performance of Rye grass and berseem fodders in Nili-Ravi buffaloes was conducted at Livestock Experiment Station Bahadarnagar, Okara. Ten lactating buffaloes were randomly selected and divided in two groups. The data obtained on various parameters were subjected to statistical analysis. Significant differences ($P<0.05$) were observed in voluntary feed intake and palatability of Rye grass and Berseem which were 63.3 ± 1.82, 47.46 ± 6.48 and 44.85 ± 6.65, 27.44 ± 7.43 respectively. No significant differences of both fodders were observed in milk yield and change in body weight of the animals. In digestibility coefficient parameters, significant differences ($P<0.05$) in both the fodders were observed in dry matter, crude protein and ether extract digestibility. Dry matter digestibility was maximum in rye grass (66.82 ± 1.82) as compared to berseem fodder (47.46 ± 6.48), while crude protein and ether extract digestibility were observed comparatively highest in berseem (66.55 ± 5.63, 45.48 ± 5.02) and lowest (48.66 ± 4.26, 42.06 ± 8.49) in rye grass respectively. Crude fiber digestibility and nitrogen free extract were statistically similar in both the fodders.

Self-sufficiency in Animal Food Products & Livestock Genomics – Go Hand in Hand

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Global demand for livestock products is expected to double during the first half of this century, as a result of the growing human population. Pakistan is also facing acute shortage of animal food products due to a huge gap in the supply demand chain. This has made it impossible for a common man to afford even minimum standards of animal protein nourishment. Per capita availability of milk and meat is no way near the minimum standards to sustain healthy life. This can only be improved by following by improving per animal producitivity by integrating present breeding schemes with genomic biotechnologies such as genome mapping, sequencing, QTL mapping for rapid genetic gains in farm livestock species. The genomic bio-technologies help identifying DNA markers associated with production traits and disease resistance. Once desirable DNA polymorphisms within genes of interest are known, recombinant DNA technology can be applied to producing genetically modified animals with higher milk and meat production potentials. With advancement in the reproductive biotechnologies it is now possible to select and rapidly propagate superior germ plasm using artificial insemination, embryo transfer and other assisted reproductive technologies (ART). The successful application of these technologies has yielded miraculous results in per animal productivity in farm animals. The application of molecular diagnostics promises the detection and characterization of pathogenic micro-organism associated with infectious diseases with the help of PCR amplification and sequencing. UVAS is the pioneering institution in initiating applied research work in applied biotechnology at its Molecular Cytogentics and Genomic Labs. A number of initiatives including AMPK Gene Identification for producing energy efficient farm animals, Parentage Analysis, Forensic cases (D-Loop), Parentage Analysis, Forensic cases (STRs), PrP gene for Scrapie susceptibility in Sheep and Goats, Booroola Gene for Fecundity traits and Genetic Diversity in Cattle and Buffalo (D-Loop/STR). This technology, in principle, is more powerful than the atomic bomb.

Neuroscience Training Programs in Pakistan

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Background: We propose to form a "Pakistan Neuroscience Association" to bring together neuroscientists from all parts of Pakistan and to facilitate communication between them.This proposal stems from positive experience with relatively new similar associations in other countries. We have been encouraged in this venture by the visit of Professor Laurence Garey to the University of Karachi from 19 to 23 November 2006, representing the Neuroscience Programmes Network of the International Brain Research Organization (IBRO). We are assured of support from the Vice-Chancellor and the Director of ICCBS.

Introduction: Pakistan has an active neuroscience community. It includes researchers and students in basic science institutes, as well as interested staff in clinical environments, such as neurologists, neurosurgeons, psychiatrists and psychologists. Scientists working on Brain Chemicals Cells and other brain related disciplines are present in every University and Research Centers through out Pakistan. Experience in other countries shows that often specialist scientists do not know who is working on what and where, and this hinders communication. A neuroscience association would help build local community feeling and encourage mutual aid. This is "communication". It would help members realize how large and enthusiastic is the local community, and where potential weaknesses and gaps exist. It would help identify topics for development. There would be an "alumni feeling". Senior scientists would be on hand to help juniors with advice, and juniors help seniors keep up with new trends. There would be opportunities for juniors to participate and organize meetings, seminars or collaborations. The association would provide a single "address" for international contacts.

Practicalities: We would suggest a basic programme of monthly meetings. They would consist of presentations from local members or visitors, and would be extended to benefit from coincidental visits by overseas neuroscientists, in the country for other reasons. They could cover partly basic, partly clinical topics. Main meetings would be outside work hours so that seniors would be available, at an equal level, and outside the workplace, for communication with juniors. Also, clinicians and basic neuroscientists would be in social contact for cross-fertilization of ideas. Initially a committee would be formed of "founding" officers, consisting of a chair, a secretary, a treasurer and 2 or 3 other members. They would be expected to perform all the functions needed in the first year of activity, and would automatically resign after loner year, to be re-elected or replaced at the first formal business or annual general meeting.

Conclusions: There may already be other related associations (eg of neurosurgeons), but this would not hinder the new society, for everyone would be free to join or not. IBRO is enthusiastic to see new ventures such as this in countries where neuroscience is developing. The Pakistan Neuroscience Association would be a candidate for association to IBRO and thereby be eligible all the benefits, such as automatic membership of IBRO for all its members, with access for them to forums, schools and fellowships. Again, in the context of IBRO, the new association would provide an ideal nucleus for the organization of schools, and training programmes.

Immunocytochemistry of Adenohypophysis in Lactating and Non Lactating Camels (*Camelus Dromedarius)*

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This study was conducted to find alterations in adenohypophysis as affected by age and physiological stages using immunohistochemistry. Pituitary glands from each of ten lactating and non lactating camels (age: 5-10 yrs and 11-yrs onward) were acquired from local abattoir of district Faisalabad and Lahore. Somatotrophs count was significantly high in 5-10 years than 11 yrs onward camels irrespective of their physiological state while overall somatotrophs count was significantly high in lactating than in non lactating camels irrespective of their age. Somatotrophs size, area and volume did not differ between two groups. Somatotrophs nucleus size, area and volume were significantly high in 5-10 yrs camels irrespective of their physiological state. Lactotrophs count, size volume and area were significantly high in 11 yrs onward camels irrespective of their physiological states. Lactotroph nucleus size, area and volume were significantly high in 11 yrs onward camels irrespective of their physiological states. Like lactotrophs, leutotroph count, size, area and volume were significantly high in 11 yrs onward camels irrespective of their physiological states. Nucleus size, area and volume were significantly high in 5-10 yrs lactating and 11 yrs non lactating as compared to their counterpart. Thyrotrophs count was significantly high in 5-10 yrs and in lactating camels irrespective of their physiological state or age group, respectively. Thyrotroph size, area and volume did not alter in the same conditions. Interaction of age and physiological state revealed that thyrotrophs count was significantly high in 5-10 yrs and 11 yrs onward lactating while its size and area were significantly high in 5-10 yrs non lactating and 11 yrs onward lactating camels. Thyrotrophs nucleus size, area and volume also followed the same pattern. It was concluded from this study that both age and physiological states affect the morphometric study of adenohypophysis of camel.