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**WELCOME TO THE CONFERENCE**

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The organizers of the conference welcome you to Islamabad, Pakistan for attending International Conference on Plants, People and Climate, 2013. The climate change has been responsible for floods, extreme weather, earthquakes, rise of sea levels, increase in crop pests, diseases and for some other catastrophes. The issue of global warming can slow down the pace of development especially in developing countries. This challenge is even bigger for 3rd world nations including Pakistan. The country’s vulnerability to such adverse impacts is likely to increase considerably in the coming decades. The purpose of the conference is to collaborate with international universities, organizations, NGO and professionals, providing a platform for national students, researchers and industrial experts, in the field of plant ecology and climate change.

The discussion topics of the conference will focus on the following themes:

1. Global warming & impact of climate change in our part of world and mitigation technologies.
2. Impact on Human, Health, Water and Energy.
3. Environment and Natural Resources.
4. Natural Disaster and Communities.
5. Agriculture and Forestry.

We hope that the conference continues the work of bringing these climate change issues to the forefront of everyone's attention.

1. **ABOUT THE CONFERENCE**

**…………………………………………………………………………………………………………**

1. **RATIONALE**

The purpose of the conference is to collaborate with international universities, organizations, NGO and professionals, providing a platform for national students, researchers and industrial experts, in the field of plant ecology and climate change. This conference will be a gathering of experts from United Nation Food Supply. USA Organization working for enhancement of environment and education, university expert of wood and fiber quality. Flood risk Management, ecosystem, forestry in relation to climate change. The target audience would be research students, Pakistani experts and Professors working in above mentioned fields.

1. **OBJECTIVES**
* To introduce our institution and its scientific activities to the national and international experts.
* To give the national participant an opportunity to share their experience with international experts for extending collaborate.
* To invite scientist from world key research institution to acquaint with updated new trends in the subject and its application in Pakistan.
* To present a soft picture of Pakistan to outer world.
* To enhance research activities in our institution.
1. **DATE AND VENUE**

5th to 7th November, 2013

Venue : National University of Sciences and Technology.(NUST) , Islamabad, Pakistan.

1. **CONFERENCE PARTICIPANTS**

The world’s top scientists in all relevant fields of climate change are planned to gather in this conference to promote exchange of knowledge and expertise among scientific community dealing with the imperative issue of climate change. The experts from China, Sudan, Poland, Argentina, USA, Nepal and Pakistan have agreed to attend the conference and are expected to participate.

1. **Aims and Objectives**

**…………………………………………………………………………………………………………**

Climate Change resulting from an increasing concentration of Greenhouse Gases (GHGs) in the atmosphere due to the use of fossil fuels and other anthropogenic activities has become a major worldwide concern. It is particularly so for Pakistan because climate change is posing a direct threat to its water, food and energy security. The country?s vulnerability to such adverse impacts is likely to increase considerably in the coming decades as the average global temperature, which increased by 0.6oC over the past century, is projected to increase further by 1.1 to 6.4oC by the end of the current century.

**Aims and Objectives:**

* Knowledge sharing on climate change impacts on flora and fauna relevant to Pakistan
* Sharing ideas, success stories and case studies from scientists, researchers and technical experts for evolving better future of the country
* Creating opportunities for extending international cooperation and collaboration in research
* Focusing on scientific policies and strategies in climate change perspectives
* Building interest to look intermixed relations of plants and people moving towards climate change vulnerability
* Providing a window for discussing current and future trends related to the plants, people and climate change

**List of speakers of International Conference on Plants, People and Climate**

 **5th- 7th November, 2013**

**International Presenters**

|  |  |  |
| --- | --- | --- |
| 1 | Name |  **Prof. Dr. Yu Liu** |
|  | Title | Tree-ring stable carbon isotope-based May–July temperature reconstruction over Nanwutai, China, for the past century and its record of 20th century warming |
|  | Institution | State Key Laboratory of Loess and Quaternary Geology, Institute of Earth Environment, Chinese Academy of Sciences, Xi’an 710075, China |
| 2 | Name | **Dr. Ryszard J. Kaczka**  |
|  | Title | Climate change and flood risk in Carpathians. Dendrogeomorphic reconstruction of flood events in Polish Tatra Mountains |
|  | Institution | University of Silesia, Poland, \*\*University of Berne, Switzerland |
| 3 | Name | **Dr. Arshia Khan** |
|  | Title | Climate change and world food resources |
|  | Institution | United Nation World Food Programme based Juba, South Sudan |
| 4 | Name | **Dr. Stella Bogino**  |
|  | Title | Dendrochronology in the Argentinean pampas: past and present research and future challenges  |
|  | Institution | Departament of Agronomic Sciences, State University of San Luis, Avenida 25 de Mayo 384, 5730, Villa Mercedes, San Luis, Argentina. |
| 5 | Name | **Dr. Kambiz Pourtamasi** |
|  | Title | Multi-Proxy data from Intra-Annual study of Tree Rings |
|  | Institution | Department of Wood and Paper Science and Technology, University of Tehran |
| 6 | Name | **Dr. Vahid Safdari** |
|  | Title | The effect of erosion on anatomical characteristics of root and bark of juniper |
|  | Institution | Department of Wood and Paper Science, Karaj Branch, Islamic Azad University, Karaj, Iran |
| 7 | Name | **Dr. Qiufang Cai** |
|  | Title | A Dendroclimatic Reconstruction Of May-June Mean Temperature Variation In The Heng Mounatins, North ChinaSINCE 1767 AD |
|  | Institution | The State Key Laboratory of Loess and Quaternary Geology, The Institute of Earth Environment, Chinese Academy of Sciences, Xi'an 710075, China |
| 8 | Name | **Dr. Narayan Gaire** |
|  | Title | Structure and dynamics of tree line with climatic change in Central and Eastern Nepal Himalaya. |
|  | Institution | Faculty of Science, Nepal Academy of Science and Technology, Khumaltar, Lalitpur GPO Box 3323, Kathmandu, Nepal |
| 9 | Name | **Dr. Prabina Rana** |
|  | Title | Population structure of Rhododendron campanulatum D. Don and associated tree species along the altitudinal gradient at Sagarmatha National Park, Nepal |
|  | Institution | Nepal Academy of Science and Technology (NAST), Khumaltar, P.O.Box 3323, Nepal |
| 10 | Name | **Dr. Immad Ahmed** |
|  | Title | The need for environmental awareness the only sustainable Solution |
|  | InstitutionNameTitleInstituteNameTitleInsttuteNameTitleInstituteNameTitleInsttuteNameTitleInsttuteNameTitleInsttuteNameTitleInsttute | EMPOWER, 2608 Top Ridge Dr.Washington, DC 2002 USA.**National presenters****Dr. Mohsin Iqbal**  Plant people-climate Nexus: from sustenance to sustainabilityGCISC**Dr. Muhammad Munir Sheikh** Forest response to climate change in PakistanGCISC**Dr. Javed Ali Khan**Impact of climate change on cities of Pakistan and options foradoptation and mitigation. GCISC**Dr. Javed Malik** Climate change Scenerio of PakistanMember Planning Commission**Dr. Ghazanfar** Water resources GCISC**Dr. Zia Hashmi** GCISC Water resources of Pakistan**Dr. Ghulam Rasul** Climate change assessment and future scenarioPakistan Metrological Dept.**Dr. Afzal Ahmed**Variation in Monsoon patternPakistan Metrological Dept. |
| 11 | Name | **Dr. Kamran Ahsan­­­** |
|  | Title | Role of ICT in Climate Change MonitoringA review Study of ICT based Climate Change Monitoring Services |
|  | Institution | Department of Computer Science, Federal Urdu University of Arts, Science and Technology |
| 12 | Name | **Dr. M. Osama Zafar**  |
|  | Title | Reonstruction of lost temperate from Gilgit and Hunza |
|  | Institution | FUUAST, Karachi |
| 13 | Name | **Dr. Abdul Razaq** |
|  | Title | Climate change and impact on biodiversity in Gilgit- Baltistan |
|  | Institute | Department of Biological Science, KIU, Gilgit |
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| 14 | Name  | **Dr. Shahid Shaukat** |
|  | Title | Effect of cultural filtrate of trichoderma species antagonist on growth of Alternaria solani |
|  | Institution | University of Karachi, Karachi |
| 15 | Name | **Dr. Zaheeruddin Khan** |
|  | Title | Potential of dendrochronology in forest ecosystem research |
|  | Institution | Department of Botany, GC University, Lahore |
| 16 | Name | **Dr. Moinuddin Ahmed** |
|  | Title | Using tree-ring chronologies for water resource management.  |
|  | Institution | Department of Botany, FUUAST, Karachi |
| 17 | Name | **Dr. Abid** |
|  | Title | Pathogenicity of some important root rot fungi to the chilli crop and their biological control |
|  | Institution | Department of Botany, FUUAST, Karachi |
| 18 | Name | **Dr. Tasveer Zehra Bokhari** |
|  | Title | Particular matter effect on foliage and bio chemical attributes of two fruiting plants of Multan |
|  | Institution | Botany Division, Institute of Pure & Applied Biology, Bahauddin Zakariya University, Multan |
| 19 | Name | **Dr. Nasrullah Khan** |
|  | Title | Composition, Structure and regeneration dynamics of Olea ferruginea Royle forests from Hindukush range of Pakistan  |
|  | Institution | Laboratory of Plant Ecology Department of Botany University of Malakand, Chakdara Dir Lower Khyber Pakhtunkhwa  |
| 20 | Name | **Dr. Arshad Ali Shedayi**  |
|  | Title | Climatic change and ethnobotanical diversity in Khunjerab National Park  |
|  | Institution | Department of Biological Sciences, Karakoram International University, Gilgit |
| 21 | Name | **Dr. M. Wahab** |
|  | Title | Forest Ecology of conifer and dendrochronological potential of Hindukush range |
|  | Institution | Institute of Plant Sciences and Biodiversity, University of Swat, Khyber Pakhtunkhwa |
| 22 | Name | **Dr. Faheem Siddiqui**  |
|  | Title | Topographic and edaphic control of arboreal vegetation and the distribution and growth of tree species in moist temperate areas of Himalayan and Hindukush region of Pakistan |
|  | Institution | Department of Botany, University of Karachi |
| 23 | Name | **Dr. Atta M. Sarangzai** |
|  | Title | Ecological status and regeneration pattern o juniper in Balochistan |
|  | Institution | Department of Botany, University of Balochistan, Quetta |
| 24 | Name  | **Dr. Syed Aneel Gilani**  |
|  | Title | Floral Diversity of Manglot Wildlife Park, Nizampur (District Nowshera) KPK, |
|  | Institution | Botanical Sciences Division, Pakistan Museum of Natural History Islamabad  |
| 25 | Name | **Dr. Sohaib Muhammad** |
|  | Title | Ecological Study Of Weed Flora In Some Wheat Fields Of Tehsil Jaranwala, District Faisalabad |
|  | Institution | Department of Botany, GC University, Lahore |
| 26 | Name | **Dr. Toqeer Ahmed Rao**  |
|  | Title | Seasonal distribution of aeromycospora of Karachi: a multivariate approach |
|  | Institution | Department of Botany, FUUAST, Karachi |
| 27 | Name | **Dr. Alamdar Hussain** |
|  | Title | Growth-climate response of Spruce (Picea smithiana) from Stak valley of Central Karakoram National Park (CKNP), Gilgit-Baltistan, Pakistan: A dendrochronological approach |
|  | Institution | Department of Botany, FUUAST, Karachi |
| 28 | Name | **Saadullah Khan Leghari** |
|  | Title | Suspended particulate matter in Ambient air at urban areas of north-east balochistan, Pakistan |
|  | Institution | Department of Botany University of Balochistan Quetta, Pakistan |
| 29 | Name | **Dr. Alia Abbas** |
|  | Title | Surface studies of the fifteen genera of phaeophycota from Karachi coast of Pakistan |
|  | Institution | Department of Botany, FUUAST, Karachi |
| 30 | Name | **Dr. Sepideh Namvar** |
|  | Title | The potential of dendrochronology in Iran in relation to the neighboring countries |
|  | Institution | University of Tehran, Iran |
| 31 | Name | **Dr. Rafat** |
|  | Title | Effect of organic mulch on relative water content (RWC) and electrolyte leakage (EL) in okra plant (lady finger) grown under salinity |
|  | Institution | Department of Botany, FUUAST, Karachi |
| 32 | Name | **Dr. Faisal Hussain** |
|  | Title | Control of some important soil-borne fungi by chitin associated with chilli (Capsicum annuum l.) in lower Sindh, Pakistan  |
|  | Institution | Sindh University, Jamshoro |
| 33 | Name | **Ramiz Raja** |
|  | Title | Ethno medicinal survey for some wild plants of Muzaffarabad, Pakistan |
|  | Institution | Botany Division, Institute of Pure & Applied Biology Bahauddin Zakariya University Multan. |
| 34 | Name | **Dr. Muhammad Akbar** |
|  | Title | Multivarite analysis of the some forests vegetation from dry temperate areas (Gilgit, Astore and Skardu districts), of Gilgit-Baltsitan, Pakistan |
|  | Institution | Department of Botany, FUUAST, Karachi |
| 35 | Name | **Umme Umara** |
|  | Title | Ethno botanical importance of some plants of Shogran valley, Pakistan |
|  | Institution | Botany Division, Institute of Pure and Applied Biology, Bahauddin Zakariya University, Multan |
| 36 | Name | **Arsalan Siddiqui** |
|  | Title | Age structure, population dynamics of growth pattern of Cedrus deodara |
|  | Institution | Dept. of Botany, University of Karachi, Karachi |
| 37 | Name | **Dr. Salma Mirza** |
|  | Title | Synthesis of Benzothiazole Derivatives and Their Urease Inhibition |
|  | Institution | H. E. J. Research Institute of Chemistry, International Center for Chemical and Biological Sciences, University of Karachi, Karachi |
| 38 | Name | **Muhammad Bilal Saeed** |
|  | Title | Ecological Status And Association Of Dalbergia sissoo In Jhok Reserve Forest Lahore |
|  | Institution | Department of Botany; GC University, Lahore |
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|  |
| 39 | Name | **Narayan Prasad Gaire** |
|  | Title | What might be the consequences of climate change on tree line in Nepal |
|  | Institution | Faculty of Science, Nepal Academy of Science and Technology, Khumaltar, Lalitpur GPO Box 3323, Kathmandu, Nepal |
| 40 | Name | **Nathsuda Pumiyumnong** |
|  | Title | Climatological research in North West Thailand |
|  | Institution | Faculty of Environment and Resource Studies,Mahidol University, Salaya, Phutthamonthon, Nakhon Pathom, THAILAND |
| 41 | Name | **Vahidreza Safdari** |
|  | Title | Effects of air pollution on Pinus eldarica wood |
|  | Institution | Department of Wood and Paper Science, Karaj Branch, Islamic Azad University, Karaj, Iran |
| 42 | Name | **Hafiza Asma** |
|  | Title | Determination of stability constant of Nicotinate camplexes by potentiometric studies |
|  | Institution | Dept. of Chemistry, University of Karachi, Karachi |
| 43 | Name | **Rubina Perween** |
|  | Title | Fungal contamination of some milk analogue (tea whitener) in Karachi, Pakistan  |
|  | Institution | Dept. of Chemistry, FUUAST, Karachi |
| 44 | Name | **Naila Ayub** |
|  | Title | Removal of Cr (VI) from aqueour solution onto Boswellia serrata. |
|  | Institution | Dept. of Chemistry, FUUAST, Karachi |
| 45 | Name | **Darakshan Ara** |
|  | Title | Adsorption power of styptic, Acacia catechu (Pale catechu), for FE (LL)ion from dilute Aqueous solutions |
|  | Institution | Dept. of Chemistry, FUUAST, Karachi |
| 46 | Name | **Asma Siddiqui** |
|  | Title | Removal of CR (VI) by adsorption onto curcuma aromatic |
|  | Institution | Dept. of Chemistry, FUUAST, Karachi |
| 47 | Name | **Saira Bashir** |
|  | Title | Adsorption studies of Cr (VI) from aqueous solution onto cucuma longa |
|  | Institution | Dept. of Chemistry, FUUAST, Karachi |
| 48 | Name | **Sobia Hashim** |
|  | Title | Adsorption studies of Cr (VI) from aqueous solution onto cinnamomum zeylanicum |
|  | Institution | Dept. of Chemistry, FUUAST, Karachi |
| 49 | Name | **Tuba** |
|  | Title | Studies on indigenous plants of Karachi for the control of root rot-Root knot disease complex |
|  | Institution | Dept. of Botany, FUUAST, Karachi |
| 50 | Name | **Faisal Hussain** |
|  | Title | Pathogenicity test of some important root rot fungi on chilli crop |
|  | Institution | Dept. of Botany, FUUAST, Karachi |
| 51 | Name | **Hina Zafar** |
|  | Title | A survey of Phylloplane mycoflora of Solanum lycopersicum, Capsicum annum and Cynodon dactylon.  |
|  | Institution | Dept. of Botany, FUUAST, Karachi |
| 52 | Name | **Jawaria sultana** |
|  | Title | Dermatophytic caused by three genera of dermotophytic fungi microsporum, Trichophyton and Epidermophyton.  |
|  | Institution | Dept. of Botany, FUUAST, Karachi |
| 53 | Name | **Alia Ahmed** |
|  | Title | Dendrochronological studies on Junipers excelsa (M.Bieb) of Balochistan, Pakistan |
|  | Institution | Dept. of Botany, University of Balochistan, Quetta |
| 54 | Name | **K. H. SHAH** |
|  | Title | Kinetics and Thermodynamics of Ca(II), Al(III) and Cr(III) sorption in a Mixed System on Amberlyst.15(H+) |
|  | Institution | National Center of Excellence in Physical Chemistry, University of Peshawar |
| 55 | Name | **Muhammad Azim Khan** |
|  | Title | Social and climate changes as major threats to the weed biodiversity of high altitude Northwest region in Pakistan |
|  | Institution | Weed Science Department, The University of Agriculture, Peshawar |
| 56 | Name | **Sheikh Saeed Ahmad** |
|  | Title | Valuating the effecst of soil ph and moisture on the plant species of changa manga forest using van dobben circles |
|  | Institution | Department of Environmental Sciences, Fatima Jinnah Women University, Rawalpindi |
| 57 | Name | **Farzana Perveen** |
|  | Title | Characteristics of the Bat Fauna (Mammalia: Chiroptera) from Peshawar and Adjacent Areas, Khyber Pakhtunkhwa, Pakistan |
|  | Institution | Chairperson, Department of Zoology, Shaheed Benazir Bhutto University, Main Campus, Sheringal, Dir Upper, Khyber Pakhtunkhwa |
| 58 | Name | **Jawaid Akram** |
|  | Title | Climate chang and few challenges |
|  | Institution | FUUAST, Karachi |

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|  |
| 59 | Name | **Mahpara Ali** |
|  | Title | Impact of vehicular exhausts on biomass and stomatal behaviour of bougainvillea spectabillis willd. along some roadsides of Lahore city |
|  | Institution | Department of Botany: GC University, Lahore  |
| 60 | Name | **Muhammad Waheed** |
|  | Title | Tree biomass along green corridor of canal bank road (cbr), lahore (from huseyn shaheed suhrawardy underpass to thokar niaz baig) |
|  | Institution | Department of Botany, GC University Lahore |
| 61 | Name | **Anser Mukhtar** |
|  | Title | Ecological study of weed flora in some wheat fields of Tehsil Jaranwala, district Faisalabad  |
|  | Institution | Department of Botany, GC University, Lahore |
| 62 | Name  | **Uzma Younis** |
|  | Title | Particulate matter effect on foliage and biochemical attributes of two fruiting plants of Multan, Pakistan |
|  | Institution | Botany Division, Institute of Pure and Applied Biology, Bahauddin Zakariya University, Multan |
| 63 | Name | **Shakil Ahmad** |
|  | Title | Effect of copper on various physiological attributes of Zea mays l. in irrigation water |
|  | Institution | Botany Division, Institute of Pure and Applied Biology, Bahauddin Zakariya University, Multan |
| 64 | Name | **Misbah Yaseen** |
|  | Title | Diversity of wild plants of salt region of Soan valley, Pakistan |
|  | Institution | Botany Division, Institute of Pure & Applied Biology-Bahauddin Zakariya University, Multan |
| 65 | Name | **Hina Zahid** |
|  | Title | Phytochemical Analysis and Antibacterial Activity of Ficus carica and Gymnema sylvestre |
|  | Institution | Botany Division, Institute of Pure and Applied Biology, Bahauddin Zakariya University, Multan |
| 66 | Name | **Ali Noor** |
|  | Title | Plant biodiversity and distribution status in astore valley, gilgit-baltistan, Pakistan |
|  | Institution | Department of Botany University of Karachi, Karachi |
| 67 | Name | **Farid Ahmed** |
|  | Title | Method for evaluating the status of scrub forest |
|  | Institution | Department of Forestry Punjab, Cooper Road, Lahore |
| 68 | Name | **Faizan Ullah** |
|  | Title | Plant Based Dye Resources of Khyber Pakhtunkhwa |
|  | Institution | Department of Plant Sciences, Quaid-i-Azam University Islamabad |
| 69 | Name | **Saima Shehzadi** |
|  | Title | Multivariate Analysis of Vegetation in Wet Temperate Forests of Pakistan |
|  | Institution | Botany Division, Institute of Pure & Applied Biology Bahauddin Zakariya University Multan |
| 70 | Name | **Sajjad Hussain** |
|  | Title | Studies of Monthly Variations in Physico-chemical parameters of Four Freshwater Bodies of Sulaeman |
|  | Institution | Institute of Molecular Biology and Biotechnology, B. Z. University, Multan |
| 71 | Name | **Sultan Mehmood Wazir** |
|  | Title | Vegetation Analysis of Zinc Enriched Hills of District Karak, KPK, Pakistan |
|  | Institution | Department of Botany, UST, Bannu |
| 72 | Name | **Ishtiaq Hussain** |
|  | Title | Diversity in landraces of Fagopyrum esculentum from different Ecological Regions of Baltistan, Pakistan |
|  | Institution | Department of Biological Sciences Karakorum International University Gilgit-Baltistan |
| 73 | Name | **Khalid Farooq Akbar** |
|  | Title | Preparing our cities for a changing climate: urban green spaces as a way out? |
|  | Institution | Department of Botany, Govt. Post-graduate College, Sahiwal |
|  | Name | **Arshad Ali Shedayi** |
|  | Title | Climate change and ethnobotanical diversity in khunjerab national park, gilgit, Pakistan |
|  | Institution | Department of Biological Sciences, Karakoram International University, Gilgit |
| 74 | Name | **Ghulam Raza** |
|  | Title | Variation in vegetation cover features across altitudinal gradients in rangelands of central karakoram national park, gilgit-baltistan, Pakistan |
|  | Institution | Department of Environmental Sciences, Karakorum International University Gilgit-Baltistan |
| 75 | Name | **Nishwa Fayyaz** |
|  | Title | Preliminary Phytochemical Analysis and Detection of Antimicrobial Activity of Ricinus communis |
|  | Institution | Botany Division, Institute of Pure and Applied Biology, Bahauddin Zakariya University, Multan |
| 76 | Name | **Ishtiaq Hussain** |
|  | Title | Diversity in landraces of Fagopyrum esculentum from different Ecological Regions of Baltistan, Pakistan |
|  | Institution | Department of Biological Sciences Karakorum International University Gilgit-Baltistan |
| 77 | Name | **Rohma Malik** |
|  | Title | Antimicrobial Activity of Nerium oleander and Nicotiana tabacum: A Comparative Study |
|  | Institution | Botany Division, Institute of Pure and Applied Biology, Bahauddin Zakariya University, Multan |
| 78 | Name | **Uzma Kanwal** |
|  | Title | Biological Activities of the Constituents of “CEDRELA TOONA” Roxb.ex Wild in Ges.Naturf. of FAMILY-MELIACEAE |
|  | Institution | GC University, Lahore |
| 79 | Name | **Muhammad Anis** |
|  | Title | Occurrence and distribution of entomopathogenic nematodes in agro-ecological zones of Pakistan |
|  | Institution | Dept. of Zoology, University of Karachi, Karachi |
| 80 | Name | **M. Ishtiaq Hussain Ghouri** |
|  | Title | Conocarpus erectus plant as a Biomonitor for air lead pollution in Karachi |
|  | Institution | Dept. of Chemistry, University of Karachi, Karachi |
| 81 | Name | **Syed Aneel Gilani** |
|  | Title | Vegetation of Dam Dhok Talian, Chakwal Pakistan |
|  | Institution | Botanical Sciences Division, Pakistan Museum of Natural History Islamabad |
| 82 | Name | **Muhamamd Wahab** |
|  | Title | Growth climate response of Picea smithiana from Dir, Pakistan |
|  | Institution | Institute of Plant Sciences and Biodiversity, University of Swat, Khyber Pakhtunkhwa |

**SCHEDULE AT A GLANCE**

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**International Conference on
Plants, People and Climate**

**Dated : 5th to 7th November, 2013**

**Venue : National University of Sciences and Technology.(NUST)**

 **Islamabad, Pakistan.**

**TENTATIVE PROGRAM**

**5th November**

 **Plenary Session 1**

**Chairperson**: Mr. Mehmood Cheema (IUCN Country representative)

**Co Chair:** Dr. Stella Bogino

11:30-11:50 **Prof. Dr. Yu Liu**

Tree-ring stable carbon isotope-based May-July temperature reconstruction over Nanwutai, China, for the past century and its record of 20th century warming

12:30-12:50 **Dr. Mohsin Iqbal (GCISC)**

 Plant people-climate Nexus: from sustenance to sustainability

12:00-12:20 **Ryszard J. Kaczka**

Climate change and flood risk in Carpathians. Dendrogeomorphic reconstruction of flood events in Polish Tatra Mountains

**LUNCH - PRAYER BREAK 1:00 to 2:00**

**Plenary Session 2**

Chairperson: Dr. Mohsin Iqbal

Co Chair: Dr. Zaheer ud Din

2:00 - 2:20 **Dr. Kambiz Pourtahmasi**

 Multi-Proxy data from Intra-Annual study of Tree Rings

 2:20-2:40 **Dr. Muhammad Munir Sheikh (GCISC)**

 Forest response to climate change in Pakistan

# 2:40-3:00 Dr. Stella Bogino

# Dendrochronology in the Argentinean pampas: past and present research and future challenges

3:00-3:20 **Dr. Qiufang Cai**

A Dendroclimatic Reconstruction of May-June Mean Temperature

Variation In The Heng Mounatins, North ChinaSINCE 1767AD

**Tea Break**

**3:30-3:50**

**Plenary Session 3**

**Session Chair: Dr. Kambiz Pourtahmasi**

**Co-Chair: Ryszard J. Kaczka**

3:50:4:10 **Dr. Narayan Gaire**

Structure and dynamics of tree line with climatic change in Central and Eastern Nepal Himalaya.

4:10:4:30 **Dr. Shahid Shaukat**

Effect of cultural filtrate of trichoderma species antagonist on growth of Alternaria solani

4:30-4:45  **Dr. Prabina Rana**

Population structure of Rhododendron campanulatum D. Don and associated tree species along the altitudinal gradient at Sagarmatha National Park, Nepal

4:45-5:00  **Dr. Kamran Ahsan­­­**

Role of ICT in Climate Change Monitoring

A review Study of ICT based Climate Change Monitoring Services

**Concluding Remark by session chair.**

**END OF SESSION**

**Wednesday 6th November**

**Plenary Session 4**

**Chairperson:** Dr. Mehmood Nasir (IG Fore*s*t)

**Co Chair:** Dr. Prabina Rana

9:30-9:45 **Dr. Immad Ahmed**

The need for environmental awareness the only sustainable solution

9:45-10:00 **Sepideh Namvar**

The potential of Dendrochronology in Iran in relation to the neighboring countries

10:00-10:15 **Dr. Moinuddin Ahmed**

Using tree-ring chronologies for water resource management.

10:15-10:30 **Dr. Javed Ali Khan**

Impact of climate change on cities of Pakistan and options foradoptation and mitigation.

**Dr. Muhammad Azim Khan**

Social and climate changes as major threats to the weed biodiversity of high altitude Northwest region in Pakistan

10:30-10:45 **Dr. Tasveer Zehra Bokhari**

Particular matter effect on foliage and bio chemical attributes of two fruiting plants of Multan

**TEA BREAK 11:00 to 11:15**

**PARALLEL SESSION A**

 **Session 5**

Chairperson: **Dr. Arshad Mahmood (GCISC)**

Co Chair: Dr. Asghari Bano

11:15-11:30 **Dr. Javed Malik (Member Planning Commission)**

 Climate change Scenerio

11:30-11:45 **Dr Ghazanfar**

Water resources GCISC

11:45:12:00 **Prof. Dr. M. Wahab**

Forest Ecology of conifer and dendrochronological potential of Hindukush range, Pakistan

12:00-12:15  **Dr. Hassan Sher**

Review on the impact of climate change on women and their livelihood, the community’s perceptions and adaptation strategies Adopted By Women

12:30-12:45 **Dr. Kabir**

Climate change caused by industrial activities in Pakistan

12:45-1:00 **Dr. Osama Zafar**

 Reonstruction of lost temperate from Gilgit and Hunza

**LUNCH BREAK 1:00 to 2:00 PM**

 **Session**

Chairperson**:** Dr. Irfan Tariq (GCISC)

Co-Chair**:** Dr.Narayan Gaire

2:00-2:15 **Dr. Zia Hashmi**

GCISC Water resources of Pakistan

2:15-2:30 **Dr. Faheem Siddiqui**

Topographic and edaphic control of arboreal vegetation and the distribution and growth of tree species in moist temperate areas of Himalayan and Hindukush region of Pakistan

2:30-2:45 **Dr. Saima Nasir/ Bibi Jamila**

A review of Scientific research output of climate change in Pakistan

2:45-3:00 **Dr. Khalid Farooq Akbar**

Preparing our cities for a changing climate: urban green spaces as a way out?

3:10-3:25 **Dr.** **Saadullah Khan Leghari**

Suspended particulate matter in ambient air at urban areas of north-east Balochistan, Pakistan

3:25-3:40 **Mahpara Ali**

Impact of Vehicular exhaust on biomass and stomatal behavior of bougainvillea spectabillis Wild. Along some road sides of Lahore city

3:40-3:55 **Dr. Faisal Hussain**

Control of some important soil-borne fungi by chitin associated with chilli *(Capsicum annuum* l.*)* in lower Sindh, Pakistan

**TEA BREAK 3:55 TO 4:10**

**Session 6**

Chairperson: Dr. Yu Liu

Co-Chair Dr. Zabta Khan Shinwari

4:10-4:25 Dr. Shehzad Jehangir

4:25-4:40 Dr. Muhammad Akbar

Multivarite analysis of the some forests vegetation from dry temperate areas (Gilgit, Astore and Skardu districts), of Gilgit-Baltsitan, Pakistan

4:40-4:55 **Sardar Khan**

Effects of Biochar application on emission of greenhouse gases from paddy soil

4:55-5:10 **Dr. Zaheeruddin Khan**

Potential of dendrochronology in forest ecosystem research

5:10 **Concluding Remarks**

**3rd Day**

**Thursday 7th November, 2013**

**Plenary Session 7**

Chairperson: Dr. Ryszard J. Kaczka

Co Chair: Dr. Immad Ahmed

9:30-9:40 **Dr. Ghulam Rasul**

Climate change assessment and future scenario

Pakistan Metrological Dept.

9.40-50 **Dr. Afzal Ahmed**

Variation in Monsoon pattern. Pakistan Metrological Dept.

9:50-10:00 **Dr. Toqeer Ahmed Rao**

Seasonal distribution of aeromycospora of Karachi: a multivariate approach

10:00-10:15 **Dr. Alamdar Hussain**

Growth-climate response of Spruce (Picea smithiana) from Stak valley of Central Karakoram National Park (CKNP), Gilgit-Baltistan, akistan: A dendrochronological approach

10:15-10:30 **Dr. Nasrullah Khan**

Composition, Structure and regeneration dynamics of *Olea ferruginea* Royle forests from Hindukush range of Pakistan

10:30-10:45 **Dr. Jawaid Akram**

Climate changes and few challenges

10:45 – 11:00 **Dr. Atta M. Sarangzai**

Ecological status and regeneration pattern of juniper in Balochistan

**TEA BREAK 11:00 TO 11:20**

**Session 8**

Chairperson: Dr. Anwar Naseem

Co-Chairperson: Dr. Moinuddin Ahmed

11:20-11:35 **Hina Zahara Bokhari**

Impact of climate change on tourism and Economics development

11:35-11:50 **Dr. Abid**

 Climate change

11:50-12:05 **Naim Rashid**

Low cost cultivation and Harvesting of microalgae for sustainable production of Bio-Fuel

12:05-12:20  **Zahir Ahmed Zahir**

Microbiial strategies to mitigate the impacts of climate change on crop yields

12:20-12:35 **Ramiz Raja**

Ethno medicinal survey for some wild plants of Muzaffarabad, Pakistan

12:35-12:50 **Akram, HM**

Impact of climate change on agriculture

12:50 – 1:00 **Muhammad Irshad**

Inheritance of some physio- morphological traits in wheat in post-anthesis high **temperature stress**

**11.30-12-30 Expert panel Discussion and Recommendations (separate room)**

**LUNCH BREAK 1:00 to 2:00 PM**

Session 9

Chairperson: Dr. Stella Bogino

Co Chair: Dr. Shakeel Babar

2:00-2:15 **Hafiz Naeem Asghar**

Plant microb Interactions for remediation petroleum hydrocarbons contaminated soil to combat Global warming

2:15-2:30 **Sultan Mehmood Wazir**

Vegetation Analysis of Zinc Enriched Hills of District Karak, KPK, Pakistan

2:30-2:45 **Ishtiaq Hussain**

Diversity in landraces of Fagopyrum esculentum from different Ecological Regions of Baltistan, Pakistan

2:45-3:00 **Muhammad Waheed**

Tree biomass along green corridor of canal bank road (cbr), lahore (from huseyn shaheed suhrawardy underpass to thokar niaz baig)

3:15-3:30 **Arshad Ali Shedayi**

Climate change and ethnobotanical diversity in khunjerab national park, gilgit, pakistan

3:30-3:45 **Ghulam Raza**

Variation in vegetation cover features across altitudinal gradients in rangelands of central karakoram national park, gilgit-baltistan, Pakistan

3:45-4:00 **Nishwa Fayyaz**

Preliminary Phytochemical Analysis and Detection of Antimicrobial Activity of Ricinus communis

**TEA BREAK 4:00 TO 4:15**

**Session 10**

Chairperson: Dr. Qiufang Cai

Co Chair Dr Tariq Mehmood

4:15-4:30 **Syed Aneel Gilani**

Vegetation of Dam Dhok Talian, Chakwal Pakistan

4:30-4:45 **Uzma Kanwal**

Biological Activities of the Constituents of “CEDRELA TOONA” Roxb.ex Wild in Ges.Naturf. of FAMILY-MELIACEAE

4:45-5:00 **Muhammad Anis**

Occurrence and distribution of entomopathogenic nematodes in agro-ecological zones of Pakistan

5:00-5:15 **Rohma Malik**

Antimicrobial Activity of Nerium oleander and Nicotiana tabacum: A Comparative Study

5:15 **Concluding remarks**

**Parallel Session B**

**6th November, 2013 (After morning tea break)**

Session Chair: Dr. Masoom Yasinzai

Co-Chair Dr. Prabina Rana

11:30-11:45 **Uzma Younas**

Particulate matter effect on foliage and biochemical attributes of two fruiting plants of Multan,

11:45-12:00 **Umme Umara**

 Ethnobotanical importance of some plants of shogran valley

12:00-12:15 **Mr. Sikandar khan Shinwari**

Biopotential of camellia sinensis (green tea) on ulcer causing bug - helicobacter pylori: in-vitro and in-vivo mouse model new horizons in therapeutics

12:15-12:30 **Kashif Nazeer Qureshi**

 Assessing Climate Change Impacts on Wheat Irrigation in Pakistan

12:30-12:45 **Arsalan Siddiqui**

Climate Change

 **LUNCH BREAK 1:00-2:00 pm**

Chairperson Dr. Mudassir Israr

Co Chair Dr. Tariq Bashir

2:00-2:15 **Dr. Abdul Razaq**

Climate change and its impact on biodiversity in gilgit- baltistan

2:15-2:30 **Farid Ahmed**

Method for evaluating the status of scrub forest

2:30-2:45 **Khawaja Shafique Ahmad**

Indigenous plant resources of Kashmir Himalayan region, district kotli, Azad Jammu & Kashmir: Biodiversity and conservational perspectives

2:45-3:00 **Karim Dino jamali**

 Drought tolerance studies in wheat (Triticum Aestivum L.)

3:00-3:15 **Muhammad Bilal Saeed**

Ecological Status and Association of Dalbergia Sissoo In Jhok Reserve Forest Lahore

3:15-3:30 **Misbah yaseen**

3:30-3:45  **M. Ishtiaq Hussain Ghouri**

Conocarpus erectus plant as a Biomonitor for air lead pollution in Karachi

3:45-4:00 **Shakil Ahmed**

Effect of copper on various physiological attributes of Zea mays l. in irrigation water

**Closing Ceremony**

1. **Thoughts of Dr. Ishfaq Ahmad, N.I, H.I, S.I on climate change**

**……………………………………………………………………………………………………………**

It gives me immense pleasure in conveying a message on the occasion of this important conference on Plants, People and Climate Change organized by the Pakistan Council of Science and Technology and collaborators. I would have liked to be present at the conference but due to health reasons I am not able to do so.

I am sending this message to convey some thoughts on current Climate Change concerns globally and in Pakistan. The international community is standing at a cross road. All members states of UNFCCC are obliged to do their home work and indicate their ambitions for adaptation / mitigation of GHG. The Collective wisdom of all would enable the international community to arrive at an agreed program in the Conference of the Parties (COP) meeting of 2015 to be held in Paris. Agreement for extension of a modified Kyoto Protocol or a new protocol, will be sought in 2015. This agreed arrangement have to ensure the success or failure of whether the international community would be able to save the planet, its people and plants from a tipping point of rise of average global temperature of 2°C above pre industrial years. This would ensure that our planet will be saved from irreversibility of Climate Change.

We in Pakistan were late in comprehending seriousness of Climate Change. It was only in the early years of last decade that the Government established the first science centre in the country namely GCISC and also the Prime Minister’s Committee on Climate Change was created. The Committee has become dysfunctional and GCISC has lost considerable manpower due to lack of funds. However the Planning Commission constituted a Task Force on Climate Change in 2008 which produced a report in 2010. Based on this report the then Ministry of Environment formulated a national policy on Climate Change. The Environment Ministry has been dissolved due to the 18th amendment in our constitution. A Ministry of Climate Change was created by the previous Government but after the elections instead of a Ministry a Division on Climate Change now exists in the Cabinet Secretariat.

resilient to Climate Change. Although being a very small contributor of GHG, our country is among the top vulnerable countries to the adverse impacts of Climate Change. The industrialized countries not only should cap their emissions but should reduce them. Damage and Loss analysis associated with Climate Change impacts, in developing countries that are particularly vulnerable to the adverse effect of change, should serve to determine the financial assistance and transfer of technology required to build adaptive capacity.

The Scientists and the intelligentsia around the world and to some extent in Pakistan are now well aware of the importance of controlling human induced Climate Change. Let the history not judge us as being complacent in the face of compelling scientific evidence that Climate Change is real and a great danger to humanity.

Let this conference unite the scientists, academia, intelligentsia and media to impress upon the government that Pakistan should play an important role in the coming UNFCCC sponsored negotiations and be counted among the countries who would internally take steps so that not only our country but the future of the planet is not endangered. Important goals may be conservation of ecosystems and realization of equitable and sustainable socio-economic growth for the people inhabiting the planet. Area under forests should increase while the population growth should be well planned. More plants and less people will ensure a safer and bright future for the planet.

1. **Abstracts**

**…………………………….……….……**

1. **A DENDRO-ECOLOGICAL STUDY OF *RHODODENDRON CAMPANULATUM* D. DON ALONG THE ALTITUDINAL GRADIENT AT SAGARMATHA NATIONAL PARK, NEPAL**

*PRABINA RANA1,2, MADAN KOIRALA2 AND DINESH BHUJU1,2*

*1Nepal Academy of Science and Technology (NAST), Khumaltar, P.O.Box 3323, Nepal*

*2Central Department of Environmental Science, Tribhuvan University, Kirtipur, Nepal*

*Corresponding author e-mail:* prabinar@hotmail.com

***Abstract***

Increase in annual temperature regimes and alteration in precipitation due to global warming can have significant effects on the forest ecosystems. Impacts of climate change are more pronounced and perceptible at higher altitudes and can be easily detected along the altitudinal gradient. The main aim is to study impact of climate and altitude on *R. campanulatum* at the treeline ecotone and subalpine forest. A total of 25 quadrates (10m X 10m) were laid down from 3950 meter above sea level (m asl) to 4350 m asl considering 5 quadrates at altitudinal difference of 100 m. The results showed that above 4250 m asl no seedlings of *R. campanulatum* were recorded while only saplings R*. campanulatum* were encountered. The density of *R. campanulatum* and its associated species *B. utilis* D. Don and *A. spectabilis* D. Don were highest at the forest line (4050 m asl). The groundline diameter and height of *R. campanulatum* decreased with altitude. Highest density of *R. campanulatum* saplings and seedlings were found at 3950 m asl. Importance value index (IVI) analysis showed that *R. campanulatum* is an important species at the study site. The age structure of *R. campanulatum* along the altitudinal gradient will be presented.

1. **A DENDROCLIMATIC RECONSTRUCTION OF MAY-JUNE MEAN TEMPERATURE VARIATION IN THE HENG MOUNATINS, NORTH CHINA SINCE 1767 AD**

*QIUFANG CAI1 AND YU LIU 1, 2*

*1The State Key Laboratory of Loess and Quaternary Geology, The Institute of Earth Environment, Chinese Academy of Sciences, Xi'an 710075, China.*

*2Department of Environment Science and Technology, School of Human Settlements and Civil Engineering of Xi’an Jiaotong University, Xi'an 710049, China.*

***Abstract***

High-resolution tree-ring records covering the last hundreds years in north China are very scarce, yet essential for understanding the process and pattern of climate change and designing climate model. In this paper, a Chinese pine (*Pinus tabulaformis* Carr.) ring-width chronology spanning 1767-2008 AD was developed using standard dendroclimatological methods in the Heng Mountains, Shanxi province of north China. Strongly negative relationships were detected between the ring-width chronology and the monthly mean temperatures (minimum, mean, and maximum) from April to September during the growing season. Based on correlation analysis, the mean temperature from May to June was reconstructed back to 1767 AD. Both spatial correlation analysis with CRU grid dataset and comparisons with other tree-ring based temperature reconstructions from surrounding areas revealed that this reconstruction represented a larger-scale regional temperature variation for north-central China. Significant spectral peaks were found at 2.04-, 2.05-, 2.22-, 7.69-, 75- and 100- year, implying the possible influence of ENSO and solar activity on the local climate. Considering the strong and negative relationship between tree growth and temperature, the future warming will possibly bring increasing drought stress for the tree growth, as shown by the recent warming since the 1950s. However, due to the limit of tree age, this reconstruction did not capture the multi-century scale variations which presents the necessity for developing more and longer tree-ring chronologies in the future in north-central China.

1. **CLIMATE CHANGE AND FLOOD RISK IN CARPATHIANS. DENDROGEOMORPHIC RECONSTRUCTION OF FLOOD EVENTS IN POLISH TATRA MOUNTAINS**

*KACZKA R.J.\*, CZAJKA B.\*, BALLESTEROS CANOVAS J. A. B.\*\*, STOFEL M.\*\**

*\*University of Silesia, Poland, \*\*University of Berne, Switzerland*

***Abstract***

*Northern foothills of Tatras are one of the densest* populated regions in Poland and also place at permanent floods risk. All of local and regional floods originate in Tatra Mountains where several torrents collect water of high-located catchments and joints in three main rivers along which most of the villages and towns are located. Tree-ring was employed to reconstruct regional climate of last 400 years. Dendrogeomorfological methods were used to define the details of main floods and to discover previously unknown past events. The dendroclimatic investigation of Norway spruce (*Picea abies*) and Scots pine (*Pinus sylvestris*) (based on tree ring width and Blue Reflectance) allow reconstructing 400 years long period of temperature and precipitation and capture several cold and humid periods.

The detailed analyses of four streams (six sectors, more then 1100 samples) were performed to gather the information about frequency and magnitude of events for the last century. To date floods scars and resin ducts were employed and the scale of the event was reconstructed base on the high and size of the scars.

1. **CLIMATE CHANGE AND WORLD FOOD RESOURCES**

*ARSHIA KHAN*

*United Nation World Food Programme based Juba, South Sudan*

*Corresponding author e-mail:* arshia-khan@wfp.org

**Abstract**

There is no debate in this issue that world climate is changing due to the developmental activities of humans. We need to understand the cycle of changing environment *i.e.* increasing temperate, precipitation and their effects on our agriculture, water resource, forestry, health and day to day human activities.

United National World Food Programme is launched in the third world countries to educate the people. In this presentation I would like to explain various activities, programme which could also be used and applied in various low income areas of Pakistan. I will inform about the various nonprofit organization and United Nations Programmes and Pakistani organization can collaborate with. We can participate with the working group to update USAID regulation II, which promote transfer of food in disaster (flood relief) areas of Pakistan.

1. **CLIMATOLOGY RESEARCH IN NORTHWEST THAILAND**

NATHSUDA PUMIJUMNONG

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**Abstract**

Because there are only a few tree species in tropical zones that show the potential for conducting dendrochronology and because tropical zones have been the target of logging concessions for a long time, there are obstacles to the study of tree rings in areas where full-grown trees with a significant tree ring width are scarce.

Nevertheless, this study attempts to select living teak trees from an elevation range of 400-1000 m above sea level (a.s.l.) from Mae Hong Son province, Northwest Thailand. The study sites are isolated. Our research aims to investigate growth, synchronise data between sites, and understand how teak tree ring width responds to ecological position and climate. In this study, we divided the study site into 4 parts, with elevations from 200-300 m, 300-400 m, 400-500 m and 500-600 m a.s.l. The results revealed that the high correlation among the five sites chosen indicates the influence of a common force on the tree growth. The climate response of teak growth showed that rainfall from the previous December to the next monsoon, March to July, in the current year, directly influences teak growth and, in turn, is negatively correlated with the temperature during the same period. Our results suggest that the teak network in Mae Hong Son province can be used as a high resolution proxy for drought and rainfall reconstruction in northwest Thailand.

# DENDROCHRONOLOGY IN THE ARGENTINEAN PAMPAS: PAST AND PRESENT RESEARCH AND FUTURE CHALLENGES

*STELLA BOGINO*

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# Abstract

The Argentinean pampas are a natural grassland area considered as the most characteristic landscape of Argentina. In 1931, Krebs and Fischer, published an analysis of tree rings of *Prosopis caldenia* Burkart (caldén) in the central Argentinean Pampas which, according to the date, may be considered as one of the first dendrochronological studies in South America. The woodlands that called the attention of Krebs and Fischer are semi-open or open semixerophytic formations that thrives in the western and driest edge of the Pampas. Across its natural area of distribution the climate is continental with warm, dry summers and cold winters. Total annual precipitation ranges from 450 to 620 mm mainly concentrated in spring and summer. The agronomist Krebs impressed by a severe drought that produced ecological and social changes tried to relate tree-ring growth of *P. caldenia* to mean annual rainfall. From then on in the last two decades many dendrochronological studies using tree rings of *P. caldenia* were made and focused on ecological, archaeological and climatological applications as for example: recruitment rates and woodland dynamics, anthropological events linked with woodland changes, the past use of forest by aborigines, fire events as one of the main disturbance events, the association between growth and water table fluctuations and tree growth and climate effect. Considering that *P. caldenia* is the main woody species in the Argentinean pampas new challenges are stated in the future in order to detect synergetic factors that affects woodland’s changes under changing social and ecological conditions.

1. **EFFECTS OF AIR POLLUTION on *Pinus eldarica* wood**

VAHIDREZA SAFDARI1\* AND MOINUDDIN AHMED2

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 *2Laboratory of plant Ecology and Dendrochronology, Department of Botany,*

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*\*Corresponding author e-mail: vahid.safdari@gmail.com*

### Abstract

Air pollution, including automobile exhaust pollution, can affect anatomical and morphological characteristics of wood. In order to evaluate this subject, the *Pinus eldarica* trees of Chitgar Park in Tehran, which extends from a crowded highway in the south (polluted site) to the semi polluted midsection and to Alborz Mountain in the north (unpolluted site) were sampled with an increment borer and cores were collected. After cross dating, the tree rings of the last five years were separated from the rest of the core. Anatomical characteristics of the cross sections, including the transition between early wood and latewood, the tangential thickness of the last-formed latewood tracheids, the frequency of rays and resin ducts and the morphological characteristics of tracheids in rings formed in the same year were studied. The results indicated that the ring widths of *P. eldarica* in the three zones are not significantly different. Rays and false rings were more frequent in the polluted and semi polluted sites than in the reference area, and wall thickness (2D) was significantly different in some years. Other morphological properties did not differ significantly except for tracheid diameted. In conclusion air pollution does not alter *P. eldarica* ring width significantly but changes some anatomical and morphological properties of its wood. Therefore trees growing on polluted sites are not suitable for Dendrochronological studies.

1. **MULTI-PROXY DATA FROM INTRA-ANNUAL STUDY OF TREE RINGS**

*KAMBIZ POURTAHMASI AND REZA OLADI*

*Department of Wood and Paper Science and Technology, University of Tehran*

*Corresponding author’s e-mail: portahmsi@ut.ac.ir*

**Abstract**

In tree-ring researches normally people will consider the whole ring as an indicator of one year. Then the relationship between each ring characteristics and climate data will be evaluated. In general, the tree ring will be formed during the growing season and the rate and percentage of wood formation is not consistent during the time even in one growing season. Using intra-annual studies can give us more information about the different phases of climate-growth relationship during one year of growth; which latter on can be used for better interpreting the existing weak correlations achieved by yearly comparison of tree growth and climate.

In this study we used different data including total ring-width, intra-annual wood formation, Dendrometer and d13C and d18O data in 5 beech trees (*Fagus orientalis*) in one site of northern Iran and compared with the climatic data gained from close by automatic climate station.

The multi-proxy data gave us the whole overview and progress of wood formation in each tree and enabled us to better understand the effect of climate on different ring parameters. Temperature (air and soil) plays a positive role in the beginning and at the end of the growing season and it can be regarded as an important growth limiting factor in the hot summer of middle of the growing season. Stable isotopes analysis showed that at the beginning of the growth, trees carry over most of the carbohydrates from the previous year to the current growing season.

The detailed results will be showed in the paper but the final conclusion is that the pattern of climate and growth relationship can be changed during one growing season and the previous year growth condition can influence the current year wood formation.

1. **STRUCTURE AND DYNAMICS OF TREELINE WITH CLIMATE CHANGE IN CENTRAL AND EASTERN NEPAL, HIMALAYA**

*NARAYAN PRASAD GAIRE1, 2, MADAN KOIRALA 2 DINESH RAJ BHUJU1, 2*

*1 Faculty of Science, Nepal Academy of Science and Technology, Khumaltar, Lalitpur*

*GPO Box 3323, Kathmandu, Nepal*

*2 Central Department of Environmental Science, Tribhuvan University*

*Kirtipur, Kathmandu, Nepal*

*Corresponding author’s e-mail:* *npgaire2007@gmail.com*

***Abstract***

Climate change has already left several biological finger prints. The high altitude natural treeline is taken as sensitive biomonitors of past and recent climate change, as well as early warning line to the climatic impacts on high altitude biota. We carried out a dendroecological study at the treeline ecotones of Mt Everest and Mt Manaslu regions of the Nepal Himalaya with the aims to assess the impact of climate change in the tree-line ecotones, and reconstruct the past environmental history of the region. Two to three vertical belt transects plots (20m wide and >100m length) were laid down in each treeline site. Using ecological and dendrochronological tools, structure, regeneration, climatic influence on radial growth and regeneration, and upward shifting of *Abies spectabilis* D. Don and *Betula utilis* D. Don were analyzed. Position of treeline in eastern region was found at higher elevation as compared to central Nepal. The tree density, basal area, DBH, height, and age decreased with increasing elevation with some spatial heterogeneity. High regeneration of *Abies* as compare to *Betula* was observed recently. The tree core analysis showed that *B. utilis* was established earlier than *A. spectabilis.* The upper distribution limit shift of *A. spectabilis* at studied sites was found 1.56m to 3.6m per year during past over 150 years. Correlation between site chronologies of *Abies* showed a positive relationship indicating some common factors limiting the growth of the tree. Tree growth-climate and regeneration-climate relationship showed that warm winter and moist summer favored the regeneration of *Abies*. Infilling of existing treeline as well as upward shifting of treeline was observed. Population demography and climate growth response indicated that both of the species had species specific response to climate change with much wider differences in the population structure of the species is anticipated as climate continues to change throughout the century.

1. **THE EFFECT OF EROSION ON ANATOMICAL CHARACTERISTICS OF ROOT AND BARK OF *JUNIPERUS EXCELSA***

*VAHIDREZA SAFDARI AND NIMA ESKINI*

*Department of Wood and Paper Science, Karaj Branch, Islamic Azad University, Karaj, Iran*

*(Vahid.safdari@gmail.com)*

**Abstract**

Dendrochronology is the dating and study of annual rings in trees and an interdisciplinary science, and its theory and techniques can be applied to many applications. Plant roots, like their above-ground counterparts, exhibit annual growth rings that are frequently found with exposed or shallowly buried bodies. Soil erosion is one of the environmental factors which affects anatomical properties of roots considerably. Exposed roots have been used in Dendrogeomorphology since the 1960s to determine erosion rates. This was done by using the root axis as the relative position of the former soil layer and then relating this measure to the age of the root in order to quantify the amount of soil erosion over time.

 The objectives of this study are to determine the effect of erosion on wood and bark anatomical properties of Juniperus excelsa’s root. The sites selected for our study were Oshtarnkoh mountain in Iran and species was Juniperus excelsa which is one of Iranin indigenous softwood and has longevity. So many roots and barks of trees in inside of soils and exposed have been sampled and many micro-sections prepared by microtome. Then the thin sections were stained in Safranin to enhance the contrast for further microscopic analysis and fixed in Canada balsam.

Results showed that wood roots under soil perform one row of late-wood and by exposing the lumen area of tracheids in early-wood and late-wood were decreased and the cell wealls appear thicker and late-wood portion increased. The axial parenchyma inclusion of dark resins in exposed roots observed frequently. Meanwhile by exposing of roots the thickness of bark decreased and the thickness of phloem and periderm in exposed root is not as wide as normal roots.

1. **TREE-RING STABLE CARBON ISOTOPE-BASED MAY–JULY TEMPERATURE RECONSTRUCTION OVER NANWUTAI, CHINA, FOR THE PAST CENTURY AND ITS RECORD OF 20TH CENTURY WARMING**

YU LIU 1, 2 \*, QIUFANG CAI 1

*1 State Key Laboratory of Loess and Quaternary Geology, Institute of Earth*

*Environment, Chinese Academy of Sciences, Xi’an 710075, China*

*2 School of Human Settlements and Civil Engineering, Xi’an Jiaotong University,*

*Xi’an 710049, China*

**Abstract**

Based on the numerical mix method, we reconstructed the mean May–July temperature (TM-J) over the past century using a stable carbon isotope series from Chinese pine trees growing in the Nanwutai region. The explained variance of the reconstruction is 43.3% (42.1% after adjusting the degrees of freedom). Compared to a ring-width temperature reconstruction (May–July) from the same site, the stable-carbon isotope-based temperature reconstruction offers two distinct advantages: 1) it captures a wider range of temperature variability, i.e. over a longer part of the year, at least May–July, even January–September; and 2) the reconstruction preserves more low-frequency climate information. The 20th century warming was well represented in the Nanwutai stable carbon isotope temperature reconstruction, indicating that this region is sensitive to global climate change. A spatial correlation analysis showed that our temperature reconstruction represents climate variations over the entire Loess Plateau in north-central China. Significant positive correlations (*p*<0.1) were found between the temperature reconstruction and ENSO, as well as SSTs in the Pacific and Indian Oceans. The reconstruction showed the periodicities of 22.78-, 4.16-, 3.45–3.97- and 2.04–2.83-year quasi-cycles at a 95% confidence level. Our results suggest that temperature variability in the Nanwutai region may be linked to Pacific and Indian Ocean SST variations and solar activity.

1. **THE NEED FOR ENVIRONMENTAL AWARNESS - THE ONLY SUSTAINABLE SOLUTION**

*IMMAD AHMED SIDDIQUI*

*EMPOWER, 2608 Top Ridge Dr.*

*Washington, DC 2002 USA.*

***Abstract***

Increasing economic activities in developing countries result in more energy and consumption demand, which generally lead to environmental degradation. There is a conventional belief that such environmental degradation would resolve as soon as these countries grow economically since that would enable them to afford environmental friendly technology as well as pro-environmental regulations and policies. However, several studies indicated that many developing countries already equipped with environmental policies, legal frameworks and economic instruments, which are regarded as highly sophisticated by international standards and yet face the worsening of environmental conditions. Major difficulties these countries confront are not only the lack of legal and economic framework for environmental protection, but also key lack of participation among general public in pro-environmentalbehaviors.

The need for active environmental awareness throughout different media outlets is foremost important and reinforced with education. The lack of funding and user centric design has low yields to changing human behavior. The same methods which markets have used over the centuries can be applied for social change. With the trends in user design research, projects and initiatives can be created, that focus not only on the issue at hand, but reinforce positive behavior, while education the target audience. With the combination of awareness and education the true sustainable path can be created, implemented and reinforced.

Moreover, there are increasing needs for such public participation due to the recent change in sources of environmental problems. Today, the sources of pollution have shifted from production to consumption processes. A well acknowledged trend, which states that growth in consumption and unbalanced consumption patterns are placing unprecedented pressure on the environment. In this light, the acceptance of pro-environmental behavior by general public, that is, to adopt sustainable life style, is an urgent issue in protecting environment and creating an environment of sustainable development.

 **ABSTRACTS**

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**A SURVEY OF PHYLLOPLANE MYCOFLORA OF *SOLANUM LYCOPERSICUM*, *CAPSICUM ANNUM* AND *CYNODON DACTYLON***

HINA ZAFAR AND ABDUL HAKEEM SHEIKH

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**Abstract**

Fungi are vital components of nearly all ecosystems and affect on human health and our economy in many ways. Biodiversity is the variation of life form in a given ecosystem and is often used as a measure of the health of biological system. Collecting or monitoring any fungal biodiversity is essential. The occurrence of phylloplane fungi on leaf surface of tomato (*Solanum lycopersicum*), chillies (*Capsicum annum*) and Bermuda grass (*Cynodon dactylon*) was investigated. A total number of 11 fungal species were isolated from surface sterilized leaf segments using dilution plating technique. Among these *Aspergillus flavus*, *Aspergillus niger*, *Aspergillus fumigatus*, *Aspergillus terreus*, *Fusarium oxysporum*, *Rhizoctonia solani*, *Penicillium expansum* and *Curvularia* sp. were isolated from tomato and *A.flavis*, *A.fumigatus*, *A.niger* and *Fusarium moniliformis* were isolated from chilies. *Cynodon dactylon* showed five species including *A. niger*, *A. flavus* , *A. fumigatus*, *Fusarium oxysporum ,* *Alternaria solani*  and *Macrophomina phaseolena.* Diversity of phylloplane assemblages was also measured.

**ADSORPTION POWER OF STYPTIC, *ACACIA CATECHU* (PALE CATECHU), FOR FE(LL) ION FROM DILUTE AQUEOUS SOLUTION**

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**Abstract**

Number of herbs use as a type of method or drug for blood vessels contraction to prevent blood flow or bleeding and these types of herbs (styptics) have ability to remove metallic ions from dilute aqueous solution**.** In this research work Pale catechu is one of the variety of *Acacia catechu* confirms the metal ion adsorption power of styptics**.** Through adsorbent (pale catechu) removal of Fe+2 ions by dilute aqueous solution is studied using complexation and batch technique. Different effects i.e. stirring, pH, contact time, adsorbate concentration and temperature were observed on percent adsorption of Fe+2 by pale catechu. Percent adsorption results verified with freundlich, D-R and Langmuir adsorption isotherm to explain equilibrium data. Thermodynamic parameters i.e. enthalpy change (△H, change in Gibb`s free energy (△G) and entropy change (△S) were calculated. Entropy’s positive value shows increase in randomness. Negative values of (△G) and positive value of (△G indicate feasibility, spontaneous nature and endothermic nature of process. At different temperatures △G values approximately remain constant and show that there is no effect of temperature on free energy of adsorption.

**ADVERSE EFFECTS OF SIMULATED ACID RAIN (SAR) ON GROWTH AND PHYSIOLOGICAL ATTRIBUTES OF TWO MUNGBEAN [*VIGNA RADIATA* (L.) WILCZEK] VARIETIES**

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**Abstract**

Environmental pollution has become a serious problem now a day’s throughout the world. The study was conducted to evaluate the effect of simulated acid rain (SAR) on the growth, morphology, physiology and yield attributes of two Mungbean [*Vigna radiata* (L.) Wilczek] varities *i.e*., NM-2006 and NM-98. The experiment was laid out in completely randomized design (CRD) in Botanical Garden, University of Agriculture Faisalabad having five treatments with five replicates. Two acids *i.e*., HCl and HNO3 were used separately and in combination at pH 3, 3.5 and 4. It was observed that SAR caused severe reduction in the K+, P, Ca+2 and Na+ as the acid concentration increased. Photosynthetic rate, transpiration rate, water use efficiency, stomatal conductance and sub-stomatal conductance were reduced with increasing concentration of SAR. Results clearly showed that at pH 3 both acids caused more severe effects as compared to pH 3.5 and 4. A comparison among varieties showed that NM-2006 proved more tolerant to SAR as compared to NM- 98.

**ADSORPTION STUDIES OF CR(VI) FROM AQUEOUS SOLUTION ONTO *CUCUMA LONGA***

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**Abstract**

Accumulation of toxic substances in soil and in the crops occurs because of industrial activities which can cause toxicity in human body. These toxic metals cause serious diseases. Chromium is essential nutrient but Cr (VI) a, strong oxidizer, consider toxic to human. Turmeric herb due to presence of curcuminoids, proteins and carbohydrates has strong potential to bind to toxic metal ion. In this work removal of Cr (VI) ion from aqueous solution was studies as a function of contact time, pH, stirring time, temperature adsorbate and adsorbent. Adsorption data have been applied in term of Langmuir and freundlich equation and their corresponding parameter were calculated. Along with thermodynamic parameter kinetic modeling was also analyze.

**ADSORPTION STUDIES OF CR(VI) FROM AQUEOUS SOLUTION ONTO *CINNAMOMUM ZEYLANICUM***

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**Abstract**

Traditional system of our foods prevents us from toxic metals. Present study based on this idea, in which commonly used herb *Cinnamomum zeylanicum* was analyzed for Cr(VI) adsorption, because at high level it will be toxic as compare to other forms of chromium. Adsorption efficiency of *Cinnamomum zeyliancum* was carried out by using visible spectroscopy. Different parameters on adsorption of Cr(VI) onto *Cinnamomum zeylanicum* were interpreted. Langmuir and Freundlich models were employed and changes in distinct parameters i.e. adsorbate, adsorbent, contact time, pH, stirring time have been determined. Thermodynamics parameters also have been studied in term of Gibb’s free energy, entropys and enthalpy changes. The negative value of (G) shows the spontaneity of the process. Kinetic modeling was also interpreted for this purpose. The adsorption data is fitted to the pseudo 2nd order reaction and calculated values of amount adsorbed at equilibrium by pseudo-second-order equations were found to be in exceptional acceptance with the experimental values.

**ASSESSMENT OF WHEAT GERMPLASM UNDER WATER-DEFICIT CONDITIONS**

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**Abstract**

Wheat germplasm evolved by wheat breeding programme at NIA,Tandojam (one hundred and eight genotypes) having distinct genetic background was screened under various water-deficit conditions. The material was evaluated under field conditions in augmented design along with four check viz; Sarsabz, Khirman, Chakwal (drought tolerant), and TD-1. The tested material was of diversified origins which include conventional bred, mutant and doubled haploid genotypes. Water stress was imposed at critical plant growth stages (tillering, booting, heading, and pre and post anthesis). The objective of present studies was to determine the potential of new and novel germplasm to water stress environments. Result indicated that twenty four genotypes could produce higher grain yield (2500-3889 kg/ha) under severe water stress environments. Genotypes IBWS 1164, IBWS 1132, IBWS 1056 and IBWS 1165 produced higher grain yield (>3000 kg/ha) and 1000 grain weight were selected. This paper will discuss wheat production under scenario of water scarcity and various effects of water stress on yield and yield components of wheat crop.

**ASSESSING CLIMATE CHANGE IMPACTS ON WHEAT IRRIGATION IN PAKISTAN**

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**Abstract**

By 2025, it is estimated that around 5 billion people, out of a total population of around 8 billion, will be living in countries experiencing water stress (with Pakistan no exception). Climate change has the potential to impose additional pressures on major food supplies especially, during the later half of 21st century in some regions including South Asia . This paper describes an assessment of the combined effects of climate change and various irrigation management practices on future wheat yield in different regions of Pakistan.

Data from the PRECIS regional climate model for baseline (1961–1990) and future (2071–2100) periods under A2 and B2 SRES climate scenarios are used as input for the STAMINA crop simulation model. Different irrigation management practices are applied to assess the impacts of climate change on future wheat yield in different regions of Pakistan. Supplementing irrigation water by 50% would likely to increase the yield in the range of 4.8-29.6% and 7-30.5% under B2 and A2 scenarios, respectively. An anticipated 50% decrease in irrigation water would have an adverse effect on yields in all the regions under both future scenarios. The effect could be more severe in case of late sown crop. Moreover, the probable decrease in wheat yield (23%-28% and 24%-29% under B2 and A2 scenarios, respectively) at the national level emphasizes the need to adapt efficient irrigation practices and to develop drought-tolerant wheat varieties.

**ANTIBACTERIAL ACTIVITY OF FICUS RELIGIOSA AND**

THUJA ORIENTALIS

ANILA KANWAL AND MUZAFFAR ALI KHAN

*Institute of Biology, BZU, Multan*

**Abstract**

The purpose of this study was to observe the antibacterial activity of aqueous ethanolic extracts of leaves two plants (Ficus religiosa and Thuja orientalis) against Gram negative bacteria (Escherichia coli) and Gram positive bacteria (Staphylococcus aureus) by using disc diffusion method. The minimum inhibitory concentration (MIC) was determined by agar well diffusion method and agar dilution method. All the bacteria were susceptible to different plant extracts. Ficus religiosa and Thuja orientalis showed antibacterial activity against both of the tested bacteria. The extract of Ficus religiosa showed maximum antibacterial activity and that of Thuja orientalis showed less inhibition against both the selected strains. Thus it was clear from study of results that the plant extracts have great potential as antimicrobial compounds against bacteria.

**ANTIBACTERIAL ACTIVITY OF OCIMUM BASILICUM AND**

**CARRISA MACROCARPA**

SHAIZA SAEED AND MUZAFFAR ALI KHAN

Institute of Biology, BZU, Multan

**Abstract**

The purpose of this study was to observe the antibacterial activity of aqueous ethanolic extracts of leaves two plants (Ocimum basilicum and Carissa macrocarpa) against Gram negative bacteria (Escherichia coli) and Gram positive bacteria (Staphylococcus aureus) by using disc diffusion method. The minimum inhibitory concentration (MIC) was determined by agar well diffusion method and agar dilution method. All the bacteria were susceptible to different plant extracts. Carissa macrocarpa and Ocimum basilicum showed antibacterial activity against both of the tested bacteria. The extract of Carissa macrocarpa showed maximum antibacterial activity against Staphylococcus aureus and that of Ocimum basilicum showed remarkable inhibition zone against Escherichia coli. Thus it was clear from study of results that the plant extracts have great potential as antimicrobial compounds against bacteria.

**ANTIMICROBIAL ACTIVITY OF *NERIUM OLEANDER* AND *NICOTIANA TABACUM*:**

**A COMPARATIVE STUDY**

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**Abstract**

Environmental circumstances play a vital role in defining the function and [distribution](http://en.wikipedia.org/wiki/Range_%28biology%29)of [plant](http://en.wikipedia.org/wiki/Plants)s.The purpose of this study was to evaluate the antimicrobial activity of aqueous ethanolic extract of two plants; *Nerium oleander* L. (Apocynaceae) and *Nicotiana tabacum* L. (Solanaceae) belonging to area of Multan district, against 1 gram-positive bacteria (*Staphylococcus aureus*) and 2 gram-negative bacteria (*Escherichia coli* and *Pseudomonas aeruginosa*) by using disc diffusion method. All the bacterial strains were found vulnerable to different plant extracts. *Nerium oleander* and *Nicotiana tabacum* exhibited antibacterial activity against all the three tested bacteria. The ethanolic extract of leaves of *Nerium oleander* showed maximum antibacterial activity against *Pseudomonas aeruginosa* at 900mg/ml concentration, whereas *Nicotiana tabacum* showed maximum antimicrobial activity (maximum zones of inhibition) against *Staphylococcus aureus* at 900mg/ml concentration. It is clear from the result of present study that the ethanolic extracts of leaves of these plants have great potential as antimicrobial agents against these common bacterial isolates. However, there is a need of further research to isolate the active ingredients for further pharmacological evaluation. The results obtained could be attributed to the differential environmental conditions or climatic changes on the ecology of these plants.

**BIOLOGICAL ACTIVITIES OF THE CONSTITUENTS OF “CEDRELA TOONA” ROXB.EX WILD IN GES.NATURF.OF FAMILY-MELIACEAE**

UZMA KANWAL

*GC University, Lahore*

**Abstract**

The present work was carried out to investigate the thin layer chromatographic behavior and pharmaceutical studies of the crude solvents extracts of leaf, flowers, bark and word of Cedrela Toona Roxb.ex Wild.In Ges.Naturf of family Meliaceae. The pharmaceutical studies included the antimicrobial potential and skin irritant behavior of 3-solvents ( pet.ether, chloroform and methanol) . Extracts of form plant parts the antimicrobial potentials were studied by measuring the zones of inhibitions and also by minimum inhibitory concentrations, against three available strains of Gram + , gram –ve bacteria and also two available species of fungi. While the rabbit ear’s skin was used for irritancy studies. Thin layer chromatography of each crude solvent extract on silica phytochemical compounds under the influence of different solvent system. CLC simply short total number and physical behavior of the compounds which could not be further identified. Antimicrobial study indicated that all the solvent extracts were comparatively resistant against the bacteria and fungi used, when compared with the standard reference drugs. All the extracts indicated a weak skin irritant potential. This was of ++ intensity and of short duration. This reaction , in most cases did not last after one day . Both these activities, could be attributed due to the active principles such as tannins, phenols, flavonaids, terpenes and unsaturated compounds etc. present in these extracts.

## BIOPOTENTIAL OF CAMELLIA SINENSIS (GREEN TEA) ON ULCER CAUSING BUG - HELICOBACTER PYLORI: IN-VITRO AND IN-VIVO MOUSE MODEL: NEW HORIZONS IN THERAPEUTICS

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**Abstract**

**Background:** *Helicobacter pylori* infection is a major cause of peptic ulcer disease and gastric cancer. This study postulated that cranberry juice would be effective in the suppression of *H. pylori* in an endemically infected population at high risk for gastric cancer. The antibacterial potential lies in the bioactive component of polyphenols present in the green tea. **Methods**: In this study, a total of 300 biopsies were collected from the patients of gastro-duodenal pathology who were referred to two major government sector hospitals in Karachi, Pakistan. All these biopsies were processed for detection of *H.pylori* by two rapid Helicourease – indigenously developed rapid urease detection kits, culture and polymerase chain reaction (PCR) for the 16S ribosomal gene of *H. pylori*. All the isolates were screened for their susceptibility against commonly prescribed antibiotics as well as antimicrobial potential of aqueous extract of green tea by agar well diffusion as well as micro-broth dilution. In-vivo studies were carried out by developing Gastritis Models in BALB/c mice (divided into 4 groups and each has got 3 test mice and 1 control mouse) by infecting orally with sublethal doses of 100 µl of 10 7 cfu/ml H pylori culture. The gastritis models were developed after inoculation and allowed them to cause gastritis for about 7days, 14 days, 21 days, 28 days and 34 days with subsequent doses of 10 % aqueous extract of green tea extract whose MIC was found to be 32 mg/ml. **Results:** In this study, a total of 94, clinical *H pylori* isolates were successfully cultured and identified by rapid and molecular methods. Most of our isolates showed a high level resistance towards Tetracycline (60%), Metronidazole (80%), and Amoxicillin (60%), Erythromycin (40 %), Clarithromycin (30%), Ofloxicin (8%).In vitro studies of green tea a significantly large zone of an average 21mm was found on most of the isolates in vitro- studies using crane berry extract. Moreover, two fold reductions of cfu/ g was noted in 7 days, 14 days and 21 days, but fairly moderate cfu/g was observed in the rest of the models as compared with those who were left untreated after culturing stomach and other gastrointestinal tract organs. The results were also found in agreement to the histopathological findings of the stomach indicating successful establishment of infection and gastritis and upon treatment by the green tea, the reduction in the bio-load. **Conclusion**: Owing to the exorbitantly high antibiotic resistance among triple therapy regimen of antibiotics like metronidazole, it is no doubt one of the potential causes of treatment failure. Therefore, in the light of current study results provide useful insights to the developments of new antimicrobial agent like green tea as a therapeutic intervention tool. Further basic studies to clarify the actual mechanism of mode of action are needed.

**CAUSES AND CONSEQUENCES OF FLOODS DURING 2010-11IN PAKISTAN**

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**Abstract**

Pakistan lies in the region that frequently experiences devastating floods. The reason of devastating floods in countries of this region (like Bangladesh, India, Pakistan, Nepal and Sri Lanka), lies in the very nature of their topography and natural ecological systems – steep and highly erodible mountains, the monsoon (heavy rain augmented by snow melt), heavily sedimented complex river systems. Human activities, widespread deforestation and pollution further increases the runoff and blocks flow. In recent years the heavy spells of rainfall associated with the occasional tropical storms may also possibly be linked to climate change.

The principal rainy season in the region is May to September; however Pakistan receives tail end of monsoon, in August and September. Meteorological record shows that nineteen major floods occurred in Pakistan over the last 65 years. Severe floods in the Indus plain happened more frequently during 1955-95 than in the preceding 70 years (1885-1955). However, with the lag of almost 15 years severity of floods further increases during last two years (2010-2011). The more plausible reason of the intensive rainfall and heavy snow melt apparently seems to be due to climatic changes and global warming.

The devastating flood of July and August, 2010, caused severe damage at national scale. The most affected areas include the provinces of Gilgit-Baltistan, KPK, Punjab, Sindh, and Kashmir. The flood took about 2000 human lives and brings heavy losses to livestock. Similarly heavy monsoon rainfall in 2011 led to severe flooding that affected about 8.9 million people, mostly in southern Pakistan’s Sindh province.

To mitigate flood related damages there is immense need for effective planning. This presentation identifies causes and consequences of floods with recommendations for effective flood related risk management, apart from establishing the links with climate change.

**CHARACTERISTICS OF THE BAT FAUNA (MAMMALIA: CHIROPTERA) FROM PESHAWAR AND ADJACENT AREAS, KHYBER PAKHTUNKHWA, PAKISTAN**

FARZANA PERVEEN\*1 AND FAIZ-UR-RAHMAN2

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**Abstract**

The present research was conducted to investigate first time the bat fauna in in Peshawar and adjacent areas, i.e., Charsadda, Kohat, Mardan and Nowshera, Khyber Pakhtunkhwa, Pakistan during July 2011-May 2013. The 188 specimens of 10 bat species belonging to 4 different families of order Chiroptera were recorded. They were belonging to family Pteropodidae (1 species): the Indian flying fox, *Pteropus giganteus* Brunnich; family Hipposideros (1 species): the fulvus leaf-nosed, *Hipposideros fulvus* Gray; family Rhinopomatidae (2 species): the lesser mouse-tailed bat, Rhinopoma hardwiki Gray and greater mouse-tailed bat, *Rhinopoma microphyllum* Brunnich; family Vespertilionidae (6 species): the kellaert’s pipistrellus, *Pipipstrellus ceylonicus* Kelaart; Indain pipistrellus, *Pipiestrellus coromandra* Grey; Javan pipistrellus, *Pipistrellus javanicus*, Gray; least pipistrellus, *Pipistrellus tenius* Temminck; Asiatic greater yellow bat, *Scotophyllus heathii* Hosefield; and Asiatic lesser yellow house or Kuhl’s pipistrellus bat, *Scotophyllus kuhlii* Leech. *Pipistrellus tenius* the smallest bat than all collected bats, however, *R. hardwiki* is a medium sized bat, moreover, *R. microphyllum* is the largest of all 3 bats of the Rhinopomatidae. Further, *S. heathii* is a bat with greater body weight, furthermore, *S. kuhlii* can only be distinguished from the *S. heathii* by its small size, while all other structures are almost similar. Due to lack of education, the most of people do not know about importance of bats. This paper provided education and awareness to the people of the study area.

**CLIMATE CHANGE AND FEW CHALLENGES**

JAWAID AKRAM

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**Abstract**

Climate is environment key to invent natural things. Casual biological trend to climate change altering the mode of extreme unexpectedness throughout the world. Some species are now hard to see, and count.Disappearing of Moose is the fine example**.** Global warming that we had experienced in the last decades influenced the entire organism’s diversity and repartition on Earth. If such things will cautiously happen they will definitely miss manage the reflection of green nature and natural laws built with its cost in the whole world. We are planning to demolish our natural grips on environmental issues. If such, uncouthness remain confirm results the decreases age of this world. A part from that minimum loss can have the maximum result if planned.

One of the most fundamental characteristics of all complex organic systems; be they the human body, human culture, an ecosystem or the biosphere itself, is that they function in terms of equilibria and optimization. The centrality of optimization in the successful functioning of all organic systems is the key to understanding a variety of ecological problems, & global warming. It is also the key to understanding the difference between the dominant economic logic and the inherent “logic” of other living systems.

**CLIMATE CHANGE AND ETHNOBOTANICAL DIVERSITY IN KHUNJERAB NATIONAL PARK, GILGIT, PAKISTAN**

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**Abstract**

Gilgit-Baltistan is rich in biodiversity and natural resources. Khunjerab National Park was established on 1971 with the aim to conserve biodiversity. KNP has unique topographical and severe climatic conditions. The present study was conducted from May to September 2009 with the aim of documenting the inventory of plants, their current status and to find out their traditional and folk uses of the existing plant resources in KNP by the adjacent inhabitants of Sost, Nazimabad, Hussainabad and Morkhund Valleys. Three field visits were conducted to collect plants and to know their locality and habitat. As a result 80 different plant species of 27 families were collected and their traditional uses were identified from the local people of the area by semi structured questioners and direct interviews. It was found that mostly the older aged people, shepherd and herbalists were familiar with the plant resource uses. The existing indigenous knowledge is critically scarce and may be wipe in future if considerable awareness programs are not initiated. Plants were collected along the road side up to 1 km in seven valleys namely Dhee, Karchani, Arbabkook, Barkhun, Turqreen, Koksail and Top. Among the plants collected 31.25% are being used as medicinal, fodder 81.25 %, fuel 18.75%, veterinary 6.25%, food 23 %, and whereas 13% of plants are used for household activities and 2.5% plants are poisonous. The most abundant plant families were categorized as Asteraceae. Chenopodiaceae, Rosaceae and Polygonaceae, while others were few in number. The plants in KNP were threatened by severe climatic conditions, high local livestock grazing pressure and increasing population along KKH and lack of knowledge about the traditional uses of the plants. Training for sustainable harvesting of plants, reducing grazing pressure, equitable resource sharing, marketing of the products and future research in wild plant resources are recommended.

**CLIMATE CHANGE AND ITS IMPACT ON BIODIVERSITY IN GILGIT-BALTISTAN**

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**Abstract**

It is general perception that temperatures are rising all over the world. This warming up is causing glaciers to melt and hence changes in water resources. Fruit trees are susceptible to temperature variations as they have evolved and become used to particular temperature range. Rise in temperature of 4-5 °C is likely to cause disruption of biodiversity. We need to work full time to monitor climate change and develop new varieties that better suited to warmer climates, if we are to maintain the life of diversity in Gilgit-Baltistan. The climate change impacts can be better visualized and explored by assessing the regional behavior of the landscapes and the responses of the local residents facing unseen challenges and risks while struggling for their survival and sustainability. Though many studies have been conducted to appraise impacts of climate change on mountain ecosystems and biodiversity but its consequence for mountain biodiversity from the herder’s perspective is yet to be discussed.

**COMPOSITION, STRUCTURE AND REGENERATION DYNAMICS OF *OLEA FERRUGINEA* ROYLE FORESTS FROM HINDUKUSH RANGE OF PAKISTAN**

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**Abstract**

This study was conducted to analyze the woody species composition, stand structure and regeneration dynamics of *Olea ferruginea* forests in Malakand Division Hindukush range of Pakistan. Five different tree communities were identified using Ward’s agglomerative clustering techniques. *Olea ferruginea* appeared as the leading dominant in all the groups that emerged from cluster analysis. The communities were distributed between an altitudinal range from 865 to 1258 m a.s.l, mainly on plains and on gentle slopes. *Mellia azedarach*, *Acacia modesta*, *Morus alba* and *Ficus palmata* and a few exotic species are common associates. Majority of the subordinate species did not occur in all the sample plots but were present in one or two groups with very low importance values, which reflect their narrow distribution. Total tree density in all groups ranged from 153-2602 plants/ha, with *O*. *ferruginea* having a relative density of 51to 87%. Overall basal area in this study ranged between 19.55 to 2353 m2 ha-1 of which 48 to 93% were contributed by the dominant species. The overall, density of juveniles (24-464 individuals ha-1) and density and basal area of the subordinate tree species were generally low. Size-class distributions of *O*. *ferruginea* disclosed a bell-shaped pattern indicating that forests were heavily exploited by local inhabitants in previous periods and recently by armed forces owing to security risks in the study area.

Ring-width characteristics, Age and growth rate of *O*. *ferruginea* was estimated by applying conventional dendrochronological techniques which provide useful information for understanding forest dynamics, community structure and function. Tree-rings did not cross-date well, neither between nor within individuals, but ring boundaries were distinct nonetheless with some problems like the formation of false and missing rings. The mean maximum estimated age was ranged 32 ± 9 - 300 ± 34 years indicating that the species is long lived. However, oldest trees can be found by the exploration of large diameter trees in the area. The results of annual increment revealed that the species is generally slow growing (3.2±1.2 years/cm) among the different broad leaved species studied so far. In addition, we found a stable linear relationships between the age and diameter (Age (years) = 3.149 × diameter (cm) + 6.667, R2 = 0.779),indicating that diameter is a good predictor of age for this broad leaved species. In view of its relatively slow growth, longevity and positive ring-width characteristics *O*. *ferruginea* seems to be a suitable choice for dendroecological and dendrochronological studies in lesser Himalayan and Hindukush ranges of Pakistan. The results obtained from this study help understand the composition, structure and regeneration dynamics of other subtropical broad leaved tree species.

**CONTROL OF SOME IMPORTANT SOIL-BORNE FUNGI BY CHITIN ASSOCIATED WITH CHILLI *(CAPSICUM ANNUUM* L.*)* IN LOWER SINDH, PAKISTAN**

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**Abstract**

Chilli (*Capsicum annuum* L.) belongs to family Solanaceae is one of the most important cash crop of the southern parts of Pakistan. *Capsicum* is cultivated on a large scale in a lower region of Sindh, Pakistan. It is an important and profitable crop of Pakistan. Several biotic and abiotic stresses affect the productivity of chilli crop. It is infected by a number of diseases particularly soil-borne diseases. Surveys of soil-borne fungal diseases associated with chilli crop in different areas of lower Sindh including Hyderabad, Tando Allahyar, Mirpurkhas, Umerkot, Kunri, Samaro, Kot Ghulam Muhammad and Digri were conducted and chilli plants showing symptoms of wilting were collected. A number of soil-borne root infecting fungi were isolated and identified suh as *Fusarium oxysporum, F. solani, Macrophomina phaseolina, Phytophthora capsici, Pythium* sp., and *Rhizoctonia solani* from collected disease plants. It was observed that all the major varieties (Sanam, Talhari, Ghotaki, Mexi) of chillies growing in lower Sindh were found highly susceptible to these fungi. The main objectives of the study were to examine the effectiveness of chitin for the management of soil-borne diseases of chilli plant by different methods *i.e.* soil amendment and transplant root dip method. Results indicated that of the two methods, soil amendment method was more effective while transplant root dip was less effective.

**CLIMATOLOGY RESEARCH IN NORTHWEST THAILAND**

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**Abstract**

Because there are only a few tree species in tropical zones that show the potential for conducting dendrochronology and because tropical zones have been the target of logging concessions for a long time, there are obstacles to the study of tree rings in areas where full-grown trees with a significant tree ring width are scarce.

Nevertheless, this study attempts to select living teak trees from an elevation range of 400-1000 m above sea level (a.s.l.) from Mae Hong Son province, Northwest Thailand. The study sites are isolated. Our research aims to investigate growth, synchronise data between sites, and understand how teak tree ring width responds to ecological position and climate. In this study, we divided the study site into 4 parts, with elevations from 200-300 m, 300-400 m, 400-500 m and 500-600 m a.s.l. The results revealed that the high correlation among the five sites chosen indicates the influence of a common force on the tree growth. The climate response of teak growth showed that rainfall from the previous December to the next monsoon, March to July, in the current year, directly influences teak growth and, in turn, is negatively correlated with the temperature during the same period. Our results suggest that the teak network in Mae Hong Son province can be used as a high resolution proxy for drought and rainfall reconstruction in northwest Thailand.

**CONOCARPUS ERECTUS PLANT AS A BIOMONITOR FOR AIR LEAD POLLUTION IN KARACHI**

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**Abstract**

Environmental pollution is a constant threat to living organisms. Lead is one of the toxic environmental pollutant. The present study deals with the inactive biomonitoring of lead pollution in air by using Conocarpus erectus plant as biomonitor. Plant samples were collected from different sites in Karachi. Wet acid digestion method was applied and the analysis of samples were performed by atomic absorption spectrometer (AAS). The results were tested by One-way analysis of variance (ANOVA). Lead concentrations were profound in industrial and high traffic density regions. Parks and residential areas showed significantly low concentrations of lead than industrial regions, the results were suppoted by Tukey’s test. The sampling was performed in pre monsoon and post monsoon season for the sake of seasonal variation assessment. Significant difference was found in the lead concentrations in pre monsoon and post monsoon periods which reflected the washout effect of rain on accumulated lead levels in plants, the results were supported by Duncan’s test. Canocarpus erectus plant can be use as a biomonitor for environmental pollution assessment.

**CLIMATE CHANGE CAUSED BY INDUSTRIAL ACTIVITIES IN PAKISTAN**

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**Abstract**

The climate change is a world wide problem in developed and developing countries. Pakistan is particularly vulnerable to climate change because it has generally a warm climate by virtue of its geographical location. Industrial activities are mainly blamed to be responsible for the surging trend of climate related disasters occurring in different urban areas of the country. After industrial revolution in Pakistan, all components of the ecosystem are badly polluted and resulted in change of climate. Unfortunately the major causes of a climate change can be attributed to anthropogenic activities such as the burning of fuel, the depletion of forests and changes in land use. Water, air and soil pollution by different industries which result in climate change in Pakistan is becoming a serious problem to environment. It is by far the biggest environmental issue in Pakistan, attracting considerably more public threats due to climate change. Industrial pollution and climate change are closely coupled. Just as industrial pollution can have adverse effects on plants, human health, ecosystems and also affect the Earth’s climate. As climate represents meteorological conditions over a long period of time, it is difficult to identify a climate fingerprint in the field of research. As a result of climate change the depletion of natural resources, the detrimental effects of pollution on human health and the uncertain prospects brought about by global climate change have become first-order issues for policy-makers and academics.

**CAUSES AND CONSEQUENCES OF FLOODS DURING 2010-11IN PAKISTAN**

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**Abstract**

Pakistan lies in the region that frequently experiences devastating floods. The reason of devastating floods in countries of this region (like Bangladesh, India, Pakistan, Nepal and Sri Lanka), lies in the very nature of their topography and natural ecological systems – steep and highly erodible mountains, the monsoon (heavy rain augmented by snow melt), heavily sedimented complex river systems. Human activities, widespread deforestation and pollution further increases the runoff and blocks flow. In recent years the heavy spells of rainfall associated with the occasional tropical storms may also possibly be linked to climate change.

The principal rainy season in the region is May to September; however Pakistan receives tail end of monsoon, in August and September. Meteorological record shows that nineteen major floods occurred in Pakistan over the last 65 years. Severe floods in the Indus plain happened more frequently during 1955-95 than in the preceding 70 years (1885-1955). However, with the lag of almost 15 years severity of floods further increases during last two years (2010-2011). The more plausible reason of the intensive rainfall and heavy snow melt apparently seems to be due to climatic changes and global warming.

The devastating flood of July and August, 2010, caused severe damage at national scale. The most affected areas include the provinces of Gilgit-Baltistan, KPK, Punjab, Sindh, and Kashmir. The flood took about 2000 human lives and brings heavy losses to livestock. Similarly heavy monsoon rainfall in 2011 led to severe flooding that affected about 8.9 million people, mostly in southern Pakistan’s Sindh province.

To mitigate flood related damages there is immense need for effective planning. This presentation identifies causes and consequences of floods with recommendations for effective flood related risk management, apart from establishing the links with climate change.

**DROUGHT TOLERANCE STUDIES IN WHEAT (TRITICUM AESTIVUM L.)**

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**Abstract**

Drought experiments were conducted during the year 2011-12. The material consisted of thirteen mutated lines from Kiran-95 variety and three check varieties Kiran (parent), NIA-Sunhari and Chakwal (a well known drought tolerant variety). Three irrigation treatments (T) were managed T1 (zero), T2 (two) and T3 (four/full) irrigations. Each irrigation Treatment had four rows with row length of two meters in three replicates. The highest plot yield was observed in lines 09 and 12 (366.67 gm) under zero irrigation treatment; however, drought tolerant control variety had lower yield (233.33 gm). In T2 mutant line 32 had the highest grain yield (550 gm); however, the Chakwal variety produced 366. 67 gm. In T3 the control and mother variety had the highest grain yield (600 gm). There were significant differences for grain yield of pooled results. Treatment 1 had the lowest grain yield per plot (250.63 gm), it was 30% and 42.5% lower/reduced than T2 (356.77 gm) and T3 (435. 63 gm) respectively. The T2 had 18% lower grain yield than T3. Mutation breeding is an important source of creating genetic variations. The aim was to improve the existing varieties for high grain yield under drought conditions.

**DETERMINATION OF STABILITY CONSTANT OF NICOTINATE COMPLEXES BY POTENTIOMETRIC STUDIES**

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**Abstract**

Nicotinic acid (3-carboxylic acid pyridine), Niacin forms complexes with many metals. It behaves may be mono, bi and tri dentate Ligand but mostly co-ordinates as monodentate Ligand. Complex formation of Niacin with different metals is a pH dependent reaction. In this study potentiometric results were used   for the calculation of stability constant. These results shows that complexes of Nicotinic acid and Cu forms (like ML, ML**2** , ML**3**) at different pH.

**DENDROCHRONOLOGICAL POTENTIAL OF JUNIPERUS EXCELSA (M.BIEB) FROM DRY TEMPERATE FOREST OF BALUCHISTAN PROVINCE, PAKISTAN**

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**Abstract**

Tree- rings are widely applied in ecological studies for determining tree ages growth rates and reconstruction of thé past climat. Wood samples in the form of cross-sections and cores were obtained from 50 living *Juniperus excelsa* trees to détermine .Age, growth rates and their ring-width characteristics from all sites of this dry temperate species was discussed.. Age and growth rate varied greatly from tree to tree and site to site and even in the same size trees. All selected trees showed annual nature of growth rings with distinct and clear ring boundaries. Cross dating was possible in all trees sample trees. Various problems encountered during cross-dating. The presence of false rings, missing rings, wedge out, lack of ring pattern consistency and lobate growth around the tree was observed in *J. excelsa*. The results indicated that at least 4 cores, a suitable site-selection and samples of tree rings in the form of trunks sections may improve ring width characteristics and can successfully be used in study of Dendrochronology.

**DIVERSTY OF WILD PLANTS OF SALT REGION OF SOAN VALLEY, PAKISTAN**

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**Abstract**

The present work reported the floristic riches of Soan Valley Punjab, Pakistan. The area enjoys arid habitat. The plant species of area are modified to severe salinity, temperature and humidity variation. A total of 51 plants belonging to 27 families were recorded during March and April, 2010. Dicotyledons contributed the major share to the overall flora of the area. Among the monocotyledons, Poaceae played important role in the flora often forming large patches of grassland. Drought adopted woodlands and shrub lands dominated by species like *Accacia modesta, Olea cuspidata, Dodonea viscosa, Gymnosporia royleana, Ziziphus numularia* covers the hills in most part of the area. The species such as *Taverniera numilariea, Daphne mucronata* and *Rhamnus pentapomica* are most important species in shrubs. Most of the species belonging to Poaceae, Asteraceae (6sp.), Acanthaceae (4sp.), Boraginaceae, Mimoceae, Oleaceae, Zygophyllaceae show adaptation to drought and salinity including the ability to re-grow vegetatively after ample rainfall. Among the halophytes, *Suada fruticosa* coexist with several salt tolerant species in the vicinity of salt lakes. The rich flora of the area is one the most fascinating and interesting to record.

**DIVERSITY IN LANDRACES OF *FAGOPYRUM ESCULENTUM* FROM DIFFERENT ECOLOGICAL REGIONS OF BALTISTAN, PAKISTAN**

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**Abstract**

Plant genetic resources are biological basis of diversity and considered as an essential component in plant ecological systems. Germplasm collection is therefore important for genetic diversity and conservation of genetic resources especially in mountain areas. The present study deals with the evaluation of Buckwheat germplasm resources from various ecological region of Baltistan. Cluster method by joining tree clustering was employed for measuring linkage analysis among buckwheat genotypes based on morphological features of seed germpalsms. UPGMA by Euclidean distances generated a cluster diving into two major groups. One cluster group with 09 whereas in another cluster group 10 landraces were included with means seed length (6.28±0.37 mm), seed width (3.90±0.17 mm), hundred grain weight (2.80±0.36 g) and maturity (77.57±1.31 days). The results concluded that most of landraces are early maturing, having much diversity in seed morphological features with good grain qualities. These findings would more useful for efficient utilization of plant genetic resources and conservation as well as exploration of wild germplasm resources in mountain ecological zones of Pakistan.

**ECOLOGICAL STUDY OF WEED FLORA IN SOME WHEAT FIELDS OF TEHSIL JARANWALA, DISTRICT FAISALABAD**

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**Abstract**

In total thirty nine weed species were studied having variable life form, % frequency and density in some wheat fields. Among these weeds thirty three belong to dicotyledon families and six to monocotyledon families. Among dicotyledons maximum weed species were found in Compositae (7), followed by Amaranthaceae (5) and Solanaceae (3). Moreover, family Chenopodiaceae, Cucurbitaceae, Malvaceae and Papilionacaeae having two species each and the rest of the dicot families contain one weed species each. On another hand in case of monocotyledons five weeds belong to family poaceae and one weed belong to typhaceae. Moreover, *Avena sativa* was found to be dominant with 73.34% frequency followed by *Convolvulus arvensis* with 70.00%, and *Poa annua* with 56.34%. Rest of the weed species were ranging from 43.33% to 5.04%.

**ECOLOGICAL STATUS AND REGENERATION PATTERNS OF *JUNIPER EXCELSA* FORESTS IN NORTH-EASTERN BALOCHISTAN**

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**Abstract**

Juniper (*juniperus excelsa*) form the dominant tree covers over large parts of north-eastern part of Balochistan. Thirty stands were randomly sampled in forests dominated by *Juniperus excelsa* during summer in 2012-2013. Vegetation parameters such as the floristic composition, density ha-1 and basal area m² ha-1, physical condition, sex ratio, size class distribution, estimation of berries, morphological variations, ages, growth rates and soil analysis. In total, 37 species of shrubs, herbs and grasses were recorded. Taxonomically 17 families, 3 monocot (6 species), 14 dicots (30 species) and 1 Gymnosperm (1 species) were identified. Analysis of all selected stands revealed different density and basal areas of juniper trees/seedlings between and within sites. Density of juniper trees (> 6 cm dbh) ranged from 106 to 379 individuals ha-¹ with an overall mean of 248±79 individuals ha-¹; the average basal area was 78±33 m² ha-¹. Regeneration is sufficient. Highest seedling density of 439 individuals ha-¹ was observed from Zizri Tore Sagran site, at elevation 2948 meter on north-east facing slope. Diameter distribution within the stands indicated balanced size class structures of J-shaped distribution with gaps appearing in the large size classes. Trees in the best condition were generally healthy (32 %). Sex ratio showed predominance of male juniper (58 %) as compare to female (39 %). Thick berries and green berries were found most abundant compare to the dry mature berries. Morphologically larger trees with pointed tops (BPT) was recorded 54±22 individuals ha-¹ or 22 % were most abundant, while young trees, bushy forms with conical tops (ANG) 48±25 individuals ha-¹ or 19 % were least dominant in the present study area. Highest radial growth rate was obtained as 13 years/cm and with an overall mean age estimated 269 years in the present study. Cross dating was possible in all trees sampled. However, a lot of problems such as false rings, missing rings, double rings and lobate growth around the stems observed.

It is also suggested that the rotational grazing practices should be adopted in grazing lands and farmers should be encouraged to grow multi-purpose tree on field bunds in agriculture lands to meet their domestic needs of fuel, fodder and timber. All these strategies will help in reducing the biotic pressure and also restoring and conserving the fragile juniper ecosystem of Ziarat, Balochistan for the future generations

**EFFECT OF ORGANIC MULCH ON RELATIVE WATER CONTENT (RWC) AND ELECTROLYTE LEAKAGE (EL) IN OKRA PLANT (LADY FINGER) GROWN UNDER SALINITY.**

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**Abstract**

The present study was carried out to determine the effect of organic mulch with or without gypsum amendment on relative water content and electrolyte leakage in leaves of okra (lady finger) plant grown under saline water irrigation. The plants were irrigated with non-saline control (ECiw = 0.5 dSm-1), S1, (ECiw = 2.0 dSm-1) and S2 (ECiw = 4.2 dSm-1). Relative water content in leaves of okra was decreased with increasing salinity level of irrigation water under without mulch control. Organic mulch alone or amended with gypsum showed increase RWC under non-saline as well as both salinities. Proportionate increase in EL was noted under salinity. The mulch alone or either amended with gypsum improves in membrane stability and reduce the EL even under salinities. Over all plant growth was reported to increase under mulch treatment as compare to without mulch.

The results of the present study suggested that application of organic mulch (with or without gypsum amendments) to the soil surface can improves salinity tolerance by improving RWC and reducing EL in plant and hence improve overall growth and yield of the plant.

**ETHNO-MEDICINAL SURVEY FOR SOME WILD PLANTS OF MUZAFFARABAD,**

**AZAD JAMMU & KASHMIR, PAKISTAN**

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*Multan-Pakistan*

**Abstract**

The present work is the study of local information of some wild plants being used for remedial purposes in District Muzaffarabad, Azad Jammu & Kashmir, Pakistan. The indigenous knowledge of local conventional uses was collected through survey and personal interviews during field trips. A total of 50 plant species were identified by taxonomic description using field guides and locally by medicinal knowledge of people living in the area. About 150 informers have been interviewed haphazardly to certificate local names and Ethno-medicinal uses of different plant species.

**ECOLOGICAL STATUS AND ASSOCIATION OF *DALBERGIA SISSOO* IN JHOK RESERVE FOREST LAHORE**

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**Abstract**

A phytosociological study was made on Joke Reserv Forest (a riverine forest) situated at the bank of river Ravi, Lahore, Punjab. to find out the status of the *Dalbergia sissoo* in the forest. Quadrat method was use to collect the data. From different ecological attributes like % frequency, density and % cover, Importance Value Index (IVI) of different species was calculated. Different communities viz; *Dalbergia sissoo-Lantana camara* community*, Dalbergia sissoo-Oxalis corniculata* community and *Dalbergia sissoo-Cynodon dactylon* community established along with *Dalbergia sissoo* were found out. Along with these five variants were found under these three basic communities which are describing the stability and disturbance level and biotic pressure on status of the *D. sissoo* forest at various levels.

**EFFECTS OF DIFFERENT LEVELS OF NACL ON GROWTH OF SOME SELECTED PLANT SPECIES**

TASVEER ZAHRA BOKHARI, SAHER ASGHAR MALIK, SHAZIA ASHRAF, ASIA NOSHEEN, UZMA YOUNIS

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**Abstract**

The present study was conducted to evaluate the effect of different concentrations of NaCl on the growth of *Phlox drumondii*, *Sesbania sesban*, *Calendula officinalis* and *Pennisetum typhoides*. From the study it was clear that *Pennisetum typhoides* and *Phlox drumondii* were more salt tolerant as compared to *Sesbania sesban* and *Calendula officinalis.* The growth of majority of the plants was decreased with increasing salt concentration. Higher concentration of salt drastically affected overall performance of all plants and had more negative impact on growth of *Sesbania sesban* and *Calendula officinalis.*

**EFFECTS OF AIR POLLUTION on *Pinus eldarica* wood**

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### Abstract

Air pollution, including automobile exhaust pollution, can affect anatomical and morphological characteristics of wood. In order to evaluate this subject, the *Pinus eldarica* trees of Chitgar Park in Tehran, which extends from a crowded highway in the south (polluted site) to the semi polluted midsection and to Alborz Mountain in the north (unpolluted site) were sampled with an increment borer and cores were collected. After cross dating, the tree rings of the last five years were separated from the rest of the core. Anatomical characteristics of the cross sections, including the transition between early wood and latewood, the tangential thickness of the last-formed latewood tracheids, the frequency of rays and resin ducts and the morphological characteristics of tracheids in rings formed in the same year were studied. The results indicated that the ring widths of *P. eldarica* in the three zones are not significantly different. Rays and false rings were more frequent in the polluted and semi polluted sites than in the reference area, and wall thickness (2D) was significantly different in some years. Other morphological properties did not differ significantly except for tracheid diameted. In conclusion air pollution does not alter *P. eldarica* ring width significantly but changes some anatomical and morphological properties of its wood. Therefore trees growing on polluted sites are not suitable for Dendrochronological studies.

**EFFECTS OF BIOCHAR APPLICATION ON EMISSION OF GREENHOUSE GASES FROM PADDY SOIL**

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*cHigher Education Department, Khyber Pakhtunkhwa, Peshawar, Pakistan*

**Abstract**

Rice paddy soil is considered one of the major anthropogenic sources of greenhouse gases such as nitrous oxide (N2O) and methane (CH4). Rice paddy soils contribute 5-19% annually to total global CH4 emission. Biochar is a carbon (C) rich material produced by pyrolyzing waste biomass. Biochar application into agricultural soil has recently attracted attention due to its potential agronomic, economic, and environmental benefits. Biochar addition to soil may mitigate the climate change. We investigated the influence of biochar upon fluxes of N2O and CH4, added to paddy soil. In this study, biochar has shown significant effects on N2O and CH4 fluxes from both cultivated and uncultivated soils. Biochar addition significantly (P<0.01) reduced N2O emission and increased the uptake/oxidation of CH4 in both cultivated and uncultivated paddy soil. We concluded that bichar can be beneficial in paddy soil and reducing the N2O and CH4 emission which will depend on site-specific conditions.

**ESTABLISHMENT OF CITRUS DIAGNOSTICS AND CERTIFICATION SERVICES IN PAKISTAN**

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**Abstract**

Citrus is an important fruit crop of Pakistan. Several fungal, viral and bacterial diseases affect the total yield of citrus crop. The confirmed and in-time diagnosis of citrus diseases is important to prevent their spread to neighboring fruit trees. Therefore, a rapid and sensitive assay based on the polymerase chain reaction (PCR) has been developed for the diagnostics of citrus greening disease, citrus canker disease and fungal diseases in citrus. Plant samples were collected from different citrus growing areas of Punjab like Sargodha, Toba Tek Singh and Faisalabad. Universal primers as well as pathogen specific primers for bacteria and fungi were used to optimize diagnostic PCR conditions. In addition, the disease causing pathogens were isolated and cultured in the lab conditions to fulfill Koch’s postulates. This detection technique that can be completed within 5 hours is a rapid and efficient method for accurate diagnosis of citrus disease causing pathogens in Pakistan.

**ETHNOBOTANICAL IMPORTANCE OF SOME PLANTS OF SHOGRAN VALLEY, PAKISTAN**

UME UMMARA

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**Abstract**

The present investigation of Shogran Valley, Pakistan reveals that the flora of study area has great ethnobotanical value. More than 40 species were collected, out of those, 15 plant species were having highest medicinal importance. These species include *Abies pindrow* Royle, *Achillea millefolium* L., *Caltha palustris* Linn, *Cedrus deodara* (Roxb. ex Lamb) G.Don, *Galium aparine* L., *Lepidium sativum* L., *Mentha longifolia* (L.) Huds, *Pinus wallichiana* A.B. Jacks, *Plantago lanceolata* L., *Stellaria media* (L.) Vill, *Taxus baccata* L., *Trigonella foenum graecum* L., *Urtica dioica* L., *Valeriana himalayana* Grub., *Valeriana Jatamansii* Jones. Plant species under study belong to family Pinaceae, Asteraceae, Brassicaceae, Caprifoliaceae, Caryophyllaceae, Labiatae, Pinaceae, Plantaginaceae, Ranunculaceae, Rubiaceae, Taxaceae, Urticaceae and Valerianaceae. A questionnaire was prepared for the sake of collecting information about various plants especially their medicinal uses. The information about medicinal plants was also taken from local hakims and traditional medical practitioners. The plant species were used for the treatment of various diseases by indigenous peoples including respiratory disorders, diuretic, fever, antioxidant, astringent, antispasmodic, stimulant, hypertension, haemorrhoids and skin diseases. The present study concluded that flora of Shogran Valley has abundant and considerable significance as far as their ethnobotanical importance is concerned.

**EVALUATING THE EFFECST OF SOIL pH AND MOISTURE ON THE PLANT SPECIES OF CHANGA MANGA FOREST USING VAN DOBBEN CIRCLES**

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**Abstract**

Diversity entails variation in the species having large number. There always a difficulty in the interpretation of the data yielded by the community samples because of the noisy data. And magnificent means are provided by the Multivariate methods for structuring such data. Changa manga forest was divided into four zones. Total 200 quadrats of 1m x 1m were laid down in whole of the forest. Species richness/abundance response to environmental gradients was investigated by using Van Dobben circles for a selected variable i.e. soil moisture and soil pH. Result shows that *Rumex crispis, Sonchus oleoraceous, Prosopis cineraria, Desmostachya bipinnata* , *cynodon dactylon, Malvastrum coromendialinum, Ageratum conyzoid, Sonchus arvensis* and *Conyza Canadensis* hold high positive response towards the positive circle of moisture while *Conyza bonariensis, Mentha spicata, Parthenium hysterophorous, Suaeda fruiticosa, Prosopis cineraria, Chenopodium album, Ranunculas muricatus, Stelleria media* and *Taraxacum officinale* show negative response toward the soil moisture. *Prosopis cineraria. Conyza bonariensis* shows the higher response towards the pH. *Mentha spicata* and *Parthenium hysterophorus, Suaeda fruiticosa, Tarxacum officinale, Cenchrus agrimonioides, Convolulus arensis* and *Cirsium arvense, Oxalis cornuculata* shows high negative response towards the pH variable. pH does not produce greatly effect on the plant present in the Zone-I and zone-III. The specie richness and pH relationship is monotonic positive. many species remain uneffected by the pH 3-7. That is why pH not showing much effect towards the species abundance as CMF pH lies in the range of 7.

**EFFECT OF COPPER ON VARIOUS PHYSIOLOGICAL ATTRIBUTES OF *Zea mays* L. IN IRRIGATION WATER**

SHAKIL AHMAD, TASVEER ZAHRA BOKHARI, RAMIZ RAJA AND

 UZMA YOUNIS

*Botany Division, Institute of Pure and Applied Biology, Bahauddin Zakariya University,*

*Multan-Pakistan*

**Abstract**

A pot experiment was conducted to evaluate the effect of copper sulphate (CuSO4) on physiological attributes of two maize (*Zea mays*) varieties (FH-810 and Yousaf Wala). The experiment was carried out in wire house of Botanical Garden, Bahauddin Zakariya University, Multan, during the summer season 2010. Seeds of *Zea mays* cultivars were obtained from Punjab Seed Certification Department. Seeds of *Zea mays* cultivars were sown in each pot (12 inch diameter and 3cm depth) contained of 10kg soil. Selected levels of copper sulphate (CuSO4) i.e. T0: control, T1: 5mM CuSO4, T2: 10mM, T3: 15mM, T4: 20mM CuSo4 were applied to both cultivars after three weeks of germination. Results of physiological parameters under the influence of T0: control, T1: 5mM CuSO4, T2: 10mM, T3: 15mM, T4: 20mM CuSO4 in *Zea mays* FH-810 and Yousaf Wala cultivars indicates decreasing trend with copper treatment. From the data it was cleared that physiological attributes (photosynthetic rate, stomatal conductance and transpiration rate) showed decreasing trend with increasing copper concentration. The reduction was more cleared in 25mM CuSO4.

**EFFECTS OF BIOCHAR APPLICATION ON EMISSION OF GREENHOUSE GASES FROM PADDY SOIL**

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**Abstract**

Rice paddy soil is considered one of the major anthropogenic sources of greenhouse gases such as nitrous oxide (N2O) and methane (CH4). Rice paddy soils contribute 5-19% annually to total global CH4 emission. Biochar is a carbon (C) rich material produced by pyrolyzing waste biomass. Biochar application into agricultural soil has recently attracted attention due to its potential agronomic, economic, and environmental benefits. Biochar addition to soil may mitigate the climate change. We investigated the influence of biochar upon fluxes of N2O and CH4, added to paddy soil. In this study, biochar has shown significant effects on N2O and CH4 fluxes from both cultivated and uncultivated soils. Biochar addition significantly (P<0.01) reduced N2O emission and increased the uptake/oxidation of CH4 in both cultivated and uncultivated paddy soil. We concluded that bichar can be beneficial in paddy soil and reducing the N2O and CH4 emission which will depend on site-specific conditions.

**FLORAL DIVERSITY OF MANGLOT WILDLIFE PARK, NIZAMPUR (DISTRICT NOWSHERA) KPK, PAKISTAN**

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**Abstract**

Floral diversity of Manglot Wildlife Park, Nizampur was studied to find out the vegetaion of the area. The area is located in Nizampur (District Nowshera) at a distance of 40 km from Attock bridge. The tract occurs between 710 56’ & 330 47’ N latitude and 710 58’ & 330 45’ E longitude. Most of the area is mountainous. The range runs East Westwards. The total area of the park is 1,756 acres. The elevation ranges between 700-3000 ft. The park was established in 1990s to serve as a sanctuary for the wild species and to create awareness among the common people about the importance of bio-diversity.

The region lies in the dry sub-tropical broad leaved scrub vegetation. The vegetation consist of scrub forest and the flora consist of shrubs and broad leaf tree species consisting of *Acacia modesta, Zizyphus nummularia, Olea ferruginea, Dodonea viscosa, Monotheca buxifoila* and *Justicia adhatoda.* The area has a fair representaion of medicinal and economically important plant species that are being used by the local people of the area.

Phytosociological survey was conducted to find the important plant plant communities in the area and to conduct the vegetation assessment in Aprl-May 2013. The results showed total 5 plant communities with total of 105 plant species in the area including the tree, shrubs and herb plant speceis. The plant species are of great importance regarding the floral diversity of the area and its socio-economic impact on the lives of the local people living in the surrounding areas.

**FLORISTIC COMPOSITION OF WEEDS IN WHEAT FIELDS OF DIFFERENT AGROECOLOGICAL CONDITIONS IN UPPER INDUS PLAINS, PUNJAB**

ZAHEER UDDIN KHAN

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**Abstract**

Frequent transect walks were made to non-saline irrigated, partially saline irrigated and riverian non-irrigated wheat fields in Upper Indus Plains, Punjab, Pakistan including districts of Faisalabad, Gujranwala, Kasur, Lahore, Okara and Sheikhupura during 2004-08. Voucher specimens were collected and their local names were enquired from local people. Nomenclature used in this report followed the flora of Pakistan. weed diversity comprising of fifty nine species belonging to 25 families in non-saline irrigated, fifty five species in partially saline irrigated and sixty five weeds of 21 families in riverian non-irrigated wheat fields were recorded. Poacceae, Asteraceae and Papilionaceae were the major contributors. They were followed by Brassicacceae, Caryophyllaceae, Euphorbiaceae and Polygonaceae. Some of the major rabi weeds were *Arundo donax* L., *Equisetum debile* Roxb., *Lotus corniculata* L., *Phragmities karka* Trin ex Steud., *Polygonum barbatum* L., *Saccharum bengalense* Retz. *Saccharum spontaneum* L., *Tamarix dioca* Roxb., *Typha angustata*  Bory & Chaub and *Veronica monantha* Retz. in riverian wheat fields while *Cotula hemispherica* wall., *Cynoglossum micranthum* Desf., *Goldbachia laevigata* D.C., *Heliotropium eichwaldii* Steud., *Heliotropium undulatum* Vahl., *Linum unitatissimum* L., *Plypogon monspeliensis* (L.) Desf., *Potentilla supine* L., *Scirpus maritimus* L., *Scripus mucronatus* L., *Spergula arvensis* L. and *Spergularia media* (L.) Presl. were identified from partially saline wheat fields. *Alhagi maurorum* Medic., *Conyza ambigua* L., *Desmostachya bipinnata* (L.) Stapf. and *Erythrea ramosissima* (Vill.) Pers. were the inhabitants of both partially saline and riverians wheat fields. A comparison of these weeds revealed the changes in ecological and management status of the wheat fields.

**FOREST ECOLOGY OF CONIFERS AND DENDROCLIMATOLOGICAL POTENTIAL FROM HINDUKUSH RANGE, PAKISTAN.**

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**Abstract**

Various conifer forests in Hindukush range were sampled. Their quantitative survey, multivariate analyses and dendrochronological studies are presented. On the basis of phytosociological analysis, twelve communities of six conifer species were recognized. *Cedrus* *deodara* and *Pinus wallichiana* were found the dominant species in the study area while *Taxus wallichaina* and *Abies pindrow* were found infrequently. *Quercus baloot* was also associated as co-dominance species. *Pinus roxburghii* forests were growing on lower elevations while *Picea smithiana* forests were found comparatively on high elevations. In understorey, a total of seventy seven other associated plant species were recorded. The relationship between vegetation and environmental factors were also explored. Four major groups were recognized in tree species data while six groups were found in the understorey vegetation using Ward’s cluster analysis. The major trends were revealed by NMS ordination that showing correlation between vegetation and some environmental factors. Wood samples of many conifers forest were also studied by using standard dendrochronological techniques. *Cedrus deodara* and *Picea smithiana* were crossdated and tree-rings width chronologies were developed. Climate and Rings-width relationship were established. The aim of this study was to investigate the distribution of coniferous tree species and climate impact on the tree-ring growth in the study area.

**FREQUENCY-SPECIFIC SOUND RESPONSIVE PHYSIOLOGICAL CHANGES IN RICE PLANT UNDER DROUGHT STRESS AND STRESS FREE ENVIRONMENT**

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**Abstract**

Frequency-specific sound responsive physiological changes in rice plants under drought stress and stress-free environment were studied. The objective behind the study was to test the physiological changes in rice plant as a result of frequency-specific sound treatments. Comparatively, high sound frequency (≥0.8kHz) improved relative water content, stomatal conductance and dark adapted quantum yield (Fv/Fm ratio) in drought stress environment. Infra-red thermal image-study of treated plants showed that average leaf temperature was increased and it was related to leaf water content and stomatal conductance. Frequency-specific sound, physiological changes and IR thermal image sensing in drought stress environment are discussed.

**FORESTS RESPONSE TO CLIMATE CHANGE IN PAKISTAN**

MUHAMMAD MUNIR SHEIKH1, GHULAM ALI BAJWA2, NAEEM MANZOOR1 & ARSHAD M. KHAN1

**Abstract**

Plants, people and climate are strongly interlinked. There is a kingdom of plantae with the forests falling within its domain, having a profound relationship with the people. The forests, like many other plants, provide people with food, supplement their fuel needs, fulfill the timber requirements and provide special plants for use in medicines. Forests have many other roles such as they conserve the land, regulate the flows of water to control the flash flooding and help reduce sedimentation in water channels and reservoirs. Besides suitable physiographic and soil conditions, plants also require favourable climatic conditions to grow and flourish. Any change in climatic conditions may disturb the forest ecosystem and may result in adverse effects on the forestry sector.

Climate Change resulting from an increasing concentration of Greenhouse Gases in the atmosphere due to the use of fossil fuel and other human activities has now become a stark reality and a major worldwide concern. Climate change in the recent decades, in particular, from the middle of the previous century has become too fast to allow forests ecosystems to accommodate themselves to these changes and further allow them gradually migrate to neighbouring areas with relatively more favourable climatic conditions. Unfortunately the forest coverage in Pakistan is miserably low, being only around 5% of the total land area of the country. Not only so; the forest area of Pakistan, for various reasons, is declining fast at a rate of 0.2–0.4% per annum, as reported in a study by ADB/GEF/UNDP in 1998. It is feared that the increasing adverse impacts of climate change in the coming decades would aggravate the situation unless remedial measures are taken well in time.

This paper briefly describes the results of a study recently undertaken by Pakistan Forest Institute (PFI) and Global Change Impact Studies Centre (GCISC) analyzing the past and projected impacts of climate change on the forests in different parts of Pakistan. In this study, the past impacts are analyzed for the 40–year period (1961-2000) using the observed reanalysis data for parameters: temperature (mean, maximum and minimum) and precipitation (annual and seasonal). Further, projections of climate change in different forest regions of Pakistan were made by downscaling (to a finer resolution of 50km x 50km) the coarser resolution (300km x 300km) outputs of a Global Circulation Model (ECHAM4) for the two different IPCC scenarios (A2 and B2). On the basis of past and projected trends of temperature changes, precipitation changes and the projected wind speed values at 10 meter height, the vulnerability of various forests is delineated as “extreme”, “severe”, “high”, “moderate” and “low” for the periods 1961-2000, 2020s (2010-2039), 2050s (2040-2069) and 2080 (2070-2099) is assessed. Forest indicators such as “Tree line shifting”; “changes in forest area”, “vegetation composition”, “forest out-turn” etc. are selected and impact of climate change on forests in the context of these indicators are studied and results drawn. These results will be of great help in developing strategies to combat the adverse impacts of climate change on forests in future.

**FUNGAL CONTAMINATION OF SOME MILK ANALOGUE (TEA WHITENER) IN KARACHI, PAKISTAN**

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**Abstract**

Tea is an instant energy providing national drink of Pakistan and consumed by the people of all social circles. In our culture dairy milk or milk analogue (tea whitener) is added in black tea to enhance the taste, color and aroma. Present study design to investigate the physical characteristics and hygienic level of the different brands of tea whitener either in liquid (TWL) or powder (TWP) states those gradually rooted in our culture available in Karachi city. In this regard hygiene of samples was checked by applying culture media Petri plate technique for fungal isolation.

**GROWTH-CLIMATE RESPONSE OF SPRUCE (*PICEA SMITHIANA*) FROM STAK VALLEY OF CENTRAL KARAKORAM NATIONAL PARK (CKNP), GILGIT-BALTISTAN,**

**PAKISTAN: A DENDROCHRONOLOGICAL APPROACH.**

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**Abstract**

A total number of 22 wood samples were investigated to explore the growth-climate response of *Picea smithiana* from Stak valley of Central Karakoram National Park. Some cores were rejected due to the complacent rings. The master series was attained highest age of 330 years (1680-2009 A.D).The sample depth was 20 cores up to 1900 A.D, 10 cores up to 1870 A.D while only a few cores sample attained up to 1780 A.D. The expressed population signal (EPS) value was 0.94 while signal to noise ratio (SNR) was 18.06. The running RBAR value was 0.47 while RBAR within the trees was 0.68 and between the trees was 0.46.

Total variance explained was 66.25% in residual ring width data and local climate data while 29.36% attained in residual chronology and grid data. Standard chronology and Skardu local climate showed strong correlation with 83.62% variance while low variance (R= 43.83%) was observed in standard chronology and grid data.

In case of temperature, July was significantly positively correlated with tree growth. Previous November and previous December were also positive and significantly correlated in 3 different response and correlation analysis. It is also observed that April was negative significantly correlated with tree growth in both correlation and response function analysis.

In case of precipitation, tree ring indices showed significant positive relationship with April and negative response in October. This indicates that the more than average rainfall in April and low rainfall in the month of October dropped the temperature and reduced sunlight which decreased the photosynthesis and harmonic activity hence plant growth was affected. June and July temperature are strongly significantly correlated and suitable for the growth of trees. Although June and July are the warm months but the conifer tree species situated at high elevation near snow where temperature favored. In addition, present study agreed that April precipitation support the growth of trees.

Our study gives additional information about growth-climate response of *Picea smithiana* from Stak valley of Skardu region. In addition it will include a new site in a tree-ring network of Northern areas of Pakistan. This tree ring chronology may be extended in time if larger and older trees are targeted in future.

**GROWTH CLIMATE RESPONSE OF *PICEA SMITHIANA* FROM DIR, PAKISTAN.**

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**Abstract**

Tree rings of two *Picea smithiana* ([Wall.](http://en.wikipedia.org/wiki/Nathaniel_Wallich)) [Boiss.](http://en.wikipedia.org/wiki/Pierre_Edmond_Boissier)forests were studied from district Upper Dir. Both the forests were located on different elevations. Samples were obtained in the form of increment cores and were crossdated. From Gojar Kali, a dated chronology was extended back since 1790-2006A.D while from Benshahi another chronology was developed since 1810-2007A.D. Mean sensitivity values were calculated about 0.191 and 0.223 respectively, while their autocorrelation values were obtained 0.729 and 0.752 respectively. Climatic data (mean monthly temperature and total monthly precipitation) record since 1967-2007A.D was obtained from nearest Meteorological Observatory from Dir Upper. Both the parameters of climate influences were tested against the two sites tree-ring series.

The results showed that temperature in previous year September, December and current year January promoted growth at Gojar Kalie, while precipitation gave positive response in previous October and February. At the Benshahi site, temperature of previous October and current April gave support to growth, while precipitation of previous November, December and current January showed positive response to growth of the same forest.

 The aim of this study was to investigate the influence of climate on the tree-ring growth of this species in the area. However, this is the preliminary results and it is suggested that more samples and sites will discover some better achievements.

**GROWTH AND CD BIOACCUMULATION RESPONSES OF VARIOUS RICE CULTIVARS DIFFERING IN THEIR SALT TOLERANCE**

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**Abstract**

The climate of Pakistan being arid to semiarid necessitates artificial irrigation for successful and economical agriculture. Continuous application of sewage water containing heavy metals could contaminate soils, crops and surface as well as ground waters warranting an immediate attention. Plants could accumulate cadmium, one of the most toxic metal pollutants, in large quantities endangering human health. Since uptake and accumulation of heavy metal pollutants in plants varies not only among plant species but also among cultivars of same species, the most feasible strategy is to recommend metal tolerant cultivars. To assess whether salt tolerant cultivars might have advantage over salt sensitive ones regarding growth and less Cd accumulation in aboveground parts, four rice cultivars were tested against application rates of 0, 10, 14, 18, 22 and 26 mg Cd L-1 of solution. Rice varieties included KS-282, IRRI-6, Basmati Shaheen (salt tolerant) and Super Basmati (salt sensitive). Results indicated that salt tolerant varieties, Basmati Shaheen, KS-282 and IRRI-6 accumulated relatively more Cd in their roots compared to that by Super Basmati (salt sensitive), without loss in root growth for the same Cd application rate. Nevertheless, varieties ranked in the decreasing order on the basis of shoot Cd bioaccumulation factor as Super Basmati > IRRI-6 > KS-282 > Shaheen Basmati. It could be concluded that salt tolerant rice cultivars were better to be recommended if rice is to grow with slight Cd contamination because of their less shoot Cd bioaccumulation while salt sensitive Super Basmati should be avoided.

**GENETIC VARIABILITY ANALYSIS OF DIVERSE RICE GERMPLASM LINES BY USING VARIOUS GENOTYPIC AND PHENOTYPIC TRAITS UNDER STRESS CONDITION.**MUHAMMAD ASHFAQ1AND MUHAMMAD SALEEM HAIDER1, MUHAMMAD ALI1, AMNA ALI1 AND GOHAR AYUB1

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**Abstract**

Genetic diversity of fifty rice genotypes including various approved varieties, basmati lines and land races were analyzed  by using desirable seed morphological traits and 15 SSR primer pairs at Institute of Agricultural Sciences, University of the Punjab, Lahore. The experiment was conducted in Randomized Complete Block Design (RCBD). All the trait (seed length, seed width, seed length width ratio, seed thickness and 1000 grain weight) showed positive significant differences among the genotypes. Correlations were also studied among these traits. Some traits showed positive association with each other and some showed negative association with each other. Seed length (SL) showed positive significant association with seed length width ratio (L/W) and 1000 grain weight (r= 0.834\*\*, r=0.099\*\*). On the other hand, seed thickness showed positive significant association with seed width and seed thickness (r= 0.254\*\*, r=0.069\*\*). Some other traits showed negative significant association with each other (seed length with seed width and seed thickness (r= -0.234\*\*, r= -0.162\*\*), seed width and seed thickness with seed length width ratio (r= -0.452\*\*, r= -0.350\*\*), seed length width ratio with 1000 grain weight (r= -0.153\*\*). The main objective of the study is to determination of the genetic diversity of rice through SSR markers and various phenotypic traits. Different SSR primer pairs were used for the study of various genetic characters of these rice genotypes by using PCR analysis after DNA extraction from the leaf sample of each genotype through CTAB method. The mean number of alleles per locus was 3.40, and the average number of polymorphism information content (PIC) values (0.554) was also observed that showed genetic variation among all genotypes. It is concluded that, all the genotypes showed almost significant genetic variability on the basis of their seed morphological traits.

**IMPACT OF VEHICULAR EXHAUSTS ON BIOMASS AND STOMATAL BEHAVIOUR OF *Bougainvillea spectabillis*Willd. ALONG SOME ROADSIDES OF LAHORE CITY**

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**Abstract**

This research work is carried out to investigate the impact of vehicular exhaust on road side plantation of Lahore city. Four road sites i.e., Mall road (R1), Jail road (R2), Canal Bridge road (R3) and Main Boulevard Gulberg (R4) were selected on the basis of their traffic densities. *Bougainvillea spectabilis*Willd.was selected as sampling plant on the basis of commonness and evenness. Three samples of each plant were collected to analyze their morphological, anatomical and physiological aspects. Morphologically *B. spectabilis* was very much affected because it is an evergreen plant while those plants that shed their leaves in a year are mostly less affected. Anatomically all samples were having partially and completely clogged stomata as compared to control samples. Moreover, high amounts of dust (g) were observed on the road side plants as they had fewer amounts of % moisture contents and stomatal index as compare to the plants from the control plants.

All this indicated a negative impact of vehicular exhausts on the health of the plant species, as a result reducing each aspect of the plant. While the ability of leaves to retain the higher load of fuel smoke dust on them was expected to be involved in reducing the air pollution. Although this smoke and dust load is not good to plant themselves and more over if inhaled by humans, can cause respiratory and many carcinogenic disorders as well.

**IMPACT OF CLIMATE CHANGE ON AGRICULTURE**

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**Abstract**

Agriculture is weather dependent and climatic factors have key role in crop productivity and food production owing to be highly vulnerable to climate change. Changes in climate are occurring because of ooceanic processes such as oceanic circulation, biotic processes, variations in solar radiation received by Earth, plate tectonics & volcanic eruptions, human-induced alterations of the natural world, Green house gases ( Oxides of N & Oxides of S), Industries, Transport Vehicles, Depletion of Ozone Layer, Pollution (Air, land, pesticide and Nuclear etc.) and Deforestation. Increased variability in weather, extreme conditions, sea level rise ruining coastal agricultural lands and CO2 fertilization are direct impacts of climate change on agriculture. While changing crop-weed competition dynamics, range changes of pests & pathogens, expanded range predicted for many pathogens and decreased biodiversity in natural ecosystems are indirect impacts. Potential Impact of climate change on Agriculture are change in cropping pattern, shortened growing season for wheat, but more time will be available for land preparation of summer crops and increased incidence of insects, pests, and diseases. Winter crop yields (wheat) might increase due to carbon fertilization but the increase will be more than offset by reduced growing season and water shortage. Summer crop yields (rice, cotton, sugarcane) might increase, again due to carbon fertilization, and improved land preparation but the increase will be offset by excessive heat and water shortage. Increased biotic stresseswill significantly affect agriculture through greater number of insect pests and increased insecticide resistance, increased vigor of weeds, herbicide resistance and host-pathogen response.To cope with the climate change and their impacts, there is need to work on stress tolerant varieties, short duration crops, innovative farming systems, crop diversification, shifting cropping pattern, adjustments in irrigation system and increasing cropping intensity.

**inheritance of SOME PHYSIO- morphological TRAITS IN WHEAT in POST-ANTHESIS high temperature stress**

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**Abstract**

 A study was conducted to investigate the inheritance pathway of some physio-morphological traits at Arid zone Research Institute Bhakkar, Pakistan during the year 2010-12. Two hundred and twenty genotypes of diverse origin were preliminary screened in heat stress and stress free conditions during 2010-11 and selected four high temperature tolerant and three thermo labile parental genotypes. Forty two F1 progeniesof 7x7 diallel crosses along with parents were evaluated in stress free and heat stress environment. F1 hybrids of Bhakkar-02 x SH-02 and its reciprocal had the highest grain yield per plant (28.00 and 27.33g) with a reduction of 29.42% and 26.78%, respectively in heat stress. The results revealed significant genotypic differences (P< 0.01) for all parameters. Adequacy tests indicated that data for spike index at anthesis, harvest index, grain set index and grain yield per plant were fit for additive dominance model while those of kernels per unit dry spike weight and heat susceptibility index were however partially adequate for further analysis. Additive component of variation (D) was significant (P< 0.01) and prominent over H1 and H2 components for spike index at anthesis, harvest index, grain set index, grain yield per plant and heat susceptibility index while dominant genes were main controlling factors for kernels per unit dry spike weight and was confidently sustained by the value of H1/D0.5 .Values of h^ 2 andH2/4H1 demonstrated asymmetrical and unequal distribution of dominant genes in parents for most of the characters. Spike length, dry biomass per plant at maturity, grains per spike, 1000-grain weight and grain yield per plant exhibited high narrow sense heritability due to the existence of additive gene action with partial dominance suggesting that these traits might be useful for the development of high temperature stress tolerant varieties by modified pedigree selection method.

**IMPACT OF CLIMATE CHANGE ON TOURISM AND ECONOMIC DEVELOPMENT**

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**Abstract**

Tourism is a million rupees industry that is highly dependent on climate resources. Climate change may provoke shifts in tourist inflows, with large economic implications. Climate change will impact tourism in many different ways. Tourism encompasses a highly diversified range of holiday types. All of these segments may have very specific weather requirements. One needs pleasant weather for sight-seeing, snow for skiing, bright sunny days for excursion etc.

The heart of the debate about climate change comes from a number of warnings from scientists and others that give the impression that human induced climate change is an immediate threat to society. Millions of people might be vulnerable to health effects, crop production might fall in low latitudes, water supplies might dwindle, precipitation might fall in arid regions, extreme events will grow exponentially and between 20–30 percent of species will risk extinction. Even worse, there may be catastrophic events such as the melting of Greenland or Antarctic ice sheets causing severe sea level rise, which would inundate hundreds of millions of people. Proponents argue there is no time to waste. Unless Greenhouse gases are cut dramatically today, economic growth and wellbeing may be at risk.

**INFLUENCE OF CLIMATIC CHANGE ON FODDER PRODUCTION AND FEASIBLE APPROACH FOR MITIGATION OF PRODUCTION LOSSES IN PAKISTAN.**

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**Abstract**

Climate change and agriculture are inter-related processes which take place on the world level. In recent past, production of major, minor crops, vegetable crops and fruit plants faced apparent decline due to change in climatic parameters in Pakistan. The weather uncertainities such as drought, floods. Storms (dust, thunder, and hail) during summer and ,fogs and frost during winter have caused serious damages, harms and losses in agriculture sector.

Both intensity and pace of climate change are presenting new and unprecedented challenges. It was observed that the rise In maximum&minimum temperature at the growth and development of various crops had negative effects on the agricultural crops. Among these crops, winter fodder crops berseem, lucerne and oats received serious setbacks in seed germination, seedling diseases and pests under high temperature conditions while these fodder crops found seriously affected during cold spell showing slow growth rate and causing delay in the cutting of the fodder crops especially berseem and lucerne. The low mean temperature and high relative humidity in winter were identified to be causing increase in berseem root rot, rise in aphid population especially on oat crop and aphid build up on berseem. Moreover these conducive conditions were found favourable for earlier development of insect pests viz., armyworm, helicoverpa, looper, semilooper, leafspot and foliar blight were recorded in high proportions during 2012 and 2013 winter seasons.

The summer fodder crops sorghum, maize, bajra and sadabahar(sorghum× sudan grass ) hybrid in Fodder Research Institute Farms Sargodha in 2012 and 2013 summer seasons were noticed to be obviously affected at germination, growth, pollination, seed setting and heading stages due to thermal stress and as well as biotic stresses, diseases viz., leafspot, stalkrot, anthracnose, and smuts and the pests i.e., shootfly and borers. The prevailing hot weather conditions at milk stage had serious adverse impacts on the yield of sorghum, maize and bajra seed crops. It was observed that higher temperature reduced the total duration of a crop cycle by inducing early flowering thus shortening the seed setting& grain fill periods. It is obvious fact that shorter the crop cycle the lower the yield and quality per unit area.

The immediate feasible approach to avoid adverse climatic impact and to reduce production risks on crops includes changing varieties with desirable characters, crops growth mappings, crop modeling,more efficient use of seed, water and fertilizer, altering the sowing plan and cultural operations integrated crop managing, improving the effectiveness of pests, diseases and weeds management practices in view of the current seasonal climatic forecasts.

In Pakistan, the forecasting and forewarning system needs to be strengthened and established to observe, record, communicate and disseminate the agrometeorological observations to be recorded by the Agronomists, Plant Pathologists, Entomologists and Agri-Ecologists as advisory recommendations to the farmers in each agro-ecolological zones of the country.

**IMPACT OF FLOODS ON HUMAN HEALTH IN BALOCHISTAN**

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Natural disasters such as floods are catastrophic events brought about by human manipulation of the environment which has led to global warming. Pakistan faced floods in the Balochistan, Punjab, Khyber Pakhtunkhwa and Sindh regions following heavy monsoon rains in the summer of 2013. This cross sectional study was conducted in Dera Murad Jamali at the helping hands relief camp. During the study, 437 patients of all age groups were examined.

Their demographic data and the nature of the disease were recorded and then analyzed using SPSS. The male to female ratio was 1:1.2. 38.4% of the patients were of age 10 years and below. Amongst the flood efectees, the most common diseases in decreasing order of frequency were diarrhea, upper respiratory tract infections, urinary tract infections, skin infections and trauma. Clean water, proper hygiene, health education along with timely medical cover can reduce morbidity and mortality.

**IMPACT OF CLIMATE CHANGE ON THE FISH BIODIVERSITY OF RIVER INDUS, DISTRICT** ATTOCK

IFTIKHAR AHMAD1, MUHAMMAD AYUB1 AND MAZHAR QAYYUM2

*1 Department of Fisheries, Punjab, 2 Department of Zooology, PMAS- Arid Agriculture University, Rawalpindi*

**Abstract**

 The present study focused on the threats posed to fish biodiversity of River Indus in district Attock emanating from the change in river flow, water pollution coupled with introduction of exotic fish species and associated anthropogenic activities. Impact of diversion of river flow through construction of Ghazi-Barotha channel has also been discussed. The study revealed that some important fish species have become endangered while others declared as threatened by the IUCN. Some potential threats to fish biodiversity, their impact and possible conservational measures have been discussed.

**INFLUENCE OF CLIMATIC CHANGE ON FODDER PRODUCTION AND FEASIBLE APPROACH FOR MITIGATION OF PRODUCTION LOSSES IN PAKISTAN BY THE AUTHORS**

INAM-UL- HAQ1 MUHAMMAD SHARIF2, ZAHEER SIKANDAR3 AND ABDUL KHALIQ4

*Solvent Free Selective Oxidation of Benzyl Alcohol to Benzaldehyde over an Eco-Friendly and Reusable Catalyst: Palladium Supported Zirconia.*

*Mohammd Ilyas and Mohsin Siddique\**

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**Abstract**

0.1 wt % Pd supported Zirconia was synthesized and characterized by various physicochemical techniques and successfully used for solvent free oxidation of benzyl alcohol to benzaldehyde. Influence of the reaction parameters (molar ratio of substrate to oxidant, amount of the catalyst, reaction time, and reaction temperature) were studied. The catalyst was reused three times without any significant loss in the catalytic activity. Nitrogen adsorption surface area analysis, FT-IR, XRD, and EDS of regenerated catalyst indicated that the catalyst was undegraded and stable after the reaction. The novelty of the work lies in obtaining a single selective product, benzaldehyde, as well as a high TON > 6000/hr for the same, under mild conditions. The effect of partial pressure of oxygen was subjected to kinetic analysis which suggested that the reaction is taking place by Langmuir-Hinshelwood Mechanism.

**INDIGENOUS PLANT RESOURCES OF KASHMIR HIMALAYAN REGION, DISTRICT KOTLI, AZAD JAMMU & KASHMIR: BIODIVERSITY AND CONSERVATIONAL PERSPECTIVES**

KHAWAJA SHAFIQUE AHMAD1, MANSOOR HAMEED1, MUHAMMAD ASHRAF2, FAROOQ AHMAD1, MUMTAZ HUSSAIN1, RIFFAT BATOOL1 AND SANA FATIMA1

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**Abstract**

Integrating indigenous knowledge in the development of management and conservation strategies of indigenous plant resources is critical to their effectiveness. The present paper documents the indigenous plant resources used in various ailments and conservation perspective of the plants of Himalayan region district Kotli. The data presented in this paper stems from a community level survey of and botanical conservation priorities of native people. The data obtained was analyzed through informant consensus factor (ICF) to determine the homogeneity of informant’s knowledge on medicinal plants. Thirty-five medicinal plants, distributed in 22 families, were documented that were effectively engaged in 14 disease ailments of local community. The largest number of remedies were found for intestinal worms, indigestion, inflammations; diarrhea, dysentery, constipation, flatulence, fever, coughs, and headache. The highest ICF value was recorded for liver and stomach diseases (0.96%) that might be is due to poor socio-economic and sanitary conditions of the study area. Vachellianilotica, Menthalongifolia and Ajugabracteosa showed the highest fidelity level (FL 100%), which is being used to cure digestive problems, skin diseases and diabetes. DMR results showed Juglanregia the most multipurpose medicinal plant, followed by Morusnigra. Ajugabracteosa and Buteamonosperma were found most threatened plants whereas fuel wood and timber mafia export were major threats to the medicinal flora of the Kashmir Himalayan region.

**KINETICS AND THERMODYNAMICS OF CA(II), AL(III) AND CR(III) SORPTION** **IN A MIXED SYSTEM ON AMBERLYST.15(H+).**

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**Abstract**

The kinetics of Ca(II), Al(III) and Cr(III) sorption onto Amberlyst.15(H+) is studied at different temperatures (293-333K) in a mixed metal system. The equilibrium time is dependent on the temperature in case of Cr(III) sorption while independent in case of Ca(II), and Al(III) sorption. The exchange capacities are observed to follow the order: Ca(II) > Cr(III) > Al(III) in a mixed system which can be co-related with hydration energy of metal ions of metal ions. The results for Cr(III) sorption in mixed system are also discussed comparatively with single system comprises only Cr(III) ions. The pH is found to decrease during sorption process in a single as well as in a mixed system. The kinetics data is evaluated by particle diffusion model. The value of activation energy determined from Arrhenius equation are observed to be 8.42, 16.61 and 6.96kJ/mol for Ca(II), Cr(III) and Al(III) respectively. Using the Eyring Equation, thermodynamic parameters of activation are calculated which indicate that Ca(II), Al(III) and Cr(III) sorption onto the Amberlyst.15(H+) is the entropy driven ion exchange mechanism.

**LOW COST CULTIVATION AND HARVESTING OF MICROALGAE FOR SUSTAINABLE PRODUCTION OF BIO-FUEL**

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*Dept. of Environmental Science, University of Gujrat, Jalalpur Jattan Road, Gujrat, Pakistan*

**Abstract**

Recently, microalgae biomass is being exploited as a feedstock for bio-fuel production. Cultivation and harvesting are critical steps in algae-based bio-fuel production process. In this study, we have focused to improve the cultivation and harvesting of microalgae for economical production of bio-fuel. In cultivation, growth rate and cell biomass are increased by investigating the effects of light and nutrients. Light and nutrients were used in different combinations. The maximum biomass yield and growth rate were observed in saturated conditions of light and nutrients. However, light had more impact than the nutrients. For economical microalgae harvesting, biopolymers were used instead of commonly used chemical flocculants. Chitosan, a biopolymer, showed high efficiency (>95%) at a dose of 120 mg/L. The harvesting efficiency was dependent on flocculants concentration, solution pH, residence time, and mixing speed.

To make algae-derived bio-fuel more economical, spent microalgae biomass (after extracting lipids) would be used in microbial fuel cells for electricity generation.

**METHOD FOR EVALUATING THE STATUS OF SCRUB FOREST**

FARID AHMED

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**Abstracts**

The purpose of this study was to develop a quick ranking system for diagnosing degree of changes resulting from human influences on a rapidly declining scrub forest of the sub-Himalayan region. The naturalness in this paper is described on the basis of structural criteria of the dominant life form, represented by the bi-species climatic climax vegetation of Olea ferruginea and Acacia modesta. Plant communities delineated on the basis of vegetation classification were regrouped on the presence and absence of the two species into natural and sub-natural communities. Natural community was further delineated on the basis of departure from the benchmark to gauge the status of naturalness within this community. The final three staged index proposed was used to evaluate the status and extent of degradation in the forest and in identifying the factors that lead to its altered status to initiate an appropriate management plan for restoration.

**MODELING THE DIAMETER DISTRIBUTION OF THREE GYMNOSPERM TREE SPECIES FROM CENTRAL KARAKORAM NATIONAL PARK, GILGIT-BALTISTAN, PAKISTAN USING WEIBULL** **FUNCTION.**

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**Abstract**

This investigation focuses on modeling the tree diameter distribution using Weibull function of three gymnosperm species, i.e. *Picea smithiana*, *Pinus* *wallichiana* and *Juniperus excelsa* dominating the forests of Central Karakoram National Park, Gilgit-Baltistan. Various workers have attempted to model the population structure of trees in their respective study areas. A number of probability distributions have been employed to find a good fit to the observed distributions. A number of recent studies have indicated the three parameter Weibull distribution as a possible model for describing the size class structure of trees. Thus, the Weibull model was selected to describe the diameter distribution of the three conifer tree species under study. The parameters for each tree distribution were estimated by a program CumFreq that employs the maximum likelihood method. The cumulative distributions of each tree species were tested against the fitted distribution. In all cases the Weibull distribution gave excellent fit to the observed data as indicated by high efficiency coefficient R. The possible implications of these models in the management of the respective forests are discussed.

**MORPHO-PHYSIOLOGICAL RESPONSES OF WHEAT (*TRITICUM AESTIVUM* L.) TO SIMULATED ACID RAIN AND MICRO NUTRIENTS**

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**Abstract**

The effect of simulated acid rain was evaluated on morphological, physiological and yield characteristics of wheat (*Triticum aestivum*) examined as a pot experiment during 2010-112. Two varieties of wheat *i.e.* Sahar 2006 and Shafaq 2006 with six treatments including control each having five repeats were used for experimentation. Sulphuric acid (H2SO4) at pH 3.0 and 3.5 were artificially prepared as simulated acid rain and micro nutrient *i.e.* Micron-T were applied by foliar spray separately and in combinations. Application of simulated acid precipitation caused significant reduction in all growth parameters as compared with that of control while micronutrients act as reducing agent against simulated acid application. As a result, Shafaq 2006 proved to be tolerant as it showed less reduction in growth, photosynthetic character, ion contents and yield as compared to its counterpart.

**MULTIVARITE ANALYSIS OF THE SOME FORESTS VEGETATION FROM DRY TEMPERATE AREAS (GILGIT, ASTORE AND SKARDU DISTRICTS), OF GILGIT-BALTSITAN, PAKISTAN**

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SYED SHAHID SHUAKAT1, MUHAMMAD FAHEEM SIDDIQUI2

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**Abstract**

Present study was conducted to investigate the relationship between vegetation and environmental factors from some forests of dry temperate areas of Himalayan regions of Pakistan. Forty stands were sampled from three districts of Gilgit-Baltistan. Ward’s cluster analysis and Detrended correspondence analysis (DCA) were applied to seek the vegetation distribution and composition. Ward’s cluster analysis when applied on tree species data and understory species data each give five groups and these five groups distinctly distributed on ordination plan. In cluster groups of trees Group I (a) and Group II are dominated by *Pinus wallichiana*, Group I (b) monospecific group of *Pinus wallichiana*,Group III *Picea smithiana*, Group IV *Betula utilis* and group V is consist on two monospecific stands of *Abies pindrow and* *Juniperus macropoda*. In cluster of ground flora Group I is dominated by *Potentilla anserine*, Group II *Urtica dioica*, Group III *Viola rupestris*, and *Fragaria nubicola*, Group IV *Cicer songaricum* and Group V *Bergenia stracheyi* consequently*.* The groups of tree and understorey vegetation are readily be superimposed on DCA ordination plane. Classification and ordination showed similar distribution pattern of tree species as well as understory vegetation. Relationships between the ordination axes with topographic (elevation and slope) and edaphic variables (pH, TDS, Salinity, conductivity and water holding capacity) also employed.

Incase of tree vegetation data cluster groups among the environmental factors only edaphic factor salinity (P < 0.05) and soil nutrient K+ (P < 0.05), (P < 0.05) showed positively correlated with axes 1, and axes 2, 3 correspondingly while in case of understory data cluster groups between the topogaraphic variables elevation (P < 0.05) was found positively correlated with axes 1. While among the edaphic factors only pH (P < 0.05), (P < 0.01) was showed positively correlated with axes 2 and 3 respectively. Whereas among the soil nutrients only Fe++ was recorded (P < 0.05) positively correlated with ordination axes 3. Both cases most of the environmental variables did not shows significant correlation this may due to the anthropogenic disturbances.

**MULTIVARIATE ANALYSIS OF VEGETATION IN WET TEMPERATE FORESTS OF PAKISTAN**

SAIMA SHEHZADI, RAMIZ RAJA, UZMA YOUNIS, SHAKIL AHMAD

*Botany Division, Institute of Pure & Applied Biology Bahauddin Zakariya University Multan.*

**Abstract**

The present study describes the floristic and vegetation composition of wet temperate forest of Pakistan. It is situated in the Galiat Forest plants division of Abbottabad between 34◦-1’ to 34◦-3.8’ N latitude and 73◦-2222.8’ to 73◦-27.1’ E longitude over an area of about 1684 hectares. Mean rainfall vegetation is about 1500mm, mean annual temperature is 21 ◦C and relatively humidity is about 66 %. Study sites ranged in altitude 2250-2350 m. A total of 27 sites were sampled for floristic and soil data by quadrate method. Data were analyzed by multivariate statistics including Cluster Analysis. Deterended Correspondence Analysis (DCA) and correlation Coefficient were used to detect relationship between altitude, some environmental factors with the composition and structure of plants communities. DCA axis 1 and 2 were used for data interpretation. Cluster Analysis delineated four vegetation types. The outcome of the cluster was confirmed by using DCA. The four groups produced by Cluster analysis were plotted on the first two axes as scattered diagram. From present study, we can conclude that Phosphorus and bare cover % were significantly associated with vegetation variation.

**NUTRIENT ANALYSIS OF SELECTED ALPINE HERBS AND DISTRIBUTION IN GHANCHE, GILGIT-BALTISTAN, PAKISTAN**

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**Abstract**

Gilgit-Baltistan is situated between longitude 72°-75° North and Latitude 35°-37° East, with a unique geographical features and dominated by mountainous landscape including K-2 (the second highest peak in the world). Present study was carried out in selected sites of Ghanche district, Gilgit-Baltistan in order to investigate the nutrient status of selected medicinal plants, altitudinal distribution of herbs and soil physico-chemical properties of soils of Alpine pastures during summer 2007. From two different sites viz. lower altitude (3150 m.a.s.l Khaplu Broq) and higher altitude (4000 m.a.s.l Mashabrum), the plants were categorized according to their distribution showing maximum (38) number of plants with 76% thriving in the mid altitudinal range of (3000-3500 m.a.sl). Species distribution represents majority of plants from Asteraceae family in the study area. Atomic Absorption Sectrophotometer was employed for the analysis. The ranking of Mg, Fe and Zn in Alpine herbs were *T. Serpyllum* > *Tanacetum senecionis* > *Delphinium brononianum > Carum carvi*. Soil nutrient analysis showed maximum P, K, and Mn concentration in soils of lower altitude while increasing percentage of organic matter, N and concentration of Fe and Zn at higher altitude. The data were analyzed by using Statistical Package STATISTICA 5.5. The findings of the study revealed variation in nutrient contents in herbs and comparatively more retention in alpine soils. The increasing tourist flow, overexploitation and changing climate are posing greater threats to local flora as well as in pressures of Alpine regions of Gilgit-Baltistan.

**Occurrence and distribution of entomopathogenic nematodes in agro-ecological zones of Pakistan**

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**Abstract**

Number of surveys were conducted to determine the occurrence, distribution and identity of indigenous entomopathogenic nematodes in ten agro-ecological and coastline of Pakistan during the years 1997-2004. A total of 4,630 samples were collected and 13.4% entomopathogenic nematodes were recovered from soil samples. Of which 08% were *Heterorhabditis* and 5.4% were *Steinernema.* in soil samples. Based on standard methods of EPN identification like molecular studies (RFLP) analysis of the ITS region of the rDNA repeat unit, SEM and classical taxonomy two new species of the genus *Steinernema* (*viz*., *Steinernema asiaticum* n. sp. Anis *et al*., (64.5%); *S. pakistanense* sp. n. (26.2%) Shahina, Anis, Reid and Rowe) and two known species were reported as new records from Pakistan (*viz.,* S. *feltiae* (=*bibionis*) Filipjev (9.2%); *H. indica* (55%) Poinar, Karunakar & David (1992).

Pakistan has a 1,046 km (650 mi) coastline and is divided into the coast of Sindh province 400 km and Balochistan province 650 km. The data presented in this thesis include 200 Km of the coastline of Pakistan ranging from Sir Creek to Gawadar Balochsitan. Collected entomopathogenic nematodes were 14% of a total of 1425 soil samples, *Heterorhabditis* found (09%) and *Steinernema* (05%).

The EPNs were extensively distributed but not throughout in all the regions of Pakistan. It was discovered that the interactions between biotic and abiotic factors seem to be the key bound for the establishment, and survival of entomopathogenic nematodes.

**PARTICULATE MATTER EFFECT ON FOLIAGE AND BIOCHEMICAL ATTRIBUTESOF TWO FRUITING PLANTS OF MULTAN, PAKISTAN**

UZMA YOUNIS, TASVEER ZAHRA BOKHARI, MUHAMMAD HASNAIN RAZA SHAH AND SAEED AHMAD MALIK

*Botany Division, Institute of Pure and Applied Biology, Bahauddin Zakariya University, Multan-Pakistan*

**Abstract**

From eight different sites of Multan the dust accumulation capacity of *Ficus carica* L. and *Psidium guajava* L. was evaluated.Leaves of these species were used to analyze the impact of dust accumulation on various foliage (leaf area, fresh and dry weights) and biochemical attributes (chlorophyll contents, carotenoids & ascorbic acid). At road sides the maximum dust accumulation was occurred in the plants while, at Bahauddin Zakariya University minimum dust was found on plants. Dust accumulation has caused a significant effect on almost all foliage and biochemical attributes of *F. carica*, whereas, it has not significant influenced on the attributes of *P. guajava*. Biochemical attributes in *P. guajava* appeared to be more prone than foliage ones.

A positive correlation was foundbetween dust accumulation and foliage attributes in *F. carica.* On the other hand,in *P. guajava* opposite was observed, however, the reverse was true for leaf biomass.Biochemical responses had shown an inconsistency as chlorophylls (a, b & total), carotenoid contents decreased and ascorbic acid contents increased with an increase in dust accumulation/deposition in both species.

**PATHOGENICITY OF SOME IMPORTANT ROOT ROT FUNGI TO THE CHILLI CROP AND THEIR BIOLOGICAL CONTROL**

**MUHAMMAD ABID AND FAISAL HUSSAIN**

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 Federal Urdu University of Art, Science & Technology,

Gulshan-e-Iqbal Campus, Karachi, Pakistan
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**Abstract**

A number of soil borne fungi are reported to cause diseases in chilli crop in Pakistan and induce heavy annual losses. During our survey conducted during July 2010 to August 2012 it was observed that in the chilli plants of lower areas of Sindh Province including Kunri, Kot Ghulam Muhammad, Mirpurkhas, Hyderabad, Tando Allahayar, Samaro, Umerkot and Digri show pathogenicity  symptoms including wilting, stunted growth, chlorosis and blotch.  Diseased plant specimens were collected and brought to laboratory. The soil borne fungi Rhizoctonia solani, Macrophomina phaseolina, Fusarium oxysporum, F. solani and Pythium sp. were isolated from specimens collected from these areas.  Pathogenicity tests were carried out under greenhouse conditions using isolated fungi on chilli and colonization and infection percentages were determined. During this study, Pythium sp., and R. solani severely affected plants compared to other fungi tested for their pathogenicity such as F. oxysporum, F. solani and M. phaseolina. In biological control, four antagonistic fungi Aspergillus flavus, A. niger, Penicillium commune and Trichoderma harzianum were used against the above mentioned plant pathogenic fungi which successfully suppressed the activity of pathogenic fungi. In addition, it disclosed that T. harzianum was highly antagonistic towards R. solani, M. phaseolina, F. oxysporum, F. solani and Pythium spp. as it showed a strong inhibitory effect on the growth and mycelial development.

**PATHOGENICITY TEST OF SOME IMPORTANT ROOT ROT FUNGI ON CHILLI CROP**

FAISAL HUSSAIN1\*, S. SHAHID SHAUKAT2 AND MUHAMMAD ABID1

*1Dr. A.G. Aerobiology and Plant Pathology Lab., Department of Botany,*

*Federal Urdu University of Art, Science & Technology, Gulshan e Iqbal Campus Karachi*

*2Department of Environmental Sciences, University of Karachi*

**Abstract**

There are a number of soil borne fungi are reported to cause diseases in chilli crop in Pakistan and cause heavy annual losses. During our surveys conducted during July 2010 to August 2012. It was observed that in the lower areas of Sindh Province including Kunri, Kot Ghulam Muhammad, Mirpurkhas, Hyderabad, Tando Allahayar, Samaro, Umerkot and Digri chilli plant were showing wilting, stunted growth, chlorosis and necrosis. Disease plant specimens were collected and brought to lab. The soil borne fungi *Rhizoctonia solani*, *Macrophomina phaseolina*, *Fusarium oxysporium, F. solani* and *Pyhtium aphanidermatum* were isolated from collected specimens. Pathogenicity test was carried out at green house using isolated fungi on chilli and colonization and infection % were calculated.

**PHYTOCHEMICAL ANALYSIS AND ANTIBACTERIAL ACTIVITY OF *FICUS CARICA* AND *GYMNEMA Sylvestre***

HINA ZAHID

*Botany Division, Institute of Pure and Applied Biology, Bahauddin Zakariya University,*

*Multan-Pakistan*

**Abstract**

The purpose of this study was to investigate antibacterial activity and to do phytochemical analysis of two medicinally important plants i.e. *Ficus carica* and *Gymnema sylvestre.* Antibacterial activity of methanolic extracts of two plants were tested against 2-gram negative bacteria (*Pseudomonas aeruginosa, Escherichia coli*) and 1-gram positive bacteria (*Staphylococcus aureus*) by using disc diffusion method. The minimum inhibitory concentration (MIC) was determined by agar well diffusion method and agar dilution method. The extract of *Gymnema sylvestre* showed maximum antibacterial activity against *Staphylococcus aureus* and showed minimum antibacterial activity against *Escherichia coli* and pseudomonas aeruginosa. While the extract of *Ficus carica* showed maximum antibacterial activity against *Staphylococcus aureus* and minimum against *Pseudomonas aeruginosa* and *Escherichia coli*. It is clear from the results that plant extracts have great potential as antimicrobial compound against bacteria. In phytochemical analysis, methanolic extracts of two plants were used. In saponin test, *Gymnema sylvestre* showed positive results while *Ficus carica* showed negative results. In ninhydrin test both the plant extracts showed negative result but in xanthoprotein test both the plants showed positive result. So, this shows that both plants also have great phytochemical value.

**PLANT BASED DYE RESOURCES OF** KHYBER PAKHTUNKHWA

**Faizan Ullah and Asghari Bano**

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**Abstract**

The 40 plant species belonging to 27 families were diagnosed as sources of natural dyes. Yellow dye was more common among the plant species followed by brown and red respectively. Leaf was found as the major source of dyes followed by bark and flower. The dye production capacity was greater in the above ground parts than that of underground parts of the plants. Asteraceae, Rosaceae and Moraceae were major plant families having greater number of dye yielding plants. The staining capacity of natural dyes was further augmented by application of iron oxide nano-particles on cloth fibers. The dye extracted from wood of Berberis was highly efficient in staining lignified plant tissues. More detailed studies and scientific investigations are needed to assess the real potential and availability of natural dye-yielding resources and for propagation of species in great demand on commercial scale. Biotechnological and other modern techniques are required to improve the quality and quantity of dye production.

**PLANT-MICROBE INTERACTIONS FOR REMEDIATION PETROLEUM HYDROCARBONS CONTAMINATED SOIL TO COMBAT GLOBAL WARMING**

HAFIZ NAEEM ASGHAR\*, MUHAMMAD YAHYA KHAN, ZAHIR AHMAD ZAHIR AND HAFIZ MUHAMMAD RAFIQUE

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**Abstract**

Concept of global warming due to climate changes is no more limited to increasing level of carbon dioxide in air but also consider significant share of toxic by-products released from petroleum hydrocarbons to increase global warming. Volatile compounds of total petroleum hydrocarbon (TPH) and/or polycyclic aromatic hydrocarbons (PAH) released from contaminated soil and water into air due to evaporation and/or burning of petroleum products act as aerosols and considerably account in global warming. There is increasing interest for remediation of TPH contaminated soils by adopting environment friendly and cost effective approaches. Judicious use of plant microbe interactions for remediation of contaminated soils is gaining attention of researches because of its ecological benefits. In present study, many bacteria were isolated from petroleum hydrocarbons contaminated soil. These bacteria were tested for their bioremediation and plant growth promotion potential in various lab studies. Efficient bacterial isolates having bioremediation and plant growth promoting activities were selected for evaluating their potential to enhance phytoremediation of TPH by using alfalfa under natural conditions. Results clearly illustrate that growth of alfalfa was decreased due to contamination but bacterial inoculation significantly improved the growth of alfalfa in TPH contamination. Bacterial inoculation not only improved the plant growth but also improved the phytoremediation potential of alfalfa by decreasing up to 75% TPH. Our study demonstrated that combined use of plants and bacteria could be very promising option to remediate petroleum contaminated soils.

**PLANTS-PEOPLE-CLIMATE NEXUS: FROM SUSTENANCE TO SUSTAINABILITY**

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**A B St R A C T**

Man is at the centre stage of ‘Plant-People-Climate’ nexus; mankind depends on plants for food for survival and plants depend on climate to provide food. Man has transformed the world into a global village but is also responsible for spoiling the environment and inducing changes through its activities that are interfering with the climate system. It is now an admitted fact that climate change is rapidly unfolding new and serious challenges to humankind at global, regional and national levels. Both the phases of climate; its interannual and seasonal variability and its long-term changes are of great significance. Climate variability has both positive and negative impacts at all levels especially on rural communities whose livelihood is rooted in climate-sensitive sectors like agriculture, livestock, forestry, biodiversity, etc. Climate variability and extremes generate droughts, floods, heat waves, hailstorms, landslides, avalanches and diseases. Extreme climate events such as El Nino and La Nina have huge impacts on agriculture and livestock, hence on food security is one of the most crucial and long lasting challenges for developing countries including Pakistan.

 Unfortunately, Pakistan is already and will be affected by the negative impacts of climate change and climate variability far more seriously than recognized by the planners and policymakers. The high vulnerability of the country to climate change lies in its vulnerable geographical location, dependence of livelihood of greater portion of the society on climate sensitive sectors, scarcity of water for irrigation, lack of preparedness for the imminent challenge and low technological and resource base. The adaptation to adverse impacts lies in capacity building of institutions and communities, investment in research, poverty alleviation, mainstreaming of climate change into national development plans, preparedness for risk and raising awareness of populace on climate change issues. The paper will provide glimpses of research work done at GCISC on climate change impacts on the productivity of staple crops of wheat and rice and some plausible solutions in managing climate change for sustainable development.

**PLANT BIODIVERSITY AND DISTRIBUTION STATUS IN ASTORE VALLEY, GILGIT-BALTISTAN, PAKISTAN**

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**Abstract**

During the study period (2005-2012) 631 naturalized phanerogames plant species were identified in Astore valley, which represents the 11.42 % of the total flora of Pakistan, belonged to 76 families and 303 genera. Besides these 33 cultivated species belonged to 17 families and 30 genera were recorded. Four species of Pteridophytes belonged to two families and two genera were also identified. Out of these 631 naturalized flowering plants 557 species (88.27 %) were angiosperms dicots belonged to 266 genera and 65 families. 64 species (10.14 %) were monocots belonged to 32 genera and 8 families. 10 species (1.58 %) were Gymnosperms belonged to 5 genera and 3 families. Among these, seven species were recognized as new to science, while two species were first time reported from Pakistan, *Taraxacum stewartii* Soesl and *Camelina microcarpa* Andrz.ex DC. One family, 7 genera and 29species were recorded as new to study area. Seven species are characterized as critically endangered, six species are endangered, 12 species vulnerable and 9 species are data deficient. Thirty seven endemic species of Pakistan found in study area are also documented. The study area is classified into five ecological zones, status of species in each zone are mentioned. Six life form classes are also classified, status of each class species are discussed. Nine years meteorological data of Astore valley is obtained from Met. Department Karachi office and analyzed the mean monthly and annual temperature, humidity and precipitation. Changing in climatic factors and effects on Biodiversity are also discussed.

**PRELIMINARY PHYTOCHEMICAL ANALYSIS AND DETECTION OF ANTIMICROBIAL ACTIVITY OF *RICINUS COMMUNIS***

NISHWA FAYYAZ

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**Abstract**

Environmental conditions exhibit a key role in outlining the utility and distribution of plants, in accordance with other factors. Climatic fluctuations are known to have had colossal and enormousinfluences on plant diversity patterns as well as on the chemical constituents present in the plants responsible for inhibiting the activity of many common bacterial strains. *Ricinus communis* L. belonging to family Euphorbiaceae, collected from District Multan, Pakistan, was investigated for preliminary phytochemical analysis and was screened for its antibacterial activity against *Staphylococcus aureus* (gram-positive), *Escherichia coli* (gram-negative) & *Pseudomonas aeruginosa* (gram-negative) by using disc-diffusion method. Differential vulnerabilities of these bacterial species were examined for varying concentrations (900mg/ml, 800mg/ml, 700mg/ml, 600mg/ml & 500mg/ml) of ethanolic extract from the plant leaves. *Ricinus communis* was found to be most operative against *Pseudomonas aeruginosa*. Maximum results were obtained at the maximum concentration of ethanol extract i.e. 900mg/ml and least results were displayed at concentration of 500mg/ml against all bacterial strains. The phytochemical analysis of *R. communis* revealed the presence of tannins, anthraquinones, saponins, phenols, flavonoids and proteins. These results could be attributed to the impact of different environmental conditions and climatic changes on the ecology of studied plant.

**PREPARING OUR CITIES FOR A CHANGING CLIMATE: URBAN GREEN SPACES AS A WAY OUT?**

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**Abstract**

Pakistan is one of the fastest urbanizing countries in South Asia and its cities are growing rapidly. Urban areas are characterized by large scale consumption of materials and energy. Because of these inputs, cities are main producers of inorganic/organic waste and are sites of heavily polluted environments. Cities generate large amounts of green house gases and are highly vulnerable to impacts of climate change (droughts, flooding, pollution, heat waves etc). Global warming due to climate change is expected to have serious impacts on our urban areas where in next 3-4 decades, 45-50% of Pakistan’s population will be living. There is an urgent need to develop adaptive strategies which can provide cost effective, easily applicable and sustainable solutions to our cities to cope with issues of climate change. Urban areas suffer from special climate conditions (dryness, heat, less wind compared to the rural surrounding) thus creating a relatively hotter and drier environment. Trees and green spaces in urban areas provide important functions such as shading, evaporative cooling and enhance infiltration of water (ecosystem services) which help in moderating urban environment. In future, urban green areas and their vegetation are expected to make significant contributions in helping our cities to adapt themselves to adverse climatic conditions.This paper explores the potential of green areas and green infrastructure in adapting our cities for future climate change.Urban greening is a cheaper way of moderating urban ecosystems at a local level. Urban trees and plants cool the surrounding environment through shade and reducing energy in the local atmosphere through evapo-transpiration. Conservation and maintenance of green spaces provide a cost-effective route to climate change adaptation that can be applied on large scale to reduce green house gas emissions in cities and protect these from adverse effects of climate change.

**RECONSTRUCTION OF PAST TEMPERATURES FROM GILGIT AND HUNZA VALLEYSNOTHERN PAKISTAN**

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*Laboratory of Dendrochronology and Plant Ecology of Pakistan Department of Botany, Federal Urdu University of Arts, Science and technology GulshanIqbal Campus Karachi, Pakistan*

**Abstract**

This study used three species (*Piceasmithiana, Juniperusexcelsa* and *Pinusgerardiana*) ring-width chronologies to investigate palaeo-temperature history in Gilgit and Hunza valleys Northern Pakistan. *Piceasmithiana*Jutial chronology was used to reconstruct March-June temperatures back to A.D. 1523. The calibration model explained 38.16% of the variance in temperature. The reconstructed temperature was tested over decadal and century time-scale. The coolest decadal time scale period revealed that 17th century experienced lowest degree of temperature and ensuing the period of “Little Ice Age” (LIA). The temperatures reached their maximum in 19th century over century time-scale. As *Pinusgerardiana*Chaprot chronology exhibited strongest temperature signal among all chronologies therefore, separate exercisewas performed where Jutial chronology reconstruction was compared with Chaprot reconstruction. Two species demonstrated the common patternin spring temperatures. However, the temperature reconstruction from Chaprot was insufficient to produce a long term proxy temperature. The current reconstruction added similar trend of temperature in comparison with the other studies throughout central Asia.

**REMOVAL OF CR (VI) FROM AQUEOUS SOLUTION ONTO *BOSWELLIA SERRATA***

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**Abstract**

In this Investigation, adsorption of Cr(VI) on *Boswellia Serrata* has been studied. Percent adsorption was determined for *Boswellia Serrata* as a function of adsorbent, adsorate, contact time, stirring time data has been interpreted in terms of Freundlich and Langmuir equation. Thermodynamic parameters for the adsorption onto *Boswellia Serrata* have been investigated. Kinetic modeling was also analyzed and adsorption followed pseudo 2nd order kinetics. The value of ΔG suggest that the adsorption of Cr (VI) on Boswellia Serrata is a spontaneous process.

**RESPONSE OF MUNGBEAN** **[*VIGNA RADIATA* (L.) WILCZEK.] TO CADMIUM AND NICKEL APPLIED AS SOIL TREATMENT**

MUHAMMAD AQEEL\*, MUMTAZ HUSSAIN\* AND SABEEH-UR-RASOOL SABIR\*

*\*Department of Botany, University of Agriculture, Faisalabad*

**Abstract**

The aim of the present investigation was to asses the effect of cadmium and nickel separately and in combination on some morpho-physiological, biochemical and yield characteristics of mungbean [*Vigna radiata* (L.) Wilczek.]. Two mungbean varieties viz., Mungbean var. 07002 and Mungbean var. M-1 were grown under nickel and cadmium application. Twenty days old plants were exposed to 15 or 30 mg L-1 nickel and cadmium whereas control plants were treated with tap water only. Application of both nickel and cadmium caused significant reduction in all growth parameters as compared with that of control. The extent of decrease in growth due to cadmium compared with nickel. Although high concentrations of both the metals in the soil drastically reduced all gas exchange characteristic, growth of the plants, ionic contents and biochemical attributes in both mungbean varieties. Cadmium application caused more reducing effect as compared to nickel. In addition, all yield attributes of both varieties of mungbean reduced due to exposure of these metals in soil. In conclusion, Mungbean 07002 proved to be tolerant as it showed less reduction in growth, photosynthetic character, ion contents and yield as compared to Mungbean M-1.

**ROLE OF SOD AND POD ISOFORMS IN THERMOTOLERANCE OF RICE (ORYZA SATIVA L.)**

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**Abstract**

Under the threat of global warming, the current challenge is to decipher the molecular mechanisms and potential biomarkers of heat stress response (HSR) and thermotolerance to identify genotypes that will withstand unfavourable environmental conditions. On the basis of above facts and importance of rice, we designed a study to understand response of rice under heat stress. For this, 20 days old seedlings of eight local rice cultivars (“IR-6”, IR-8”, “DR-82”, “DR-83”, “DR-92”, “K-95”, “Sada Hayat” and “Shahkar”) were subjected to heat stress (42±2°C) and recovery (28±2°C) treatments and leaf samples were collected after 24, 48 and 72 h at each treatment for the quantification of reactive oxygen species (H2O2), superoxide dismutase (SOD), catalase (CAT), ascorbate peroxidase (APX) and peroxidase (POD) by spectrophotometric assays. Native-PAGE was carried out for identification of SOD and POD isoforms through differential staining. Results revealed that heat stress increased production of H2O2 suggesting activation of oxidative stress by high temperature. SOD, CAT and POD activity were increased gradually with increasing heat episode and decreased during recovery while APX showed reverse response. Among the cultivars “K-95” showed lowest concentration of H2O2 and highest antioxidants activity. Controlled production of H2O2  in cultivar “K-95” may be due to the better performance of antioxidant defence machinery to detoxify ROS. It can be concluded from the result that improved antioxidant enzymes at high temperature is very crucial for plant survival and this may be use as potential bio-marker for thermo-tolerance in rice.

 **ROLE OF HIGHER EDUCATION INSTITUTIONS TO UNDERSTAND THE CHALLENGES OF CLIMATE CHANGE**IFTIKHAR A RAJA, ARSHID PERVEZ AND AMIR H MALIK

*Department of Environmental Sciences*

*COMSATS Institute of Information Technology*

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**Abstract**

The world today is facing many challenges and envisages emerging needs. The climate change, food, peace and security, global economic and financial systems are a few of these challenges and needs. These challenges have emphasized the need for approaches to education that equip and empower people of all ages to deal with uncertain environmental, economic and related issues. Higher education institutions have been deeply involved in such changes. They have been studying them, teaching and investigating them, and live with them at first hand. Although there exists a range of educational and research initiatives but these are not enough to support the present situation. That is why they are going through what might be one of the most extraordinary and engaging periods of their history. These challenges has opened a horizon full of complex challenges but at the same time huge opportunities for the future. To respond the problems the higher education institutions have to find their role by rethinking – creating the knowledge through research and disseminating through teaching. Environmental Challenges must be internationalized, shared at local, regional and global level. The Higher Education Institution ‘HEI’ play a major role in:

* Knowledge generation through learning, collaborating and sharing
* Creating a database of climate change activities in the region
* Setting a tendency for HEIs to follow or replicate the research of developed world institutions according to the local needs.
* Utilizing valuable indigenous information existing in local communities, farmers in the rural areas
* Not wasting the time, leaving the crisis to grow, where it become difficult to resolve

The paper reviews the present day climate challenges, the response of higher education institutions and initiatives taken by COMSATS Institute Information Technology, Abbottabad in Pakistan also the support provided by Higher Education Commission of Pakistan.

**REMOVAL OF CR (VI) BY ADSORPTION ONTO CURCUMA AROMATICA**

ASMA SIDDIQUI\* AND HUMERA ANWER

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**Abstract**

Due to broad industrial use, chromium is considered a severe environmental contaminant. Pollution of soil and water by chromium (Cr) is of new concern. Although there are various other valence states but Cr (VI) is considered the most toxic. Cr (VI) shows harmfull effect on human health. Curcuma aromatic has the ability to absorb toxic metals so the removal efficiency of this herb from Cr (VI) containing aqueous solution was investigated. Using adsorption technique effect of contact time, pH, stirring time, temperature adsorbate and adsorbent are studied. Results were analyzed by Langmuir and freundlich equation. Thermodynamic parameters for the adsorption system have been determine.The data were also analyze using first and second kinetic model.

**ROLE OF HIGHER EDUCATION INSTITUTIONS TO UNDERSTAND THE CHALLENGES OF** **Climate Cahge**IFTIKHAR A RAJA, ARSHID PERVEZ AND AMIR H MALIK

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**Abstract**

The world today is facing many challenges and envisages emerging needs. The climate change, food, peace and security, global economic and financial systems are a few of these challenges and needs. These challenges have emphasized the need for approaches to education that equip and empower people of all ages to deal with uncertain environmental, economic and related issues. Higher education institutions have been deeply involved in such changes. They have been studying them, teaching and investigating them, and live with them at first hand. Although there exists a range of educational and research initiatives but these are not enough to support the present situation. That is why they are going through what might be one of the most extraordinary and engaging periods of their history. These challenges has opened a horizon full of complex challenges but at the same time huge opportunities for the future. To respond the problems the higher education institutions have to find their role by rethinking – creating the knowledge through research and disseminating through teaching. Environmental Challenges must be internationalized, shared at local, regional and global level. The Higher Education Institution ‘HEI’ play a major role in:

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The paper reviews the present day climate challenges, the response of higher education institutions and initiatives taken by COMSATS Institute Information Technology, Abbottabad in Pakistan also the support provided by Higher Education Commission of Pakistan.

**REVIEW ON THE IMPACTS OF CLIMATE CHANGE ON WOMEN AND THEIR LIVELIHOOD, THE COMMUNITY’S PERCEPTIONS AND ADAPTATION STRATEGIES ADOPTED BY WOMEN.**

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**Abstract:**

The current desk review investigates the impacts of climate change on women and their livelihood, the community’s perceptions and experiences in district Swat of Khyber Pukhtoonkhwa of Pakistan with the aims to provide new information in this area to influence policy anddecisionmakers totake intoaccount the gender especially the women aspects of climate change at all levels. During the review process it was explored that a strong relationship exist between climatic change and people livelihood, which is dependent on natural resource base and poverty.However, the available resources could not be explored and used for the socio-cultural and economic development of the people of district Swat; developing the inter-cultural linkages of Swat with people of other parts of Pakistan, and with the international community. Moreover, theses resources are greatly affected by short term climate variability and could be harmed significantly by long-term climate change. For instance the duration of plants especially of agricultural crop growth cycle is closely related to temperature, an increase in temperature will speed up growth and shorten the duration between sowing and harvesting time, which eventually have an adverse affect on primary productivity of fodder for both domestic and wild animals. Climate change is also reported to have affected crop productivity, decrease water availability, and contribute to the expansion of invasive species and the prevalence of tropical diseases like Dengue mosquitoes. Similarly the hydrological cycle is also likely to be influenced by global warming, as water resources are inextricably linked with climate and the projected climate change has serious implications for our water resources. The current desk review revealed that melting glaciers, drying of wetlands, deforestation, irregular monsoon rains, drought, erosion, landslides and depletion of forest areas are aggravating the regulation of water flow in the area and endangering not only the biodiversity of the area but also the livelihoods of the local population. There is a strong indications that climatic change intensifying these hazards and the 2010 flood in Swat is one the strongest and visible evidence of climate change. Majority of the mountainous dwellers are linking climatic change with the 2010 flood, landslides, the drying of perennial springs and pest outbreaks. The survey also showed that more that 65% respondents from herder’s perspectives on climate change in district Swat have witnessed changes in glaciers, weather patterns, and decline in forage quality and quantity in the rangelands. Such changes have affected the socio-economics of the local communities who are forced to adopt laborious and expensive option of stall feeding their livestock. However, the authors of the present desk review suggest that detail assessment of the impact of climate change in district Swat require further research and analysis.

**ROLE OF ICT IN CLIMATE CHANGE MONITORING**

**A REVIEW STUDY OF ICT BASED CLIMATE CHANGE MONITORING SERVICES**

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**Abstract**

The word ‘Climate Change” is not as simple and small in meaning as it seen. It exhibits dangerous and alarming consequences. Climate changes continuously occurring from East to West, North to South, Soil to Sky, Water to Air, Forest to Desert, Ocean to Mountains, in fact everywhere. Climate change Monitoring (CCM) is the phenomena to observe and record climate changes and put forward them for decision makers or domain experts to prevent environment, avoid or at least prepare for different kinds of natural disasters, to prevent contamination of various precious natural resources including water, air and soil etc. Rapid advancement of Information and Communication Technology (ICT) is blessing for mankind and incorporation of this revolutionary technology in serving mankind in diverse domain is remarkable. Use of ICT in climate change mitigation, adoption and monitoring not only replacing the conventional techniques and systems also adding great accuracy, reliability and flexibility also provide diverse choices in related domain. ICT Technology is contributing in variety of domain, similarly these fruitful technologies using in Climates changes observation, Climate changes monitoring and climates changes adoption as well as in Disaster Management. ICT based application can help in reducing climate changes impacts on environment. By using ICT in climate monitoring specially, provide real time observation, reduce cost, decrease power consumption, lively tracking, real time data processing and analysis etc. This review study evaluates how widely ICT and ICT based applications can be used in mitigation, adoption and monitoring of climate changes in developed and developing countries.

**SURFACE STUDIES OF THE FIFTEEN GENERA OF PHAEOPHYCOTA FROM KARACHI COAST OF PAKISTAN**

**ALIA ABBAS1 AND MUSTAFA SHAMEEL2**

*1Department of Botany, Federal Urdu University of Arts, Science and Technology,*

*Gulshan-e-Iqbal, Karachi-7530, Pakistan*

*2Department of Botany, University of Karachi,*

*Karachi-75270, Pakistan*

**Abstract**

Fifteen genera of brown algae were collected from different coastal areas of Karachi during March 2006-June 2010 and investigated for their surface structure, pattern of cell-walls, size and shape of the surface cells and nature of their arrangement. On the basis of detailed investigation, criteria have been developed to distinguish these genera due to the structure of their surface cells. Similarly eight species of the genus *Dictyota* Lamouroux and two species of *Padina* Adanson have also been distinguished

**SUSPENDED PARTICULATE MATTER IN**

**AMBIENT AIR AT URBAN AREAS OF NORTH-EAST BALOCHISTAN, PAKISTAN**

SAADULLAH KHAN LEGHARI, MUDASSIR ASRAR ZAIDIAND

ATTA MUHAMMED SARANGZAI

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**Abstract**

Study was carried out to assess the Suspended particulate matter (SPM) in ambient air at urban areas of south Balochistan (Quetta, Zob and Lorali cities) by standard methods. The observations indicated that the SPM levels at Quetta, Zob and Lorali in residential areas were in critical level (>210 μg/m3), whereas in green belt areas it was moderate to high level (63 to 174μg/m3). It was observed that the average SPM ranged from 321 to 582μg/m3 during summer and 155 to 287μg/m3 during winter at Quetta, whereas in green belt areas it was (66 to 178 μg/m3).The average SPM at Zob residential areas ranged from 278 to 389 μg/m3 during summer and 123 to 261 μg/m3 during winter, whereas in green belt area it was (60 to 170 μg/m3). At Lorali urban areas the average SPM ranged from 158 to 284μg/m3 during summer and 112 to 245 μg/m3 during winter, whereas in green belt area it was moderate to high level (63 to 174 μg/m3). The SPM values in Green Belt areas are keeping up to moderate to high and do not reach up to critical levels but in the residential areas as there are no particulate emission control. The SPM level thus building up to the critical level. The Green Belt / Urban Forest in vicinity of Residential; Road Sides and Industrial areas, may be the option for control of particulate matter in environment around residential areas/ industrial area, since Trees can act as efficient biological filters, cost effectively removing significant amounts of particulate pollution from urban atmosphere.

**SEASONAL DISTRIBUTION OF AEROMYCOSPORA OF KARACHI: A MULTIVARIATE APPROACH**

TOQEER AHMED RAO1, SYED SHAHID SHAUKAT2, ABDUL HAKEEM SHAIKH1, MOINUDDIN AHMED3, ALAMDAR HUSSAIN3 AND SHAZIA HAIDER4

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**Abstract**

This part of study focuses on the seasonal distribution of aerospora of Karachi. Sampling of aeromycospora was performed at five localities (Sites) within the city by the help of multivariate techniques. The climate of Karachi is characterized as subtropical maritime desert with three main seasons, *i*.*e*., winter, summer and monsoon. Generally, the temperature and humidity are high providing conducive conditions for the growth of fungi. Pollution of various kinds, particularly unattended refuse dumping sites in city also provide favorable sites for fungal growth. A total of 10 fungal species were recorded including *Aspergillus candidus*, *A*. *flavus*, *A*. *fumigatus*, *A*. *niger*, *A*. *terreus*, *A*. *wentii*, *Alternaria solani*, *Curvularia clavata*, *Drechslera dematioidea* and *Penicillium notatum*. Aerospora was dominated by *Aspergillus* spp. Difference among localities were disclosed by cluster analysis and principal component analysis.

**SAKESAR - A NATIONAL PROTECTIVE AREA, SYMBOL OF CONSERVED BIODIVERSITY AND ENVIRONMENT IN PAKISTAN**

AMIN SHAH

*Department of Biological Sciences, University of Sargodha, Sargodha, Pakistan*

**Abstract**

Soon valley is one of the most famous valleys of Pakistan situated in the Central Punjab province. Though valley with an area of 300 sq/ miles (35 miles long and 9 miles is width) is unique in many aspects but usually known for the scenic place, Sakesar. Sakesar is the highest peak of Salt Range. and is located at a height of 5, 010 feet above sea level. Sakesar is blessed with beautiful evergreen conserved jungle. The area was took under the control of PAF in late 1950,s site for a high powered radar which provide air defence cover for the northeastern part of the western wing. Sakesar Mountain is the in mountain of the Punjab where snow fall occur during winter. The scenic jungle is mostly comprised of Olea ferruginea trees. Acacia modesta shares in the low while Pinus longifolia trees shares Olea trees at high altitudes. Ceratonia siliqua and Clematis orientalis are the unusual plant species that are flourishing here. Other known taxon are Sophora mirophylla, Dodonea viscosa, Buxus wallichiana, Nannorhopes ritchiana, Plantago major and Salvia millefera etc. Conservation like Sakesar should be taken as an example for Biodiversity and Environment.

**SEASONAL EFFECT ON THE HEAVY METALS CONTENT IN SOIL SAMPLES COLLECTED FROM DIFFERENT AREAS OF LAHORE CITY AND ROLE OF NANOTECHNOLOGY TO SOLVE ENVIRONMENTAL ISSUES**

MUHAMMAD AKHYARFARRUKH

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**Abstract**

Soil samples, from surface and depth, from different sites of Lahore were collected and analyzed for heavy metals by Atomic absorption spectrophotometer. Concentration of Fe was found highest in all soil samples while the level of Cd was found lowest. Concentration of Pb , Cu and Cr were found to be highest in high traffic density areas as compared to residential areas, where as the concentration of Fe, Ni and Cd were almost same in all soil samples.The amount of Pb was found higher in surface samples while the amount of Cu was found lower in surface samples.

Seasonal changes (rain) effect the concentration of metals in soil samples. The amount of Pb increase significantly in surface soil samples after rain fall. The collected data manifests that the automobile exhaust is the main cause of pollution in urban areas of Lahore.

Nanotechnology, a cutting-edge technology provides a sustainable solution for the environmental issues. Metal oxides nanoparticles have unique property due to their high adsorption capacity and good catalytic activity. CaOand MgOnanocatalysts were prepared by hydrothermal method using anionic surfactant, sodium dodecyl sulphate (SDS), as a templating agent. The as-synthesized nanocatalysts were further used as substrate for the synthesis of alumina and Zinc doped metal oxidesnanocatalysts via deposition-precipitation method. Thesenanocatalysts were characterized by FTIR, XRD, TGA, TEM and FESEM techniques. The catalytic efficiencies of these nanocatalysts were studied for the photodegradation of 2, 4, 6-trinitrophenol (2,4,6-TNP), which is an industrial pollutant. The direct optical band gap of the nanocatalyst was found as 3.3 eV and provide control over environmental problems.

**SUSCEPTIBILITY OF EUPHORBIACEAE PLANT EXTRACTS TO DIAMONDBACK MOTH, PLUTELL XYLOSTELLA** **(LEPIDOPTERA: PLUTELLIDAE)**

UMER AYYAZ ASLAM SHEIKH, KIRAN SHEHZADI AND MUNIR AHMAD

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**Abstract**

Introduction: Diamondback moth, Plutella xylostella is a serious insect pest of brassica crops whose larvae skeletonize their food factories. It has developed resistance against all insecticides used for its management and stresses the search for alternatives for its control and reduces their hazards to consumers. Five plant extracts of Ricinus cummunis, Euphorbia heliscopia, E. hirta, E. milii and E. pulcherrima with a standard insecticide (chlorpyrifos) were tested. Second instar larvae of field collected P. xylostella were used for toxicity tests under laboratory conditions and changes in their biological parameters. Chlorpyrifos showed maximum mortality with LC50 of 1.13 ppm whereas R. cummunis was most effective with LC50 of 28.8 ppm followed by E. heliscopia, E. milii, E. hirta and E. pulcherrima of 32.9, 43.7, 44.6 and 40.5 ppm, respectively after 72 hrs exposure. Lethal and sublethal effects of these extracts on development of different life traits of P. xylostella were also tested. At LC20, mean duration of all larval instars was maximum on chlorpyrifos (12.79 days) and minimum on E. milii (11.66 days) while adult longevity was the lowest on chlorpyrifos (11.02 days) and the highest on E. milii (12 days). Fecundity was less on chlorpyrifos and R. cummunis relative to fecundity to E. milii and E. heliscopia and egg viability was maximum (65.2%) on E. milii and minimum on chlorpyrifos (42.4%). Oviposition period was maximum on E. milii (6.71 days) and minimum on chlorpyrifos (5.33 days). At lethal concentrations of LC50 and LC80, mean duration of all larval and pupal duration was maximum on chlorpyrifos and minimum on R. cummunis. Adult longevity and fecundity was significantly lowered on chlorpyrifos as compared to E. milii. Chlorpyrifos and R. cummunis were observed to be the most effective bioinsecticides followed by E. helioscopia, E. milii, E. hirta and E. pulcherrima which needs further field testing for effective management tool against this important insect pest as a safe insecticide.

**SOCIAL AND CLIMATE CHANGES AS MAJOR THREATS TO THE WEED BIODIVERSITY OF HIGH ALTITUDE NORTHWEST REGION IN PAKISTAN**

MUHAMMAD AZIM KHAN

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**Abstract**

Northwest Frontier region of Pakistan covers an area of 74,521 km². It includes 25 districts with elevation ranging between 173 m to 7700 m. Some of the high altitude mountains are Himalayas "Home of the Snow, Tirich Mir and Nowshaq. The geological formations are mainly composed of alluvial and loess. The major soil groups distributed in the region are sandy, sandyloam, clay and clayloam. Due to its geographical borders with Afghanistan the region is experiencing a great unrest and severe land degradation. These factors coupled with the climate change and social instability is resulting in the disruption of the high altitude ecosystems as well. The changes in the climatic conditions have lead to the dominance of many weeds. Later produce large number of seeds which are therefore overtaking the native flora. The devastating floods in summer 2010 accelerated the problem of diversity disturbance as millions of animals, wildlife and pollinators were disturbed which have proved detrimental for the biodiversity of the area together with the changing rainfall pattern and these need to be properly addressed. The temperature changes are pushing the weeds adapted to low temperatures towards the areas with higher temperatures and vice versa. As weeds play a vital role in the household economy of millions of farmers in the region, therefore the yield and biodiversity losses need greater attention. Currently, the unrest in the area has totally disrupted the daily life and living style of the inhabitants. Thus the social issues have lead towards the negligence of conservation strategies of flora and fauna. Internally displaced people use herbs for different diseases therefore the migrants and war affected people carry the seeds with them. This adds further to the spread of weeds. The homeless people collect the plants for fuel purposes which also accelerates the weed dispersal. The growth and development of weeds was promoted when Army banned cultivation of crops on the roadsides to avoid the ambush. In this way the weed diversity as well as the diversity of pollinators has been disturbed which can pose many social, economical and political problems in the days to come. Apart from personnel observations, comprehensive survey and field experiments were conducted and it was observed that many weeds repoted earlier in the regions have become dominant and problematic invasive weeds. Thus weed shift has occured that could be dangerous for agriculture. The competitive index of many weeds have been changed due to climatic conditions and cultural practices. This paper presents an overview of all these aspects and possible suggestions to address the problem.

**STRUCTURE AND DYNAMICS OF TREELINE WITH CLIMATE CHANGE IN CENTRAL AND EASTERN NEPAL, HIMALAYA**

NARAYAN PRASAD GAIRE1, 2, MADAN KOIRALA 2 DINESH RAJ BHUJU1, 2

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**Abstract**

Climate change has already left several biological finger prints. The high altitude natural treeline is taken as sensitive biomonitors of past and recent climate change, as well as early warning line to the climatic impacts on high altitude biota. We carried out a dendroecological study at the treeline ecotones of Mt Everest and Mt Manaslu regions of the Nepal Himalaya with the aims to assess the impact of climate change in the tree-line ecotones, and reconstruct the past environmental history of the region. Two to three vertical belt transects plots (20m wide and >100m length) were laid down in each treeline site. Using ecological and dendrochronological tools, structure, regeneration, climatic influence on radial growth and regeneration, and upward shifting of *Abies spectabilis* D. Don and *Betula utilis* D. Don were analyzed. Position of treeline in eastern region was found at higher elevation as compared to central Nepal. The tree density, basal area, DBH, height, and age decreased with increasing elevation with some spatial heterogeneity. High regeneration of *Abies* as compare to *Betula* was observed recently. The tree core analysis showed that *B. utilis* was established earlier than *A. spectabilis.* The upper distribution limit shift of *A. spectabilis* at studied sites was found 1.56m to 3.6m per year during past over 150 years. Correlation between site chronologies of *Abies* showed a positive relationship indicating some common factors limiting the growth of the tree. Tree growth-climate and regeneration-climate relationship showed that warm winter and moist summer favored the regeneration of *Abies*. Infilling of existing treeline as well as upward shifting of treeline was observed. Population demography and climate growth response indicated that both of the species had species specific response to climate change with much wider differences in the population structure of the species is anticipated as climate continues to change throughout the century.

**STUDIES ON INDIGENOUS PLANTS OF KARACHI FOR THE CONTROL OF ROOT ROT-ROOT KNOT DISEASE COMPLEX**

TUBA AND MUHAMMAD ABID

*Dr. A.G. Aerobiology and Plant Pathology Lab., Botany Dept.*

 *Fed. Urdu Univ. of Arts, Sci. and Technology, Karachi, Pakistan.*

**Abstract**

Destruction of food and feed crops by disease resulted in malnutrition, migration and death of people and animals which are well documented in history. Soil borne plant pathogen specially fungi and nematodes economically damage field crops. when soil borne fungi such as *Macrophomina phaseolena*, *Fusarium* spp and *Rhizoctonia solani* associated with root knot nematode (*Meloidogyne* spp.) it form a disease complex which produce great losses in agricultural productivity.

Chemical fungicides and nematicides are generally used to control this disease complex but it is costly and not hazard free method. Therefore, our aim is to control this disease complex by indigenous plants of Karachi because some of the plants have strong pesticidal activity.

**STUDIES OF MONTHLY VARIATIONS IN PHYSICO-CHEMICAL PARAMETERS OF FOUR FRESHWATER BODIES OF SULAEMAN**

**MOUNTAIN RANGE, D. G. KHAN REGION, PAKISTAN**

SAJJAD HUSSAIN1AND MUHAMMAD ALI1

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*2Institute of Pure & Applied Biology, B. Z. University, Multan-Pakistan*

**Abstract**

The present study was designed to demonstrate the pioneer attempt of seasonal variations in physico-chemical parameters of four freshwater bodies ( Hill Torrents ) of Sulaeman Mountain Rangr, D. G. Khan, Pakistan. The sampling was done from January 2012 to December 2012. Water samples were collected on monthly basis from four different sites. The different physico-chemical parameters including air temperature, water temperature, photoperiod, density, viscosity, surface tension, light penetration, dissolved oxygen, carbon dioxide, pH, electrical conductivity, carbonates, bicarbonates, sodium, calcium, magnesium, chlorides, sulphates, sodium adsorption ratio, total alkalinity, total hardness as Caco3 and total dissolved solids were studied during the study period. Analysis of above mention parameters were carried out by using various standard methods. There was a highly significant effect of monthly variations on different physico-chemical parameters in four different studied sites and most of the parameters were within tolerable limits of water quality. It was concluded that the most of the physico-chemical parameters of these four studied sites are favorable for aquatic biodiversity.

**SYNTHESIS OF BENZOTHIAZOLE DERIVATIVES AND THEIR UREASE INHIBITION**

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*H. E. J. Research Institute of Chemistry, International Center for Chemical and Biological Sciences, University of Karachi, Karachi-75270, Pakistan*

*PCSIR Laboratories Complex, Karachi, Shahrah-e-Dr. Salimuzzaman Siddiqui, Karachi-75280, Pakistan*

**Abstract**

A nickel containing metalloenzyme urease (urea amidohydrolase; EC 3.5.1.5) catalyzes the hydrolysis of urea into ammonia and carbon dioxide. Urease is produced by various bacterial species such as *Helicobacter pylori* (HP) that causes urinary stone formation, peptic ulcer, pyelonephritis and hepatic coma. It also produced by a variety of plants, algae, fungi, bacteria and in soil enzymes.**1,2** The study of urease inhibition is of medical, agricultural and environmental significance. For this purpose, a number of compounds have been proposed as urease inhibitors to reduce environmental problems and enhance the uptake of urea nitrogen by plants.**3,4** The benzothiazole derivatives were prepared by reacting different substituted phenacyl bromide with mercaptobenzothiazole which results in S-alkylated products **1**-**33**.**5** The resulting derivatives were screened for the urease inhibitory activity for identifying the potential lead compounds. Out of thirty-three (33) synthetic compounds six (6) demostrated potent anti-urease activities. Benzothiazole derivatives 2-(1,3-benzothiazol-2-ylsulfanyl)-1-(3-hydroxyphenyl)-1-ethanone, 3-{2-[(6-amino-1,3-benzothiazol-2-yl)sulfanyl]acetyl}-2*H*-chromen-2-one, 2-[(6-amino-1,3-benzothiazol-2-yl)sulfanyl]-1-(3-methoxyphenyl)-1-ethanone, 2-[(5-chloro-1,3-benzothiazol-2-yl)sulfanyl]-1-(3-hydroxyphenyl)-1-ethanone, 2-[(6-amino-1,3-benzothiazol-2-yl)sulfanyl]-1-(3-hydroxyphenyl)-1-ethanone, and 2-[(6-ethoxy-1,3-benzothiazol-2-yl)sulfanyl]-1-(3-hydroxyphenyl)-1-ethanone showed potent activities with IC50 values 11.17 ± 0.099, 0.75 ± 0.028, 16.04 ± 1.86, 9.97 ± 0.64, 0.280 ±0.017 and 1.0 ± 0.055 *μ*M, respectively when compared with the standard thiourea (IC50= 21.9 ± 1.4)

**TOPOGRAPHIC AND EDAPHIC CONTROL OF ARBOREAL VEGETATION AND THE DISTRIBUTION AND GROWTH OF TREE SPECIES IN MOIST TEMPERATE AREAS OF HIMALAYAN AND HINDUKUSH REGION OF PAKISTAN**

MUHAMMAD FAHEEM SIDDIQUI1, SYED SHAHID SHAUKAT2

AND MOINUDDIN AHMED2

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**Abstract**

This study attempts to investigate the possible role of edaphic variables on the distribution pattern of pine tree species in moist temperate area of southern Himalayan and Hindukush region of Pakistan. Arboreal vegetation of 41 sites was analyzed using point-centered quarter method. Soil samples from 41 different sites were collected to determine the edaphic characteristics. Overall the soils of the study area were slightly acidic. Salinity was observed in the range of 0.10-1.3 %, with a mean of 0.16 % ± 0.03. Total dissolved salts ranged between 16.8 to 377 mg / liter with a mean of 195.1± 30.11. Electrical conductivity of the forty one soil samples ranged between 0.0347 - 0.732 mmhos/cm with the mean value of 319 ±28.21 mmhos/cm. The amount of organic matter ranged from 2.62 to10.52 % while the mean value was 4.98 ± 0.24 %. Water holding capacity ranged between 32.50 to 65.40 % with a mean of 53.81±1.14. Minimum soil compaction was 90 PSI (pounds per square inch) while the maximum compaction was 250 PSI with a mean value of 166.7± 5.58 PSI. Weak or spurious correlations were observed between structural attributes of four pine species with the physiographic factors. Density of *Pinus wallichiana* A.B.Jackson*, Abies pindrow* Royle and *Picea smithiana* (Wall.) Boiss. while basal area of *Pinus wallichiana, Cedrus deodara* (Roxb.) G. Donf. and *Picea smithiana* did not show any significant correlation with the soil variables. Only soil conductivity was weakly correlated with basal area of *Abies pindrow* (P < 0.1). Density of *Cedrus deodara* showed positive significant but weak correlation (P < 0.1) with water holding capacity and a negative correlation (P < 0.05) with salinity. The structural features of the tree vegetation were usually uncorrelated with the edaphic features. However, any substantial edaphic relationships disclosed for the dominant tree species are discussed. It was concluded that weak or no correlation among the variables due to long history of anthropogenic disturbance.

**THE POTENTIAL OF DENDROCHRONOLOGY IN IRAN IN RELATION TO THE NEIGHBORING COUNTRIES**

SEPIDEH NAMVAR AND KAMBIZ POURTAHMASI

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**Abstract**

Iran is a wide country. With the land area of 1,648,195 km2 is the 18th-largest country in the world. Around 10 percent is covered by the forest. Among the different species exist in Iran, Juniper and Oak trees are well distributed in Iran which both will provide appropriate potential for dendrochronological studies in Iran. In addition the distributions of these two species are in the areas closed to our neighboring countries. As an examples Pointer years of extremely low and high values of tree growth during the 20th century were extracted by applying the so called Cropper technique. The spatial distribution and climatologic background of these pointer years was examined within a regional chronology network of 15 high elevation tree-ring sites enclosing Turkey, Iran, southern Russia, Kirghizia, Pakistan, Nepal and the Tibetan Plateau. The results show that the similarity of growth reactions at the north Iranian sites is greater with Asian high mountain regions than with the eastern Mediterranean area. Negative pointer years with a wide distribution within the study area are more common (1913, 1917, 1951, 1961, 1975, 1991) than positive pointer years (1940, 1981). This study showed the potential of dendrochronology in relation to the neighboring countries.

**TOXIC EFFECTS OF SIMULATED ACID RAIN (SAR) ON TWO SUNFLOWER (*HELIANTHUS ANNUUS* L.) HYBRIDS APPLIED IN COMBINATION WITH GROWTH PROMOTERS**

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**Abstract**

Environmental pollution has become a global problem and a major threat for the health of wild as well as cultivated crops. This study was designed to assess the effect of simulated acid rain (SAR) and growth promoters on morphological and yield attributes of two sunflower (*Helianthus annuus* L.) hybrids i.e., FH-331 and FH-352 grown under natural conditions in the Botanical Garden at University of Agriculture Faisalabad. Five treatments of acid rain and growth promoters (Micron-T and Fashion) alone or in combination were applied. Shoot and root lengths (cm), shoot and root fresh and dry weights (g), number of leaves, and yield attributes (Capitulum diameter, capitulum dry weight and hundred achene weight per plant) were significantly reduced by SAR. Growth promoters to some extent reduced the drastic effects of SAR and improved the growth rate of plants. Among hybrids FH-331 proved more tolerant to SAR as compared to FH-352.

**Tree biomass along green corridor of canal bank road (CBR), lahore (from Huseyn Shaheed Suhrawardy underpass to Thokar Niaz Baig)**

MUHAMMAD WAHEED, SOHAIB MUHAMMAD, ZAHEER-UD-DIN KHAN,

NADEEMULLAH AND ADEEL AHMAD

*Department of Botany, GC University Lahore*

*Corresponding author e-mail: tabassum.ravian@gmail.com*

**Abstract**

The present work was done to find out living tree Biomass along Green Corridor of Canal Bank Road (CBR), Lahore from Huseyn Shaheed Suhrawardy underpass to Thokar Niaz Baig. The CBR was divided into two green belts, green belts along Banks of Canal and Green Belts along the adjacent roadsides. Banks of Canal have 23 tree species belong to 13 families whereas adjacent roadsides have 30 tree species belong to 15 families. Banks of Canal and Adjacent roadsides have 6822 and 12532 total tree species respectively. Approximately 32% tree species along Banks of Canal and 38% tree species along adjacent roadsides belong to DBH class C (6-12 inches). Overall, Class C has maximum 36% tree species while Class D and B have 21% and 18% tree species, respectively.

**USING TREE-RINGS CHRONOLOGIES FOR WATER MANAGEMENT OF PAKISTAN**

MOINUDDIN AHMED

*Laboratory of Dendrochronology and Plant Ecology, Dept. of Botany, Federal Urdu University of Arts, Science and Technology, Gulshan-e-Iqbal Campus, Karachi*

**Abstract**

A THREE-YEAR study has recently been carried out using a new technology (Dendrohydrology) at Laboratory of Dendrochronology and Plant Ecology of Pakistan Dept. of Botany Federal Urdu University of Arts, Science and Technology Karachi, Pakistan. This research was funded by Pak, US and Higher Education Commission of Pakistan.

Water flow of Indus River at Partab Bridge for 500 years has been evaluated with the help of tree rings. As flow peaks in May-September time, therefore, five months were chosen for reconstruction. Average reconstructed flow is below the mean of gauge flow of Partab Bridge. Early period (1962-1987) of reconstructed flow is quite similar with the gauge data as compared to late period (1988-2000). It means that actual and reconstructed Partab flow is significantly correlated. High flow rate (mean= 3904 m3/s) was also observed during 1684-1700. Because results of actual and reconstructed mean flow have come closer to each other, we should use this reconstructed data for future prediction of River flow.

In this spirit, the long-term average reconstructed (3545 m3s-1) should be used as the best estimate of expected discharge from May to September at Partab Bridge in the future, but continued strong inter-decadal variability in the future, like in the past, would most likely to cause multi-departures from this expectation to occur. This statement assumes that climate change over the Upper Indus Basin (UIB) in the future do not affect the continuation of the interdecadal variabilty found. Past or significantly increase the melting of glaciers discharge component so far, it does not seem to be the case if the current stable state of Karakoram glaciers is an indication (Hewitt, 2005; Armstrong, 2010; Gardelle, 2012).

We found the most disturbing feature in the stream flow reconstruction during the prolonged period of 112 year low flow period from 1572 to 1683 where mean flow was 3377 m3/s which is 11% below the mean of gauge data. The driest period was 1637-1663 where mean reconstructed flow was 3271 m3/s and the flow was 8.1% below the average. This period, if repeat in the future will cause reduced Pakistan’s capacity for irrigation and hydroelectric power generation provided by Tarbela Dam which is the most worrying feature if happens in the future. Therefore we need more dams.

**VARIATION IN VEGETATION COVER FEATURES ACROSS ALTITUDINAL GRADIENTS IN RANGELANDS OF CENTRAL KARAKORAM NATIONAL PARK, GILGIT-BALTISTAN, PAKISTAN**

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*2 Department of Forestry & Range Management, PMAS-Arid Agriculture University Rawalpindi, Pakistan*

*3Department of Biological Sciences, Karakorum International University*

*Gilgit-Baltistan, Pakistan*

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**Abstract**

# Pakistan possesses 50.88 million hectare of rangelands, out of which (5%) lies in the high-rainfall rangelands of Alpine pastures. Rangelands of Central Karakorum National Park (CKNP) in Gilgit-Baltistan, is regarded as vital ecological resources of Pakistan. Vegetation cover features were investigated for grasses, shrub and forb along altitudinal gradients (~500 m intervals) using quadrate method (20 quadrates each per line transects) in Brumbrama (3955 masl), Jongfong (3488 masl) and Gambabramachan (3051 masl) rangelands of CKNP area Hushe. Total vegetation cover of grasses was maximum (24.20±3.34%) at the highest altitude Brumbrama followed mid altitude, the total cover of shrub (22.75±4.13 %) was much dominated at mid altitude Jongfong, whereas forb was much higher in population (20.75± 3.44%) at the lowest altitude Gambabramachan, followed by (16.25±4.11 %) at Brumbrama range of Hushe Valley, Baltistan. ANOVA showed significant differences for shrubs and forbs at (P < 0.05) and the productivity of shrub and grasses was highest at mid altitude Jongfong range 115.5kg/ha and 38 kg/ha respectively, however forb productivity was highest (164 kg/ha) at Gambabramachan range site. A strong correlation (r=0.958) was found for vegetation cover features between range sites Jongfong and Gambabramachan. These findings revealed promising outcomes for vegetation diversity at altitudinal gradients in ecologically significant regions of CKNP and would be very helpful for integrated rangeland management and sustainable park policy for researchers.

# VEGETATION ANALYSIS OF ZINC ENRICHED HILLS OF DISTRICT KARAK, KPK, PAKISTAN

SULTAN MEHMOOD WAZIR\*AND\*\*AND IRAM GUL\*

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*\*\*Botany Division, Institute of Pure and Applied Biology, BZU, Multan.*

**Abstract**

The present research work was carried out in September and October 2012 to analyze the vegetation of zinc enriched hills and its outskirts of District Karak by quadrat method. The research area was divided mainly into three stands keeping in view the morphology and edaphic factors of the research area i.e. Plain area, Floody sandy area, Mountain area. The plain area was analyzed by quadrat method and taken forty quadrats and the dominant community was *Cynodon-Nerium*-Community on the basis of important value index (IVI). In the floody sandy area total thirty quadrats were taken randomly and the dominant community was *Eucalyptus-Saccharum*-Community on the basis of important value index (IVI). The vegetation of mountain area was analyzed also by using total thirty quadrats which show the dominant community of *Cymbopogon-Nerium*-Community on the basis of important value index (IVI).After completing the whole analysis of the area; it was concluded that the community *Cynodon-Nerium* was found to be the most dominant in plain area and the percentage of *Cynodon dactylon* was 28.83 %, *Nerium indicum* was 25.55 % while in the floody sandy area the dominant *Eucalyptus-Saccharum*-community was having percentage of *Eucalyptus* species 30.63 % while that of *Saccharum spontaneum* was 29 %. In the mountain area the dominant community was *Cymbopogon-Nerium*. The percentage *of Cymbopogon* specieswas 30.63 % while that of *Nerium indicum* was 27.37 %.The whole analysis showed that the community of *Nerium indicum, Cynodon dactylon* and *Cymbopogon* was found in most of the research area, so they were generalist in the area while in the floody sandy area the generalists were *Eucalyptus* species and *Saccharum spontaneum.*

**VEGETATIONAL DIVERSITY OF DAM DHOK TALIAN CHAKWAL PAKISTAN.**

1SYED ANEEL GILANI, 2AMIR M. KHAN, 3RIZWANA A. QURESHI, 4NAJAM-UL-HUDA KHAN

*1Botanical Sciences Division, Pakistan Museum of Natural History, Islamabad Pakistan*

*2Department of Botany, Kohat University of Sciences and Technology, Kohat Pakistan*

*3Department of Plant Sciences, Quaid-i-Azam University, Islamabad Pakistan*

*4Pakistan Wetland Program, Islamabad Pakistan*

**Abstract**

Chakwal is located in the south of Rawalpindi at a distance of 97 km. It lies between 32° 56' north and 72° 54' east. The environment is cool with sub humid climate. The colour of the soil of this area is brown. Almost 90% population lives in rural areas. Vegetation of Chakwal is scrubby. The one of the local dams in the area is Dhok-Talian Dam, which is situated in District Chakwal at the coordinates i.e. 32046’34.66’’ N and 72058’47.8’’ E, at an elevation of 596 Meters. Six different sites of the dam area were selected for the vegetational analysis using the standard quadrate analysis. Predetermined sampling points laid out with the help of GPS, during base line survey conducted in 2011 including the inlet zone, outlet zone and surrounding areas of the dam. A total of 05 -10 transect lines each measuring 25 m length were laid (each transect line representing respective sampling point) distributed randomly over the entire study area. On the basis of Importance Value Index (IVI.), sampled vegetation was described into different plant communities. The main vegetaion included the scrubby vegetaion mainly composed of shrubs, herbs and grasses with few tree species. The main tree species included *Acacia modesta, Delbergia sisso, Zizyphus nummularia.* The main shrubs included *Justicia adhatoda, Capparis decidua, Berberris lycium, Nerium oleander.* The dominant species included *Trichodesma indica, Fagonia indica, Euphorbia prostrata, Eclipta prostrata* and *Solanum surratense.* The main grasses/ monocots species included *Desmostachya bipinnata, Cynadon dactylon, Saccharum spontaneum.* The grasses and the herbs were the species under the grazing pressure by the cattle of the local people. The tree species were cut for feulwood purposes. There is a need for the conservation of the species under serious threat of overgrazing or fuelwood cutting so that the species may not become extinct in future.

1. **APPENDICES**

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**Appendix – I**

**List of Foreign Invited Speakers of International Conference on Plants, People and Climate**

**Islamabad 5th to 7th November, 2013**

|  |  |  |
| --- | --- | --- |
| **S.No** | **Name** | **Country** |
| 1 | Dr. Yu Liu | China |
| 2 | Arshia Khan | Sudan |
| 3 | Dr. Ryszard J. Kaczka | Poland |
| 4 | Dr. Stella Bogino | Argentina |
| 5 | Immad Ahmed | USA |
| 6 | Narayan Gaire | Nepal |
| 7 | Prabina Rana | Nepal |
| 8 | Kambiz Pourtahmasi | Iran |
| 9 | Dr. Vahid Safdari | Iran |
| 10 | Sepideh Namvar | Iran |
| 11 | Qiufang Cai | China |

**Appendix – II**

**Scientific Committee**

|  |  |  |
| --- | --- | --- |
| Prof. Dr. Mudassir Asrar | PCST, Islamabad |  |
| Prof. Dr. Moinuddin AhmedDr. Irfan TariqDr. Javed Ali Khan | Federal Urdu University of Arts, Science and Technology, KarachiClimate Change DivisionClimate Change Divisio |  |
| Prof. Dr. Stella Bogino | *State University of San Luis, Argentina* |
| Prof. Dr. Shahid Shaukat | University of Karachi, Karachi |
| Prof. Dr. Q-Bin Zhang | Chinese Academy of Sciences, China |
| Prof. Dr. Kambiz Pourtamasi | University of Tehran, Karaj, Iran |
| Prof. Dr. D. Khan | University of Karachi, Karachi |
| Dr. Tariq Mahmood | PCST, Islamabad, Pakistan |
| Dr. Shakeel Babar | PCST, Islamabad, Pakistan |
| Dr. Qiufang Cai | Institute of Earth Environment, Chinese Academy of Sciences, China |
| Dr. Kamran Ahsan | Federal Urdu University of Arts, Science and Technology, Karachi |
| Dr. Jonathan Palmer | University of New South Wales, Sydney, Australia |
| Dr. Ghazala Shaheen | PCST, Islamabad, Pakistan |
| Dr. Abdul Razzak | International Karakorum University, Gilgit, Pakistan |
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