Pir Mehr Ali Shah

Arid Agriculture University, Rawalpindi

Self-Assessment Report (2021-22)
Department of Botany (PhD Botany)

- **Program Self-Assessment Team**
  - **Prof . Dr. Rahmatullah Qureshi (Coordinator)**
  - **Dr . Khafsa Malik (Member)**
  - **Dr . Noshin Ilyas (Member)**

CONTENTS

Introduction

Department of Botany, PMAS Arid Agriculture Rawalpindi, is one of the leading department regarding academic and research activities. PhD is the highest degree program which was started in year 2001. Till now, 93 PhD research scholars successfully received their degrees and 9 research scholars got enrolled in the program. Scholars are actively involved in research activities.

The Department has highly competent and qualified faculty, all of them have doctorate experience from reputable National and International Universities/Institutes. Our faculty is currently composed of 8 faculty members, all of these are PhDs and mostly faculty members are HEC approved supervisors for Indigenous PhD programs. The faculty members are specialized in various fields of Botany i.e. plant physiology, taxonomy, ecology ethnobotany, plant pathology, ecotoxicology, and environmental pollution and gene transformation. The faculty has produced many publications in national and international reputable journals.

Presently, the department is providing research facilities in all areas of medicinal plants including phyto chemistry, molecular characterization of various compounds & allelopathic screening of plant extracts, phytosociology, ethnobotany, aflatoxin and their integrated management, stress physiology, gene transformation, taxonomic studies in all fields including algal and fungi**.** Furthermore, almost 19 PhD scholars have availed IRSIP program of HEC . As per rule of HEC PhD scholars have to complete course work followed by synopsis defense and approval before starting research work in labs. This program has made it possible to introduce latest techniques and approaches in their research. PhDs also publish one research paper as per requirement of degree.

This PhD program aims to develop research and development activities that shall create highly qualified human resources in the field of management sciences. The purpose of Ph.D degree is to encourage the students who have contributed significantly in their fields by

using the path of research. The scholars engaged in PhD program will not only work on conceptual principles but will also seek for practical solutions to address the social and economic and managerial problems currently faced by our nation. The research of the students will help the industry in improving their work, as well as help the service industry in increasing the quality of their employees.

SECTION 1

Components of Self-Assessment Process:

This Self-Assessment has been prescribed on the cradle of the eight criteria described in self-Assessment Manual. The Self-Assessment Report (SAR) contains eight sections. The first section outlines the program mission and objectives. Section 2 provides information about the curriculum development. Section 3 enlists the laboratories and other relevant information followed by student support and guidance. The last four sections provide information about student support, process control, faculty characteristics and institutional facilities and support provided by the university.

Criterion-1 :Program Mission, Objectives and Outcomes

Introduction

The department of Botany is actively progressing towards wide range of careers by producing quality researchers in the form of PhDs. Various activities are in progress under plentiful research project funded by projecting donor establishments including University itself.

1-1: Standard Documented measurable objectives

Mission of the Program:

Our mission is to acquire the PhD scholars a sound background and skills necessary for careers as university teachers and researchers. We typically engage PhD scholars in dissertation research and seminars participation.

Objectives

1. To impart practical knowledge and scientific skills in the concerned subject by employing advanced analytical approaches.
2. To broaden the vision of students.
3. To planning for current and future researchable issues along with attachment to the latest teaching & research methods.

Outcomes:

1. Integration was achieved through interviews, discussion on latest developments in the field and translation in applied research projects/ thesis research.

2. Ph.D scholars are imparted practical knowledge using advanced analytical techniques.

3. Updating of curricula is done to achieve the objective of anticipation of new courses teaching/researchable areas.

Objectives	Improvement Identified	Improvement Made	Outcome 1	Outcome 2	Outcome 3
To impart practical knowledge and scientific skills	New research facilities are needed to be included	Improvement in research	+++	+++	++
To broaden the vision of students	Teaching and research methodology is needed to be improved	Teaching and research methods have been revised in order to make them more attractive and understandable	++	+++	+++
Planning for current & future researchable issues	New research areas	Better research and publications	+++	++	+++

\+ = Moderately satisfactory
++ = Satisfactory
+++ = Highly satisfactory

Meeting Standards1-2: Program Outcome Measurement

A number of assessments based on the SAR questionnaires were commenced to assess the Program outcomes/ graduates of the department and teacher's evaluation. Maximum students filled the survey forms.

Program Assessment Results:

The outcomes of Program assessment by the SAR are presented in graphical method. However, the inclusive outcomes show that the students are contented with the Program and method of teaching.

Student Course Evaluation

Maximum of the students' favor almost the course contents of each course, their prospect and applications in daily life beside with the presentation by the concerned tutor. The outcomes of this survey are presented graphically, which are affixed.

Standards1-3:

- Action taken had been submitted earlier as separate file for all previous report.
- Emphasis on student involvement in class activity/teacher interaction. More emphasis on practical.

Strength of program

- Updated course, curriculum in accordance with HEC criteria overall student satisfaction.

Weaknesses of the Program

1. Lack of Gas supply in Laboratories
2. As an integral part of the department, it must have
   - Departmental library
   - Green house
   - Herbarium & botanic garden
   - Computer Lab
3. There is a lack of lectures halls.
4. There is lack of supporting staff.
5. There is a need of short foreign training to faculty members
6. Lack of essential equipment like

- PCR equipment and ultra-centrifuge.
- Scanning electronic microscope.
- Homogenizer

Future development

1. Improvement in class, infrastructure. lecture halls, multimedia, chair.
2. To establish computer Lab for student
3. To establish herbarium and Botanical garden in order to aid the students by physically observing plants in preserved and live state.
4. To develop departmental library

Standard 1-4:

- Number of students enrolled are 51
- Student faculty ratio 1:20.
- Average grade point as per university policy.
- Employ were 80% satisfy.
- Student evaluation was good.
- Seed certification, plant identification , soil fertility.
- All are well satisfied.

Conferences/Seminars/Workshops Organized/Attended by Faculty members (2021-2022)

➢ Dr.Rehmatullah Qureshi:

1. **Qureshi, R.** 2021. **Hemp—A nature's multifunctional gift for human being.** In: International Conference on Plant Science and Management of Dryland for Agriculture and Biodiversity- A step Towards Sustainable Development" organized by the University of Balochistan Quetta, dated 1-2 June,-2021
2. Delivered talk as invited speaker titled, "**Hemp—A Nature's Gift for Human Wellbeing"** in the International conference on "Bridging the Gap between Research and Sustainable Development Goals" organized by the Center of Plant Sciences & Biodiversity, University of Swat dated May 24-26, 2022.
3. Delivered talk as invited speaker titled, "**Plant Biodiversity of Pakistan: Resources, Opportunities, and Development** at the Department of Botany, University of Veterinary and Animal Sciences, Lahore, Pakistan dated 21 to 23 March 2022.
4. Delivered a Talk as an Invited Speaker titled, "**Hemp—A Nature's Gift for Human Survival** in the International Conference on New Trends in Biological Sciences organized by the University of Okara dated 21 to 22 March 2022.
5. Delivered a talk as a Speaker on "**Medicinal Plants –A hope in addressing COVID -19 issue**" in the webinar entitled as "COVID-19 emergency and trajectory: A pathway to the medicinal Plants" at the Rawalpindi Women University held on April 2, 2021.
6. Delivered a Talk as Keynote Speaker titled, "**Hemp—A nature's gift for Human Survival** in the Silver Jubilee Event Seminar organized by the PMAS-AAUR dated 25-11-2021.
7. Delivered a Talk as Guest Speaker titled, "**Research Advancement of Agriculture Sector in Sindh"** in the webinar organized by the Government College University Hyderabad dated 28-06-2021.
8. Delivered as an Invited Lecture on "**Human life of desert dwellers in Pakistan"** at the **Fourth International Conference on Biosciences (ICBS-2021)** jointly organized by the Department of Plant Science, Quaid-e-Azam University Islamabad and Biological Society of Pakistan dated15.06.2021.
9. Delivered a Talk as Guest Speaker titled, "**Plant Biodiversity and Natural Resources of Pakistani Deserts"** in the online seminar organized by the Khwaja Fareed University of Engineering & Information Technology, Rahim Yar Khan, dated 28-01-2021.

Seminars/Conferences Organized

1. International conference on "**Bridging the Gap between Research and Sustainable Development Goals**" organized by the Center of Plant Sciences & Biodiversity, the University of Swat dated May 24-26, 2022 (**Member, Organizing Committee**).

2. 16th Three Days National Weed Science Congress on "Vegetation management and agro-biodiversity: Trends and implications, dated June 18-20, 2021 organized by Weed Science Society of Pakistan at the University of Agriculture Peshawar (**Member, Organizing Committee**).

➢ Dr.Noshin Ilyas

1. Webinar on "Above and below ground fluxes for combating climate change", organized by DAS, PMAS-AAUR on 18th August, 2022.
2. One-day Webinar on "Use of PGPR for Sustainable Agricultural and Environmental Applications" on 4th June, 2021.
3. One day e-seminar on World Soil Day" jointly organized by COMSATS University, Asian PGPR Society (Pakistan Chapter) and Multiomics on 5th December 2021.
4. Invited Guest Speaker at "**International Conference by Biotechnology Society of Nepal"** at "**Khatmandu, Nepal**" on **16th December till 23th December, 2022**.
5. Oral presentation at **6th Postgraduate Colloquium for Environmental Research 2022 -June 09-11, 2022** at **Langkawi Island, Malaysia**
6. Oral presentation and session chair at, **The 7th International Mediterranean Symposium on Medicinal and Aromatic Plants-November,** held at **Izmir, Turkey, 18-20 November, 2021**.
7. Featured speaker and moderator for "**First Asian PGPR Indonesian Chapter International e-conference**" held online by Universitas Udayana, Bali, Indonesia on **28-30th August 2021.**

➢ Dr.Naveed Iqbal Raja

1. Zafer, M. H., N. I. Raja And U. Rashid. 2022.Green Synthesis And Foliar Application Of Selenium Nanoparticles To Improve Physiological And Biochemical Profiling Of Haunglongbing Infected Mandarin

Plants. Conference: 1st International Conference (Online) Trends and Research in Chemistry (TRIC 2022). At: Department of Chemistry, University of Education Lahore

2. International conference on "**Urban Horticulture" Global scenario and local prospects 23 & 24th** June **2022**

PROGRAM OBJECTIVES & OUTCOMES:

1. Practical knowledge and scientific skills will be imparted in the concerned subject by employing advanced analytical approaches.
2. It will broaden the vision of students.
3. Current and future researchable issues will be planned along with attachment to the latest teaching & research methods.
4. Integration will be achieved through interviews, discussion on latest developments in the field and translation in applied research projects/thesis research.
5. PhD scholars will acquire practical knowledge using advanced analytical techniques.
6. Updating of curricula will be done to achieve the objective of anticipation of new courses teaching/researchable areas.

STUDENTS COURSE &
TEACHER EVALUATION
PERFORMA

SPRING 2021

Ph.D BOTANY

COURSE EVALUATION

Pir Mehr Ali Shah

Arid Agriculture University, Rawalpindi

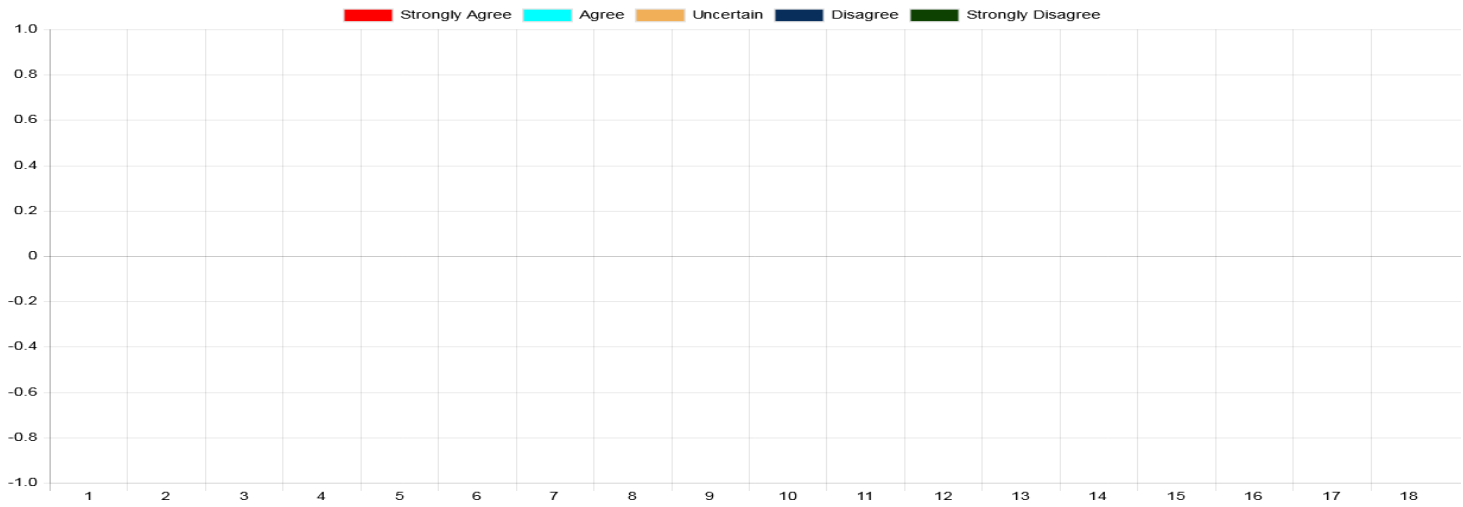
PERFORMA 10

Course Evaluation

SPRING – 21

Session Name: 2 **Teacher Name:** Dr.Rahmatullah Qureshi **Course Name:**Thesis Research

Section: B **Degree:** Ph.D (Botany) **Semester#** 3



SPRING 2021

Ph.D BOTANY

TEACHER EVALUATION

Pir Mehr Ali Shah

Arid Agriculture University, Rawalpindi

PERFORMA 10

Teacher Evaluation

Spring-21

Session Name: SPRING-21

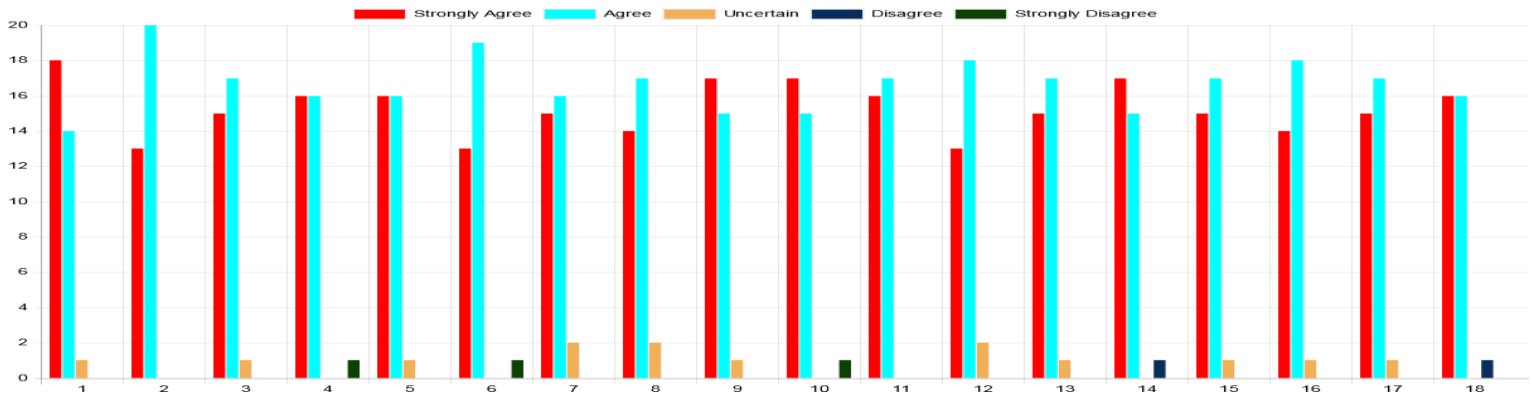
Teacher Name: M. Naveed Iqbal

Course Name: Integrated Biological Resource Management

Section: A

Degree: Ph.D (Botany)

Semester# 1



General Comments of the Students about this Teacher:

Weaknesses: The students showed satisfactory response

Strengths: Ideas and concepts were presented clearly. Course work and relevant material was up to date and teacher included recent materials in the course subject.

FALL 2021

Ph.D BOTANY

COURSE EVALUATION

Pir Mehr Ali Shah

Arid Agriculture University, Rawalpindi

PERFORMA 10

Course Evaluation

FALL – 21

Session Name: FALL -21

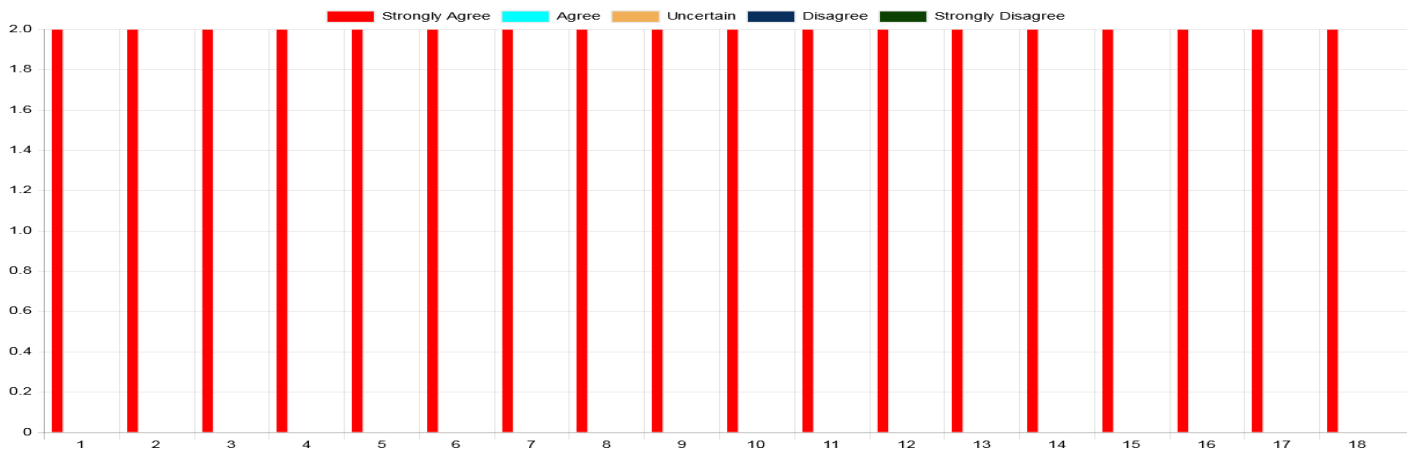
Section: A

Teacher Name: M. Naveed Iqbal

Degree: Ph.D (Botany)

Course Name: Physiological Genetics of Plants

Semester# 2



General Comments of the Students about this Course

Weaknesses: No weakness recorded.

Strengths: The material of the course was modern and updated. Instructor communicated this course in a respectable routine, with all characteristics of training, communication skill, contribution, including modern concepts, punctuality and behavior, etc.

TEACHER EVALUATION

(FALL -21)

Pir Mehr Ali Shah

Arid Agriculture University, Rawalpindi

PERFORMA 10

Teacher Evaluation

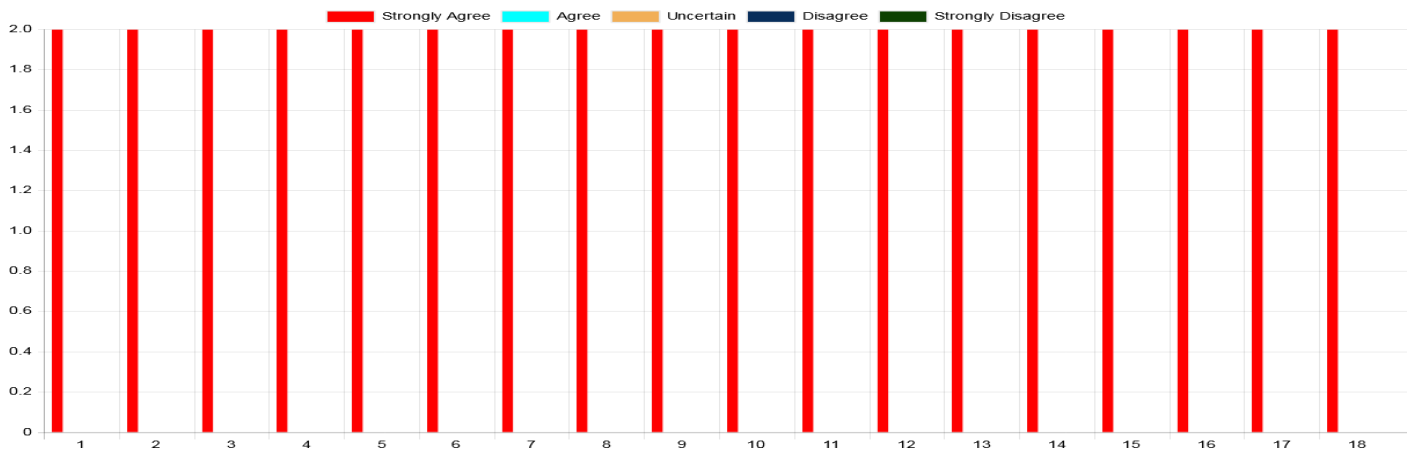
FALL-21

Course Name:

Physiological Genetics of Plants

Session Name: FALL - 21 **Teacher Name**: M. Naveed Iqbal

Section: A **Degree**: Ph.D (Botany) **Semester:** 2



General Comments of the Students about this Teacher

Weaknesses: No weakness recorded.

Strengths: The material of the course was modern and updated. Instructor communicated this course in a respectable routine, with all characteristics of training, communication skill, contribution, including modern concepts, punctuality and behavior, etc.

Pir Mehr Ali Shah

Arid Agriculture University, Rawalpindi

PERFORMA 1

Teacher Evaluation

FALL-21

Session Name: FALL-21

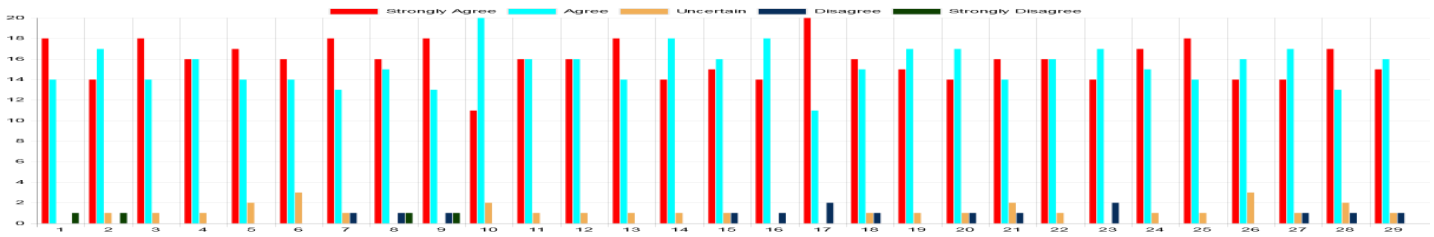
Section: A

Teacher Name: M. Naveed Iqbal

Degree: Ph.D (Botany)

Course Name: Integrated Biological Resource Management

Semester# 1



General Comments of the Students about this Teacher:

Weaknesses: No weakness recorded.

Strengths: Teacher gave well organized material and presented well.Teacher was regular. Subject objectives were clear. Course was well structured to achieve the good learning balance.

Pir Mehr Ali Shah

Arid Agriculture University, Rawalpindi

PERFORMA 10

Teacher Evaluation

FALL-21

Session Name: FALL-21

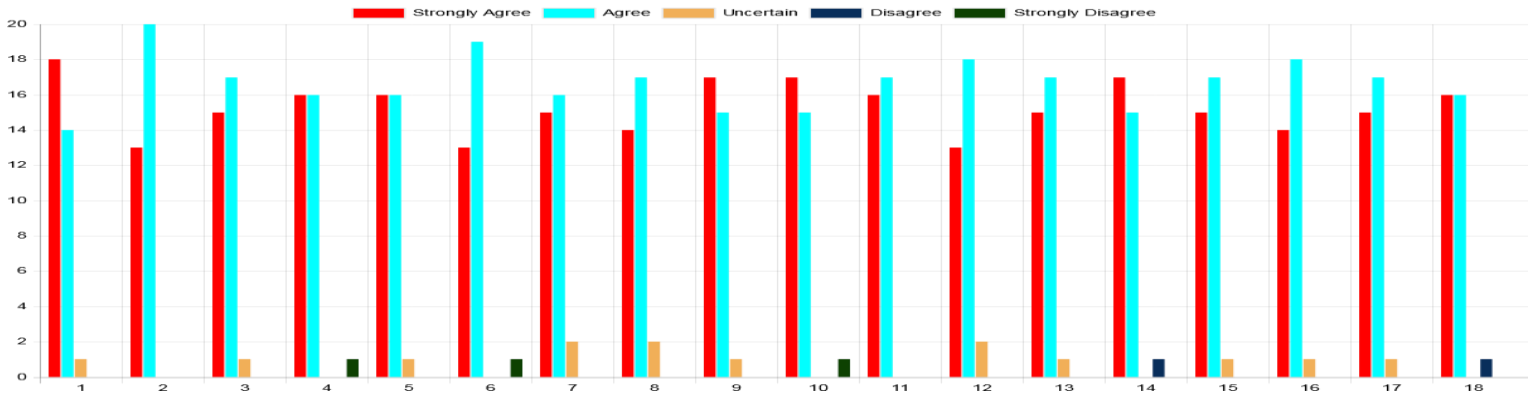
Section: A

Teacher Name: M. Naveed Iqbal

Degree: Ph.D (Botany)

Course Name: Integrated Biological Resource Management

Semester# 1



General Comments of the Students about this Teacher

Weaknesses: No greater weakness was recorded.

Strengths: The tutor showed the respect towards the students and encouraged the class participation. The instructor had balanced attitude and had communication skills.

SPRING 2022

Ph.D BOTANY

COURSE EVALUATION

Pir Mehr Ali Shah

Arid Agriculture University, Rawalpindi

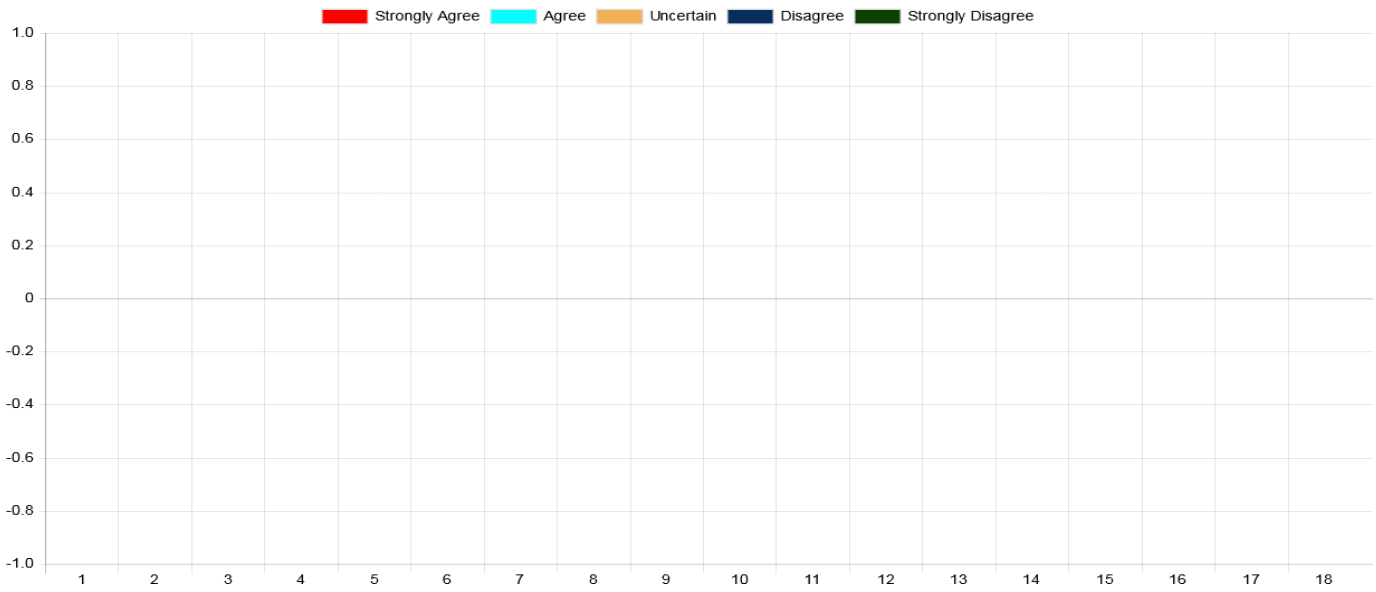
PERFORMA 10

Course Evaluation

SPRING-22

Session Name: SPRING-22 **Teacher Name:** YAMIN BIBI **Course Name:** Thesis Research

Section: E **Degree:** Ph.D (Botany) **Semester#** 3



SPRING 2022

Ph.D BOTANY

TEACHER EVALUATION

Pir Mehr Ali Shah

Arid Agriculture University, Rawalpindi

PERFORMA 10

Teacher Evaluation

SPRING-22

Session Name: SPRING-22

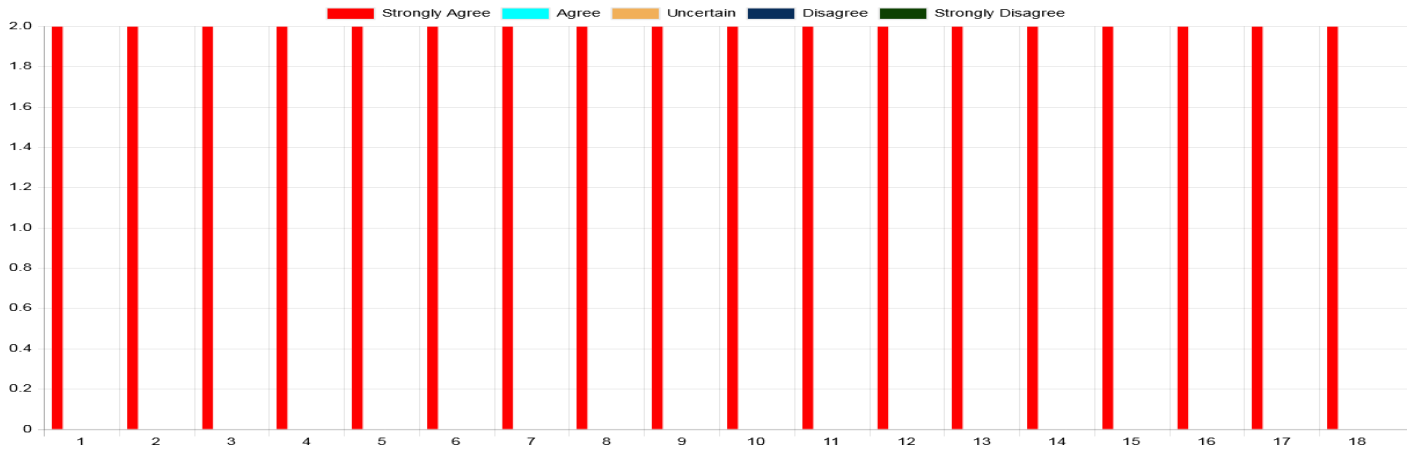
Section: A

Teacher Name: M. Naveed Iqbal

Degree: Ph.D (Botany)

Course Name: Physiological Genetics of Plants

Semester# 2



General Comments of the Students about this Teacher

Weaknesses: No weakness recorded.

Strengths: The material of the course was modern and updated. Instructor communicated this course in a respectable routine, with all characteristics of training, communication skill, contribution, including modern concepts, punctuality and behavior, etc.

Pir Mehr Ali Shah

Arid Agriculture University, Rawalpindi

PERFORMA 10

Teacher Evaluation

SPRING-22

Course Name: Seminar-II

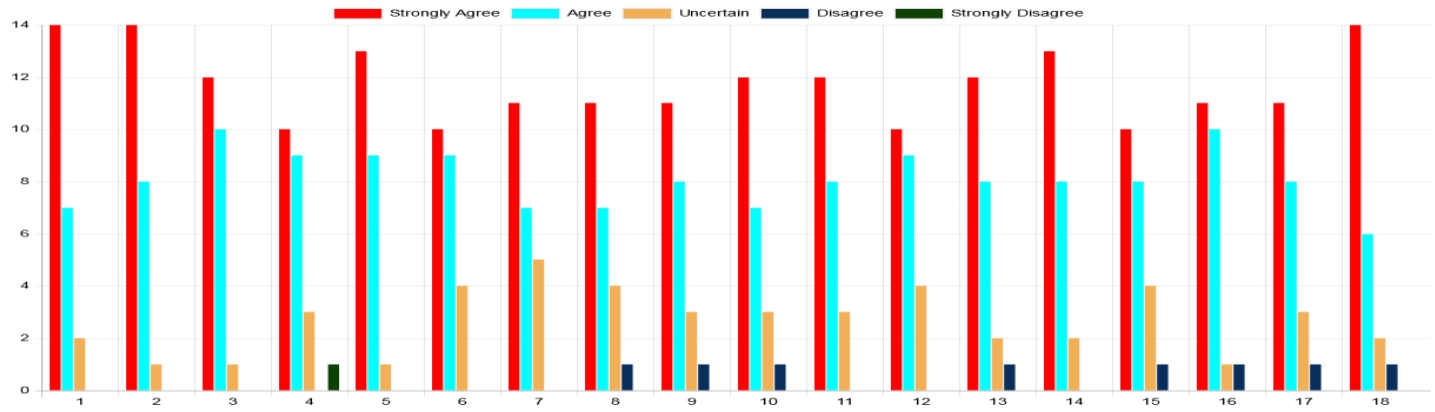
Teacher Name: Zia ur Rehman Mashwani

Session Name: SPRING-22

Semester# 2

Section: A

Degree: Ph.D (Botany)



General Comments of the Students about this Teacher:

Weaknesses: The students showed satisfactory response

Strengths: Ideas and concepts were presented clearly. Course work and relevant material was up to date and teacher included recent materials in the course subject.

Pir Mehr Ali Shah

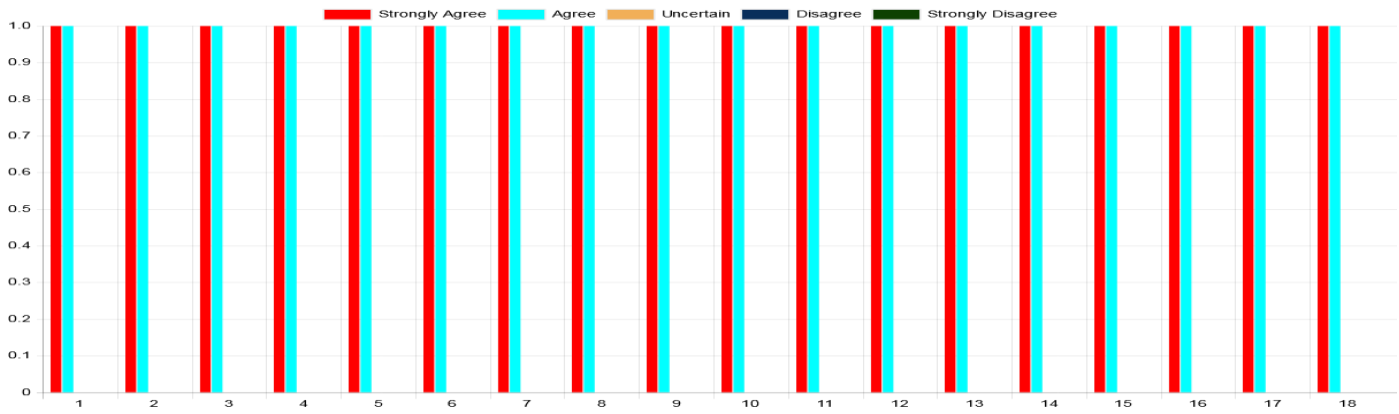
Arid Agriculture University, Rawalpindi

PERFORMA 10

Teacher Evaluation

SPRING-22

	Teacher Name:Khafsa Malik	Course Name: Research Techniques and Instrumentation
Session Name: SPRING-22	Degree: Ph.D (Botany)	
Section: A		Semester# 2



General Comments of the Students about this Teacher:

Weaknesses: No weakness recorded.

Strengths: Teacher gave well organized material and presented well.Teacher was regular.

Subject objectives were clear. Course was well structured to achieve the good learning balance.

FALL 2022

Ph.D BOTANY

COURSE EVALUATION

Pir Mehr Ali Shah

Arid Agriculture University, Rawalpindi

PERFORMA 10

Course Evaluation

FALL-22

Session Name: FALL-22

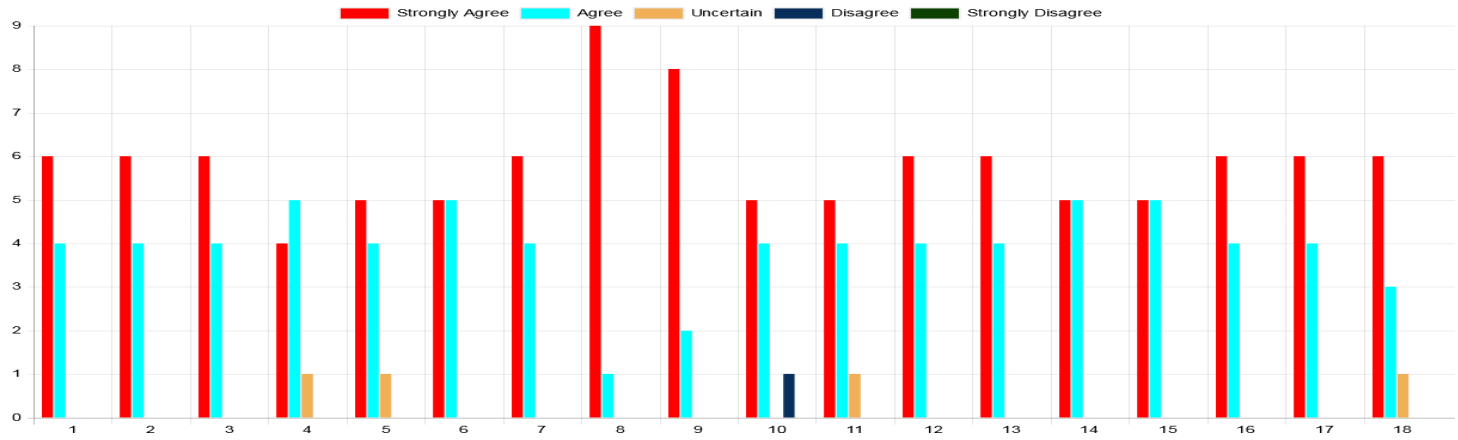
Section: A

Teacher Name: Dr. Rahmatullah Qureshi

Degree: Ph.D (Botany)

Course Name: Integrated Biological Resource Management

Semester# 1



General Comments of the Students about this Course

Weaknesses: No greater weakness was recorded.

Strengths: The tutor showed the respect towards the students and encouraged the class participation. The instructor had balanced attitude and had communication skills.

FALL 2022

Ph.D BOTANY

TEACHER EVALUATION

Pir Mehr Ali Shah

Arid Agriculture University, Rawalpindi

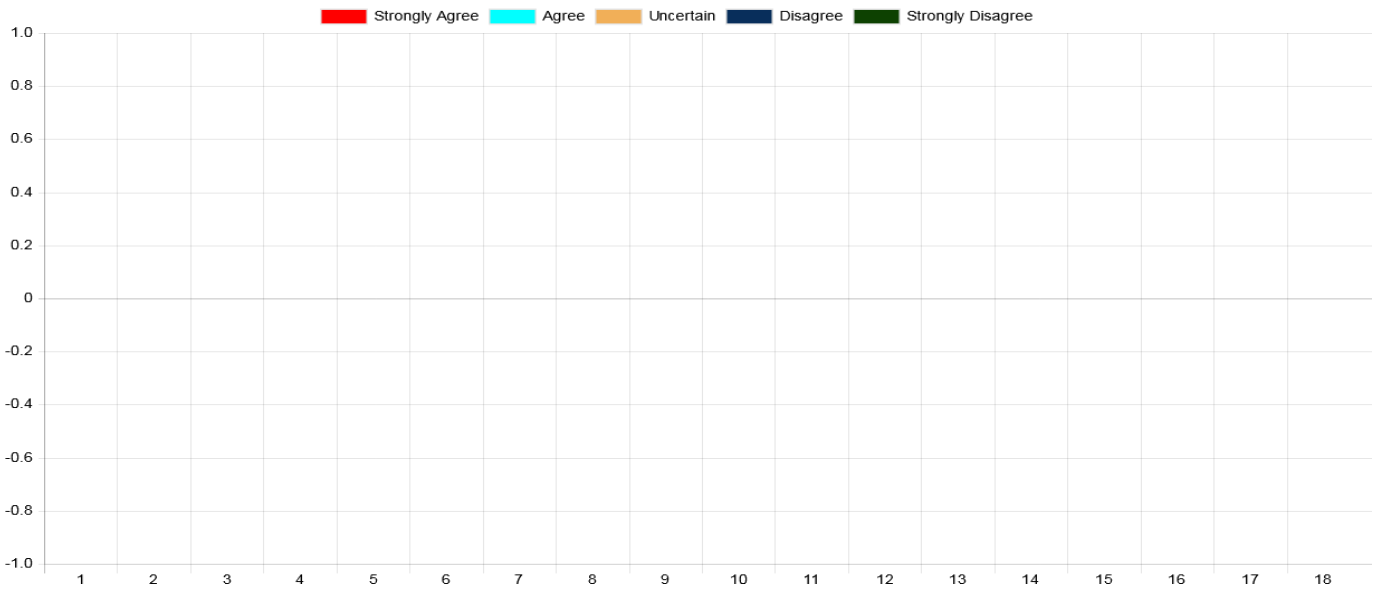
PERFORMA 10

Teacher Evaluation

FALL-22

Session Name: FALL-22 **Teacher Name:** YAMIN BIBI **Course Name:** Thesis Research

Section: E **Degree:** Ph.D (Botany) **Semester#** 3



No data available.

Pir Mehr Ali Shah

Arid Agriculture University, Rawalpindi

PERFORMA 1

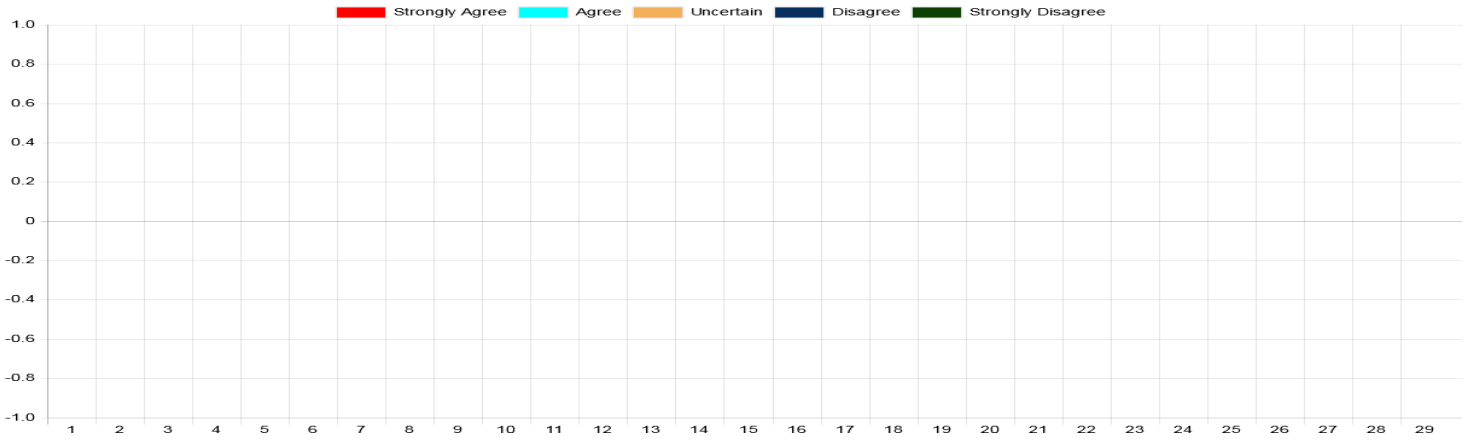
Teacher Evaluation

FALL-22

Session Name: FALL-22 **Teacher Name:** M. Naveed Iqbal **Course Name:** Thesis Research

Semester# 3

Section: D **Degree:** Ph.D (Botany)



No data available.

Pir Mehr Ali Shah

Arid Agriculture University, Rawalpindi

PERFORMA 10

Teacher Evaluation

FALL-22

Session Name: FALL-22

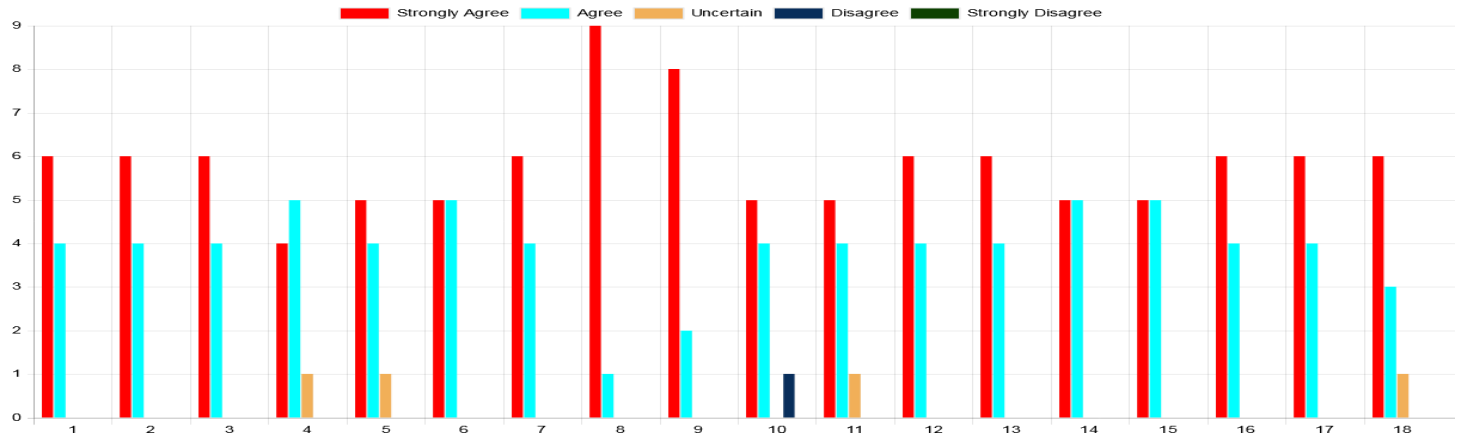
Section: A

Teacher Name: Dr. Rahmatullah Qureshi

Degree: Ph.D (Botany)

Course Name: Integrated Biological Resource Management

Semester# 1



General Comments of the Students about this Teacher

Weaknesses: No greater weakness was recorded.

Strengths: The tutor showed the respect towards the students and encouraged the class participation. The instructor had balanced attitude and had Scommunication skills.

Pir Mehr Ali Shah

Arid Agriculture University, Rawalpindi

PERFORMA 10

Teacher Evaluation

FALL-22

Session Name:2

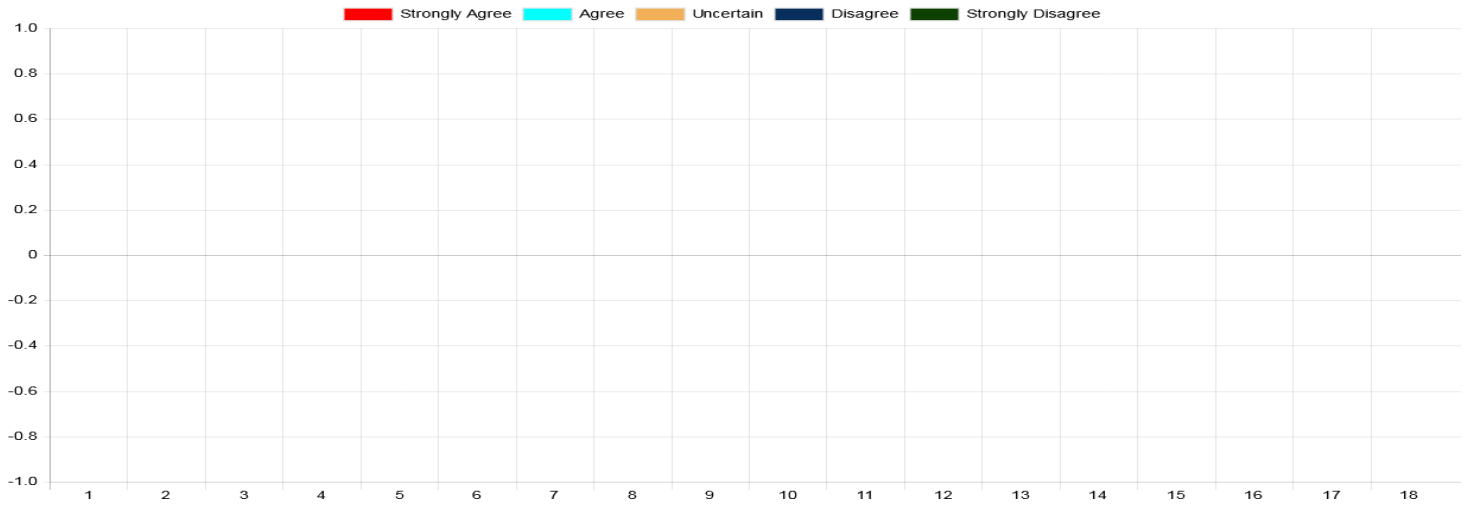
Teacher Name: Dr.Rahmatullah Qureshi

Course Name: Thesis Research

Section: B

Degree: Ph.D (Botany)

Semester#3



No. data available.

Performa 2 : <u>FACULTY COURSE REVIEW REPORT Ph.D.</u>

Course Codes	Title	Credit hours	Assessment Method/ Exam	Number Of students	Comment On curriculum	Any change in course For future	Sames-ter	% grade					Course Instruct-or
								A	B	C	D		
Spring-2021													
BOT-720	Seminar-II	1 (1-0)	Examinati-on/ assignment or viva	9	Satisfactory	Not yet	Spring-2021	80	20	0	0	0	Dr. Zia-ur-Rehman Mashw-ani
			Examinati-on/ Assingment Or Viva		Satisfactory	Not	Spring-						

STAT-711	Advanced Experime-ntal design with data processing	3(2-2)		9		yet	2021	65	25	10	0	0	Dr. Muham-mad Hanif	
BOT-716	Research techniques and instrument-ation	3(0-6)	Examinati-On/ Assessment & viva	9	Satisfactory	Not yet	Spring-2021	85	15	0	0	0	Dr. Khafsa Malik	
BOT-733	Physiolog-ical Genetics	3(3-0)	Examinati-On/ Assessment & viva	4	Satisfactory	Not yet	Spring-2021	60	35	5	0	0	Dr. Naveed Iqbal	

	of plants												Raja
BOT - 730	Environm-ental plant physiology	3(2-2)	Examinati-on/Assignme nt/ Viva	5	Satisfactory	Not yet	Spring - 2021	80	20	0	0	0	Dr. Noshin Ilyas
BOT – 726	Environm-ental Toxicology and Bioremediation	3(2-2)	Examinati-on/Assignment/ Viva	2	Satisfactory	Not yet	Spring - 21	50	50	0	0	0	Dr. Saira Asif
BOT-799	Research Thesis	50(0-50)	Presentation and speaking skills	9	Satisfactory	Not Yet	Spring - 2021	100	0	0	0	0	Respective supervisor

Fall-2021													
BOT-720	Seminar-I	1(1-0)	Examination /Quiz/ Viva	8	Satisfactory	Not yet	Fall 2021	75	25	0	0	0	Dr.Ziaur Rehman Mashwani
BOT-751	Integrated Biological Resource Management	3(3-0)	Examination /Quiz/ Viva	6	Satisfactory	Not yet	Fall 2021	50	50	0	0	0	Dr.Naveed Iqbal Raja
BCH-751	Advances in Biotechnology	3(3-0)	Examination /Quiz/ Viva	9	Satisfactory	Not yet	Fall 2021	45	35	20	0	0	Respective Department
			Examinatio	7	Satisfa	Not	Fall	6	2	1	0	0	

ZOOL-751	Project Planning ,Monitoring and Evaluation	3(3-0)	n /Quiz/ Viva		Ctory	yet	2021	5	0	5			Respective Department
BOT-799	Thesis	50(0-100)	Examination /Quiz/ Viva	10	Satisfa Ctory	Not yet	Fall 2021	100	0	0	0	0	Respective Supervisor
SPRING-2022													
BOT-720	Seminar-II	1(1-0)	ClassQuiz assignment and Exam	9	Satisfa Ctory	No	Spring – 22	100	0	0	0	0	Dr.Ziaur Rehamn Mashwani
STAT-711	Advanced experimental design with data processing	3(2-2)	Presentation And	3	Satisfa Ctory	No	Spring – 22	66.6	33.3	0	0	0	Dr. Ziaur Rehman Mashwani

			Speaking Skill										
BOT-716	Research Techniques and instrumentation	3(0-6)	Examination /Quiz/ Viva	4	Satisfactory	No	Spring – 22	50	50	0	0	0	Dr. khafsa Malik
BOT – 733	Physiological	3(3-0)	Examination	4	Satisfactory	No	Spring – 22	75	25	0	0	0	Dr. Naveed
	Genetics of Plants		n /Quiz/ Viva		Ctory								Iqbal Raja

BOT – 730	Environmental Plant Physiology	3(2-2)	Examination /Quiz/ Viva		Satisfactory	No	Spring - 22						Dr. Noshin Ilyas
BOT – 799	Research Thesis	50(0-50)	Examination /Quiz/ Viva	9	Satisfactory	No	Spring - 22	80	20	0	0	0	Respective Supervisor
Fall-2022													

BOT- 720	Seminar -I	1(1-0)	Examination /Quiz/ Viva	7	Satisfactory	Not yet	Fall - 22	7	0	0	0	0	Dr. Zia Ur Rehman Mashwani
BOT – 751	Integrated Biological Resource Management	3(3-0)	Examination /Quiz/ Viva	5	Satisfactory	Not yet	Fall - 22	60	25	15	0	0	Dr. Rematullah Qureshi
BCH – 751	Advances in Biotechnology	3(3-0)	Examination /Quiz/ Viva	9	Satisfactory	Not yet	Fall - 22	55	25	15	0	0	Dr. Azra Khanum
ZOOL – 751	Project Planning, monitoring and evaluation	3(3-0)	Examination /Quiz/ Viva	6	Satisfactory	Not yet	Fall - 22	66.6	33.3	0	0	0	Dr. Bushra Allah Rakha
BOT – 799	Thesis	50(0-100)	Examination /Quiz/ Viva	9	Satisfactory	Not yet	Fall - 22	85	15	0	0	0	Respective supervisor

Proforma 3 : GRADUATING STUDENTS SURVEY.

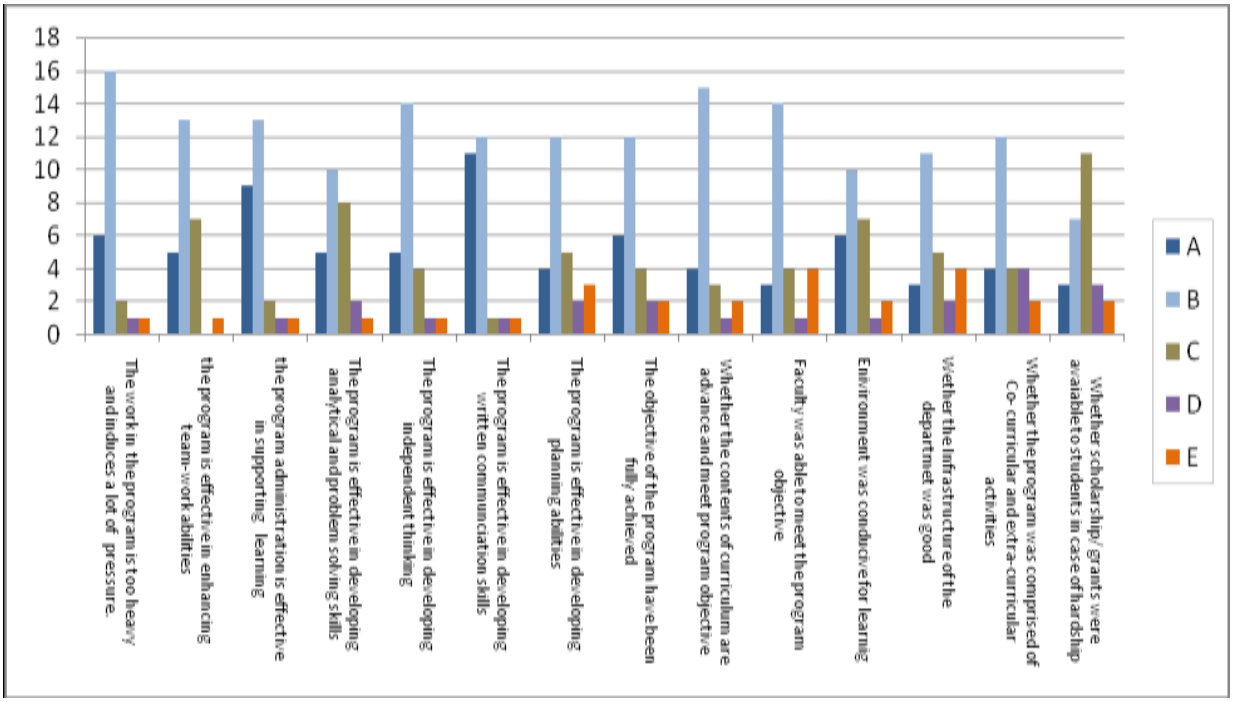
Results of survey of graduating students based on Performa 3 are represented in the given graph. The graduating students in the last semester were surveyed after thesis evaluation. Majority of students showed their satisfaction regarding all the parameters on average.

Best Aspects of the Program

- Helping attitude of the faculty for all students in research and extra-curricular activities
- Highly qualified faculty
- Research projects in collaboration

Weaknesses:

- Computational facilities need extension
- Need of more lecture halls
- Laboratory equipment needs up gradation


18
16
14
12
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A
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E
The work in the program is too heavy and induces a lot of pressure.
the program is effective in enhancing team-work abilities
the program administration is effective in supporting learning
The program is effective in developing analytical and problem solving skills
The program is effective in developing independent thinking
The program is effective in developing written communication skills
The program is effective in developing planning abilities
The objective of the program have been fully achieved
Whether the contents of curriculum are advance and meet program objective
Faculty was able to meet the program objective
Environment was conducive for learning
Wether the Infrastructure of the departmet was good
Whether the program was comprised of Co- curricular and extra-curricular activities
Whether scholarship/grants were available to students in case of hardship

Performa 4: RESEARCH STUDENTS PROGRESS REVIEW

	Question	**Comments by Students**
1	Please outline details of your progress in your research since your last review	Ph.D.students collaborated with foreign Faculty through IRSIP program and published various research papers,
2	Do you have any comments on the Level of supervision received?	Satisfied
3	What do you achieve over the Next six months?	Ph.Ds. have accomplished research projects for Their degree.
4	Do you have any comment on generic or subject specialist training you may have received or would to like to receive internally or externally?	Ph. Ds. have planned to get by HEC-IRSIP for 06 months abroad
5	Do you have easy access to sophisticated scientific equipment's?	Yes
6	Do you have sufficient research material/commodities available?	Yes

The results of this proforma showed that most of the research students are satisfied with their research activities. All of the students had access to sophisticated instruments and have sufficient research material and commodities available. Research students have the motivation to increase their research activities by applying through HEC-IRSIP.

Proforma 5 : <u>FACULTY SURVEY</u>

The results of personnel overview demonstrated that most of the employees were satisfied with their level of scholarly endeavors. All the employees have a good and respectable correspondence among themselves and with the students. However, a portion of the employees have reservations about the time they have for themselves and research services.

S. No.	Parameter	Dr.Rahmat ullah Qureshi	Dr.Abida Akram	Dr.Noshin Ilyas	Dr.Naveed Iqbal Raja	Dr.Yamin Bibi	Dr Ziaur Rehman Mashwani	Dr. Khafsa Malik	Dr. Saira Asif
1.	Your mix of research, teaching and community Service	A	A	B	B	A	A	A	B
2.	The intellectual stimulation Of your Work	B	A	A	B	B	A	A	B
3.	Type of teaching/ rese Arch you	A	B	B	B	B	A	A	A

	currently do.								
4.	Your interaction with students	B	A	B	B	A	A	A	B
5.	Cooperation you received From colleagueS	A	B	A	A	A	B	A	A
6.	The mentoring Availablе to you	A	B	A	B	A	B	A	A
7.	Administrative support From the departmenT	B	A	B	A	B	B	B	B
8.	Providing clarity about the faculty promotion Process	A	B	A	B	A	B	A	B

9.	Your prospects for advance ment and progress throughra Nks	B	A	B	A	B	B	A	B
10.	Salary and compens ation Packages	A	B	A	B	C	B	B	B
11.	Job security and stability at the departmen T	B	A	B	A	A	A	A	A
12.	Amount of time you have for yourself and family	B	C	C	B	B	B	A	C
13.	The overall climate at the	A	B	A	A	B	A	A	B

	Departm ent								
14.	Whether the departme nt is utilizing your experien ceand knowled Ge	B	A	B	A	A	A	A	A

Proforma 06 : SURVEY OF DEPARTMENT OFFERING PH.D PROGRAMS

S.No	Requirements	Comments
1	**General Information:**	
1.1	Name of Dept.	Botany
1.2	Name of Faculty	Sciences
1.3	Date of initiation of Ph.D.program	2002
1.4	Total number of academic journals subscribed in area Relevant to Ph.D.program.	10
1.5	Number of Computers available per Ph.D. student	01/student
1.6	Total Internet Band width available to all the students in the Department.	As per university Policy
2	**Faculty Resources:**	
2.1	Number of faculty members holding Ph.D.degree in the department.	09
2.2	Number of HEC approved Ph.D.Advisors in the department.	09
3	**ResearchOutput:**	
3.1	Total number of articles published last year in International Academic Journals that are authored by faculty members and Students in the department.	250
3.2	Total number of articles published last year in AsianAcademic Journals that are authored by faculty members and students in the department.	70
3.3	Total number of on-going research projects in the department Funded by different organizations	06

3.4	Number of post-graduate students in the department holding scholarships/fellowships.	11
3.5	Total Research Funds available to the Department from all sources.	6 million
3.6	Number of active international linkages involving exchange of researchers/students/ faculty etc.(Attach Details).	Through HEC
4	**Student Information:**	
4.1	Number of Ph.D. degrees conferred to-date to students from the Department during the past three academic years.	
4.2	Number of Ph.D .students currently enrolled in the department.	51
4.3	Ratio of number of students accepted to total number of applicants for Ph.D. Program.	1:5
5	**Program Information**	
5.1	Entrance requirements into Ph.D. Program	M.Phil.
5.2	Is your Ph.D. program based on research only?(Y/N)	Yes
5.3	Maximum number of years in which a Ph.D. degree has to be completed after initial date of enrollment in Ph.D. program.	As per University Policy
5.4	Total number of post M.Sc.(16year equivalent)courses required for Ph.D.	As per University Policy
5.6	Total number of Ph.D. level courses taught on average in a Term / Semester.	As per University Policy
5.7	Do your students have to take/write:	
	a. Ph.D. Qualifying examination(Y/N)	Yes
	b. Comprehensive examination(Y/N)	Yes
	c. Research paper in HEC approved Journal	Yes

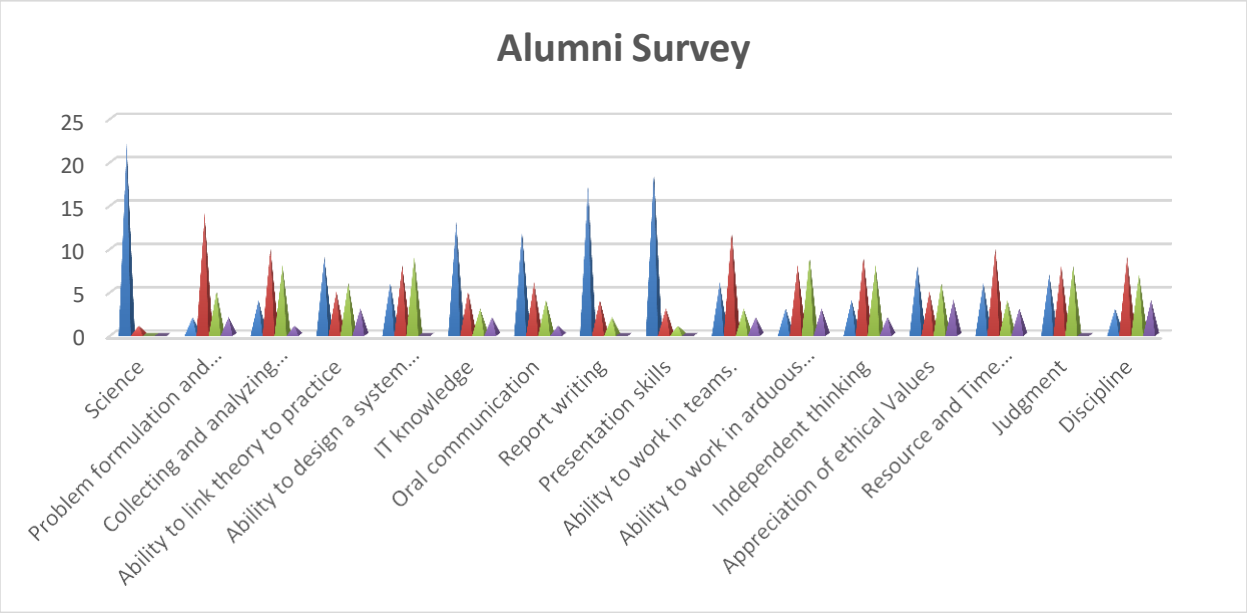
	d. Any other examination(Y/N)	Yes(university organized test and Gat subject)
5.8	Total number of International examiners to which the Ph.D. Dissertation is sent.	As per HEC policy
5.9	How is the selection of an examiner from technologically	As per University

	Advanced countries carried out?	Policy
5.10	Is there a minimum residency requirement (on-campus) for award of Ph.D. degree?	As per university Policy
6	**Additional Information**	
6.1	Any other information that you would like to provide.	Nil

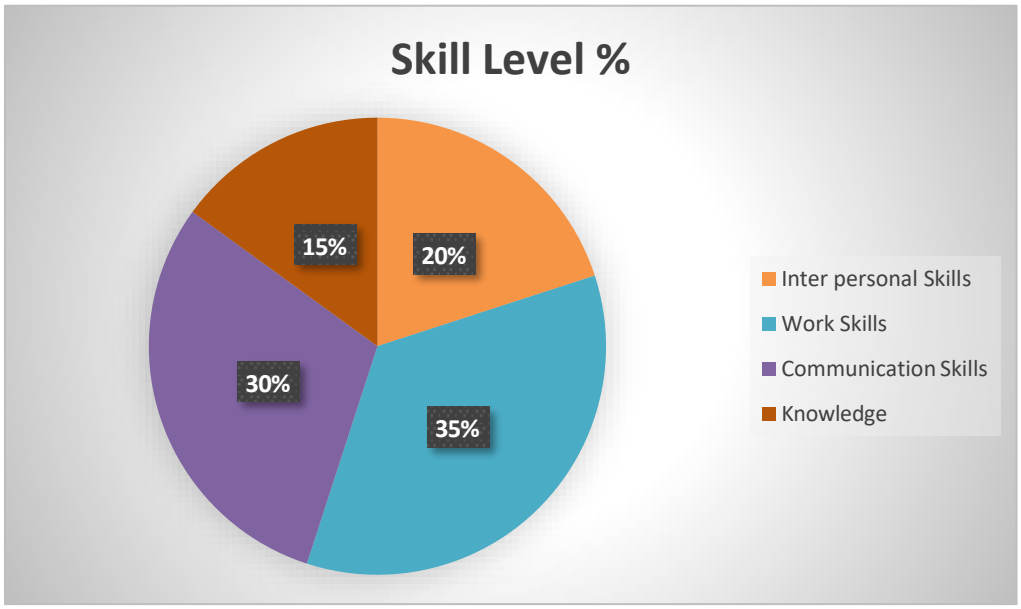
Proforma 7 : **ALUMNI SURVEY RESULTS:**

Majority of the Alumni have rated the knowledge imparted by the department, problem formulation and solving skills of the department in excellent category.

Interpersonal skills have been graded A by majority of the Alumini. Alumini was satisfied with ability to work in team, management and leadership skills, faculty and department infrastructure.



Proforma 08: **EMPLOYER SURVEY**



Performa 8 was sent to students working in several other organizations and their feedback was recorded. Students are working under different academic and research organizations. They are satisfied with the problem solving skills of the department. They are satisfied with all parameters regarding time management skills, ability to work in team as well as appreciation of ethical values etc. Some of the students highlighted that department should provide more research facilities.

Table 3 : Quantitative Assessment of the Department (Year 2021-2022)

Sr.No.	Particular	No	Remarks
1	Ph.D.	40	In employment
2	Students : Faculty	1:20	

The evaluation process indicated high efficiency of system and satisfactory impact of outcomes. Almost all the graduates and post graduates got jobs in various organizations (provincial department, universities, research organizations, banks and private firms).

Table 4 : <u>Present performance Measures for Research Activities</u>

S. No	Faculty	Journal Publication (National & International)	Conference Publication (proceedings abstract)	Projects
1.	Dr.Abdul Waheed	87	Nil.	0
2.	Dr.Abida Akram	17	03	01
3.	Dr.Rahmatullah Qureshi	238	08	07
4.	Dr.Noshin Ilyas	98	04	05
5.	Dr.Naveed Iqbal Raja	107	17	13
6.	Dr.Yamin Bibi	28	05	0

S. No	Faculty	Journal Publication (National&Internati onal)	Conference Publication (proceedings abstract)	Projects
7.	Dr.ZiaUrRehman Mashwani	112	14	05
8.	Dr.Saira Asif	7	0	0
9.	Dr.Khafsa Malik	37	20	1

The department is well staffed;distinguishing feature is the availability of all expertise (Genomics, Ecology, Taxonomy, Physiology, and Mycology).

Faculty Satisfaction Regarding the Administrative Services

- There are some reservations of faculty about some administrative offices of the university about disposal of documents which usually delayed.

Table 5 : Degree requirements

Degree	Pre-requites
Ph. D.	M.Sc. (Hons)/MS/M. Phil. Examination in first division or with aggregate CGPA of not less than 3.00 out of 4.00 from a recognized institution,entry test and interview. Application of the candidate must be accompanied with comprehensive research proposal to be undertaken by the candidate. The candidate must have to clear international GRE test before submission of thesis.

Criteria 2:

Curriculum Design and Organization

A. Title of Degree Program : PhD in Botany

Intent: All the courses for degree program were developed by board of studies, faculty and then academic council. Guidelines given by HEC curriculum committee are also considered.

B. Definition of Credit Hour

A student must complete a definite number of credit hours. One credit hour is one theory lecture or two hours laboratory (practical work/weeks). One credit hour carries 20 marks.

C. Degree Plan

Presently three degree programs including PhD are organized by the department.

- **Ph.D**

The program contents meet the program objectives as highlighted and provide by the Higher Education Commission, Government of Pakistan.

Table 6 : Core Courses

S. No.	Course	Title	Credit
1	BOT-720	Seminar-II	1(1-0)
2	STAT-711	Advanced Experimental design with data processing	3(2-2)
3	BOT-799	Research Thesis	50(0-50)
4	BOT-720	Seminar-I	1(1-0)
5	BOT-751	Integrated biological resource management	3(3-0)
6	BCH-751	Advances in biotechnology	3(3-0)

7	ZOOL-751	Project planning, monitoring and evaluation	3(3-0)
8	BOT-799	Thesis	50(0-100)
Optional Courses			
9	BOT-716	Research techniques and instrumentation	3(0-6)
10	BOT-733	Physiological genetics of plants	3(3-0)
11	BOT-730	Environmental plant physiology	3(2-2)
12	BOT-726	Environmental toxicology and bioremediation	3(2-2)

Curriculum course requirement for M.Sc./ M.Phil./ Ph.D degree is summarized in the following table, whereas , their detailed description is also provided at end of report.

Standard 2.1: Assessment of the Curriculum of Botany Department

The assessment of curriculum is done in the following table and the courses are cross tabulated according to the program out comes.

Meeting Standard 2.1: Courses versus Program

Outcomes Table 7: Course vs. Program Outcome

	OUTCOMES			
COURSE	1	2	3	4
BOT 728	***	***	**	**
BOT731	**	***	***	**
BOT737	**	**	***	***
BOT721	***	***	**	**

* **= Relevant**

** **=Relevant and satisfactory**

*** **=Very relevant and satisfactory**

- The curriculum fits well and satisfies the core requirements for the program, as specified the respective accreditation body.
- The curriculum satisfied the general arts and professional and other discipline required for the program according to demands and requirements set by the higher education Commission**.**

Standard 2-2: Elements Vs Courses

Meetingstandard2-2: Percentage of Elements in Courses

Elements	**Courses**
Theoretical backgrounds	BOT-701, BOT-702, BOT-703, BOT-704, BOT-705, BOT-706, BOT-707, BOT-708, BOT-709, BOT-710, BOT-711, BOT-713, BOT-714, BOT-715, BOT-717, BOT-718, BOT-721, BOT-722, BOT-723, BOT-724, BOT-725, BOT-726, BOT-727, BOT-728, BOT-729, BOT-730, BOT-732, BOT-733, BOT-735, BOT-738
Problem analysis	BOT-712, BOT-736, BOT-737, BOT-751
Solution designs	BOT-716, BOT-719, BOT-720, BOT-731, BOT-734, BOT-799

Standard 2-3

The curriculum for the core courses is designed as per requirements as approved by HEC.

Standard 2-4

The curriculum meets major requirements as approved by HEC.

Standard 2-5

There standard has been answered in table 4.4 as directed in manual.

Standard 2-6

Recorded for research activity (Journal recorded.). Bio-information software GIS, statistical analysis.

Standard 2-7

Enhancing Oral and written Communication Skills of the students

- Skill is developed through seminars, assignment and presentation by the faculty in their respective courses.

SECTION 3

Criterion 3: LABORATORIES AND COMPUTING FACILITIES

There are four Laboratories in the department. The facilities and short comings of these laboratories are listed as under.

LAB-1

Laboratory title	***Plant Ecology Lab.*** (for the graduate and post graduate students)
Location and Area	Faculty of Sciences, Department of Botany,1st floor, New Academic Block.
Objectives	Laboratory is used for ➢ Research work for the graduate and post graduate students. ➢ Practical exercise and demonstration to master students in their introductory and major courses. ➢ Laboratory is spacious and adequate for research and teaching. ➢ Used for implementing the funded projects by the university, HEC, PSF, PARC and other agencies.
Major apparatus **Viz equipment's**	Microscopes, thermograph, EC meter, pH equipment's shaker, refrigerator, vacuum meter, pH metered.
Safely	Safely measures are unavailable against fire(extinguisher), minor hazards

Regulations	And accidents, injuries (First Aid Kit). However, the university maintains a Medical Dispensary for such incidents.

LAB-2

Laboratory title	***Plant Physiology Lab*** (for the graduate and postgraduate students)
Location and Area	Faculty of Sciences, Department of Botany,1st floor, New Academic Block.
Objectives	Laboratory is used for ➢ Implementing the funded projects by the university, HEC, PSF, PARC and other agencies. ➢ Research work for the graduate and postgraduate research fellows. ➢ Practical exercise and demonstration to master students in their introductory and major courses. ➢ Laboratory is spacious and adequate for teaching as well as research purpose.
Major apparatus size equipment's	UV visible spectrophotometer, water potential apparatus, Refrigerators, pH metere, meter balance, etc
Safely Regulations	Safely measures are unavailable against fire (extinguisher) , minor hazards and accidents, injuries (First Aid Kit). However, the university maintains a Medical Dispensary for such incidents.

LAB-3

Laboratory title	***Molecular Mycology Lab.*** (For the master and post graduate research scholars.)
Location and Areas	Faculty of Sciences ,Department of Botany,1st floor , New Academic Block.

Objectives	Laboratory is used for ➢ Implementing the funded projects by the university ,HEC,PSF, PARC and other agencies. ➢ Laboratory is spacious and adequate. ➢ Practical exercise and demonstration to master students in their introductory and major courses. ➢ Research work for the graduate and post graduate research scholars.
Major apparatus viz equipments	Autoclave, Test tube mixer, deep freezer, refrigerators, elective balance, HPLC, research microscopes, Phase contrast Microscope, Electrophoresis, Laminar Flow, etc.
Safely Regulations	Safely measures are unavailable against fire (extinguisher), minor hazards and accidents , injuries (First Aid Kit). However , the university maintains a Medical Dispensary for such incidents.

LAB-4

Laboratory title	***Plant Taxonomy &Ethnobotany Lab.*** (For the master and postgraduate research scholars.)
Location and Area	Faculty of Sciences, Department of Botany,1st floor , New Academic Block. .

Objectives	Laboratory is used for ➢ Laboratory is spacious and adequate for undertaking research and teaching in the relevant field. ➢ Practical exercise and demonstration to master students in their introductory and major courses. ➢ Used for implementing the funded projects by the university, HEC, PSF, PARC and other agencies. ➢ Research work for the graduate and post graduate research scholars.
Major apparatus viz equipments	Dissecting microscope, deep freezer, electric balance, microscopes, sieve shaker, refrigerator, Hotplate, pH and EC meter, plant pressers, stereomicroscope etc.
Safely Regulations	Safely measures are unavailable against fire (extinguisher), minor hazards and accidents, injuries (First Aid Kit). However, the university maintains a Medical Dispensary for such incidents.

SECTION 4: Criterion 4: Student Support and Advising

Departmental Orientation

All newly admitted students are given orientation session at departmental level. It covers orientation about semester system, introduction of faculty and staff and use departmental facilities and services.

Student Advisor

One of the faculty members is deputed as student advisor. The services provided by the student advisor are:

- Organization of function at departmental level
- Solving students problems (personal and academic)
- Providing general assistance

Standard 4.1: Required courses outside the department

- Courses are taught as per approved scheme of study. Required courses outside department

Optional Courses			
1	BOT-716	Research techniques and instrumentation	3(0-6)
2	BOT-733	Physiological Genetics of Plants	3(3-0)
3	BOT-730	Environmental plant physiology	3(2-2)
4	BOT-726	Environmental toxicology and bioremediation	3(2-2)

Standard 4.2 : Structure of the Courses

The majority of the courses are divided into two major aspects: Theoretical and Practical.

- **Theoretical portion** covered in teaching, assignments and presentations.
- **Practicals aspects** are covered by performing experiments in Labs and fields. In order to update students about the latest developments in study area visits to various research organization are as is also organized.

Standard 4.3 : Guidance to the Students

There is a strong and regular communication between student advisors and students to discuss about program requirements. Regular interaction between student and teacher supports advising and counseling system.

There is student councilor in department who solves the problems of students on weekly base.

	Question	**Comments by Students**
1	Please outline details of your progress in your research since your last review	Ph.D. students collaborated with foreign faculty through IRSIP program and published Various research papers,
2	Do you have any comments on the Level of supervision received?	Satisfied
3	What do you plan to achieve over the Next six months?	Ph.Ds are accomplished research projects for Their degree.
4	Do you have any comment on generic Or subject specialist training you may	Ph.Ds. have planned to get by HEC-IRSIP for 06 months abroad
	Have received or would to like to Receive internally or externally?	
5	Do you have easy access to Sophisticated scientific equipment's?	Yes
6	Do you have sufficient research material/ commodities available?	Yes

The results of this proforma showed that most of the research students are satisfied with their research activities. All of the students had access to sophisticated issues and have sufficient research material and commodities available. Research students have the motivation to increase their research activities by applying through HEC-IRSIP.

5: PROCESS CONTROL

Standard 5.1 : Admission Criteria for Each Program

- The process of admission well established and followed as per rules and criteria set by university. For this purpose an advertisement is given in the national papers by the Registrar office.
- Admission criteria:
    - **Ph.D.** (M.Phil with CGPA ¾ or1st division under annual examination system with International GRE must be cleared before submission of theses.
- It is based on the recommendations of supervisory committee
- Admission criteria are revised every year before the announcement of admissions.

Standard 5.2 : Process of Registration and Monitoring of Students.

- The complete list of finally admitted candidate after fulfilling the admission criteria is to be forwarded to the registrar office for proper registration in the specific program. Registration numbers are issued to the students
- Students are registered once in a degree program.
- Mid, Final, Practical exams and assignments are used to monitor student progress.

Standard 5.3: Recruiting Process for Faculty

Recruitment policy for faculty followed by the University is as per HEC standard recommendation. New inductions are as follows:

- Vacant and newly created positions are advertised in the leading daily newspapers. Applications are received by the registrar office; call letters are issued to the short-listed candidates on the basis of their experiences, qualification, publications and other qualities/ activities as fixed as per university rules.
- The candidates are interviewed by the university selection Board. Principal and alternate candidates are selected.
- Selection of candidates is approved by approved by issuing orders to join within a specified time period.
- Induction of new candidates depends upon the number of approved vacancies.
- Standard set by HEC are considered.

Retention of Excellent Faculty Members

- At present, no procedure exists for retaining highly qualified faculty members.
- HEC also supports appointment of highly qualified members as foreign faculty professor, National Professors and deputes them in various departments of the university.

Standard 5.4 : Process and Procedure to Ensure Teaching and Delivery of Course Material

- Periodical revision of the curriculum helps high quality teaching. This revision is based upon requirements, innovations and new technology.
- With the emergence of new fields, new courses are set and included in the curriculum.
- Relevant and supporting materialism available in university library.
- Lecture aids are prepared by the teachers and given to the students.
- Most of the lectures are also supplemented by overheads, slides and pictures.
- All efforts are made that the courses and knowledge imparted meet the objectives and outcomes. The progress is regularly reviewed in the staff meetings.

5.5. Completion of Program Requirements

- Announcement of the date of commencements examination by the controller of examinations announces.
- Notification of results after 30 days of the examinations finish, the controller office notifies the results of the students.
- The evaluation procedure consists of quizzes, mid and final examinations, practical formulas, assignments and reports, oral and technical presentation.

SECTION 6

Criterion 6: FACULTY

Standard 6.2: Effective Programs for Faculty Development

- Proficient implementation and accessibility of pleasing research and academic facilities are provided conferring to the faculty members.
- Provided conferring to the faculty members.
- Incentives in the practice of allowances to thesis supervisors have been implemented lately to promote high standard research.

Standard 6.3 : Faculty member motivation

- There is a calamitous necessity of motivation

Standard 6.1: Full Time Faculty

Table 8: Faculty Distribution by Program Areas in Botany

Program area of specialization	Courses in the area and average number of sections per year	Number of faculty members in each area	Number of faculty with Ph. Degree
Taxonomy &Ethnobotany	-	-	-
Ecology	1	1	1
Physiology	2	2	2
Mycology and Plant Pathology	-	-	-
Tissue Culture	-	-	-
Total	3	3	3

Table 9: Faculty Specialization

S. No	Name	Position	Qualification	Specialization
2.	Dr. Abida Akram	Professor	Ph.D.	Mycologist
3.	Dr. Rahmatullah Qureshi	Professor	PhD	Plant Taxonomy &Ethnobotany
4.	Dr. Noshin Ilyas	Assist Professor	PhD	Plant Microbiologist
5.	Dr. Naveed Iqbal Raja	Assist Professor	PhD	Tissue culture
6.	Dr. Yamin Bibi	Assist Professor	PhD	Phyto chemistry
7.	Dr. Khafsa Malik	Assist Professor TTS	PhD	Plant Taxonomy
8.	Rosaria Asif	Assist Professor	PhD+ post-doc	Tissue Culture
9.	Razia Ur Rehman	Assist Professor	PhD	Ethnos pharmacology

SECTION 7

Criterion 7: Institutional Facilities

Standard 7-1 infrastructure

The institutional facilities are insufficient though the department has provided 7: Institutional shortfalls are under:

- The department lack departmental library.
- Labs of the department lack the gas supply
- There is only one lecture hall for all classes on departmental disposal and there maiming shared with other department.
- New Labs are also required.
- Up turn the department budget for research and experimentation.
- The Department lacks the computer and internet laboratory.

Standard 7.2 Library facilities

The university central library has very limited number of books, journals and periodical, it's a small library in term of space and facilities no catalogue systems; it does not meet the standards of a university library. Department itself does not have a library.

Standard 7.3 ClassRoom and Faculty Offices

- Faculty offices are inadequate.
- Shortage of lecture halls

Standard 8.1 Support and Financial Resources

At present department have a very insufficient financial resource to maintain the present needs of the department. Individual research grants for students and maiming departmental research activities. There is dire need of increasing the financial resources allocated to the department to establish a library, laboratories and computer facilities. Suggestions and factors that can contribute to the motivation to the faculty are given as follows:

- Research grants to the young faculty members.
- Discrimination should be discouraged at all levels.
- Sabbatical leaves for researches in the country and abroad.

Standard 8.2 High Quality Graduate Students and Research scholars

Graduate students are enrolled once in a year. However, PhD scholars are enrolled semester wise. A strict merit policy adopted and GRE/NTS examination is implemented. Lately, details of the students and research scholars are given following tables.

Table 12: Showing the Number of students obtaining degree in PhD programs from2021-22.

STUDENTS	**NOS**	
	2021	2022
Ph. D.	42	51

Students: Faculty ratio	1:20	Fulfills HEC criteria

Standard 8.3 Financial Resources:

Total budget of the department for the financial year 2021-22 is Rs. 55000/- (Fifty thousand rupees only) which hardly fulfills the departmental needs particularly for the purchase of necessary chemicals, etc.

Performa 9: Faculty Resume

Prof. Rahmatullah Qureshi, *PhD*

Chairman/HoD/Project Director, Hemp Research Project
Department of Botany, Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi, Punjab, Pakistan
Telephone: +9251-9292117
Cell Phone: +92300-6730496, +92333-1543336
Email: rahmatullahq@yahoo.com, rahmatullahq@uaar.edu.pk
ORCID: https://orcid.org/my-orcid?orcid=0000-0001-9184-1216
ResearcherID: https://www.webofscience.com/wos/author/record/F-1441-2018
https://publons.com/researcher/1421790/rahmatullah-qureshi/
Research gate: https://www.researchgate.net/profile/Dr_Qureshi2
Google Scholar: https://scholar.google.com.pk/citations?user=JnCxlBgAAAAJ&hl=en
Scopus: https://www.scopus.com/authid/detail.uri?authorId=24339116000
Linkedin: https://www.linkedin.com/in/rahmatullah-qureshi-b1b05252 /
Stanford World University ranking: Pakistan ScientistsAgriculture & Forestry i10 Productivity Rankings in Pakistan 2024 (adscientificindex.com)
Twitter: https://twitter.com/rahmatullahdr?lang=en
Youtube Channel: https://studio.youtube.com/channel/UClWxhcH42L_lQUO6GAYxIMg

Education

- S.S.C., Biology, *Board of Intermediate & Secondary Education, Sukkur, 1987.*
- F.Sc., Biology, *Board of Intermediate & Secondary Education, Sukkur, 1989.*
- B.Sc., Biology, *Department of Botany, Shah Abdul University Khairpur, 1992*. M.Sc. Botany, *Department of Botany, Shah Abdul University Khairpur, 1995.*
- PhD Eco-Taxonomy, *Department of Botany, Shah Abdul University Khairpur, 2005.*

Experience

S.No.	Date	Title	Institution
1.	*01.10.2022 to Date*	Chairman, Department of Botany	*Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi*
2.	*01.08.2021 to Date*	Director, Hemp Project	*Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi*
3.	*28.07.2019 to Date*	Tenured Professor of Botany	*Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi*
4.	*14.12.2010 to 27.07.2019*	Associate Professor of Botany	*Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi*
5.	*23.05.2007 to 13.12.2010*	Assistant Professor of Botany	*Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi*
6.	*04.01.2002 to 22.05.2007*	Seed Certification/Testing Assistant (BPS-17)	*Federal Seed Certification & Registration Department, Islamabad*
7.	*25.09.1998 to 31.12.2001*	Research Associate	Department of Botany, *Shah Abdul Latif University, Khairpur*

Honors & Awards

- Best Research Professor Award-2022 By PMAS-Arid Agriculture University, Rawalpindi
- Best Research Professor Award -2020 By PMAS-Arid Agriculture University, Rawalpindi
- The Government of Pakistan -PCST, *Productive Scientist of Pakistan Award -2016* (C-category)
- The Government of Pakistan – PCST, *Productive Scientist of Pakistan Award -2014* (D-category)
- The Government of Pakistan – PCST, *Productive Scientist of Pakistan Award -2013*
- The Government of Pakistan – PCST, *Productive Scientist of Pakistan Award -2012*
- The Government of Pakistan – PCST, *Productive Scientist of Pakistan Award -2011*
- HEC Recognized PhD Supervisor

No.	udent's Name	esis title (Short title)	mpletion Year
	zwan Sarwar	lation, identification and culturing of algae for bioremediation.	23
	ahid Ali	ristic diversity, phytosociology and quantitative ethnobotanical enumeration of District Chakwal	22
	hana Kouser	licylic and abscisic acid induced physiological and biochemical changes in selected wheat cultivars under heat stress	19
	asim Ahmed	ytosociology, floral diversity and conservation status of Muree- Kotli Sattaian-Kahuta National Park	19
	shad Mehmood Khan	ytodiversity, Vegetation Composition and Ethnoecology of Muzaffarabad District, Azad Jammu and Kashmir, Pakistan	18
	rza Faisal Qaseem	ysio-molecular evaluation of some exotic wheat lines under drought and heat stress	18
	uhammad Maqsood	totoxic and phytochemical analysis of selected medicinal plants from Salt Range, Pakistan	17
	ehmooda Munazir (HEC Indigenous Scholar)	sessment of antimicrobial, antioxidant activities and phytochemical screening of *Leptadenia pyrotechnica*	15
	umaira Shaheen (HEC Indigenous Scholar)	ristic & Ethnobotanical Enumerations of Thal Desert, Punjab, Pakistan	15
	uhammad Ilyas	ytosociological and Ethnobotanical appraisal of Kabal Valley Swat with Especial Reference to Plant Biodiversity Conservation	15
	ubashrah Munir (HEC Indigenous Scholar)	logy of Algal Flora from Kallar Kahar Lake and its tributaries.	14

	ul Rahim (HEC Indigenous Scholar)	bactivity Guided Assessment of some medicinal plants of Malakand	14

Memberships

- Convener, TTS Review Committee, PMAS-AAUR
- Member, Affiliation Committee, Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi, Pakistan
- Member, Disciplinary Committee, Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi, Pakistan
- Member, Board of Faculty of Agriculture & Crop Sciences, PMAS-Arid Agriculture University, Rawalpindi
- Member, Board of Faculty of Sciences, PMAS-Arid Agriculture University, Rawalpindi
- Project Director/Convener, Hemp Research Project at PMAS Arid Agriculture University, Rawalpindi from 2020 to Date.
- Member, Academic Council, PMAS-Arid Agriculture University, Rawalpindi since 14.12.2010.
- Member, Departmental Tenure Review Committee, Department of Botany, PMAS-Arid Agriculture University, Rawalpindi
- Member, Departmental Tenure Review Committee, Department of Horticulture, PMAS-Arid Agriculture University, Rawalpindi
- Member, Departmental Tenure Review Committee, Department of Economics, PMAS-Arid Agriculture University, Rawalpindi
- Member, Departmental Tenure Review Committee, Department of Agriculture Extension, PMAS-Arid Agriculture University, Rawalpindi
- Member, Departmental Tenure Review Committee, Department of Forestry & Range Management, PMAS-Arid Agriculture University, Rawalpindi
- Member, Departmental Tenure Review Committee, Precision Agriculture, PMAS-Arid Agriculture University, Rawalpindi
- Member, Departmental Tenure Review Committee, Zoology, Wildlife & Fisheries Department, PMAS-Arid Agriculture University, Rawalpindi
- Member, Curriculum development of BS/M. Phil./PhD of Botany/Biology at PMAS Arid Agriculture University, Rawalpindi.
- Member, Board of Studies for Botany, Forestry & Range Management, Statistics & Mathematics, PMAS Arid Agriculture University, Rawalpindi
- Member, Board of Faculty, PMAS Arid Agriculture University, Rawalpindi

	bith Rehman	getation and ethnobotanical evaluation of North Waziristan Agency. Hazara University, Mansehra	24
	rhana Amin	alysis of natural neuroprotective compounds against neurodegenerative diseases in model animal. Department of Biotechnology, International Islamic University, Islamabad.	23
	ıfiza Bushra Shamsheer	e of morphological and functional molecular markers to study the genetic diversity of *Cymbopogon citratus*. Department of Botany, Lahore College for Women University, Lahore, Pakistan	23
	kht Zareen Rahim	ıtritional assessment and phytochemical analysis of some selected wild fruits of medicinal plants from Balochistan, Pakistan,	222

		Department of Botany, Balochistan University, Quetta (Co-Supervisor)	

- Member of Plantation Committee at URF, Koont
- Member of the Review Committee for Research Proposals

A. PhD awarded (Major Supervisor)

A. PhD awarded (Co-Supervisor)

B. PhD Theses Supervised (Member)

1.	Matiullah	ological evaluation for sustainable utilization of plant resources of Lalkoo Valley, District Swat.	23
2.	Vajiha Seerat	aracterization of toxigenic and atoxigenic strains of *Aspergillus flavus* in maize	22
3.	Rahmat Wali	nnopharmacological valuation of medicinal plants of fairy meadows and surrounding valleys, Gilgit Baltistan, Pakistan	22
4.	ukhsana Afzal	Isolation and characterization of oyster mushroom from hilly areas of Sub-Himalayan Range	22
5.	Zafar Iqbal	Biosystematics of Coccinellidae (Coleoptera) from Northern Pakistan. Department of Entomology, PMAS-Arid Agriculture University, Rawalpindi	20
6.	Muhammad Faraz Khan	Ethnobotanical and biological screening of selected medicinal plants of Sudhanoti, Azad Kashmir	19
7.	ouseef Anwar	Allelopathic of selected weeds of wheat crop under rainfed conditions	18
	Muhammad Shoaib Amjad	Ecological evaluation of vegetation structure and diversity in District Kotli Azad Jammu and Kashmir, Pakistan	2017
8.	obia Khadam	Analysis of *Carica papaya* and assessment of its impact of liver enzymes and hematological profile in mice.	2016
9.	Mehmood-ul-Hassan	Impact of cropping and tillage systems on weeds and wheat yield	2016
10.	aista Akhund	Integrated management of mycotoxins red chilies	2016
11.	ehana Kauser	Morphological and biochemical adaptations of local cultivar of barley (*Hordeum vulgare* L.) under drought	2015
12.	Safdar Ali	Weed population dynamics and wheat productivity under different tillage systems in Pothwar	2015
13.	angam Khalil	Habitat preference and breeding biology of grey partridge (*Francolinus pondicerianus*) in	2015

		salt range, Punjab	
14.	Asma Ahmed	Phytochemical analysis of selected medicinal plants for antidiabetic compounds	2015
15.	ervaiz Anwar	Biochemical analysis of oil extracted from wild olive (*Olea ferruginea*) and its comparison with standard oil of cultivated olive (*Olea europea*)	2014
16.	Khalid Mehmood	Improvement of wheat for drought tolerance through Genetic Engineering	2014
17.	mmar Fatima	Drought stress induced metabolic changes in local cultivar of wheat (*Triticum aestivum* L.)	2014
18.	khira Shamim	Relative physiological & biochemical evaluation of some tomato (*Lycopersicon esculentum* L.) genotypes under water deficit conditions	2013

M. Phil. Awarded (Major Supervisor)

1.	Muhammad Imran	oristic diversity and phytoecology of Tehsil Dera Ismail Khan, KP, Pakistan	23
2.	kmat Ullah	uantitative ethnobotanical appraisal of Shawal Valley, South Waziristan, Khyber Pakhtunkhwa, Pakistan	22
3.	aista Rafique	epato-protective activity of silver nano-based formulation of *Cichorium intybus* in rats	22
4.	esha Siddiqa	Green synthesis of silver nanoparticles from chicory compound against induced hepatic damage in rats	2022
5.	azina Jabeen	Antioxidant potential of plant-mediated silver nanoparticles by using *Withania somnifera*	21
6.	uhammad Arif Hussain	Biogenic nanosilver against bacterial disease of potato	2021
7.	rwa Iftikhar	Green synthesis of silver nanoparticles by using *Withania coagulens* for antioxidant and antimicrobial activity	21
8.	war Hussain	G.I.S. mapping of the vegetation types of District Swabi, KPK, Pakistan	2020
9.	hira Javaid	Green synthesis of silver nanoparticle from *Trichodesma indicum* and its pharmacognostic potential	2020
10.	ed Sabir Hussain Shah	Distribution pattern of rare and threatened plant species using G.I.S. mapping from Kotli, AJK	2020
11.	irza Afzal Baig	Population dynamics and distribution of *Saussurea costus* (Falc.) Lipsch. from Azad Jammu & Kashmir, Pakistan	2019
12.	hseena Jamil	Floristic composition and biological spectra of Mountain Zindapir, Hassan Abdal, Punjab, Pakistan	2019

13.	bna Ijaz	Botanical demography, flowering phenology and life form of National Agriculture Research Centre, Islamabad	2019
14.	hia Wahid	Nutraceutical potential of *Moringa oleifera* from Pakistan	2019
15.	azmeen	Antimicrobial activity and phytochemical evaluation of *Cichorium intybus*	2018
16.	ahab	Nutraceutical potential of melon seeds	2018
17.	Iqra Yasmin	Comparative antioxidant activity of medicinal plants used in Bazoori formulation	2018
18.	aria Ahmed	Formulation and biological evaluation of chicory compound	2018
19.	uhammad Mursalin	Population dynamics of medicinal plants of Zhandrai, Dir Kohistan	2018
20.	ha Shakeel	Phytochemical analysis and antioxidant activity of *Corchorus depressus*	2017
21.	iba Idrees	Antifungal activity of selected medicinal plant extracts against *Fusarium oxysporum* f.sp. *lentis*	2016
22.	Aqsa Ashfaq	Antifungal activity of selected medicinal plant diffusates against *Colletotrichum gloeosporioides*	2016
23.	dia Kalid	Floral diversity of Tehsil Dhirkot, District Bagh AJK	2016
24.	am Iftikhar	Micro-propagation and antioxidant activity of *Solanum villosum*	2015
25.	id Safeer	Floristic bioecology of Mahasheer National Park, AJK	2015
26.	uhammad Imran	Botanical wisdom of Tehsil Balakot, KPK	2015
27.	rhan Anwar	Vegetation analysis of Rangelands of District Bakhar (Punjab), Pakistan	2015
28.	dullah Rahim	Ethnobotanical profile of District Battagram, KPK	2014
29.	ma Sharif	Ethnobotanical Enumeration of Tehsil Bagh, AJK	2014
30.	daf Anwaar	*In vitro* anthelmintic activity of native medicinal plants from Thal Desert	2013
31.	leem Ullah	Floristic and ethnobotanical investigations of Monocotyledons from Thal Desert	2013
32.	rza Faisal Qaseem	Folk wisdom of plants used by the rural communities of Kotli, Azad Jammu and Kashmir	2013
33.	hrish Sadia	Allelopathic potential of *Tagetes minuta* for controlling broad and narrow leaved weeds	2012
34.	ida Hussain	Ethnobotanical study of Rawalakot, AJK	2012
35.	ahida Perveen	Antimicrobial activity of *Cymbopogon jwarancusa* from Thal Desert	2012

36.	emoona Akram	Weed flora dynamics of maize crop in Tehsil Gujrat, Pakistan	2012
37.	khsana Kosar	Weed flora composition of wheat crop in Tehsil Gujrat, Pakistan	2012
38.	neen Masood	Ecotaxonomic study of cyanophyta of Kallar Kahar Lake	2012
39.	ma Hanif	*In Vitro* assessment of M*oringa oleifera* against some pathogenic fungi.	2011
40.	ida Rasheed	Allelopathic appraisal of *Ailanthus altissima* for the control of broad and narrow leaved weeds	2011
41.	unazza Shahzad	Antibacterial and antioxidant activities of *Moringa oleifera* from Thal desert, Pakistan	2011
42.	rah Majeed	Allelopathic effects of *Chenopodium ambrosioides* and *Conyza canadensis* from Potohar region	2011
43.	rkhanda Jabeen	Estimation of genetic diversity of *Nigella sativa* through morphological and molecular techniques	2011
44.	asim Ahmed	Phytosociological and ethnobotanical aspects of Batnara and Simbar villages of district Abbottabad	2011
45.	matullah	Ethnobotanical evaluation of Frontier region Tank, KPK	2011
46.	uhammad Maqsood	Ethnobotanical investigation of arid lands of district Khushab	2011
47.	l-e-Raana	Screening and evaluation of *Euphorbia* spp. for grassy weed management	2011
48.	umaira Shaheen	Ethnotaxonomy of Santh Saroola and its neighboring areas of Tehsil Kotli Sattian, Rawalpindi	2010
49.	. Shafiq Ahmad	Ethnobotany of Sharda and its allied areas (Neelum Valley), Azad Jammu and Kashmir	2010
50.	hana Kousar	Antimicrobial activity of *Fagonia indica* from Thal Desert Punjab	2010
51.	m Zahra	Floral Diversity of Santh Saroola and its neighboring areas of Tehsil Kotli Sattian, Rawalpindi	2010
52.	hira Batool	Ethnobotany of Bochhal and Miani villages, Tehsil Kallar Kahar, District Chakwal	2010
53.	nna	Taxonomic revision of *Medicago* spp. from Pakistan	2010
54.	dra Raana	Taxonomic revision of *Gnaphalium* and *Conyza* from Pakistan	2010
55.	azala Nasreen	Taxonomy of *Eclipta prostrata* from Pakistan	2010
56.	bia Nazar	Invasive species of Tehsil Kallar Kahar, District Chakwal	2010
57.	ahid Mehboob	Phytosociology of Lehtrar valley, Kottli Satian, District Rawalpindi	2009

58.	ɒureen Ashraf	Antimicrobial activity of *Hippophae rhamnoides* L.	2009
59.	ɒureen Fatima	Effect of different post-harvest treatments on storage life of *Capsicum annuum* L.	2009
60.	ɑliha Khanum	Survey of economically important plant species of University Research Farm at Koont	2009

C. **M. Phil. Awarded (Co-Supervisor)**

	ɯma Zareef	Ethnobotanical indices based of traditionally valued flora of Kallar Syedan, Rawalpindi, Pakistan. Qurtuba University of Science & Technology, Peshawar	2019
	ɒith Rehman	Ethnobotanical evaluation of North Waziristan Agency. Hazara University, Mansehra	2015
	ɯmar Abbas	Ethnobotany of Naltar valley, Northern Areas, Pakistan. Karakorum International University, Gilgit-Baltistan	2009

Service Activity

Advisory Services for other Institutions (International)

- Master & Doctoral Theses Examination of University of Cairo, Egypt
- Master & Doctoral Theses Examination of Fayoum University, Egypt
- Doctoral Thesis Examination of Charles Sturt University, Australia

Advisory Services for other Institutions (National)

- Member of Scrutiny Committee for the Appointments of Faculty, Swat University
- Member of Selection Board, Poonch University, Rawalakot, Azad Jammu & Kashmir
- Member of Selection Board, Mirpur University of Science & Technology, Azad Jammu & Kashmir
- Member Review Committee for the Department of Botany, Lahore College for Women University
- Member Review Committee for the Department of Botany, Islamia University, Bahawalpur
- Member Review Committee for the Department of Botany, Shah Abdul Latif University, Khairpur
- Elected member as Vice President (Punjab) for the executive body/council of the Pakistan Botanical Society from 2013 to 2017
- Member, Departmental Tenure Review Committee (Botany), Bahauddin Zakria University, Multan, Pakistan
- Member, Departmental Tenure Review Committee (Botany), The Islamia University, Bahawalpur, Pakistan
- Member, Departmental Tenure Review Committee (Botany), University of Muzaffarabad, Azad Jammu & Kashmir
- Member, Board of Studies, Department of Botany, University of Muzaffarabad, Azad Jammu & Kashmir
- Member, Board of Studies, Department of Botany, University of Poonchh Rawalakot, Azad Jammu & Kashmir
- Member, Board of Studies, Institute of Plant Sciences, University of Sindh, Jamshoro since 14.03.2014 to date
- Member, External Quality Assessment, Department of Biology, Karakorum International University, Gilgit-Baltistan

- Member Selection Board, Federal Public Service Commission
- Advisor, Punjab Public Service Commission

Representation in the Scientific Bodies

- Member, *National Accreditation Council for Life Sciences (NACLS), HEC*
- Vice President (Sindh) for the *Scientific Association of Young Scholars* (https://sciplatform.com/society/cabinet/)
- Nominated member by the Govt. of Pakistan as *Multidisciplinary Expert Panel (MEP) for The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, IPBES Secretariat, Bonn, Germany*
- Founder Member, *Pakistan Wildlife Society*
- Life Member, *Pakistan Botanical Society since 2001*
- Life Member, *Weed Science Society of Pakistan, since 2006*

Life Member, *Latifian Green Globe Forum*, Shah Abdul Latif University, Khairpur

RESEARCH INTEREST

- Phytogeography
- Plant Ecology
- Biosociology
- Plant Systematics
- Aromatic, Poisonous and Medicinal Plants
- Research Planning and Report Writing
- Economic Botany
- Applied Ethnobotany
- Conservation of Phytodiversity
- Conservation & Management of Plant Resources
- Plant Taxonomy & Embryology
- Ethnobotany

Publications

(A) PUBLISHED BOOKS (INTERNATIONAL)

1. **Qureshi, R**. 2012. The Flora of Nara Desert, Pakistan. Nova Science Publishers, Inc. Hauppauge, New York, USA. Hard cover (ISBN: 978-1-62081-683-7). Pp. 1-317.
2. **Qureshi, R.** and H. Shaheen. 2013. *The Ethnobotanical profile of Tehsil Kotli Sattian, Rawalpindi, Pakistan.* Nova Science Publishers, Inc. Hauppauge, New York, USA. 978-1-62417-290-8. Pp. 1-165.

3. Malik, T.H. and **R. Qureshi**. 2015. ***Potentially Important Food Plants of Pakistan*. Food Plant Solutions Field Guide – Pakistan, Version 4, Food Action Group, Rotary Club of Devonport North District 9830 & Food Plants International.** **https://www.researchgate.net/publication/285917531_Potentially_important_Food_Plants_of_Pakistan.**

4. Abd El-Ghani**, M.M., F.M.** Huerta-Martínez**, L.** Hongyan **and R.Qureshi. 2017. *Plant Responses to Hyperarid Desert Environments*. Springer International Publishing, New York, USA (ISBN 978-3-319-59134-6).**

A. Book chapters

1. **Qureshi, R.,** M.B. Baig and A.O. Belgacem. 2023. Climate change and innovative ecological interventions through climate-smart agriculture in the Cholistan Desert of Pakistan. In: *Climate-Smart and Resilient Food Systems and Security* (Editors: Behnassi, M., A.A. Al-Shaikh, M.B. Baig, R.H. Qureshi and T.K.A. Faraj). Springer International Publishing AG, Springer Nature (In Press).

2. Munazir, M., **R. Qureshi**, M. Munir and H. Mukhtar. 2022. Role of phytoremediation as a promising technology to combat environmental pollution. In: *Phytoremediation for Environmental Sustainability* (Editors: R. Prasad). Springer International Publishing AG, Springer Nature, ISBN: 978-981-16-5620-0, pp. 423-466.

3. **Qureshi, R.** 2020. Phytodiversity and the conservation status of the Nara Desert, Pakistan. In: *Environmental Pollution, Biodiversity and Sustainable Development: Issues and Remediation* (Editors: Hasnain Nangyal and Muhammad Saleem Khan). Apple academic press, CRC Press, Florida (USA) and Canada, Taylor & Francis group. Pp. 51-76. http://www.appleacademicpress.com/environmental-pollution-biodiversity-and-sustainable-development-issues-and-remediation/9781771888059?fbclid=IwAR1YIYw7UDqfFWBrGjjfk8SU94uVkTTxrhTJpF0Y-ML5-cEkBTErS2NmUfg

4. **Qureshi, R.** 2018. Medicinal uses of trees and shrubs by the inhabitants of Nara Desert, Pakistan.In: *Plant and Human Health, Volume 1: Ethnobotany and Physiology* (Editors: Ozturk, M. & K. R. Hakeem), Springer International Publishing AG, Springer Nature, pp. 391-407. https://doi.org/10.1007/978-3-319-93997-1_10.

5. Munir, M. and **R. Qureshi.** 2018. Antidiabetic plants of Pakistan**.** In: *Plant and Human Health, Volume 1: Ethnobotany and Physiology* (Editors: Ozturk, M. & K. R. Hakeem), Springer

International Publishing AG, Springer Nature, pp. 463-547. https://doi.org/10.1007/978-3-319-93997-1_13.

6. **Qureshi, R.** and G.R. Bhatti. 2014**.** Floral diversity of Nara Desert, Pakistan**.** In: Biodiversity of Pakistan (Editors: Rafique, M., K.A. Ibupoto, S.A. Hussain and K. Mahmood), Pakistan Museum of Natural History, Islamabad. pp. 413-431. **(ISBN:** 978-969-8040-28-4).

7. Hussain, I., Q. Abbas, S.W. Khan and **R. Qureshi**. 2014. Traditional uses of plants for the control of hepatitis, kidney stone and urinary tract infection from Haramosh valley, district Gilgit. In: Biodiversity of Pakistan (Editors: Rafique, M., K.A. Ibupoto, S.A. Hussain and K. Mahmood), Pakistan Museum of Natural History, Islamabad. pp. 463-469. **(ISBN:** 978-969-8040-28-4).

8. **Qureshi, R.** 2011. Floral Diversity, Threats and Conservation Measures: A Case Study from Nara Desert, Pakistan In: *Deserts: Fauna, Flora and Environment* (Editors: Guevara, J., C. Sivaperuman and E. Grünwaldt). Nova Science Publishers, Inc. Hauppauge, New York, USA. Pp. 53-77. **ISBN**: 978-1-61470-038-8.

B. Papers international (impact factored)

1. Siddiqa, A., R**. Qureshi**, N.I. Raja, I.A. Khan, M.Z. Ahmad, S. Rafique, A. Ali, A. Ahmad and P. Kaush. 2024. Liver-boosting potential: Chicory compound-mediated silver nanoparticles for hepatoprotection-biochemical & histopathological insights. Frontiers in Pharmacology, 15, 1325359. **(Impact Factor: 5.6).**

2. Rehman, S., Z. Iqbal, **R. Qureshi** & A. Khan. 2024. Floristic composition, biological spectrum and phenological pattern of vegetation in Tribal District North Waziristan, Khyber Pakhtunkhwa, Pakistan. Frontiers in Forests and Global Change, 6, 1287629.

3. Rehman, S., Iqbal, Z., Qureshi, R., Shah, G. M., Afzal, A., Rahman, K. U., ... & Shah, S. S. H. 2024. Quantitative ethnomedicinal survey of wild edible fruits used by the indigenous community in North Waziristan, Khyber Pakhtunkhwa, Pakistan. Ethnobotany Research and Applications, 28, 1-20.

4. Rehman, S., Iqbal, Z., & Qureshi, R. 2023. Ethnomedicinal plants uses for the treatment of gastrointestinal disorders in Tribal District North Waziristan, Khyber Pakhtunkhawa, Pakistan. Ethnobotany Research and Applications, 26, 1-22.

5. Jabeen, S., **R. Qureshi**, M. Ikram, A. A. Omar, M. Hussain, N. Elnaggar, & H. F. Oraby 2023. Phyto-fabrication and characterization of silver nanoparticles using *Withania somnifera*: Investigating antioxidant potential. Green Processing and Synthesis, 12(1), 20230167.

6. Rehman, S., Z. Iqbal, **R. Qureshi,** T.S. AlOmar, N. Almasoud, M. Younas, A. Rauf and M. Irfan. 2023. Ethno-Dentistry of medicinal plants used in North Waziristan, Pakistan. International Dental Journal, In Press:

7. Zareef, H., F. Sarim and **R. Qureshi**. 2023. Quantitative ethno-gynecological survey of traditional medicinal plants from Punjab province, Pakistan. Ethnobotany Research and Applications, 26: 1–20. **(Impact Factor: 0.268).**

8. Fatima, I., M. Munir, R. Qureshi, U. Hanif, N. Gulzar and A.A. Sheikh. 2023. Advanced methods of algal pigments extraction: A review. *Critical Reviews in Food Science and Nutrition*, DOI: 10.1080/10408398.2023.2216782 **(Impact Factor: 11.208).**

9. Rahim, G., **R. Qureshi**, A. Hazrat, B. Ahmad, A.A. Khan, T. Aziz, M. Alharbi, and A. Alshammari. 2023. Phytochemical, antimicrobial, radical scavenging and *in-vitro* biological activities of *Teucrium stocksianum* leaves. *Journal of the Chilean Chemical Society*, 68(1): 5748-5754. **(Impact Factor: 1.431).**

10. Khadim, S., K. Malik, **R. Qureshi**, Misbah, and S. Rehman. 2023. Ethnogynecological study of traditional therapeutic plants used by the indigenous communities: A case study from District Gujrat, Punjab, Pakistan. Ethnobotany Research and Applications 26:2. http://dx.doi.org/10.32859/era.26.2.1-23. **(Impact Factor: 0.268).**

11. Zareef, H., M.T. Gul, **R. Qureshi**, H. Aati and M. Munazir. Application of ethnobotanical indices to document the use of medicinal plants in Tehsil Kallar Syedan, District Rawalpindi, Punjab, Pakistan. Ethnobotany Research and Applications 25: 49. DOI: http://dx.doi.org/10.32859/era.25.49.1-29 **(Impact Factor: 0.268).**

12. Rehman, S., Z. Iqbal, **R. Qureshi**, and G.M. Shah. 2023. Quantitative ethnobotanical study of medicinal plants used by the indigenous communities of Shawal Valley, District North Waziristan, Pakistan. Ethnobotany Research and Applications, 25: 48. **(Impact Factor: 0.268).**

13. Aftab, F., **R. Qureshi**, T. Munawar, A. Waheed, M. Rashid and S. Rehman. 2023. Quantitative analysis of ethnomedicinal plants of Tehsil Khuiratta, Azad Jammu & Kashmir, Pakistan. Ethnobotany Research and Applications 25: 37. **(Impact Factor: 0.268).**

14. Ullah, H., **R. Qureshi**, M. Munazir, Y. Bibi, A. Saboor, M. Imran, M. Maqsood and S. Ali. 2023. Quantitative ethnobotanical appraisal of Shawal Valley, South Waziristan, Khyber Pakhtunkhwa, Pakistan. Ethnobotany Research and Applications 25: 27. **(Impact Factor: 0.268).**

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41. **Qureshi, R.,** G.R. Bhatti and A.K. Chaudhary. 2009. Phytodiversity under Human Induced degradation: A case study from Nara Desert, Pakistan. Held during March 27-29, 2009 by Shah Latif University Botanical Garden & Herbarium, Khairpur.

42. **Qureshi, R.** and G.R. Bhatti. 2008. Forage species of Nara Desert, Pakistan. 1st International Conference of Plant Scientists & 10th National Meeting of Plant Scientists organized by Pakistan Botanical Society, at University of Agriculture, Faisalabad during 20th to 22nd April, 2008.

43. **Qureshi, R.** and G.R. Bhatti. 2008. Floristic enumeration of Rohri Hills, Sindh, Pakistan. 1st International Conference of Plant Scientists & 10th National Meeting of Plant Scientists organized by Pakistan Botanical Society, at University of Agriculture, Faisalabad during 20th to 22nd April, 2008.

44. **Qureshi, R.**, M.A. Khan, M.A. Aslam Arain and A. Hussain. 2006. Impact of weeds on wheat seed quality-A case study from Rahim Yar Khan, Pakistan. Second International Weed Science Conference organized by University of Arid Agriculture, Rawalpindi, Pakistan during March 20-22, 2006. Abstract #9 page# 5.

45. **Qureshi R.** and G.R. Bhatti. 2000. Indigenous uses of Caesalpinia bonduc (L.) Roxb. with particular reference to the people of Sukkur district. Role of Traditional/Alternative Medicine in Health Care-In and Beyond 2000 AD. Organized by Hamdard University, Hamdard Foundation Pakistan & AMDA from 30th October to 2nd November 2000 at Regent Plaza Karachi.

46. **Qureshi R.,** G.R. Bhatti, A. Saeed and M.M. Hassan. 2000. Medicinal plants of Capparidaceae Familiy Growing around Madina-Tul-Hikmah. 7th National Conference of Plant Scientists organized by the department of Botany, University of Punjab, Nov. 14-16, 2000 Abstract #TMEA-3.

47. Bhatti, G.R., **R. Qureshi** and M. Shah. 2000. Ethnobotany of Qadan Wari of Nara Desert. 7th National Conference of Plant Scientists organized by the department of Botany, University of Punjab, Nov. 14-16, 2000 Abstract #TMEA-9.

RESEARCH GRANTS AND CONTRACTS

Projects in-hand

- Domestication of Industrial and Medicinal Hemp, funded By the Ministry of Science & Technology, Pakistan as P.I. (799 million)

Projects completed

- Nutritional assessment and phytochemical screening of some selected wild fruits from Balochistan, Pakistan (No: 10114/Punjab/NRPU/R&D/HEC/2017) as P.I.
- Production through suspension culture and *In vivo* testing of *Bistorta amplexicaulis* compounds (No: 10406/Punjab/NRPU/R&D/HEC/2017) as Co-P.I.
- Ethnobotanical survey of Thal Desert, Punjab Pakistan. 2013. funded by Pakistan Science Foundation Islamabad (Three Years duration). (Principal Investigator).
- Floristic & Ethnobotanical enumerations of Kallar Kahar Lake and its adjacent areas. 2010. Funded by Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi. (Principal Investigator).
- Floral Biodiversity of Khanpur Dam, District Hazara Khyber Pakhtunkhwa. 2010. Funded by WWF, Islamabad (Principal Investigator).
- Floristic Inventory of University Research Farm at Koont and its surrounding areas. 2008-2009. Funded by Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi (Principal Investigator).
- Floristic Study of Arid Zone (Desert- Nara Region) Sindh, Pakistan, Sponsored by Pakistan Science Foundation, Project No. S-SALU/ENVR (45) during 1998-2001 (as Research Associate).

Projects submitted

- Pilot scale production of bioactive-organic fertilizer from agriculture wastes by using innovative techniques (PSF worth Rs. 20. million as PI) vide 4th Call for Proposals (CFP) Project No. PSF/CRP/TH/4/CFP/542.
- Development of silver nano-particles synthesized nano-sanitizer by using medicinal plants against COVID-19 (PSF worth Rs. 20.065 million as Lead PI).
- Preparation and development of herbal disinfectant formulations using selected local medicinal plants for potential commercialization, DoST, worth of Rs. 11.613 million (Co-PI).
- Formulation and preparation of topical antiviral herbal disinfectants from the native plants of Pakistan (No. 5783/RRG/R&D/HEC/2020), HEC worth of Rs. 15.88 million (as PI).

- Benchmarking the honey industry for food security, sustainable rural livelihood, and economic growth: Exploration of rangelands potentials as Lead PI (No. 2670/GCF/R&D/HEC/2020),HEC worth Rs. 123.719 million.
- Assessment of different *Ziziphus* species for melliferous potential and production of prime export quality Pakistani honey-Phase-I as PI (No. 806/NRPU/R&D/HEC/2020) HECworth of 14.31 million.
- Establishment of Herbarium & Botanical Garden submitted to Ministry of Science & Technology worth of 380 million.

Travel grants

- 8th International Conference in Microbial and Plant Biotechnology (ICMPB)" held in Kafrelsheikh University, Egypt by PHEC vide letter No. PHEC/A&R/ITG/1-408/2016 dated 14.09.2018.
- *1st International Conference on "Agriculture, Forestry & Life Sciences" (ICAFLS 2018)*" held in Budapest, Hungary by HEC vide letter No. 298.109/TG/R&D/HEC/2018 dated 15.08.2018)
- International Conference on Anthropology in the World, organized by British Museum of Natural History, London by Pakistan Science Foundation, Islamabad, vide letter No. PSF/P&D/T.G.II (534)/11 dated 14.05.2012.
- Hong Kong International Tropical Medicine Forum, Hong Kong, China by Pakistan Science Foundation, Islamabad vide letter NO. PSF/P&D/T.G-II (470)/11 dated 09.01.2012.
- International Symposium on Medicinal & Aromatic Plants, Thailand by the Higher Education Commission, Islamabad vide letter No. 145.40/1/HEC/R&D/2011/138 dated 25.11.2011

RESEARCH OR CREATIVE ACCOMPLISHMENT

1. Patent# 644/2011

Title: Polyherbal composition to act as cooling, refrigerant, antioxidant, and appetizer

Brief Introduction of the product:

The present invention provides a unique combination of herbal composition to act as a cooling/demulcent drink and a refrigerant tonic that can be used for treating the burning sensation of palms and soles, thirst, dehydration, weakness, jaundice, and lack of appetite. The composition includes a therapeutically effective amount of plant extracts of *Cichorium Foeniculum, Apium, Corchorus, Citrullus,* and *Cucumis* seeds.

Applicability of product/in Sector/Industry/Market: Herbal/Phyto-pharmaceutical/Nutraceutical Industry

Benefits/Uses of the product:

This new blend of herbs can be used as a cooling/demulcent drink and refrigerant tonic for treating the burning sensation of palms and soles, thirst, dehydration, weakness, jaundice, and lack of appetite. The resultant herbal composition can be used as a cooling and energy drink that provides energy to the body during harsh summer days as demulcent drink.

2. **Title of the Product Developed: Mehria Analgesic Balm**

Brief Introduction of the product:

The formulation is designed to reduce instant pain and inflammation of acute hidden injury and chronic joint and muscle pain. It also includes a sufficient amount of heat blocking, blood circulation, and a soothing and anti-inflammatory component for the joints and/or muscles comprising aromatic plant extracts such as *Cinnamomum, Eucalyptus, Mentha, Syzygium* and *Thymus*.

Applicability of product/in Sector/Industry/Market: Herbal/Phyto-pharmaceutical

Benefits/Uses of the product:

A pain-relieving herbal composition that contains a nerve-inhibiting active component that is used in reducing pain by stopping nerve endings that gesture pain.

3. **Title of the Product Developed: Mehria Throat Soother**

Brief Introduction of the product:

The mucous membrane of the throat gets infected easily due to its favorable environment by viruses and bacteria. These microbes produce inflammation and irritation of the membrane, resulting in a sore throat. This would be the result of the entrance of dirt, dust smoke, or various irritants in the respiratory system. The coughing signs are itchiness of the throat and difficulty in swallowing. In order to treat sore throat and associated infection, a polyherbal formulation is designed with a careful blend of effective herbs that are used by the traditional healers of the country.

Applicability of product/in Sector/Industry/Market: Herbal/Phyto-pharmaceutical

Benefits/Uses of the product:

This polyherbal composition in syrup form is related to effective management and treatment of sore throat including flue and associated cough.

PROFESSIONAL PRESENTATIONS

Resource Person/Guest Speaker/Keynote lecture

1. Delivered talk as invited speaker titled, "**Hemp - A Weed or Menace"** in 9th International and 18th National Conference on "**Biodiversity and Medicinal Plants: A Way Forward to Sustainable Development**" (BMP-SD 2023) during December 14-16, 2023.
2. Delivered talk as invited speaker titled, "**Hemp - A Weed for Human Well-Being"** in National Workshop Food Security in wake of Climate Change, Biodiversity, Non-Timber Forest Products & Weeds organized by Weed Science Society of Pakistan at Shaheed Benazir Bhutto University, Sheringal, Upper Dir dated 9-11 August 2023.
3. Delivered Invited speech on "**Plant Biodiversity of Pakistan: Resources, Opportunities and Development**" on June 05, 2023 by the Department of Botany, UVAS, Lahore.
4. Delivered talk as invited speaker titled, "**Hemp—A Nature's Gift for Human Wellbeing"** in the International conference on "Bridging the Gap between Research and Sustainable Development Goals" organized by the Center of Plant Sciences & Biodiversity, University of Swat dated May 24-26, 2022.

5. Delivered talk as invited speaker titled, "**Plant Biodiversity of Pakistan: Resources, Opportunities, and Development** at the Department of Botany, University of Veterinary and Animal Sciences, Lahore, Pakistan dated 21 to 23 March 2022.
6. Delivered a Talk as an Invited Speaker titled, "**Hemp—A Nature's Gift for Human Survival** in the International Conference on New Trends in Biological Sciences organized by the University of Okara dated 21 to 22 March 2022.
7. Delivered a talk as a Speaker on "**Medicinal Plants –A hope in addressing COVID -19 issue**" in the webinar entitled as "COVID-19 emergency and trajectory: A pathway to the medicinal Plants" at the Rawalpindi Women University held on April 2, 2021.
8. Delivered a Talk as Keynote Speaker titled, "**Hemp—A nature's gift for Human Survival** in the Silver Jubilee Event Seminar organized by the PMAS-AAUR dated 25-11-2021.
9. Delivered a Talk as Guest Speaker titled, "**Research Advancement of Agriculture Sector in Sindh"** in the webinar organized by the Government College University Hyderabad dated 28-06-2021.
10. Delivered as an Invited Lecture on "**Human life of desert dwellers in Pakistan"** at the **Fourth International Conference on Biosciences (ICBS-2021)** jointly organized by the Department of Plant Science, Quaid-e-Azam University Islamabad and Biological Society of Pakistan dated15.06.2021.
11. Delivered a Talk as Guest Speaker titled, "**Plant Biodiversity and Natural Resources of Pakistani Deserts"** in the online seminar organized by the Khwaja Fareed University of Engineering & Information Technology, Rahim Yar Khan, dated 28-01-2021.
12. Delivered a keynote speech titled, "**Food and Animals Feed Plant Resources of Desert Habitat"** in Flora & Fauna of Desert of Pakistan organized by the Department of Zoology, University of Okara, dated 11th July 2020.
13. Delivered an invited lecture titled, "**Deserts of Pakistan: Human Resilience and Folk Wisdom of Native Plants"** Cultural Heritage and Human Resilience in the Desert Environment" organized by the Department of Botany, Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi, dated 17th June 2020
14. Delivered an invited lecture titled, "**Plant Wealth of Pakistan: Existing Resource Utilization and Future Prospects**" in "Biodiversity for Sustaining Life" organized by the Department of Botany, Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi, dated 5th June 2020.

15. Delivered an invited lecture titled, "**Plant Biodiversity of Pakistan: Opportunities and Threats**" in the Nature for Life Solutions, organized by the Department of Botany, Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi, dated 3rd June 2020.
16. Delivered an invited lecture titled, "**Plant Biodiversity-Solutions for sustaining human life**" in the "Seminar on International Day for Biological Diversity – 2020" organized by the Department of Zoology, University of Education, Lahore dated 21st May 2020.
17. Delivered an invited lecture titled, "**Microhabitats associated flora, plant life and ecosystem services of the Nara Desert, Pakistan**" to be presented in the "**International Symposium on Plant Life of South Asia**" organized by the Center for Plant Conservation, the University of Karachi dated 24th to 27th February 2020.
18. Delivered an invited lecture (Resource Person) titled, "**Plant Biodiversity and Conservation Status of Murree-Kotli Sattian-Kahuta National Park**" on the Eve of International Biodiversity Day, Organized by the Pakistan Museum of Natural History, Islamabad dated 22nd May 2019.
19. Invited speaker on **"Salicylic and Abscisic acid-induced physiological and biochemical changes in selected wheat cultivars under heat stress**" In: National Conference on Agricultural Problems and Food Security in the Changing Climate organized by the University of Agriculture, Peshawar, dated November 15 -17, 2018.

20. Delivered invited lecture on **"Medico-botanical and cytotoxic screening of some selected plants of salt range, Pakistan**" In:1stInternationalConference on "Agriculture, Forestry & Life Sciences" (ICAFLS 2018), dated 06-08 September 2018, Budapest Hungary.
21. Given an invited lecture on "**People, Plants and Climate: From regional and Global Perspective**" in Sardar Bahadur Khan Women University, Quetta Organized by the ORIC dated 18th July 2018.
22. Delivered an invited talk on "**Plants as factories for pharmaceutical Industry: Recent trends and Challenges**" in a three-day training workshop on Pharmaceutical Analysis Organized by the Department of Applied Biotechnology and Genetic Engineering, International Islamic University, Islamabad dated July 12 to 14, 2018.

23. Delivered a talk on "**Medicinal plants as potential source for oncology: A case study from the Salt Range, Punjab, Pakistan**" in three days International Symposium on Advances in Physics Organized by the Department of Physics and Applied Mathematics, Pakistan Institute of Engineering and Applied Sciences, Islamabad dated 24-26 October 2017.
24. Delivered an invited lecture (Resource Person) titled, "**Plant Biodiversity of Pakistan: Opportunities and Threats"** on the Eve of International Biodiversity Day, Organized by the Pakistan Museum of Natural History, Islamabad dated 22nd May 2017.
25. Deliver a keynote lecture titled, "**Phytodiversity, Classification & Ordination Sudhan Gali Hamalyan Forest Vegetation, Azad Jammu and Kashmir, Pakistan"** at the 6th International and 15th National Conference of Botany Jointly organized by the Pakistan Botanical Society & Sardar Bahadur Khan Women's University, Quetta dated 9th to 11th May 2017.
26. Delivered a talk on "**Plant resources and livelihood in arid environment: A case study from Thal Desert, Pakistan**" in three days international conference on "Asia-Pacific Policy Dialogue on Water, Energy and Food Security for Poverty" Organized by UNESCO & PMAS Arid Agriculture University Rawalpindi-Pakistan dated November 23 - 25, 2016.
27. Delivered an invited lecture titled, "**Vegetation Studies of Kabal Valley, District Swat Pakistan Using Multivariate Approach"** at the 13th National Conference of Weed Science jointly Organized by Weed Science Society of Pakistan & Shaheed Benazir Bhutto University, Upper Dir dated 19-21 August 2016.
28. Delivered an invited lecture titled, **Ecosystem Service of District Khushab Aridlands (Thal Desert), Punjab, Pakistan** in the International Symposium of ForumPSE, Agadir, Morocco dated 21-22 March 2016.
29. Delivered an invited lecture titled, "**Significance of Plant Biodiversity: Prospects from Pakistan"** Organized by the Department of Botany, Gorden College, Rawalpindi, dated 8th January 2016.
30. Delivered an invited lecture titled, "**Role of Plants for the Sustainable Biodiversity**" on the International Day for Biological Diversity "Biodiversity for Sustainable Development" Organized by the Pakistan Museum of Natural History, Islamabad in collaboration with Pakistan Science Foundation and Ministry of Science &Technology dated 22nd May 2015.
31. Delivered an invited talk on **"Plants as a renewable source of energy: prospects from Pakistan"** in three days International Conference on Energy Production From Agriculture

Biomass and Domestic Waste organized by the Department of Biochemistry, PMAS-AAUR dated 15-17th April 2014.

32. Delivered invited talk on "**Floral biodiversity of the major deserts of Pakistan and their conservation issues**" on the occasion of International biodiversity day scheduled on 22nd May, 2013 celebrated by Pakistan Museum of Natural History in collaboration with the Ministry of Science & Technology, Pakistan Science Foundation & International Centre for Integrated Mountain Development (ICIMOD).
33. Delivered lecture as a guest speaker on "**Future Challenges and Plants**" in the symposium on "Industry-Academia Linkages for Plant Sciences and plant products" organized by the Department of Botany, University of Gujrat scheduled on 23rd May 2013.
34. Delivered invited talk on "**Commercially oriented medicinal plants from deserts of Pakistan**" in a Seminar and exhibition on Medicinal and Aromatic plants jointly organized by the Pakistan Museum of Natural History (PMNH), National Rural Support Program (NRSP) under the USAID Entrepreneurs project named "Value Chain Development Project for Medicinal & Aromatic Plants (MAP), Swat dated 17.06.2013.
35. Delivered talk on "**Traditional Date palm farming in Pakistan**" at the International conference on Date Palm: "Present Status and Future Prospects" organized by University College of Agriculture & Environmental Science, The Islamia University of Bahawalpur, Pakistan, dated 02 to 03.09.2013.
36. Delivered invited talk on **"Plants as source of energy"** Two-day training workshop on Biofuel production from agricultural waste organized by the Department of Biochemistry, PMAS-AAUR dated 13-14 April 2010.
37. Display of stall on **Arid Zone Medicinal Plants** in Spring Flower Show 2010 conducted by the Department of Horticulture, PMAS-AAUR in collaboration with the National Horticultural Society of Pakistan on 16-19th March 2010.

Seminars/Conferences Organized

1. International Seminar on International Seminar on "**Sustainable Agriculture in Climate Change Mitigation and Adaptation**" dated 25th January, 2024 as Chief Organzer.
2. One-day training workshop for Tabibs/Hakims on "**Medicinal Plants: Identification and their importance in global perspective**" on 17th January 2024 as Chief Trainer.

3. 9th International and 18th National Conference on "**Biodiversity and Medicinal Plants: A Way Forward to Sustainable Development**" (BMP-SD 2023) during December 14-16, 2023 as Chief Organizer.
4. Three-days International Conference & Expo on "**Medicinal Plants & Natural Products**" scheduled from 14th to 16th December 2023 as Chief Organizer
5. International conference on "**Bridging the Gap between Research and Sustainable Development Goals**" organized by the Center of Plant Sciences & Biodiversity, the University of Swat dated May 24-26, 2022 (**Member, Organizing Committee**).
6. **16th Three Days National Weed Science Congress on "Vegetation management and agro-biodiversity: Trends and implications**, dated June 18-20, 2021 organized by Weed Science Society of Pakistan at the University of Agriculture Peshawar (**Member, Organizing Committee**).
7. One Day Online International Seminar on "**Environmental Issues Posed by Pestiferous Aquatic Midges: A Global Perspective"** at Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi, dated 9th October 2020 (**Organizer**).
8. One Day Online International Symposium on "**Cultural Heritage and Human Resilience in the Desert Environment**" at Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi, dated 17th June 2020 (**Organizer**).
9. One Day International Online Seminar on "**Biodiversity for Sustaining Life**" at Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi, dated 5th June 2020 (**Organizer**).
10. One Day International Online Seminar on "**Nature for Life Solutions**" at Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi, dated 3rd June 2020 (**Organizer**).
11. One Day Online International Seminar on "**Role of Plant Diversity in Entrepreneurship and Herbarium Development"** at Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi, dated 10th March 2020 (**Organizer**).
12. International conference on **"Tackling Climate Change through Plant Breeding"** organized by PMAS-Arid Agriculture University, Rawalpindi dated 13th to 15th November,2017 (**Member, Organizing Committee**).
13. International conference on **"Asia Pacific Policy Dialogue on Water, Energy and Food Security for Poverty Alleviation in Dryland Regions"** organized by PMAS-Arid Agriculture University, Rawalpindi dated 1st to 3rd November, 2016 (**Member, Organizing Committee**).

14. **5th International and 14th National Conference of Botany**, organized by Pakistan Botanical Society, University of Karachi, dated 27 to 15 to 18th January 2016 (**Member, Organizing Committee**).
15. **4th International and 13th National Conference of Botany**, organized by Pakistan Botanical Society, Shaheed Benazir Bhutto University, Sheringal, Upper Dir, Pakistan, dated 27 to 30.08.2014 (**Member, Organizing Committee**).
16. Three-day International Conference on **"Energy Production from Agriculture Biomass and Domestic Waste"** organized by the Department of Biochemistry, PMAS-AAUR dated 15-17 April 2014 (**Member, Organizing Committee**).
17. One-day seminar on "**Emerging Trend in Establishing Botanical Garden**" at Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi dated 13.03.2014 (**Organizer**).

Seminar/Conferences/Symposia Attended

1. International online Seminar on "**Flora & Fauna of Desert of Pakistan**"organized by the Department of Zoology, University of Okara, dated 11th July, 2020.
2. International online symposium on "**Cultural Heritage and Human Resilience in the Desert Environment"** organized by the Department of Botany, Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi, dated 17th June, 2020
3. International online Seminar on "**Biodiversity for Sustaining Life"** organized by the Department of Botany, Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi, dated 5th June, 2020.
4. International online Seminar on "**Nature for Life Solutions"** organized by the Department of Botany, Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi, dated 3rd June, 2020.
5. Online Seminar on "**International Day for Biological Diversity – 2020**" organized by the Department of Zoology, University of Education, Lahore dated 21st May, 2020.
6. **International symposium on Plant Life of South Asia**" organized by the Center for Plant Conservation, University of Karachi dated 24th to 27th February 2020.
7. 1st International and 3rd national conference on "**Bioactivity of pytochemicals**" organized by The University of Lahore, dated 26-27th November, 2019
8. International Biodiversity Day, organized by the Pakistan Museum of Natural History, Islamabad dated 22nd May, 2019.

9. 2nd international three days international conference on "Water Scarcity and Sustainable Agriculture in Pakistan: Challenges and Solutions" organized by the department of Geography, Shah Abdul Latif University, Khairpur dated 5th to 7th March, 2019.
10. National Conference on "Agricultural Problems and Food Security in the Changing Climate" organized by the University of Agriculture, Peshawar, dated November 15 -17, 2018.
11. International Seminar on "Crop Wild Relatives Genetic Resources of Pakistan and their Utilization" November in National Agricultural Research Jointly Organized by Pakistan Agricultural Research Council, Islamabad and Crop Trust, Bonn, Germany dated 14, 2018, National Agricultural Research Centre, Islamabad Council, Islamabad
12. National Conference on Agricultural Problems and Food Security in the Changing Climate organized by the University of Agriculture, Peshawar, dated November 15 -17, 2018.
13. 8th International Conference in Microbial and Plant Biotechnology (ICMPB), jointly organized by Egyptian Botanical Society & organized by Kafrelsheikh University, Egypt, dated 3rd to 4th October, 2018.
14. 1st International Conference on "Agriculture, Forestry & Life Sciences" (ICAFLS 2018), dated 06-08 September 2018, Budapest Hungary.
15. 14th National Weed Science Conference Jointly organized by the Weed Science Society of Pakistan & Islamia College University Peshawar, dated 24th to 25th March, 2018.
16. 7th International and 16th National conference of Botany Jointly organized by the Pakistan Botanical Society & Islamia College University and University of Peshawar, dated 23rd to 27th March, 2018.
17. Three days International Symposium on Advances in Physics Organized by the Department of Physics and Applied Mathematics, Pakistan Institute of Engineering and Applied Sciences, Islamabad dated 24-26 October, 2017.
18. 3rd International Symposium "Conservation Issues of Edible Wild Resources of Hindukush Himalayas" jointly organized by the Department of Botany, Islamia College Peshawar & University of Peshawar, dated July 21-24, 2017.
19. International Biodiversity Day, Organized by the Pakistan Museum of Natural History, Islamabad dated 22nd May, 2017.

20. 15th National and 6th International conference of Botany, organized by Pakistan Botanical Society, Sardar Bahadur Khan Women University, Quetta dated 9th to 11th May, 2017.

21. 1st National Conference on Bioactivity of Phytochemical (NCBP) Theme: Using Plants to Improve Life organized by Institute of Molecular Biology and Biotechnology, The University of Lahore dated 4th to 6th October, 2017.

22. One day seminar on "Significance of Plant Biodiversity: Prospects from Pakistan" Organized by the department of Botany, Gorden college, Rawalpindi, dated 8th January, 2016.

23. 5th International and 14th National conference of Botany, organized by Pakistan Botanical Society, University of Karachi, , dated 27 to 15 to 18th January, 2016.

24. Three days international conference on "Asia-Pacific Policy Dialogue on Water, Energy and Food Security for Poverty" Organized by UNESCO & PMAS Arid Agriculture University Rawalpindi-Pakistan, dated November 23 - 25, 2016.

25. Consultant meeting dated 04 to 05..08.2016 jointly organized by JICA and NTDC at Ramada Hotel, Islamabad.

26. 13th National Conference of Weed Sciences jointly Organized by Weed Science Society of Pakistan & Shaheed Benazir Bhutto University, Upper Dir dated 19-21 August, 2016.

27. Biodiversity Day Celebration on 22nd May, 2016 Jointly organized by Ministry of Science & Technology, Ministry of Climate Change, PSF & Pakistan Museum of Natural History, Islamabad.

28. 2nd International Symposium on Biodiversity of Pakistan: Prospects and Associated Issues organized by Department of Botany University of Peshawar at Baragali Summer Campus Abbotabad dated May 22-24, 2016.

29. International Symposium of ForumPSE, Agadir, Morocco dated 21-22 March, 2016.

30. Strategic management of biodiversity in the Jhelum-Poonch River Basin: Challenges for Hydropower Development organized by ICF, Haigler Baily at Serena Hotel, Islamabad dated 12-13th June, 2015.

31. International Seminar on "Research in Pharmacy: Opportunities for Phramacists to Contribute in Healthcare System, Faculty of Pharmacy, University of Baluchistan, Quetta, 1st June, 2015, Serena Hotel, Quetta.

32. 4th International and 13th National conference of Botany, organized by Pakistan Botanical Society, Shaheed Benazir Butto University, Sheringal, Upper Dir, Pakistan dated 27 to 30.08.2014.

33. International conference on Date Palm: "Present Status and Future Prospects" organized by University College of Agriculture & Environmental Science, The Islamia University of Bahawalpur, Pakistan dated 02 to 03.09.2013.

34. Anthropology in the world organized by Royal Anthropological Institute, British Museum, London, dated 8th to 10th June, 2012. P. 106.

35. The International Symposium on Medicinal and Aromatic Plants scheduled 15-18th December, 2011 at Chiang Mai, Thailand. P. 55

36. National symposium on Biodiversity of Pakistan organized by Pakistan Museum of Natural History, Islamabad during 7-9th June, 2011.

37. Biodiversity is our Life (IC Biour-Life) during December 29-31, 2010 organized by Centre for Biodiversity & Conservation (CBC), Shah Latif University, Khairpur (Mir's), Sindh. P. 14.

38. Two days Training workshop on Biofuel production from agriculture waste organized by the Department of Biochemistry, PMAS-AAUR dated 13-14th April, 2010.

39. National workshop to train the Stakeholders about the Implication of WTO/TRIPs on Traditional Knowledge/Traditional Medicines organized by National Institute of Health (NIH) in collaboration with Ministry of Health and World Health Organization at NIH, Islamabad dated 5-6 th April, 2010.

40. International workshop on Plant Conservation and Reversing Desertification: A Way Forward organized by the Department of Environmental Sciences, Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi in collaboration with CNR-IBAF, Italy dated 12-13th October, 2009. 4

41. Symposium "Compatible with climate change" conducted by Shah Latif University Botanical Garden & Herbarium, Khairpur during March 27-29, 2009.

42. 1st International Conference of Plant Scientists & 10th National Meeting of Plant Scientists organized by Pakistan Botanical Society, at University of Agriculture, Faisalabad during 20th to 22nd April, 2008.

43. One day Digital Library Workshop organized by HEC dated 19.11.2007.

44. International Workshop on "Carbon and water exchange in pants under changing climate condition, organized by Department of Environmental Science, Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi dated 5-7 October, 2007.

45. Second International Weed Science Conference, Organized by Weed Science Society of Pakistan held at University of Arid Agriculture, Rawalpindi, Pakistan, March 20-22, 2007.

46. 8th National Meeting of Plant Scientists organized by Pakistan Botanical Society on 24- 28 February, 2003 at University of Karachi.

47. 6th National Conference on Biochemistry and Molecular Biology organized by All Pakistan Chemists Association of Pakistan held on 15-17 February, 2001 at Shah Abdul Latif University Khairpur.

48. 7th National Meeting of Plant Scientists organized by Pakistan Botanical Society on 14- 16 November 2000 at Punjab University Lahore.

49. Role of Traditional/Alternative Medicine in Health Care-In and Beyond 2000 AD. Organized by Hamdard University, Hamdard Foundation Pakistan & AMDA on 30th October to 2nd November 2000 at Regent Plaza Karachi.

50. Novartis Crop program (Cotton) organized by Novartis Pakistan Pvt. Ltd. At Forum Inn Hotel Sukkur on Thursday, May 18, 2000.

51. One-day Conference on "Herb, Medicine & Therapeutics" by Pakistan Society of Pharmacognosy at Ambassador Hall-3, Hotel Marriott, Karachi, November 27, 1999.

52. Importance, awareness and agriculture technology employed in cotton crop" organized by FMC United in collaboration with Shah Abdul Latif University Khairpur, held at Allama I.I. Kazi Hall on Thursday, July 15, 1999.

List of Refernces

1. **Prof. Dr. Muhammad Mukhtar**, Vice Chancellor, National Skill University, Islamabad, Email mukhtar.muhammad@gmail.com, Cell: 0345-3117777.

2. **Prof. Dr. Monier M. Abd El-Ghnai** (Ph.D., D.Sc.), Cairo University, Egypt, Email: mmabdelghnai@gmail.com, Cell: 0020-1063779294.

Name	**Dr. Noshin Ilyas**
Personal	Associate Professor, Department of Botany, PMAS, Arid Agriculture University, Rawalpindi, Pakistan. E-mail: **noshinilyas@yahoo.com**, **noshinilyas@uaar.edu.pk** Contact: 092-333-5310587 (Cell) 092-51-5418017 (landline)
Experience	Dec 15, 2021 till date **Associate Professor ,** Department of Botany, PMAS, Arid Agriculture University, Rawalpindi, Pakistan Apr 2010 -14th Dec 2021 **Assistant Professor ,** Department of Botany, PMAS, Arid Agriculture University, Rawalpindi, Pakistan Feb 2010- Mar 2010 **Lecturer,** Department of Botany, PMAS, Arid Agriculture University, Rawalpindi, Pakistan
Awards and Honors	President of Pakistan Asian PGPR Society for Sustainable Agriculture Country representative for IFOAM-Organics International. 1st Prof. Dr. Abdul Hameed Gold Medal (2021) in Applied and Environmental Microbiology Received Research Award (2023) in category of Professor /Associate Professor from PMAS-Arid Agriculture University Rawalpindi Received Research Award (2020) in female category of Assistant Professor /Lecturer from PMAS-Arid Agriculture University Rawalpindi University nominee for Abdus Salam Gold Medal in Basic Sciences for Scientists under 40 in Biology (2021) University nominee for COMSTECH Young Scientist Award (2021) Secretary, Faculty Board of Sciences and Board of Studies, Botany Research Paper Incentives by PMAS-Arid Agriculture University Rawalpindi. HEC approved supervisor HEC Indigenous Scholarship for Ph.D. Gold Medal in M.Sc

Graduate Students	**Years**	**Degree**	**Name**
Postdocs	2014	Ph.D	Memoona Ilyas 04-arid-976
Undergraduate Students Honour Students	2015	Ph.D	Nazima Batool
	2018	Ph.D	Tauseef Anwar (12-arid-1391)
	2019	Ph.D	Hina Waheed

			(12-arid-1390)
	2021	Ph.D	Roomina Mazhar
	2021	Ph.D	Maimona Saeed (09-arid-1443)
	2022	Ph.D	Fatima Bibi 10-arid-1821
	2023	Ph.D	Nosheen Akhtar (13-arid-2281)

Ph.D (Under Supervision)

1.	Noman Rafique (19-ARID-2069)	Interactive Effects Of Melatonin And Salicylic Acid On Canola Under Drought Condition
2.	Qudsia Bano 01-arid-1522	Combined Usage of Plant Growth Promoting Rhizobacteria and Agro-industrial Wastes for Wheat Production in Drought Conditions
3.	Asma Hameed (20-arid-1412)	Biodiesel synthesis using nanocatalyst from non-edible oilseeds
4.	Samina Iqbal 22-ARID-2867	Biodegradation of organophosphate pesticide residues in tomato
5.	Neelum Naheed 20-Arid-1408	Formulation and Efficacy Testing of Selenium Based Liquid Nanobiofertilizer from Lignocellulosic Wastes for Improved Crop Productivity

M. phil produced

2011	M.Phil	Nadia Zafar (05-arid-744)
2012	M.Phil	Qudsia Bano (01-arid-1522)
2012	M.Phil	Fakhara Ambreen (08-arid-833)
2012	M.Phil	Hafsa Aman (08-arid-935)
2012	M.Phil	Urva-til-Vusqa

			(08-arid-937)
	2013	M.Phil	Saman Rafique Mirza 09-arid-1455
	2013	M.Phil	Tayyaba Khalil 11-arid-3766
	2013	M.Phil	Shadana Kanwal 11-arid-3763
	2013	M.Phil	Kiran Manzoor 11-arid-3740
	2014	M.Phil	Fatima Bibi 10-arid-1821
	2014	M.Phil	Maimona Saeed 09-arid-1443
	2014	M.Phil	Roomina Mazhar 09-arid-1453
	2016	M.Phil	Sidra Kanwal 12-arid-2447
	2016	M.Phil	Kainat William 14-arid-4334
	2016	M.Phil	Robina Gul 12-arid-1244
	2017	M.Phil	Maryum Zahoor 12-Arid-2431
	2017	M.Phil	Sadia Iftikhar 12-Arid-1447
	2017	M.Phil	Rizwana Ikraam 13-Arid-2284
	2017	M.Phil	Hafiza Saira Ashraf 15-Arid-4537
	2018	M.Phil	Fatima Batool 16-arid-3754
	2018	M.Phil	Maha Nisar 16-arid-3757
	2018	M.Phil	Seemab Zaheer 14-arid-4408
	2018	M.Phil	Uzma Shoukat

			13-arid-3361
	2019	M.Phil	Aqsa Naseem 17-arid-2567
	2019	M.Phil	Faria Jehan 17-arid-2571
	2019	M.Phil	Komal Mumtaz 17-arid-2575
	2020	M.Phil	Kinza Tanvir 14-arid-4351
	2020	M.Phil	Hina Abbassi 16-arid-3677
	2020	M.Phil	Zil e Haleefa 16-arid-3706
	2021	M.Phil	Komal Razzaq 17-arid-2501
	2021	M.Phil	Sundus Tanveer 19-arid-2065
	2022	M.Phil	Sabiha Mehmood 18-arid-1750
	2022	M.Phil	Maria Hameed 20-arid-1404
	2022	M.Phil	Gul Wareen 16-arid-1778
	2023	M.Phil	Nazish Akhtar 21-arid-1708
	2023	M.Phil	Sadaf Tanveer 21-arid-1711
	2023	M.Phil	Nageen Bostan 21-arid-17
		M. Phil (under supervision)	
	1.	Rafia Noor ul Ain 22-ARID-2115	Biocompatibility assessment of rice husk derivatives for remedial applications
	2.	M. Umer 22-Arid-2114	Effect of nanosilica and plant growth promoting rhizobacteria on growth of wheat
	3.	Anum Gul	Electrochemical conversion of

		17-Arid-2489	biomass derived products into high-Value Chemicals
	4.	Asima Shaheen 22-arid-2110	Bioprospecting plant growth-promoting rhizobacteria from rice rhizosphere
	5.	Ayesha Bashir 19-Arid-2553	Green power generation by organic electrode bases plant microbial cells for wastewater treatment
	6.	Maria Afzal 22-arid-2413	Genome wide association analysis of selected salt tolerant rice genotypes
	7.	Aniqa Naseem 23-Arid-1800	Potential of Rhizobacteria for phytoremediation of pharmaceutical contaminated wastewater
	8.	Riffat Batool 23-Arid-1811	Catalytic conversion of lignocellulosic biomass into useful products
	9.	Syeda Sarah Jawad 23-Arid-1812	E-waste munching rhizoremediation
	10.	Habiba Akram 1123-Arid-130	Biodiesel production from algal lipids
	11.	Mahnoor 23-Arid-1933	Biodegradation strategy for co-exposure of polystyrene microplastics and herbicide residues

Service Activity	***A) Courses Taught***		
	Course Title		
	Plant Proteomics	***Credit Hours***	***PhD/MPhil/MSc***
	Stress Physiology	3(2-2)	Ph.D/M.Phil
	Physiology and Genetics of BNF	3(2-2)	Ph.D/M.Phil
	Plant Physiology	3(2-2)	Ph.D/M.Phil
	Environmental Pollution	3(2-2)	M.Sc
	Plant Anatomy	3(2-2)	M.Sc

	B. Courses Developed	3(2-2)	M.Sc
	Course Title	**Credit Hours**	**PhD/MPhil/MSc**
	Physiology and Genetics of Biological Nitrogen Fixation	3(2-2)	Ph.D/M.Phil
Brief Statement of Research Interest	Plant microbe interaction under abiotic stress. Physiological, biochemical and molecular mechanism of abiotic stress tolerance in plants.		
Publications	1. Maimona Saeed , **Noshin Ilyas** Fatima Bibi , Sumera Shabir , Sabiha Mehmood , Nosheen Akhtar , Iftikhar Ali EMAIL logo , Sami Bawazeer , Abdel Rahman Al Tawaha and Sayed M. Eldin. **2023** Nanotechnology Reviews, Nanoremediation approaches for the mitigation of heavy metal contamination in vegetables: An overview. 2. Bostan, N., **N. Ilyas***, N. Akhtar, S.Mehmood, R. U. Saman, R.Z. Sayyed, A. A. Shatid, M. Y. Alfaifi, S. E. I. Elbehairi, S. Pandiaraj, **2023.** Environmental Research. Toxicity assessment of microplastic (MPs); a threat to the ecosystem 3. F. Bibi, **N. Ilyas***, M. Saeed, S. Shabir, A. A. Shatic, M.Y. Alfaifi, K.T.T. Ameshod, S. Chowdhury R. Z. Sayyed. 2023. Environmental Science and Pollution Research. Innovative production of value-added products using agro-industrial wastes via solid-state fermentation. 4. Saeed M, **N Ilyas*,** Bibi F, , Shabir S, Jayachandran K, Sayyedd RZ, Showe PL, A A Shati, M Y Alfaifi. 2023. Chemosphere. Adsorption kinetics of a bioengineered microbiome based biochar system for insitu remediation of total petroleum hydrocarbons (TPHs) contaminated soil. 5. Maimona Saeed, Noshin Ilyas, Fatima Bibi, Sumera Shabir, Krish Jayachandran, RZ Sayyed, Ali A Shati, Mohammad Y Alfaifi, Pau Loke Show, Zarrin Fatima Rizvi. 2023. Chemosphere. Development of novel kinetic model based on microbiome and biochar for in-situ remediation of total petroleum hydrocarbons (TPHs) contaminated soil. 6. **Tanveer S,** Ilyas N*, **Akhtar N, Sayyed R. Z., Almalki WH. 2023. Crop & Pasture Science. 2023.** Induction of regulatory mechanisms by multifaceted soil microbes (PGPR) in crops facing drought stress. 7. **Tanver S, Akhtar** N, Ilyas*** N,** Sayyed RZ**, Fitriatin BN, Parveen K, Bukhari NA. 2023.** Interactive effects of Pseudomonas putida and salicylic acid for mitigating drought tolerance in Canola (*Brassica napus*		

L.).

8. Rafique N, Aqeel M, Raja **N Ilyas,*** Shabbir G, Ajaib M, Sayyed RZ, Alharbi and SA Ansari MJ. 2023. Plant and Soil. **Interactive effects of melatonin and salicylic acid on *Brassica napus* under drought condition.**
9. Karimian MA, Nasab BF, Sayyed RZ*, **Ilyas N**, Almalki WH, Vats S, Munir SSaid H, Rahi AM. **2023.** Pakistan J of Botany/ Salicylic acid foliar spray promotes yield, yield components, and physiological characteristics in foxtail millet under drought stress.
10. Urooj S., S. Mumtaz, I. Khan, M. A. Yameen, M. Riaz, U. Khan, **N. Ilyas**, I. Nawaz, R. Ahmad, W. Khan. 2023. Kuwait Journal of Science. Effect of honey use with *Seriphidium chitralense podlech* on growth and biofilm formation of *Pseudomonas aeruginosa*
11. V Meylani, E Surahman, A Fudholi, WH Almalki, **N Ilyas**, R.Z Sayyed. 2023. Journal of Environmental Chemical Engineering. Biodiversity in Microbial Fuel Cells: Review of a Promising Technology for Batik Wastewater Treatment.
12. M Shahbaz, A Akram, A Mehak, E Haq, N Fatima, G Wareen, BN Fitriatin, RZ Sayyed, **N. Ilyas***, M. K. Sabullah. Plants. 2023. Evaluation of Selenium Nanoparticles in Inducing Disease Resistance against Spot Blotch Disease and Promoting Growth in Wheat under Biotic Stress.2023. Evaluation of Selenium Nanoparticles in Inducing Disease Resistance against Spot Blotch Disease and Promoting Growth in Wheat under Biotic Stress.
13. S Rai, AF Omar, M Rehan, A Al-Turki, A Sagar, **N Ilyas**, RZ Sayyed. **2023.** Planta 257 (2), 27. https://link.springer.com/article/10.1007/s00425-022-04052-5. Crop microbiome: their role and advances in molecular and omic techniques for the sustenance of agriculture.
14. G Wareen, M Saeed, **N Ilyas***, S Asif, M Umair, RZ Sayyed, S Alfarraj, W. A Alrasheed, T. H. Awan. 2023. Chemosphere. Comparison of pennywort and hyacinth in the development of membraned sediment plant microbial fuel cell for waste treatment.
15. S Mehmood, **N Ilyas***, N Akhtar, WY Chia, AA Shati, MY Alfaifi, RZ Sayyed, Y. M Pusparizkita, H. Siti H. Munawaroh, P.M.Quan, P. L.Show. 2023. Environmental Research. Structural breakdown and phytotoxic assessments of PE degradation through acid hydrolysis, starch addition

	and Pseudomonas aeruginosa bioremediation 16. S Shabir, **N Ilyas***, M Saeed, F Bibi, RZ Sayyed, WH Almalki. Environmental Research. 2023. Treatment technologies for olive mill wastewater with impacts on plants. 17. Yasmin H, Shah ZA, Mumtaz S, Ilyas N, Rashid U, Alsahli AA, Chung YS. 2023. Front Plant Sci. 2023. Alleviation of banded leaf and sheath blight disease incidence in maize by bacterial volatile organic compounds and molecular docking of targeted inhibitors in *Rhizoctonia solani*. 18. **llyas N*.,** N. Akhtar, A. Naseem, R. Qureshi, A. Majeed, M.M. Al-Ansari, L. Al-Humiad, R.Z. Sayyed, K.M. Mukhtar 2022. Journals of Applied Microbiology. The potential of *Bacillus subtilis* and phosphorus in improving the growth of wheat under chromium stress. 19. M.Saeed, **N.Ilyas***, K. Jayachandran, S. Shabir, N. Akhtar, A. Shahzad, R.Z .Sayyed, A.Bano. 2022. Environmental Pollution. Advances in Biochar and PGPR engineering system for hydrocarbon degradation: A promising strategy for environmental remediation. 20. S. Shabir, **N. Ilyas***, M.S. Ahmad, M. M Al-Ansari, L. Al-Humaid, M.S .Reddy. 2022. Chemosphere. Designing of pretreatment filter technique for reduction of phenolic constituents from olive-mill wastewater and testing its impact on wheat germination. 21. Akhtar, N.; **Ilyas, N***.; Meraj, T.A.; Pour-Aboughadareh, A.; Sayyed, R.Z.; Mashwani, Z.-u.-R.; Poczai, P.2022. Nanomaterials. Improvement of Plant Responses by Nanobiofertilizer: A Step towards Sustainable Agriculture. 22. **llyas N*.,** , H. Yasmin, S. Sahreen, Z. Hasnain, P. Kaushik, A. Ahmad, P. Ahmad. 2022. Chemosphere. Efficacy of citric acid chelate and *Bacillus* sp. in amelioration of cadmium and chromium toxicity in wheat. 23. Akhtar N., **N. Ilyas*. 2022.** Plant and Soil. Role of nanosilicab to boost the activities of metabolites in *Triticum aestivum* facing drought stress. 24. Awan, S.A., I.Khan, M. Rizwan, Z. Ali, S.Ali, N. Khan, N.Arumugam, A. I. Almansour, **N. Ilyas*. 2022.** Chemosphere. A new technique for reducing accumulation, transport, and toxicity of heavy metals in wheat (*Triticum aestivum* L.) by bio-filtration of river wastewater, 25. Saeed M., **N. Ilyas***, F. Bibi, K. Jayachandran, S. Dattamudi, A.M. Elgorban. 2022. Environmental Pollution. Biodegradation of PAHs by *Bacillus marsiflavi*, genome analysis and its plant growth promoting

	potential. 26. **Bhat BA, Tariq L, Nissar S, Islam ST, Islam SU, Mangral Z, Ilyas N,** Sayyed RZ***, Muthusamy G, Kim W, & Dar TH*. 2022.** J of Applied Microbiology. Plant-associated rhizobacteria in plant growth and metabolism as a tool for sustainable agriculture. 27. Mir M.I, Hameeda B., Quadriya H., Kumar K.B., **Ilyas N**., Zuan, ATK., Enshasy, HA., Dailin D.J., Kassem H.S., Gafur A, Sayyed R.Z. 2022. Frontiers in Nutrition. Multifarious Indigenous Diazotrophic Rhizobacteria of Rice (*Oryza sativa* L.) Rhizosphere and Their Effect on Plant Growth Promotion. *28.* S Sabir, M Arshad, **N Ilyas,** F Naz, MS Amjad, NZ Malik. 2022. Green Processing and Synthesis. Protective role of foliar application of green-synthesized silver nanoparticles against wheat stripe rust disease caused by *Puccinia striiformis.* 29. Sagar A, Rai S, **Ilyas N**, Sayyed RZ, Al-Turki AI, El Enshasy HA, Simarmata T. 2022. Halotolerant Rhizobacteria for Salinity-Stress Mitigation: Diversity, Mechanisms and Molecular Approaches. Sustainability. 30. K Anwar, A Nadeem, Y Bibi, F Iftikhar, **N Ilyas**, G Yasin, M. Kabir. 2022. Pakistan Journal of Botany. Lead harms seed germination and growth of *Albizia lebbeck (*L.*)* Benth. And *Prosopis juliflora* (Sw.) Dc. 31. Noor R., H. Yasmin, **N. Ilyas**, A. Nosheen, M. N. Hassan, S.Mumtaz, N. Khan, A. Ahmad, P. Ahmad. 2022. Chemosphere. Comparative analysis of iron oxide nanoparticles synthesized from ginger (*Zingiber officinale*) and cumin seeds (*Cuminum cyminum*) to induce resistance in wheat against drought stress. *32.* Bibi F, **N. Ilyas***, M. Arshad, A.Khalid, M.Saeed, S.Ansar, J. Batley. 2022. Chemosphere. Formulation and efficacy testing of bio-organic fertilizer produced through solid-state fermentation of agro-waste by *Burkholderia cenocepacia*, 33. H. Yasmin, A.Bano, N. L. Wilson, A.Nosheen, R.Naz, M.N. Hassan, **N.Ilyas,** M.H.Saleem, A. Noureldeen, P.Ahmad, I. Kennedy. 2022. Physiologia Plantarum. Drought tolerant Pseudomonas sp. Showed differential expression of stress-responsive genes and induced drought tolerance in Arabidopsis thaliana. 34. U Rashid, H Yasmin, MN Hassan, R Naz, A Nosheen, M Sajjad, **N. Ilyas**, R. Keyani, Z. Jabeen, S. Mumtaz, M.N. Alyemeni, P. Ahmad.

	2022. Plant Cell Reports. Drought-tolerant *Bacillus megaterium* isolated from semi-arid conditions induces systemic tolerance of wheat under drought conditions 35. S. Shabir, **N. Ilyas***, S Asif, M. Iqbal, S. Kanwal, Z. Ali . 2021. Journal of Plant Growth Regulation. Deciphering the Role of Plant-Derived Smoke Solution in Ameliorating Saline Stress and Improving Physiological, Biochemical, and Growth Responses of Wheat. 36. H. Mustafa, **N Ilyas*,** N. Akhtar, N.I. Raja, T. Zainab, T. Shah, A. Ahmad, P. Ahmad. 2021. Ecotoxicology and Environmental Safety. Biosynthesis and characterization of titanium dioxide nanoparticles and its effects along with calcium phosphate on physicochemical attributes of wheat under drought stress. 37. N Akhtar, **N Ilyas*,** Z. Mashwani, R. Hayat. P. Ahmad. 2021. Plant Physiology and Biochemistry. Synergistic Effects of Plant Growth Promoting Rhizobacteria and Silicon dioxide Nano-Particles for Amelioration of Drought Stress in Wheat. 38. M. Saeed, **N. Ilyas***, M. Arshad, M. Sheeraz, I. Ahmed, A. Bhattacharya. 2021. Journal of Environmental Chemical Engineering. Development of a plant microbiome bioremediation system for crude oil contamination. 39. M Saeed, **N Ilyas*,** K Jayachandran, S Gaffar, M Arshad, M. S. Ahmad, F. Bibi, K. Jeddi, K. Hessini. 2021. Saudi Journal of Biological Sciences. Biostimulation Potential of Biochar for remediating the crude oil contaminated soil and Plant Growth. 40. N Akhtar, **N Ilyas*,** H Yasmin, RZ Sayyed, Z Hasnain, E.A Elsayed, H.A El Enshasy. 2021. Saudi Journal of Biological Sciences. Role of *Bacillus cereus* in Improving the Growth and Phytoextractability of *Brassica nigra* (L.) K. Koch in Chromium Contaminated Soil. 41. K. Masood, H. Yasmin, S. Batool, **N. Ilyas**, A. Nosheen, R.Naz, N. Khan, M.N. Hassan, A. Aldhahrani, F. Althobaiti,2021. *Saudi Journal of Biological Sciences.* A Strategy for Mitigating Avian Colibacillosis Disease Using Plant Growth Promoting Rhizobacteria and Green synthesized Zinc Oxide Nanoparticles. 42. SP Kusale, YC Attar, RZ Sayyed, RA Malek, **N Ilyas**, N L. Suriani, N. Khan, H.A El Enshasy. 2021. Molecules. Production of Plant Beneficial and Antioxidants Metabolites by *Klebsiella variicola* under Salinity Stress. 43. H Yasmin, U Rashid, MN Hassan, A Nosheen, R Naz, **N. Ilyas**, M.

	Sajjad, A. Azmat, M. N. Alyemeni. 2021. Physiologia Plantarum. Volatile organic compounds produced by *Pseudomonas pseudoalcaligenes* alleviated drought stress by modulating defence system in Maize (*Zea mays* L.).**N. Ilyas***, U. Shoukat, M. Saeed, N. Akhtar, H. Yasmin, W. Khan, S.Iqbal. 2021. Scientific Reports. Plant growth and remediation potential of pyrochar (pyrolytic breakdown and iochar addition) in crude oil-contaminated soils. 44. Iqbal Z, Sarkhosh A, Balal RM, Gómez C, Zubair M, **Ilyas N,** Khan N and Shahid MA. 2021. *Front. Plant Sci.* Silicon Alleviate Hypoxia Stress by Improving Enzymatic and Non-enzymatic Antioxidants and Regulating Nutrient Uptake in Muscadine Grape (*Muscadinia rotundifolia Michx*.). 45. N. Abbasi. NI Raja, N**. Ilyas**, Z. Mashwani, M. Ikram. 2021. Green Processing and Synthesis. Foliar applications of plant-based titanium dioxide nanoparticles to improve agronomic and physiological attributes of wheat (*Triticum aestivum* L.) plants under salinity stress. 46. SP Kusale, YC Attar, RZ Sayyed, RA Malek, **N Ilyas**, N L. Suriani, N. Khan, H.A El Enshasy. 2021. Agronomy. Inoculation of Klebsiella variicola Alleviated Salt Stress and Improved Growth and Nutrients in Wheat and Maize. 47. **Ilyas N*;** K. Mumtaz, N. Akhtar, H. Yasmin, R. Z. Sayyed, W.Khan, H. A. El Enshasy, D. J. Dailin, E. A. Elsayed, Z. Ali. 2020. Sustainability. Exopolysaccharides Producing Bacteria for the Amelioration of Drought Stress in Wheat. 48. H Yasmin, R Naz, A Nosheen, MN Hassan, **N Ilyas**, M Sajjad, S Anjum. 2020. Sustainability. Identification of New Biocontrol Agent against Charcoal Rot Disease Caused by *Macrophomina phaseolina* in Soybean (Glycine max L.). 49. Khan, I. Awan, S.S., Ikram, R. Rizwan M. , Akhtar, N. Yasmin H., Sayyed, R.Z. Ali S. **Ilyas N*. 2020.** Physiologia Plantarum. Effect of 24-Epibrassinolide on plant growth, antioxidants defense system and endogenous hormones in two wheat varieties under drought stress. 50. Awan, S.A., **N.Ilyas,** I. Khan, M.A. Raza, A. Rehman, M. Rizwan, A. Rastogi, R. tariq, M. brestic. 2020. Plants. Bacillus siamensis Reduces Cadmium. Accumulation and Improves Growth and Antioxidant Defense System in Two Wheat (Triticum aestivum L.) Varieties. 51. H Yasmin, R Naz, A Nosheen, MN Hassan, **N Ilyas**, M Sajjad, S Anjum.

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	62. T Anwar, **N Ilyas**, R Qureshi, M Munazir, Bz Rahim, H Quresh **2019.** Applied Ecology and Environmental Research 17 (2), 1717-1739. Allelopathic potential of *Pinus roxburghii* needles against selected weeds of wheat crop 63. H Waheed, **N Ilyas**, N Iqbal Raja, T Mahmood, Z Ali. **2019**. International Journal of phytoremediation 64. 21(2):170-179. Heavy metal phyto-accumulation in leafy vegetables irrigated with municipal wastewater and human health risk repercussions **65.** Sohail1, U. Amara, S.Shad3, **N. Ilyas**, A. Manaf2, N.I.Raja and Z.R. Mashwani1 66. **2018** IET Nanobiotechnology. 13 (1), 46-51. *In vitro* Germination and Biochemical Profiling of *Brassica napus* in Response to. Biosynthesized Zinc Nanoparticles 67. F Yasmeen, NI Raja, **N Ilyas**, S Komatsu. **2018**. Plant Molecular Biology Reporter 68. 36 (2), 326-340. Quantitative Proteomic Analysis of Shoot in Stress Tolerant Wheat Varieties on Copper Nanoparticle Exposure. 69. S Qadeer, S Mahmood, M Anjum, **N Ilyas**, Z Ali, A Khalid. **2018**. Process Safety and Environmental Protection. 115: 99-107. Synchronization of lipid-based biofuel production with waste treatment using oleaginous bacteria: A biorefinery concept 70. T Anwar, **N Ilyas**, R Qureshi, M Munazir, AM Khan, L Ansari, BZ Rahim 71. **2018**/ Applied Ecology and Environmental Research. 16 (5), 5405-5421 Allelopathic activity of solvent extracts of *Rhazya stricta* decne. Against selected weeds of wheat cro 72. Batool N., **N. Ilyas**, A Shahzad, M. Arshad and F.Sahi **2018.** Pakistan Journal of Agriculture Sciences 31(5): 2005-2009. Quantitative Trait Loci (QTLs) Mapping for Salt Stress Tolerance in Wheat at Germination Stage 73. Batool N, M.Arshad, F.Hassan, **N.Ilyas**, A. Shahzad. **2018**. Pakistan J Pharmaceutical Sciences (PJPS) 74. 31 (4) : 1441-1448. Review-A review of therapeutic potential of Mangi feraindica 75. Batool N and **N. Ilyas**. Pakistan Journal of Pharmaceutical Sciences (PJPS) 55(1), 47-55. Physicochemical and Antimicrobial properties of canola (Brassica napus L.) seed oil

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	mays l.) under drought stress 106. S Iqbal, A Bano, **N Ilyas**. **2012**. Pakistan Journal of Botany 44: 51-56. Abscisic acid (ABA) seed soaking induced changes in physiology of two wheat cultivars under water stress 107. **Ilyas N**., A. Bano, S. Iqbal, N.I. Raja. **2012**. Pakistan Journal of Botany 108. 44: 71-80. Physiological, biochemical and molecular characterization of *Azospirillum* spp. isolated from maize under water stress 109. Raja N.I., A.Bano, A. Bano, H. Rashid, Z. Chaudary , **N. Ilyas**. **2010**. Pakistan Journal of Botany 110. 42(5): 3613-3631. Improving Agrobacterium-mediated transformation protocol for integration of XA21 gene in wheat (*Triticum aestivum* L.) 111. Iqbal S., Bano A. and **Ilyas N**. **2010**. Journal of Agricultural Research 48:1-13.. Drought and Abscisic Acid Induced Changes in Protein and Pigment Contents of Four Wheat (*Triticum aestivum* L.) Accession 112. **Ilyas N**. and Bano A., **2010**. Biology and fertility of soil. 46:393–406. Azospirillum strains isolated from roots and rhizosphere soil of wheat (*Triticum aestivum* L.) grown under different soil moisture conditions 113. Bano A. and **N. Ilyas**, **2009**. Aspects of Applied Biology. 98:171-178. Production of bioactive metabolites by *Rhizobium* and *Azospirillum* strains isolated from maize grown in various moisture regimes in field. 114. **Ilyas N**., A. Bano and S. Iqbal. **2008**. International Journal of Agriculture and Biology. 10: 612–8.Variation in *Rhizobium* and *Azospirillum* strains isolated from maize growing in arid and semiarid areas. **Title of the Book** • Pakistan chapter in FiBL & IFOAM – ORGANICS INTERNATIONAL the World of organic agriculture STATISTICS & EMERGING TRENDS 2022. • Pakistan chapter in FiBL & IFOAM – ORGANICS INTERNATIONAL the World of organic agriculture STATISTICS & EMERGING TRENDS 2023

	• Iqbal, S., Jahan, S., Jabeen, K., **Ilyas, N**. **(2023**). Signaling Pathway of Reactive Oxygen Species in Crop Plants Under Abiotic Stress. In: Faizan, M., Hayat, S., Ahmed, S.M. (eds) Reactive Oxygen Species. Springer, Singapore. https://doi.org/10.1007/978-981-19-9794-5_14 • Shah I, Hamid B, Zaman M, Fatima S, Farooq S, Datta R, Danish S, N Ilyas & Sayyed R Z. Microbial Biosurfactants: An Eco-friendly Approach for Bioremediation of Contaminated Environments Biosurfatnats : Production and applications in Bioremediation/ Reclaimation. Vol III, R. Z. Sayyed (Eds), CRC Press- Taylor & Francis group, USA, **2022**, pp 197-202 • Fatima Bibi and Noshin Ilyas. Bio-Organic Fertilizer in Stress Mitigation in Plants. In: Plant Tolerance to Environmental Stress: Role of Phytoprotectants. 1st Edition. Mirza Hasanuzzaman, Masayuki Fujita, Hirosuke Oku, M. Tofazzal Islam Eds, CRC Press-Taylor and Francis, USA, **2021**, pp 277-284 • Sumera Shabir and Noshin Ilyas. Role of Plant-Derived Smoke in Amelioration of Abiotic Stress in Plants. In: Plant Tolerance to Environmental Stress: Role of Phytoprotectants. 1st Edition. Mirza Hasanuzzaman, Masayuki Fujita, Hirosuke Oku, M. Tofazzal Islam Eds, CRC Press-Taylor and Francis, USA, **2021**, pp 413-426 • Roomina Mazhar and Noshin Ilyas.Heavy Metal Toxicity in Plants and Its Mitigation. In: Approaches for Enhancing Abiotic Stress Tolerance in Plants 1st Edition. Editors: Mirza Hasanuzzaman, Kamrun Nahar, Masayuki Fujita, Hirosuke Oku, Tofazzal Islam Eds. CRC Press-Taylor and Francis, USA, **2021**, pp171-178 • Maimona Saeed and Noshin Ilyas. Hydrocarbon Contamination in Soil and its Amelioration. In: Approaches for Enhancing Abiotic Stress Tolerance in Plants 1st Edition. Editors: Mirza Hasanuzzaman, Kamrun Nahar, Masayuki Fujita, Hirosuke Oku, Tofazzal Islam Eds. CRC Press-Taylor and Francis, USA, **2021**, pp 219-226 • Maimona Saeed and Noshin Ilyas. Toxicity of soil hydrocarbon pollution for wheat crop. In: Agronomic Crops: Stress Responses and Tolerance Volume 3. Hasanuzzaman, Mirza (Ed.), Springer, Singapore, **2020,** pp 603-611 • Roomina Mazhar and Noshin Ilyas. Heavy Metal Toxicity In: Agronomic Crops: Stress Responses and Tolerance Volume 3. Editors:

	Hasanuzzaman, Mirza (Ed.), Springer, Singapore, **2020**, pp • Sumera Shabir and Noshin Ilyas. Possible influence of climate change on wheat crop n: Agronomic Crops: Stress Responses and Tolerance Volume 3. Editors: Hasanuzzaman, Mirza (Ed.), Springer, Singapore, **2020**, pp 579-592 • Fatima Bibi and Noshin Ilyas Effect of Agricultural Pollution on Wheat Crop In: Agronomic Crops: Stress Responses and Tolerance Volume 3. Editors: Hasanuzzaman, Mirza (Ed.), Springer, Singapore, **2020**, pp 593-601 • RZ Sayyed, N Ilyas, B Tabassum, A Hashem, EF Abd_Allah, HP Jadha. Plausible Role of Plant Growth-Promoting Rhizobacteria in Future Climatic Scenario. Environmental Biotechnology, : For Sustainable Future, Sobti RC, NK Arora & R Kothari Eds. Springer, Singapore, **2019,** pp 175-119 • Potential use of soil microbial community in agriculture. In: Bacteria in Agrobiology: Plant Probiotics. Edited by: Dinesh K Maheshwari, Springer, Switzerland, **2012,** pp 45-64. • Microbes & Agrochemicals to Stress Tolerance. In: Climate Change and Management of Cool Season Grain Legume Crops. Editors: Yadav, S.S. McNeil D.L. Redden R, and Patil S. Springer, **2010,** pp 307-324.
Research grants and contracts	**Research Collaboration (International)** • The Crop Microbiome Survey • Foundation member from Pakistan • Global initiative of Crop Microbiome and Sustainable Agriculture **Research Projects (Completed)** • Development of NANOBIOFERTLIZER (Nano-Encapsulated PGPR) with Silicon dioxide Nano-Particles for improvement of Wheat Yield. • "Exploration of Genetic Variations for Drought Tolerance in Wheat (*Triticum aestivum* L) by Using Some Physiological and Biochemical Attributes" • Mitigation of heavy Metal Stress on Maize Crop Through Application of PGPR **esearch Projects (Submitted)** • Free Amino Acids and Short Peptide Fertilizer (FASPF) from fermentation of agro wastes by PGPR •

Other research or creative accomplishments	**Training Courses and Workshops Attended** • Participated in "**Conference on Tourism 4.0 for Rural Development, 08–09 November 2023, Indonesia** • Participated in APO Online Workshop on True Value and Cost Accounting in Organic Agriculture, Mongolia, 10–12 October 2023. • **Keynote Speaker** on the topic **'Planning and Writing Competitive Grant Proposal'** at University of Sialkot on **November 30, 2022**, • International Workshop on Climate-smart Agriculture Techniques and Practices, 26-28 April 2022, Philippines (Digital). • International workshop on "Capacity building of Faculty members/Professional in Crop yield gap/produce in the areas of agriculture, Livestock and allied disciplines (Pakistan) ('20-'22)" September 8 (Wed) – September 15 (Wed), 2021 / 8 days. • International workshop on "Digital Multicountry Observational Study Mission on Emerging Models of Controlled-environment Agriculture in Japan" organized by APO,27-29 July, 2021 • International workshop on value added agriculture organized by APO, Islamabad, 18-22 Nov, 2019 • International Workshop on "Use of Genome Editing & other New Breeding Technologies for Global Food Security. COMSTECH, 33-Constitution Avenue, G-5/2, Islamabad April 8-10, 2019. • International Workshop on Plant Genetic Resources and Genebank Operations Management System COMSTECH, 33-Constitution Avenue, G-5/2, Islamabad May 8 – 11, 2018 • Participated in workshop "Training worshop on abiotic stress tolerance in plants ' by NIAB, 5 to 9 Sep, 2011. • Participated in International Workshop on Climate Change and Sustainability of Agro-Environment: Challenges and Interventions held at PMAS AAUR on June 3-4, 2010. • Participated as an organizer in 2nd International Seminar on Medicinal Plants (ISMP) held in Lahore College for Women University on Jan 14-16, 2010. • Participated in 6th Annual Nationall Training Course on Modern Techniques in Biotechnolgy held at National Institute For Biotechnology And Genetic Engineering(NIBGE), Faisalabab, 5-9 May, 2008.

	• Participated in International Thematic Workshop on Biofertilizer Technology held at COMSTECH, Islamabad January 22nd -28th, 2008. • Participated in the training course on 'Nuclear & other Techniques in Food & Agricultural Research' at Nuclear Institute for Food & Agriculture(NIFA), Peshawar, from 12th November to 23rd November, 2007. • Participated in International Symposium on Strategies for Crop Improvement Against Abiotic Stress, An Event of Centenary, Celebration, University of Agriculture, Faisalabad, 18-20 september, 2006. **Seminar Organized** • Webinar on "Above and below ground fluxes for combating climate change", organized by DAS, PMAS-AAUR on 18th August, 2022. • One day e-seminar on World Soil Day" jointly organized by COMSATS University, Asian PGPR Society (Pakistan Chapter) and Multiomics on 5th December 2021. • One-day Webinar on "Use of PGPR for Sustainable Agricultural and Environmental Applications" on 4th June, 2021. • One-day seminar on "Advances in Plant, Soil and Microbe Interactions" on 6th December, 2019 • Organizer in 9th International and 18th National Conference on Biodiversity and Medicinal Plants: A Way Forward to Sustainable Development held on December 14-16, 2023 at PMAS-Arid Agriculture University Rawalpindi, organized by Weed Science Society of Pakistan and PMAS-Arid Agriculture University Rawalpindi.
Selected professional presentations	• Invited Speaker/VIP Guest at **9th ALGOA and 4th GAOD Summits** held at Kauswagan, Lanao del Norte, Philippines / **5th ~ 9th June 2023**) • Invited Guest Speaker at "**International Conference by Biotechnology Society of Nepal"** at "**Khatmandu, Nepal**" on **16th December till 23th December, 2022**. • Oral presentation at **6th Postgraduate Colloquium for Environmental Research 2022 -June 09-11, 2022** at **Langkawi Island, Malaysia** • Oral presentation and session chair at, **The 7th International Mediterranean Symposium on Medicinal and Aromatic Plants-November,** held at **Izmir, Turkey, 18-20 November, 2021**.

	• Featured speaker and moderator for "**First Asian PGPR Indonesian Chapter International e-conference**" held online by Universitas Udayana, Bali, Indonesia on **28-30th August 2021** • Oral presentation at "**Botany 2018: Thriving Biodiversity'** held in **Rochester USA** from **July 21-25, 2018** • Oral presentation at "**5th Asian PGPR Conference for Sustainable Agriculture "** held in **Bogor, Indonesia** from **16-19th July, 2017.** • Oral presentation at "**19TH International Sunflower Conference"** held in **Edirne, Turkey** from **29 MAY – 3 JUNE, 2016.**

3. **Dr. Shahina A.Ghazanfar**, Head of Temperate Regional Team, Royal Botanic Gardens, Kew, Richmond, Surrey, TW9 3AB, UK. Email: s.ghazanfar@kew.org

4. **Prof. Dr. Mirza Barjees Baig**, Agricultural Extension and Rural Society, the King Saud University, Saudi Arabia, Cell: +966554963784, Email: mbbaig@ksu.edu.sa

5. **Prof. Dr. G. Raza Bhatti**, Vice Chancellor, Sheikh Ayaz University, Shikarpur, Sindh (Ex-Member, Operations, Higher Education Commission) Email: razabhatti@yahoo.com, Cell: 0302-8311999.

6. **Prof. Dr. Manzoor Hussain Soomro,** Founder President, ECO Science Foundation (ECOSF), Email: manzoorhsoomro@gmail.com, Cell: 0092-3315442161

7. **Prof. Dr. Khan Bahadur Marwat**, Ex-Vice Chancellor & Emiratus Professor, Department of Weed Sciences, University of Peshawar, Email: kbmarwat@yahoo.com

8. **Prof. Dr. Muhammad Qaiser,** Ex-Vice Chancellor & Chief Editor, Pakistan Journal of Botany, University of Karachi, Karachi, Pakistan. Email: qaism@gmail.com, pakjbot@yahoo.com

9. **Prof. Dr. Daniel Potter**, University of California Davis, Email: dpotter@ucdavis.edu

10. **Prof. Dr. Hongyan Liu**, Peking University, China, Email: lhy@urban.pku.edu.cn

11. **Prof. Dr. Munir Ozturk,** Vice President, Islamic World Academy of Sciences, Turkey & Professor of Ecology & Environmental Sciences, Ege University, Turkey, Email: munirozturk@gmail.com, Cell: 0090-5353098104.

Zia-ur-Rehman Mashwani, PhD

Personal Information

Assistant Professor

Department of Botany ☎+92-333-9022077

Faculty of Sciences ✉ zia.botany@gmail.com

PMAS Arid Agriculture University mashwani@uaar.edu.pk

Rawalpindi 46300. Pakistan

Experience

9/2016 – to date	Assistant Professor, Department of Botany, PMAS Arid Agriculture University, Rawalpindi, Pakistan.
2/2010 – 9/2016	Lecturer, Department of Botany, PMAS Arid Agriculture University, Rawalpindi, Pakistan.
8/2007 – 6/2009	Research Associate, Department of Plant Sciences Quaid-i-Azam University, Islamabad, Pakistan.

Honor and Awards

- Winner of "**Research Award 2022" &** "**Research Award 2020**" by The Office of Research Innovation and Commercialization (ORIC) of PMAS Arid Agriculture University, Rawalpindi on 22-01-2021
- Winner of the best research paper award in **6th HEC Outstanding Research Awards 2015-2016** by Research and Development Division (R&D) Higher Education Commission of Pakistan.
- Received **Best Oral Presentation award** at **VIII International Agriculture Symposium (AGROSYM 2017)** 5-8 October 2017, Jahorina, Bosnia and Herzegovina
- **RECEIVED TRAVEL GRANTS THRICE FROM HEC AND PHEC TO PARTICIPATE AND PRESENT A RESEARCH PAPER IN INTERNATIONAL SCIENTIFIC MEETINGS IN CHINA AND BOSNIA**
- **Excellent Paper award** in International Conference on Environment, Biomedical and Biotech. (ICEBB 2011) by organizing committee held at August 19-20, 2011 in Shanghai, China.
- HEC Indigenous 5000 Ph.D Fellowship Program (Batch IV)
- Distinction (Merit) certificate from University of Peshawar, on securing 2nd position in M.Sc (Botany) from Department of Botany, with 870/1200(72.5%)
- Fauji Foundation Merit Scholarship
- Quaid-i-Azam University Merit Scholarship
- Throughout first class academic carrier.

Memberships

- American Society of Microbiology
- Regular Member of Society of Economic Botany (SEB)
- Life Member of Pakistan Botanical Society (PBS)
- SILAE (Italo-Latin American Society of Ethnomedicine)

- Weed science society Pakistan
- Pakistan Academy of Sciences

Students

PhD Students Supervised

S.No.	Name	Research Title	Year of Completion
1	**Muhammad Faraz Khan**	Ethnobotanical profile and biological screening of selected medicinal plants of Sudhanoti, Azad Kashmir.	**2019**
2	**Sohail**	Response of Canola to Green Synthesized Zinc Nanoparticle.	**2020**
3	**Bilal Javed**	Green Synthesis, Characterization and Biological Applications of Silver Nanoparticles	**2020**
4	**Rahmat Wali**	Ethnopharmacological evaluation of medicinal plants of Fairy Meadows and surrounding valleys, Gilgit Baltistan, Pakistan	**2022**
5	**Matiullah**	Ecological Evaluation for Sustainable Utilization of Plant Resources of Lalkoo Valley, Swat	**2023**
6	**Ubaid-ul-Hasan**	Nanoparticle assisted Biofortifaction of wheat with Zn and Fe	**2023**
7	**Maarij Khan**	Plant mediated synthesis, characterization, and biological applications of Cerium Oxide nanoparticles	**2023**

PhD Students Supervising

S.No.	Name	Research Title	Year of Completion
1	**Amir Ali**	Evaluation of phytosynthesized nanoparticles mediated in-vitro cultures of *Caralluma tuberculata* for antidiabetic potential	**In progress**
2	**Ilyas Ahmed**	Selenium nanoparticle mediated biofortification and Aflatoxin management in *Sesamum indicum*	
3	**Zohaib Younas**	Improving Canola oil quality by reducing Erucic acid content through molecular intervention and Selenium nanoparticles	
4	**Tayyaba Yousaf**	Comparative antioxidant and antidiabetic efficacy of selected *Mentha* species extract and selenium nanoparticle	
5	**Naireen Ahmed**		

M. Phil. Students Supervised

S.No.	Name	Research Title	Year of Completion
1	**Sherish Javed**	**Phytochemical quantification and biological screening of Artemesia vulgaris Linn.**	**2011**
2	**Uzma Bashir**	**Chemical and Biological characterization of**	**2011**

		Boerhavia procumbens	
3	**Saadia Irum**	**Phytochemical and antioxidant potential of Berberis lycium Royle.**	**2012**
4	**Humara Amin**	**Phytochemical and Pharmacognostic evaluation of Amaranthus viridis and A.spinosus**	**2013**
5	**Raheela Ismail**	**Nutraceutical Potential of wild vegetables Rumex hastatus and R. nepalansis**	**2013**
6	**Shabnum Bibi**	**Pharmacognostic and phytochemical screening of Sisymbrium irio L.**	**2013**
7	**Arsh Bibi**	**Comparative secondary metabolites analysis and antioxidant potential in calli of Nigella sativa L.**	**2014**
8	**Ayesha Rehman**	**Differential secondary metabolites analysis and antioxidant potential in calli of Cassia asbus L.**	**2014**
9	**Tasneem Bashir**	**Phytochemical composition and nutracetical evaluation of Morus alba fruit.**	**2015**
10	**Ubaid Ul Hassan**	**Phytochemical characterization and nutracetical potential of Ziziphus muratiana fruit.**	**2015**
11	**Seemab Gul**	**Biological and analytical characterization of sea-buckthorn (Hippophae rhamnoides) seed oil.**	**2016**
12	**Rahmat Wali**	**Quantitative ethnomedicinal study of plant used in Fairy Meadow National Park, Diamir, Gilgit Baltistan.**	**2016**
13	**Malik Shamsher**	**Ethnobiology of Taxila Valley, A quantitative approach.**	**2017**
14	**Umme Amara**	**Response of Brassica napus to Zinc nanoparticles under controlled condition.**	**2017**
15	**Rahimullah**	**Effect of silver nanoparticle on the growth, yield and quality of Canola.**	**2017**
16	**Usman Ali**	**Phytochemical assessment and antioxidant potential of selected Pteridophytes from Poonch, Azad Kashmir.**	**2017**
17	**Amir Ali**	**Effect of silver nanoparticle on regeneration and antioxidant capacity of Caralluma tuberculate.**	**2018**
18	**Umm-e-Ammara**	**in-vitro Seed germination, growth and biochemical profile of Zea mays in response to silver nanoparticle.**	**2018**
19	**Salahuddin**	**Exploration of Plant based ethnomedicines used by the local communities along Pak-Afghan Border region, Khyber agency.**	**2019**
20	**Khalid Kamran**	**Impact of Foliar application of green Zinc nanoparticles on secondary metabolites of Canola Seeds.**	**2019**
21	**Marij Khan**	**Iron Nanoparticles assisted biofortification of wheat (Triticum aestivum).**	**2019**
22	**Asma Ibrar**	**Biological evaluation of various solvent extracts of Hylotelephium ewersii and Oxyria digyna.**	**2019**
23	**Kiran Gul**	**Biological evaluation of various solvent extracts of Artemisia glacialis and Rheum austral.**	**2019**
24	**Safia Rani**	**Zinc Nanoparticles assisted biofortification of wheat (Triticum aestivum)**	**2019**
25	**Sundus**	**Toxicity assessment of Zinc nanoparticles on**	**2019**

	Khursheed	**Brassica napus.**	
26	**Iqra Syed**	**Natural dye mediated synthesis of silver nanoparticle and pharmacological potential.**	**2020**
27	**Riaz Khan**	**Response of tomoato to foliar application of salicyclic acid and Zinc nanoparticle.**	**2020**
28	**Laraib Nawaz**	**Mentha arvensis mediated synthesis of Cerium oxide nanoparticle for evaluation against bacterial plant pathogen**	**2021**
29	**Rabia Fareed**	**Fabrication of Mentha longifolia leaf extract assisted Cerium oxide nanoparticle and evaluation of antibacterial properties**	**2021**
30	**Zohaib Younas**	**Varietal response of Selenium nanoparticles for seed germination, biochemical characterization and antioxidant profiling of different varieties of Sesamum indicum**	**2022**
31	**Tayyaba Yousaf**	**Hypoglycemic activity of Mint based Cerium Oxide Nanoparticles**	**2022**
32	**Said Rahim**	**Comparative Antihyperglycemic activity of green synthesized silver nanoparticles and alcoholic extract of wild Olea ferruginea Royle**	**2022**
33	**Kiran Tanveer**	**Application Silver-Selenium nanocomposite for the management of fungal diseases in Capsicum annuum**	**2023**
34	**Laila Noor**	**Phytochemical profiling and antidiabetic potential of Monotheca buxifolia fruit**	**2023**
35	**Muhammad Hasnain**	**Phytochemical composition, antioxidant and antidiabetic activities of the fruit of Elaeagnus angustifolia L.**	**2023**
36	**Naireen ahmed**	**Synthesis of biogenic ZnO/TiO2 nanocomposite and evaluation it antimicrobial potential**	**2023**

M. Phil. Students Supervising

1. **Ubaidur Rahman (22-arid-2121)** Influence of biochar amendment and foliar application of ZnO-Se nanocomposite on Soybean (*Glycine max*)
2. **Rafia Latif (22-arid-2115)** Effect of ZnO-Se Nanocomposite and Organic Compost on Growth, Yield, and Fatty Acid Profile of Sunflower (*Helianthus annuus*)
3. **Hira Hassan (19-arid-2598)** Combine use of Biochar and Selenium nanoparticles for the improvement in growth, yield, and quality of Ground nut (*Arachis hypogea*)
4. **Unsa Shafi (22-arid-2547)** Effect of Silica Nanoparticles on Selected Arsenic Accumulator Plant Species
5. **Umme Rubab**

Service Activity

- Research Coordinator, Botany department, PMAS-AAUR
- Program Team Representative, Quality Enhancement Cell (QEC)
- Central Lab In-charge, Department of Botany
- In-charge, timetable and date sheet
- Focal person and faculty representative in Student Resource centre
- Department Course in-charge

- Member, ASA executive body
- Member, M.Sc. admission committee
- Member, M.Phil./Ph.D. admission committee
- Member, Board of Studies of Botany and Biology
- Member, Program assessment team Biochemistry

Brief Statement of Research Interest

Expertise in Phytonanotechnolgy, Ethnobotany, phytochemistry, proteomics, metabolomics, diversity analysis.

Publications

1. Abasi, F. Raja, N.I. **Mashwani, ZuR**. Ehsan, M. Ali, H. Shahbaz, M. (2024) Heat and Wheat: Adaptation strategies with respect to heat shock proteins and antioxidant potential; an era of climate change. International Journal of Biological Macromolecules. 256 (1)128379. https://doi.org/10.1016/j.ijbiomac.2023.128379 (**IF: 8.2, W, Q1**)

2. Iqbal, M. Raja, N.I. Mashwani, ZuR. Yasmeen, F. Hussain, M. Ejaz, M. Abasi, F. Ehsan, M. Ikram, M. & Proćków, J. (2024) Insight into carbohydrate metabolism, protein quantification and mineral regulation in wheat (Triticum aestivum L.) by the action of green synthesized silver nanoparticles (AgNPs) against heat stress. Journal of Biomolecular Structure and Dynamics, https://doi.org/10.1080/07391102.2024.2311333 (**IF: 4.4, W, Q1**)

3. Aravinth, A. Dhanasundaram, S. Perumal, P. Kamaraj, C. Khan, S.U. Ali, A. Ragavendran, C. Amutha, V. Rajaram, R. Santhanam, P. Luna-Arias, J.P. **Mashwani, ZuR.** (2024) Evaluation of Brown and red seaweeds-extracts as a novel larvicidal agent against the deadly human diseases-vectors, Anopheles stephensi, Aedes aegypti and Culex quinquefasciatus. Experimental Parasitology. 256 (108651) https://doi.org/10.1016/j.exppara.2023.108651 (**IF: 2.1, X, Q2**)

4. Parveen, J. Sultana, T. Kazmi, A. Malik, K. Ullah, A. Ali, A. Qayyum, B. Raja, N.I. **Mashwani, ZuR.** Rehman, S.U. **(2023)** Phytosynthesized Nanoparticles as Novel Antifungal Agent for Sustainable Agriculture: A Mechanistic Approach, Current Advances, and Future Directions, Journal of Nanotechnology, ID 8011189,2023. https://doi.org/10.1155/2023/8011189 (**IF: 4.2, X, Q2**)

5. Afzal, T., Bibi, Y., Mashwani, ZuR., Gilani, S. S., Naheed, N. Jabeen, A. Afzal, R.N. (2023). PotentHypoglycemicPhytochemicalsfrom Citrus: Citrus for Diabetes. DIET FACTOR (Journal of Nutritional & Amp; Food Sciences), 4(03). https://doi.org/10.54393/df.v4i03.78 (**HEC Recognized Y**)

6. Sultana, T. Malik, K. Raja, N. I. Sohail, Hameed, A. Ali, A. **Mashwani, ZuR**. Baloch, M. Y. J. and Alrefaei, A. F. (2023) Phytofabrication, characterization, and evaluation of novel bioinspired selenium–iron (Se–Fe) nanocomposites using *Allium sativum* extract for bio-potential applications" Green Processing and Synthesis. 12(1):20230049. https://doi.org/10.1515/gps-2023-0049 (**IF: 4.3, X, Q2**)

7. Kamaraj, C. Ragavendran, C. Prem, P. Kumar, S. N. Ali, A. Kazmi, A. Ullah, A. Kumar, R.C.S. Khan, S.U. Luna-Arias, J.P. **Mashwani, ZuR.** Balasubramani, G. Rehman, S.U. (2023) Exploring the Therapeutic Potential of Traditional Antimalarial and Antidengue Plants: A Mechanistic Perspective", Canadian Journal of Infectious Diseases and Medical Microbiology, 1860084, 20 https://doi.org/10.1155/2023/1860084 (**IF: 2.8, X, Q2**)

8. Ali A, **Mashwani ZuR**, Raja NI, Mohammad S, Luna-Arias JP, Ahmad A and Kaushik P (2023) Phytomediated selenium nanoparticles and light regimes elicited in vitro callus cultures for biomass accumulation and secondary metabolite production in Caralluma tuberculata. Frontiers in Plant Sciences. 14:1253193. https://doi.org/10.3389/fpls.2023.1253193 (**IF: 5.6, W, Q1**)

9. Hassan, U. Khan, M. Younas, Z. Raja, N. I. **Mashwani ZUR** and Sohail. (2023) Effect of phytogenic iron nanoparticles on the bio-fortification of wheat varieties. Green Processing and Synthesis. 12: 20238002. https://doi.org/10.1515/gps-2023-8002 (**IF: 4.3, X, Q2**)

10. Khan, M., Sohail, Raja, N.I. Asad, M. J., & **Mashwani, ZuR**. (**2023**). Antioxidant and hypoglycemic potential of phytogenic cerium oxide nanoparticles. Scientific Reports, **13**, 4514 https://doi.org/10.1038/s41598-023-31498-8 (**IF: 4.996, W, Q1**)

11. Ahmed, N. Tanveer, K. Younas, Z. Yousaf, T. Ikram, M. Raja, N.I. **Mashwani, ZuR**. Alghamdi, S, Al-Moraya, I.S. & Shesha, N.T. (**2023**) Green-processed nano-biocomposite (ZnO–TiO2): Potential candidates for biomedical applications. Green Processing and Synthesis. 12: 20230076 https://doi.org/10.1515/gps-2023-0076 (**IF: 4.3, X, Q2**)

12. Ejaz, M. Raja, N.I. Khan, S.A. Mashwani, ZuR. Hanif, A. Iqbal, I. Hussain, M. Syed, A. Iqbal, R.K. Qureshi, H. Anwar, T. and Rauf, A. (**2023**). Biosynthesized silver nanoparticles ameliorate biotic stress in rice (Oryza sativa) by intricating biochemical and mineral profile. Pakistan Journal of Botany, 55(6): 2019-2028. http://dx.doi.org/10.30848/PJB2023-6(21) (**IF: 1.101, X, Q4**)

13. Imran, S. Bibi, Y. Munawar, T. Yousaf, A. M. Hasnain, M. & **Mashwani, ZuR.** (**2023**). A panoramic review on ethnomedicinal, therapeutic, phytochemical, and advance attributes, of the genus Ziziphus Mill., native to Pakistan. *Ethnobotany Research and Applications*, *25*, 1–32. http://dx.doi.org/10.32859/era.25.67.1-31 (**HEC Recognized W category**)

14. Rukh, S. Kazmi, A. Nabi, G. Irshad, M. Ali, A. Muhammad, S. **Mashwani, ZuR**. and Sultana, T. (**2023**) Improvement of in vitro regeneration frequency, polyphenolic and antioxidant profile of Strawberry (Fragaria ananassa Cv. Chandler) via indirect organogenesis. Journal of Pure and Applied Agriculture 8(1): 45-55 https://ojs.aiou.edu.pk/index.php/jpaa/article/view/1392 (**HEC Recognized Y**)

15. Raza, M.U.; Abasi, F.; Shahbaz, M.; Ehsan, M.; Seerat, W.; Akram, A.; Raja, N.I.; **Mashwani, ZuR**.; Hassan, H.U.; Proćków, J. **(2023)** Phytomediated Silver Nanoparticles (AgNPs) Embellish Antioxidant Defense System, Ameliorating HLB-Diseased 'Kinnow' Mandarin Plants. *Molecules 28*, 2044. https://doi.org/10.3390/molecules28052044 (**IF: 4.927, W**)

16. Ahmad, I. Younas, Z. **Mashwani, ZuR**. Raja, N. I. Akram, A. **(2023)** Phytomediated Selenium Nanoparticles Improved Physio-morphological, Antioxidant, and Oil Bioactive Compounds of Sesame under Induced Biotic Stress. ACS Omega. 8 (3), 3354-3366 https://doi.org/10.1021/acsomega.2c07084 (**IF: 4.132, W**)

17. Badshah I, Mustafa N, Khan R, **Mashwani ZuR**, Raja NI, Almutairi MH, Aleya L, Sayed AA, Zaman S, Sawati L, Sohail. (**2023**) Biogenic Titanium Dioxide Nanoparticles Ameliorate the Effect of Salinity Stress in Wheat Crop. *Agronomy*. 13(2):352. https://doi.org/10.3390/agronomy13020352 (**IF: 3.949, W**)

18. Younas, Z. **Mashwani, ZuR**. Ahmad, I. Khan, M. Zaman, S. Sawati, L. Sohail. (**2023**) Mechanistic Approaches to the Application of Nano-Zinc in the Poultry and Biomedical Industries: A Comprehensive Review of Future Perspectives and Challenges. *Molecules*. 28(3):1064. https://doi.org/10.3390/molecules28031064 (**IF: 4.927, W**)

19. Matiullah, Amjad, UR. Zahid, U. Aamir, S. Qureshi, R. Burslem, D. F.R.P. & **Mashwani, ZuR.** (**2022**). Distribution Pattern of Tree Species and Richness along an Altitude Gradient in the Sub-Alpine Temperate Zone of Hindu Kush Mountainous Forests, Pakistan: Tree species richness along elevation gradient. Proceedings of the Pakistan Academy of Sciences: B. Life and Environmental Sciences, 59(4), 81–92. https://doi.org/10.53560/PPASB(59-4)741 (**HEC Recognized X category**)

20. Ali A, **Mashwani ZuR**, Ahmad I, Raja NI, Mohammad S and Khan SU **(2022)** Plant in vitro cultures: A promising and emerging technology for the feasible production of antidiabetic metabolites in *Caralluma tuberculata*. Frontiers in Endocrinology. 13:1029942. https://doi.org/10.3389/fendo.2022.1029942 (**IF: 6.055, W**)

21. Shahbaz, M. Fatima, N. **Mashwani, ZuR**. Akram, A. Haq, Eu. Mehak, A. Abasi, F. Ajmal, M. Yousaf, T. Raja, NI. UlHassan, H. Pérez, de la Lastra, JM. **(2022)** Effect of Phytosynthesized Selenium and Cerium Oxide

Nanoparticles on Wheat (Triticum aestivum L.) against Stripe Rust Disease. *Molecules*. 2022; 27(23):8149. https://doi.org/10.3390/molecules27238149 (**IF: 4.927, W**)

22. Matiullah, Rahman, A. U. Ullah, Z. Qureshi, R. Burslem, D. F. R. P. **Mashwani, ZuR**. **(2022)** Composition and structure of plant communities in the Moist Temperate Forest Ecosystem of the Hindukush Mountains, Pakistan. Brazilian Journal of Biology. 82, 2022, https://doi.org/10.1590/1519-6984.266637 (**IF: 1.32, X**)

23. Kamaraj, C. Ragavendran, C. Kumar, R.C.S. Ali, A. Khan, S.U. **Mashwani, ZuR**. Luna-Arias, J.P. Pedroza, J.P.R. **(2022)** Antiparasitic potential of asteraceae plants: A comprehensive review on therapeutic and mechanistic aspects for biocompatible drug discovery. Phytomedicine Plus. 2(4):100377, https://doi.org/10.1016/j.phyplu.2022.100377 (**HEC Recognized Y category**)

24. Ahmad I, **Mashwani ZUR**, Raja NI, Kazmi A, Wahab A, Ali A, Younas Z, Yaqoob S, Rahimi M. **(2022)** Comprehensive Approaches of Nanoparticles for Growth Performance and Health Benefits in Poultry: An Update on the Current Scenario. Biomed Research International. 17;9539908. https://doi.org/10.1155/2022/9539908 (**IF: 3.246, W**)

25. Afzal, A., Shafqat, A., Akhtar, S., Sultana, T., Kazmi, A., Ali, A., **Mashwani, ZUR**, El Askary, A., Gharib, A.F., Ismail, K.A. and Khalifa, A.S., **(2022)** Biosorbents Removed Copper Heavy Metal from Agricultural Land Cultivated with Vigna radiata (Mung Bean). International Journal of Agronomy, Article ID 6067181. https://doi.org/10.1155/2022/6067181 (**IF: 2.06 X**)

26. Shahbaz, M., Akram, A., Raja, N.I., Mukhtar, T., **Mashwani, ZUR**, Mehak, A., Fatima, N., Sarwar, S., Haq, E.U. and Yousaf, T. **(2022)** Green Synthesis and Characterization of Selenium Nanoparticles and its Application in Plant Disease Management: A Review. Pakistan Journal of Phytopathology, 34(1), pp.189-102. https://doi.org/10.33866/phytopathol.034.01.0739 (**HEC Recognized Y**)

27. Younas, Z., Naseer, S., Kazmi, A., Ali, A., Wahab, A., Sultana, T., Shoukat, I., Hameed, A., Afzal, M., **Mashwani, ZUR**. and Rahimi, M., **(2022)** Assessment of Diversity among Important Brinjal (Solanum melongena) Cultivars Using Morphological Markers. Journal of Food Quality, Article ID 4255554. https://doi.org/10.1155/2022/4255554 (**IF: 3.20, W**)

28. Ehsan M, Raja NI, **Mashwani ZUR**, Zohra E, Abasi F, Ikram M, Mustafa N, Wattoo FH, Proćków J, Pérez de la Lastra JM. **(2022)** Effects of Phytogenically Synthesized Bimetallic Ag/ZnO Nanomaterials and Nitrogen-Based Fertilizers on Biochemical and Yield Attributes of Two Wheat Varieties. *Nanomaterials*. 12(17):2894. https://doi.org/10.3390/nano12172894 (**IF: 5.719, W, Q1**)

29. Satti, S.H. Raja, N.I. Ikram, M. Oraby, H.F. **Mashwani, ZUR**. Mohamed, A.H. Singh, A. Omar, A.A. **(2022)** Plant-Based Titanium Dioxide Nanoparticles Trigger Biochemical and Proteome Modifications in Triticum aestivum L. under Biotic Stress of Puccinia striiformis. *Molecules*, *27*, 4274. https://doi.org/10.3390/molecules27134274 (**IF: 4.927, W, Q1**)

30. Khan, M. **Mashwani, ZUR.** Ikram, M. Raja, N.I. Mohamed, A.H. Ren, G. Omar, A.A. **(2022)** Efficacy of Green Cerium Oxide Nanoparticles for Potential Therapeutic Applications: Circumstantial Insight on Mechanistic Aspects. *Nanomaterials*, *12*, 2117. https://doi.org/10.3390/nano12122117 (**IF: 5.719, W, Q1**)

31. Sohail, Sawati L, Ferrari E, Stierhof Y-D, Kemmerling B and **Mashwani ZUR. (2022)** Molecular Effects of Biogenic Zinc Nanoparticles on the Growth and Development of Brassica napus L. Revealed by Proteomics and Transcriptomics. Front. Plant Sci. 13:798751. doi: 10.3389/fpls.2022.798751 (**IF: 6.627, W, Q1**)

32. Wali R, Khan MF, Mahmood A, Mahmood M, Qureshi R, Ahmad KS, **Mashwani ZUR** (**2022**) Ethnomedicinal appraisal of plants used for the treatment of gastrointestinal complaints by tribal communities living in Diamir district, Western Himalayas, Pakistan. PLoS ONE 17(6): e0269445. https://doi.org/10.1371/journal.pone.0269445 (**IF: 3.752, W, Q1**)

33. Ehsan, M. Waheed, A. Ullah, A. Kazmi, A. Ali, A. Raja, NI. **Mashwani, ZUR.** Sultana, T. Mustafa, N. Ikram, M. Li, H. **(2022)**. Plant-Based Bimetallic Silver-Zinc Oxide Nanoparticles: A Comprehensive Perspective of Synthesis, Biomedical Applications, and Future Trends. BioMed Research International. Article ID 1215183, https://doi.org/10.1155/2022/1215183 (**IF: 3.246, W, Q1**)

34. Abasi F, Raja NI, **Mashwani ZUR,** Amjad MS, Ehsan M, Mustafa N, Haroon M, Proćków J. **(2022)** Biogenic Silver Nanoparticles as a Stress Alleviator in Plants: A Mechanistic Overview. *Molecules*. 27(11):3378. https://doi.org/10.3390/molecules27113378 (**IF: 4.927, W, Q1**)

35. Shabir, S. Ilyas, N. **Mashwani, ZUR.** Ahmad, M. S. Al-Ansari, M. M. Al-Humaid, L. Reddy, M.S. **(2022)** Designing of pretreatment filter technique for reduction of phenolic constituents from olive-mill wastewater and testing its impact on wheat germination. Chemosphere. Volume 299 (134438) https://doi.org/10.1016/j.chemosphere.2022.134438 (**IF: 8.927, W, Q1**)

36. Akhtar, N. Ilyas, N. Meraj, T.A. Pour-Aboughadareh, A. Sayyed, R.Z. **Mashwani, ZUR.** Poczai, P. **(2022)** Improvement of Plant Responses by Nanobiofertilizer: A Step towards Sustainable Agriculture. *Nanomaterials*, 12, 965. https://doi.org/10.3390/nano12060965 (**IF: 5.719, W, Q1**)

37. Ikram, M. Raja, N. I. **Mashwani, ZUR.** Omar, A. A. Mohamed, A. H. Satti, S. H. and Zohra, E. **(2022)**. Phytogenic Selenium Nanoparticles Elicited the Physiological, Biochemical, and Antioxidant Defense System Amelioration of Huanglongbing-Infected 'Kinnow' Mandarin Plants *Nanomaterials* 12, no. 3: 356. https://doi.org/10.3390/nano12030356 (**IF: 5.719, W, Q1**)

38. Anum, F. Raja, N.I. Sultana, T. Kazmi, A. Ali, A. Qayyum, B. Afzal, A. Nijibat, A. **Mashwani ZUR. 2021**. Spectral Lights Based Treatment Enhanced Biomass Accumulation and Secondary Metabolites Production in Callus Culture of Citrus reticulata. Philippine Agricultural Scientist. Vol. 104 No. 3, 287-298 (**IF: 0.191, HEC Recognized Y**)

39. Shah, SA. Iqbal, W. Sheraz, M. Javed, B. Zehra, SS. Abbas, HABE. Hussain, W. Sarwer, A. **Mashwani, ZUR.** (**2021**). Ethnopharmacological Study of Medicinal Plants in Bajwat Wildlife Sanctuary, District Sialkot, Punjab Province of Pakistan. Evidence-Based Complementary and Alternative Medicine, Article ID 5547987, 25 pages, https://doi.org/10.1155/2021/5547987 (**IF: 2.65, W Q1**)

40. Akhtar, N. Khan, S. Rehman, SU. Rehman, ZU. **Mashwani, ZUR.** Rha, E. S. and Jamil, M. **(2021)**. Zinc Oxide Nanoparticles Enhance the Tolerance and Remediation Potential of Bacillus spp. against Heavy Metal Stress. Adsorption Science & Technology. Volume 2021.Article ID 1774528. https://doi.org/10.1155/2021/1774528 (**IF: 4.373, W, Q1**)

41. Zohra, E. Ikram, M. Omar, A. Hussain, M. Satti, SH. Raja, NI. **Mashwani, ZUR** and Ehsan, M. **(2021**) Potential applications of biogenic selenium nanoparticles in alleviating biotic and abiotic stresses in plants: A comprehensive insight on the mechanistic approach and future perspectives" *Green Processing and Synthesis*, 10(1):456-475. https://doi.org/10.1515/gps-2021-0047 (**IF: 3.97, X, Q2**)

42. Batool SU, Javed B, Sohail, Zehra SS, **Mashwani ZUR,** Raja NI, Khan T, ALHaithloul HAS, Alghanem SM, Al-Mushhin AAM, Hashem M, Alamri S. (2021) Exogenous Applications of Bio-fabricated Silver Nanoparticles to Improve Biochemical, Antioxidant, Fatty Acid and Secondary Metabolite Contents of Sunflower. *Nanomaterials*.11(7):1750. https://doi.org/10.3390/nano11071750 (**IF: 5.719, W, Q1**)

43. Akhtar, N. Ilyas, N. **Mashwani, ZUR.** Hayat, R. Yasmin, H. Noureldeen, A. Ahmad, P. (**2021**) Synergistic effects of plant growth promoting rhizobacteria and silicon dioxide nano-particles for amelioration of drought stress in wheat. Plant Physiology and Biochemistry. 166:160-176. **https://doi.org/10.1016/j.plaphy.2021.05.039** (**IF: 5.437, W, Q1**)

44. Ikram, M. Javed, B. Hassan, S.W. Satti, S.H. Sarwer, A. Raja, N.I. & **Mashwani, ZUR.** (**2021)**. Therapeutic potential of biogenic titanium dioxide nanoparticles: a review on mechanistic approaches. Nanomedicine (Lond.) **https://doi.org/10.2217/nnm-2021-0020** (**IF: 6.096, W, Q1**)

45. Sultana, T. Javed, B. Raja, N.I. & **Mashwani, ZUR. (2021).** Silver nanoparticles elicited physiological, biochemical, and antioxidant modifications in rice plants to control Aspergillus flavus. Green Processing and Synthesis 10: 314 –324 **https://doi.org/10.1515/gps-2021-0034 (IF: 3.97, X, Q2)**

46. Khan, T. Khan, M. Karam, K. Ullah, N. **Mashwani, ZUR.** Nadhman, A. (**2021**) Plant in vitro Culture Technologies; A Promise Into Factories of Secondary Metabolites Against COVID-19. Frontiers in Plant Science. 12:610194. **https://doi.org/10.3389/fpls.2021.610194** (**IF: 6.627, W, Q1**)

47. Khan, M.F., Mashwani, ZUR., Mehmood, A. Qureshi, R. Sarwar, R. Ahmed, K. S. Quave, C. L. (**2021**). An ethnopharmacological survey and comparative analysis of plants from the Sudhnoti District, Azad Jammu and Kashmir, Pakistan. J Ethnobiology Ethnomedicine 17:14 **https://doi.org/10.1186/s13002-021-00435-2** (**IF: 3.404, W, Q1**)

48. Maria Ehsan, M.Raja, N. I. **Mashwani, ZUR.** Ikram, M. Zohra, E. Zehra, S.S. Abasi, F. Hussain, M. Iqbal, M. Mustafa, N. Ali, A. **2021.** Responses of bimetallic Ag/ZnO alloy nanoparticles and urea on morphological and physiological attributes of wheat. IET Nanobiotechnol. 2021;1–9. DOI: 10.1049/nbt2.12048 **(IF:2.05, X, Q3)**

49. Satti, S**.** H**.** Raja, N**.** I**.** Javed, B**.** Akram, A**. Mashwani, ZUR** Ahmad, M**.** S**.** Ikram**,** M**. (2021).** Titanium dioxide nanoparticles elicited agro-morphological and physicochemical modifications in wheat plants to control *Bipolaris sorokiniana*. PLoS ONE**.** 16(2) **https://doi.org/10.1371/journal.pone.0246880** (**IF: 3.752, W, Q1**)

50. Javed, B., Ikram, M., Farooq, F. Sultana, T. **Mashwani, ZUR.** & Raja, N. I. **(2021)** Biogenesis of silver nanoparticles to treat cancer, diabetes, and microbial infections: a mechanistic overview. Appl Microbiol Biotechnol. **https://doi.org/10.1007/s00253-021-11171-8** (**IF: 5.561, W, Q1)**

51. Ikram M, Javed B, Raja NI, **Mashwani ZUR. (2021)** Biomedical Potential of Plant-Based Selenium Nanoparticles: A Comprehensive Review on Therapeutic and Mechanistic Aspects International Journal of Nanomedicine, 2021;16:249-268. **https://doi.org/10.2147/IJN.S295053 (IF: 7.033, W, Q1)**

52. Mustafa, N., Raja, N. I. Ilyas, N. Ikram, M. **Mashwani, ZUR** and Ehsan, M. **2021.** Foliar applications of plant - based titanium dioxide nanoparticles to improve agronomic and physiological attributes of wheat (Triticum aestivum L.) plants under salinity stress. Green Processing and Synthesis 2021; 10: 246 –257 **(IF: 3.97, X, Q2)**

53. Ahmed,F., B. Javed, A. Razzaq, **ZUR. Mashwani. (2021)** Applications of copper and silver nanoparticles on wheat plants to induce drought tolerance and increase yield. IET Nanobiotechnology, 2021:1–11 . DOI:10.1049/nbt2.12002 **(IF: 2.05, X, Q3)**

54. Anwar, K. Munawar, T. Jabeen, S. Arshad, F. Bibi, F. **Mashwani ZUR**. and Kabir, M. (**2021**). Pharmacological investigations and chemical constituents of some medicinal xerophytes of Thal desert, Pakistan: A Mini Review. Bioresearch Journal. 18(3): 2395-2405 **(HEC Recognized Y)**

55. Sohail, Kamran K, Kemmerling B, Shutaywi M, **Mashwani ZUR (2020)** Nano zinc elicited biochemical characterization, nutritional assessment, antioxidant enzymes and fatty acid profiling of rapeseed. PLoS ONE 15(11): e0241568. **https://doi.org/10.1371/journal.pone.0241568 (IF: 3.752, W, Q1)**

56. Ikram, M., Raja, N. I., Javed, B., **Mashwani, ZUR.,** Hussain, M., Hussain, M., Ehsan, M., Rafique, N., Malik, K., Sultana, T., & Akram, A**. (2020).** Foliar applications of bio-fabricated selenium nanoparticles to improve the growth of wheat plants under drought stress, *Green Processing and Synthesis*, *9*(1), 706-714. doi: **https://doi.org/10.1515/gps-2020-0067 (IF: 3.97, X, Q2)**

57. Javed, B**. Mashwani, ZUR.** Sarwer, A, Raja N. I. & Nadhman A. **(2020)** Synergistic response of physicochemical reaction parameters on biogenesis of silver nanoparticles and their action against colon cancer and leishmanial cells, Artificial Cells, Nanomedicine, and Biotechnology, 48:1, 1340-1353, DOI: 10.1080/21691401.2020.1850467 **(IF: 6.355, W, Q1)**

58. Khan, T., Khan, M. A. **Mashwani, ZUR.** Ullah, N. Nadhman, A. **(2021).** Therapeutic potential of medicinal plants against COVID-19: The role of antiviral medicinal metabolites, Biocatalysis and Agricultural Biotechnology. 31:101890, **https://doi.org/10.1016/j.bcab.2020.101890** . **(HEC Recognized X category, Q2)**

59. Javed, B., & **Mashwani ZUR. (2020).** Synergistic Effects of Physicochemical Parameters on Bio-Fabrication of Mint Silver Nanoparticles : Structural Evaluation and Action Against HCT116 Colon Cancer Cells. International Journal of Nanomedicine, 15, 3621–3637. **https://doi.org/10.2147/IJN.S254402 (IF: 7.033, W, Q1)**

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70. Javed, B., Seerat, W., Sarwer, A., & **Mashwani ZUR. (2020).** Ethnopharmacological approaches of the native hill people of Murree and Kotli Sattian, District Rawalpindi, Province of Punjab, Pakistan. Botany Letters, 1–17. **https://doi.org/10.1080/23818107.2020.1806106** **(IF: 1.566, X, Q3)**

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75. T. Khan N. Ullah, M. A. Khan, **ZUR Mashwani,** A. Nadhman. **2019.** *Plant*-based gold nanoparticles; a comprehensive review of the decade-long research on synthesis, mechanistic aspects and diverse applications. Advances in Colloid and Interface Science. 272(102017) **https://doi.org/10.1016/j.cis.2019.102017** **(IF: 15.19, W, Q1)**

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77. *Ali. F., M. Tariq, F. A. Shaheen,* **ZUR Mashwani,** *T. Zainab, A. Gulzar.* ***2019.*** *Toxicity of different plant extracts and green silver* nanoparticles *against Plutella xylostella (Lepidoptera: Plutellida). Plant Protection. 3(3):151-159* **https://doi.org/10.33804/pp.003.03.3112**

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98. Amara, U., **ZUR. Mashwani,** A. Khan, S. Laraib, R. Wali, U. Sarwar, Q. Ain, S. Shakeel, Rahimullah, and Sohail. **2017.** Conservation Status and Therapeutic Potential of Saussurea lappa: An Overview. American Journal of Plant Sciences, 8(3):602-614. **https://doi.org/10.4236/ajps.2017.83041**

99. **Mashwani ZUR.,** M. A. Khan, T. Khan and A. Nadhman. **2016.** Application of Plant terpenoids in the synthesis of colloidal silver nanoparticles. Advances in Colloid and Interface Science. 234:132-141. http://dx.doi.org./10.1016/j.cis.2016.04.008 **(IF: 15.19, W, Q1)**

100. Sabir, S., A. Akram, N.I. Raja, **ZUR. Mashwani,** Sohail, H. M. Sadaf, M. Hussain, I. Riaz, N. Ahmad, E. Ahmed**. 2016.** A probe into the medicinal potential of Viola canescens – A threatened medicinal plant from Himalaya. Journal of Coastal Life Medicine. 4(7): 575-579. DOI: 10.12980/jclm.4.2016J6-41

101. **Mashwani ZUR.,** T. Khan, M. A. Khan and A.Nadhman. **2015.** Synthesis in plants and plant extracts of silver nanoparticles with potent antimicrobial properties: current status and future prospects. Applied Microbiology and Biotechnology. 99(23):9923-9934 **https://doi.org/10.1007/s00253-015-6987-1 (IF:5.561, W, Q1)**

102. Shaheen, H., **ZUR. Mashwani** and M. E.I. Dar. **2015.** Spatial patterns and diversity of alpine vegetation across Langer-Shandur valley, Hindukush Himalayas. Current Science. 108(8):1534-1539 **(IF: 1.169, X, Q3)**

103. Rehman, K., **ZUR. Mashwani,** M. A. Khan, Z. Ullah, H. J. Chaudhary**. 2015.** An Ethno botanical perspective of traditional medicinal plants from the Khattak tribe of Chonthra Karak. Pakistan. Journal of Ethnopharmacology. 165:251-259 **(IF: 5.195, W, Q1)**

104. Bibi, S., **ZUR. Mashwani,** K. Rehman, N. I. Raja, M. Gulfraz. **2015.** Biological screening of polarity based extracts of leaves and seeds of *Sisymbrium irio* L. Pakistan Journal of Botany 47 (SI): 301-305 **(IF: 1.101, X, Q4)**

105. Bashir, T., **ZUR. Mashwani** and K. Zahra, S. Tabassum and Mudrikah. **2015.** Chemistry, Pharmacology and Ethnomedicinal Uses of Helianthus annuus (Sunflower): A Review. Pure and Applied Biology, 4(2): 226-235

106. **Mashwani, ZUR.,** M. A. khan, M. Ahmad. **2014.** Potential of Pakistani traditional medicinal plants to combat diabetes. Journal of Traditional Chinese Medicine. 15; 34(4): 488-490 **(IF: 2.547, X, Q3)**

107. Khan, G., F. Zhang, Q. Gao, **ZUR. Mashwani,** K.Rehman, M.A.Khan and S. Chen. **2013.** Trichomes diversity in the tropical flora of Pakistan. J. Med. Plant. Res 7(22):1587-1592

108. **Mashwani, ZUR.,** M.A. Khan, S. Irum and M. Ahmad. **2013.** Antioxidant potential of root bark of Berberis lycium Royle. from Galliyat, Western Himalaya, Pakistan. Pakistan Journal of Botany, 45(SI): 231-234. **((IF: 1.101, X, Q4)**

109. **Mashwani, ZUR.,** M. A. khan, M. Ahmad, M. Zafar, N. I. Raja, M. Arshad and Samiullah**. 2012.** Macro-mineral quantification of the forage grass species in the Gandgar Hills, Western Himalaya, Pakistan. Pakistan Journal of Botany, 44: 117-121 SI. **(IF: 1.101, X, Q4)**

110. **Mashwani, ZUR.** M.A.Khan, M.Ahmad, M.Arshad. **2011.** The Diversity of grasses in the Gandgar Range, Northwest Pakistan. Proceeding of 2nd International Conference on "Biodivesity is our Life, 29-31 Dec 2010" organized by The Centre of Biodiversity and Conservation (CBC), Shah Abdul Latif University, Khairpur.

111. Ahmad, F., M. A. Khan, M. Ahmad, M. Arshad**, ZUR. Mashwani. 2011.** Foliar epidermal anatomy as an aid to the identification of grasses in tribe Aveneae (subfamily Pooideae, Poaceae) from salt range of Pakistan. J. Med. Plant. Res. 5(1):81-87.

112. Zafar, M., M. A. Khan, M. Ahmad, S. Sultana, S. K. Marwat, F. Ahmad, **ZUR Mashwani. 2010.** Elemental analysis of some medicinal plants used in traditional medicine by atomic absorption spectrophotometer (AAS). J.Med.Plant.Res.4 (19):1987-1990. DOI: 10.5897/JMPR10.081

BOOK CHAPTER PUBLISHED

1. Abasi, F. Raja, N.I. Mashwani, ZuR. Amjad, M. Ehsan, M. Mustafa, N. Mehmood, A. Ali K. (**2023**). Chapter 1 - A paradigm shift in sustainable use of natural resources and their ecosystem services. Pages 3-31 In Chatterjee, U. et al., (Eds) Water, Land, and Forest Susceptibility and Sustainability; Insight Towards Management, Conservation and Ecosystem Services, Science of Sustainable Systems (Vol. 2). Elsevier. https://doi.org/10.1016/B978-0-443-15847-6.00013-6
2. Siddiqa, A. Ikram, M. Zohra, E. Raja, N. I. **Mashwani, ZuR.** Mohamed, A. Z. Zahedi, S. M. Abbas, A. Omar, A. A. (**2023**) Chapter 1. Overview of Nanomaterials and their Synthesis. In Mishra, K.K., & Kumar, S. (Eds.) Biotic Stress Management of Crop Plants using Nanomaterials (1st ed.). CRC Press. https://doi.org/10.1201/9781003322122
3. Zohra, E. Ikram, M. Raja, N. I. **Mashwani, ZuR.** Omar, A. A. Mohamed, A. H. Zahedi, S. M. Abbas, A. (**2023**) Chapter 3. Nanomaterials as Nano-Fertilizers. In Mishra, K.K., & Kumar, S. (Eds.) Biotic Stress Management of Crop Plants using Nanomaterials (1st ed.). CRC Press. https://doi.org/10.1201/9781003322122
4. **Mashwani, ZuR.** Wali, R. Khan, M.F. Abasi, F. Khalid, N. Raja, N. I. **(2022)** Chapter 6 - Antibacterial activity of some selected medicinal plants of Pakistan, Editor(s): François Chassagne, In Book; Medicinal Plants as Anti-Infectives. p: 209-234, ISBN 9780323909990, https://doi.org/10.1016/B978-0-323-90999-0.00007-0 Elsevier.
5. **Mashwani, ZuR.** (**2020)** Environment, Climate change and Biodiversity. In S. Fahad et al. (eds.), *Environment, Climate, Plant and Vegetation Growth*, https://doi.org/10.1007/978-3-030-49732-3_19. Springer.
6. Khan, M. A., Khan, T., **Mashwani, ZuR,** Riaz, M. S., Ullah, N., Ali, H., & Nadhman, A. (**2019)** Plant cell nanomaterials interaction: Growth, physiology and secondary metabolism. In *Comprehensive Analytical Chemistry* (Vol. 84, pp. 23-54). Elsevier.

Research Grants and Contracts

1. Green synthesis and evaluation of silver nanoparticles for antimicrobial and biochemical profiling in Kinnow (Citrus reticulata L.) to enhance fruit quality and productivity under biotic stress. Funding Program: National research program for universities (NRPU) Research grants. Funding Agency: HEC, Worth: **2.22 million PKR** Duration: 3 years Status: awarded as Co-PI (**2018**)

2. Physio-morphic and biochemical characterization of wheat varieties in response to silver-based nanoparticles against heat stress Funding Program: National research program for universities (NRPU) Research grants. Funding Agency: HEC, Worth: **2.32 million PKR** Duration: 3 years Status: awarded as Co-PI (**2017**)

3. Agro-Morphological and Biochemical responses of Maize (Zea mays L.) to Green Synthesized Silver Nanoparticle". Funding agency: PMAS AAUR ORIC, Worth: **0.195 million**, Duration: 1 year, Status: Awarded as PI (**2018**)

4. Study of Growth, Yield and Quality of Oil of Canola in response to the Application of Zinc Nanoparticle (ZnNP) Funding agency: PMAS AAUR ORIC, Worth: **0.18 million**, Duration: 1 year
Status: Completed as PI (**2017**)

5. Evaluation of Antioxidant Activities of *Berberis lycium* Royle Funding agency: PMAS AAUR ORIC, Worth: **0.128 million**, Duration: 1 year Status: Completed as PI (**2011**)

Research or Creative Accomplishment

1. Silver nanoparticles formula for controlling aflatoxin level in rice grain (Receipt no 2203044655) (**2022)**
2. Bio-formulated silver nanoparticles for controlling canker in Citrus reticulate L. (**2022)**
3. Nanofertilizers for improvement of seed quality and fatty acid profile in Canola **(2022)**
4. Six transgenic wheat varieties for4 Bacterial disease resistance (**2011**)
5. Establishment of an efficient protocol for transformation of *Xa21* gene in wheat

Professional Presentations

1. Invited speaker in **4th Invention to Innovation Summit, KP,2018** at CECOS university Peshawar (22-23 November 2018)
2. Participated in **2nd International Science conference Natural Science, climate & biodiversity** organized at UAJ &K, Muzaffarabad (15-17 September 2018)
3. Invited speaker **in 2nd International conference "Conservation of Medicinal and Aromatic plants for improving the livelihood of mountain communities through industrial linkage**" at University of Sawat, Mangora funded by HEC and WWF (03-05 September 2018)
4. Participated in **Particle Distribution Techniques and Elemental Concentration EDXRF** seminar organized by Rawalpindi chamber of Commerce and Industries, Rawalpindi funded by Horiba Scientific (25th April 2018)
5. Participated in **7th International and 16th National conference on Plant Resources: Current Trends, Challenges and solutions** held on 23-26 March 2018 at Islamia College University Peshawar organized by Pakistan Botanical Society.
6. Oral Presentation in **Agriculture and Food Security Workshop Session** in **Science-Policy Conference on Climate Change (SP3C)**, 18-20 Dec 2017, Islamabad, Pakistan jointly organized by GCISC, MUET and University of Utah.
7. Attended a workshop entitled "**Kigali Amendment-The way forward**" organized by Ministry of Climate Change (National Ozone Unit), Govt. of Pakistan October 25, 2017.
8. Oral presentation and abstract published in **VIII International Agriculture Symposium (AGROSYM 2017)** 5-8 October 2017, Jahorina, Bosnia and Herzegovina.
9. Oral presentation of two articles and abstract published in **XIX International Botanical Congress (IBC 2017),** July 23-29, 2017 Shenzhen, China.
10. Participated in International Symposium "**Nanomedicines: Development, Testing and Application Possibilities**", 1st March 2016 and **"International workshop on Experimental Biology: From Basics to Advance**" (IWEB-2016), 2-4 March 2016, at NORI, Islamabad
11. Oral presentation and abstract published in "**1st international Symposium on the Himalayas of Pakistan; Resources and Conservation Issues"** November 27-30, 2014 at Hazara University, Mansehra
12. Oral presentation and abstract published in **International Conference on Emerging Trends in Life Sciences for Sustainable Development** 9-11th October 2014, Forman Christian College (A Chartered University), Lahore, Pakistan
13. Oral presentation and abstract published in **International Conference of Plant Sciences** organized by Department of Botany, at GC University, Lahore Pakistan on 22-24 September 2014
14. Poster presentation and abstract published in the **5th International Conference on Agriculture, Food Security and Climate Change** jointly organized by University of Poonch Rawalakot, PAS-Forum and HEC on 09-14 September 2014.

15. Oral presentation and abstract published in **4th International and 13th National conference of Botany** organized by Pakistan Botanical Society at Shaheed Benazir Bhutto University, Sheringal, Dir Upper, Khyber Pakhtunkhwa Pakistan on 27-30 August 2014.
16. Participate in "**2nd Annual Entrepreneur Conference LCL 2013"** organized by Enterpreneur Development Institute (EDI) at Jinnah convention Center Islamabad at 30th Nov. 2013.
17. Oral presentation and abstract published in "**First national conference on poverty alleviation through sustainable management of biodiversity in Pakistan**" September 29-30, 2012 Bara Galli, Organized by Institute of Plant Sciences and Biodiversity, Uni. Of Swat and HEC.
18. Oral and Poster presentations and abstract published in "**12th National & 3rd International Conference of Botany**", published by Pakistan Botanical Society on September, 1-3, 2012 at Quaid-i-Azam University, Islamabad
19. Oral presentation and abstract published in "**National Science Conference, Roadmap to cutting edge technology**", January 10-12, 2012 at PMAS Arid Agriculture University, Rawalpindi
20. One day research workshop on "**Citation & Referencing in Research using EndNote X5**" on 25th August 2011 jointly organized by Quality enhancement Cell (QEC) of PMAS-AAUR and Research Centre for Training & Development, IRP.
21. Oral presentation and abstract published in "**2011 International Conference on Environmental, Biomedical and Biotechnology-ICEBB",** August 19-20, 2011 at Shanghai, China organized by APCBEES.
22. Oral presentation and abstract published in **National Symposium on Biodiversity of Pakistan** to be held on June 7-9, 2011 at Hotel Margala, Kashmir Highway. Islamabad. Organized by Pakistan Museum of Natural History, Garden Avenue, Islamabad.
23. Oral Presentation and abstract published in **3rd international Weed science Conference** (April 18-20, 2011) at Department of Weed Sciences, Khyber Pukhtoonkhwa Agriculturae University Peshawar.
24. Oral Presentation and abstract published in **International Conference of the Plant Scientists** (**ICPS-2011**), at Department of Botany, GC university Lahore(February 22-24, 2011).
25. Oral Presentation and abstract published in three days International conference (December 29-31, 2010) on "**Biodiversity is our Life(IC Biour-Life)**" at Centre of Biodiversity and Conservation, Shah Abdul latif University (SALU), Khairpur.
26. National workshop to trained stakeholders about "**The implications of WTO/TRIPs on Traditional Knowledge/Traditional Medicine"** organized by NIH and Ministry of Health and WHO, Islamabad. April 4, 2010.
27. 2 day **National workshop** on "**Adaptation and Implementation of GACP and FCP guideline**" at NIH, Islamabad. April5-6, 2010
28. COMSTECH three week workshop (April 6-24, 2009) on "Science Technology and Innovation" held at COMSTECH secretariate, Islamabad.
29. 9th Biennial PSBMB Conference (Dec. 2008) on "**Advances in Biochemistry and Molecular Biology**" at PMAS Arid Agriculture University, Rawalpindi.
30. Three day (May 27-29, 2008) International Workshop on "**Basic Techniques in Research, Dissertation and Scientific Paper Writing"** held at KUST.
31. 14th Annual Training Course on "**Safety Measures on the Use of Radiations in Agriculture and Biology"** Held at Nuclear Institute of Agriculture and Biology (NIAB), Faisalabad on 1st to 4th April, 2008.

Certificate achieved in a workshop organized by the joint collaboration of HEC & Uni. Of Peshawar, on ``**Training of Trainer for Bio-Diversity Conservation**

Muhammad Naveed Iqbal Raja, PhD

Personal Information

Associate Professor

Department of Botany ☎+92-313-5257004, +92-334-5257004

Faculty of Sciences drnaveedraja@gmail.com

PMAS Arid Agriculture University drnaveedraja@uaar.edu.pk

Rawalpindi 46300. Pakistan

Experience

15/12/2021- till date	Associate Professor, Department of Botany PMAS Arid Agriculture University, Rawalpindi
9/2010 – 14/12/2021	Assistant Professor, Department of Botany PMAS Arid Agriculture University, Rawalpindi
2/2010 – 6/2010	Visiting Lecturer, Department of Plant Sciences Quaid-i-Azam University, Islamabad
2009-2010	Research Fellow, Martin Luther university Halle-Wittenberg, Germany
2008 – 2009	Lecturer, MAJU, Blue Area Islamabad
2005 – 2009	Ph.D/ HEC Scholar, Quaid-I-Azam University/HEC Indigenous, Islamabad
2005 – 2007	Research Fellow, Agriculture Biotechnology Programme, NARC, Islamabad
2003 – 2005	M.Phil Research, PCSIR Labs., Islamabad
2002 – 2004	Lecturer, Islamabad College for Boys, G-6/3, Islamabad
2001 – 2002	Research Assistant, ABI, NARC, Islamabad
2000 – 2010	Visiting Academy Teacher, Zawayia, Hall Mark, The Sun Academy in Islamabad
1998 – 2000	Science Teacher, Shaheen Degree College, Chakwal

Honor and Awards

- Working as Associate Professor Botany, from15th December 2021
- University research award of the year 2020 (Assistant Professor and lecturers-male)
- Total Research Publication: 137 (Cumulative impact factor: 409.576, Citation: 2870, h-index: 30, i10 index= 47)
- Total Profession experience: 24 years
- Post PhD experience: 14 years
- Total PhD thesis supervised: 09
- PhD thesis submitted: 01
- PhD Students supervising: 05
- Total M.Phil/MS thesis supervised: 42
- Total M.Phil/MS thesis supervising: 7
- Research Project (completed as PI): 06
- Research Project (Awarded and in-progress): 01
- Research Project (submitted as PI or Co-PI): 06
- Total Patents ; 13
- International Conferences/symposia/workshop attended inside/outside Pakistan: more than 100

Memberships

Pakistan Journal of Botany

Students

PhD Students Supervised

S.No	**Student's Name**	**Thesis title (Short title)**	**Completion**

			year
1.	Farhat Yasmeen 07-arid-1315	Morpho-Physiological and Biochemical Response of Wheat (T*riticum aestivum* l.) to Cu and Fe Nanoparticles	2017
2.	Samina Yasmin 07-arid-1269	Detection and Sequence Determination of Begomoviruses associated with Leaf Curl Disease at C*apsicum* spp.	2018
3.	Mubashir Hussain 13-Arid-3282	Strategies for The Production of Chemically Consistent Plantlets of *Citrus reticulata L.*	2019
4.	Muhammad Ejaz 00-arid-1082	Control of Aflatoxin in Rice, by Application Silver Nano-Particles.	2020
5.	Seema Hussan Satti 00-arid-1057	Synthesis and Characterization of TiO_2 NPs and their Evaluation for Anti-Fungal Effects on Wheat.	2021
6	Muhammad Iqbal 13-arid-3283	Physio-Morphic And Biochemical Characterization of Wheat Varieties in Response to Silver Nanoparticles Against Heat Stress	2021
7	Nilofar Mustafa Abbasi 18-arid-47	Differential role of green synthesized titanium dioxide nanoparticles on wheat in response to salinity	2022
8.	Maria Ehsan 14-arid-4355	Response of Bread Wheat to green hybrid nanoparticles and fertilizers	2023
9.	Muhammad Ikram 19-arid-2068	Biofabrication of selenium nanoparticles and assessment of their antioxidant and antimicrobial and application potential in *Citrus reticulata*	Waiting for final viva 2023

PhD Students Supervising

S.No	**Student's Name**	**Thesis title (Short title)**
1.	Fozia Abbasi 21-arid-70	Differential Role of Phytogenic Se/Fe Hybrid Nanoparticles on Wheat in Response to Heat stress
2.	Sajid Hussain 22-arid-2866	Synthesis and Evaluation of Silver Selenium Nanocomposite against Bacterial diseases in Cotton
3.	Shakil Sabir 22-arid-2870	Assessing the potential of Silver Selenium Nanocomposite as a sustainable solution for fungal diseases in apple (Malus domestica) orchards.
4.	Said Rahim	New Induction
5.	Fizza Arshad	New Induction

M. Phil. Students Supervised

S.No	**Student's Name**	**Thesis title (Short title)**	**Year of Completion**
1.	Farhat Yasmeen	Screening of Pakistani Wheat (*Triticum aestivum* L.) Varieties for Thermo-Tolerance Against Heat Shocks.	2011
2.	Aisha Kanwal	*In Vitro* And Molecular Characterization of Transgenic Wheat (*Triticum aestivum* L.) Resistant for Bacterial Diseases.	2011
3.	Ghazala Mustafa	Comparative Study of Bacterial Diseases Susceptibility in Local Transgenic and Non-Transgenic Wheat Varieties.	2012
4.	Mehvish Sitara	Effect of UV, Gamma and X-Rays Radiations on Morphological and Physiological Characters of Different Varieties of *Zea mays*	2012

5.	Muhammad Tajammal Khan	Mirco- Propagation of Myrtle (*Myrtus communis* L.)	2013
6.	Madiha Rashid	Morphological and Physiological Effects of UV, Gamma and X-Rays on Different Varieties of Wheat (*Triticum aestivum* L.)	2013
7.	Anila Masood	Detection and Characterization of Anti-Mircobial Activity of *Aloe vera* Gel	2013
8.	Aisha Ramzan	Establishment of an Efficient Protocol for Callus Induction and Regeneration of *Cassia angustifolia*	2015
9.	Shakeela Haider	Effect of Light Regime and Growth Promoters on *In Vitro* Seed Germination of Sea Buckthorn.	2015
10.	Mubashir Hussain	*In Vitro* Propagation of *Citrus Reticulata*	2015
11.	Anam Shabir	Ethnobotanical Wisdom of The Inhabitant of Devi Galli, Azad Kashmir	2016
12.	Usman Ahmad	Physico-Chemical Characterization of Black-Pepper Seed Oil	2016
13.	Tayyaba Asghar	Composition and Physiological Effects of *Silybum marianum* Seed Oil	2016
14.	Sumaira Aslam	Antibacterial and Antifungal Effects of Aloe, Turmeric and Lemon and Their Potential Role in Callus Induction and Regeneration	2017
15.	Imran Khan	In Vitro Conservation and Production of Desiccation Tolerant Synthetic Seeds of Mandarin	2017
16.	Hina Javed	Effect of Different Wavelengths of Light on Cell Proliferation and Differentiation of Bread Wheat Calli	2017
17.	Maria Ehsan	Effect of Green Silver Nano-Particles on Germination and Growth of Wheat Against Heat Stress	2018
18.	Uneeza Javaid	Effect of Green Silver Nano-Particles on *Citrus reticulata* L. Under Biotic Stress	2018
19.	Noor Ul Ain	Evaluation of Antifungal and Antibacterial Activities of Green Silver Nano-Particles Synthesized from *Citrus reticulata* L.	2018
20.	Faiza Anum 14-arid-4345	Effect of Green Silver Nano-Particles on Morphogenic and Biochemical Variations in Callus Cultures of *Citrus Reticulata* L. Under Different Spectral Lights	2018
21.	Tahira Sultana	Effect of Plant Based Silver Nano-Particles on Germination and Post Germination Expression of Rice Against *Aspergillus flavus*	2019
22.	Saman Yaqoob	Effect of Iron Nano-Particles on Wheat Under Drought Stress	2019
23.	Abrar Ahmad	Effect of Green Synthesized Silver and Copper Nano-Particles on Growth Parameters of Maize	2019
24.	Sehrish Mehmood	Antenatal Screening of Local Females for Haematological Problems	2019
25	Asad Ali	Effect of Calcium Phosphate and Selenium Nanoparticles on Wheat Against Drought Stress	2020
26	Qurat-Ul-Ain	Effect of Green Synthesized Silver Nanoparticles in Stress on Wheat Calli	2020
27	Imran Badshah	Effect of Titanium Dioxide Nanoparticles on Wheat Under Salinity Stress	2020
28	Rabia Khalid	EFFECTS OF GREEN SYNTHESIZED SILVER	2020

	(VU MS170200339)	NANOPARTICLES ON *ZEA MAYS* UNDER DROUGHT STRESS	
29	Sabtain Hussain (19-arid-2061)	Evaluation of green synthesized Silver Nanoparticles for Anti-fungal activity in Date palm fruit (*Phoenix dactylifera* L.)	2021
30	Sidra Khalid (19-arid-2063)	Assessment of green synthesized Silver Nanoparticles against fruit canker of Guava (*Psidium guajava*)	2021
31.	Efat Zohra (20-arid-1398)	Response of phytosynthesized multivariant micronutrient based nano-fertizer on bread wheat	2022
32.	Hammad ul Hassan (18-arid-1768)	Antimicrobial and Antioxidant potential of *Olea Ferruginea* mediated selenium nanoparticles	2022
33.	Muhammad Hasnain Waheed Malik (20-arid-1478)	Study the effect of CRISPR/cas9 based GBSS gene knockout in potato	2022
34	Habiba Ijaz (21-Arid-1701) Botany	Development of Nano-super solution to improve yield in wheat by foliar spray	2023
35	Sana Zarish (21-arid-1712) Botany	Development of insecticidal nano- composite solution to control termite losses in rice	2023
36	Iqra Ilyas (18-arid-1561) Biology	Development of Nano-biocidal spray to treat Bacterial disease in plants	2023

M. Phil. Students Supervising

S.No	**Student's Name**	**Thesis title (Short title)**	**Ex. Year of Completion**
1	Amna Mushtaq 22-arid-2209 (Biology)	Qualitative and quantitative analysis of Brassica Sp. after application of iron nanoparticles.	2024
2	Ibtesam Tahir Malik 19-arid-2564 (Biology)	Cytotoxic effect of Se/Fe/ Zn/ Ag/Cu/Ce Nanoparticles on shrimp's larvae.	2024
3	Nimra Sardar 22-arid-3776	Anti-diabetic activities of Zn nano particles synthesized from *Azadirachta indica*	2024
4	Muhammad Imran 22-arid-2113	Ethnobotanical study of selected medicinal plants of Neelum Valley as a threptic agents to manage diabetes.	2024
5	Sana Naveed 22-arid-2118	Green synthesized Se nanoparticles from *Hamilia hetromalla* and evaluation of their Anti-diabetic activities.	2024
6	Toshiba Sher (17-arid-2441)	Assessment of *in vitro* anti-diabetic activity of Zn-Se nanocomposites from *Justicia adhatoda*.	2025
7	Umama Iltaf (19-arid-2022)	Amplification of rooting by using nano-formulation in cuttings of selected fruiting plants.	2025
8	Muhammad Saeed (21-arid-121)	Evaluation of insecticidal potential of bio-fabricated Silver nanoparticles in *Zea mays* against armyworms fall disease.	2025
9	Um E Rubab (23-arid-1813)	Optimizing Plant Grafting via Nanoparticle-Mediated Delivery Systems for Growth Promoting Compounds	2025
10	Amna Ashraf (23-arid-1799)	In Vitro Assessment of Rooting and Shooting Capability: Aloe Vera-Based Nanoparticles as Novel Biostimulants for Plant Growth.	2025

Service Activity

- Presently Teaching at Department of Botany, PMAS Arid Agriculture University Rawalpindi as Associate Professor.
- HEC Approved Supervisor.
- Working on Nano-biotechnology to cope biotic and abiotic stresses in crop plants
- Worked as research fellow at Martin Luther university Halle-Wittenberg, Germany
- *Agrobacterium* mediated transformation for production of resistance against Bacterial Leaf Streak in six wheat varieties.
- Establishment of an efficient protocol for transformation of *Xa21* gene in wheat
- Microbial growth and Pathological studies for Bacterial diseases
- Plant tissue culture, micro-propagation and *In Vitro* techniques for Wheat, Rice, Banana, Canola, Tomato and Sugar Cane.
- DNA extraction, PCR analysis and Blotting techniques
- HPLC, IR-Spectroscopy and Atomic Absorption Spectroscopy
- Collection, Identification and taxonomy of local medicinal plants
- Isolation of Alkaloids and Flavonoids
- Uses of local Herbs for Liver diseases (Hepatitis etc.)

Research Interest

- Nano- Biotechnology
- Modern Agricultural Practices in Pakistan
- Plant Biotechnology (Production of Transgenic Crops)
- Proteomics (Stress tolerance Proteins)
- Genetic Engineering and Molecular Biology
- Plant Cell, Tissue and Organ Culture
- Biochemical Analysis of Medicinal Plants
- Radiobiology

Publications

2024

1. Ali A, Mashwani Z-u-R, **Raja NI**, Mohammad S, Ahmad MS, Luna-Arias JP (2024) Exposure of *Caralluma tuberculata* to biogenic selenium nanoparticles as *in vitro* rooting agent: Stimulates morpho-physiological and antioxidant defense system. PLoS ONE 19(4): e0297764. https://doi.org/10.1371/journal.pone.0297764. **IF.3.7**
2. Khan M, R Wali, Z-u-R Mashwani, **N I Raja**, R Ullah, A Bari, S Zaman. Nanowarriors from Mentha: Unleashing Nature's Antimicrobial Arsenal with Cerium Oxide Nanoparticles. *ACS Omega* **2024** *9* (13), 15449-15462. DOI: 10.1021/acsomega.4c00236 **IF.4.1**
3. Ali, H., Mahmood, I., Qadir, G.,**N I Raja**, F Abasi, M Ahmed, M F Ali, H Jawad & J Proćków. Synergistic effect of Paclobutrazol and silver nanoparticles (AgNPs) control the pod shattering in canola (Brassica napus L.) via physiological interferences: a mechanistic overview. Acta Physiol Plant 46, 42 (2024). https://doi.org/10.1007/s11738-024-03664-6 **IF.2.6**
4. Siddiqa A, Qureshi R, **Raja NI**, Khan IA, Ahmad MZ, Rafique S, Ali A, Ahmad A and Kaushik P (2024) Liver-boosting potential: chicory compound-mediated silver nanoparticles for

hepatoprotection—biochemical and histopathological insights. Front. Pharmacology. 15:1325359. doi: 10.3389/fphar.2024.1325359 **IF.6.3**

5. Shahbaz, M., Seelan, J. S. S., **Raja, N. I.,** Abasi, F., Fatima, N., Mehak, A., Raza, M. U., … Proćków, J. (2024). Nanotechnology for controlling mango malformation: a promising approach. Journal of Biomolecular Structure and Dynamics, 1–21. https://doi.org/10.1080/07391102.2024.2312449 **IF.4.4**
6. Iqbal, M., **Raja, N. I.,** Mashwani, Z. ur R., Yasmeen, F., Hussain, M., Ejaz, M., … Proćków, J. (2024). Insight into carbohydrate metabolism, protein quantification and mineral regulation in wheat (Triticum aestivum L.) by the action of green synthesized silver nanoparticles (AgNPs) against heat stress. Journal of Biomolecular Structure and Dynamics, 1–15. https://doi.org/10.1080/07391102.2024.2311333 **IF.4.4**

2023

7. Abasi, F., Raja, N. I., Ehsan, M., Ali, H., & Shahbaz, M. (2023). Heat and Wheat. Adaptation strategies with respect to heat shock proteins and antioxidant potential; an era of food security and climate change. International Journal of Biological Macromolecules, 128379. **IF.8.25**
8. Bibi, S., Raza, M., Shahbaz, M., Ajmal, M., Mehak, A., Fatima, N., ... & Maimaiti, Y. (2023). Biosynthesized silver nanoparticles enhanced wheat resistance to Bipolaris sorokiniana. Plant Physiology and Biochemistry, 203, 108067.**IF.6.26**
9. Ali, A., Mashwani, Z. U. R., Raja, N. I., Mohammad, S., & Luna-Arias, J. P. (2023). Phytomediated Selenium nanoparticles and light regimes elicited in vitro callus cultures for biomass accumulation and secondary metabolites production in Caralluma tuberculata. Frontiers in Plant Science, 14, 1253193.**IF 5.6**
10. Ejaz, M., Raja, N. I., Khan, S. A., Mashwani, Z. U. R., Hanif, A., Iqbal, M., ... & Rauf, A. (2023). Biosynthesized silver nanoparticles ameliorate biotic stress in rice (Oryza sativa) by intricating biochemical and mineral profile. Pak. J. Bot, 55(6), 2019-2028.**IF 1.03**
11. Sultana, T., Malik, K., Raja, N. I., Sohail, Hameed, A., Ali, A., ... & Alrefaei, A. F. (2023). Phytofabrication, characterization, and evaluation of novel bioinspired selenium–iron (Se–Fe) nanocomposites using Allium sativum extract for bio-potential applications. Green Processing and Synthesis, 12(1), 20230049. **IF.4.9**
12. Khan, M., Sohail, Raja, N. I., Asad, M. J., & Mashwani, Z. U. R. (2023). Antioxidant and hypoglycemic potential of phytogenic cerium oxide nanoparticles. *Scientific Reports*, *13*(1), 4514. **(IF 4.9)**
13. Zohra E., M. Ikram, N. I. Raja, Z.R. Mashwani, A. H. Mohamed, S. M. Zahedi, A. Abbas, A. A. Omar. 2023. Biotic Stress Management of Crop Plants using Nanomaterials. Chapter 3. Nanomaterial as Nanofertilizers. CRC Press. 1st Edi, https://doi.org/10.1201/9781003322122 **(Book Chapter)**
14. Siddiqa A, M. Ikram, E. Zohra, N. I. Raja, Z.R. Mashwani, A. H. Mohamed, S. M. Zahedi, A. Abbas, A. A. Omar. 2023. Biotic Stress Management of Crop Plants using Nanomaterials. Chapter 1. Overview of

Nanomaterials and their Synthesis. CRC Press. 1st Edi, https://doi.org/10.1201/9781003322122 **(Book Chapter)**

15. Raza U, M.; Abasi, F.; Shahbaz, M.; Ehsan, M.; Seerat, W.; Akram, A.; Raja, N.I.; Mashwani, Z.u.-R.; Hassan, H.U.; Proćków, J. 2023. Phytomediated Silver Nanoparticles (AgNPs) Embellish Antioxidant Defense System, Ameliorating HLB-Diseased 'Kinnow' Mandarin Plants. *Molecules*, *28*, 2044. https://doi.org/10.3390/molecules28052044 **(IF: 4.927)**
16. Rafique, N., Ilyas, N., Aqeel, M. et al. Interactive effects of melatonin and salicylic acid on Brassica napus under drought condition. Plant Soil (2023). https://doi.org/10.1007/s11104-023-05942-7 **(IF: 4.192)**
17. Shahbaz M, A. Akram,, N. I. Raja,, T. Mukhtar,, A. Mehak,, N. Fatima, M. Ajmal , K. Ali , N. Mustafa, F. Abasi. 2023. Antifungal activity of green synthesized selenium nanoparticles and their effect on physiological, biochemical, and antioxidant defense system of mango under mango malformation disease. Plos One. https://doi.org/10.1371/journal.pone.0274679 **(IF: 3.752)**
18. Badshah, I.; Mustafa, N.; Khan, R.; Mashwani, Z.-u.-R.; Raja, N.I.; Almutairi, M.H.; Aleya, L.; Sayed, A.A.; Zaman, S.; Sawati, L.; Sohail. Biogenic Titanium Dioxide Nanoparticles Ameliorate the Effect of Salinity Stress in Wheat Crop. *Agronomy* 2023, *13*, 352. https://doi.org/10.3390/agronomy13020352 **(IF: 2.24)**
19. Ahmad I., Z. Younas, Z.R. Mashwani, N.I. Raja, A Akram 2023. Phytomediated Selenium Nanoparticles Improved Physio-morphological, Antioxidant, and Oil Bioactive Compounds of Sesame under Induced Biotic Stress. ACS Omega, 8, 3, 3354–3366 https://doi.org/10.1021/acsomega.2c07084**(IF: 4.132)**

2022

20. Ali, A., Ahmad, I., Raja, N. I., Mohammad, S., & Khan, S. U. (2022). Plant in vitro cultures: A promising and emerging technology for the feasible production of antidiabetic metabolites in Caralluma tuberculata. Frontiers in Endocrinology, 13. (IF: 6.055)
21. Shahbaz M., N. Fatima, Z. R. Mashwani, A. Akram, A. Mehak, F. Abasi, M. Ajmal, T. Yousaf, N. I. Raja, H. UlHassan and J. M. P. Lastra. 2022. Effect of Phytosynthesized Selenium and Cerium Oxide Nanoparticles on Wheat (Triticum aestivum L.) against Stripe Rust Disease. Molecules. 27(23): 8149. https://doi.org/10.3390/molecules27238149 **(IF: 4.927)**
22. Ilyas A. Z. R. Mashwani, N. I. Raja, A. Kazmi, A. Wahab, A. Ali, Z. Younas, S. Yaqoob, M. Rahimi. 2022. "Comprehensive Approaches of Nanoparticles for Growth Performance and Health Benefits in

Poultry: An Update on the Current Scenario", BioMed Research International, vol. 2022, Article ID 9539908, 13 pages, https://doi.org/10.1155/2022/9539908. **(IF: 3.246)**

23. Ehsan, M.; Raja, N.I.; Mashwani, Z.U.R.; Zohra, E.; Abasi, F.; Ikram, M.; Mustafa, N.; Wattoo, F.H.; Proćków, J.; Pérez de la Lastra, J.M. Effects of Phytogenically Synthesized Bimetallic Ag/ZnO Nanomaterials and Nitrogen-Based Fertilizers on Biochemical and Yield Attributes of Two Wheat Varieties. *Nanomaterials* 2022, *12*, 2894. https://doi.org/10.3390/nano12172894 **(IF: 5.346)**
24. Hassan, H.U.; Raja, N.I.; Abasi, F.; Mehmood, A.; Qureshi, R.; Manzoor, Z.; Shahbaz, M.; Proćków, J. Comparative Study of Antimicrobial and Antioxidant Potential of Olea ferruginea Fruit Extract and Its Mediated Selenium Nanoparticles. *Molecules* 2022, *27*, 5194. https://doi.org/10.3390/molecules27165194 **(IF: 4.927)**
25. Mustafa, N.; Raja, N.I.; Ilyas, N.; Abasi, F.; Ahmad, M.S.; Ehsan, M.; Mehak, A.; Badshah, I.; Proćków, J. Exogenous Application of Green Titanium Dioxide Nanoparticles (TiO2 NPs) to Improve the Germination, Physiochemical, and Yield Parameters of Wheat Plants under Salinity Stress. Molecules 2022, 27, 4884. https://doi.org/10.3390/molecules27154884 **(IF 4.927)**
26. Satti, S. H., Raja, N. I., Ikram, M., Oraby, H. F., Mashwani, Z. U. R., Mohamed, A. H., ... & Omar, A. A. (2022). Plant-Based Titanium Dioxide Nanoparticles Trigger Biochemical and Proteome Modifications in Triticum aestivum L. under Biotic Stress of *Puccinia striiformis*. *Molecules*, *27*(13), 4274. **(IF: 4.927)**
27. Shahbaz, M., Akram, A., Raja, N. I., Mukhtar, T., Mashwani, Z. U., Mehak, A., ... & Yousaf, T. (2022). Green Synthesis And Characterization Of Selenium Nanoparticles And Its Application In Plant Disease Management: A Review. *Pakistan Journal of Phytopathology*, *34*(1), 189-102. **(IF 0.316)**
28. Khan, M., Mashwani, Z. U. R., Ikram, M., Raja, N. I., Mohamed, A. H., Ren, G., & Omar, A. A. (2022). Efficacy of Green Cerium Oxide Nanoparticles for Potential Therapeutic Applications: Circumstantial Insight on Mechanistic Aspects. *Nanomaterials*, *12*(12), 2117. **(IF: 4.921)**
29. Abasi, F., Raja, N. I., Mashwani, Z. U. R., Amjad, M. S., Ehsan, M., Mustafa, N., ... & Proćków, J. (2022). Biogenic Silver Nanoparticles as a Stress Alleviator in Plants: A Mechanistic Overview. *Molecules*, *27*(11), 3378. **(IF: 4.927)**
30. Ehsan, M., Waheed, A., Ullah, A., Kazmi, A., Ali, A., Raja, N.I., Mashwani, Z.U.R., Sultana, T., Mustafa, N., Ikram, M. and Li, H., 2022. Plant-Based Bimetallic Silver-Zinc Oxide Nanoparticles: A Comprehensive Perspective of Synthesis, Biomedical Applications, and Future Trends. *BioMed research international*, *2022*. **(IF: 2.583)**
31. Shah, S.M.D.M., Shabbir, G., Malik, S.I., Raja, N.I., Shah, Z.H., Rauf, M., Zahrani, Y.A., Alghabari, F., Alsamadany, H., Shahzad, K. and Yang, S.H., 2022. Delineation of Physiological, Agronomic and

Genetic Responses of Different Wheat Genotypes under Drought Condition. *Agronomy*, *12*(5), p.1056. **(IF: 2.24)**

32. Rafique, N., Ilyas, N., Aqeel, M., Raja, N.I. and Shabbir, G., 2022. Interactive Effects of Melatonin and Salicylic Acid on Brassica Napus Under Drought Condition.
33. A Ulfat, F Abasi, A Munir, A Rafaqat, SA Majid, NI Raja.2022. Sustainable Crop Productivity and Quality Under Climate Change. 157-169. **(Book Chapter)**
34. Ali, S., Qureshi, R., Raja, N.I. And Khan, M.A., 2022. Vegetation Composition And Biological Spectra Of The District Chakwal, Pakistan Using Multivariate Analyses. *Pak. J. Bot*, *54*(6), Pp.2241-2251. **(If: 1.1)**
35. Z. R. Mashwani,R. Wali, M. F. Khan, F.Abasi, N. Khalid, N. I. Raja. 2022. Medicinal Plants as Anti-Infectives Current Knowledge and New Perspectives . Chapter 6 - Antibacterial activity of some selected medicinal plants of Pakistan. 2022, Pages 209-234. **(Book Chapter)**
36. Ikram,M., N. I. Raja, Mashwani Z.U.R, Omer A.A, Mohamad A. H, Satti. S. H and Zohara, E. 2022. Phytogenic Selenium Nanoparticles elucidated the physiological, biochemical and antioxidant defense system amelioration of Huanglongbing infected Kinnow Mandarins plants. *Nanomaterials*. 12(3). 356 **IF: 5.067**

2021

37. Mustafa, H., N. Ilyas, N. Akhtar, N. I. Raja, T. Zanib, T. Shah, A. Ahmad and P. Ahmad. (2021). Biosynthesis and characterization of titanium dioxide nanoparticles and its effects along with calcium phosphate on physicochemical attributes of wheat under drought stress. Ecotoxicology and Environmental Safety 223(1):112519. DOI: 10.1016/j.ecoenv.2021.112519 **IF. 6.291**
38. Anum, F., **N. I. Raja**, T. Sultana, A. Kazmi, A. Ali, B. Qayyum, A. Afzal, A. Nijibat, Z. R. Mishwani. 2021. Spectral Lights Based Treatment Enhanced Biomass Accumulation and Secondary Metabolites Production in Callus Culture of Citrus reticulate. Philippine Agricultural Scientist 104(3):287-298. **IF. 0.368**
39. Zohra, E., M. Iram, A.A. Omar, M. Hussain, S. H. Satti, **N. I. Raja**, Z. R. Mishwani and M. Ehsan. 2021. Potential applications of biogenic selenium nanoparticles in alleviating biotic and abiotic stresses in plants: A comprehensive insight on the mechanistic approach and future perspectives. Green Processing and Synthesis 10(1):456-475 DOI: 10.1515/gps-2021-0047 **IF. 2.83**
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Research Grants and Contracts

1. Green synthesis and evaluation of silver nanoparticles for antimicrobial and biochemical profiling in Kinnow (Citrus reticulata L.) to enhance fruit quality and productivity under biotic stress. Funding Program: National research program for universities (NRPU) Research grants. Funding Agency: HEC, Worth: 2.22 million PKR Duration: 3 years Status: Awarded as PI (**2018 completed in 2023**)
2. Physio-morphic and biochemical characterization of wheat varieties in response to silver-based nanoparticles against heat stress Funding Program: National research program for universities (NRPU) Research grants.

Funding Agency: HEC, Worth: 2.32 million PKR Duration: 3 years Status: Awarded as PI (**2017 completed in 2023**)

3. Nanoparticles Assisted Production of Algal Biomass for Bioethanol Formation. Funding agency: PMAS AAUR ORIC, Worth: 0.212 million, Duration: 1 year, Status: Awarded as PI (**2018 completed in 2019**)
4. In vitro response of Citrus reticulata by application of Green Silver Nano-particles for the production of Disease free plants. Funding agency: PMAS AAUR ORIC, Worth: 0.16 million, Duration: 1 year

Status: Completed as PI (**2017 completed in 2019**)

5. Evaluation of anti-bacterial and anti-fungal activities of green silver nano-particles synthesized from *Citrus reticulata* L. Funding agency: PMAS AAUR ORIC, Worth: 0.17 million, Duration: 1 year Status: Completed as PI (**2011 completed in 2012**)
6. Correlation of percentage disease resistance with level of gene expression in transgenic wheat with *Xa21* gene. Funding agency: HEC, Worth: 0.5 Million Duration: 1 year Status: Completed as PI **(2011 completed in 2013)**

Projects details as PI (Submitted)

1. Differential role of phyto-mediated Se/Fe Nanocomposite on wheat in response to heat stress. A case study on climate change in Pakistan. Project ID: 1136. Submitted to: ALP, PARC, Submitted on 01-06-2023 Proposed Budget: 9.22 Million PKR.

2. Evaluating the Effect of Heat Stress by using photosynthesized Se/Fe Nanocomposite on wheat. Project ID: CP-1-2023-103-QG6Z. Submitted to: PSF, Submitted on 12-07-2023 Proposed Budget: 8.46 Million PKR.
3. Growth and yield responses of bread wheat to green synthesized super-nanofertilizers. PAKISTAN SCIENCE FOUNDATION UNDER NSLP ENDOWMENT FUND. 4 m
4. Production and evaluation of chitosan-metal nanocomposites / nano-agrochemicals to control rust of wheat and other crops.**PARC, ALP. Worth: 4.085 million** (submitted on 11th March, 2023)
5. Formulation and Application of Super-Nanofertilizers on Wheat. **Endowment Fund Secretariat, UAF Worth: 2.86 million** (submitted on 25th July, 2023).
6. Control of aflatoxins in rice, by application of silver nano-particals. **ORIC, PMAS-UAAR. Worth: 0.28 million** (submitted on 6th August, 2022)

7. Green synthesis and evaluation of silver nanoparticles for antimicrobial and biochemical profiling in Kinnow (Citrus reticulata L.) to enhance fruit quality and productivity under biotic stress. Funding Program: National research program for universities (NRPU) Research grants. Funding Agency: HEC, Worth: 2.22 million PKR Duration: 3 years Status: Awarded as PI (**2018 completed in 2023**)
8. Physio-morphic and biochemical characterization of wheat varieties in response to silver-based nanoparticles against heat stress Funding Program: National research program for universities (NRPU) Research grants. Funding Agency: HEC, Worth: 2.32 million PKR Duration: 3 years Status: Awarded as PI (**2017 completed in 2023**)
9. Nanoparticles Assisted Production of Algal Biomass for Bioethanol Formation. Funding agency: PMAS AAUR ORIC, Worth: 0.212 million, Duration: 1 year, Status: Awarded as PI (**2018 completed in 2019**)
10. In vitro response of Citrus reticulata by application of Green Silver Nano-particles for the production of Disease free plants. Funding agency: PMAS AAUR ORIC, Worth: 0.16 million, Duration: 1 year

Status: Completed as PI (**2017 completed in 2019**)

11. Evaluation of anti-bacterial and anti-fungal activities of green silver nano-particles synthesized from *Citrus reticulata* L. Funding agency: PMAS AAUR ORIC, Worth: 0.17 million, Duration: 1 year Status: Completed as PI (**2011 completed in 2012**)
12. Correlation of percentage disease resistance with level of gene expression in transgenic wheat with *Xa21* gene. Funding agency: HEC, Worth: 0.5 Million Duration: 1 year Status: Completed as PI **(2011 completed in 2013)**

Projects details as PI (Submitted)

7. Differential role of phyto-mediated Se/Fe Nanocomposite on wheat in response to heat stress. A case study on climate change in Pakistan. Project ID: 1136. Submitted to: ALP, PARC, Submitted on 01-06-2023 Proposed Budget: 9.22 Million PKR.

8. Evaluating the Effect of Heat Stress by using photosynthesized Se/Fe Nanocomposite on wheat. Project ID: CP-1-2023-103-QG6Z. Submitted to: PSF, Submitted on 12-07-2023 Proposed Budget: 8.46 Million PKR.
9. Growth and yield responses of bread wheat to green synthesized super-nanofertilizers. PAKISTAN SCIENCE FOUNDATION UNDER NSLP ENDOWMENT FUND. 4 m
10. Production and evaluation of chitosan-metal nanocomposites / nano-agrochemicals to control rust of wheat and other crops.**PARC, ALP. Worth: 4.085 million** (submitted on 11th March, 2023)
11. Formulation and Application of Super-Nanofertilizers on Wheat. **Endowment Fund Secretariat, UAF Worth: 2.86 million** (submitted on 25th July, 2023).

12. Control of aflatoxins in rice, by application of silver nano-particals. **ORIC, PMAS-UAAR. Worth: 0.28 million** (submitted on 6th August, 2022)

Projects details as Co-PI (Submitted)

1. Biofortification of Wheat with Nano Zinc and Iron. **Endowment Fund Secretariat, UAF Worth: 3.582 million** (submitted on 25th July, 2019).

2. Response of Tomato To Foliar Application Of Salicylic Acid And Zinc Nano Particle **ORIC, PMAS-UAAR. Worth: 0.295 million**

3. Phytogenic Selenium Nanoparticles for biofortification and mitigation of drought stress in Wheat. Funding Program: National research program for universities (NRPU) Research grants. Funding Agency: HEC, Worth: **6.88** million PKR Duration: 3 years Status: Submitted as Co-PI (**2019**)

Projects details as Co-PI (Submitted)

4. Biofortification of Wheat with Nano Zinc and Iron. **Endowment Fund Secretariat, UAF Worth: 3.582 million** (submitted on 25th July, 2019).

5. Response of Tomato To Foliar Application Of Salicylic Acid And Zinc Nano Particle **ORIC, PMAS-UAAR. Worth: 0.295 million**

6. Phytogenic Selenium Nanoparticles for biofortification and mitigation of drought stress in Wheat. Funding Program: National research program for universities (NRPU) Research grants. Funding Agency: HEC, Worth: **6.88** million PKR Duration: 3 years Status: Submitted as Co-PI (**2019**)

Research or Creative Accomplishment

6. Silver nanoparticles formula for controlling aflatoxin level in rice grain (Receipt no 2203044655) (**2022)**
7. Bio-formulated silver nanoparticles for controlling canker in Citrus reticulate L.(**2022)**
8. Nanofertilizers for improvement of seed quality and fatty acid profile in Canola **(2022)**
9. Six transgenic wheat varieties for4 Bacterial disease resistance (**2011**)
10. Establishment of an efficient protocol for transformation of *Xa21* gene in wheat

Professional Presentations

1. **5th Plant Science Student Conference, 2009** at Leibniz Institute of Plant Biochemistry Halle, Germany (23-26 June 2009)
2. **20th FAOBMB Symposium in Genomics** organized at PMAS-AAUR (17-20 December 2008)
3. **1st International Seminar on Medicinal Plants conference** at Dept. of Organic Chemistry, Lahore College for Women University (21-23 May 2008)
4. **International Conference of Plant Scientists (10th National Meeting of Plant Scientists)** organized by The Pakistan Botanical Society, UoA, Faisalabad (21-24th April 2008)
5. **National Conference on "Recent Advances in Agriculture Biotechnology"** held on18-19 March 2008 at Pakistan Academy of Sciences, Islamabad.
6. **Third International Symposium on Biotechnology** 14-17 Dec 2005, Sindh University, Jamshoro.
7. **18th FAOBMB Symposium "Genomics and Proteomics in Health and Agriculture"** organized by Punjab University Lahore (20-23 Nov 2005)
8. **Biodiversity of Northern Areas of Pakistan** 7-10 March 2004, HEC Auditorium, Islamabad.
9. **Third National and First International Conference of Plant Scientists (Pakistan Botanical Society)** organized by University of Arid Agriculture, Rawalpindi (23-27 June 2003)
10. Genetic Engineering, its potentials and future impacts on plants improvements. 26th January, 2017. Department of Botany. Govt. Gordon College, Rawalpindi.
11. Moral values and Education. 11 December, 2018. Green Leads School System. Dhoke Syedan Campus, Rawalpindi on occasion of Inauguration Ceremony.
12. 4th Invention to Innovation Summit, KP, 22-23 November, 2018, CECOS university Peshawar
13. 2nd International Science conference on Natural Science, climate & biodiversity,15-17 September, 2018. UAJ &K, and HEC.

14. 2nd International conference "Conservation of Medicinal and Aromatic plants for improving the livelihood of mountain communities through industrial linkage" 03-05 September, 2018. University of Sawat, Mangora. WWF and HEC
15. Particle Distribution Techniques and Elemental Concentration EDXRF seminar. 25th April, 2018. Rawalpindi chamber of Commerance and Industries, Rawalpindi. Horiba Scientific.
16. Zafer, M. H., N. I. Raja And U. Rashid. 2022.Green Synthesis And Foliar Application Of Selenium Nanoparticles To Improve Physiological And Biochemical Profiling Of Haunglongbing Infected Mandarin Plants. Conference: 1st International Conference (Online) Trends and Research in Chemistry (TRIC 2022). At: Department of Chemistry, University of Education Lahore
17. International conference on "**Urban Horticulture" Global scenario and local prospects 23 & 24th** June **2022**
18. Global Science, Technology and Management conference (GSTMC-2023), 09-11 Febuary, 2023, Islamia University Bahawalpur.
19. International conference on Food and applied sciences (ICFAS-2023) 03-05, August, 2023, Shaheed Benazir Bhutto University Sherigal (Dir), KPK. Pakistan
20. Fifth international conference on Emerging trends in bioinformatics and biosciences (ICETBB-2023) 14-16, September, 2023 Hazara University Mansehra, KPK. Pakistan

9th International and 18th National conference on Biodiversty and Medicinal Plants: A way forward for Sustainable Development. 14-16 December, 2023. Department of Botany, PMAS Arid Agriculture university Rawalpindi (as Organizer tea

Dr.Saira Asif

Name	**Dr. Saira Asif**
Personal	Assistant Professor, Department of Botany, PMAS, Arid Agriculture University, Rawalpindi, Pakistan. E-mail:, sairaasif@uaar.edu.pk Contact: +923340510179 (Cell); +92-51-9290093 (landline)
Experience	Dec 2021 to till date **Assistant Professor,** Department of Botany, PMAS, Arid Agriculture University, Rawalpindi, Pakistan May 2021 to April 2022: Working as a **Post Doctorate Research Fellow** in Brno University of Technology, Brno, Czech Republic, EU. September 2008 to December 2021 **Lecturer,** Department of Botany, PMAS, Arid Agriculture University, Rawalpindi, Pakistan
Awards and Honors	• Life Time Member of Pakistan society of Botany • Awarded as an Outstanding Reviewer by Elsevier in year 2016, 2017 and 2018. • Won Technology Award and PKR 25000 cash price for first price of poster presentation in "8th Invention to Innovation Summit 2019" at University of the Punjab, Lahore, 02-03 April, 2019.

Graduate Students Postdocs Undergraduate Students Honour Students	**Ph.D (Under Supervision)** 03 **M. phil produced** 12 **M. Phil (under supervision)** 08
Service Activity	***A) Courses Taught*** ***Course Title/code*** ***PhD/MPhil/MSc*** BOT 726 M.Phil BOT 704 M.Phil BOT 502 M.sc BOT 504 M.sc BOT 507 M.sc BOT 303 M.sc
Brief Statement of Research Interest	Biofuel production; Cleaner process development; Process Intensification technologies; Hydrodynamic cavitation; Ultrasonics; Biomass conversion; Energy; Sustainable Engineering; Non-edible oils; Biodiesel synthesis, heterogeneous catalyst development, life cycle energy assessment and social-economic impact of biofuel.
Publications	**1.** Bibi, F., Ishtiaq Ali, M., Ahmad, M., Bokhari, A., Shiong Khoo, K., Zafar, M., **Asif, S.,** Mubashir, M., Han, N., Loke Show, P., 2022. Production of lipids biosynthesis from *Tetradesmus nygaardii* microalgae as a feedstock for biodiesel production. Fuel 326, 124985. **2.** Dawood, S., Ahmad, M., Zafar, M., **Asif, S.,** Klemeš, J.J., Bokhari, A., Mubashir, M., Han, N., Ibrahim, M.M., El-Bahy, Z.M., Khoo, K.S., 2022. Biodiesel synthesis from Prunus bokhariensis non-edible seed oil by using green silver oxide nanocatalyst. Chemosphere 291, 132780. **3.** Gul, S., Ahmad, Z., Asma, M., Ahmad, M., Rehan, K., Munir, M., Bazmi, A.A., Ali, H.M., Mazroua, Y., Salem, M.A., Akhtar, M.S., Khan, M.S., Chuah, L.F., **Asif, S.,** 2022. Effective adsorption of cadmium and lead using SO3H-functionalized Zr-MOFs in aqueous medium.Chemosphere 307, 135633. **4.** Hou, J., Shen, Z., Tan, X., Ali, T.E., Assiri, M.A., **Asif, S.,** Han, N., 2022. Transition metal oxide-based membranes for oxygen separation. Chemosphere 308, 136272. **5.** Khan, R.A., Khan, N.A., El Morabet, R., Alsubih, M., Qadir, A., Bokhari, A.,

Mubashir, M., **Asif, S.,** Cheah, W.Y., Manickam, S., Klemeš, J.J., Khoo, K.S., 2022. Geospatial distribution and health risk assessment of groundwater contaminated within the industrial areas: an environmental sustainability perspective. Chemosphere 303, 134749.

6. Li, Z., Gao, X., Li, M., Yan, Q., Zhang, N., Yu, B., Zhang, B., Zhang, S., Helal, M.H., Abu Ali, O.A., Nassan, M.A., Qyyum, M.A., **Asif, S.,** Bokhari, A., 2022. Steroid hormone-inducible biosensor based on EGFP-tagged and environmental application. Environmental Research, 114303.

7. Mukhtar, A., Saqib, S., Lin, H., Hassan Shah, M.U., Ullah, S., Younas, M., Rezakazemi, M., Ibrahim, M., Mahmood, A., **Asif, S.,** Bokhari, A., 2022. Current status and challenges in the heterogeneous catalysis for biodiesel production. Renewable and Sustainable Energy Reviews 157, 112012.

8. Nawaz, S., Ahmad, M., **Asif, S.,** Klemeš, J.J., Mubashir, M., Munir, M., Zafar, M., Bokhari, A., Mukhtar, A., Saqib, S., Khoo, K.S., Show, P.L., 2022. Phyllosilicate derived catalysts for efficient conversion of lignocellulosic derived biomass to biodiesel: A review. BioresourceTechnology 343, 12606.

9. Rozina, Ahmad, M., **Asif, S.,** Klemeš, J.J., Mubashir, M., Bokhari, A., Sultana, S., Mukhtar, A., Zafar, M., Bazmi, A.A., Ullah, S., Khan, M.S., Koyande, A.K., Mofijur, M., Show, P.-L., 2022a. Conversion of the toxic and hazardous Zanthoxylum armatum seed oil into methyl ester using green and recyclable silver oxide nanoparticles. Fuel 310, 122296.

10. Rozina, Chia, S.R., Ahmad, M., Sultana, S., Zafar, M., **Asif, S.,** Bokhari, A., Nomanbhay, S., Mubashir, M., Khoo, K.S., Show, P.L., 2022b. Green synthesis of biodiesel from Citrus medica seed oil using green nanoparticles of copper oxide. Fuel 323, 124285.

11. Tan, X., Alsaiari, M., Shen, Z., **Asif, S.,** Harraz, F.A., Šljukić, B., Santos, D.M.F., Zhang, W., Bokhari, A., Han, N., 2022. Rational design of mixed ionic–electronic conducting membranes for oxygen transport. Chemosphere 305, 135483.

12. Wang, Q., Han, N., Bokhari, A., Li, X., Cao, Y., **Asif, S.,** Shen, Z., Si, W., Wang, F., Klemeš, J.J., Zhao, X., 2022. Insights into MXenes-based electrocatalysts for oxygen reduction. Energy 255, 124465.

13. Chuah L.F., Bokhari A., **Asif S.,** Klemeš J.J., Dailin D.J., Enshasy H.E., Yusof A.H.M., 2022, A Review of Performance and Emission Characteristic of Engine Diesel Fuelled by Biodiesel, Chemical Engineering Transactions, 94, 1099-1104.

14. Qadeer, M.U., Ayoub, M., Komiyama, M., Daulatzai, M.U.K., Mukhtar, A., Saqib, S., Ullah, S., Qyyum, M.A., **Asif, S.**, Bokhari, A., (2021). Review of Biodiesel Synthesis Technologies,Current Trends, Yield Influencing Factors and Economical Analysis of Supercritical Process. Journal of Cleaner Production 309, 127388.

15. **Asif S.,** Klemeš J.J., Bokhari A., Chofreh A.G., 2021, Pilot Scale Intensification of Pistacia Khinjuk Oil via Chemical Interesterification using Hydrodynamic Cavitation Technology, Chemical Engineering Transactions, 89, 277-282.

16. Bokhari A., Klemeš J.J., **Asif S.,** 2021, Aeration Supported Process Intensification of Waste Water for Degradation of Benzene in an Orifice Type Hydrodynamic Cavitation System, Chemical Engineering Transactions, 88, 949-954.

17. Chuah L.F., Klemeš J.J., Bokhari A., **Asif S.,** 2021, A Review of Biodiesel Production from Renewable Resources: Chemical Reactions, Chemical Engineering Transactions, 88, 943-948.

18. Dawood, S., Koyande, A.K., Ahmad, M., Mubashir, M., **Asif, S**., Klemeš, J.J., Bokhari, A., Saqib, S., Lee, M., Qyyum, M.A., Show, P.L., (2021). Synthesis of biodiesel from non-edible (Brachychiton populneus) oil in the presence of nickel oxide nanocatalyst: Parametric and optimisation studies. Chemosphere 278, 130469.

19. Shabir, S., Ilyas, N., **Asif, S.,** Iqbal, M., Kanwal, S., Ali, Z., 2021. Deciphering the Role of Plant-Derived Smoke Solution in Ameliorating Saline Stress and Improving Physiological, Biochemical, and Growth Responses of Wheat. Journal of Plant Growth Regulation. https://doi.org/10.1007/s00344-021-10473-5.

20. **Asif, S.,** Mubashir, M., Klemeš, J.J., Saqib, S., Mukhtar, A., Bokhari, A., Lukose, J., Koyande, A.K., Chew, K.W., Show, P.L., 2021. Enhanced production of non-edible Xanthium spinosum- based biodiesel using waste biomass under dynamic conditions. Biomass Conversion and Biorefinery. https://doi.org/10.1007/s13399-021-01804-3.

21. Munir M., Ahmad M., Mubashir M., **Asif S**., Waseem A., Mukhtar A., Saqib S., Munawaroh S.H.S., Lam M.K., Khoo S.K., Bokhari A., Show P.L., (2021). A practical approach for synthesis of biodiesel via non-edible seeds oils using trimetallic based montmorillonite nano-catalyst, Bioresourse Technology 328, 124859.

22. Ahmad M.S., Klemeš J.J., Alhumade H., Elkamel A., Shen B., Mahmood A.,

	Ibrahim M., Mukhtar A., Saqib S., **Asif S.**, Bokhari A., (2021) Thermo-Kinetic Study to Elucidate the Bioenergy Potential of Maple Leaf Waste (MLW) by Pyrolysis, TGA and Kinetic Modelling, Fuel 293, 120349. **23.** Amen R., Hameed J., Albashar G., Kamran H.W., Shah M.U.H., Zaman M.K.U., Mukhtar A., Saqib S., Ch S.I., Ibrahim M., Ullah S., Al-Sehemi A.G., Ahmad S.R., Klemeš J.J., Bokhari A., **Asif S.**, (2021) Modelling the higher heating value of municipal solid waste for assessment of waste-to-energy potential: A sustainable case study, Journal of Cleaner Production 287: 125575. **24.** Ullah, S., Al-sehemı, A. , Klemeš, J.J. , Saqıb, S. , Gondal, S. , Saqıb, S. , Arshad, A. , Saqıb, S. , Mukhtar, A. , Ibrahım, M. , **Asıf, S.**, Bokharı, A. "A Review of the Progress of COVID-19 Vaccine Development". Duzce Medical Journal 23 (2021): 1-23 **25. Asif, S.,** Klemeš, J.J., Mukhtar, A., Saqib, S., Chuah L.F., Bokhari, A., (2021). Intensification of Biodiesel Synthesis in a Cavitation System from Xanthium Spinosum Oil. Chemical Engineering Transactions. Scopus Indexed. https://www.aidic.it/icheap15/programma/115asif.pdf
Research grants and contracts	**Research Projects (Completed) = 0** **Research Projects (Submitted) = 0**
Other research or creative accomplishments	**Seminar Organized** • Organizer in 9th International and 18th National Conference on Biodiversity and Medicinal Plants: A Way Forward to Sustainable Development held on December 14-16, 2023 at PMAS-Arid Agriculture University Rawalpindi, organized by Weed Science Society of Pakistan and PMAS-Arid Agriculture University Rawalpindi.

Dr.Abida Akram

Name	**Abida Akram**
Personal	**CNIC**: 37405-2924797-2 **Office Phone**:92-051-9292117 **Cell.** 92-333-5320262 **E-mail**: abidauaar@hotmail.com Cello m

	Address:	Cello, Primarily Shah, Primarily, Rawalpindi
Courses taught		**B.Sc. (Hons)** • General Botany. • Plant Ecology • Plant Physiology **BS (Forestry)** • GeneralBiology-1 • General Biology-II **M.Sc. Botany** • Morphology of non- vascular plants, Bacteria and Virus • Environmental Pollution • Plant Physiology • Arid Zone Ecology

	• Economic Botany • Forensic Botany • Mycology and Plant Pathology • Plant Microbe Interactions **M.Sc. Biology** • Environmental Biology • Biodiversity • Mycology and Plant Pathology **M.Phil./Ph.D Botany&Biology** • Plant Microbe Interaction • Forensic Botany **M.B.A(Agri-business)**

M. Phil thesis supervised	• Role of Plant based Nanoparticles on Growth of Wheat under Biotic Stress • Evaluation of Green Synthesized Silver Nanoparticles on Disease incidence Against Canker in Mandarin • Integrated impact of oil seed cakes and biocontrol agents for management of • Root Knot Nematodes • Aflatoxin contamination in Barley and its products. • Assessment of Aflatoxin in Wheat and its Associated products • Pathological evaluation of secondary metabolites produced by Fusarium sp. isolated from Sesame. • Impact of some abiotic factors on *in vitro* development of Alternaria sp. Isolated from Sesame • Establishment of an efficient protocol for plantlet's regeneration via direct and indirect organogenesis in *Vitis vinifera* L. • Pathological evaluation of secondary metabolites produced by Alternaria sp. isolated from Sesame • Study of some mushrooms collected from Islamabad for their antioxidant activity • Histopathological studies of sesame seedlings infected with *Alternaria*spp.

	• *In vitro* evaluation of different bio-agents against *Sclerotium rolfsii* Sacc. • Soil myco flora of Bhoman Batth Tehsil Wazirabad, Gujranwala. • Assessment of antifungal efficacy of selected spices against *Aspergillus* spp. • Prevalence of fungal contamination in various drinking water sources.	
		Histopathological studies of chickpea seedling infected with *Sclerotium rolfsii*
		Myco flora associated with seeds of Sesame (*Sesamum indicum* L.) from Sialkot and its management
		Molecular characterization of fungal isolates and afla toxins contamination in chickpea flour
		Evaluation of *Pongamia pinnata* products against the *Sclerotium rolfsii* extracted from chickpea.
		Histo pathological studies of chickpea seedling infected with *Fusarium* Spp.
		Identification and ethnological study of mushrooms collected from Soon Valley
		Effect of seed-born myco flora of Lentil on their mycotoxin and nutritional profile
		Nutritional profile, myco flora assessment and aflatoxin contamination in chickpea
		Molecular characterization of Sclerotium *rolfsii* Sacc.isolated from chickpea
		Screening of Pothowar region grasses for their allelopathic effect

	□	Evaluation of intraspecific relationship of *Solanum melongenna* L. and *Lycopersicon esculantum* Miller basedon SDS-PAGE.
	□	Evaluation of allelopathic activity of some leguminous plants
	□	Preliminary screening of some higher plants for evaluation Of their allelopathic potential.
Ph.D thesis supervised	• Isolation of Alternaria and Fusarium spp., their pathogenesis and Pathogenesis related proteins with Sesame (*Sesame indicum* L.) • Integrated management of myco toxins in Red chilli. • Exploration of mechanism of action of *Aspergillus* and *Fusarium*spp. in Sesame. • Isolation and characterization of toxigenic and atoxigenic strains of *Aspergillus flavus* in maize. • QTL Mapping of *Aspergillus flavus* resistance in Chilli (*Capsicum annum*).	
Ph.D thesis co-supervised	Nil	
Publications (Nonimpact factor)	• Nayyar, B. G., **A.Akram**, S. Akhund, W. Seerat and S. Sadia. 2016. Comparative Efficacy of physico-chemical and biological treatments on seed germination and myco flora of *Sesamum indicum* L. Sc., Tech. and Dev. 35 (4): 171-178.□ • Sultana,K.,M.I.Bhatti,**A.Akram**,G.Irshad,M.I.Mastoiand□	
		M. Jiskani. 2015. Check list of mushrooms Asco. And Gasteromycetes of Kaghan Valley III. Sci.Int. (Lahore), 27(6), 6199-6205

		Ajmal, M., **A. Akram,** A. Ara, S. Akhund and B. G. Nayyar. 2015. *Morchella esculenta* : An edible and health beneficial mushroom.Pak. J of F. Sc 25(2): 71-78
		Hussain, A., S. M. Iqbal, Q. Abbas and **A. Akram.** 2008. Morophological variablity of *Sclerotium rolfsii*Sacc. Pak. J. Phytopath. 20 (2): 241-244
		Shahid, A. K., S. M. Iqbal and **A. Akram.** 2006. In vitro efficacy
		of plant extracts against *Sclerotium rolfsii* Sacc. Mycopath. 4(1):1-4
		Ali. R. J., S. M. Iqbal, C. A. Rauf and **A. Akram.** 2005. Studies on the pathogenic variability in *Ascochyta pisi*. International Journal of Agriculture and Biology. 7(2): 272- 274.
		Akram, A., S. M. Iqbal, S. Riaz and C. A. Rauf. 2004. In vitro evaluation of fungicides against *Fusarium oxysporum* f. sp ciceri. Mycopatah.2(2): 61-63
		Iqbal, S. M., A. R. Jamali, C. A. Rauf and **A. Akram.**2001. Screening of Pea (*Pisum sativum* L.) germplasm against blight disease caused by *Ascochyta Pisi.* Pak. J., Phyt. Path. 1(13): 1355-1357.
		Yasmin. A., **A. Akram,** F. Hassan, M. S. Naeem and M. Saqib. 2011. Preliminary screening of some higher plants for evaluation of their allelopathic potential.Crop & En. 2(2):52- 59
		Gul. B., S. M. Iqbal, **A. Akram** and U. Iqbal. 2007. Biological control of soil borne pathogens in chickpea (*Cicer arietinum L*.Proceeding of International conference (March 20-22, 2007) on Achieving sustainable pulses production in Pakistan, organized by Agricultural Foundation of Pakistan

		Gul. B., S. M. Iqbal, **A. Akram** and U. Iqbal. 2007. Chemical control of soil borne pathogens in chickpea (*Cicer arietinum* L.)Proceeding of International conference (March 20-22, 2007) on Achieving sustainable pulses production in Pakistan, organized by Agricultural Foundation of Pakistan
		Pervaiz,S.,R.Asghar.,M.Ahmad,**A.Akram,**A.Kanwala nd M.J.Noor.2005.Palynological study of wildplant species of University of Arid Agriculture,Rawalpindi, Pakistan. Hamdard Medicus. XLVIII,1 (5-9)
		Akram,A.,G.JilaniandM. Akram.2003.Responseofcotton
		To the synergistic & growth regulations. AsianJ.PlantSci. 2(13): 974-977.
		Asghar,R**.,**M.Ahmad**,**M. Zafar**,A.Akram,**J.Mahmoodand M. Hassan. 2003. Antibacterial efficiency of *Acacia modesta* Wall Miswak Against dental Pathogen. Pak .J Boil. Sci. 6(24): 2024-2025
		Bokhari, S. Y.A., Zafar, M., M.A. Tariq. and **A. Akram.**2003. Taxonomical descriptionand ethno-botanical survey for indigenous use of some medicinal plants of Rawalpindi District. As. J. of pl. Sci. 2(6): 475-479.
		Arshad, M. and **A. Akram.** 1999. Soil Fertility Problems in Central RachnaDoab.Pak.JournalBiol.Sci.2(4):1355- 1357.
Research Interest		Mycology & Plant Pathology
		Morphological & Genetic variability in Fungi
		Mycoflora and Mycotoxins Management

	□	Characterization of Oyster mushrooms
	□	Fungal Secondary Metabolites
	□	Anti microbial activity of Plants& Bio agents
Impact factor Publications	□	Laala, G., M. U. Raja, S. R. A. Gardezi, G. Irshad, **A. Akram** and I. Bodlah. 2019. Study ofmacrofungi belonging to order agaricales of Poonch District Azad Jammu and Kashmir (AJK). Pure Appl. Biol. 8(1): 27-33.□
	□	http://dx.doi.org/10.19045/bspab.2018.700160□
	□	Nayyar, B. G., S. Woodward, L. A. J. Mur, **A. Akram,** M. Arshad, S. M. S. Naqvi, S. Akhund. 2018. Identification and pathogenicity of Fusarium species associated with sesame (*Sesamum indicum* L.) seeds from the Punjab, Pakistan Physiological and Molecular Plant Pathology (102) 128-135. **Impact Factor1.395**□
	□	**Akram, A.,** P.Amber, S. M. Iqbal, R. Qureshi, A. Javed, S. Mukhtar. 2017. RAPD based characterization of chickpea isolates of *Sclerotium rolfsii*. Pak. J. Bot., 49(5): 2015-2022**.** **Impact. Factor 0.69**□
	□	Akhund, S., **A. Akram**, N. Q. Hanif,R. Qureshi, F. Naz, B. G. Nayyar. 2017. Pre-harvest aflatoxins and *Aspergillus flavus* contamination in variable germplasms of red chillies from Kunri, Pakistan. Mycotoxin Res. 33:147–155.□
	□	DOI10.1007/s12550-017-0274-1.**Impactfactor2.00**□
	□	Ara A., **A. Akram**, M. Ajmal, S .Akhund, B.G. Nayyar, BG W. SeeratandS.Mukhtar.2017.Histo pathological

		studiesof
		sesame(*Sesamumindicum*L.)seedlings infected with *Fusarium oxysporum*.Pl.Path.&Quar.7(1):82–90(2017)
		Hussain, M.N. I. Raja,**A.Akram** , A. Iftikhar, D.Ashfaq , F. Yasmeen, R. Mazhar, M. Imran, M.Iqbal. 2017. A status review on the pharmacological implications of Artemisia absinthium: Acritically endangered plant .AsianPac. J. Trop Dis; 7(3): 185-192
		Shabbir,Z.,S. Latif,S. Talib,M. Hussain,M. Ali,M. W. Yasir, **A.**
		Akram, U. M. Quraishi. 2017. Exploring novel diversity for biofortification in Elite D-genome synthetic hexaploidy wheat(AABBDD).Int.J.Biosci.1(1)100-108. **Impactfactor0.553**
		Akhund.S.,**A.Akram**,R.Qureshi,F.Naz,N.Q.Hanif,B. G. Nayyar. 2016. Natural occurrence of multiple fungi in variable germplasms of Red chillies from Kunri,Pakistan,Int. J.Biosci.9(6)213-225.**Impactfactor 0.553**
		Sabir, S.,**A. Akram,**N. I. Raja, Z. R. Mashwani, Sohail,H. M. Sadaf, M. Hussain, I. Riaz, N. Ahmad and E. Ahmed. 2016. A probe into the medicinal potential of *Viola canescens* – A threatened medicinal plant from Himalaya. J. Coas. L. Medi. 2016; 4(7): 575-579.

		Qureshi,H.,M.Arshad,**A.Akram**,N.I.Raja,S.Fatimaan d M. S. Amjad. 2016. Ethnopharmacological and phytochemical account of paradise tree (MeliaazedarachL. Meliaceae). Pure Appl. Biol., 5(1): 5-14.
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Name	**Dr.YaminBibi**

Personal	Assistant Professor Department of Botany PMAS Arid Agriculture University Rawalpindi. Pakistan Email address :dryaminbibi@uaar.edu.pk Contact #: +923035712234
	•

Courses taught	• General Pharmacognosy • General Pharmacology • Plant Ecology • Research Planning and Report Writing Conservation and Management of Plant Resources • Plant Microbe Interaction • Arid Zone Ecology • Plant Reproductive Biology
	from Thal Desert, Pakistan **(Khurshid Anwar, Thesissubmitted: 2020-2021)** 2. Ethnomedicinal Survey of Tehsil Malakwal,District Mandi-Bahauddin, Punjab, Pakistan **(Tayyaba Munawar, Thesis Submitted 2020- 2021)** 3. Evaluation of Immune Boosting Potential of SelectedMedicinal Plant Species **(Irum Khalid, Research work in Process 2021-2022)** 4. CytotoxicityAssessmentofFractionatedExtractsof *Euphorbia royleana* **(Neelum Naheed, Research work in process 2021-2022)** 5. Biological Efficacy of PurifiedCompounds from Selected plant Species **(Ayesha Khanum,Research work in process 2021-2022)** 6. Cytotoxic and AntimicrobialEfficacy of *Alhagi maurorum* **(Syeda Sobia Gillani M.Philcompleted in 2020)** 7. Pharmacological Evaluation of *Pseudocrypoteris foetida* Extracts **(Tayyiba Afzal M.Phil completed in 2020)** 8. Antioxidant and Phytochemical Analysis of *Prinsepia utilis* Extracts **(Saiqa Sharif M.Phil**
M.Phil thesis supervised	1.Pharmacological Studies on Selected Plant Species

	completed in 2020) 9. Cytotoxicity Assessment of *Thalictrum foliolosum* leaves and Roots Extracts **(Rozina Ishaq M.Phil completed in 2020)** 10. Green Synthesis Of Silver nano particles from selected Species and their effect on Bioactivities **(Aroosa Habib M.Phil completed in 2019)** 11. Bioactivities on*Ficus palmata* and *Calotropis Procera* Extracts **(Raafia Batool ChaudhryM.Phil completed in 2019)** 12. Antioxidant and antimicrobial effects of *Withania Coagulans* Fruit Extracts **(Bibi Fiza M.Phil completed in 2019)** 13. Neutraceutical analysis of some underutilized plant species **(Kiran Javed M.Phil completed in 2018)** 14. Neutraceutical Assessment of some selected wild vegetables **(Basma Jalil M.Phil completed in 2018)** 15. Ethnomedicinal survey of selected villages of district Bagh Azad Jammu and Kashmir **(Tasneem Maqsood M.Phil completed in 2018)** 16. Evaluation of phyto toxic activity of *Thevetia Peruviana* extracts **(Najma Parveen M. Phil**

	Completed in 2018) 17. Investigation of Cytotoxic and Antimicrobial Potential of *Myrsine Africana* **(Sadaf Laraib M.Phil completed in 2017)** 18. Antioxidant and Cytotoxic Activities of Selected Ethnomedicinal Plants of Balakot Region **(Uzma Sarwar M.Phil completed in 2017)** 19. Nutraceutical Potential of Some Selected Plants of Tehsil Plandri AJK **(Kiran Naseem M.Phil completed in 2017)** 20. Assessment of antioxidant Potential of Selected Aromatic Plants **(Qurat Ul Ain M.Phil completed in 2017)** 21. Nutraceutical Assessment of *Capsella bursa- pastoris* **(Iqra Riaz M.Phil completed in 2016)** 22. Nutritional and Medicinal Evaluation of *Solanum villosum* **(Nabeela Ahmad M.Phil completed in 2016)** 23. Anti oxidant and Cytotoxic Evaluation of *Caralluma tuberculate* **(Mudrikah M.Phil completed in2015)** 24. In vitro Toxicity Assessment of *Cedrela serrata* Extract **(Shaista Tabasuum M.Phil completed in 2015)** 25. Pharmacological Studies on *Bidens biternata* **(Kulsoom Zahara M. Phil completed in 2015)** 26. Biochemical Evaluation of *Kickxiaramosissima* (Zakia Binish M. Phil completed in 2014) 27. Investigation on Antimicrobial Effects of *Echinops echinatus* **(Lunba Shafique M. Phil completed in 2014)**

Ph.D thesis supervised	1. Identification and Characterization of Antioxidant and Cytotoxic Activities of Selected Medicinal Plants of Gallyat Region, Pakistan (Muhammad Ishaque Ph.D .completed in 2018). 2. Bio assay Guided Assessment of Selected Medicinal Plants of Pakistan. (Huma Mehreen Sadaf Ph.D. In Process of foreign evaluation 2021) 3. Bioassay guided characterization of selected Bidens species (Kulsoom Zahara Ph.D. In Process of foreign evaluation 2021) 4. Cytotoxicity Guided Screening and Characterization of Selected Solanaceous Plant Extracts. (Iqra Riaz Ph.D. In thesis write up2021). 5. Evaluation of plant extract based strategy for foodbio- preservation (Nadia Sardar Ph.D. In thesis writeup 2021).
Ph.DthesisCO-supervised	1. Assessment of Growth and Physiochemical Responses of Wheat to Chemo-Blended Silver and Iron Nanoparticles **(Hafiz Muhammad Jhanzab Ph.D.completed in 2019).** 2. Eco biological and Allelochemical Characterization of Selected Invasive Plants of Pothwar Region of Pakistan **(Huma Qureshi Ph.D. completed in 2018).** 3. Taxonomic, Phytochemical and Biological Screening of Some Selected Medicinal Plants of Lesser Himalaya Pakistan. **(Ejaz Ahmed Ph.D. completed in 2018**).

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Research Interest	Plant Based Natural Products , Bio evaluation ,Isolation& Chemical Characterization
Impact factor Publications	**Impact Factor Publication**
	Impact Factor Publication 1. Ahmed,S.,Owen,C.P.,Waheed,A.,Nisa,S.,Bibi, Y., & Chaudhary, M. F. (2009). Biochemical evaluation of extracts from Caralluma tuberculata against hormone-

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	stress along with chemical characterization through advance Fourier Transform and Nuclear Magnetic Resonance spectroscopic methods towards green chemotherapeutic agents. Saudi Pharmaceutical Journal. (Impact factor = 2.802). 39. Ishaque, M., Bibi, Y., & Qayyum, A. (2021). Fruits of Rosa brunonii Lindle: An Ethnomedicinal Plant from Foothills of Himalaya with Antibacterial, Antitumor and Cytotoxic Properties. Arabian Journal for Science and Engineering, 1-9. (Impact factor = 1.711). 40. Noureen, H., Alam, S., Al Ayoubi, S., Qayyum, A., Sadiqi, S., Atiq, S., Bibi, Y., & Ahmad, S. (2021). Mechanism of rice bran lipase inhibition through fermentation activityof probiotic bacteria. Saudi Journal of Biological Sciences. (Impact factor = 2.802). 41. Laraib, S., Sharif, S., Bibi, Y., Nisa, S., Aziz, R., & Qayyum, A. (2021). Phytochemical Analysis and Some Bioactivities of Leaves and Fruits of Myrsine africanaLinn. Arabian Journal for Science and Engineering, 46(1), 53-63. (Impact factor =1.71). 42. Binish,Z.,Bibi,Y.,Zahara,K.,Nisa,S.,Manaf,A.,

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	Khan, S., Sabir, M., ... & Qayyum, A. (2021). Pharmacological properties of biogenically synthesized silver nanoparticles using endophyte Bacillus cereus extract of Berberis lyceum against oxidative stress and pathogenic multidrug-resistant bacteria. Saudi Journal of Biological Sciences. (Impact factor =4.219).

Bookchapters	Kulsoom Zahara &**Yamin Bibi.** 2020. Advancement in Plant Based Drug Development to Overcome Multivariate Drug Resistance in Today's Drug Discovery" In: RECENT PROGRESS IN MEDICINAL PLANTS Vol. 51 - Antimicrobial Resistance and Bioactive Natural Products". EDITOR :Dr. Sujogya Kumar Pandaand Dr. Debasmita Dubey. Studium Press, USA.

DR KHAFSA MALIK

Name	Dr. Khafsa Malik
Personal	• **Father name**: Haji Abdul Manan • **Organization Address:** Department of Botany, Faculty Of Sciences, PMAS Arid Agriculture University, Rawalpindi, Pakistan • **Email**: khafsamalik786@gmail.com • **Contact Number**: 03355858546
Experience	• **Nov 2019 To Date**; Assistant Professor; Pir Mehar Ali Shah ARID Agriculture University Rawalpindi • **Mar-Nov 2019**; Assistant Professor; University of Gujrat, Sub campus Rawalpindi • **2015-2019**; Visiting Lecturer; Quaid-e-Azam University, Islamabad • **2014**; Research Associate; NARC (National Agriculture Research Institute) • **2013**; Research Associate; SDPI (Sustainable Development Policy Institute) • 2012; Research Associate; Department of Plant Sciences Quaid-e-Azam University Islamabad
Honor and Awards	• Secured First Position and Shield in Poster Presentation "On International Biodiversity Day," organized by Department of Plant Sciences, Quaid-e-Azam University, Islamabad, Pakistan. • Scored third position in MPhil • Merit Scholarship in M.Phil. from Quaid-e-Azam University, Islamabad. • Merit Scholarship in PhD from Quaid-e-Azam University, Islamabad • Fourth international conference on Biosciences (ICBS-2021) organized by Biological society of Pakistan in Collaboration with Department of Plant Sciences, Quaid-e Azam University Islamabad, Pakistan 15th June 2021 (Won Gold Medal) • Got Shield in 9th International conference on Biodiversity and Medicinal plants: A way forward to Sustainable Development held on 14-16 Dec, 2023
Memberships	• Member Pakistan Botanical Society

Graduate Students Postdocs Undergraduate Students Honour Students	• Number of MPhil students 17 • Number of PhD students 5 • Eternal Examiner of MPhil student 10 • Committee member of MPhil student 12
Service Activity	• 2nd Seminar of DAS event calendar Medicinal plants for health and security presented by Khafsa Malik 18 Feb 2021 (speaker). • Fourth international conference on Biosciences (ICBS-2021) organized by Biological society of Pakistan in Collaboration with Department of Plant Sciences, Quaid-i- Azam University Islamabad, Pakistan 15th June 2021 (Won Gold Medal) (speaker). • Webinar on systematics characterization and its taxonomic implication in fern and their allies, 17 Nov 2021 (speaker). • Role of sciences in human health, food safety and survival 25 Nov, 2021 (Hosting) • 9th International conference on Biodiversity and Medicinal plants: A way forward to Sustainable Development held on 14-16 Dec, 2023 (Hosting)
Publications	**Books** • Malik, K., Ahmad, M., Öztürk, M., Altay, V., Zafar, M., & Sultana, S. (2021). *Herbals of Asia: Prevalent Diseases and Their Treatments*. Springer Nature.. (Accepted) • **Contributed Chapters:** Khafsa Malik, Mushtaq Ahmad, Muhammad Zafar, Shazia Sultana, Athar Tariq, Neelam Rashid. 2019. Medicinal plants used for treatment of prevalent diseases in Northern Pakistan of Western Himalayas. Intect book. United states. 1-20. (Published) • Khafsa Malik, Mushtaq Ahmad, Muhammad Zafar and Shazia Sultana. 2019. Medicinal-Aromatic Plants as Biomedicine for skin diseases in Pakistan (Taylor and Francis). Amsterdam, Netherlands. 1-52. (Processing) • Mushtaq Ahmad, Khafsa Malik, Neelam Rashid, Muhammad Zafar and Shazia Sultana. 2019. Endemic Plant Diversity and Distribution Pattern in Afghanistan. (Springer). United States.1-60. (Processing) • Plants as Biomedicine for Skin Diseases in Pakistan Khafsa Malik,

Mushtaq Ahmad, Zabta Khan Shinwari, Muhammad Zafar, Neelam Rashid, and Shazia Sultana

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- Parveen, J., Sultana, T., Kazmi, A., Malik, K., Ullah, A., Ali, A., Qayyum, B., Raja, N. I., Mashwani, Z. U. R., Rehman, S. U. "Phytosynthesized Nanoparticles as Novel Antifungal Agent for Sustainable Agriculture: A Mechanistic Approach, Current Advances, and Future Directions", *Journal of Nanotechnology*, vol. 2023, Article ID 8011189, 16 pages, 2023. https://doi.org/10.1155/2023/8011189
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- Ashfaq ZZ, Zubair W, Malik K, et al. Ethnobotany, Phytochemistry and pharmacological properties of Withania coagulans: A review. Authorea Preprints; 2023. DOI: 10.22541/au.169817943.38681794/v1.
- Sultana, T., Malik, K., Raja, N. I., Sohail, Hameed, A., Ali, A., & Alrefaei, A. F. (2023. Phytofabrication, characterization, and evaluation of novel bioinspired selenium–iron (Se–Fe) nanocomposites using Allium sativum extract for bio-potential applications. *Green Processing and Synthesis*, *12*(1), 20230049.
- Khadim, S., Malik, K., Qureshi, R., & Rehman, S. (2023). Ethnogynecological study of traditional therapeutic plants used by the indigenous communities: A case study from District Gujrat Punjab, Pakistan. *Ethnobotany Research and Applications*, *26*, 1-23.

	• Malik, K., Ahmad, M., Shinwari, Z. K., Zafar, M., Rashid, N., & Sultana, S. (2023). Plants as Biomedicine for Skin Diseases in Pakistan. *Plants as Medicine and Aromatics: Pharmacognosy, Ecology and Conservation*, 205. • Saboon, Bibi, Y., Ayoubi, S. A., Afzal, T., Gilani, S., Malik, K., ... & Kumar, S. (2023). Antioxidant-Activity-Guided Purification and Separation of Octocry lene from Saussurea heteromalla. *Separations*, *10*(2), 107. Saboon, Bibi, Y., Ayoubi, S. A., Afzal, T., Gilani, S., Malik, K., ... & Kumar, S. (2023). Antioxidant-Activity-Guided Purification and Separation of Octocrylene from Saussurea heteromalla. *Separations*, *10*(2), 107. • Ansari, L., Ahmad, W., Saleem, A., Imran, M., Malik, K., Hussain, I., ... & Munir, M. (2022). Forest Cover Change and Climate Variation in Subtropical Chir Pine Forests of Murree through GIS. *Forests*, *13*(10), 1576. • Gul, F., Malik, K., Qureshi, R., Ahmad, M., Ansari, L., Zafar, M., ... Gul, F., Malik, K., Qureshi, R., Ahmad, M., Ansari, L., Zafar, M., ...Folklore use of medicinal plants for treatment of gynecology diseases in Pakistan. • Sadaf, H. M., Bibi, Y., Ayoubi, S. A., Safdar, N., Sher, A., Habib, D., ... & Qayyum, A. (2022). Extraction, Separation and Purification of Bioactive Anticancer Components from Peganum harmala against Six Cancer Cell Lines Using Spectroscopic Techniques. *Separations*, *9*(11), 355. • Khan, K., Ahmad, M., Ali, M., Zafar, M., Haq, I. U., Papini, A., ... & Malik, K. (2022). Melissopalynological and biochemical profile of honeybee (Apis mellifera L.) flora in Southern Khyber Pakhtunkhwa, Pakistan. *Plant Biosystems-An International Journal Dealing with all Aspects of Plant Biology*, 1-10. • Use of scanning electron microscopy to analyze sculpturing pattern and internal features of ollengrain wall in some members of Astragaleae (sub family: Papilionoidae). • Melissopallynological and Biochemical profile of Honey bee (Apis mellifera L.) flora in Southern Khyber Pakhtunkhwa, Pakistan.

- Gul, F., Malik, K., Qureshi, R., Ahmad, M., Ansari, L., Zafar, M., ... & Rashid, N. Palyno-morphological attributes of some selected plant species of family Asteraceae from district Dera Ismail Khan, KPK, Pakistan. *Microscopy Research and Technique*.
- Khan, K., Ahmad, M., Zafar, M., Malik, K., Sultana, S., Ahmad, S., ... & Ullah, K. (2021). PALYNO-MORPHOLOGICAL STUDY OF WEEDY MELLIFEROUS (BEE VISITED) PLANTS USING LIGHT MICROSCOPIC TECHNIQUES FROM SOUTHERN KHYBER PAKHTUNKHWA, PAKISTAN. *Pakistan Journal of Weed Science Research*, *27*(2).
- Shah, S. N., Ahmad, M., Zafar, M., Hadi, F., Khan, M. N., Noor, A., ... & Hussain, M. (2021). Application of spore morphology to solve identification problems in certain species of family Dryopteridaceae from Malakand Division, Pakistan. *Microscopy Research and Technique*.
- Javed, B., Farooq, F., Ibrahim, M., Abbas, H. A. B., Jawwad, H., Zehra, S. S., ... & Nawaz, K. (2021). Antibacterial and antifungal activity of methanolic extracts of Salix alba L. against various disease causing pathogens. *Brazilian journal of biology= Revista brasleira de biologia*, *83*, e243332.
- Khan, F., Muhammad, Z., Ullah, T., Khan, K., Ahmad, S., Kamal, A., & Malik, K. (2021). FLORISITIC COMPOSITION AND ECOLOGICAL CHARACTERISTICS OF FLORA OF TEHSIL SARAI NAURANG, DISTRICT LAKKI MARWAT, PAKISTAN. *Pakistan Journal of Weed Science Research*, *27*(3), 263.
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- Ikram, M., Raja, N. I., Javed, B., Hussain, M., Hussain, M., Ehsan, M., ... & Akram, A. (2020). Foliar applications of bio-fabricated selenium nanoparticles to improve the growth of wheat plants under drought stress. *Green Processing and Synthesis*, *9*(1), 706-714.

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- Rashid N, Zafar M, Ahmad M, Malik K, Haq Iu, Shah SN, Mateen A, Ahmed T: 2018. Intraspecific variation in seed morphology of tribe vicieae (Papilionoidae) using scanning electron microscopy techniques. *Microscopy research and technique.* 81(3):298-307.
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- Shah SN, Ahmad M, Zafar M, Malik K, Rashid N, Ullah F, Zaman W, Ali M: 2018.A light and scanning electron microscopic diagnosis of leaf epidermal morphology and its systematic implications in Dryopteridaceae: Investigating 12 Pakistani taxa. *Micron.* 111:36-49.
- Rashid N, Zafar M, Ahmad M, Khan MA, Malik K, Sultana S, Shah SN: 2018. Taxonomic significance of leaf epidermis in tribe Trifolieae L.(Leguminosae; Papilionoideae) in Pakistan. *Plant Biosystems-An International Journal Dealing with all Aspects of Plant Biology.* 1-11.
- Shah SN, Celik A, Ahmad M, Ullah F, Zaman W, Zafar M, Malik K, Rashid N, Iqbal M, Sohail A: 2018. Leaf epidermal micromorphology and its implications in systematics of certain taxa of the fern family Pteridaceae from Northern Pakistan. *Microscopy research and technique.* 1-18.

Submitted to Journal

- Malik K, Ahmad M, Zhang G, Rashid N, Zafar M, Sultana S, Shah SN: Traditional herbal medicine practices among local communities of

	Pakistani Himalayas for the treatment of tuberculosis. *Journal of Herbal medicine*. 2020. • Malik K, Ahmad M, Zhang G, Rashid N, Zafar M, Sultana S, Shah SN: An ethnobotanical approach to treat glottis disorders in Northern Pakistan. *Brazilian journal of pharmacognosy*. 2020. • Khan, K., Malik, K., Ahmad, M., Querishi, R.U., Aziz, A. (2023) Diversity of melliferous flora (Apiaries) from the Bannu Division; Pollen micro-morphological investigation using LM and SEM Techniques. • Khan, K. and Malik, K. (2023) Micromorphology of melliferous plants diversity in tropical areas of Pakistan. • Khan, K., Malik, K., Ahmad, M., Qureshi, R.U., Aziz, A. (2023) Palyno-morphological diversity bee flora with aspect of melissopalynology and honey analysis from Division Bannu Khyber Pakhtunkhwa, Pakistan**.** • Khan, K., Ahmad, M., Ali, M., Zafar, M., Haq, I. U., Papini, A., ... & Malik, K. (2022). Systematic description of melliferous floral diversity in Bannu division. *Review of Botany* **(Submitted)**. • Salihah, F., Malik, K., Qureshi, R., Ahmad, M., Ansari, L., Zafar, M., ... & Rashid, N.(2022). Folklore use of medicinal plants for treatment of Gynecological diseases in Pakistan. BioMed Research International. **(Submitted)**.
Research Grants and Contracts.	• Number of Projects : 1 • Abstracts & Proceedings: 20
Other Research or Creative Accomplishments	• International Conference on Bio-fuel organized by PMAS Arid Agriculture University, Rawalpindi, Pakistan (April 18-20th, 2012). • **Facilitator** during 12th National and 3rd International Conference of Botany organized by Pakistan Botanical Society & Quaid-i-Azam University, Islamabad, Pakistan (Sep. 1-3rd, 2012). • Symposium on biodiversity of Pakistan, organized by Pakistan Museum of Natural History , PSF, Ministry of Science and Technology, Government of Pakistan Islamabad (June 7-9, 2011).

	• First National Conference on Poverty Alleviation through Sustainable Management of Biodiversity in Pakistan from, Organized by Institute of Plant Sciences and Biodiversity, University of Swat, convened in Bara Gali Summer Campus, University of Peshawar (Sep. 29-30, 2012) • **Facilitator** during International Workshop on "Medicinal Plants: Conversation and Sustainable Use", Pak-US joint initiative, Department of Biotechnology, Quaid-i-Azam University, Islamabad, Pakistan. • Certificate of participation in dual use of science education conference in Pakistan academy of sciences (Dec. 8-10, 2011) • Certificate of participation in dual use of science education conference in Pakistan academy of sciences (Feb 2015). • Attending the 4th meeting for promoting of science in PASTIC (March. 2015). • Policy Makers and a practitioners Awareness Workshop on Dual Use Education (March 30, 2015) • 5th Invention to Innovation Summit 3-4 Nov 2015, University of Haripur (Nov 2015) • Biodiversity Conference in Baragahli (May 2016) • 2 days Biodiversity Conference in Baragahli (May 2017) • Two day work shop on Herbarium Digitalization Techniques in Quaid-i-Azam University Islamabad (April 2018) • 2nd International Conference, Conservation of Medicinal and Aromatic plants for improving the livelihood of Mountain communities through industrial linkages September 03-05-2018 • Two days Training workshop on Digitalization: Georeferencing and mobilization of Plant occurrence data from Pakistan 26th- 27th November 2018 • Fourth international conference on Biosciences (ICBS-2021) organized by Biological society of Pakistan in Collaboration with Department of Plant Sciences, Quaid-i- Azam University Islamabad, Pakistan 15th June 2021 • The Prediction of Wheat Yield for Pakistan by Using Stochastic Modeling" by Dr. Muhammad Hanif, Associate Professor, Department of Mathematics & Statistics; will be conducted Online through ZOOM on Thursday, 24th June 2021 at 02:00 p.m.

	• Advanced techniques in Forests, 2 days' workshop at PMAS Arid Agriculture University, Rawalpindi, Pakistan (Nov 30-1 Dec, 2021). • 2nd Seminar of DAS event calendar Medicinal plants for health and security presented by Khafsa Malik 18 Feb 2021. • Fourth international conference on Biosciences (ICBS-2021) organized by Biological society of Pakistan in Collaboration with Department of Plant Sciences, Quaid-i- Azam University Islamabad, Pakistan 15th June 2021. • Webinar on systematics characterization and its taxonomic implication in fern and their allies, 17 Nov 2021 . • Role of sciences in human health, food safety and survival 25 Nov, 2021. • International Conference & workshop Dengue Infection and emerging threat due to recent floods emergency and climate change; Are we prepared? 14-15 Nov, 2022 Quaid-i-Azam University Islamabad • Conference on World fisheries day 21 Nov, 2022, Quaid-i-Azam University Islamabad. • Conference on climate smart agriculture innovations and adaptations June 15-17, 2022 University of Poonch Rawalakot • Conference of soil health and sustainable development goals held on March 9-11-20222 at University of Agriculture Faisalabad • Conference on soil degradation an alarming threat to food security and environment March 3-4 2022 • Conference on Epidemic and Pandemic Preparedness held on 5-7 Dec 2022, Islamabad. • Conference on Pathogen transmission beyond borders: Understanding the complexities of cross-species infectious disease held on 16-18 Oct 2023, Islamabad. • 2nd International Conference of Sciences "Revamped Scientific Outlook of 21st century, 2023 held on 15-11-23 at Rawalpindi Women University. • 1stInternational Conference on "Challenges & Innovation in Medical Lab Sciences" held on Nov 29- Dec1, 2023 at The University of Haripur. • Conference on Morpho- Palynological Analysis of Honeybee Floral Species held on 9-10 Dec, 2023.

	• 9th International conference on Biodiversity and Medicinal plants: A way forward to Sustainable Development held on 14-16 Dec, 2023.
Selected Professional Presentations	• 2nd Seminar of DAS event calendar Medicinal plants for health and security presented by Khafsa Malik 18 Feb 2021 (speaker). • Fourth international conference on Biosciences (ICBS-2021) organized by Biological society of Pakistan in Collaboration with Department of Plant Sciences, Quaid-i- Azam University Islamabad, Pakistan 15th June 2021 (Won Gold Medal) (speaker). • Webinar on systematics characterization and its taxonomic implication in fern and their allies, 17 Nov 2021 (speaker). • Role of sciences in human health, food safety and survival 25 Nov, 2021 (Hosting) • 9th International conference on Biodiversity and Medicinal plants: A way forward to Sustainable Development held on 14-16 Dec, 2023 (Hosting)

SUMMARY AND CONCLUSION

This Self-Assessment Report (SAR) covers activities and achievements in Ph.D. program carried out in department of Botany, Pir Mehr Ali Shah Arid Agriculture Rawalpindi from 2021- 2022. During this period, Botany Department has produced a large number of Ph.Ds.

International academic and research standards are highly observed in the department.

The efficiency and effectiveness was measured through branded standards and was found to be acceptable. Survey indicates a good level of research work being pursued in the department. In Botany department 98 percent of faculty members are HEC approved supervisors. Ph.D graduates are prepared to fill faculty and research scientist positions at research-intensive universities or secure positions at research institutes and centers that conduct and manage large- scale education- based evaluations.

Upon successful program completion, we expect that graduates will be prepared for employment in

research/faculty positions at top-tier research institutions. They will contribute to the interdisciplinary public discourse on education; engage in and promote evidence-based practices through the application of rigorous methodology; link education research to policy and practice; provide leadership in the field by developing an independent line of ethical and culturally responsive research; contribute to development of the next generation of scholars; be able to influence school policy and reform. Although there are less HEC indigenous scholarship available to Ph.D. students but the department is trying to facilitate their research work. Students further avail IRSIP program of HEC to incorporate advance techniques in their research.

Novel research finding are being published in ISI recognized impact factor journals with improved citation. Research being carried by Ph.D. students is also strengthening research activities in department. Collaborations with other institutions and universities are being developed to boost up the research activities. Institutional facilities need to be strengthened. Major shortcomings have been observed in survey for Ph.D. program which include lack of lecture halls ,laboratory equipment's , gas supply to laboratories and departmental library and Computer laboratory latest equipment like GC- MS is another limitation. By institutional support will greatly promote and strengthen academic, research, management and leadership capabilities.

Prepared by:

Dr. Khafsa Malik
Assistant Professor
Department of Botany
Pir Mehr Ali Shah Arid Agriculture University,
Rawalpindi

Dr. Noshin Ilyas
Associate Professor
Department of Botany
Pir Mehr Ali Shah Arid
Agriculture University,
Rawalpindi

Prof. Dr. Rahmat Ullah Qureshi
Chairman
Department of Botany
Pir Mehr Ali Shah
Arid Agriculture University, Rawalpindi

Checked By:

Director,
Quality Enhancement
Pir Mehr Ali Shah Arid Agriculture University,
Rawalpindi

Date of submission to HEC: