

Akhtar Rasool, PhD

Insect Molecular Biologist

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PERSONAL DETAILS

Date of birth: March 15, 1983

Postal Address: Centre for Biotechnology & Microbiology Kanju Township, Sector C
Campus, University of Swat, Swat, Khyber Pakhtunkhwa, Pakistan

EDUCATIONAL PROFILE

Doctor of Philosophy (PhD) Insect Molecular Biology (2008 – 2015)	Pakistan Institute of Engineering & Applied Sciences, Islamabad, Pakistan/Max Planck Institute for Chemical Ecology, Jena, Germany
Bachelor of Science (B.S (Hons) 4 years) Biotechnology (2001-2006)	University of Malakand, Khyber Pakhtunkhwa, Pakistan
F.Sc (2001)	BISE Swat, Khyber Pakhtunkhwa, Pakistan
S.S.C (1999)	BISE Swat, , Khyber Pakhtunkhwa, Pakistan

RESEARCH TITLE (Thesis)

- PhD: Molecular evidence of insecticides resistance in *Helicoverpa armigera* and expression profiles of genes involved in metabolic resistance.
- BS (Hons): Cancer Incidence and Risk Factor Determination in Districts Dir Pakistan

PUBLISHED RESEARCH ARTICLES/BOOK CHAPTER

- Rasool, A., Akbar, F., Rehman, A., and Jabeen, H. (2020). Genetic Engineering of Rice for Resistance to Insect Pests. In Rice Research for Quality Improvement: Genomics and Genetic Engineering (pp. 129-148). Springer, Singapore.
- Rahat, Murad Ali, Adil Shah Khan, Romana Bibi, Muhammad Haris, Fazal Akbar, Muzafar Shah, Akhtar Rasool, and Muhammad Israr. "Monozygotic and Dizygotic Twins Differences in Fingerprint Patterns of Swat District." *Advancements in Life Sciences* 7, no. 4 (2020): 232-236.
- Rahat, Murad Ali, Muhammad Haris, Zaib Ullah, Saba Gul Ayaz, Mian Nouman, **Akhtar Rasool**, and Muhammad Israr (2020). "Domestic animals' identification using PCR-RFLP analysis of cytochrome b gene." *Advancements in Life Sciences* 7, no. 3: 113-116.
- Wali Khan, Nisa, N.N., Khan, A.R., Rahbar, B., Mehmood, S.A., Ahmed, S., Kamal, M., Shah, M., **Rasool, A.**, Pahanwar, W.A. and Ullah, I. (2020). Roosting ecology and

morphometric analysis of *Pteropus medius* (Indian flying fox) in Lower Dir, district, Pakistan. *Brazilian Journal of Biology*

- Naseem, Muhammad Tayyib, Muhammad Ashfaq, Arif Muhammad Khan, **Akhtar Rasool**, Muhammad Asif, and Paul DN Hebert. (2019). "BIN overlap confirms transcontinental distribution of pest aphids (Hemiptera: Aphididae)." *PloS one* 14, no. 12: e0220426.
- Muzafar Shah Fazal Akbar, Jan Khan, Tauqeer Rahman, Akhtar Rasool, Muhammad Israr, Naseer Ullah (2019). Brief Report on Top-10 Human Associated Protozoans in Pakistan. *Acta Scientific Veterinary Sciences*, 2(1), 11-13
- Muhammad Ashfaq, Jamal S. M. Sabir, Hosam O El-Ansary, Kate Hj Perez, Valerie Levesque-Beaudin, Arif Muhammad Khan, **Akhtar Rasool**, Carlene Gallant, Joseph Addesi, Paul D N Hebert. (2018). Insect diversity in the Saharo-Arabian region: Revealing a little-studied fauna by DNA barcoding. *PLOS ONE* 13(7): e0199965. <https://doi.org/10.1371/journal.pone.0199965>
- Thomas K. Walsh, Nicole Jousen, Kai Tian, Angela McGaughran, Craig J. Anderson, Xinghui Qiu, Seung-Joon Ahn, Lisa Bird, Nena Pavlidi, John Vontas, Jaeun Ryu, **Akhtar Rasool**, Isabella Barony Macedo, Wee Tek Tay, Yongjun Zhang, Mary E. A. Whitehouse, Pierre Jean Sylvie, Sharon Downes, Lori Nemec and David G. Heckel. (2018). Multiple recombination events between two cytochrome P450 loci contribute to global pyrethroid resistance in *Helicoverpa armigera*. *PLOS ONE*, <https://doi.org/10.1371/journal.pone.0197760>.
- Asma Manzoor, Javed Iqbal Qazi, Ikram-ul-Haq, Hamid Mukhtar and **Akhtar Rasool**. (2017). Significantly Enhanced Biomass Production of a Novel Bio-Therapeutic Strain *Lactobacillus plantarum* (AS-14) by Developing Low Cost media Cultivation Strategy. *Journal of Biological Engineering*. 11:17. doi: 10.1186/s13036-017-0059-2
- Muhammad Tayyib Naseem Muhammad Ashfaq, **Akhtar Rasool**, Paul D N Hebert. (2016). Genetic diversity of aphid in Pakistan with global comparison as virus vector. Conference Paper, Combined Australian Entomological Society and Entomological Society of New Zealand
- Romana Iftikhar, Muhammad Ashfaq, **Akhtar Rasool**, Paul D. N. Hebert. (2016). DNA barcode analysis of thrips (Thysanoptera) diversity in Pakistan reveals cryptic species complexes. *Plos One*, PONE-D-15-28048
- Muhammad Afzal Naeem, Zahid Mukhtar, Qaiser M. Khan, Zafar Mahmood Khalid, **Akhtar Rasool** and Shahid Mansoor. (2015). Biosafety studies of transgenic cotton expressing insecticidal gene from Australian funnel web spider (*Hadronyche versuta*). *Pakistan Journal of Agricultural Sciences*, 52(3), 685-690,
- Arif Muhammad Khan, Muhammad Ashfaq, Azhar Abbas Khan, **Akhtar Rasool**, Javed Iqbal, Shahid Mansoor (2015). Plant inoculation with recombinant potato virus X induces RNA interference in solenopsis mealybug, *Phenacoccus solenopsis* Tinsley (Hemiptera: Pseudococcidae). *Biotechnology Letters*, 37(10):2083-90

- Joußen, N., **Rasool, A.**, Pavlidi, N., Ahn, S.-J., Vontas, J., Heckel, D.G. (2015). A worldwide resistance mechanism of the insect pest *Helicoverpa armigera* (Lepidoptera: Noctuidae): the chimeric P450 enzyme CYP337B3. *Antenna Special Edition, 10th European Congress of Entomology, York, UK, 3-8 August 2014*, 61-62
- **Akhtar Rasool**, Nicole Joußen, Sybille Lorenz, Renate Ellinger, Bernd Schneider, Muhammad Ashfaq, and David G. Heckel. (2014). A new occurrence of the chimeric P450 enzyme CYP337B3 of *Helicoverpa armigera* confers cypermethrin resistance in Pakistan. *Insect Biochemistry and Molecular Biology* 53, 54-65
- Alam Zeb, **Akhtar Rasool**, Shagufta Nasreen. (2008). Cancer Incidence in District Dir (NWFP) Pakistan; a preliminary study. *Journal of Chinese Medical Association*. 71(2):62–65doi:10.1016/S1726-4901(08)70076-5.
- Alam Zeb, **Akhtar Rasool**, Shagufta Nasreen. (2006). Occupational Cancer Incidence in District Dir (NWFP) Pakistan; a five years study from 2000-2004. *Asian Pacific Journal of Cancer Prevention*. 7(3):483-4.

RESEARCH SUPERVISION

PhD	01 (01 Co-supervision)
MPhil	06 (04 Co-supervision)
MSc Zoology	26 (22 completed)
BS Zoology	37 (33 completed)

RESEARCH PROJECTS

- Title “Demographic and phylogenetic analysis of *Helicoverpa armigera* pyrethroids resistant strain in Pakistan” from March 2016 to December 2017. **Completed**
PKR: Rs. 0.43 million, Awarded by Higher Education Commission, Pakistan,
- Title “Establishment of Insect Molecular Biology Lab/Museum at University of Swat” **submitted** to Directorate of Science and Technology, Department of Science & Technology and Information Technology, Government of Khyber Pakhtunkhwa, Pakistan.
PKR Rs.40 million
- Title “Molecular Evidence of Mysterious Disease in *Schizothorax* spp” **submitted** to Higher Education Commission of Pakistan, **PKR Rs. 2.63 million** under HEC-NRPU program
- Title “Assessment of Field Evolved Insecticide Resistance in Fruit Flies in Pakistan for Future Food Security”, submitted to Higher Education Commission of Pakistan **PKR Rs. 8.7 Million**, under HEC-NRPU program

RESEARCH ABSTRACTS/TALKS/POSTERS

- Akhtar Rasool, Shafiq Aziz, Muhammad Israr and Naseer Ullah (2019). Economic losses due to fish diseases. 3rd international conference “empowering nation through science”, organised by Women University Mardan, KP, Pakistan (**talk**).

- Akhtar Rasool, Said Jasim Shah, Muhammad Sardar, Muhammad Israr and Naseer Ullah. Evidences of Idiopathic disease in the indigenous fish population of River Swat. International Fisheries & Aquaculture Conference – 2019, organised by Department of Fisheries and Aquaculture, University of Veterinary and Animal Sciences, Lahore (**invited talk**)
- Akhtar Rasool (2018). DNA barcoding and its uses in Biological Science. Department of Zoology, Dr. Khan Shaheed Govt. Degree College Kabal, Swat. (**Invited talk**)
- Said Jasim Shah, Muhammad Sardar, Muhammad Israr, Muzafar Shah, Naseer Ullah and **Akhtar Rasool**. (2017). Mysterious Fish Disease in River Swat, Pakistan. Conference on Computational Biology and Genomics | Centre for Human Genetics Hazara University Mansehra (**Poster**).
- Shafiq Aziz, Anwar Ul Haq, Ubaid Ur Rahman, Muhammad Israr, Muzafar Shah, Naseer, Ullah and **Akhtar Rasool**. (2017). Ichthyofaunal Diversity, Abundance and Distribution in the Streams of District Swat, Pakistan. Conference On Computational Biology and Genomics | Centre for Human Genetics Hazara University Mansehra (**Poster**).
- **Akhtar Rasool**, Muzafar Shah and Fazal Akbar. (2016). Demographic and phylogenetic analysis of *Helicoverpa armigera* pyrethroids resistant strain in Pakistan” in 1st international conference on advances in biotechnology. Akhuwat-FIRST and GC Women University Faisalabad. (**invited talk**).
- Nicole Joußen, Akhtar Rasool, Nena Pavlidi, Seung-Joon Ahn, Xinghui Qiu, Tom Walsh, John Vontas, David G. Heckel. (2015). Recombination creates a worldwide insecticide resistance mechanism in the insect pest species *Helicoverpa armigera*. Conference on “RESISTANCE’15”, at Rothamsted Research, Harpenden, Herts, AL5 2JQ, UK (**Poster**).
- Joußen, N., **Rasool, A.**, Pavlidi, N., Ahn, S.-J., Vontas, J., Heckel, D.G. (2014). Crucial amino acids and the evidence for multiple origin - The chimeric CYP337B3 of *Helicoverpa armigera*, 12th International Symposium on Cytochrome P450 Biodiversity and Biotechnology, Kyoto, JP (**invited talk**)
- Joußen, N., **Rasool, A.**, Pavlidi, N., Ahn, S.-J., Vontas, J., Heckel, D.G. (2014). A worldwide resistance mechanism of *Helicoverpa armigera* - Crucial amino acids and the evidence for multiple origin in the chimeric CYP337B3, ICE Symposium, MPI for Chemical Ecology, Jena, DE (**Talk**)
- Joußen, N., Pavlidi, N., **Rasool, A.**, Ahn, S.J., Vontas, J., Heckel, D.G. (2014). Universal weapon CYP337B3: Pyrethroid resistance of *Helicoverpa armigera*. SAB Meeting 2014, MPI for Chemical Ecology, Jena, DE (**Poster**)
- Gulnaz Afzal, **Akhtar Rasool** and Muhammad Khalid Mukhtar. (2014). Seasonal dynamic effect on araneid diversity species composition and population dynamics of the araneid fauna in winter wheat fields. International Conference of Biochemical

and Chemical Sciences, University of Agriculture, Faisalabad, Pakistan (**Talk**)

- Muhammad Ashfaq, M. Sajjad Mirza, Arif Muhammad Khan, Jawwad Hassan Mirza and **Akhtar Rasool**. (2013). DNA Barcode Analysis of Mosquito Species from Pakistan. International Conference on Biotechnology. NIBGE, Faisalabad, Pakistan. (**Poster**)

SEMINARS, SYMPOSIUMS AND WORKSHOPS (International and National)

- **Organiser** in one day seminar on “Coronavirus Infection: Prevention and Control”, Centre for Biotechnology & Microbiology, University of Swat. Held on March 03, 2020.
- **Organiser** in one day seminar on “Kashmir Current Plights”, University of Swat. Held on February 04, 2020.
- **Participated** in one day seminar on “Introduction to Mathematical Modelling” organised by Department of Mathematics & Statistics, University of Swat. Held on November 4th 2019.
- **Participated** in one day training seminar on “MinION Nanopore DNA Sequencing”, organised by Centre for Omic Sciences, Islamia College University, Peshawar. Held on September 24, 2019.
- **Organiser** in one day seminar on “Ambians & Reptiles”, University of Swat. Held on September 19, 2020.
- **Participated** in two day workshop on “Ulasi Taroon Youth Capacity Building workshops”, organised by Center for Research and Security Studies (CRSS) at University of Swat. Held on June 21-22, 2019.
- **Participated** in one day seminar on “Introduction to research in Herpetology”, organised by University of Buner. Held on June 21, 2020.
- **Organiser** one day seminar on “Prevention and Control of Mosquito-Borne Diseases (Dengue and Malaria)” on World Malaria Day. Society of Disaster Management and Health Affairs, University of Swat. Held on April 25, 2018.
- **Participated** in Cultural expo held on April 24, 2018 at University of Swat.
- **Participated** in one day workshop on “First Aid and Emergency safety training” organised by Society of Disaster Management and Health Affairs. Held on April 12, 2018
- **Participated** in one day seminar on “Self-Assessment Report Writing” organised by Quality Enhancement Cell, University of Swat. 09 March, 2017.
- **Participated** in one day workshop on “Quality Assurance through Promoting Anti-Plagiarism Culture” organised by Quality Enhancement Cell, University of Swat. 4 January, 2017.

- **Participated** in one day seminar on “Intellectual Property Rights (IPRs)” at Directorate of Outreach, Research, Innovation and Commercialization (DORIC), University of Swat. 25 November, 2016.
- **Organised** One day workshop on “leadership, motivation and rule of law” at Centre for Animal Sciences & Fisheries and Department of Forensic study, University of Swat on October 21, 2016.
- **Participated** in “Pakistan Center of Excellence (PACE) Collaborative Workshops” at Center for Research and Security and Studies (CRSS), Islamabad. 23-26 September, 2016.
- **Participated** in “13th National Congress Of Weed Science” organized Weed Science Society of Pakistan and Shaheed Benazir Bhutto University, Sheringal Upper Dir, August 19-21, 2016.
- **Participated** in “7th one day workshop on the significance of bioinformatics in life sciences” at Capital University of Science and Technology, Islamabad (May 07, 2016).
- **Participated** in “National symposium on Economic Development through Medicinal Plants cultivation and conservation at University of Swat, Swat (May 05-06, 2016).
- **Member Organizing Committee** of “1st National student conference on “Biological Sciences” at National Institute for Biotechnology and Genetic Engineering (NIBGE), Faisalabad, Pakistan (March 27 to 28, 2014)
- **Participated** in “International Conference of Biochemical and Chemical Sciences at University of Agriculture Faisalabad (UAF), Pakistan (February 24 to 26, 2014)
- **Participated** in 3rd National workshop on “sustainable and integrated management of insect pests and diseases of crops” at Nuclear Institute for Agriculture and Biology (NIAB), Faisalabad, Pakistan.
- **Participated** in “International Conference on Biotechnology” at National Institute for Biotechnology and Genetic Engineering (NIBGE), Faisalabad, Pakistan (April 22 to 26, 2013)
- **Member Organizing Committee** of “Two-day symposium on Dengue Fever: Virology and Vector Control” at National Institute for Biotechnology and Genetic Engineering (NIBGE), Faisalabad (January 31 to February 01, 2013)
- **Participated** in 11th The International Max Planck Research School (IMPRS) Symposium, Max Planck Institute for Chemical Ecology, Dornburg, Germany (August 8 to 10, 2012)
- **Participated** in two days institute symposium at Max Planck Institute for Chemical Ecology (MPI-ICE), Jena, Germany (September 22 to 23, 2011)
- **Participated** in one day symposium on “Biotech cotton in Pakistan: Progress and prospects” National Institute for Biotechnology and Genetic Engineering (NIBGE), Faisalabad, Pakistan (5/27/2010-5/27/2010)

- **Member Organizing Committee** One day symposium on "Insect genomics: Applications and potential for pest control" National Institute for Biotechnology and Genetic Engineering (NIBGE), Faisalabad, Pakistan (March 3, 2009)
- **Participated** in 1st national symposium on "Biotechnology; Recent advances" Department of Biotechnology, University of Malakand, Chakdara Lower Dir, KPK, Pakistan (May 21 to 24, 2007) [local]

SUBJECTS TAUGHT/TEACHING

- Cell & Molecular Biology, Biological Techniques, Genetics, Immunology, Biochemistry, Proteomics Genomics & Metabolomics, Animal Biotechnology and Genetic Engineering

OTHER RESPONSIBILITY

- Member National Curriculum Revision Committee, Higher Education Commission Pakistan, Pakistan for BS Zoology and MS Zoology degree program.
- Higher Education Commission Pakistan Approved Supervisor for supervising MPhil and PhD students.
- Head of Department of Centre for Animal Sciences & Fisheries, University of Swat, Pakistan.
- Convener Board of Studies, Departmental Semester Examination Committee, and Departmental Purchase Committee of Centre for Animal Sciences & Fisheries, University of Swat, Pakistan
- Member Board of Study of Centre for Biotechnology & Microbiology, and Department of Forensic Studies, University of Swat, Pakistan
- Member of Affiliation Committee different colleges, University of Swat, Pakistan

WORKING EXPERIENCE

- Working as an Assistant Professor at University of Swat in Centre for Animal Sciences and Fisheries from 4th August 2015 till present.
- Working as collaborator in international project determination of global patterns of a synthetic pyrethroid resistance mechanism in *Helicoverpa armigera*, funded by Deutsche Forschungsgemeinschaft (DFG), Germany (Year 2013-2015)
- Worked in Department of entomology, Max Planck Institute for Chemical Ecology (MPI-ICE), Jena Germany as a visiting PhD scholar (14/03/2013 to 24/04/2012).
- Worked as an internee in Ministry of Agriculture under National Internship Program (NIP) for eight months in agriculture extension and floriculture (01/06/2007 to 31/03/2008).

LAB AND BIOINFORMATICS SKILLS

- Expertise in DNA, RNA, protein and microsomes isolation, PCR, Quantitative real time PCR, RACE-PCR, cDNA synthesis, Gene Cloning and transformation, southern and western blotting, Enzyme Linked Immunosorbent Assay (ELISA), HPLC, AFLP markers analysis, Enzyme bioassay (metabolic), fermentation techniques, Enzyme Purification, Gene

Expression Study and Bioinformatics tools (Primer Designing, DNA sequence analysis, Synthetic Gene Designing etc.).

- Expertise in insects (*Helicoverpa armigera*, *Bemisia tabaci*, *spodoptera litura* and maize stem borer, Mealybugs and *Bemisia tabaci*) rearing in lab and green house, insect toxicity bioassay, particularly chemical insecticides and transgenic plants (*Bt* and ω -*ACTX-Hv1a* toxin (*Hvt*)).
- Insect's genomics and insect cell culturing for transient and stable gene expression studies.
- DNA barcoding of insects (economically important insect pests).
- Having skill and expertise in Microsoft Office, computer software, statistical analysis softwares (SPSS, Statistix, Arlequin), Reference manager (Endnote), Molecular Biology Analysis Software (DNA Star, Sequencher 5.1, qBase, AFLP Quantar TM Pro, MEGA, Structure 2.3 and Structure Harvester, Dnasp 5) and internet search related to molecular biology work. Basic knowledge of data analysis through R.

REFERENCES

Muhammad Ashfaq, Ph.D.

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Prof. David G Heckel

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