

HENA HAYAT

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PROFESSIONAL SUMMARY

A well-qualified agriculture and Biotechnology professional from eminent Universities with diverse experience in reputed Labs of India like Council of Scientific and Industrial Research (CSIR) Lab, Indian Council of Agricultural Research (ICAR) Lab, Lectureship/ Asst Professorship, background of Biotechnology/Agriculture and Intellectual Property Rights (IPRs).

AREAS OF INTEREST

- Sustainable energy research focusing on Bio-hydrogen , Bio-ammonia , Bio-ethanol as energy alternatives.
- Electrolysis based carbon-free fuel production from renewable resources
- Modification of micro-organism using gene editing tools such as CRISPR-Cas system to produced high quantity (MUFA) of bio-fuels with low GHG emission

EDUCATION

- Ph.D. in Botany (Biotechnology) University of Mumbai, Mumbai
- M.Sc. AGRI. (Plant Breeding & Plant Biotechnology) - Punjab Agricultural University, Ludhiana, Punjab
- BSc. (Agri.) Punjab Agricultural University, Ludhiana, Punjab
- Post Graduate Diploma in Intellectual Property Rights (IPR) from University of Mumbai.

PROFESSIONAL EXPERIENCE

A. Teaching Experience and Research :

1. The Institute of Science (Post Graduate College), as an Assistant Professor in Department of Biotechnology (**M.Sc. Biotech Course**) at Mumbai University (2009-11)
2. The Institute of Science, Mumbai University for M.Sc. classes (2011-14) as a visiting /part time faculty at Department of Botany (Subjects taught- Cytogenetics, Bioinformatics)

B. Research Experience

1. The Institute of Sciences , Mumbai- as a Research Scholar-2014-2022
2. Central Institute of Medicinal & Aromatic Plants (CIMAP) (CSIR Lab), CSIR nominated Researcher at CIMAP, Lucknow (2years)
3. Indian institute of Pulses Research (IIPR), ICAR- Senior research fellow - worked on gene pyramiding of Wilt genes in resistance in chickpea and mutation breeding for functional male sterility in black gram (Vigna Mungo) (2years)

C. Volunteer Experience

1. Took PG Classes on volunteer basis for M.Sc. (Bioinformatics, Biostat., Biophysics) at The Institute of Science, Mumbai during Ph.D. course
2. Project Coordinator for Environment conservation through segregated waste management Project which involved interaction with internal team and external collaborators for Reuse- Reduce- Recycle. (1.25 yrs)

RESEARCH & TECHNICAL FAMILIARITIES

1. Lab Skills

- Biofuel Synthesis from Oil-seeds ((Trans-esterifications)
- Gas Chromatography Mass Spectrometry (GC-MS)
- High-performance liquid chromatography (HPLC)
- Thermo gravimetric analysis (TGA)
- CRISPER- CAS9 gene editing technology, •PCR (DNA Finger Printing/ Molecular marker analysis) •Plant Tissue culture , callus culture, • Cloning • SDS PAGE
- Bioinformatics Tools (like BLAST, CLUSTAL W, Pattern search, 3D structures, Homology Modelling, Mass Spectrometry (Peptide Mass Fingerprinting)
- Antimicrobial activities against fungi and bacteria

2. Field Skills

- Hybrid production in Crops
- Gene Pyramiding to introduce multiple disease resistant genes via back crosses in crops.
- Evaluation of Crosses , Parents, Progenies and Segregation Generation studies
- Molecular Marker Assisted Selection
- Evaluation of parents and crosses for their Genetic combining and Specific Combining ability respectively.
- Studies on Genetic and Cytoplasmic Male sterile lines

Fellowships /Awards/Certifications

- **U.G.C. fellowship for Ph.D. programme** (2013-14,15-16)
- **National Eligibility Test (NET)exam** (2008) recognized by University Grants Commission (UGC)/CSIR
- **CSIR Jubilee Internship Award** (2006).
- **National Agricultural Talent Scholarship (NATS)** by **ICAR** throughout Bachelor's degree programme
- **Certificate of Appreciation** for work by the organizations which won the coveted National award for "**Swachhta Hi Seva** Commended at a Defence Non-Government Organisation (NGO) for Segregated Waste Management for environment conservation. (2017)

Development of 3 Medicinal Plant Varieties (Intellectual Properties)

Actively contributed at **CIMAP, CSIR, Lucknow** in research towards development and release of following commercial varieties

1. CIM Angana - A high yielding Tulsi variety (*Ocimum sanctum.*, Commercially successful and in high-demand .

2.CIM Madhu - A high yielding *Stevia rebaudiana* variety has leaves with negligible pungency for (A non-sugar substitute for diabetic patients).

3.CIM Mithi - Registration on of High yielding variety – “CIM- Mithi” Stevia. (A non-Sugar alternative)

Guide for Dissertations for M.Sc. Biotechnology

Guide/Internal guide to **M.Sc. Biotechnology students** for their Research and Dissertations while working as Asst. Professor at The Institute of Science, Mumbai University. Some of the interesting research topics I had guided were:

1. Associations of genetic polymorphisms of Cytochrome P4502C9 with adverse effects of warfarin (Drug).
2. PCR Products cloning of HIV-2 GAG gene and its Diagnostic applications.

Other activities/responsibilities /information

1. **Conducted National level Seminar** as an organizing secretary while working in The institute of Science, Mumbai University.
2. **Conducted training for M.Sc. students** - Imparted training for PCR techniques, Bioinformatics and Plant Tissue culture to M.Sc. Botany and Biotechnology students .
3. **Extension work-** Volunteered on many occasions and conducted/ participated in Science and Farmer Fairs organized by my Institutes as a part of extension work.
4. **Project Co-ordinator-** Commended at a Defence Non-Government Organisation (NGO) for Segregated Waste Management for environment conservation. Awarded **Certificate of Appreciation** for work by the organizations which won the coveted national award for Swachhta Hi Seva under "Swachh Bharat Mission".

Publications

1. V.D. Mendhulkar and **Hena Hayat** (2016). Optimization of Genomic DNA extraction from the leaf tissues of *Jatropha* species for molecular studies. Asian Journal of Microbiology, Biotechnology and Environmental Sciences. Vol. 18, No. (3) : 2016 : 623-626.
2. **H. Rizvi**, B. Kalyana and P. K. Agrawal. (2013). Molecular analysis of kabuli and desi type of Indian chickpea(*Cicer arietinum* L.) cultivars using STMS (PCR)markers. J. Plant Biochem. Biotechnol. DOI 10.1007/s13562-012-)
3. **Hena Hayat** and Mendhulkar V. D. (2016). A simplified approach to transesterification for GC-MS analysis in *Jatropha curcas*. Der Pharmacia Lettre, 2016, 8 (10):233-23
4. Smita Singh, **Hena Rizvi**, R.K. Lal, S. Sarkar, P. Gupta, S.K. Rai. (2014).Genetic Variability and Character Associations Among Economic Traits in Fennel (*Foeniculum vulgare* Miller). Journal of Essential Oil Bearing Plants. 17(6) 1367-1372. (Elsevier indexed).
5. Shiv Kumar, Sanjeev Gupta, **Hena**, Subhojit Datta, Bansa Singh, and B. B. Singh (2012)Inheritance of Protruded Stigma in Black Gram [*Vigna mungo* (L.) Hepper]. CROP SCIENCE, VOL. 52.(Elsevier, scopus indexed).
6. R.K. Lal, S.P.S. Khanuja, **Hena Rizavi**, A.,K.Shasany, R. Ahmad, Ram Chandra, A.A. Naqvi, Hari O. Misra, Aparbal Singh, Neelakshhi Singh,R.S. Lohia, Kushagra Bansal, M.P.Darokar, A.K.Gupta, A. Kalara, O.P. Dhawan, J.R. Bahl, A.K. Singh, Hari Shankar, Dharmendra Kumar, and M. Alam (2008). Registration of a high yielding dark purple pigmented, variety 'CIM-Angana' of Shyam tulsi (*Ocimum sanctum* L.). J M.A.P. Sci. 30(1):92-94.
7. R.K. Lal, R. Chandra, M.M. Gupta, A. K. Singh, Manju Singh, R. K. Verma, H.O. Misra, A. Kalra, A.K. Gupta, C. Lal, H. P. Singh, B. Kumar, H. N. Singh, H. Shankar, O. P. Dhawan, A. Krishna, K. Bansal, **Hena Rizavi**, R.P. Bansal, H.S. Chauhan, S. Singh, Mohd, Zaim,

- J.R. Bhal and R, Panday. (2011). Registration of a high yielding variety "CIMAP MADHU" of Stevia (*Stevia rebaudiana* Bert.). JMAPS. 33 (1):77- 80.
8. RK LaL, R Chandra, MM Gupta, AK Singh, M Singh, RK Verma, HO Mishra, A Kalra, AK Gupta, C Lal, HP Singh, B Kumar, HN Singh, H Shankar, OP Dhawan, A Krishna, K Bansal, H Rizvi, RP Bansal, HS Chauhan, S Singh, M Zaim, JR Bahl and R Pandey. Registration of a high yielding variety "CIM-Madhu" of Stevia (*Stevia rebaudiana*). J. Med. Arom. Pl. Sci. (2011) 33 (1): 77-80. 0187-1.
 9. Datta S, Rai R, Tiwari K, Kashyap M, Hena and Kumar S. 2007. Phylogenetic analysis of pulse crops using RAPD markers. Journal of Food Legumes 20(1): 9-11.
 10. Lal R K, Khanuja S P S, Bansal, K, Agnihotri, A K, Misra H O and Hena (2006). Psyllium (*Plantago ovata* Forsk) its conservation and utilization. *Journal Med. Aromat Plant Sci.* 27:499-505
 11. Lal R K, Khanuja S P S, Misra H O, Bansal, K, Hena and Naqvi A A (2006). Genetic diversity in secondary metabolites of curry leaf (*Murraya koengii* (Linn) Spreng). *Indian perfumer.* 49: 519-524.
 12. Lal R K, Khanuja S P S, Bansal, A K, Misra H O and Hena.(2006). Genetic variability over environments and its exploitation in fennel (*Foeniculum vulgare* Mill). *Indian perfumer.*