

CURRICULUM VITAE

MANU PRIYA

Plant Physiology Lab
Department of Botany
Panjab University,
Chandigarh, India-160014.
Email: priya.manu1989@gmail.com
Contact: +8968724698

ACADEMICS

- Assistant Professor Botany
(GDC NAGROTA SURIAN, HIMACHAL PRADESH) 2020-2022
- Ph. D, Botany: Plant Physiology 2014-2020
Panjab University, Chandigarh
- Master of Science, Botany 2010-2012
Himachal Pradesh University, Shimla
- Bachelor of Science, Life Sciences 2007-2010
MCM DAV College, Kangra

FELLOWSHIPS AND AWARDS

- Qualified CSIR-UGC JRF 2014 conducted by Council of Scientific and Industrial Research (AIR-58)
- Qualified SET (state eligibility test) 2014 conducted by HPPSC (Himachal Pradesh Public Service Commission).
- Qualified ARS-NET (Agricultural Research Scientist) 2017 conducted by ICAR (Indian Council of Agricultural Research)
- Awarded Gold Medal for 1st position in M.Sc. Botany

CONFERENCES

- Attended lecture series of **BIO-CLUB (CRIKC)** on 8th November 2014 at Panjab University, Chandigarh
- Participated in “**Biotechnology for Biofuels: A Regulatory Perspective**” a one day symposium held on March 30th, 2015 at ICSSSR complex, Panjab University, Chandigarh
- Attended a workshop on “**Research Methodology**” held at Panjab University, Chandigarh under Technical Quality Improvement Program from October 19, 2015 to October 21st, 2015.

- Presented a poster entitled “**Temperature stress: Sensing and Defense mechanisms in Plants**” during 9th Chandigarh Science Congress held at Panjab University, Chandigarh from 25th to 27th February, 2015
- Participated in the 1st ISEES International Conference on “**Sustainable Energy and Environmental Challenges (SEEC-2017)**” from 26th to 28th February 2017, held at CIAB, Mohali
- Attended Har Gobind Khorana Memorial Symposium on “**Genes, Genomes and Membrane Biology**” held at NABI, Mohali during December 03-05, 2017
- Presented a poster on “**Interplay between ROS signaling, Nitric Oxide (NO) and during 9th -11th February 2021. Anti-oxidant systems in Plant Abiotic Stress Tolerance**” in the 11th Chandigarh Science Congress during 9th -11th March, 2017
- Presented a poster on “**Reactive Oxygen Species (ROS): The Key Message in Abiotic Stress Response**” during International Conference on Emerging Areas of Environmental Science and Engineering, Guru Jambheshwar University of Science and Technology, Hisar from 16th -17th February, 2017
- Won 3rd Best Poster Award for poster entitled “**Assessment of mungbean (*Vigna radiata* L. WILCZEK) genotypes for heat tolerance**” under the theme Abiotic Stress Management presented in National Web Conference on **Sustaining Pulse Production for Self Sufficiency and National Security (Pulse WebCon 2021)**

PUBLICATIONS

1. Sharma, L., Priya, M., Bindumadhava, H., Nair, R. M., & Nayyar, H. (2016). Influence of high temperature stress on growth, phenology and yield performance of mungbean [*Vigna radiata* (L.) Wilczek] under managed growth conditions. *Scientia Horticulturae*, 213, 379-391.
2. Priya, M., Dhanker, O. P., Siddique, K. H., HanumanthaRao, B., Nair, R. M., Pandey, S., ... & Nayyar, H. (2019). Drought and heat stress-related proteins: an update about their functional relevance in imparting stress tolerance in agricultural crops. *Theoretical and Applied Genetics*, 132(6), 1607-1638.
3. Sharma, L., Priya, M., Kaushal, N., Bhandhari, K., Chaudhary, S., Dhankher, O. P., ... & Nayyar, H. (2020). Plant growth-regulating molecules as thermoprotectants: functional relevance and prospects for improving heat tolerance in food crops. *Journal of Experimental Botany*, 71(2), 569-594.
4. Priya, M., Sharma, L., Kaur, R., Bindumadhava, H., Nair, R. M., Siddique, K. H. M., & Nayyar, H. (2019). GABA (γ -aminobutyric acid), as a thermo-protectant, to improve the reproductive function of heat-stressed mungbean plants. *Scientific Reports*, 9(1), 1-14.
5. Priya, M., Sharma, L., Singh, I., Bains, T. S., Siddique, K. H., Bindumadhava, H., ... & Nayyar, H. (2019). Securing reproductive function in mungbean grown under high temperature environment with exogenous application of proline. *Plant Physiology and Biochemistry*, 140, 136-150.

6. Chaudhary, S., Priya, M., Jha, U. C., Pratap, A., HanumanthaRao, B., Singh, I., ... & Nayyar, H. (2022). Approaches Toward Developing Heat and Drought Tolerance in Mungbean. *Developing Climate Resilient Grain and Forage Legumes*, 205-234.
7. Priya, M., Pratap, A., Sengupta, D., Singh, N. P., Jha, U. C., Siddique, K., & Nayyar, H. (2020). Mungbean and high temperature stress:: responses and strategies to improve heat tolerance. In *Heat stress in food grain crops:: Plant breeding and omics research* (pp. 144-170). Bentham Science Publishers.
8. Priya, M., Siddique, K. H. M., Dhankhar, O. P., Prasad, P. V., Hanumantha Rao, B., Nair, R. M., & Nayyar, H. (2018). Molecular breeding approaches involving physiological and reproductive traits for heat tolerance in food crops. *Indian Journal of Plant Physiology*, 23(4), 697-720.

BRIEF SUMMARY OF Ph.D. THESIS

Title: “Exploring the mungbean (*Vigna radiata* L. WILCZEK) genotypes for heat tolerance and probing the underlying mechanisms”

Summary: Mungbean is an important warm-season legume crop well adapted with in temperature range of 27-30°C for optimum growth. The crop experiences abnormally high temperature at the reproductive stage during its normal cultivation season and particularly in late-sown conditions. The impacts are larger on late-sown crop and consequently, its yield gets constrained because of inhibition of vegetative growth, reproductive failures shown as a drop in flowers and pods number, less pod filling and reduced seed size. To increase the productivity of mungbean, it is crucial to find out the genetic variation for heat tolerance in the core germplasm and probe the mechanisms governing heat sensitivity in this crop. In this background, we have conducted a study for evaluating mungbean lines for heat tolerance at the whole plant level, both at vegetative and reproductive stages, to capture physiological, growth and yield responses to explore the mechanism of heat tolerance in this very important legume crop. Initially, forty-one mungbean genotypes procured from AVRDC, ICRISAT, Hyderabad and Punjab Agricultural University, Ludhiana, were screened to identify the contrasting ones (heat-tolerant and heat-sensitive), which were further tested for their ability to tolerate heat stress through various tolerance parameters. Later on, twenty-two elite mungbean genotypes procured from the Indian Institute of Pulses Research, Kanpur were screened on the basis of various growth and yield parameters in the field as well as in controlled environmental conditions. Our findings showed that high temperatures (>40/28°C) were harmful to flowering

and pod setting, which resulted in a marked reduction in pods and seeds number. We also found significant genetic variation among tested elite mungbean genotypes for heat tolerance. Genotypes EC693358, EC693357, EC693369, Harsha and ML1299 were evaluated as heat-tolerant on the basis of biomass, the number of flowers, pods, and seeds' weight/plant. These genotypes would not only serve as useful donor/s for breeding programs but also may act as a promising base plant source to gain thorough insights on heat stress-induced effects in plant metabolism. Some leaf-based traits such as SPAD value, leaf area, as well as some pollen-based traits such as pollen viability and pollen germination (*in vitro* and *in vivo*) also appear to be useful for comparing heat-tolerant and heat-sensitive genotypes. Further, these genotypes showed considerable tolerance to varying day and night temperatures in our study.

Another set of genotypes were tested for their tolerance to heat stress in second screening experiment. Genotypes SML2006, SML2007, SML1831 and SML1829 were considered as heat-tolerant as other genotypes in terms of their superior stability for leaf-based traits such as stomatal conductance, chlorophyll fluorescence and SPAD value for chlorophyll. These genotypes also performed better in excised leaf stay green assay, excised leaf water retention capability test suggesting that these genotypes were able to maintain their leaves functional for a long time, compared to heat-sensitive genotypes.

PROFESSIONAL REFERENCES

Prof. Harsh Nayyar

Department of Botany
Panjab University, Chandigarh -160014 [India]
E-mail- harshnayyar@hotmail.com

Prof. N.K. Matta

Department of Botany
Kurukshetra University, Kurukshetra -136119 [India]
E-mail- nk_matta@yahoo.com

Prof. Shanti S. Sharma

Department of Botany
Sikkim University, Sikkim -737102 [India]
E-mail- sssharma@cus.ac.in

I declare that the information given above is true to the best of my knowledge.