Department of Botany
University of Kashmir

Research Facilities

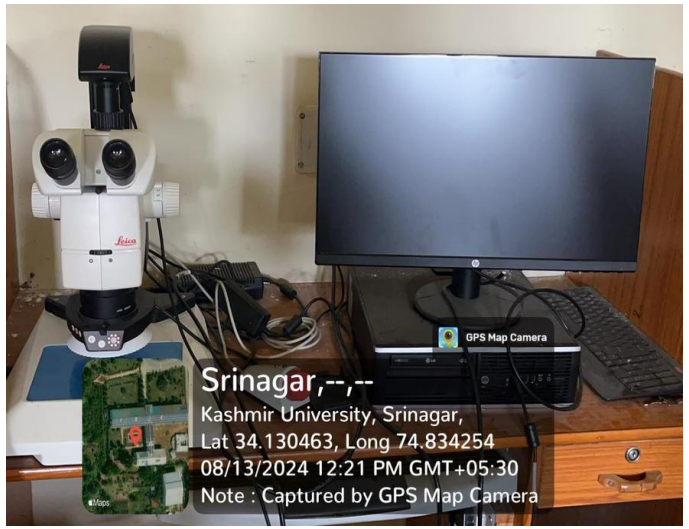
Self-Study Report (SSR) 2019-2023

Equipment details:

Name & Picture of the Equipment

↑

Microscope with microphotography



↑

Stereozoom Microscope

Status of the working Condition

Working

OUTCOME

Phytotaxa 571 (2): 219–226
https://www.mapress.com/pt/
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Article

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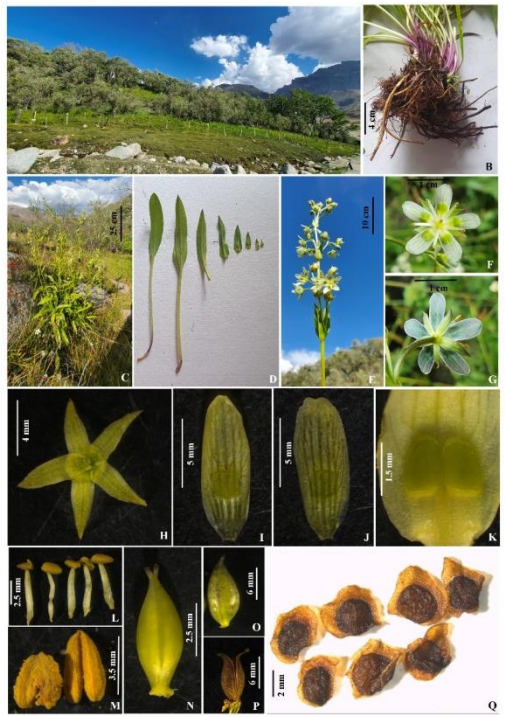
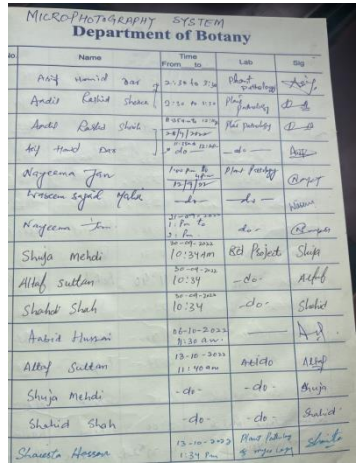
PHYTOTAXA
ISSN 1179-3163 (online edition)

https://doi.org/10.11646/phytotaxa.571.2.8

***Swertia drassensis*, a new species from Drass, Ladakh Himalaya**

SAKINA BANOO[1,3], ANZAR AHMAD KHUROO[1,4*] & AIJAZ HASSAN GANIE[2,5]
[1] *Centre for Biodiversity & Taxonomy, Department of Botany, University of Kashmir, Srinagar – 190006, Jammu and Kashmir, India*
[2] *Department of Botany, University of Kashmir, Kargil Campus – 194103, Kargil, Ladakh, India*





Equipment details:

Name & Picture of the Equipment

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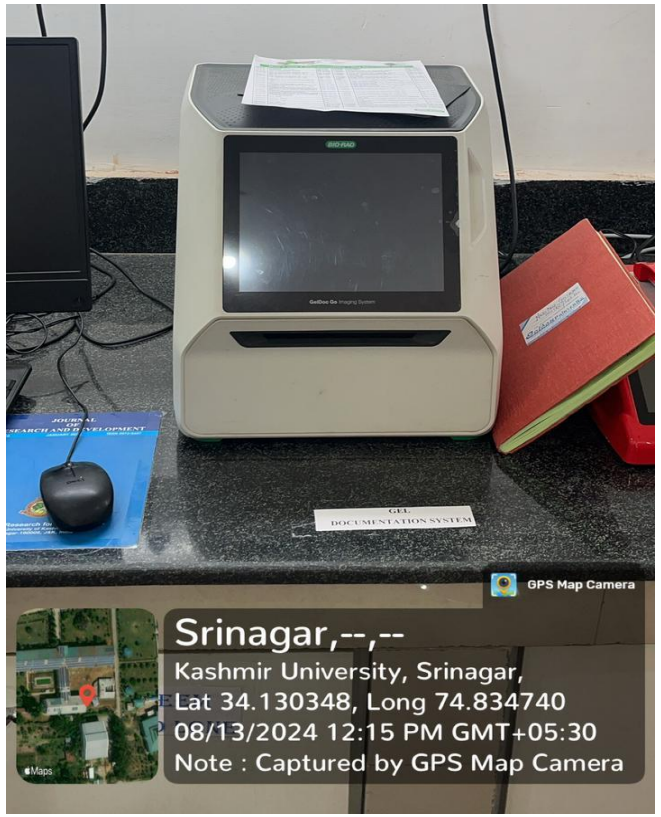
2 D Gel Electrophoresis



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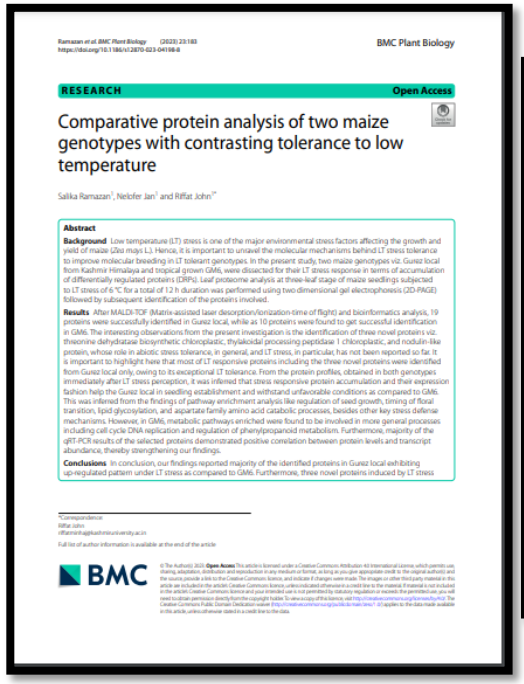
Gel Doc

Status of the working Condition

Working

OUTCOME

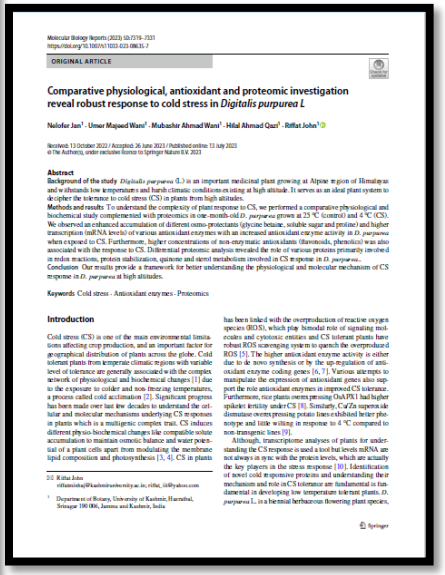


BMC Plant Biology

RESEARCH Open Access

Comparative protein analysis of two maize genotypes with contrasting tolerance to low temperature

Salika Ramazan, Nelofer Jan and Riffat John



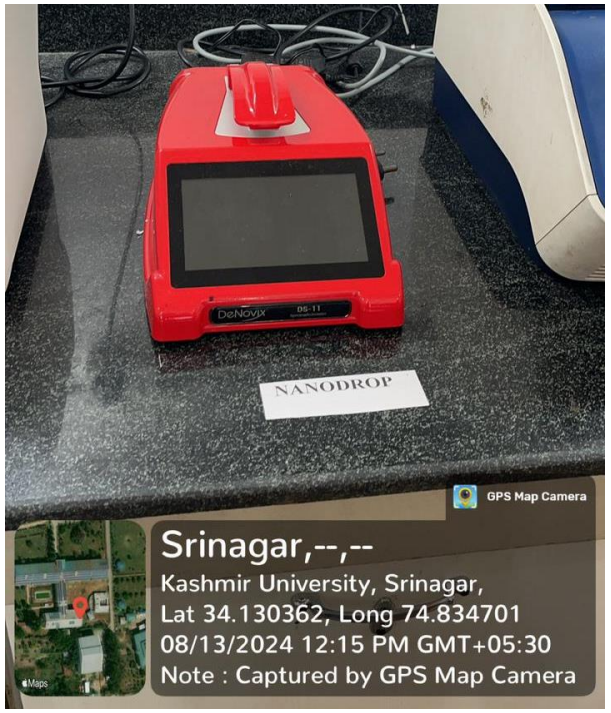
ORIGINAL ARTICLE

Comparative physiological, antioxidant and proteomic investigation reveal robust response to cold stress in *Digitalis purpurea L*

Nelofer Jan · Umer Majeed Wani · Mubashir Ahmad Wani · Hilal Ahmad Qazi · Riffat John

Equipment details:

Name & Picture of the Equipment



Nanodrop

Cold Centrifuge

Status of the working Condition

Working

OUTCOME

Environmental Science and Pollution Research (2023) 30:84283–84299
https://doi.org/10.1007/s11356-023-28197-2

RESEARCH ARTICLE

Plant invasion shifts soil microbiome and physico-chemical attributes along an elevational gradient in Kashmir Himalaya

Khalid Hussain[1] · Rameez Ahmad[1] · Martin A. Nuñez[2] · Tanvir Ul Hassan Dar[3] · Irfan Rashid[4] · Anzar Ahmad Khuroo[1]

Received: 28 November 2022 / Accepted: 6 June 2023 / Published online: 26 June 2023

Abstract
Soil microbial communities, being situated at the interface of aboveground plant and belowground soil systems, can play a pivotal role in determining ecosystem response to the drivers of global environmental change, including invasive species. In mountains, invasive plants occurring along elevational gradients offer a unique natural experimental system to investigate the impact of invasions in determining patterns and relationships of soil microbial diversity and nutrient pools at much shorter spatial distances. Here, we studied the impact of a global plant invader, *Leucanthemum vulgare*, on the diversity of soil microbiome and physico-chemical attributes along an elevational gradient (1760–2880 m) in Kashmir Himalaya. We used Illumina MiSeq platform to characterize the soil microbiome in pair-wise invaded and uninvaded plots at four different sites along the gradient. We found a total of 1959 bacterial operational taxonomic units (OTUs) belonging to 152 species, and a relatively higher number of 2475 fungal OTUs belonging to 589 species. The α-diversity of soil microbiome showed a gradual increase from low to high elevation and differed significantly ($p < 0.05$) between the invaded and uninvaded plots. The β-diversity revealed distinct microbiome clustering among the sampling sites. Plant invasion also altered soil physico-chemical attributes along the elevational gradient. Overall, our findings suggest that the *L. vulgare*-induced shifts in soil microbiome and nutrient pools may be a belowground self-reinforced mechanism to facilitate its successful invasion along the elevational gradient. Our study provides new insights into invasive plant–microbe relationships with wide implications for climate warming-driven elevational range shifts in mountains.

Keywords Invasion impact · Elevation · *Leucanthemum vulgare* · Microbiome · Physico-chemical

Equipment details:

Name & Picture of the Equipment

(2750 m)

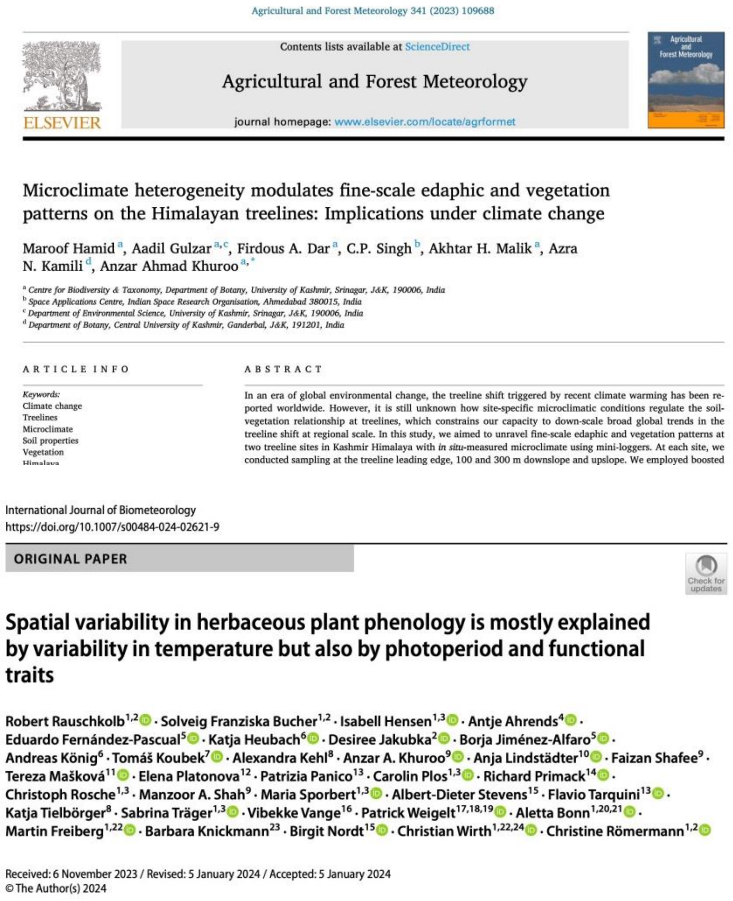
Automatic Weather Statio

(1590 m)

Status of the working Condition

Working

OUTCOME



Agricultural and Forest Meteorology 341 (2023) 109688

Contents lists available at ScienceDirect

Agricultural and Forest Meteorology

journal homepage: www.elsevier.com/locate/agrformet

Microclimate heterogeneity modulates fine-scale edaphic and vegetation patterns on the Himalayan treelines: Implications under climate change

Maroof Hamid [a], Aadil Gulzar [a,c], Firdous A. Dar [a], C.P. Singh [b], Akhtar H. Malik [a], Azra N. Kamili [d], Anzar Ahmad Khuroo [a,*]

[a] Centre for Biodiversity & Taxonomy, Department of Botany, University of Kashmir, Srinagar, J&K, 190006, India
[b] Space Applications Centre, Indian Space Research Organisation, Ahmedabad 380015, India
[c] Department of Environmental Science, University of Kashmir, Srinagar, J&K, 190006, India
[d] Department of Botany, Central University of Kashmir, Ganderbal, J&K, 191201, India

ARTICLE INFO

Keywords:
Climate change
Treelines
Microclimate
Soil properties
Vegetation

ABSTRACT

In an era of global environmental change, the treeline shift triggered by recent climate warming has been reported worldwide. However, it is still unknown how site-specific microclimatic conditions regulate the soil-vegetation relationship at treelines, which constrains our capacity to down-scale broad global trends in the treeline shift at regional scale. In this study, we aimed to unravel fine-scale edaphic and vegetation patterns at two treeline sites in Kashmir Himalaya with *in situ*-measured microclimate using mini-loggers. At each site, we conducted sampling at the treeline leading edge, 100 and 300 m downslope and upslope. We employed boosted

International Journal of Biometeorology
https://doi.org/10.1007/s00484-024-02621-9

ORIGINAL PAPER

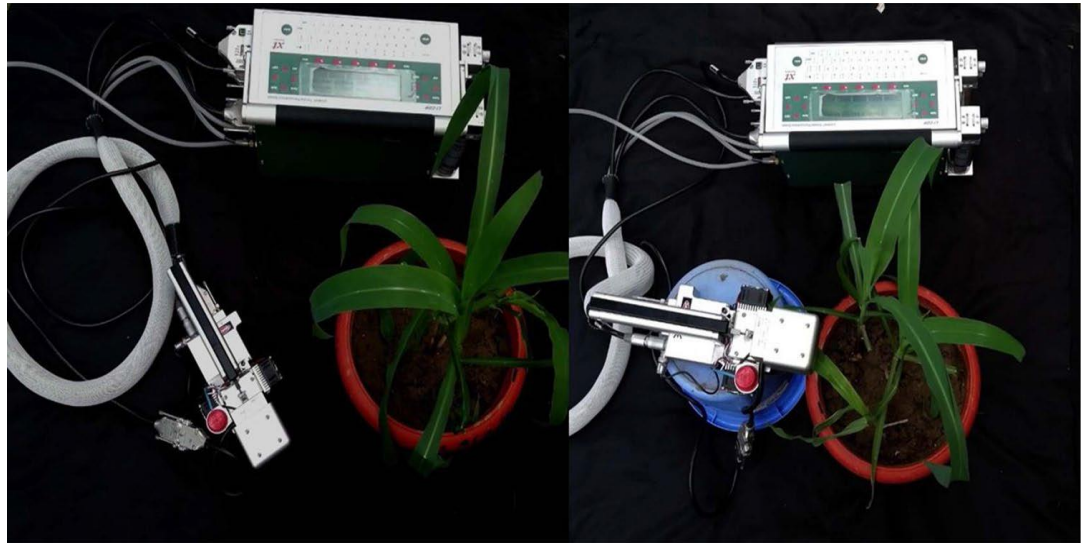
Spatial variability in herbaceous plant phenology is mostly explained by variability in temperature but also by photoperiod and functional traits

Robert Rauschkolb[1,2] · Solveig Franziska Bucher[1,2] · Isabell Hensen[1,3] · Antje Ahrends[4] · Eduardo Fernández-Pascual[5] · Katja Heubach[6] · Desiree Jakubka[2] · Borja Jiménez-Alfaro[5] · Andreas König[6] · Tomáš Koubek[7] · Alexandra Kehl[8] · Anzar A. Khuroo[9] · Anja Lindstädter[10] · Faizan Shafee[9] · Tereza Mašková[11] · Elena Platonova[12] · Patrizia Panico[13] · Carolin Plos[1,3] · Richard Primack[14] · Christoph Rosche[1,3] · Manzoor A. Shah[9] · Maria Sporbert[1,3] · Albert-Dieter Stevens[15] · Flavio Tarquini[13] · Katja Tielbörger[8] · Sabrina Träger[1,3] · Vibekke Vange[16] · Patrick Weigelt[17,18,19] · Aletta Bonn[1,20,21] · Martin Freiberg[1,22] · Barbara Knickmann[23] · Birgit Nordt[15] · Christian Wirth[1,22,24] · Christine Römermann[1,2]

Received: 6 November 2023 / Revised: 5 January 2024 / Accepted: 5 January 2024
© The Author(s) 2024

Equipment details:

Name & Picture of the Equipment



LiCOR Accessories

Status of the working Condition

Working

OUTCOME

Photosynthesis Research (2021) 150:213–225
https://doi.org/10.1007/s11120-021-00829-z

ORIGINAL ARTICLE

Combined gas exchange characteristics, chlorophyll fluorescence and response curves as selection traits for temperature tolerance in maize genotypes

Salika Ramazan[1] · Hilal Ahmad Bhat[2] · Mohammad Arief Zargar[3] · Parvaiz Ahmad[4,5] · Riffat John[1]

Received: 6 January 2021 / Accepted: 8 March 2021 / Published online: 30 March 2021

Abstract
Maize is a low-temperature (LT)-sensitive plant and its physiological responses towards LT of temperate regions developed is an adaptive trait. To further our understanding about the response of maize to LT at the physiological and photosynthesis level, we conducted Infrared Gas Analysis (IRGA using LICOR6400-XT in 45-day-old grown two maize genotypes, one from temperate region (Gurez-Kashmir Himalayas), viz., Gurez local (Gz local), and another from tropics (Gujarat), viz., GM6. This study was carried out to evaluate the underlying physiological mechanisms in the two differentially temperature-tolerant maize genotypes. Net photosynthetic rate (A/P_N), 18.253 in Gz local and 25.587 (μmol CO_2 m^{-2} s^{-1}) in GM6; leaf conductance (gs), 0.0102 in Gz local and 0.0566 (mmol H_2O m^{-2} s^{-1}) in GM6; transpiration rate (E), 0.5371 in Gz local and 2.9409 (mmol H_2O m^{-2} s^{-1}) in GM6; and water use efficiency (WUE), 33.9852 in Gz local and 8.7224 (μmol CO_2 mmol H_2O^{-1}) in GM6, were recorded under ambient conditions. Also, photochemical efficiency of photosystem II (PSII) (F_v/F_m), 0.675 in Gz local and 0.705 in GM6; maximum photochemical efficiency (F_v'/F_m'), 0.310234 in Gz local and 0.401391 in GM6; photochemical quenching (qP), 0.2375 in Gz local and 0.2609 in GM6; non-photochemical quenching (NPQ), 2.0036 in Gz local and 1.1686 in GM6; effective yield of PSII (ΦPSII), 0.0789 in Gz local and 0.099 in GM6; and electron transport rate (ETR), 55.3152 in Gz local and 68.112 in GM6, were also evaluated in addition to various response curves, like light intensities and temperature. We observed that light response curves show the saturation light intensity requirement of 1600 μmol for both the genotypes, whereas temperature response curves showed the optimum temperature requirement for Gz local as 20 °C and for GM6 it was found to be 35 °C. The results obtained for each individual parameter and other correlational studies indicate that IRGA forms a promising route for quick and reliable screening of various stress-tolerant valuable genotypes, forming the first study of its kind.

Keywords Gurez local · IRGA · Light · Low-temperature stress · Net photosynthetic rate · Maize

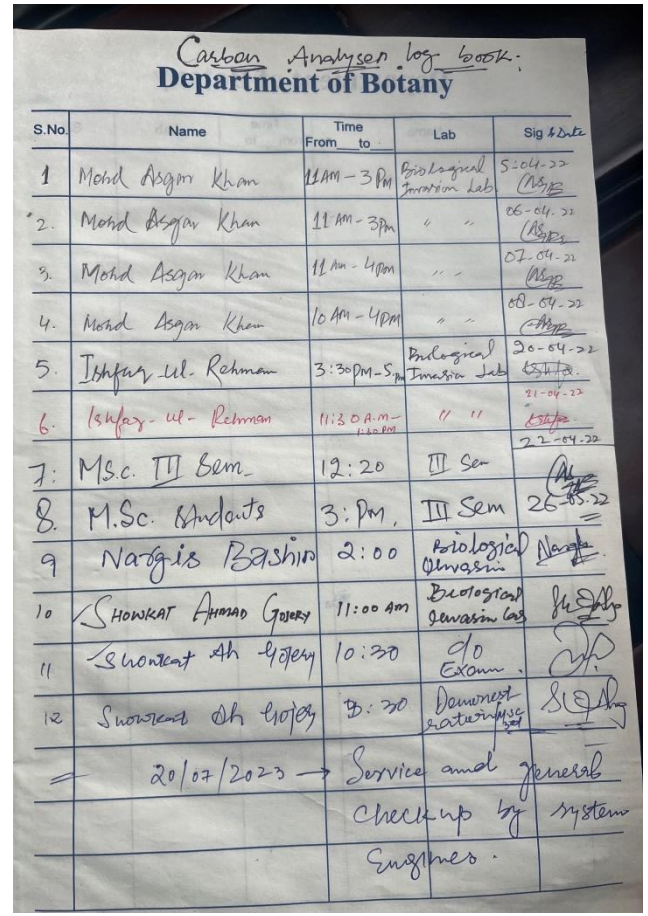
Equipment details:

Name & Picture of the Equipment

Carbon Analyser

Status of the working Condition

Working



Carbon Analyser log book:

Department of Botany

S.No.	Name	Time From to	Lab	Sig & Date
1	Mohd Asgar Khan	11AM-3PM	Biological Invasion Lab	5-04-22
2.	Mohd Asgar Khan	11 AM-3PM	" "	06-04-22
3.	Mohd Asgar Khan	11 AM-4PM	" "	07-04-22
4.	Mohd Asgar Khan	10 AM-4PM	" "	08-04-22
5.	Ishfaq-ul-Rehman	3:30PM-5PM	Biological Invasion Lab	20-04-22
6.	Ishfaq-ul-Rehman	11:30 A.M-1:30 PM	" "	21-04-22 / 22-04-22
7.	M.Sc. III Sem	12:20	III Sem	
8.	M.Sc. Students	3:PM,	III Sem	25-05-22
9	Nargis Bashir	2:00	Biological Invasion	
10	Showkat Ahmad Gojery	11:00 AM	Biological Invasion lab	
11	Showkat Ah Gojery	10:30	do Exam.	
12	Showkat Ah Gojery	8:30	Demonstrating	
=	20/07/2023 →	Service and general Checkup by system Engineer.		

Equipment details:

Name & Picture of the Equipment

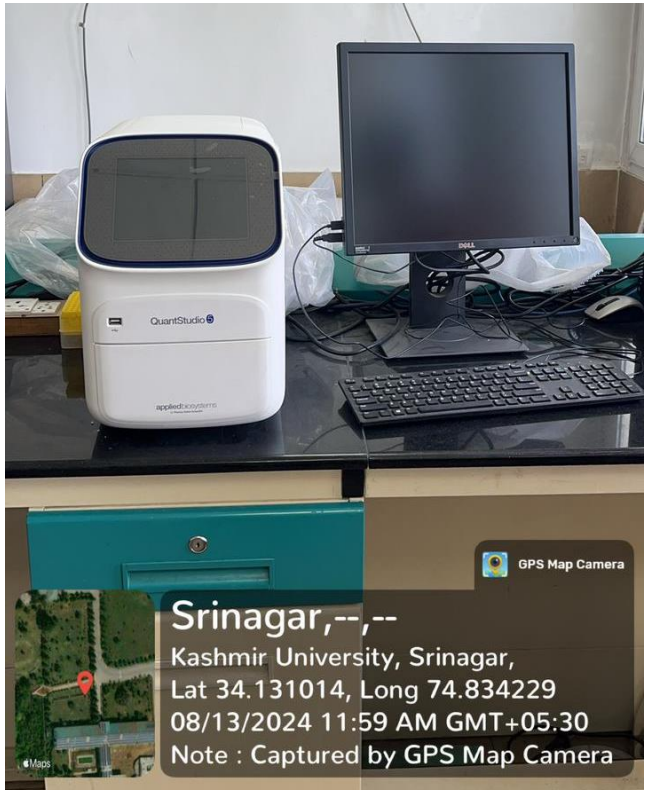
Biolog microbial identification system

Status of the working Condition

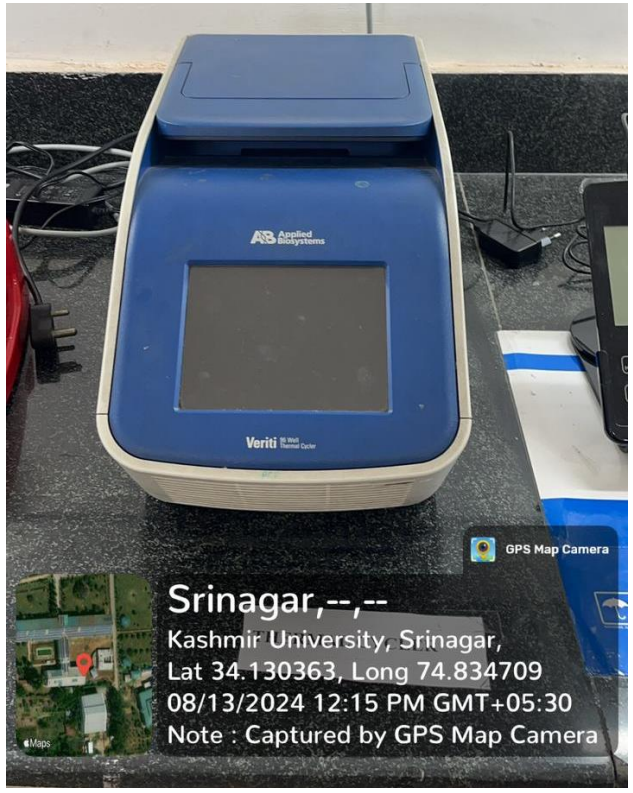
Working

Equipment details:

Name & Picture of the Equipment



Real Time PCR



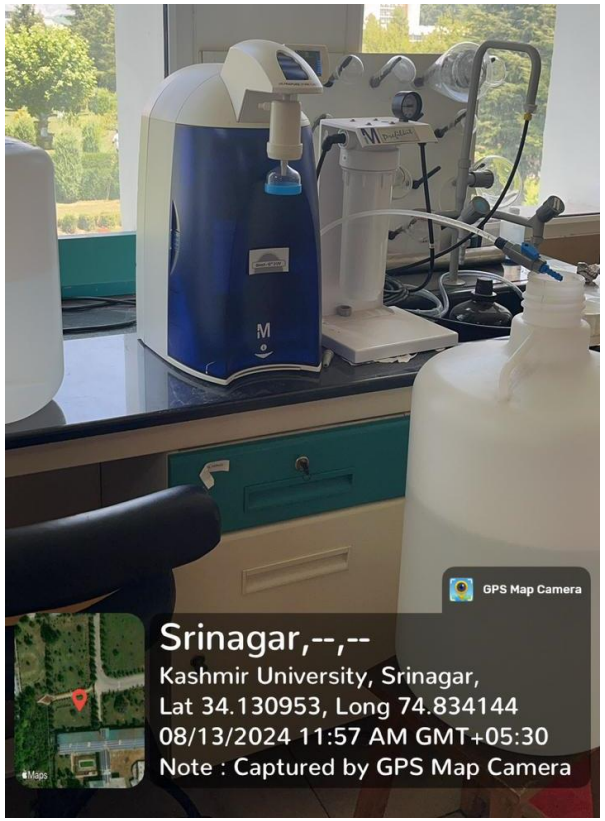
PCR

Status of the working Condition

Working

Equipment details:

Name & Picture of the Equipment



Milli Q water purification system

Deep Freezer

Status of the working Condition

Working

Equipment details:

Name & Picture of the Equipment

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Laminar

↑

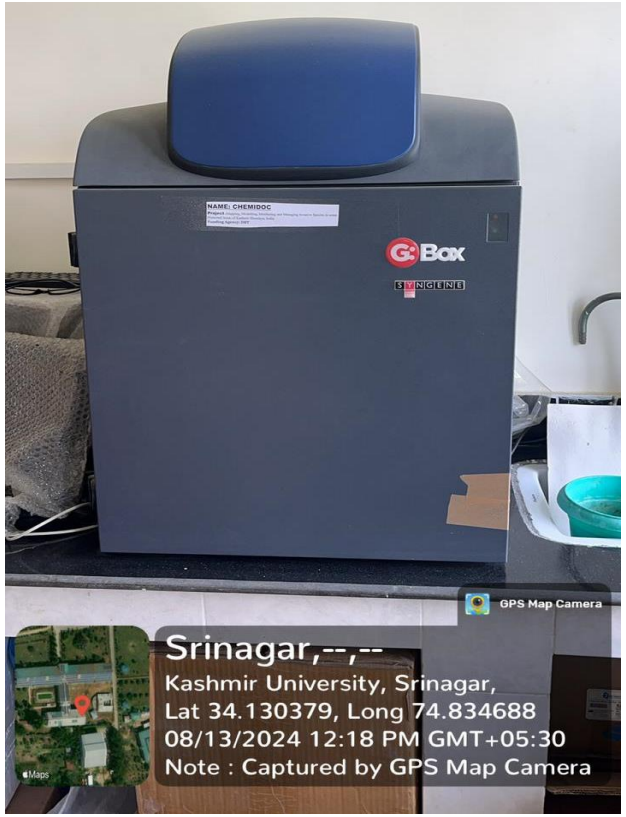
Autoclave

Status of the working Condition

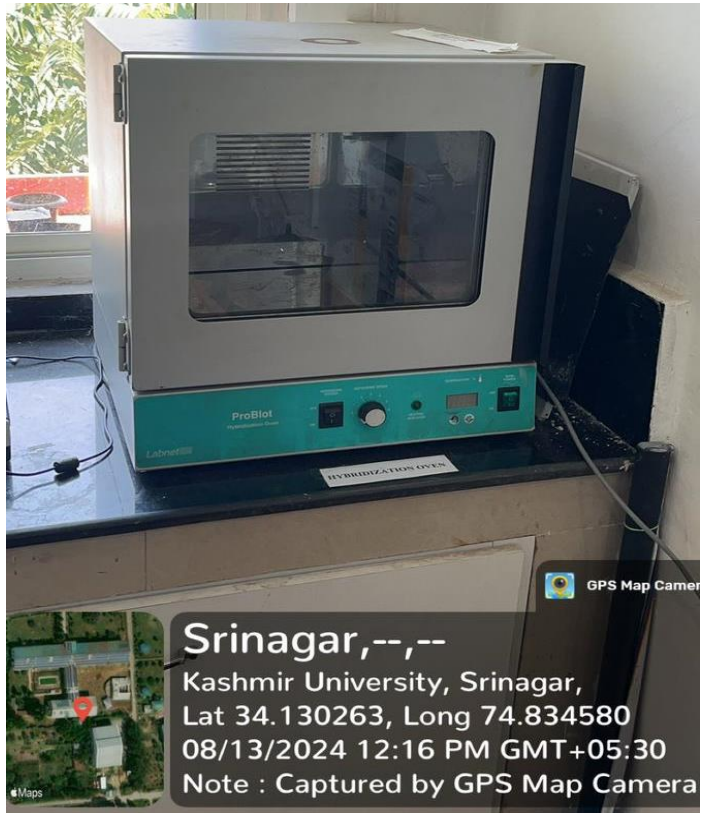
Working

Equipment details:

Name & Picture of the Equipment



Gel Doc



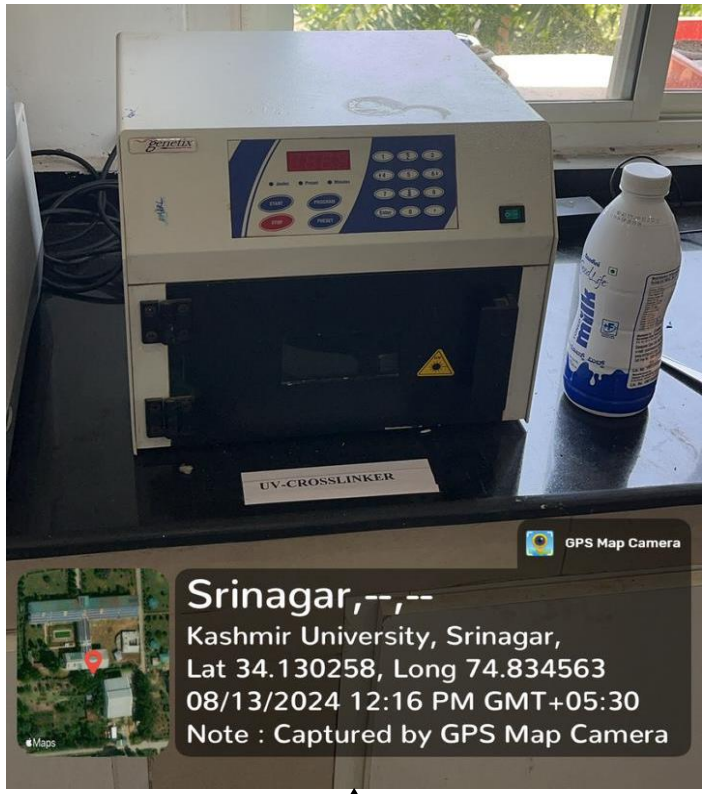
Hybridization oven

Status of the working Condition

Working

Equipment details:

Name & Picture of the Equipment



UV Cross Linker

UV illuminator

Status of the working Condition

Working

Equipment details:

Name & Picture of the Equipment

↑

Multi-User Thermal Cycler

↑

pH Meter

Status of the working Condition

Working

Equipment details:

Name & Picture of the Equipment

↑

Oven

↑

B.O.D Incubator

Status of the working Condition

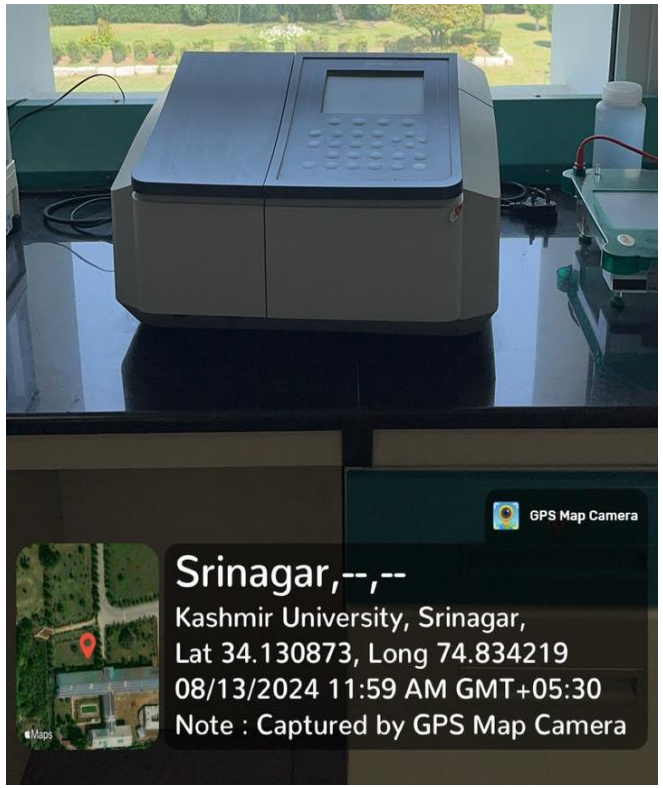
Working

Equipment details:

Name & Picture of the Equipment

↑

Gas Chromatograph



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Spectrophotometer

Status of the working Condition

Working

Equipment details:

Name & Picture of the Equipment

↑

Centrifuge

↑

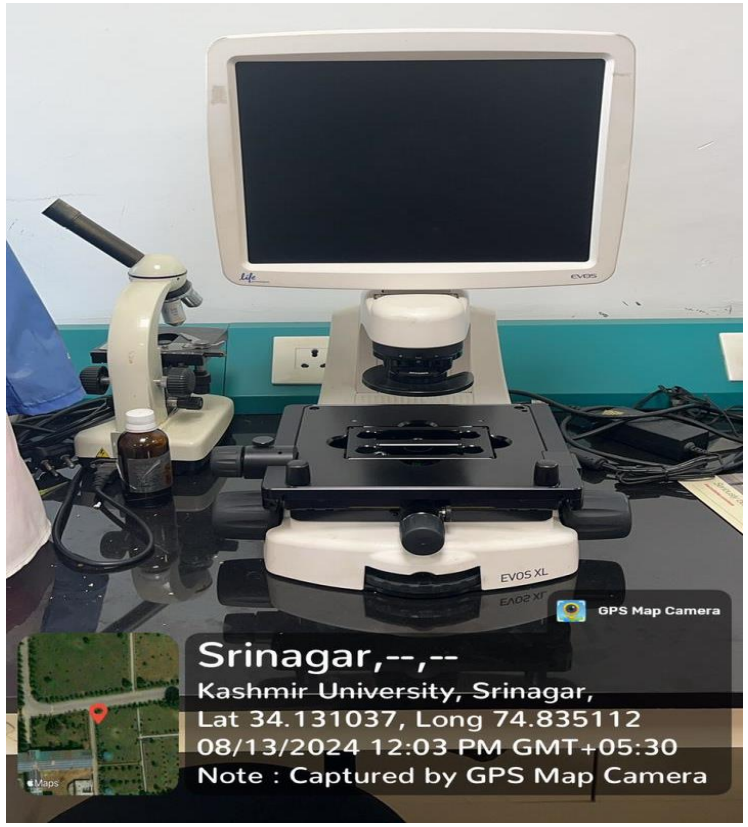
UV Vis Spectrophotometer

Status of the working Condition

Working

Equipment details:

Name & Picture of the Equipment



↑

Core AMG Imaging System

↑

Unitron zoom Stereomicroscope

Status of the working Condition

Working

Equipment details:

Name & Picture of the Equipment

↑

Inverted Biological Microscope

↑

Leaf Area Meter

Status of the working Condition

Working