

ICAR National Fellow Project on Development and implementation of Novel Algorithms and Software Modules for PGR Informatics

Annual Report 2019-20

Sunil Archak ICAR-NBPGR New Delhi

1. E- Herbarium

(Project objective: Design, development and implementation central databases) pgrinformatics.nbpgr.ernet. in/nhcp



National Herbarium of Cultivated Plants housed in NBPGR has >23,000 specimens. NHCP is the only herbarium of crop plants in India. Researchers and students aspire to visit the NHCP for taxonomic knowledge as well as specimen identification purpose. However, everyone cannot physically visit the herbarium. In order to make the unique herbarium accessible to all prospective users, an E-Herbarium was developed in collaboration with herbarium curators.

The E-Herbarium has about 7000 images belonging to more than 3500 species made available in digital format. Users can browse the E-Herbarium by a quick search or by an advanced search. Taxonomic details, herbarium details and a high-resolution image with zoom in option are provided for every accession for the ease of retrieving this valuable



information.

HERBARIUM

E-Herbarium gives access to the only crop plants herbarium of India



E-Herbarium Portal was released for public access by the Dr Ramesh Sonti, Director, NIPGR and Dr Partha Sarathi Roy, Senior Advisor, RS & GIS Research Programme, ICRISAT during the 43rd Foundation Day of ICAR-NBPGR on Aug 1, 2019.



2.

MTS Inventory

(Project objective: Design, development and implementation central and provider databases) pgrinformatics.nbpgr.ernet.in/mts



Immediate purpose of germplasm conservation is its utilization in crop improvement programs. To enhance the PGR utilization, ICAR-NBPGR has a network of medium-term storages (MTS) at Delhi and regional stations as well as a few ICAR institutes. A standard procedure of germplasm indenting is already in place. However, the process suffers delays and lack of tracking by indentors and managers. In order to facilitate the process, the entire process of germplasm indenting needs to be developed into a web-enabled service.



Homepage of MTS: Provides infographics and links to various resources

Web-enabled germplasm supply service primarily requires availability of germplasm accessions in MTS facilities that a user can browse and place indents. The service therefore requires a dynamic database where availability information can be managed by respective MTS centres and indent process be managed by Germplasm Exchange Unit of NBPGR. As a first step, a MTS database was constructed, which is being populated. Simultaneously, MTS Inventory application is also developed. The application is under testing involving all stakeholders.

Station [MTS]	 Accession
Akola, NBPGR RS	15540
Bhowali, NBPGR RS	7956
Hyderabad, NBPGR RS	4590
Jodhpur, NBPGR RS	6968
New Delhi, NBPGR-Division of Germplasm Evaluation	19105
Shillong, NBPGR RS	862
Thrissur, NBPGR RS	4934
Station [MTS]	Accession

Developed in ICAR National Fellow Project Copyright (c) 2018-19 All Rights Resereved, National Bureau of Plant Genetic Resources, Indian Council of Agricultural Research Ministry of Agriculture (Govt. of India). Pusa Campus. New Delbi-110012. INDIA

MTS wise tabulated information

Advanced sear	rch V Cro	p Name Brinja	1			<u>~</u> 711	Search
	MTS	S Name Hyder	abad, NBPGR RS			<u>~</u> 1	
	Yea	r of HarvestingSele	ct Year			∽□	
otal 711							X
Accession	Crop Name	Botanical Name	Harvesting-Year	Origin	QTY	Deposite Date	Imp Traits
EC379244	Brinjal	Solanum melongena		ITALY	1G	01/06/2019	-
EC316224	Brinjal	Solanum melongena		SRI LANKA	1G	01/06/2019	-
EC383342	Brinjal	Solanum melongena		TAIWAN, PROVINCE OF CHINA	1G	01/06/2019	-
EC316235	Brinjal	Solanum melongena		SRI LANKA	1G	01/06/2019	-
EC316226	Brinjal	Solanum melongena		SRI LANKA	1G	01/06/2019	-
EC316227	Brinjal	Solanum melongena		SRI LANKA	1G	01/06/2019	-
EC316277	Brinjal	Solanum melongena		SRI LANKA	1G	01/06/2019	-
EC316280	Brinjal	Solanum melongena		SRI LANKA	1G	01/06/2019	-
EC316261	Brinjal	Solanum melongena		SRI LANKA	1G	01/06/2019	-
	Brinial	Solanum melongena		SRI LANKA	1G	01/06/2019	-

Advanced search facility



3. In Vitro Genebank

(Project objective: Design, development and implementation central databases) pgrinformatics.nbpgr.ernet.in/invitro



ICAR-NBPGR houses one of the largest multi-crop plant tissue culture genebank in the world. Development of database and application for web-enabled inventorization is being carried out.



4. Genebank to Genbank (*Project objective: Design, development and implementation central databases*) pgrinformatics.nbpgr.ernet.in/g2g



G2G, a unique application linking germplasm data with genomic resources data, was reported as a beta application last year. As a follow-up of participation in ITPGRFA meetings, changes in linking, retrieval and data update were effected in the G2G database and application interface. In the past year, whole genome sequence metadata were added to the G2G database. Data now stands at Genebank module (2.3 million) and GenBank module (17 million) with addition of 300K protein, one million germplasm accessions, one thousand cultivars linking genebanks and genbank, 2500 whole genome sequences and 29 more species. G2G is expected to be launched soon.

Kala namak		FIND		G2G COVERS GENER	BANK CULTIVAR 97892		ніт is 6,263 cu	LTIVAR.	
CULTIVAR	Kala namak	СКОР		Rice	TOTAL HIT	513			
Organism	Cultivar	GenBank ID	Genebank ID	Genebank	Source Country	Date_of_Collection	GI	Туре	Genome
↓ ^A Z	₽ ^A Z	₽Ž	₽Ž	₽Ž	₽ <mark>\$</mark>	₽ <mark>₽</mark>	-	-	-
Oryza sativa	Kala namak	KF730943	13449	NIAS	Collected	-	577858571	NUC	
Oryza sativa	Kala namak	KF730943	IC553819	NBPGR	India	5/26/2007	577858571	NUC	Yes
Oryza sativa	Kala namak	KF730943	IC554653	NBPGR	India	9/20/2007	577858571	NUC	Yes
Oryza sativa	Kala namak	KF730943	IC331949	NBPGR	India	11/16/1999	577858571	NUC	Yes
Dryza sativa	Kala namak	KF730943	IC553821	NBPGR	India	5/26/2007	577858571	NUC	Yes
Dryza sativa	Kala namak	KF730943	IC554618	NBPGR	India	9/20/2007	577858571	NUC	Yes
Dryza sativa	Kala namak	KF730943	IC554649	NBPGR	India	9/20/2007	577858571	NUC	Yes
Oryza sativa	Kala namak	KF730943	IC623267	NBPGR	India	11/20/2016	577858571	NUC	Yes
Oryza sativa	Kala namak	KF730943	IRGC 23920	PHL001	Nepal	1972	577858571	NUC	Yes
Oryza sativa	Kala namak	KF730943	IC554620	NBPGR	India	9/20/2007	577858571	NUC	Yes
)ryza sativa)ryza sativa	Kala namak Kala namak	KF730943 KF730943	IRGC 23920 IC554620	PHL001 NBPGR	Nepal India	1972 9/20/2007	577858571 577858571		Yes Yes



5.

Characterization and Evaluation DB

(Project objective: Design, development and implementation central and provider databases) pgrinformatics.nbpgr.ernet.in/crp-ab



Enhanced use of genetic resources is possible only with creating interest among breeders and researchers. Breeders' interest is to search for germplasm with desirable phenotype. In order to provide an easy interface for search based on phenotypic data, one must have a comprehensive database of characterization and evaluation experiments carried out in NARS. A database and a web-enabled search engine was developed to look for the desirable



germplasm.

								Dashboa
Free Search Evaluation Database								
elangovan		All Proje	ct					~
Submit								
otal Experiment : 5								
10 🗸 records per page		Search:						
Experiment Title	PIs/CO-PIs			CropName	Year	Location	Accessions	Checks
Characterization of Finger millet germplasm at IIMR, Hyderabad (Kharif-2017) under CRP-AB	Dr. M. Elangovan, Non	e		Finger Millet	2017	IIMR, Hyderabad	2000	2
Characterization of Finger millet germplasm at IIMR, Hyderabad (Kharif-2018) under CRP-AB	Dr. M. Elangovan, Non	e		Finger Millet	2018	IIMR, Hyderabad	2014	3
Characterization of Sorghum germplasm (2459) at IIMR, Hyderabad, Rabi-2015	Dr. M. Elangovan, Dr. S	Sushil Pandey, NB	PGR New Delhi	Sorghum	2015	IIMR, Hydrabad	2459	2
Characterization of Sorghum germplasm at IIMR, Hyderabad (Rabi- 2016) under CRP-AB	Dr. M. Elangovan, Dr S NBPGR New Delhi	ushil Pandey and	Dr Chitra Pandey,	Sorghum	2016	IIMR, Hyderabad	6823	2
Characterization of Sorghum germplasm at IIMR, Hyderabad (Rabi- 2017) under CRP-AB	Dr. M. Elangovan, Dr S NBPGR New Delhi	ushil Pandey and	Dr Chitra Pandey,	Sorghum	2017	IIMR, Hyderabad	4416	2
Experiment Title	PIs/CO-PIs			CropName	Year	Location	Accessions	Checks
Convright (Developed in ICAR	National Fellow Proj	ect f Plant Genetic Resourc	es				
Copyright (Indian Council of Agricultu	Developed in ICAR c) 2016-17 All Rights Reserevec ral Research, Ministry of Agricu	National Fellow Proj d, National Bureau ol ulture (Govt. of India)	ect f Plant Genetic Resourc), Pusa Campus, New D	es, elhi-110012, INDI/	4			₽ Dashbo
Copyright (Indian Council of Agricultu Sraphical View	Developed in ICAR c) 2016-17 All Rights Resereve al Research, Ministry of Agricu	National Fellow Proj d, National Bureau ol ulture (Govt. of India)	ect Plant Genetic Resourc), Pusa Campus, New Dr	es, elhi-110012, INDV	4			🏨 Dashbo
Copyright (Indian Council of Agricultu Graphical View Select crop and character name Select Crop Name	Developed in ICAR 2016-17 All Rights Reserved ral Research, Ministry of Agricu	National Fellow Proj d, National Bureau ol ulture (Govt. of India) Select a Cha	ect Plant Genetic Resourc J, Pusa Campus, New D Sector	es, elhi-110012, INDI/	4			2 Dashboa
Copyright (Indian Council of Agricultu Graphical View Gelect crop and character name Select Crop Name Wheat	Developed in ICAR 2016-174 IRights Reserved	National Fellow Proj d, National Bureau of ulture (Govt. of India) Select a Cha Days to 7	ect I Plant Genetic Resourc I Plant Genetic Resourc Note: Source Aracter S% spike emergence	es, elhi-110012, IND//	A			∰ Dashbo ∽
Copyright (Indian Council of Agricultu Sraphical View Select Crop and character name Select Crop Name Wheat Submit Reset	Developed in ICAR 2016-17 AIR lights Reserved ral Research, Ministry of Agricu 	National Fellow Proj d, National Bureau of Julture (Govt. of India) Select a Cha Days to 7: 5% spike (ect Plant Genetic Resource Plant Genetic Resource www.ewe. www.ewe	es, elhi-110012, IND//	A			Dashbo
Copyright (Indian Council of Agricultu Select crop and character name Select Crop Name Wheat Submit Reset	Developed in ICAR 2016-17 AIR lights Reserved ral Research, Ministry of Agricu at - Days to 75 149 149	National Fellow Proj d, National Bureau of Julture (Govt. of India) Select a Cha Days to 75 5% Spike of 146	ect Plant Genetic Resourc Plant Genetic Resource arracter 5% spike emergence 364 364 364	es, elhi-110012, IND//	A			Dashbo
Graphical View Select Crop and character name Select Crop Name Wheat Wheat Submit Reset Submit Reset Submit Reset Submit Reset Submit Reset Submit Reset Submit Reset Submit R	Developed in ICAR 2016-17 AIR lights Reserved ral Research, Ministry of Agricu at - Days to 75 149 149 149 149	National Fellow Proj d, National Bureau of Julture (Govt. of India) Select a Cha Days to 7: 5% spike of 5% spike of 146 106 - 130	ect (Plant Genetic Resource (Plant Genetic Resource) aracter 6 mergence 364 364 131 - 155 1 vailable	es, ekh-110012, IND//	A			Dashbo Control of the second

Advanced search module

FEP 1	:									
elect C	rop Name					Select a Character				
Cabb	age				~	Crispness				
TEP 2	:									
Enter va	alue within a range		Min:			Max:			Add to Query	
			Mir	1		Ma	X			
					OR					
<mark>Select s</mark> Use shi	tate(s) ft key for multiple selections)		Low Medi	um	•	>> High		•	Add to Query	
036 311	it key for multiple selections,		High		- 1	~				
			Othe	15						
					-			-		
STEP	3: Tota	al Accession :	15 Total IC :	0 Total I	EC : 15					
Deview	your Query									
Plant si	pread(cm) between 20 and 40									
Davs to	60% head maturity between 10	9 0 and 150								
Leaf.co	lour='Dark green'									
Lear co	iour- Darkgreen									
Submi	t Reset									
dvanc	e Search Result								(G B
dvanc	e Search Result									Э в
.dvanc ≈ Filter	e Search Result									о в (
dvanc × Filter	e Search Result Column of Report									Э В (
dvanc ≈ Filter otal R	e Search Result Column of Report ecords : 15									о в (
dvanc ≈ Filter otal R Sr. No	e Search Result Column of Report ecords : 15 ExperimentNumber	Accession	Botanicalname	PLT VGR	LEAF CLR	NUM NWRAP LEV	PLT SPD	NUM WARP LEV	DAYS 50 HEAD FORM	Э В (
dvanc ≫ Filter otal R sr_No	e Search Result Column of Report ecords : 15 ExperimentNumber	Accession	Botanicalname Brassica	PLT_VGR	LEAF_CLR	NUM_NWRAP_LEV	PLT_SPD	NUM_WARP_LEV	DAYS_50_HEAD_FORM	G B
dvanc ≫ Filter otal R sr_No 1	e Search Result Column of Report ecords : 15 ExperimentNumber V0495201501HP004700004	Accession EC840368	Botanicalname Brassica oleracea var.	PLT_VGR Good (7)	LEAF_CLR Dark green (3)	NUM_NWRAP_LEV 9.20	PLT_SPD 31.20	NUM_WARP_LEV	DAYS_50_HEAD_FORM 53.00	G B D.
dvanc ≈ Filter otal R sr_No 1	e Search Result Column of Report ecords : 15 ExperimentNumber V0495201501HP004700004	Accession EC840368	Botanicalname Brassica oleracea var. capitata	PLT_VGR Good (7)	LEAF_CLR Dark green (3)	NUM_NWRAP_LEV 9.20	PLT_SPD 31.20	NUM_WARP_LEV	DAYS_50_HEAD_FORM 53.00	O B 11
odvanc ≈ Filter otal R sr_No 1 2	e Search Result Column of Report ecords : 15 ExperimentNumber V0495201501HP004700004 V0495201501HP004700004	Accession EC840368 EC840377	Botanicalname Brassica oleracea var. capitata Brassica oleracea var.	PLT_VGR Good (7) Others (99)	LEAF_CLR Dark green (3) Dark green (3)	NUM_NWRAP_LEV 9.20 15.40	PLT_SPD 31.20 38.60	NUM_WARP_LEV	DAYS_50_HEAD_FORM 53.00 55.00	G E 10 10
dvanc	e Search Result Column of Report ecords : 15 ExperimentNumber V0495201501HP004700004 V0495201501HP004700004	Accession EC840368 EC840377	Botanicalname Brassica oleracea var. capitata Brassica oleracea var. capitata	PLT_VGR Good (7) Others (99)	LEAF_CLR Dark green (3) Dark green (3)	NUM_NWRAP_LEV 9.20 15.40	PLT_SPD 31.20 38.60	NUM_WARP_LEV	DAYS_50_HEAD_FORM 53.00 55.00	O E 10 10
idvanc SFilter Sr_No 1 2 3	e Search Result Column of Report cords : 15 ExperimentNumber V0495201501HP004700004 V0495201501HP004700004	Accession EC840368 EC840377 EC840380	Botanicalname Brassica oleracea var. capitata Brassica oleracea var. capitata Brassica	PLT_VGR Good (7) Others (99) Good (7)	LEAF_CLR Dark green (3) Dark green (3) Dark green	NUM_NWRAP_LEV 9.20 15.40 10.80	PLT_SPD 31.20 38.60 31.80	NUM_WARP_LEV	DAYS_50_HEAD_FORM 53.00 55.00 73.00	D 10 11
dvanc ⇒ Filter otal R Sr_No 1 2 3	e Search Result Column of Report cords : 15 ExperimentNumber V0495201501HP004700004 V0495201501HP004700004	Accession EC840368 EC840377 EC840380	Botanicalname Brassica oleracea var. capitata Brassica oleracea var. capitata Brassica oleracea var. capitata	PLT_VGR Good (7) Others (99) Good (7)	LEAF_CLR Dark green (3) Dark green (3) Dark green (3)	NUM_NWRAP_LEV 9.20 15.40 10.80	PLT_SPD 31.20 38.60 31.80	NUM_WARP_LEV	DAYS_50_HEAD_FORM 53.00 55.00 73.00	G E 10 11
dvanc ⇒ Filter otal R Sr_No 1 2 3 4	e Search Result Column of Report Column of Report Cords : 15 ExperimentNumber V0495201501HP004700004 V0495201501HP004700004 V0495201501HP004700004 V0495201501HP004700004	Accession EC840368 EC840377 EC840380 EC840396	Botanicalname Brassica oleracea var. capitata Brassica oleracea var. capitata Brassica oleracea var. capitata Brassica	PLT_VGR Good (7) Others (99) Good (7)	LEAF_CLR Dark green (3) Dark green (3) Dark green (3) Dark green	NUM_NWRAP_LEV 9.20 15.40 10.80	PLT_SPD 31.20 38.60 31.80 24.60	NUM_WARP_LEV	DAYS_50_HEAD_FORM 53.00 55.00 73.00 65.00	G E 10 10
dvanc ötal R Sr_No 1 2 3 4	e Search Result Column of Report ecords : 15 ExperimentNumber V0495201501HP004700004 V0495201501HP004700004 V0495201501HP004700004	Accession EC840368 EC840377 EC840380 EC840396	Botanicalname Brassica oleracea var. capitata Brassica oleracea var. capitata Brassica oleracea var. capitata Brassica oleracea var. capitata	PLT_VGR Good (7) Others (99) Good (7) Good (7)	LEAF_CLR Dark green (3) Dark green (3) Dark green (3) Dark green (3)	NUM_NWRAP_LEV 9.20 15.40 10.80 10.40	PLT_SPD 31.20 38.60 31.80 24.60	NUM_WARP_LEV	DAYS_50_HEAD_FORM 53.00 55.00 73.00 65.00	O B 10 10
dvanc ⇒ Filter otal R sr_No 1 2 3 4	e Search Result Column of Report ecords : 15 ExperimentNumber V0495201501HP004700004 V0495201501HP004700004 V0495201501HP004700004	Accession EC840368 EC840377 EC840380 EC840396	Botanicalname Brassica oleracea var. capitata Brassica oleracea var. capitata Brassica oleracea var. capitata Brassica oleracea var. capitata	PLT_VGR Good (7) Others (99) Good (7) Good (7)	LEAF_CLR Dark green (3) Dark green (3) Dark green (3) Dark green (3)	NUM_NWRAP_LEV 9.20 15.40 10.80 10.40	PLT_SPD 31.20 38.60 31.80 24.60	NUM_WARP_LEV	DAYS_50_HEAD_FORM 53.00 555.00 73.00 65.00	O B 10 11 14
✓ Filter Öotal R Sr_No 1 2 3 4 5	e Search Result Column of Report Column of Report Cords : 15 ExperimentNumber V0495201501HP004700004 V0495201501HP004700004 V0495201501HP004700004 V0495201501HP004700004 V0495201501HP004700004	Accession EC840368 EC840380 EC840396 EC840893	Botanicalname Brassica oleracea var. capitata Brassica oleracea var. capitata Brassica oleracea var. capitata Brassica oleracea var. capitata	PLT_VGR Good (7) Others (99) Good (7) Good (7) Good (7)	LEAF_CLR Dark green (3) Dark green (3) Dark green (3) Dark green (3)	NUM_NWRAP_LEV 9.20 15.40 10.80 10.40 13.00	PLT_SPD 31.20 38.60 31.80 24.60 37.50	NUM_WARP_LEV	DAYS_50_HEAD_FORM 53.00 55.00 73.00 65.00 49.00	D 10 11 14
✓ Filter Öotal R Sr_No 1 2 3 4 5	e Search Result Column of Report ecords : 15 ExperimentNumber V0495201501HP004700004 V0495201501HP004700004 V0495201501HP004700004 V0495201501HP004700004	Accession EC840368 EC840377 EC840380 EC840396 EC840893	Botanicalname Brassica oleracea var. capitata Brassica oleracea var. capitata Brassica oleracea var. capitata Brassica oleracea var. capitata	PLT_VGR Good (7) Others (99) Good (7) Good (7)	LEAF_CLR Dark green (3) Dark green (3) Dark green (3) Dark green (3)	NUM_NWRAP_LEV 9.20 15.40 10.80 10.40 13.00	PLT_SPD 31.20 38.60 31.80 24.60 37.50	NUM_WARP_LEV	DAYS_50_HEAD_FORM 53.00 55.00 73.00 65.00 49.00	G B 10 11 14 14
dvanc Sr_No 3 4 5 6	E Search Result Column of Report cords : 15 ExperimentNumber V0495201501HP004700004 V0495201501HP004700004 V0495201501HP004700004 V0495201501HP004700004 V0495201501HP004700004 V0495201501HP004700004 V0495201501HP004700004	Accession EC840368 EC840377 EC840380 EC840396 EC840893 EC840893	Botanicalname Brassica oleracea var. capitata Brassica oleracea var. capitata Brassica oleracea var. capitata Brassica oleracea var. capitata Brassica oleracea var. capitata Brassica oleracea var. capitata	PLT_VGR Good (7) Others (99) Good (7) Good (7) Good (7) Good (7) Good (7) Good (7)	LEAF_CLR Dark green (3) Dark green (3) Dark green (3) Dark green (3) Dark green (3) Dark green	NUM_NWRAP_LEV 9.20 15.40 10.80 10.40 13.00	PLT_SPD 31.20 38.60 31.80 24.60 37.50 35.60	NUM_WARP_LEV	DAYS_50_HEAD_FORM 53.00 55.00 73.00 65.00 49.00 52.00	O B D 110 111 112 112 111 111
dvanc Filter otal R sr_No 1 2 3 4 5 6	E Search Result Column of Report cords : 15 ExperimentNumber V0495201501HP004700004 V0495201501HP004700004 V0495201501HP004700004 V0495201501HP004700004 V0495201501HP004700004 V0495201501HP004700004 V0495201501HP004700004	Accession EC840368 EC840377 EC840380 EC840396 EC840893	Botanicalname Brassica oleracea var. capitata Brassica oleracea var. capitata Brassica oleracea var. capitata Brassica oleracea var. capitata Brassica oleracea var. capitata Brassica oleracea var. capitata	PLT_VGR Good (7) Others (99) Good (7) Good (7) Good (7) Good (7) Good (7)	LEAF_CLR Dark green (3) Dark green (3) Dark green (3) Dark green (3) Dark green (3) Dark green (3)	NUM_NWRAP_LEV 9.20 15.40 10.80 10.40 13.00 15.60	PLT_SPD 31.20 38.60 31.80 24.60 37.50 35.60	NUM_WARP_LEV	DAYS_50_HEAD_FORM 53.00 55.00 73.00 65.00 49.00 52.00	O B 10 10 11 12 12 11 11
dvanc Sr_No 1 2 3 4 5 6 7	E Search Result Column of Report ecords : 15 ExperimentNumber V0495201501HP004700004 V0495201501HP004700004 V0495201501HP004700004 V0495201501HP004700004 V0495201501HP004700004 V0495201501HP004700004 V0495201501HP004700004	Accession EC840368 EC840377 EC840380 EC840396 EC840893 EC840899	Botanicalname Brassica oleracea var. capitata Brassica oleracea var. capitata Brassica oleracea var. capitata Brassica oleracea var. capitata Brassica oleracea var. capitata Brassica oleracea var. capitata	PLT_VGR Good (7) Others (99) Good (7) Good (7) Good (7)	LEAF_CLR Dark green (3) Dark green (3) Dark green (3) Dark green (3) Dark green (3) Dark green (3)	NUM_NWRAP_LEV 9.20 15.40 10.80 10.40 13.00 15.60 12.00	PLT_SPD 31.20 38.60 31.80 24.60 37.50 35.60	NUM_WARP_LEV	DAYS_50_HEAD_FORM 53.00 55.00 73.00 65.00 49.00 52.00 45.00	O E

6. Post-graduate Teaching and Research Guidance

I hold a dual faculty position at IARI, New Delhi:

- Faculty of Plant Genetic Resources, NBPGR
- Faculty of Bioinformatics, IASRI

I taught/continue to teach the following courses as Course Leader:

- 1. BI 504 Evolutionary Biology (2+1)
- 2. BI 624 Genome Wide Association Study (2+1)
- 3. PGR 507 Information Management in Plant Genetic Resources (2+1)
- 4. PGR 500 Biodiversity and Plant Genetic Resources (2+0)
- 5. PGS 503 Intellectual Property and its Management in Agriculture (1+0)

Completed students: MSc: 5 PhD: 1

Current PhD Students

Plant Genetic Resources

- 1. Mr. Shailendra Solanki, 10648, Analysis of genetic variation in Artocarpus hirsutus (Wild Jack) collections from Western Ghats
- 2. Ms. Shephalika Amrapali, 10854, Olfactory, biochemical and molecular profiling of rose germplasm for fragrance
- 3. Mr. Puneeth, 11304, *Development of informatics system to document on farm conservation: A case study*
- 4. Ms. Monika Jha, 11561, Pumpkin germplasm screening for industrial use as baby-food

Bioinformatics

- 5. Ms. Soumya Sharma, 10778, Development of database of genes and gene families responsible for nutritional content in field crops
- 6. Ms. Sneha Murmu, 11006, *Computational approaches to understand host-pathogen interactions between wheat and its blast fungus*
- 7. Ms. Shweta Kumari, 11007, Comparative analysis of domestication related genes in minor pulses
- 8. Mr. Dipro Sinha, 11227, Deep learning methods in epigenetic studies
- 9. Ms. Tanwy Das Mandal, 11465, Computational approaches to integrate deep learning to improve identification of genome-wide associations

Dr. Suni Archak National Fellow ICAR-National Bureau of Plant Genetic Resources New Delhi-110012