

1st NGC2018
First National Genetics Congress
New Delhi
December 14-16, 2018

1st National Genetics Congress

on

Genetics for Sustainable Food, Health and Nutrition Security

December 14-16, 2018

ICAR-Indian Agricultural Research Institute
New Delhi 110 012

Book of Abstracts

Organized by

Indian Society of Genetics & Plant Breeding (ISGPB)
A Block, F-2, First Floor, NASC Complex, D.P.S. Marg, IARI,
P.O. Pusa Campus, New Delhi 110 012

Published by
The Indian Society of Genetics and Plant Breeding
New Delhi 110 012

Printed at
M/s. Kamala Print-N-Publish
O 96 New Mahavir Nagar
New Delhi 110 018

www.isgpb.org

Correct Citation: ISGPB (2018). Book of Abstracts, 1st National Genetics Congress on "*Genetics for Sustainable Food, Health and Nutrition Security*", December 14-16, 2018, ICAR-Indian Agricultural Research Institute, New Delhi 110 012.

1st National Genetics Congress

on

"Genetics for Sustainable Food, Health and Nutrition Security"

December 14-16, 2018

at

ICAR-Indian Agricultural Research Institute, New Delhi 110 012

ABSTRACTS

Compiled and Edited by

S M S Tomar
Akshay Talukdar
S K Chakrabarty
Gyan P Mishra
Gopala Krishnan S
Vignesh M
Shailendra K Jha

www.isgpb.org

Indian Society of Genetics and Plant Breeding
A Block, F-2, First Floor, NASC Complex, D.P.S. Marg, IARI, Pusa Campus,
New Delhi 110 012

EXECUTIVE COUNCIL of ISGPB (2018-19)

President	:	T Mohapatra
Vice-Presidents	:	HK Chaudhary and C Tara Satyavathi
Secretary	:	Sanjay Singh
Editor	:	SMS Tomar
Treasurer	:	RK Sharma
Councillors	:	Sharad Tiwari (Central Zone)
		RN Sarma (Eastern Zone)
		DN Singh (Mid-Eastern Zone)
		Sanjay Kumar Singh (Northern Zone)
		TE Nagaraja (Southern Zone)
		MP Deshmukh (Western Zone)

NATIONAL ORGANIZING COMMITTEE

Chief Patron	:	MS Swaminathan
Patron(s)	:	VL Chopra, HK Jain, GS Khush, RS Paroda, Mangala Rai, NK Bhan, K Vijay Raghavan, PL Gautam, Manju Sharma, M Mahadevappa, CD Mayee
Advisors	:	Akhilesh K. Tyagi, B. Sharma, BD Singh, BS Dhillon, Deepak Pental, EA Siddiq, G Kalloo, KM Bujarbaruah, KS Gill, KV Peter, KV Prabhu, ML Madan, MP Yadav, MV Gupta, PKGupta, Purvi Mehta-Bhatt, Raju Barwale, RNK Vamzai, RP Sharma, SA Patil, Sameer Brahmchari, SC Lakhotia, SK Datta, SK Sharma, SK Vasal, SR Sree Rangasamy, Sudhir K Sopory, Sushil Kumar
Chairman	:	RB Singh
Co-Chairman	:	HS Gupta
Organizing Secretary	:	NK Singh
Co-Organizing Secretaries	:	Sanjay Singh, Akshay Talukdar

MEMBERS OF ORGANISING COMMITTEE

A Bandyopadhyay, AD Pathak, AK Joshi, AK Singh, Akshay K. Pradhan, Anand K Singh, Ashok K Singh, Bidyut K Sarmah, BM Prasanna, BN Singh, C Viswanathan, DK Agarwal, DK Yadava, DS Brar, Gaya Prasad, GP Singh, GS Nanda, Imran Siddiqui, JC Rana, JK Jena, JS Chauhan, JS Sandhu, K Veluthambi, KK Narayanan, KML Pathak, KP Viswanatha, Kuldeep Lal, Kuldeep Singh, MC Kharkwal, MP Pandey, OP Yadav, P Raghav Reddy, PK Ranjekar, PM Salimath, R Chandra Babu, Rajvir S Rathi, Ram K Singh, Ramesh V Sonti, Ravi P Singh, RK Singh, RK Varshney, RM Singh, RRB Singh, Sanjay Kumar, Shailaja Hittalmani, SK Singh, SR Bhat, Sujay Rakshit, TR Sharma, Usha Vijayraghavan, Vani Brahmchari, WS Lakra, YS Nerkar

PREFACE

The Indian Society of Genetics and Plant Breeding, the oldest and most prestigious registered society of practicing Geneticists and Plant Breeders from public and private institutions and the students pursuing Genetics and Plant Breeding disciplines, has vital role to play in fostering the progress of science of Genetics and Plant Breeding in the country. The Society was founded 77 years ago in January, 1941 at the Indian Congress Session at BHU, Varanasi by a group of Indian geneticists and plant breeders of that time led by Late Dr. B.P. Pal, the First Secretary and also the First Editor of the Society's official publication, The Indian Journal of Genetics & Plant Breeding. The Society has now more than 2000 members comprising 1800 life members, 200 honorary members and 42 foreign members.

Genetics has witnessed an era of innovations and discoveries during the last two decadeswhich has created new tools offering immense opportunities to improve crops, livestock, fishes and microbes, and to manage hitherto intractable plant, human and animal ailments. The application of artificial intelligence to analyze the vast amount of genomics and phenomics data is providing rare insights into the genetic basis of complex traits. The success of genetically improved organisms in enhancing farm productivity has explicitly underlined the impact of the science of Genetics. The science of Genetics will remain relevant to address the emerging challenges of food, health and nutritional security in the wake of the burgeoning world population projected to be 9.7 billion by 2050. For sustaining and continuing the legacy of success, renewed emphasis is needed in the science of Genetics and allied fields to utilize the power of new technologies.

In view of the above, the Indian Society of Genetics and Plant Breeding (ISGPB) has organized the 1stNational Genetics Congress (NGC) with the theme "Genetics for Sustainable Food, Health and Nutrition Security" during December 14-16, 2018 at ICAR-Indian Agricultural Research Institute, New Delhi. The NGC is offering a common platform for the Indian geneticists working with different living systems including microbes, plants, animals, fishes and human beings to review the recent advances in various spheres of Genetics and to develop a roadmap for addressing future National challenges. Further, the Congress is providing an opportunity for the young scientists, researchers, students to participate and present their works and ideas. The importance and implications of sharing and use of genetic resources, genetic profiling, genomic data etc. will also be discussed, which may help in formulating guidelines for our national policies in these areas. The Book of Abstracts contains about 475 abstracts of scientific papers which have been arranged as per Technical Sessions of the Congress. The abstracts have been classified into two main groups: Invited and contributed papers for floor presentation (coded IC) and papers for Poster presentation (coded PS). PS papers have been again grouped into VII sessions as session VIII does not contain any poster presentation. The abstracts were edited wherever needed, however onus of originality and validity of data and opinion given on the abstract rests with authors. We hope that the Book of Abstracts will act as handy reference to the students, teachers, researchers and scholars.

Editors

The Indian Society of Genetics and Plant Breeding, gratefully acknowledges the following organisations/institutions for supporting the 1st National Genetics Congress on "*Genetics for Sustainable Food, Health and Nutrition Security*".

Sponsors

Indian Council of Agricultural Research, Krishi Bhavan, New Delhi 110 014

National Bank for Agriculture and Rural Development, Head Office Plot C-24, 'G' Block Bandra Kurla Complex, Bandra (East) Mumbai 400 051

Mahyco, Seed Company Ltd., Resham Bhavan, 4th Floor, 78, Veer Nariman Road, Mumbai 400 020 and Delhi Office : 4E/15 Ashoka Centre, 3rd Floor, Jhandewalan Extn., New Delhi 110 055

Protection of Plant Varieties and Farmers' Rights Authority, Govt. of India, Ministry of Agriculture & Farmers Welfare, Department of Agriculture, Co-operation & Farmers Welfare, NASC Complex, DPS Marg, Opp. Todapur Village, New Delhi 110 012

National Biodiversity Authority, 5th Floor, TICEL Bio Park, CSIR, Road, Taramani, Chennai 600 113

Monsanto India Ltd., F Block, 2nd Floor, International Trade Tower, Nehru Place, New Delhi 110 019

Co-sponsors

XV Genetics Congress Trust, A Block, F-2, First Floor, NASC Complex, D.P.S. Marg, IARI, P.O. Pusa Campus, New Delhi 110 012

Mahatma Phule Krishi Vidyapeeth, Rahuri 413722, Maharashtra

Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli 415712, Maharashtra

Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola 444104, Maharashtra

Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani 431402, Maharashtra

Saveer Biotech Limited, 1442, Ch. Hardhyan Singh Marg, New Delhi 110 003

Bio-Engineering India Ltd., Maharashtra

CONTENTS

Preface			... v
Invited and Contributory Papers			... 1-40
POSTER PRESENTATION			
SESSION I	- Genetic Resource Management and Use	Day 1	... 41-167
SESSION II	- Genetics and Breeding for Climate Resilience	Day 2	... 169-270
SESSION III	- Breeding for Input Use Efficiency and Nutritional Enhancement	Day 1	... 271-316
SESSION IV	- Advanced Genetic Tools for Enhancing Breeding Efficiency	Day 2	... 317-380
SESSION V	- Application of Bioinformatics and Statistical Tools in Genetics	Day 2	... 383
SESSION VI	- Genetic Engineering	Day 2	... 384
SESSION VII	- Ethics, IPR and Regulations for use of Genes/Genetic Resources	Day 2	... 385-388
SESSION VIII	- Genetics Educaiton	...	...
Author Index			... 389

terminator and kanamycin as a selectable marker. The construct has been mobilized into Agrobacterium tumefaciens strain LBA4404 for efficient delivery of T-DNA into rice. Genetic transformation experiments in japonica and indica cultivars, Kitaake and PR124, respectively, are being carried in our genetic transformation lab. Further, expression and bioassay analysis will be conducted out for the presence of resistance. From this study, it is anticipated that β-1, 3-glucanase is a potential target for enhancing resistance in rice for sheath blight.

PS II – 129

Identification of water stress tolerant amaranthus genotypes (*Amaranthus tricolor* L.) with high yield and quality

A. M. Shahiba, Beena Thomas and Arun Chacko

Plant Breeding and Genetics, College of Agriculture, Vellayani 695 522, Kerala

Email: shahiba6408@gmail.com

The present study entitled “Identification of water stress tolerant amaranthus genotypes (*Amaranthus tricolor* L.) with high yield and quality” was carried out in the Dept. of Plant Breeding and Genetics, College of Agriculture, Vellayani during 2016-2018, with an objective to identify high yielding genotypes of amaranthus with good quality and tolerance to water stress.The character Vitamin A content registeredthe highest GCV (41.22%) and PCV (41.25%). High heritability coupled with high genetic advance was observed for leaf width, number of branches, yield plant^{-1}, protein content, fibre content and vitamin A. The yield plant^{-1}was found to be significantly and positively correlated with leaf width, number of branches, yield plot^{-1}, membrane integrity, proline content of leaves and vitamin A both at genotypic and phenotypic levels. Petiole length and percentage leachate were found to be negatively correlated with yield plant^{-1}. Path analysis revealed that number of branches, yield plot^{-1}and proline content of leaves had the maximum positive direct effect on yield plant^{-1}. The present study showed that genotype A22 (Madhur local) was superior in yield performance under water stress condition followed bygenotypeA9 (Kazhakkuttom local), genotypeA20 (Poonkulam local) and the genotypeA2 (Palakkadu local). The genotype A22 (Madhur local) also recorded the maximum stem girth, number of branches, length of leaf lamina, leaf to stem ratio, membrane integrity, relative water content and proline content of leaves with high Vitamin A and low oxalate content. Presence of proline in the leaves might be considered as an important water stress tolerance mechanism.