INDIAN ROSE FEDERATION

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Presidents Page

Dear Rosarians,

The much awaited monsoon rains have arrived with great fury and abundance causing great deal of satisfaction to farmers and rose growers in many parts of India. Many a rose society is organising their monsoon rose shows in such a conducive ambience with great zeal and enthusiasm.

One such rose society is the Rose Society of Pune, organising its 98th Rose Show on 27th August - 2016. We are proud to bestow an honour on a veteran rosarian from Kodaikanal Mrs. Girija Viraraghavan with the 'Vijay Pokarna Gold Medal'. Her contribution to the cause of the rose world in terms of research and study is phenomenal. With her celebrated husband Viru, she has devoted her life, time and energies to this cause. This world renowned couple was honored by the Huntington 'GREAT ROSARIANS OF THE WORLD' award in 2006.

The Viraraghavan couple has recently created sort of a history in rose world in international plane about which all of us, Indian Rosarians should be very proud of. Their creation, a Tea rose 'FAITH WHITTLESEY' has won a very prestigious 2017, AGRS (American Garden Rose Selection) award. The AGRS award has replaced earlier AARS awards. This rose has won the AGRS Heirloom Hybrid Award.

While Viru is engrossed in his painstaking work of rose breeding, Girija is researching the Rose's history in India, and together they are endeavoring, through their exemplary work to put the Indian Rose Federation on the rose map of the world.

Our dear President Emeritus, Mr. Ahmed Alam Khan has brought lot of laudatory applause from world rose leaders by hosting the grand International Regional Conference of the World Federation of Rose Societies in December 2014, at Hyderabad. Both these events have increased our responsibility to take the rose activity in India to such an height that world rose community will appreciate our efforts and contribution. I'm sure and confident that with advice and guidance from Viraraghavan's and Ahmedbhai, the march of the IRF on the global platform will be satisfactory.

Warm regards,

Suresh Pingale.

Viru Viraraghavan receiving the American Rose Society award for his beautiful hybrid "Faith Whittlesley".

FAITH WHITTLESLY

EDITORIAL

Hello Dear Members,

Well, not much, some facts of life, Suffering is no doubt undesirable to all and joy desired by all. But yet by measures of happiness available, we find happiness sparse and suffering abundant. Even those happy as per accepted indicators suffer from worries of different nature, some say life is full of suffering and sorrow. Life maybe a yoke bit it is a wonderful yoke, we are yoked to.

Lions, crocodiles, hippos, elephants, whales, dolphins vultures, peacocks, nightingales, piranhas all are ruled over by man, but still unhappiness knocks at our doors, are these creatures at all unhappy, worried, God knows ! but they with a full tummy hunt no more, nor graze more, maybe make efforts to spread their species, but no more beyond requirement. But man needs more than his needs, he rears an insatiable pet greed, forever hungry, forever awake, forever prodding, nudging one to plan, worry, be envious for things that would remain consigned to a store only. Reducing us to being mere store keepers with a stick of avarice to whip up discontentment, uncertainty, envy to formulate a portion of suffering for self and others, so truly is this life.

The rain drops that fall on the towering mountains rush to meet their kin in the sea, hurling down the streams only to once again hitchhike the clouds and kiss the peaks, such is the cycle of nature, shuttling between day and night, spring and autumn, life and dust, green and yellow, the eyes gaze at the sky and fall back on the earth to discover life abound, miracles all around, journey of birds and mammals, stars and planets, the dew drops and torrents, planktons and whales follow and order unheard, unwritten, but Final.

regards

Arshad Bhiwandiwala.

Ge Hong
Professor
Vice Chairman of China Rose Association
Vice Chairman of Chinese Society for Plant Tissue Culture and Propagation
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Education Background

A well - known rose breeder and the expert of tissue culture on ornamental horticulture - China, received her B.Sc. degree (1985) in Landscape Architecture in Beijing Forestry University Beijing, P. R. China and her M.S. degree (1999) in Crop Genetics in the Graduate School – Chinese Academy of Agricultural Sciences (CAAS), Beijing, P.R. China.

Professional Experience

She had been dedicated for the collection and conservation of flower germplasm resources, the improvement of tissue culture techniques, the genetics and breeding of rose, slipper orchid a chrysanthemum for three decades from Research Assistant (1985) to Professor (2008) till now In 1995, she was sent to Ben - Gurion University of the Negev, Israel as a visiting scholar for the improvement of flower breeding and cultivation.

Research Interests

The research was mainly focused on: (a) the collection and conservation for the gene pool flower germplasm resources, the evaluation and domestication of the important and specific flowers originated in China. (b) the improvement of the

techniques for tissue culture, virus - free and rapid propagation for important ornamental plants. (c) the genetics of the important ornamental traits including flower development, flower color, fragrance and recurrently - flowering of rose, chrysanthemum and slipper orchid. (d) the innovation and breeding of new varieties for rose, chrysanthemum and slipper orchid.

Achievements

She was one of the pioneers for rose breeding in China. More than 20 new varieties had been released and applied to all over the country, and 8 of them obtained the Authorized Certificate as new varieties in Beijing. She was also dedicated to tissue culture and propagation techniques the commercial flowers in China, and won the Second Class Prize of the National Scientific Technological Progress Award in 2007. More than 50 scientific articles were published in international and Chinese journals during the decades.

Some photos of displays at Beijing


花绘北京
出口
Hello Rose

Yang Shuhua.

Ph. D. Associate Professor
Vice Director of Department of Flower Breeding,
Institute of Vegetables & Flowers (IVF),
Chinese Academy of Agricultural Sciences (CAAS)
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Education Background

A geneticist and breeder on ornamental horticulture, received his B.Sc. degree (2000) and degree (2003) in Forestry and Horticulture from Huazhong Agricultural University, Hubei, P. China and his PhD degree in Plant Science (2007) from Institute of Botany, Chinese Academy of Sciences, Beijing,
P. R. China.

Research Experience and Interests

He was responsible for the germplasm evaluation, genetic and breeding of roses in Department of Flower Breeding, Institute of Vegetables & Flowers, Chinese Academy of Agricultural Sciences since 2007. During 2010 - 2012, employed as a postdoctoral researcher - Eole Normale Superieure de Lyon, France for exploring the molecular mechanism of formation of double flower in rose. Currently, the research was mainly focused on: a) the genetic diversity of wild roses in North China; b) the genetic mapping and functional genomics for the critical traits such as leaf and flower colors, and cold -resistance in roses; c) the cold – resistant breeding for new rose varieties.

Publications

More than 20 scientific articles had been published in the international and Chinese journals such as Environmental & Experimental Botany, Functional Plant Biology, The Journal Horticultural Science & Biotechnology, In Vitro Cellular & Developmental Biology - Plant. Functional Plant Biology, PLos One, Journal of Food Chemistry and Acta Horticulturae Sinca etc.

The Evaluation, Innovation and Application of Wild Rose Species in North West China.

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Abstract : Rose is one of the most important ornamental crops, and more than 24,000 varieties were registered all over the World, it is known that the genus Rosa contains over 150 species World – widely but only 10 – 15 species are in the background of the most varieties. Here we would like to introduce the practices on the utilization of wild species in North West China for rose breeding during the last three decades since 1981, the introgression of R. beggeriana from North West China to the modern roses was manipulated in our Institution, which successfully released many new shrub rose varieties with the extreme cold resistance. Moreover, a yellow – leaf mutant of r. beggeriana was created by 60Co y – ray irradiation and was psychologically due to the impairment of chlorophyll biosynthesis, which giving a prospect on the innovation of color leaf rose varieties. During 2006 – 2010, the investigation and evaluation of wild rose species in Xinjiang, China was initiated and the population genetic diversity of 3 widely distributed species of R. beggeriana, R. laxa and R. Platyacantha was described carefully based on the morphological, karyotpic and molecular markers respectively. The domestication and ecophysiological adaptive mechanism of the potential germplasm R. platyacantha with golden petals and cold resistance were performed in Beijing and the origins of Xinjiang for the evaluation of the genotypes. Recently, the genetic mapping focused on the traits of

cold resistance, leaf and flower colors, and inflorescence are performing on F1 population of yellow mutant of R. beggeriana and R. davurica which may decipher the molecular mechanism of the traits mentioned above, and will be finally beneficial to our rose breeding in the coming future.

Key words : wild rose species, evaluation, innovation and application.

Introduction.

Rose is one of the most important ornamental crops, and more than 24,000 varieties were registered all over the World, it is known that the genus Rosa contains over 150 species World – widely but only 10 – 15 species are in the background of the most varieties, leaving the vast untapped resources. A good practice for the introgression of wild rose genes into the current varieties was the application of wild species in North west China for the distant hybridization. Sine 1980's, we introduced R. beggeriana from North west China to Beijing and hybridized the species with modern roses for the innovation. During the decades, many new shrub rose varieties with the extreme cold resistance were successfully released to the communities, public gardens and parks. The innovation had been further performed on the species by using 60Co y – ray irradiation, which a yellow – leaf mutant had been created and named as R.beggeriana "Aurea". The morphological, physiological and molecular studies had been currently conducted for deciphering the reason why the leaves turned yellow. On the other hand, we initiated the investigation and evaluation of wild species in the originated sites of Xinjiang, North west China since 2006. The population genetic diversity of three species of R.beggeriana, R.laxa and R.platyacantha was described carefully based on the morphological, karyotpic and molecular markers, respectively. These works were beneficial to the protection and utilization of the wild species. As another potential germplasm with brilliant gold petals promising stress – resistance. R.platyacantha had been successfully domesticated in Beijing the evaluation on the photosynthetic adaptation of the populations originated from different altitudes. In this paper we try to summary the works in our institution on the evaluation, innovation and application of wild rose species from North west China during the past decades.

2. The evaluation of wild species in Xinjiang, North west China.

Xinjiang Uygur Autonomic Region located in North west China, which is a continental arid climate with only 1.92% of forest coverage rate. As the typical shrubs between the forests and deserts, more than 10 wild rose species distributed in Xinjiang. During 2006 – 2010, we carried out 10 times of investigations for wild rose species and at least 8 species had been located and identified in the originated sites of Northern Xinjiang. The genetic diversity of three widely distributed species R.beggeriana, R.laxa and R.platyacantha had been delicately analyzed in their distributions of Northern Xinjiang using the morphological, karyotpic molecular markers. The karyotype results showed that R.beggeriana and R.platyacantha were diploid while R.laxa was tetraploid. The phenotypic diversity based on morphological traits from leaves, fruits and seeds demonstrated that there were abundant phenotypic variations among the populations of each species. However, the genetic diversity based on AFLP markers exhibited that there were relatively low genetic variations among the populations of three species, which their gene differentiations coefficient ranked as R.laxa (32.36%), R.beggeriana (14.78%) and R.platyacantha (8.10%), respectively. Moreover the cluster analysis indicated that phenotypic diversity of the populations of each species did not strictly classify according to the geography distances, while genetic diversity were clustered mainly based on the geography distances, implying the effects of environments on the genotype of all three species. On the other hand, we successfully introduced the six populations of R.platyacantha from Northern Xinjiang to Beijing since the seeds were germinated and the seedlings were grown in the nursery of our institute. The photosynthetic adaptation of R.platyacantha has been conducted on 2 year old seedlings in 2009. The results showed that the population from different altitudes of northern Xinjiang could be adaptive to the high air temperatures in summer of Beijing. However, there was a significant depression of photosynthesis in the seedlings from the highest altitude compared with other altitudes, suggesting that environments in the highest altitude affected the occurrences of genetic variations in population of R.platyacantha, in addition, the freezing tolerance experiments indicated that the half lethal low temperature (LT50) of three species from Xinjiang were lower than -20^{c} which exhibited the much higher freezing tolerances than other species from South

China. The studies on the evaluation of wild species in Xinjiang, North west China can provide the exact guides for the protective strategy, the innovation and application of these wild species.

3. The germplasm innovation using wild species in Xinjiang.

R.beggeriana had been introduced to Beijing in the early 1980's, which is the first species Xinjiang applied for the improvement of new rose varieties in our institute. The interspecies hybridization had been carried out on R.beggeriana and the modern varieties since 1980 almost 10 years of the hybridization and selection, we screened more than 10 excellent individuals and propagated as the new rose varieties or lines. We also applied 60Co y – ray to irradiate the seeds of R.beggeriana, which the seedlings were grown in the nursery of our institute. A sport mutant with yellow – leaves in the branch had been observed in the seedlings in 2006. We grafted the branch and propagated the yellow – leaf mutants. The back cross test between R.beggeriana and its yellow – leaf mutant showed that the yellow – leaf traits could be stably inherited. We finally named yellow – leaf mutant as "golden rose" or R.beggeriana 'Aurea'. The morphological, physiological and molecular analysis indicated that there were less stomatal density, lower chlorophylls, and less chloroplasts in the leaves of yellow – leaf mutant than the wild type of R.beggeriana, which could be due to the impaired chlorophyll biosynthesis pathway. The seedlings of R.beggeriana, "Aurea" also exhibited a decline photosynthetic ability compared with R.beggeriana. Recently, population of Rosa beggeriana and R.davurica was established for obtaining the rose varieties with the yellow – leaves and red flowers. The expected traits had been well exhibited in the F1 progenies in the investigation last year. The F1 populations had also been applied for the construction of genetic linkage map using AFLP and SSR markers. The results showed that the yellow – leaf mutant trait was located in the 4^{th} linkage group of Rosa beggeriana, 'Aurea", which definitely could be beneficial for the mapping and cloning of the candidate genes associated with the leaf – color mutant.

4. The application of new rose varieties.

In the past thirty years we has successfully conducted the introductions, investigations and evaluation of many wild rose species in Xinjiang, Northwest China, especially the innovation of Rosa beggeriana by the methods of the distant hybridization and irradiated mutation. Till now more than 10 new varieties or lines had been propagated and applied to many farms, companies and parks, which were warmly welcomed by the producers and consumers. During 2012 – 2014, we carried out the region experiments in three different private companies or public organization and investigated the main ornamental and resistant traits among the varieties such as 'Tianxiang', Tianshanbaixue', Tianshantaoyuan', 'Tianshanzhiguang' and 'Tinashanzhixing'. The results showed that the shrub roses owned the obvious advantage with strong cold resistance, vigorous growth and full of flowers. The five new roses varieties had passed the examination and approval of the Committee of Beijing Municipality on authentication of the tree and ornamental varieties, and finally obtained the Certificates as excellent varieties in Beijing. In addition some of inter specific lines from Rosa beggeriana completed the regional tests for the authentication of ornamental varieties in this year, prepared for the application of the certificated as the excellent varieties in Beijing.

Conclusion.

Through many years of the research works, the research group had made the notable achievements in the evaluation, germplasm innovation and the new varieties application of rose resources in Xinjiang, Northwest China. We had conserved total 8 wild rose species, conducted the genetic diversity among the populations of three widely - distributed species Xinjiang. The yellow – leaf mutant had been obtained by using 60Co y – ray irradiation with further studies on the hybridization for the red – petal and yellow – leaf traits and the genetic mapping for the yellow – leaf mutant trait. Through the distant hybridization there were many new rose varieties released during the three decades. Five shrub rose varieties finally obtained Certificates as the excellent varieties in Beijing, and ten scientific papers had been published. For the next step, we should continue and expand the inter specific hybridization. For the next step, we should continue and expand the inter specific hybridization to R.

beggeriana, R. laxa and R. platyacantha, for obtaining the more and better new germplasm. The region tests and the extension works should be strengthened to the application of new varieties. Moreover, it is very necessary to enhance the basic researches to accelerate the rose breeding process by using the modern biotechnology such as the technique of molecular – aid selection (MAS).

Fig.2 New rose cultivars named *Rosa* 'Tianshan' series
(a) 'Tianxiang'; (b) 'Tianshanbaixüe'; (c) 'Tianshantaoyuan' ; (d) 'Tianshanzhiguang'; (e) 'Tianshanzhixing'

Fig.1 New rose cultivars named *Rosa* 'Tianshan' series
(a) *R. beggeriana*'Aurea'; (b) *R. davurica*; (c) and (d) some of F1 progenies.