

New cultivars of Bougainvillea evolved at National Botanical Research Institute, Lucknow

Bud sports, Induced mutations, seedling selection, hybridization and colchiploidy has played significant role in origin and evolution of new cultivars of present day ornamental plants grown in gardens and bougainvillea is no exception. The National Botanical Research Institute, Lucknow has performed a pivotal role in undertaking advance research in bougainvillea under the dynamic leadership of Dr.T.N.Khoshoo in mid sixties and work is still continued. It has converted the plant resources of bougainvillea into valuable and novel germplasm by using various available breeding tools. Senior Scientists of this Institute have not only enriched our knowledge in bougainvillea but have given rich diversity in terms of socio-economic benefits to nursery men, soft landscape architect and hobby oriented growers.

Plant improvement work in bougainvillea at National Botanical Research Institute has been carried out by three main groups. Scientist from mutation breeding group mainly concentrated their research work with double bracted bougainvillea as hybridization was not possible in it due to complete absence of flowers from the bracts where mutation breeding remains the only alternative way for its further improvement. The scientist from cytogenetics division started work with single bracted bougainvillea by using hybridization and colchiplody as a major tools for its further improvement. Scientist of Plant introduction and acclimatization division and Garden division have been deeply involve in maintaining huge germplasm collection at National Botanical Garden from time to time and many bud sports in bougainvillea have been reported by them, which added new dimension to our germplasm collection. Detail description of the bougainvillea developed at National Botanical Research Institute, Lucknow is given below:

Archana: It is a bud sport of multibracted bougainvillea cultivars '*Roseville's Delight*'. Dr.G.S.Srivastava reported it from National Botanic Gardens, Lucknow. Variegation is in the form of pale yellow spots or blotches distributed all over the leaf surface in the forms of stripes or in patches of different shapes and size. Bracts are persistent. Cultivar is ideally suitable for topiary and soft landscaping work.

Arjuna: It is a gamma ray induced mutant of 'Partha'. Leaves are variegated. Central portion of the leaf is green and its margin is surrounded by creamish tissues. Bract colour is pinkish purple. Gupta and Shukla (1974) reported this mutant from National Botanic Garden, Lucknow. Cultivar is ideal for pot culture and soft landscaping.

Begum Sikander: It is a hybrid of 'Dr.B.P.Pal' and 'Jennifer Fernic'. Zadoo and Khoshoo reported this hybrid from National Botanic Gardens, Lucknow in the year 1969. Plant growth is restricted. Thorns are slightly curved at the tip. Leaves

are green and their surface is glabrous. Leaf shape is elliptical. Bract size is medium. In cooler months bract colour is white in the central portion with purple margin which turns self colour in summer. Flower tube is slightly swollen at the base and its colour is green. It is a recurrent bloomer cultivar. Flowers are borne in trusses through out the shoots. Cultivar is good for pot culture and it can be grown as ideal bush.

Chitra: It is a hybrid of 'Tetra Mrs. McClean and 'Dr.B.P.Pal. Khoshoo et. al. reported this hybrid from National Botanical Research Institute, Lucknow in 1981. Thorns are large. Young leaves are coppery while mature leaves are dark green and its surface is glabrous. Inflorescence appears at the end of the branch. Bract size is large and its colour is magenta. Some times bracts look like geranium. Cultivar is very good as potted plant and it can be grown in window boxes.

Dr.B.P.Pal: This cultivar is evolved by colchicines treatment as a cyto chimera in shoots of bougainvillea cultivar 'Shubra'. It is actually evolved as tetraploid of 'Shubra' and developed by Zadoo and Khoshoo from National Botanic Gardens, Lucknow. Plant growth is restricted. Thorns are slightly curved at the tip. Leaf colour is green and its surface is glabrous. Leaf shape is ovate. Bract size is medium and its colour is white. Flower tube is slender and its colour is green. Flower borne in trusses through out the shoot. This cultivar is a recurrent bloomer and considered as of the best cultivar among the single bracted bougainvillea. Cultivar can be grown in any form.

Los Banos Variegata: It is a gamma ray induced mutant of multibracted bougainvillea cultivars 'Los Banos Beauty'. Banerji and Datta reported the mutant in 1987. Leaves are variegated and has excellent pattern. It looks very attractive due to presence of green irregular center and white margin with of which is more than 1cm. Bract colour remains the same i.e. mallow purple. In extreme cases few albino shoots are emerged in old plant with pink stem. Very old plant produces few branches with Rhodamine purple bracts, which are Mahara type. These branches have green leaves. International Bougainvillea Registration Society, New Delhi, has already registered it. This cultivar is Ideal for landscaping and pot culture.

Los Banos Variegata silver margin: It is a gamma ray induced mutant of multibracted bougainvillea cultivars 'Los Banos Beauty'. Banerji reported the mutant in 2002. Leaves are variegated and have combination of green and silver margin. It looks very attractive due to presence of green regular center and silver white margin with of which is 1-2mm. variegated leaves are slightly incurved and in extreme cases leaves are spoon shaped. Mutant is not clearly visible from a long distance as its variegation is not very contrast like Los Banos Variegata. Bract colour is mallow purple just like Los Banos Beauty and Los Banos Variegata. Plant can be used in topiary work.

Los Banos Variegata 'Jayanthi': This is a chemical mutagen (Ethyl Methane Sulphonate {EMS} 0.02% aqueous solution) induced chlorophyll variegated mutant of bougainvillea cv. 'Los Banos Beauty'. The mutant differs from original variety only in foliage colour without in any change in bract colour. Mutant showed two types of variegated leaves. One type was mosaic have four visible colours i.e. Olive green (Yellow Green Group 146B, Fan-3), Pale (Yellow Green Group 146D, Fan-3), Deep Green (Yellow Green Group 146 A, Fan-3) and Light Yellow (Yellow Green Group 154D, Fan-3), mixed with different shades of green. The second type of leaf have green center portion with white margin. Foliage of this type has three major colour combinations i.e. Light Yellow (Yellow-Orange Group 19C, Fan-1) Green (Green Group 147B, Fan-3) and Light Green (Yellow-Green Group 148C, Fan-3) Jayanti and Datta, 2006).The plant looks very attractive if grown in bush form. It can be grown as pot plant.

Mahara Variegata: It is a gamma ray induced mutant of multibracted bougainvillea cultivars '*Mahara*'. Datta and Banerji reported these mutants from National Botanical Research Institute, Lucknow in 1994. Leaves are variegated and their pattern is not fixed. Variegation varies from leaf to leaf with combination of creamish yellow and various shades of green overlapped patches. Young leaves are coppery while the old leaves have dull yellow and faded green colour. Bract colour is Rhodamine purple which remains unaltered. International Bougainvillea Registration Society, New Delhi, has already registered it. It can be grown as potted plant and can be used for landscaping.

Mahara Variegata abnormal leaves: It is a gamma ray induced mutant of multibracted bougainvillea cultivar '*Mahara*'. Banerji reported the mutant in 2002. Leaves are variegated and are of peculiar types. Margin is unevenly undulated and leaf lamina is asymmetrical in shape. Variegation in various shades of green and light green pattern haphazardly spread all over the surface of leaves giving it a curio look. Old leaf texture is leathery. Bract colour remains unaltered but its shapes and size reduced. Most of the bracts are asymmetrical. This is the first mutant of bougainvillea where leaf variegation is associated with leaf and bract shape and size changed. The cultivar can be ideally used in topiary work.

Manohar Chandra Variegata: It is a bud sport of '*Manohar Chandra*'. Young leaves are coppery and old leaves have green center and yellow margin. S.C.Sharma and Bisaria report it in the year 1985 from National Botanical Research Institute, Lucknow. The cultivar is ideal for road side plantation and pot culture.

Mary Palmer Special: It is a hybrid of '*Princess Margaret Rose*' and '*B.P.Pal*'. It is triploid in nature. Zadoo and Khoshoo reported this cultivar from National Botanic Garden, Lucknow in the year 1974. The plant is vigorous growing. Thorns are curved. Leaves are broadly ovate. Bract size is medium and its colour is white, magenta or blotched with no definite pattern and it varies from branch to

branch. Flowers are borne in trusses and more at the end of the branches. Cultivar is very good for pot culture and landscaping.

Mrs. McClean Nirmal: It is a bud sport of 'Mrs. McClean'. Leaves are variegated. Young leaves are green to coppery white. Variegation in leaves comprises of combination of green and white tissues in patch form. Mr.G.S.Srivastava from Plant Introduction and acclimatization section, National Botanical Research Institute, Lucknow reported it in 1982. This cultivar is for pot culture.

Pallavi: It is a gamma ray induced variegated mutant of '*Roseville's Delight*' evolved at National Botanical Research Institute, Lucknow by Banerji et. al. (1987). The Variegated mutant has been released in the name of Pallavi. The mutant has been registered with International Bougainvillea Registration Society; New Delhi. Variegated leaves are having light green, pale green combination in various shades. Variegation is very prominent in young shoots and it masks with age and in older shoots it is not very clear. No Change in bract colour was noticed however in older plants shoot having Mahara types of bract bunches developed which are very common as it is commonly found in the old Roseville's Delight growing plants. Bracts are persistent. Variety is ideal for pot culture and topiary work.

Parthasarthy: It is a bud sport of 'Partha'. Leaves are variegated. Leaves have light green colour in the center with cream white surrounding margin. Some of the leaves exhibit entirely cream colour. Bract colour is like Partha. It is reported from Dr.S.C.Sharma from National Botanical Research Institute, Lucknow in the year 1974.

Spectabilis Variegata: It is a bud sport of *B.spectabilis*. Leaves are variegated. Cream and white tissues spread all over the surface of leaf and its pattern quite resembles with cv. 'Rao'. Bract colour is fuschia purple. S.Percy Lancaster reported this sport from National Botanic Garden, Lucknow in the year1986.

Surekha: It is a bud sport of 'Scarlet Queen Variegata'. Leaves are variegated. Pale yellow patches of different shape and size spread all over the surface of leaf. Bract colour is carmine to fuschia purple. Bract margin is crinkled. S.C.Sharma reported this sport from NBRI, Lucknow in the year1981.

Tetra Mrs.McClean: This cultivar of bougainvillea is evolved by colchicines treatment from bougainvillea cultivar Mrs. McClean which is diploid in nature. It appears as a cytochimera. Plant nature is tetraploid i.e. $2n=2x=68$. The cultivar is raised by Zadoo and Khoshoo from National Botanical Garden, Lucknow in the year1969. Plant growth is restricted. Thorns are straight. Leaves are green and its surface is glabrous. Bracts are medium in size and its colour is burnt orange. Greenish veins are very prominent and spread all over the bract surface. Flower tube is slender and tinged with orange colour. Blooms appear in huge trusses and more at the end of the branches. The cultivar is a recurrent bloomer.

Wajid Ali Shah: The cultivar is evolved as hybrid of 'Dr.B.P.Pal and 'Mrs.Chico'. Hybrid is evolved by Zadoo and Khoshoo from National Botanic Garden, Lucknow in the year 1977. Plant is triploid in nature and its chromosome number is $2n=2x=51$. Plant growth is intermediate. Juvenile leaves are coppery. Mature leaves are green and their shape is ovate. It blooms profusely during winters. Inflorescence develops at the end of branch. Bracts are bicolor. Irregular patches of parchment white and rosein purple spread all over the surface of bracts. The bracts are non persistence in nature.

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