

**A CHECKLIST AND MACROMORPHOLOGICAL CHARACTERISATION OF *ROSA* L. (ROSACEAE)
IN JOS, PLATEAU STATE, NIGERIA**

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ABSTRACT

Members of the genus *Rosa* L. have become well domesticated on the Jos Plateau due to its near temperate climate; yet, they have remained underexploited. It is necessary to document the existing varieties and types, as well as record differences in their external morphology for easy identification and proper utilization. Based on information provided at the office of the Plateau Horticultural Society as well as by prominent rosarians, gardens and nurseries were located and visited for consultation and data collection. Photographs of flowers and leaves were taken for comparison with those in rose monographs, catalogues and encyclopaedias so as to facilitate their recognition. Twenty-nine (29) rose varieties were encountered, including one (1) species-like rose, six (6) miniatures, six (6) old garden roses, nine (9) hybrid teas and seven (7) floribundas. Out of these, there were two (2) climbers, one (1) rambler, seven (7) small shrubs/miniatures and eighteen (18) shrubs. The key characters which differentiated the varieties were habit, length of flowering stem, number, size, presence or absence of prickles or thorns and their shapes, number of leaflets, number of flowers per stem, number of petals per flower, size of flower as well as presence or absence of hips. The high number of hybrids and the occurrence of representatives of all the classes of roses in the study area is an indication that the rose cut-flower industry may flourish on the Jos Plateau, Nigeria, if properly harnessed.

keywords: Checklist; macromorphology; *Rosa* L.; Jos Plateau; document; cut-flower

INTRODUCTION

The rose plant is strictly native to the northern hemisphere, meaning that members of the genus *Rosa* found south of the equator have been introduced there over the years (Smulders *et al.*, 2013). In Nigeria, the European tin miners and missionaries were the first to domesticate the rose plants just as they did with the progenitors of the hybrid roses such as China rose (*Rosa chinensis*) and tea rose (*R. odorata*) in Europe in the year 1752 (Austin, 2012). Austin (1992) reported that there are more than 100 botanical species in the genus *Rosa*, and that members of the group referred to as the Modern Rose were created from only a few of the species or wild roses. This is a diverse group of plants, and the various types are put to different uses in formal and informal displays. They have been applied for foundation plantings in landscape as hedges, ground covers, specimens, or trained on arches, pillars and pergolas for vertical definition. The ideal rose is the hybrid tea which came about as a result of introgressive hybridization of the modern rose during the late 19th and early 20th centuries. Traits such as disease resistance, hardiness, floral complexity and doubling were inculcated from the European roses, while recurrent flowering and floral pigmentation came from the China rose lineage (Lammerts, 1945).

Presently, all the hybrid teas cultivated by rose growers in Nigeria, and Jos in particular, have been imported by enthusiasts and rosarians from Scotland, France, California and African countries such as Kenya. These, with the polyanthas and floribundas, are the most popular classes. The roses called the 'species' are old-fashioned, having natural, wild features particularly the presence of many thorns on vegetative parts and single-petal flowers. Members are more vigorous and become established easily on their roots in the nursery; thus, they are suitable as motherstocks. Examples include *R. canina* and *R. rugosa*. In addition to these classes, there are many

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other varieties and hybrids suitable in the landscape and as cut-flowers.

A major challenge during this survey had been the limited knowledge possessed by garden owners about this range of plants, particularly so since the collections encountered were not organised, especially systematically. The names ascribed to the sampled varieties were largely based on flower colour or source, and both gardeners and rose buyers often mistake varieties with the same floral features as the same. Thus, little is known about the origin, lineage, uses and botany within this locality. If properly harnessed, Nigeria could benefit from the \$2 billion annual global market worth of rose cut-flowers and essences (Lemper, 1976). This work is an attempt toward solving these problems by providing some apparent diagnostic taxonomic information and a short Flora for the identification of members of this genus in Jos in particular and Nigeria at large.

MATERIALS AND METHODS

Physical features of the study area

The Jos Plateau is reported to be geographically located on long. 09° 56' N, lat. 08° 53' E and 1,217 m above sea level, with an average temperature of between 18 and 25°C, and mean annual rainfall of about 146 cm. It covers an area of 8,600 km² situated about 181 km from the Federal Capital Territory (FCT), Abuja. The soil is composed of eroded gneiss formation with granite intrusions forming massifs. Its relief is characterised by regions of flat highlands and valleys which gives it varying degrees of slopes.

Sampling method

Visits were made to some notable commercial and home gardens within Jos and environs where appreciable numbers of roses are under cultivation, especially the nurseries located opposite the Central Bank of Nigeria (CBN) and Church of Christ in Nations (COCIN) Headquarters, Jos, Plateau State. Varieties were randomly selected and pruned back so as to observe and assess characters of shoots and flowers using naked eyes, magnifying glass and meter rule. Information about the common names and possible sources of the varieties were also obtained.

Morphological assessment

The external morphologies of sprouted buds were carefully observed until maturity. Pigmentation, sizes and shapes of young and mature leaves, apical buds as well as cane bark, thorns and flowers were carefully noted. Height, width, number and size of the vegetative and floral parts were recorded for comparative purposes. Photographs of blooms and leaves were made using an OLYMPUS *fe* digital camera. Identification was done on site and by comparing living materials and pictures with materials in Catalogues, Manuals, Floras as well as internet sources.

RESULTS AND DISCUSSION

Photographs of the 29 types of roses encountered and sampled on the Jos Plateau are presented as Plate 1 R1 to Plate 5 R29, while their vegetative and floral characteristics were outlined as shown in Tables 1, 2 and 3. This number falls short of the 200 botanical species and over 35,000 hybrids available worldwide (Roger and Martyn, 1988; Hummer and Janick, 2009).

The following lists comprise the types and varieties studied with brief description of the classes and the purpose for which they are being used in the study area.

Species-type or species derivatives

Members have compact, dense growth with >7 leaflets in each leaf. Generally, they are old-fashioned, seen only in informal settings within the shrub border. They require little care with prolonged blooms and have been classified here as small shrubs (Cunja *et al.*, 2014). The only representative encountered was:

Keep-in-touch (Plate 1 R1) - Highly thorny with red velvety petals rich in fragrance. Seen as a potted specimen

Miniature roses

They are ever-blooming replicas of the larger polyanthas that produce full but small flowers in truss (Shahrin *et al.*, 2015). They are used for many purposes both in formal and informal gardens, and city parks for edging, in flower or window pots. They showed variations in the pigmentation of both shoot and flower buds and their height has made them to be grouped among the small shrubs. Petal colours varied from Persian pink in 'The Fairy' to Aureolin yellow in 'Little Angel' (Plate 2 R7). The seven (7) varieties of miniature roses encountered in the study area include:

Little Jewel (Plate 1 R2) – Much branched with penta-leaflet leaves and very full flowers

Little Buckaroo (Plate 1 R3) - Apical buds maroon in colour with few branches and leaves

Little white pet (Plate 1 R4) – The one other truly white rose encountered (apart from Snow White) although highly branched and thorny

Magic Carrousel (Plate 1 R5) – Few branches and thorns. The pink margin and sturdy neck, seen in many floral arrangements

The Fairy (Plate 1 R6) - A small much branched shrub with green thorns on mature stem

The Little Angel (Plate 2 R7) – The only truly yellow rose sampled, creates a good contrast in the landscape

Old garden roses

This comprises natural derivatives of the species roses which used to grace Royal gardens before the introduction of the first hybrid tea 'La France' (Schneider and Dewolf, 1995). Cultivars such as *Escapade* (Plate 2 R8) and *Excelsa* (Plate 2 R9) are climbing and rambling, respectively. Members with dwarf polyanthas and hybrid perpetual habits have also been listed here. Four (4) others encountered in the study area are:

Kaduna Orange (Plate 2 R10) – Very hardy tall shrub whose flowers open stupidly like pompom although good in wreaths

Lille Marlene (Plate 2 R11) - Dwarf shrub, many stamens but few petals. Important as groundcover in the landscape

Purple Splendour (Plate 2 R12) – The flowers are double with few petals on thorny stems.

Queen of Denmark (Plate 3 R13) – A vigorous shrub which branches well after pruning. Petals many and in rosette. Important as cut-flowers.

Hybrid Tea roses

Progenies of a cross between Hybrid Perpetuals and Tea Roses done in 1867 (Abd-Elrahim and Osman, 2017). The most popular group of roses with large bush, single flower at the end of a long stem and varieties of petal pigments of various hues, in mono or mixed colours. Listed below are the nine (9) types encountered:

Ambassador (Plate 3 R14) – One of the Helena roses imported from Meilland Selection, Paris, thornless and highly preferred in floral arrangements.

Andrea Stelzer (Plate 3 R15) – A climbing hybrid tea with many thorns and few petals in flowers. Used to introduce vertical definition in the landscape.

Anne Harkness (Plate 3 R16) – A fragrant, large shrub. Good for hedging and as cut flower.

Chrysler Imperial (Plate 3 R17) – Believed to have been imported from Scotland recently, its velvety red petals are a delight in an arrangement.

Ena Harkness (Plate 3 R18) – Indefinite strong fragrance with weak floral neck. The large blooms fill the wreath space easily.

Eutin (Plate 4 R19) – A very good hybrid tea whose petals open well. Branches well to offer more flower heads per plant.

Limburgstar (Plate 4 R20) – So named because it was certainly imported from a town called Limburg in Scotland in the 90s. A true hybrid tea with long stem and other export standard qualities.

Massage (Plate 4 R21) – Also a Helena rose grown in Jos during the early 80s. The cream coloured petals are prone to blighted spots when grown under direct sunlight.

Peadouce (Plate 4 R22) – The large blooms have fragile neck, but are good in the bridal bouquet. Vigorous, thorny and fragrant.

Floribunda roses

Also known as hybrid polyanthas due to the combination of the dense flower clusters and large blooms characteristic of the polyanthas and hybrid teas, respectively (Mohapatra and Rout, 2005). Their vigorous growth and prolonged flowering make them ideal for garden beds and border hedges.

The following were identified and studied:

Masquarade (Plate 4 R23) – A climber which produces a truss of bicolour flowers although not perpetually. Preferred as the pergola plant.

Pink Queen Elizabeth (Plate 4 R24) – A popular rose worldwide, the fragrant blooms are also good as cut flowers if harvested early.

Yellow Queen Elizabeth (Plate 5 R25) – The flower becomes spent easily; however, it provides a shade of yellow on the bed or borders.

Samurai (Plate 5 R26) – A unique Helena rose with wavy petals and tea fragrance. Highly thorny with short stem. Good for wreath- making.

Showbiz (Plate 5 R27) – A very vigorous type with ascending tendencies. Splendid screen marker with showy trusses of flowers.

Snow White (Plate 5 R28) – Rich white flowers on well branched vigorous stems. Important as part of bridal bouquets.

William Baffin (Plate 5 R29) – A well branched small shrub. Useful as groundcovers and for edging.

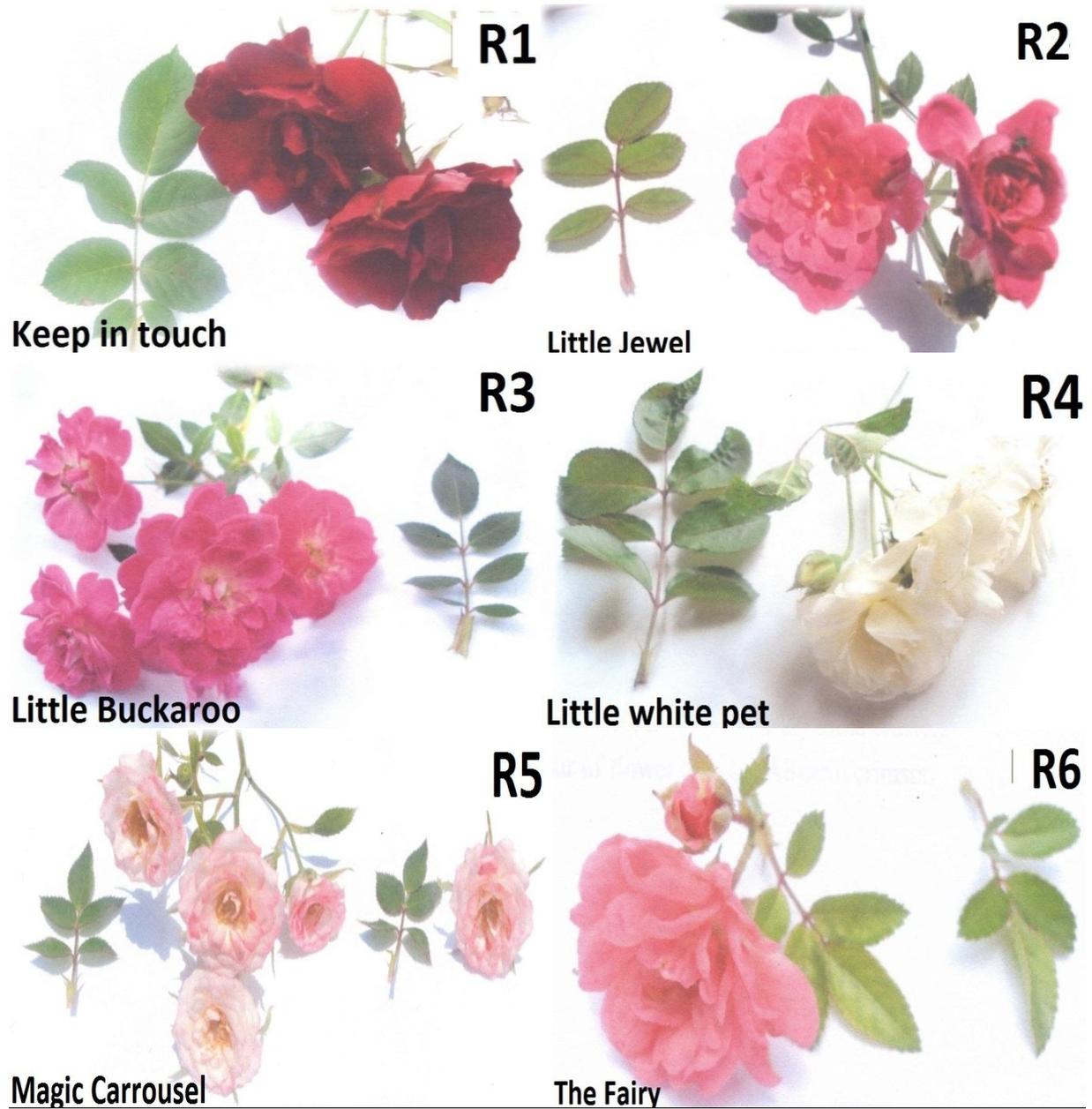


Plate 1: The species-like rose ‘Keep in touch’ and other small shrubs of the miniature type studied in Jos, Nigeria.

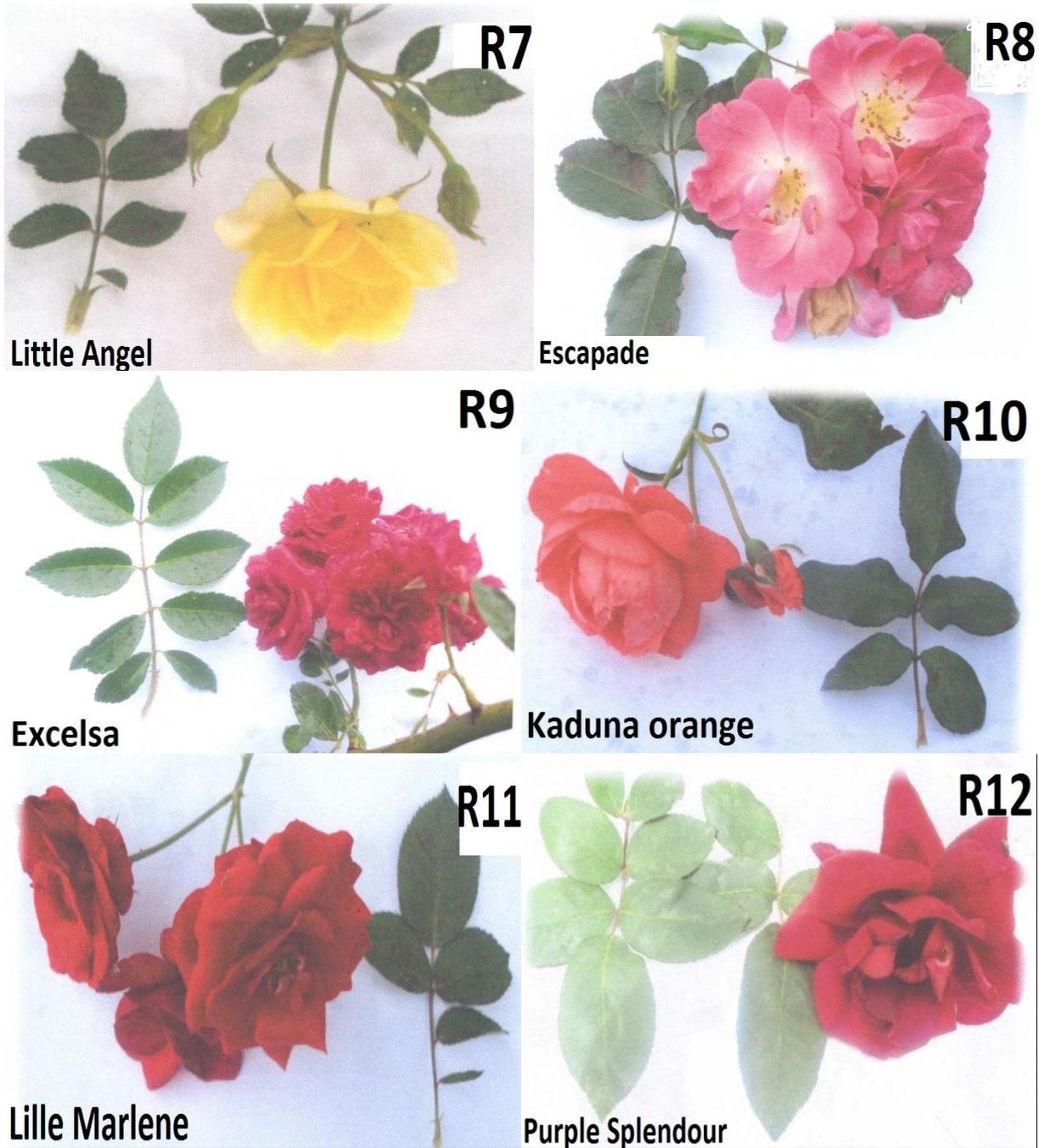


Plate 2: The rambler ‘Excelsa’ with some miniatures and old garden roses encountered in Jos, Nigeria.

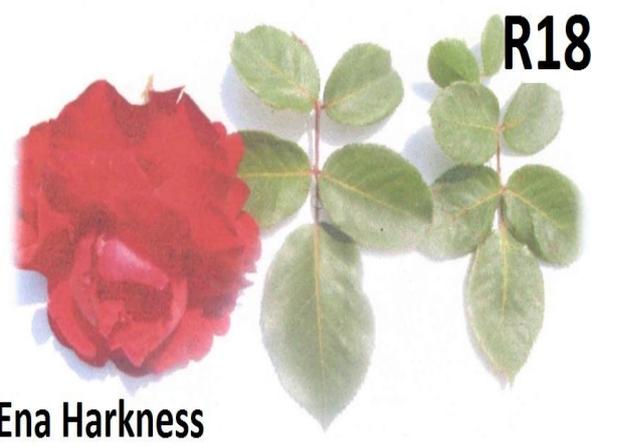
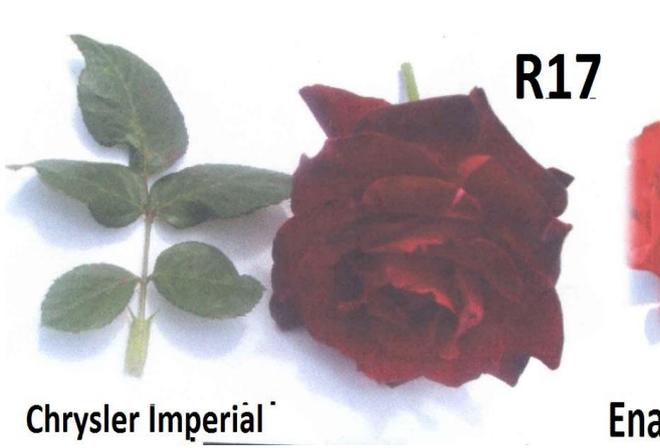


Plate 3: Good flower form in ‘Ambassador’ and ‘Anne Harkness’, as well as other hybrid teas studied in Jos, Nigeria.

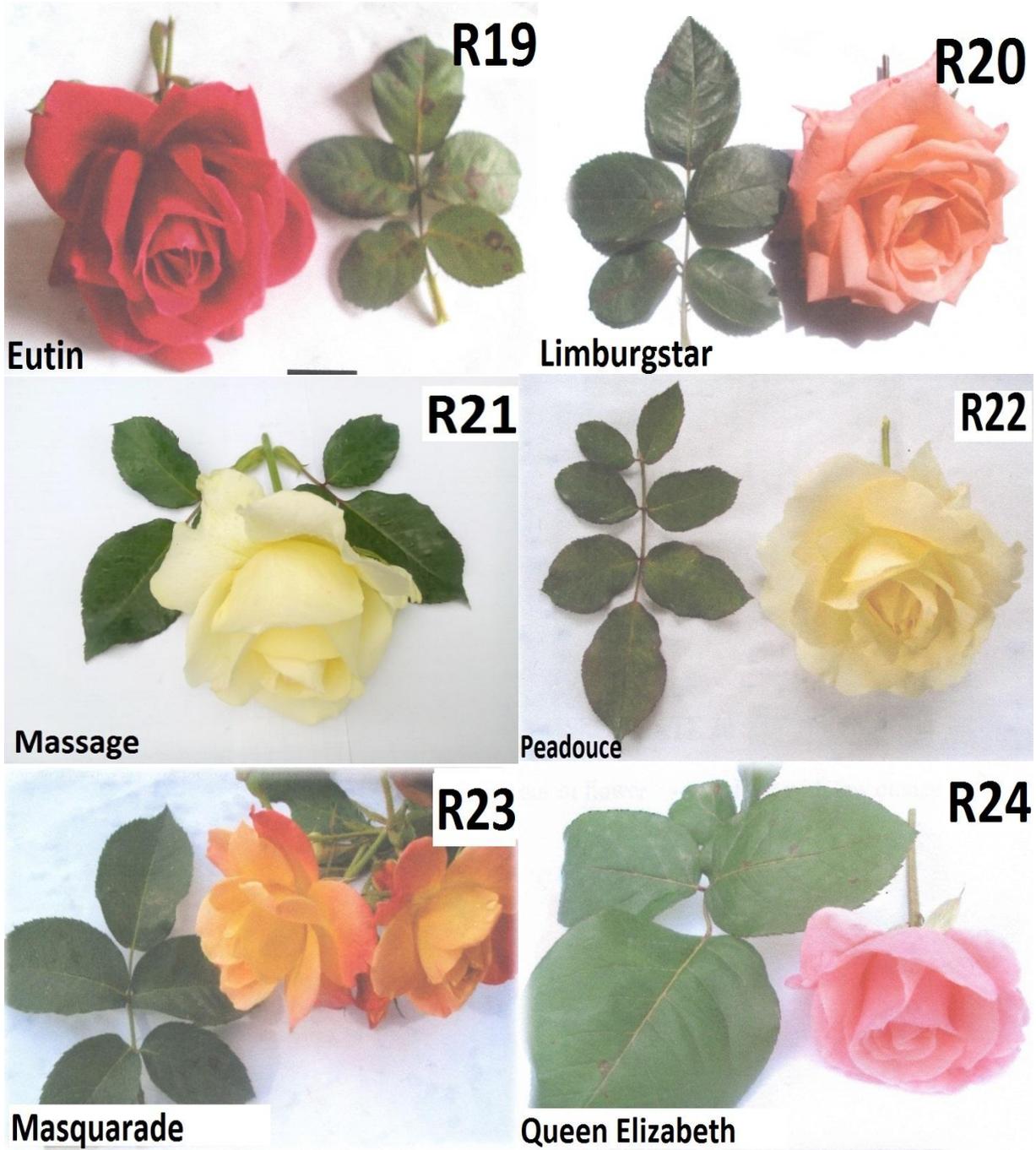
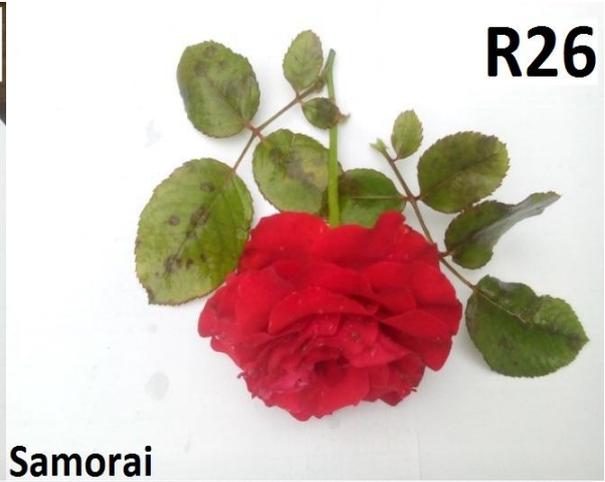


Plate 4: Hepta-leaflet leaf in the vigorous ‘Peadouce’ and bicolour flowers in ‘Masquarade ‘ collected in Jos, Nigeria



R25

Yellow Queen Elizabeth



R26

Samorai



R27

Showbiz



R28

Snow white



R29

William Baffin

Plate 5: Polyantha nature of inflorescence in 'William Baffin' and other floribundas encountered in Jos, Nigeria.

The varieties of roses studied may be distributed across 3 recognisable classes or groups with the hybrid teas constituting about 31% of the number (Fig. 1). This is a group comprising members that symbolise the ideal rose with large, longish, pointed flower buds, and having full or double-petalled blooms in all sorts of colours. They are useful both on the landscape as garden ornamental plants, and especially as cut-flowers due to their long vase life. They, however, lack the rich fragrance of the species roses (Wylie, 1954). The only one species-type rose or their likely derivative recorded during this survey (Keep-in-touch) is an indication that scent biosynthesis and emissions were not traits of priority during the domestication of roses in Jos (Debener, 1999). Rather, the high number of hybrid teas recorded within the study area is an indication of how commercially viable they are, being preferred for characteristics such as plant and flower development and architecture, senescence as well as ease of reproduction and adaptation.

Worrisome is the arbitrary naming of types and varieties within the study area. For example, the floribunda, 'Kaduna Orange,' and hybrid tea, 'Limburgstar,' were confirmed to have been whimsically so named because they were sourced from Kaduna, Nigeria and Limburg, Europe, respectively. Moreover, varietal names such as Ena Harkness, Queen Elizabeth and Masquarade have been clearly agreeable with names available in literatures, unlike names such as Ambassador, the Fiary, Massage, Samourai and many others which were not encountered or did not match the content of catalogues consulted (Columbia Encyclopaedia, 2009). In most cases, rose buyers make their requests based on the colour they desire by making general and open statements like 'I want to buy red rose' or 'I need a bouquet of white rose blooms', without being specific about the varietal name, fragrance or shade of the colour. This has resulted in many customers receiving, for instance, cream coloured blooms as whites, leading to perpetuation of the misidentification (Lidwien, 1980).

Figure 2 represents distribution of the sampled varieties in Jos based on habits and it reveals that the roses encountered in the study area were mostly shrubby. These representations agree with reports by authors such as Presnov *et al.* (2002) that members have different growth forms whereby there is even a bush of the hybrid Mrs. Herbert Stevens and a climbing variety. In the same manner, both pink and yellow petal Queen Elizabeth variety have been reported in this research, the yellow colour being bestowed by *Rosa foetida* (Bendahmane *et al.*, 2013). The Queen Elizabeth varieties are easily identified with the persistent hip they produce (Celik *et al.*, 2009). The bush roses and climbers have the habit of adding new growth or branches from the old wood while the ramblers produce new long stems from below the collar level. Table 1 indicates that the rose types studied showed variations in colour hues of young and mature leaves, thorns and stem bark. The hybrid teas, Ambassador and Massage, reported in this work rarely produce thorns thus making them highly valued as cut-flowers due to ease of handling. Guterman *et al.* (2002) and Matsumoto and Fukui (1996) reiterated that the wide disparities in floral characteristics could be due to the fact that the genome of this taxon is believed to be the most tampered with among all existing groups of plants. Thus, the present cultivar of roses classified as the complex *Rosa x hybrida* comprises individuals showing different habits but seem to be bearing huge doses of the *R. chinensis* alleles as a result of several backcrosses (De Vries and Dubois, 1984; Dubois and De Vries, 1987). The climbing and rambling roses, however, lack the recurrent blooming expressed by these genes. The small bushes include the true miniatures which rarely grow beyond 50 cm but branch excessively (Table 2). In the landscape, this dwarf characteristic is best retained if they are not fed excessively. Hybrids of these categories may be grafted on to a sturdy climber or rambler so as to create standard roses which, with the shrub roses, give brave and graded formal displays in the garden.

The petal is the most important part in the *Rosa*, and since the early 18th century, much have been done as part of the domestication process toward improving several flower characters relating to floral quality such as recurrent flowering, double flowering, petal colour and size, as well as fragrance. The grouping of Keep-in-touch as species-type or species-derivative rose in this research may be disputed mainly because it produced more than 10 petals in each flower bud. Theissen and Saedler (2001) emphasised that species individuals produce <5 petals while their early derivatives may have up to ten petals within the corolla. Otherwise, the perpetual-flowering and dense habit reflects the rugosa and china heritage (Table 3). The double and full flowers characteristic of the modern and hybrid roses in this work are reportedly formed when there is a shift of the boundary between A and C functions, resulting in misexpression of genes and replacement of a certain whole, towards the centre of flower leading to homeotic conversion of stamens to petals (Krizek and Fletcher, 2005; Dubios *et al.*, 2011).

In conclusion, characters such as habit, stem length, thorn, production of hips as well as some foliage attributes could assist in the identification and utilization of individuals. The high number of hybrids recorded in this

Study (Fig. 1) is an indication that the preference for and importance of members of this taxon as cut-flowers is increasingly being recognised in Nigeria. If properly harnessed, Ajala *et al.* (2005) and Agyeno *et al.* (2010) noted that certain varieties of roses present the prospect for boosting the cut-flower industry in Nigeria.

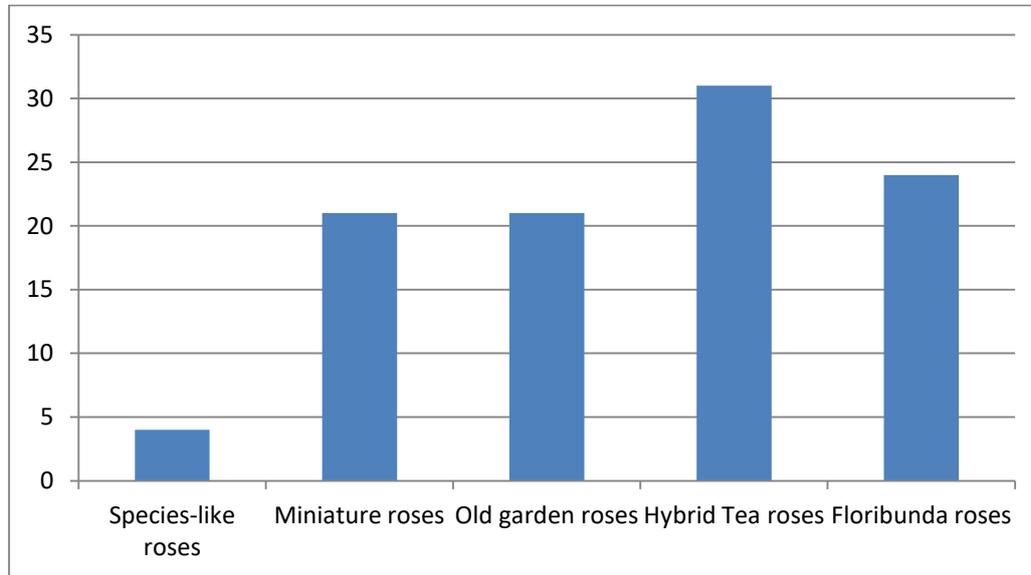


Fig 1: Percentage distribution of 29 varieties/types of *Rosa* L. studied in Jos Plateau, Nigeria, across the different classes of roses.

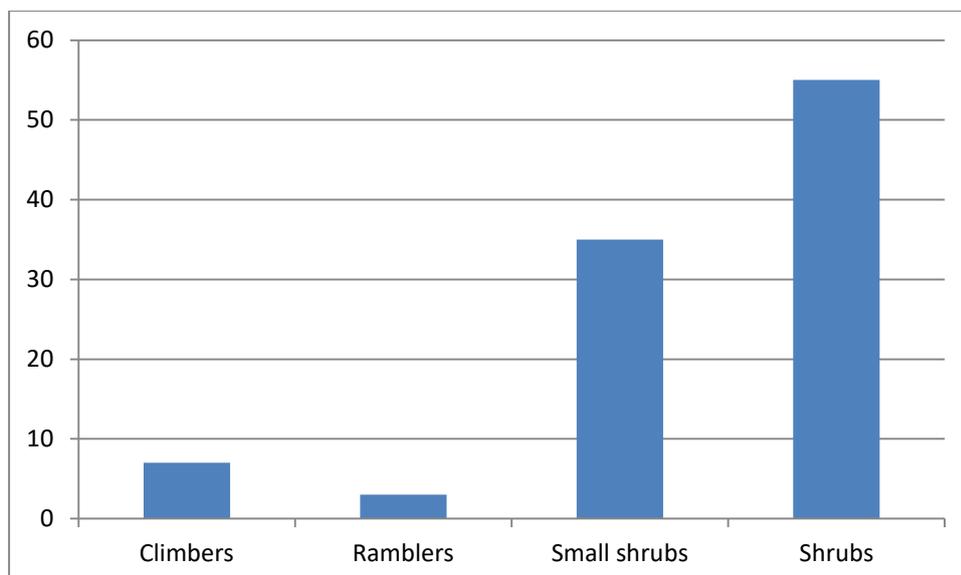


Fig 2: Percentage distribution of 29 varieties/types of *Rosa* L. studied in Jos Plateau, Nigeria, across the different habits and growth forms.

Table 1: Habit and colour description of vegetative parts on 29 varieties of the rose plant studied in Jos-Plateau State, Nigeria.

Class	Variety Name	Colour of Foliage		Colour of thorns		Colour of Bark	
		Apical Buds	Mature Stems	Young Stems	Mature Stems	Young Stems	Mature Stems
Specie-like roses	Keep in Touch	Crimson/patches of Lime	Dark pastel green	Cardinal	Green	Maroon/shades of green	Green
Miniature roses	Little Jewel	Bright green	Hunter green	Cardinal	Carmine/Chocolate shades	Lemon/Carmine margin	Kelly green
	Little Buckaroo	Maroon	Green/Carnelian	Cerise	Maroon	Carmine	Yellow green
	Little White Pet	Lime/Cardinal patches	Forest green	Yellow green/Cerise shades	Maroon	Green/Crimson shades	Forest green/Olive
	Magic Carrousal	Sangria	Forest green	Cerise	Carmine/Maroon	Bright maroon	Forest green
	Littlest Angel	Olive/Carnelian patches	Forest green	Carmine pink	Maroon	Sap green	Hooker's green
	The Fairy	Lime/Cardinal patches	Olive/Yellowish green	Maroon/Chocolate	Green	Lime	Green
Old garden roses	Escapade	Maroon/Lime patches	Hunter green	Cerise/Lime patches	Rosewood/Chocolate patches	Maroon/Lime shades	Hooker's green
	Excelsa	Lime/Carnelian edges	Forest Green	Maroon/Chocolate patches	Carnelian/green shades	Crimson/Green shades	Hunter green
	Kaduna Orange	Maroon/patches of lime	Dark pastel green	Cardinal	Maroon/Light brown	Carnelian	Yellow green
	Lille Marlene	Carmine	Forest green	Green	Green/Maroon patches	Pear	Kelly green
	Purple Splendour Queen of Denmark	Carnelia/Green patches Lime/Cerise margins	Forest green Hunter green	Sangria Cardinal	Maroon/Chocolate Maroon/Chocolate shade	Crimson Sap green	Kelly's Green Yellow green
Hybrid Tea roses	Ambassador	Carnelia	Forest green	Green/Cerise tips	Cerise/greenish	Carnelian/Crimson	Indian green
	Andrea Stelzer	Maroon/Green patches	Hunter green	Cardinal	Maroon/Carmine	Forest green	Sap green
	Ann Harkness	Maroon/Green patches	Hunter green	Bright green/Shades of Cerise	Green	Yellow green	Lime/Shades of Carnelian
	Chrysler Imperial Ena Harkness	Carnelian/lime patches Carnelian	Forest green Green	Green/Cerise tips Cerise/Carnelian patches	Cerise/Green shades Carmine/Chocolate	Carnelian/Crimson Carnelian	Green Green

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	Escapade	Maroon/Lime patches	Hunter green	Cerise/Lime patches	Rosewood/chocolate patches	Maroon/Lime shades	Hooker's green	
	Eutin	Carmine/Green patches	Green	Cerise	Sangria	Carnelian/green patches	Hooker's green	
	Limburgstar	Maroon	Hunter green	Bright green	Green yellow	Rosewood/Chocolate	Dark pastel green	
	Massage	Carnelian	Green/Yellow	Yellow green	Green Yellow	Sap green	Forest green	
	Peadouce	Carnelian/Green patches	Hooker's green	Bright green	Green	Sap green	Forest green	
Floribunda roses	Masquarade	Maroon/Lime patches	Hunter green	Bright green/Cerise	Green/Maroon	Carnelian	Yellow	
	Queen Elizabeth	Maroon/green patches	Forest green	Green yellow	Maroon/green shades	Sap green	Yellow green	
	Yellow Queen Elizabeth	Lime/Cerise margins	Green	Cardinal	Maroon/Chocolate shade	Sap green	Yellow green	
	Samorai	Carnelia	Yellow	Lime	Cerise/Carnelia patches	Carmine/Chocolate	Green yellow	
	Showbiz	Maroon/green patches	Hooker's green	Carmine	Carmine	Maroon	Green	Yellow green
	Snow White	Maroon/Lime patches	Hooker's green	Lime/Cardinal tips	Cardinal	Maroon/Chocolate shades	Carnelian/Lime shades	Yellow green
	William Baffin	Maroon	Hooker's green	Dark pink	Cardinal	Cardinal	Carmine pink	Yellow green

List of Colours: Courtesy Wikipedia, the Free Encyclopedia

Table 2: Mean values of measurements and counts of some vegetative parameters on 29 rose varieties in Jos-Plateau State, Nigeria

Class	Variety name	Lgth of 1 st gntn stem(cm)	Gth of 1 st gntn stem(cm)	No. of branches	No. of thorns/ca ne	Size of thorns (mm ³)	Lgth of Leaf (cm)	No. of leaflets
Specie-like roses	Keep in touch	> 46.0	3.9	3	44	120.67	12.4	7
Miniature roses	Little Jewel	50.5	2.0	9	14	43.85	5.7	5
	Little Buckaroo	37.5	1.4	4	16	43.8	6.6	7
	Little White Pet	113.6	2.5	17	20	125.97	10.6	7
	Magic Carrousel	66.0	2.5	4	7	63.53	7.9	5
	The Fairy	41.0	1.4	12	33	26.61	4.3	5
	Littlest Angel	32.5	2.0	3	15	133.95	6.9	7
Old garden roses	Escapade	108.0	3.2	-	37	105.18	15.5	7
	Excelsa	106.0	2.7	-	18	35.24	12.9	9
	Kaduna Orange	72.5	4.6	4	23	106.53	13.3	7
	Lille Marlene	44.0	2.5	3	>214	28.45	10.9	7
	Purple Splendour	47.0	3.6	4	109.0	96.36	14.2	7
	Queen of Denmark	114.5	2.5	1	22	145.7	11.6	7
Hybrid Tea roses	Ambassador	67.4	3.1	1	2	27.87	15.2	5
	Andrea Stelzer	137.9	5.8	5	66	192.18	16.7	7
	Anne Harkness	126.0	3.8	14	13	777.38	13.3	7
	Crysler Imperial	83.2	2.8	4	12	8.12	9.5	5
	Ena Haarkness	98.0	3.5	5	58	104.83	14.6	7
	Eutin	70.8	2.9	5	188	136.5	9.3	5
	Limburster	187.3	3.4	1	30	421.2	17.2	5
	Message	48.6	2.9	-	-	39.48	12.9	5
	Peadouce	51.5	3.2	5	52	71.25	14.4	7
Floribunda roses	Masquerade	> 136.0	3.5	3	> 235	248.05	14.4	5
	Queen Elizabeth	53.0	2.8	2	51	177.19	19.0	5
	Yellow Queen Elizabeth	51.2	2.7	2	48	137.55	18.0	5
	Samourai	42.2	2.0	1	19	71.96	12.3	5
	Showbiz	121.0	3.4	3	47	124.36	16.4	5
	Snow white	> 150.0	3.5	5	91	93.91	12.4	5
	William Baffin	> 50.5	1.6	2	14	47.52	10.7	5

NOTE: lgth= length, Gth= Girth, gntn= generation, No= number

Table 3: Quantitative and qualitative results of floral assessment

Class	Variety name	Mean No. of Stamens	Mean No. of carpels	Mean No. of Petals	Flower Vol. (cm ³)	Hips	Size of hips (cm ³)	Petal Class	Flower Pigment
Species-like rose	Keep in touch	109	55	13	1.28	+	1.14	Semi-double	Carmine/dark margin
Miniature rose	Little Jewel	70	47	49	0.41	-	-	Very full	Rose pink
	Little Buckaroo	95	52	37	0.61	-	-	Full	Rose
	Little White Pet	103	88	32	0.79	+	1.02	Full	Isabelline
	Magic Carrousel	71	64	42	0.53	-	-	Very full	Peach/pink margin
	The Fairy	93	56	24	0.12	-	0.08	Double	Persian pink
	Little Angel	65	54	35	0.71	-	0.78	Full	Aureolin yellow
Old garden roses	Escapade	63	32	18	1.98	+	1.02	Double	Rose pink/white base
	Excelsa	98	62	67	0.60	-	-	Very full	Rose
	Kaduna Orange	156	100	44	3.68	-	-	Very full	Coral red
	Lille Marlene	90	42	17	1.37	+	-	Double	Vernatian red
	Purple Splendour	89	46	19	4.40	-	3.37	Double	Crimson/shade of magenta
	Queen of Denmark	112	108	65	4.18	+	-	Very full	Light pink
Hybrid tea roses	Ambassador	98	65	47	7.61	-	-	Full	Velvety red
	Andrea Stelzer	224	134	21	5.82	-	-	Double	Persian pink
	Anne Harkness	93	79	25	2.80	+	1.6	Double	Aureolin
	Crysler Imperial	123	147	36	3.92	-	-	Full	Carnelian/darker margin
	Ena Haarkness	110	89	25	3.80	-	1.12	Double	Rosso corsa
	Eutin	123	147	36	2.81	+	-	Full	Amaranth
	Limburster	194	129	34	6.55	-	-	Full	Orange/pinkish reverse
	Massage	97	63	48	7.43	+	-	Full	Cream
	Peadouce	182	172	42	7.71	-	-	Full	Maize cream
Floribunda roses	Masquerade	95	51	26	2.04	-	1.24	Full	Golden yellow/pink margin
	Queen Elizabeth	106	68	34	3.40	+	1.49	Full	Lavender pink

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Yellow Queen Elizabeth Samurai	101	68	36	3.42	-	1.42	Full	Maize
Showbiz	92	53	54	3.62	-	-	Very full	Persian red
Snow white	88	29	17	1.53	-	0.94	Double	Rosso corsa
William Baffin	138	56	39	5.37	+	-	Full	White
	95	42	37	0.61	+	-	Full	Alizarin crimson

Petal Classification

Single	=	4-11petals
Semi- double	=	12-16petals
Double	=	17-25petals
Full	=	26-40petals
Very full		

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