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Research Note

# *M.* 'Teresita Lantin-Rosario' and *M.* 'Dolores A. Ramirez' – New Varieties of *Mussaenda*

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**An outstanding selections of *Mussaenda* developed at the Institute of Plant Breeding (IPB), College of Agriculture and Food Science (CAFS), University of the Philippines Los Baños (UPLB) were registered to the National Seed Industry Council as new varieties. These are *Mussaenda* 'Teresita Lantin-Rosario' and *Mussaenda* 'Dolores A. Ramirez', named after an ornamental plant breeder and a National Scientist, respectively, in recognition of their significant contributions to the fields of genetics and plant breeding. *Mussaenda* 'Teresita Lantin-Rosario' is a hybrid and a progeny from a cross between *M.* 'Maria Makiling' and *M.* 'Diwata'. The calyx lobes are all petaloid, numerous, and hairy. Petaloids are creamy white (157C) with visible midrib and pale yellow-green veins underneath, are ovate to suborbicular in shape, and are 5.0–9.3 x 3.7–7.5 cm in size. *M.* 'Dolores A. Ramirez' is also a hybrid from the cross *M.* 'Maria Makiling x *M.* 'Doña Trining'. The calyx lobes are all petaloid, two to three of which are more enlarged while the rest are partially expanded in a cluster, are elliptic-lanceolate to ovate-orbicular in shape, 4.5 - 9.0 x 0.3 - 6.2 cm in size, and are empire rose (48A) with prominent pinkish white veins above and orient pink (36D) below with a tinge of yellow-green (145A) towards the apex.**

**Keywords:** multi-petaloid, *Mussaenda, Mussaenda* 'Dolores A. Ramirez', *Mussaenda* 'Teresita Lantin-Rosario', NSIC-registered variety

## INTRODUCTION

*Mussaenda*, commonly known as 'Doña', is one of the Philippines' most outstanding contributions to the global ornamental industry and is a very popular landscaping material owing to its spectacular display of colorful enlarged bracts, long blooming habit, and wide adaptability. These ornamental shrubs have been a source of pride for the University of the Philippines Los Baños (UPLB) since the discovery of the mutant species *M. philippica* var. *aurorae* in Mt. Makiling in 1915 (Rosario 1998). This finding, together with the continuous efforts of several researchers and plant breeders, made *Mussaenda* breeding feasible, which resulted to several outstanding varieties.

Traditionally, *Mussaenda* cultivars were named after the First Ladies of the Philippines, with a total of 12 varieties starting from 'Doña Aurora' (First Lady Aurora Quezon) to 'Doña Ming' (First Lady Amelita Ramos). Others were also named after several women of distinction such as Institute of Plant Breeding (IPB)-developed varieties *M.* 'Emerlinda R. Roman' and *M.* 'Clara L. Davide' (Siar 2009), or after legendary nymphs as in the case of *M.* 'Maria Makiling'.

The most recent varieties are *Mussaenda* 'Teresita Lantin-Rosario' and *Mussaenda* 'Dolores A. Ramirez', named after an ornamental plant breeder and a National Scientist, respectively. The outstanding characteristics of these two varieties are discussed in this paper.

## MATERIALS AND METHODS

*Mussaenda* is known for the presence of heterostyly which is also one of the contributing factors for self-incompatibility of some cultivars/varieties (Siar and Rosario 2001). Pin-type varieties (long-styled flower, stigma higher than the anthers) are used as female

parents and thrum-type varieties (short-styled flower, stigma lower than the anther) are used as male parents. These hybrids were generated in 2001 – 2002, with *M.* 'Maria Makiling' as the female parent. Initial evaluation and selection were done during the flowering seasons of 2010 – 2011, and asexual propagation of selected promising varieties was carried out to increase the number of plants for further replicated characterization and variety registration.

Morpho-characterization for horticultural traits was made for two (2012 and 2014) and three (2012 and 2019 – 2020) flowering seasons for *M.* 'Teresita Lantin-Rosario' and *M.* 'Dolores A. Ramirez', respectively. Three randomly selected plants and 10 inflorescences per plant were used for plant, leaf, and floral traits. Quantitative traits were measured using a meterstick, a ruler, or a caliper while qualitative traits such as shape and venation were determined following the description of Hickey et. al (1999). The colors of the leaves and inflorescences were established using the 2007 Royal Horticultural Society (RHS) Colour Chart (RHS 2007). These varieties were registered to the Germplasm Technology Registration and Recommendation Office (GTRRO) of the Institute of Plant Breeding under the College of Agriculture and Food Science (CAFS), University of the Philippines Los Baños (UPLB) and to the National Seed Industry Council (NSIC), the Bureau of Plant Industry (BPI), and the Department of Agriculture (DA).

## RESULTS AND DISCUSSION

### *Mussaenda* 'Teresita Lantin-Rosario'

This NSIC-registered hybrid variety (NSIC 2016 Or 26) was named after Dr. Teresita Lantin-Rosario, a Professor Emeritus and a known ornamental breeder from the College of Agriculture and Food Science, UPLB. It is a selection from the progenies of the cross *M.* 'Maria Makiling' x *M.* 'Diwata' (Fig. 1). This variety is similar to its parents in terms of petaloid color but is bigger and thicker and with a difference in shape. The morpho-characterizations of the hybrid and the parents are presented in Table 1.

The shrubs have a spreading growth habit of about 1.45 m when potted and grow vigorously when directly planted to the ground (Fig. 2). The mature leaves are 8.9 x 17.2 cm and are elliptic-lanceolate with acuminate apex: light green with minute short hairs on both sides.

The calyx lobes are all petaloid, numerous, and hairy. Petaloids are creamy white (157C) with visible midrib and pale yellow-green veins underneath, are ovate to suborbicular, and are 5.0 - 9.3 x 3.7 - 7.5 cm in size (Fig. 3).


**Fig. 1. *Mussaenda* 'Teresita Lantin-Rosario' (bottom) and its parents *M.* 'Maria Makiling' (upper left) and *M.* 'Diwata' (upper right).**

**Fig. 2. Profuse flowering of *Mussaenda* 'Teresita Lantin-Rosario' showing fully expanded calyx lobes.**

The true flowers are smaller than the parents at diameters of 16 - 23 mm with very short hairs, have ovate to ovate-orbicular corolla lobes, and are Nasturtium orange (25B)

**Fig. 3. Close-up of above and underneath surfaces of fully expanded calyx lobe.**

**Table 1. Morpho-Characteristics of *M.* 'Teresita Lantin-Rosario' and its parents.**

| | | *M.* 'Teresita Lantin-Rosario' | *M.* 'Maria Makiling'* | *M.* 'Diwata'* |
|---|---|---|---|---|
| Bract | Color | creamy white (157C) with visible midrib; below with very pale yellow-green veins | creamy white with soft white hairs; below slightly greenish white with pale green veins and margins; | pure white with short soft white hairs above |
| | Size | 5.0 – 9.3 x 3.7 – 7.5 cm | 8.0 – 9.0 x 6.0 – 7.0 cm | 5.0 – 7.5 x 3.0 – 5.0 cm |
| | Other Characteristics | All bracts almost of the same size; hairy; ovate to suborbicular with acuminate apex; | Calyx-lobes all petaloid; broadly elliptic to ovate to suborbicular; slightly limp | Calyx-lobes all petaloid; elliptic to ovate; |
| Flower | Color | presence of very short hairs on both surfaces; nasturtium orange (25B) | orpiment orange (25A) with buttercup yellow (15A) hairs at center | lemon yellow (13A) with saffron yellow (21A) hairs at the center |
| | Size Across | 16.0 – 23.0 mm | 25.0 – 26.0 mm | 20.0 – 21.0 mm |
| | Lobe shape | Ovate to ovate-orbicular shape | Ovate | Ovate |
| | Corolla tube length | 17.0 – 25.0 mm | 25.0 – 26.0 mm | 20.0 – 23.0 mm |
| | Corolla tube width | 6.0 – 8.0 mm | 4.0 mm | 4.0 mm |
| | Throat | Light greenish with few white hairs; throat with dense yellow hairs | Yellowish green with minute hairs; throat with dense dresden yellow (5A) hairs | Pale green with very short white hairs; throat with dense primrose yellow (4A) hairs |
| | Style length | 13.0 – 21.0 mm | 28.0 mm | 7.0 – 8.0 mm |
| | Stigma Lobes | 5.5 – 8.0 mm lobe width; thin; open/appressed; mostly exserted | thick; exserted | thin; appressed |
| | Anther | 8.5 – 14.0 mm long; 4.5 – 7.0 mm thick lobe | 14.0 – 17.0 mm long; 5.0 – 7.0 mm thick lobe | 20.0 mm long; 4.0 – 5.0 mm thick lobe |
| | Pollen | Present | Present | Present |
| Fruit | | Present | Present | Present |

* ROSARIO TL. 1984. The ornamental *Mussaenda* of the Philippines. Institute of Plant Breeding, College of Agriculture, University of the Philippines at Los Baños, Laguna. p. 54.

in color. The corolla tubes measure 17 – 25 mm long and are light-greenish with few white hairs, with the throat having dense yellow hairs (Fig. 4). Anther lobe lengths are 5 – 7 and 9 – 14 mm above the tube base and 2 – 6 mm below the throat, with pollen. The style is 13 – 21 mm long and the stigma lobes are 6 – 8 mm long, open or appressed and exserted (Fig. 5). This variety is a pin type and readily produces fruits.

**Fig. 4. True flower showing top and bottom of corolla.**

**Fig. 5. Longitudinal section of true flower showing the hairy corolla tube; style and anther (distance between vertical lines = 1 mm).**

### *Mussaenda* 'Dolores A. Ramirez'

This hybrid variety was named in honor of the National Scientist Dolores A. Ramirez for her outstanding contributions to the field of genetics. It is an outstanding selection with profuse inflorescence generated from a cross between *M.* 'Maria Makiling' x *M.* 'Doña Trining' (Fig. 6). Table 2 presents the morphological characters of the hybrid.

**Fig. 6. Inflorescence of *M.* 'Dolores A. Ramirez' (bottom); and parents *M.* 'Maria Makiling' (upper left) and *M.* 'Doña Trining' (upper right).**

**Fig. 7. Growth habit of *M.* 'Dolores A. Ramirez'.**

The potted plants that measure 110.4 cm high are more compact compared to other selections (Fig. 7). The leaves are elliptic-ovate with acuminate apex, light green (137B) adaxially, yellow green (146D) abaxially, and with creamy white trichomes on both surfaces.

It is a proliferous bloomer with an average of 15.2 inflorescences. Each inflorescence has an average of 13.8

**Table 2. Morpho-characteristics of *M.* 'Dolores A. Ramirez' and its parents.**

| | | *M.* 'Dolores A. Ramirez | *M.* 'Maria Makiling' | *M.* 'Doña Trining' |
|---|---|---|---|---|
| Bract | Color | Empire Rose (48A) with prominent pinkish white palmately netted venation above; Orient pink (36D) below with tinge of yellow green (145A) towards apex | creamy white with soft white hairs; below slightly greenish white with pale green veins and margins * | above blood red 5C-D), below Orient Pink (36C) with reddish veins and hair* |
| | Size | 0.4 – 7.0 x 1.4 – 7.6 cm | 1.4 – 7.5 x 0.9 – 6.3 cm | 4.5 – 9.0 x 0.3 – 6.2 cm |
| | Other Characteristics | Calyx lobes all petaloid, one to two more enlarged and the rest partially expanded; elliptic lanceolate to ovate-orbicular; | Calyx-lobes all petaloid; broadly elliptic to ovate to suborbicular; slightly limp * | One calyx-lobe petaloid and others unexpanded; ovate-elliptic to ovate-orbicular; |
| Flower | Color | Primrose Yellow (4A) above and dark reddish orange (175C) at the center; pale greenish yellow with deep pink margin below | orpiment orange (25A) with buttercup yellow (15A) hairs at center * | above mimosa yellow (8C) with few minute red hairs at ridges bases; creamy white with long red hairs below * |
| | Size Across | 17.3 – 28.5 mm | 13.7 – 18.1 mm | 17.2 – 23.0 mm |
| | Lobe shape | Broadly ovate | Ovate | Semi-orbicular |
| | Corolla tube length | 10.0 – 22.0 mm | 15.9 – 28.4 mm | 19.5 – 30.0 mm |
| | Corolla tube width | 7.0 – 9.0 mm | 5.3 – 6.8 mm | 8.6 – 10.5 mm |
| | Throat | Yellowish green with pink hair at uppermost portion; throat with dense yellow hairs down to the anther base | Yellowish green with minute hairs; throat with dense Dresden yellow (5A) hairs * | Pale to yellowish green at the base, pinkish yellow towards the top with dense red hairs* |
| | Style length | 4.8 – 8.0 | 12.1 – 20.8 mm | 1.5 – 13.0 mm |
| | Stigma Lobes | 0.5 – 1.0 mm; thick; exserted | 0.7 – 1.1 mm; thick; exserted | 0.9 – 1.3 mm |
| | Anther | 2.6 – 7.0 mm long; 0.2 – 0.5 mm thick lobe | 5.3 – 6.6 mm long; 0.4 – 0.9 mm thick lobe | 5.5 – 6.6 mm long; 0.3 – 1.3 mm thick lobe |
| | Pollen | absent | present | present |
| Fruit | | absent | present | absent |

* ROSARIO TL. 1984. The ornamental *Mussaenda* of the Philippines. Institute of Plant Breeding, College of Agriculture, University of the Philippines at Los Baños, Laguna. p. 54.

**Fig. 8. Profuse flowering of *Mussaenda* 'Dolores A. Ramirez' (top); Close-up of above (bottom left) and underneath surfaces (bottom right) of enlarged calyx lobe.**

**Fig. 9. True flower showing top and bottom view of corolla.**

flowers. The calyx lobes are all petaloid with two to three being more enlarged, and the rest are partially expanded in a cluster (Fig. 8). At anthesis, enlarged and partially expanded lobes are elliptic-lanceolate to ovate-orbicular and slightly curled along the margin, empire rose (48A) with prominent veins on top, orient pink (36D) underneath with a tinge of yellow green (145A) towards the apex, and with minute hairs on both surfaces.

True flowers are 17.3 – 28.5 mm across. Corolla lobes are broadly ovate, slightly convex, primrose yellow (4A) above and burnt orange (175C) at the center, and are very light yellow below with a greenish tinge near the apex and pink hairs along the edges (Fig. 9). This selection is a

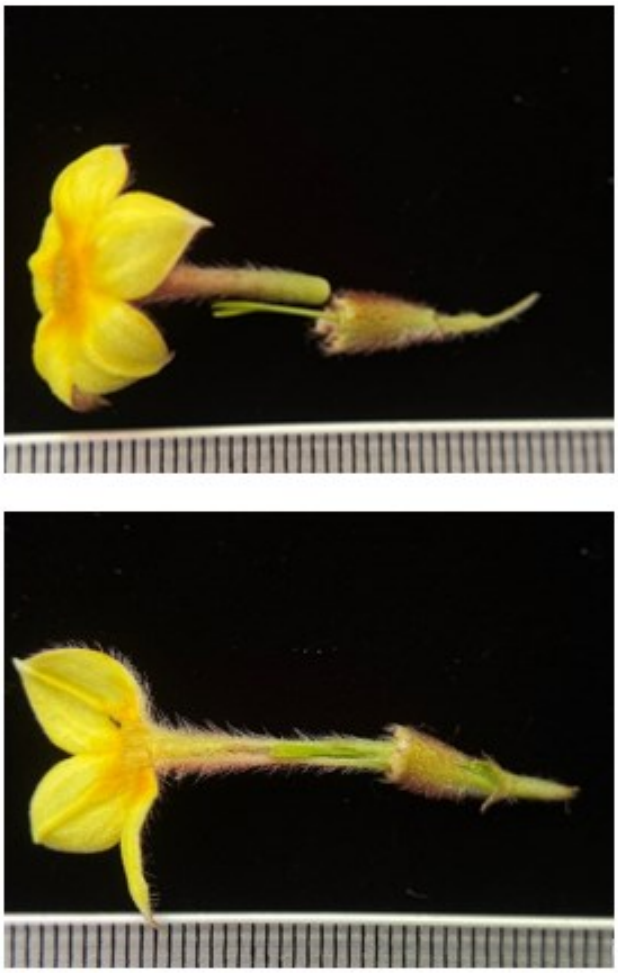

**Fig. 10. Longitudinal section of true flower showing the hairy corolla tube; short style and long anther without pollen (distance between vertical lines = 1 mm).**

thrum type with a 4.8 – 8.0 mm style length and 14.1 – 23.8 mm anther above tube base, without pollen (Fig. 10).

This *Mussaenda* hybrid is a continuous bloomer even during dormant months and has no tendency of drooping even during the peak of flowering. It has longer blooming days compared to both parents at 31.5 d and has a longevity of 2 – 3 d for bract and true flower, respectively. *Mussaenda* 'Teresita Lantin-Rosario' and *Mussaenda* 'Dolores A. Ramirez' are hybrid varieties being mass-propagated at the National Seed Foundation, IPB for commercialization.

## CONCLUSION

*M.* 'Teresita Lantin-Rosario' and *M.* 'Dolores A. Ramirez' are the first batch of *Mussaenda* cultivars under the Outstanding Women of Science Series. These were selected and registered based on the uniqueness of petaloid color and form, prolificacy, and long blooming period. Mass propagation and technology promotion are

underway to further expand the commercialization and the adoption of these new *Mussaenda* cultivars by local ornamental growers.

## ACKNOWLEDGMENT

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## REFERENCES CITED

HICKEY L, ASH A, ELLIS B, JOHNSON K, WILF P, WING, S. 1999. Manual of leaf architecture - morphological description and categorization of dicotyledonous and net-veined monocotyledonous angiosperms by Leaf Architecture Working Group. p. 65.

[RHS] The Royal Horticultural Society. The Royal Horticultural Society colour chart. 2007. London.

ROSARIO TL. 1984. The ornamental *Mussaenda* of the Philippines. Institute of Plant Breeding, College of Agriculture, University of the Philippines at Los Baños, Laguna. p. 54.

ROSARIO TL. 1998. Ornamental *mussaendas* of the Philippines. College, Laguna, Philippines: College of Agriculture, University of the Philippines Los Baños. p. 70.

SIAR SV. 2009. Centennial *mussaendas*: *Mussaenda* 'Emerlinda R. Roman' and *Mussaenda* 'Clara L. Davide'. Philipp Agric Scientist. 92(3):344-346.

SIAR SV, ROSARIO TL. 2001. Heterostyly in *Mussaenda* I. Dimorphism in floral characters of the pin and thrum morphs. Philipp Agric Scientist. 84(1):64-71.