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Two Multibranching and Double-color Varieties of Bougainvillea: 'Time Memory' and 'Bin Fen'

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Bougainvillea is the common name for plants of the genus *Bougainvillea* in the family Nyctaginaceae, which is native to South America and has been spread around the world in tropical and subtropical areas as an ornamental plant with colorful bracts, a profuse flowering habit, and tolerance to a variety of stresses (Roy 2019). For its remarkable diversity, bougainvillea has been used as a bush, climbers, hedges, groundcovers, pot culture, slopes, bonsai, and cascade, among uses (Datta 2022; Sindhu et al. 2020).

Bract color is the most important ornamental trait of bougainvillea, and the varieties with double-color bracts are even more popular. For example, the famous variety 'Chitra' has bracts that show different colors (red, purple, yellow, and white), and are widely used in landscaping and home gardening (Table 1). However, only a few double-color varieties are available (Li et al. 2022), and most of these are characterized by weak branching and overexuberant growth of the main branches. Therefore, they need to be pruned frequently to create and maintain an ornamental canopy in cultivation and landscaping.

To develop more bougainvillea varieties with double-color bracts and compact plant shapes, we launched a targeted improvement program in 2019. Two novel varieties, 'Time Memory' and 'Bin Fen', were selected and presented here.

Origin

'Time Memory' is a new variety selected from the F1 progeny of a cross between 'Chitra' (♀) and 'Lateritia' (♂), and 'Bin Fen' is a hybrid from the cross between 'Chitra' (♀) and 'Singapore Pink' (♂). Artificial pollination was conducted in Jan 2019 in the nursery of Tropical Crops Genetic Resources Institute, Chinese Academy of Tropical Agricultural Sciences (TCGRI-CATAS), Danzhou, China (lat. 19°35′ N, long. 109°42′ E). After 1 month, the hybrid-bearing seeds were harvested and sown. In Dec 2019, the individual candidate plants 1902-1 and 19100-13 were selected for asexual reproduction through cuttage. In Mar 2020, the regenerated plants were repeatedly propagated through cuttings for subsequent generations. From 2021 to 2023, phenotypic traits related to plant habit, thorns, leaves, and flowers were measured repeatedly (Table 1). Finally, the two lines were recognized as promising varieties and named 'Time Memory' and 'Bin Fen', respectively (Fig. 1).

Description and Performance

The characteristics of bougainvillea lines were investigated and described according to "Guidelines for the Conduct of Tests for Distinctness, Uniformity, and Stability—*Bougainvillea* Comm. ex Juss (LY/T3206-2020) (CPVO 2014)." The observation and measurement were conducted on 30 to 50 plant samples grown in plastic greenhouses in TCGRI-CATAS nursey (Danzhou, China).

Plant habit. 'Time Memory' and 'Bin Fen' are both semiupright, perennial shrubs with strong branching ability (Fig. 1A and C).

Branches. The shoots of 'Time Memory' and 'Bin Fen' are reddish green and medium green, respectively, and the mature branches are both brown.

Thorns. The annual branch thorns of the two varieties were of medium length, averaging 1 cm.

Table 1. Field performance of *Bougainvillea* 'Time Memory' and 'Bin Fen' in CATAS-TCGRI nursey (2021–23, Danzhou, China).

	Test results		
Characteristics	'Time Memory'	'Bin Fen'	'Chitra'
Plant habit	Semi-upright	Semi-upright	Semi-upright
Thorn			
Size	Medium	Medium	Long
Type	Slightly curved	Slightly curved	Straight
Leaves			
Color	Dark green	Dark green	Dark green
Length (cm)[i]	9.6 ± 1.0	10.9 ± 0.5	8.8 ± 1.0
Width (cm)[i]	6.5 ± 0.6	8.4 ± 0.4	7.3 ± 0.6
Petiole length (cm)[i]	1.2 ± 0.2	2.1 ± 0.3	1.8 ± 0.2
Shape	Medium ovate	Medium ovate	Broad ovate
Floral tubes			
Depth (cm)[i]	2.3 ± 0.2	2.7 ± 0.1	2.2 ± 0.1
Bracts			
Type	Single	Single	Single
Color at flowering	Orange yellow (RHS 23D), Pinkish white (N155B), Purplish Red (58C), and Yellowish Pink (36C)	Reddish orange (RHS 172B), Red (51A), Yellow Pink (159D), and Yellow Green (157A)	Red (RHS N74B), white (69C)
Length (cm)[i]	4.5 ± 0.5	5.3 ± 0.3	4.3 ± 0.3
Width (cm)[i]	3.3 ± 0.3	4.5 ± 0.2	3.7 ± 0.5
Shape	Medium ovate, cordate base	Broad elliptic, obtuse base	Broad ovate, cordate base
Persistent after flowering (yes/no)	No	No	No

[i] Data are ± standard deviation.

RHS = Royal Horticultural Society.

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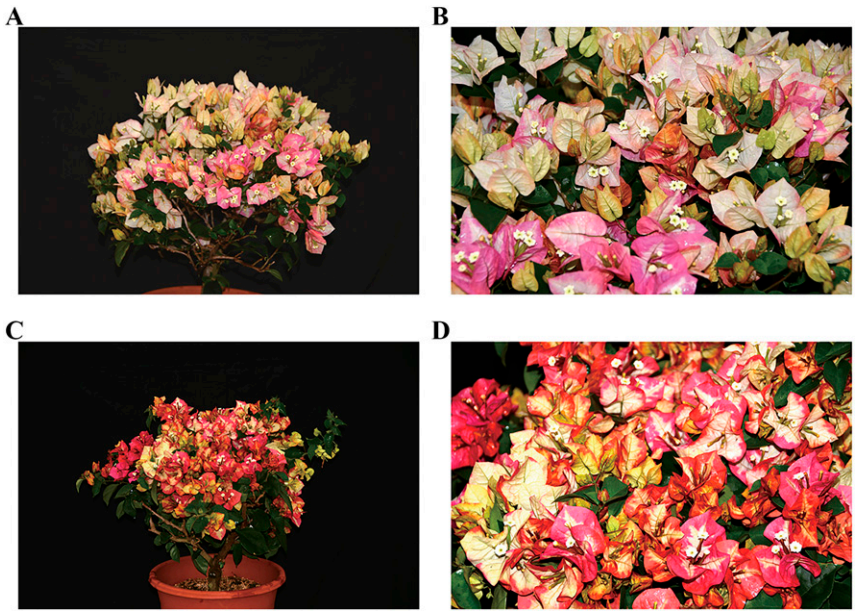

Fig. 1. The phenotypic characteristics of Bougainvillea cultivars Time Memory (**A** and **B**) and Bin Fen (**C** and **D**).

Leaves. For 'Time Memory', young leaves are reddish-green, and mature leaves are dark green, medium ovate, average length of 9.6 cm, width of 6.5 cm, and average petiole length of 1.2 cm. For 'Bin Fen', young leaves are medium green in color, and mature leaves are dark green, medium ovate, with an average length of 10.9 cm, width of 8.4 cm, and an average petiole length of 2.1 cm (Table 1).

Inflorescence. 'Time Memory' inflorescences are borne at the top and middle of the branches, with an average peduncle length of 3.4 cm. 'Bin Fen' inflorescences are borne mainly at the tips of the branches, and the average length of the peduncle is 3.3 cm.

Flowers bracts. The primary colors of the bracts were described by comparison using Royal Horticultural Society (RHS) Colour Chart (2015). 'Time Memory' has yellow-green sepals; immature bracts of yellow (RHS 14D) and orange-yellow (RHS 23D); and mature bracts of pinkish white (RHS N155B), purplish red (RHS 58C), and yellowish pink (RHS 36C), the bracts with medium ovate shape, acuminate apex, and cordate base (Table 1; Fig. 1B). 'Bin Fen' has yellowish-white sepals, immature bracts of varying degrees of reddish orange (RHS 172B) and yellow (RHS 160D), and mature bracts of yellowish pink (RHS 159D), red (RHS 51A), and yellowish green (RHS 157A), the bracts with broadly elliptic shape, obtuse-acute apex, and cordate base (Table 1; Fig. 1D).

In summary, the distinguishing features of 'Time Memory' and 'Bin Fen' are mainly as follows: 1) both plants are compact and strongly branched. 2) Their bracts present a rich but varied range of flower colors. 3) Compared with the female parent Chitra and other multicolor cultivars, there are significant differences in plant shape, bracts, leaf size and shape, and other traits. These characteristics make them unique and they are expected to become popular potted plants and landscape varieties.

Availability

'Time Memory' and 'Bin Fen' have been propagated by the nursery of TCGRI-CATAS in Hainan, China. Plants for research purposes may be obtained directly from the author (niujunhai2014@sina.com).

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