Camellia flowers are highly prized for their beauty worldwide and are strongly symbolic in many cultures. A new interspecific hybrid cultivar, Camellia ‘Maozi’, generated by crossing Camellia pubipetala with C. japonica ‘Dahong Mudan’, exhibits strong hybrid vigor and has small flowers with a rare light tone of purple. In southwest China with a subtropical monsoon climate, young Camellia ‘Maozi’ trees flush shoots three times in spring, summer, and autumn, with an average annual growth of 12.9 cm. Adult trees flush once a year. Floral bud formation occurs in late April and early May. Camellia ‘Maozi’ flowers are sterile with no fruits and seeds produced. While an individual flower wilt in 4–8 days after opening, the blossom can last 1–3 months. Frost damage can be found in young leaves when temperature drops to 4–7 °C. Under direct sunlight with temperatures of 37–39 °C lasting for more than 2 days, young leaves can turn yellow on their edges. Its primary diseases include sooty mold, shoot tip blight, and tea aphid (Toxoptera aurantii). Rooting of stem cuttings occurs directly from stems, mostly without callus development. Two hours of treatment with 500 mg L^{-1} indole-3-butyric acid and rooting in a mix of latosolic red soil and vermiculite (2:1 v/v) resulted in high rooting rate and quality of aboveground growth. Grafting can be carried out from May to September, while survival rate and new shoot length are highest in July. The most compatible rootstock is C. oleifera, followed by C. polyodonta. The results of this study are of value for understanding the reproductive biology of Camellia ‘Maozi’ and further disseminating it as a new cultivar for camellia collection.

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at the base were chosen. All rootstock cuttings and scions were from the camellia germplasm bank collected and maintained by Guangxi Academy of Forestry, China.

Observations of biological characteristics. In 2013, twenty 12-year-old adult Camellia ‘Maozi’ trees and thirty 1-year-old cuttings were selected and observed for phenological stages of plant growth and characteristics for three consecutive years. For an individual adult tree, observation was conducted on five branches located in the south, north, east, and west side of the tree.

Cutting propagation. Healthy and partially lignified branches from adult Camellia ‘Maozi’ trees were cut into 8- to 10-cm-long sections containing one to two buds and one to two leaves. Cutting propagation was tested in eight different soil matrices and conducted on 1 June 2015. The soil matrices consisted of latosolic red soil, coconut husk, pearlite, vermiculite, and peat in various combinations: H1 (latosolic red soil: coconut husk = 2:1), H2 (latosolic red soil: pearlite = 2:1), H3 (latosolic red soil: vermiculite = 2:1), H4 (latosolic red soil: vermiculite = 1:1), H5 (latosolic red soil: peat = 2:1), H6 (vermiculite: pearlite = 1:1), H7 (vermiculite: coconut husk = 1:1), and control (CK1) (100% latosolic red soil) (Table 1). To measure pH, 10 g of each soil substrate were mixed in 50 mL carbon dioxide-free distilled water separately in a shaker for 30 min. pH values were measured with a Mettler Toledo FE20 FiveEasy Benchtop pH Meter (Greisensee, Switzerland) after filterization. The base (3–4 cm) of each cutting was soaked in 500 mg L−1 indole-3-butyric acid (IBA) for 1.5 h before being buried in soil media.

To study the effects of different plant growth regulators on cutting propagation, the base of Camellia ‘Maozi’ cuttings was treated in eight experimental designs: N1-2 h in 500 mg L−1 1-naphthaleneacetic acid (NAA), N2-0.5 h in 2000 mg L−1 NAA, M1-2 h in 500 mg L−1 IBA, M2-1 h in 1000 mg L−1 IBA, M3-quickly dipped in a mix of 2000 mg L−1 IBA and talc, L1-2 h in 500 mg L−1 indole-3-acetic acid (IAA), L2-0.5 h in 2000 mg L−1 IAA, and control (CK2)-2 h in tap water (Table 2). After the treatments, the cuttings were inserted into latosolic red soil. This experiment was conducted in June 2015.

Grafting propagation. To identify the optimal time of the year for conducting grafting of Camellia ‘Maozi’, five dates were tested: May 11, June 1, July 3, Aug. 6 and 10 Sept. 2015. C. osmantha were used as rootstock. Five rootstocks (C. japonica ‘Dahong Mudan’, C. polyodonta, C. oleifera, C. japonica ‘Hei Mudan’ and Camellia ‘Maozi’) were compared for their impacts on grafting survival rate and performance of scions. This study was conducted in May 2015.

Propagation conditions. Both cutting and grafting propagations were conducted under a shade canopy that was ~2.25 m in height and blocked 70% to 80% sunlight. Initially, the plants were covered with plastic to ensure high humidity (80% to 90%) until new shoots flushed. Fungicide carbendazim and zineb (0.3% to 0.5%) was sprayed on the plants every 10–15 d for disease control.

Experimental design and data processing. Complete random block design was used in all experiments, with three replicates for each treatment. There were 100 cuttings for each replicate in cutting propagation and 60 plants for each replicate in grafting propagation. Rooting and budbreak were recorded 100 d after cutting propagation. Fresh roots were weighed after being rinsed with tap water and blot dried on paper towels. The diameter of new shoots was measured at the base 5 months after grafting, and the survival rate, budbreak, diameter of new shoots, and number of new leaves were recorded. Data were processed and analyzed by Excel and SPSS 17.0.

Results

Phenology. Camellia ‘Maozi’ started to produce new shoots in early December and the flushing period lasted into January. Leafing and shooting occurred simultaneously. Young trees produced new shoots three times in a year, in spring, summer, and autumn, with each shooting lasting 25–30 d. The adult trees (12 years old) flushed only once yearly and shooting lasted for 15–20 d. Floral buds formed in late April and early May. Among the 20 adult trees surveyed, flowering mostly

![Fig. 1. Illustrations of Camellia japonica ‘Dahong Mudan’, C. pubipetala, and Camellia ‘Maozi’. Flower of (A) male parent C. japonica ‘Dahong Mudan’, (B) flower of female parent, Camellia pubipetala, (C–E) flowers of Camellia ‘Maozi’, (F) Camellia ‘Maozi’ cuttings, (G) a new Camellia ‘Maozi’ shoot, (H) a heavily pruned Camellia ‘Maozi’ plant, and (I) 2-matrix H3 latosolic red soil: peat, 3-control latosolic red soil only) rooting of cuttings. The scale bars in A–E represent 2 cm, while 5 cm in F–I.](image)

Table 1. Effects of different soil matrices on rooting characters and growth.a

| Name of soil matrices | Composition of soil matrices | pH     | Sprouting rate (%) | New shoot length (cm) | Rooting rate (%) | Root number | The longest root length (cm) | Root fresh wt (g) |
|-----------------------|------------------------------|--------|--------------------|-----------------------|-----------------|-------------|-------------------------------|-------------------|
| H1                    | Latosolic red soil: coconut husk = 2:1 | 5.49   | 16.67 c            | 1.55 c                | 80.17 b         | 11.30 b     | 5.38 b                         | 0.15 b            |
| H2                    | Latosolic red soil: pearlite = 2:1      | 5.82   | 58.31 a            | 3.60 b                | 100.00 a        | 24.70 a     | 7.61 ab                        | 0.34 a            |
| H3                    | Latosolic red soil: vermiculite = 2:1   | 5.49   | 68.35 a            | 5.64 a                | 100.00 a        | 27.80 a     | 8.53 a                         | 0.46 a            |
| H4                    | Latosolic red soil: vermiculite = 1:1   | 5.35   | 56.33 a            | 3.73 b                | 91.57 ab        | 19.60 ab    | 8.12 ab                        | 0.32 a            |
| H5                    | Latosolic red soil: peat = 2:1          | 5.02   | 62.50 a            | 4.75 ab               | 100.00 a        | 19.30 ab    | 7.06 ab                        | 0.37 a            |
| H6                    | Vermiculite: pearlite = 1:1             | 5.40   | 41.67 b            | 3.94 ab               | 91.67 ab        | 19.70 ab    | 8.40 ab                        | 0.37 a            |
| H7                    | Vermiculite: coconut husk = 1:1         | 4.95   | 12.50 c            | 1.44 c                | 60.83 c         | 9.60 b      | 5.20 b                         | 0.16 b            |
| CK1                   | Latosolic red soil (100%)               | 6.07   | 17.09 c            | 1.87 c                | 73.36 bc        | 11.36 b     | 6.09 ab                        | 0.19 b            |

*aDifferent letters in the table indicate significant difference (P < 0.05).
occurred in winter and spring (January–March), lasting 3 months.

Growth characteristics. _Camellia ‘Maozi’_ can be defined as evergreen shrubs or small trees, with a mature height of 3–5 m. Cuttings grew fast in their first 2 years, with shoots flushing three times in a year (Fig. IF and G). New shoots mainly appeared in March, May, and August, with mean increments of 3.9, 4.1, and 4.9 cm, respectively. Young cuttings gained an average annual growth of 15.9 cm in height. Adult trees only flushed once yearly. Elongation of new shoots in adult trees ended in March, while secondary growth of stem mainly occurred in summer and autumn. _Camellia ‘Maozi’_ exhibited strong capability of flushing and branching. As a result, it could be heavily pruned. Adult trees 6 or 7 years old were found to be able to spur out 5–10 branches within a year when being pruned at the main stem (Fig. IH).

Flowering and fruiting habit. The flowers of _Camellia ‘Maozi’_ were pale violet red in color (Fig. 1C–E) (Royal Horticultural Society color code, RHS# CD69C9), located in the axil of leaves on 1- to 3-year-old branches. The flowers had six to eight petals, three styles, and numerous golden stamens. The life span of a single flower was 4–8 d. _Camellia ‘Maozi’_ cuttings started to flower in 4–5 years, 1–2 years earlier than grafted plants. Some of the trees in the Nursery were more than 10 years old. None of them have produced seeds. Therefore, _Camellia ‘Maozi’_ seems sterile.

Adaptability. _Camellia ‘Maozi’_ grows well in a warm and damp climate. Shading was needed for 1- to 2-year-old cuttings and grafted plants. Young plants also required an average annual temperature of at least 20 °C, with the coldest temperature not below 2 °C. Although young plants could survive when the lowest mean temperature reached 4–7 °C, young leaves suffered freeze injury. When the temperature reached 37–39 °C for three consecutive days, young plants could get sunburns under direct sunlight, with young leaves turning yellow on edges. _Camellia ‘Maozi’_ grew well in acidic or subacid red and yellow-red soil. A decade’s observations found that the primary diseases included sooty mold, shoot tip blight, and powdery leaf tip blight. _Meliola camelliae, Capnadium sp.,_ and _Phyllosticta sp._ were the common causal agents. The diseases could be controlled by fungicides such as carbendazin (500–600 ppm) and chlorothalonil (750–900 ppm). The primary insect pests were tea green leafhoppers (_J. formosana_) and tea aphids (_T. aurantii_). It was found that 80% dichlorvos (1:1500 dilution) was effective in killing the pests.

Cutting propagation: the effects of soil matrices on rooting and growth of _Camellia ‘Maozi’_ cuttings. The soil matrices were acidic, with pH values ranging from 4.95 to 6.07 (Table 1), as recommended by both American Camellia Society (https://www.americancamellias.com/care-resource-general-culture-requirements/planting-camellias) and Royal Horticultural Society (https://www.rhs.org.uk/advice/profile/pid=327) for camellia cultivation. All cuttings grown in soil matrices of _H. retusa_ (laticol red soil: pearlite = 2:1), _H. retusa_ (laticol red soil: vermiculite = 2:1), and _H. retusa_ (laticol red soil: peat = 2:1) generated roots (100% rooting rate). Rooting rate of cuttings grown in _H. retusa_ (laticol red soil: coconut husk = 2:1), _H. retusa_ (laticol red soil: vermiculite = 1:1), and _H. retusa_ (vermiculite: peat = 1:1) was 67.8% (100% rooting rate). Rooting rate of new shoots in _H. retusa_ (laticol red soil: coconut husk = 2:1), _H. retusa_ (laticol red soil: vermiculite = 1:1), and _H. retusa_ (vermiculite: peat = 1:1) was the lowest (60.83%), not significantly different from the control (CK.), which was laticol red soil and had a rooting rate of 73.36%. Among the soil matrices tested, cuttings in the soil _H. retusa_ (laticol red soil: vermiculite = 2:1) exhibited the best growth, having a significantly higher flushing rate (68.35%), new shoot length (5.64 cm), rooting rate (100%), root number (27.80), length of the longest root (8.53 cm), and root fresh weight (0.46 g) when compared with the control. The growth of cuttings in the soil matrices _H. retusa_ (laticol red soil: coconut husk = 2:1) and _H. retusa_ (vermiculite: coconut husk = 1:1) was the poorest, with no significant differences with the control. Mold was found at the bases of cuttings rooted in the soil _H. retusa_ (laticol red soil: coconut husk = 2:1) and _H. retusa_ (vermiculite: coconut husk = 1:1) soil matrices, resulting in low survival rates. Figure II shows the roots generated in matrices _H. retusa_ (laticol red soil: peat) and control (laticol red soil).

Cutting propagation: the effects of plant growth regulators on rooting and growth of _Camellia ‘Maozi’_ cuttings. The treatments _M_ 1 (2 h in 500 mg L⁻¹ IBA) and _M_ 2 (1 h in 1000 mg L⁻¹ IBA) resulted in the highest new shoot rates, followed by _N_ 1 (2 h in 500 mg L⁻¹ NAA), _N_ 2 (0.5 h in 2000 mg L⁻¹ NAA), and _L_ 1 (2 h in 500 mg L⁻¹ IAA) treatments had the longest new shoot length (an average of 3.78 ± 0.32 cm) and the largest number of new leaves (an average of 3.1 ± 0.44). Rooting rate in the _M_ 1 (2 h in 500 mg L⁻¹ IBA), _M_ 2 (1 h in 1000 mg L⁻¹ IBA), _N_ 2 (0.5 h in 2000 mg L⁻¹ NAA), and _L_ 1 (2 h in 500 mg L⁻¹ IAA) was the highest, while root number in _N_ 2 (0.5 h in 2000 mg L⁻¹ NAA) was largest. None of the hormone treatments had a significant effect on the length of the longest root of each rooted cuttings. Fresh root weight was the highest in the cuttings treated with _N_ 2 (0.5 h in 2000 mg L⁻¹ NAA), _N_ 1 (2 h in 500 mg L⁻¹ NAA), and _M_ 2 (2 h in 500 mg L⁻¹ IBA) (an average of 0.48 ± 0.04 g). It was found that lower concentrations of auxin were beneficial for rooting, shoot elongation, and leaf development. Overall, _N_ 2 (0.5 h in 2000 mg L⁻¹ NAA) and _M_ 2 (2 h in 500 mg L⁻¹ IBA) resulted in the best rooting and growth of the cuttings. Cuttings treated with _M_ 1 (quickly dipped in a mix of 2000 mg L⁻¹ IBA, and _L_ 1 (5.5 h in 2000 mg L⁻¹ IAA) performed similar to or poorer than the control, which was mock treated with tap water.

Examination of 100 random cuttings per treatment found 100% rooting directly from the bark for NAA and IAA treatments, and 95% for IBA treatments, while calli were observed on some of the cuttings. Thus, rooting of cuttings derived primarily from the root primordium in the bark, not from calli. Depending on the types of treatments, the number of roots per plantlet ranged between 7 and 62, with an average of fifteen 120 d after cutting propagation, while root length ranged from 2 to 12 cm.

Cutting propagation: effect of grafting time on the survival and growth of scions. When _C. osmantha_ was used as rootstock and grafting was performed between May and September, at least 90% of success rate was achieved 3 months after grafting, with July 3 being the highest (100%) followed by June 1 (97%) (Table 3). Grafting in June and July had the highest flushing rates, 95% and 94%, respectively, as well as new shoot length, 13.1 cm for July and 12.3 cm in June. However, no significant differences were found among the grafting times at the P value of 0.05.

| Table 2. Effects of different growth regulators on rooting characters and growth.† |
| --- |
| Labeling of treatments | Concen of growth regulator and exposure time | Sprouting rate (%) | New shoot length (cm) | Leaf number | Rooting rate (%) | Root number | The longest root length (cm) | Root fresh weight (g) |
| N₁ | 2 h in 500 mg L⁻¹ NAA | 47.83 b | 3.98 a | 2.80 ab | 80.43 b | 36.20 b | 7.40 a | 0.47 ab |
| N₂ | 0.5 h in 2000 mg L⁻¹ NAA | 38.96 b | 3.16 ab | 2.40 ab | 89.13 a | 46.40 a | 6.01 a | 0.53 a |
| M₁ | 2 h in 500 mg L⁻¹ IBA | 60.87 a | 4.05 a | 3.60 a | 100.00 a | 35.80 b | 7.57 a | 0.45 ab |
| M₂ | 1 h in 1000 mg L⁻¹ IBA | 52.17 ab | 3.87 a | 3.30 a | 99.98 a | 18.90 cd | 7.27 a | 0.30 bc |
| M₃ | Quickly dipped in a mix of 2,000 mg L⁻¹ IBA and talc | 15.22 c | 1.87 bc | 1.80 bc | 67.39 c | 7.00 e | 6.25 a | 0.14 d |
| L₁ | 2 h in 500 mg L⁻¹ IAA | 45.65 b | 3.83 a | 3.40 a | 97.83 a | 12.90 de | 5.93 a | 0.21 d |
| L₂ | 0.5 h in 2000 mg L⁻¹ IAA | 4.35 d | 1.31 c | 1.20 c | 58.70 c | 12.60 de | 6.24 a | 0.26 cd |
| CK₂ | 2 h in tap water | 17.39 c | 1.97 bc | 2.40 ab | 78.26 bc | 11.60 de | 6.11 a | 0.18 d |

†Different letters in the table indicate significant difference (P < 0.05).
Grafting propagation: effect of rootstocks on the survival and growth of scions. Among the five rootstocks being tested, survival rate with C. oleifera reached 100%. Camellia ‘Maozi’ scions also performed the best on C. oleifera considering budbreak rate, new shoot length, and number of new leaves (Table 4). Survival rate on C. polyodonta, C. japonica ‘Hei Mudan’, and Camellia ‘Maozi’ was 88%, 89%, and 54%, respectively, 5 months after grafting. While C. polyodonta resulted in budbreak rate, new shoot length, and number of new leaves comparable to those of C. oleifera, Camellia ‘Maozi’ scions grafted on C. japonica ‘Hei Mudan’ and Camellia ‘Maozi’ did not perform as well. None of the Camellia ‘Maozi’ scions grafted on C. japonica ‘Dahong Mudan’ survived, suggesting these two genotypes are incompatible. Our results indicate that rootstock genotype play an important role in the success of grafting and the growth performance of scions.

Discussion and Conclusion

Camellia is a woody perennial flower, and thus breeding of new cultivars can take a long time. Although many breeding strategies can be used to shorten the cycle in many species (van Nocker and Gardiner, 2014), classical breeding remains the main strategy in camellias. As an interspecific cultivar obtained by crossing C. japonica ‘Dahong Mudan’ with C. pubipetala (Wei et al., 2013), Camellia ‘Maozi’ has a strong root system, shows strong hybrid vigor (Supplemental Table 1), and has strong capability to sprout after pruning. Cuttings elongate three times yearly in the first 2 years, with an average of increment of 15.9 cm, whereas adult trees flush once a year. Its primary diseases include sooty mold, shoot tip blight, and leaf tip blight. Tea green leafhoppers (J. formosana) and tea aphids (T. aurantii) are the primary insect pests observed. The purple flower color of Camellia ‘Maozi’ is unique, distinctively different from its parents, which have red (RHS# FF3030) and yellow (RHS# FFFF00) colors, respectively. Floral buds start to form in late April and early May. While an individual flower wilts 4–8 d after opening, the blossom can last 3 months, occurring during January and March. In contrast, the female parent blossoms between November and April, while the male parent blossoms during February and March (Liang and Huang, 1989). Its unique purple color in flowers, blossom timing coinciding with several major Chinese holidays, and vigorous hybrid growth make Camellia ‘Maozi’ an excellent addition to the camellia collection and profitable for commercial marketing.

Like its male parent, Camellia ‘Maozi’ is sterile with no fruits and seeds produced. However, propagation can be achieved vegetatively. Because it is asexual, vegetative propagation can help maintain desirable traits and ensure consistency of a cultivar of plant. In addition, vegetative propagation can save time and money for commercial plant production because plants bypassing the immature seedling phase reach the mature phase sooner. In our study, Camellia ‘Maozi’ cuttings and grafted plants flowered 2–3 and 1–2 years, respectively, earlier than their seedling parent.

Camellia ‘Maozi’ is easy to root. Without hormone treatments, a rooting rate of 78% was achieved. However, without hormone treatments, flushings rate (17%), new shoot length (1.97 cm), and root fresh weight (0.18 g) were significantly low. Our study indicated that the types of plant growth regulators and soil matrices played important roles in rooting and growth performance of Camellia ‘Maozi’ cuttings, similar to the findings in other cultivars in the genus (Chen and Li, 2013; Gao, 2012; Larcher and Scariot, 2009; Liao et al., 2013; Zhang et al., 2012). For instance, NAA could increase survival rate of C. oleifera cuttings from 67.9% (control, without NAA treatment) to 87.8–100% (Hu et al., 2013). Camellias require well-drained soil (Min and Bartholomew, 2007). It was found in our study that vermiculite, a preferred substrate for potting ornamentals and nut trees (Gao, 2012; Hu et al., 2013; Zhang et al., 2015), provided better drainage, thermal insulation, moisture holding, and good air permeability for Camellia ‘Maozi’ cuttings. Soaking the bottom parts of cuttings in 500 mg·L⁻¹ IBA for 2 h and then rooting them in a mix of latosolic red soil and vermiculite (2:1 v/v) resulted in optimal rooting and growth performance. In contrast, mold was found in cuttings grown in matrices containing coconut husks. These cuttings also had the lowest flushing rate. Therefore, sterilization and disinfection are recommended when using coconut husks for Camellia ‘Maozi’ rooting.

A success rate of at least 90% could be achieved when grafting was carried out during May to September and C. osmantha was used as rootstock. However, grafting conducted in July is recommended since grafting success rate was highest and new shoots had the most vigorous growth. It is worth noting that C. osmantha, recently registered in the Catalogue of Life: Higher Plants in China (http://www.etaxonomy.ac.cn/node/108854?language=en), is a species of section Paracamellia (Ma et al., 2012) and is related to C. f Liuiviatilis. Among the five rootstocks compared, C. oleifera was most compatible for Camellia ‘Maozi’. Commonly known as tea-oil camellia, C. oleifera is a native of China and its seeds are used extensively in China as cooking oil (Robards et al., 2015). Its natural geographical distribution is at latitudes ranging from 23°30’ to 31° N and longitudes ranging from 104°30’ to 121°25’ E, where the climate is one of intermediate subtropical moist monsoon types. This distribution spans 11 provinces in the south of China (He and He, 2002). It is important to evaluate growth performance of grafted Camellia ‘Maozi’ having C. oleifera as rootstock in this region in future studies for assessing distribution potential. The second most compatible rootstock for Camellia ‘Maozi’ is C. polyodonta with 89% survival rate. Camellia ‘Maozi’ and C. japonica

### Table 3. Survival and growth of grafted Camellia ‘Maozi’ with different grafting dates during May to September.

| Grafting dates | Number of individuals for grafting | 3 mo. after grafting | 5 mo. after grafting |
|---------------|----------------------------------|----------------------|----------------------|
|               | Surviving individual | Survival rate (%) | Budbreak rate (%) | New shoot length (cm) |
| 11 May        | 180 | 163 | 90.56 | 90.23 | 11.46 |
| 1 June        | 180 | 157 | 97.22 | 95.31 | 12.65 |
| 3 July        | 180 | 180 | 100 | 93.67 | 13.08 |
| 6 Aug.        | 180 | 178 | 93.89 | 86.43 | 10.92 |
| 10 Sept.      | 180 | 171 | 95.00 | 83.72 | 11.16 |

### Table 4. Survival and growth of grafted Camellia ‘Maozi’ with different rootstocks.*

| Rootstocks          | Survival rate (%) | Budbreak rate (%) | Survival rate (%) | Budbreak rate (%) | New shoot length (cm) | New shoot diam (cm) | Number of leaves on new shoots |
|---------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|---------------------|-------------------------------|
| C. japonica ‘Dahong Mudan’ | 12.82 c | 0.26 d | 7.78 | 0 d | 0 c | 0c | 0c |
| C. polyodonta       | 96.97 a | 69.70 ab | 88.33 b | 84.67 b | 6.35 b | 3.27 a | 6.10 ab |
| C. oleifera         | 100.00 a | 82.05 a | 100.00 a | 96.10 a | 11.65 a | 3.47 a | 7.30 a |
| C. japonica ‘Hei Mudan’ | 95.17 a | 20.51 c | 100% | 41.03 c | 3.80 b | 3.30 b | 3.70 b |
| Camellia ‘Maozi’    | 72.73 b | 24.24 c | 54.44 b | 36.36 c | 4.35 b | 1.57 b | 3.70 b |

*Different letters in the table indicate significant difference (P < 0.05).
‘Dahong Mudan’ had low compatibility with a grafting success rate lower than 7.8% five months after grafting. This is the first report on the biological characteristics of Camellia ‘Maozi’ and its propagation techniques. Knowledge obtained through the study is valuable for the cultivation and dissemination of the new cultivar.

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**Supplemental Table 1. Comparison of stem growth of *Camellia ’Maozi’* and its parental species.**

| Genotype | Height of cuttings (cm) | Stem diam of cuttings (mm) |
|----------|-------------------------|-----------------------------|
|          | February | April | June | August | October | December | February | April | June | August | October | December |
| *Camellia ’Maozi’* | 18.17 ± 0.84 a | 25.45 ± 1.23 a | 29.75 ± 1.84 a | 35.65 ± 0.68 a | 37.52 ± 0.58 a | 43.26 ± 0.69 a | 58.04 ± 1.05 a | 62.35 ± 0.59 a | 76.92 ± 1.04 a | 80.31 ± 0.64 a | 82.13 ± 0.41 a |
| *C. pubipetala* | 10.21 ± 0.70 b | 11.16 ± 0.26 b | 14.39 ± 0.60 b | 17.19 ± 0.87 b | 18.13 ± 0.48 b | 19.34 ± 0.48 b | 36.03 ± 0.24 b | 46.81 ± 0.70 b | 53.11 ± 0.72 b | 62.42 ± 0.54 b | 68.32 ± 0.49 b | 70.17 ± 0.45 b |
| *C. japonica ’Dahong Mudan’* | 9.51 ± 0.96 b | 10.62 ± 0.65 b | 11.45 ± 0.63 c | 16.18 ± 0.31 c | 17.32 ± 0.36 c | 17.63 ± 0.30 c | 33.54 ± 0.63 c | 43.27 ± 0.55 c | 50.71 ± 0.79 c | 60.53 ± 0.65 c | 63.91 ± 0.93 c | 69.75 ± 1.14 b |

Cuttings that were 9 cm long and had a diameter of 3 mm at the base were treated with 1500 ppm IBA for 45 min and then rooted in latosolic red soil in June 2012. Thirty healthy cuttings were randomly selected for each genotype. Measurements of stem height and diameter at the base were taken every 2 months in 2013. Data were processed and analyzed by Excel and SPSS 17.0. Different letters in the table indicate significant difference ($P < 0.05$). The results indicated that *Camellia ’Maozi’* cuttings grew faster than its parental species in both stem height and diameter.