

观赏鲜食兼用猕猴桃新品种满天红2号的选育

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摘要: 满天红2号是通过自然授粉实生群体选育而成的观赏与鲜食兼用的猕猴桃新品种。该品种树势中等, 萌芽率54.37%, 花枝率98.96%。花以单花为主, 红色, 花量大, 花冠直径42.91 mm, 花瓣6~8枚, 花柄长33.87 mm; 花丝数53.77枚, 紫红色, 花药黄色; 柱头数35.65枚, 白色。果实圆柱形, 平均单果质量84.28 g, 最大单果质量106 g, 果面密生褐色短茸毛; 果肉黄色, 肉质细腻, 可溶性固形物含量(w , 后同)16.9%, 总糖含量10.48%, 可滴定酸含量1.31%, 维生素C含量101 mg·100 g⁻¹, 钾含量335 mg·kg⁻¹, 钙含量46.5 mg·kg⁻¹。在武汉地区, 4月中旬开花, 9月底果实成熟, 果实生育期在165 d左右。

关键词: 猕猴桃; 新品种; 满天红2号; 观赏鲜食兼用

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A new edible ornamental kiwifruit cultivar Mantianhong No.2

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Abstract: Mantianhong No.2, bred by Wuhan Botanical Garden, Chinese Academy of Sciences, is a new edible and ornamental kiwifruit cultivar. It was selected from the open-pollinated seeds of *Actinidia eriantha* Benth which usually has red flowers and white indumenta on the branchlets, buds, abaxial leaf surface, petioles, inflorescences and sepals. Twenty-eight seedlings of *A. eriantha* were planted in 2001, among them one plant had red flowers in bloom and bore a relatively small fruits in 2004, and the buds of it were then grafted onto five plants of *A. chinensis* var. *deliciosa* in 2005. One grafted plant numbered '1-16-3-2' stably had red flowers in bloom in 2010, and bore fruit with a bigger size and a better flavor than those of the parent, and the soluble solids content of the fruit was 16% higher than that of the parent. Five plants from the '1-16-3-2' were grafted in 2011, and they all bore fruit with a stable yield level and quality in both 2012 and 2013. After several generations of grafting, they still had stable yields and fruit quality. In addition, they were also cultivated in other three regions of Hubei province, including Danjiangkou, Yichang and Enshi, and tested trees in Danjiangkou, Yichang and Enshi showed better comprehensive behaviors than those in Wuhan. In 2020, Mantianhong No.2 obtained the national Plant Variety Rights (CNA20172333.1) from the Ministry of Agriculture and Rural Affairs. The vines are slightly vigorous or mild-vigorous. The apricus surface of one-year-old shoot is yellowish brown, and densely covered by a thick layer of dirty yellow tomentum, and the internodes are 29-40 mm long. The two-year-old stems are brown, sparsely covered with white ash-like downy hairs. The leaves are thick and chartaceous, somewhat brittle and easily damaged, heart form in shape. The leaf blade is 100-130 mm long and 80-130 mm wide. The flowers are mainly solitary. The flowers stalk is 33.87 mm long, light green, and covered with white tomentum. The calyx has 5-7 petals, which are oblong or obtuse at apex with wrinkled strips, brownish white. The opening flowers are pink to red, with 6-8 petals. The corollas are 42.91 mm in diameter. The petals are nearly elliptic. There are 35.65 stamens

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per flower, filaments are 2-3 mm long, and pink near to petals. The pistils average are rudimentary and overshadowed. The ovaries are 1-1.3 mm long and 0.8- 1.0 mm wide. The fruit weights is 84.28 g with maximum 106 g, twice to three times larger than most fruits of *A. eriantha* collected from the wild. The typical fruit is cylindrical with very small, round or slightly long round fruit spots. The fruit skin is brownish green, and densely covered with abundant brown hairs. The fruit shoulder is truncate and the fruit apex is slightly flat. The fruits are difficultly peeled. The fruit flesh is yellow, fine textured and smooth. The fruit core is small, oval shape and yellowish white. The fruit flavor is good and sweet. The soluble solid contents (SSC) range from 16.9%, the total sugars content is 10.48%, the titratable acids is 1.31%, and the vitamin C contents is 101 mg · 100 g⁻¹ fresh weight. The concentrations of K, Ca in fruit are 335 mg · kg⁻¹ and 46.5 mg · kg⁻¹, respectively. The fruits can be stored in ambient condition for four months. In Wuhan region, the time of bud break is mild march, and the time of flowering is mild-April. The time of fruit mature is mild-September or late-September. The fruit development period is about 165 days. This new cultivar is suitably cultivated in the regions with the average temperature in winter above -3 °C, such as Hubei, Zhejiang, Jiangsu and Fujian provinces. It has a moderate disease resistance. It is susceptible to the soft rot disease when exposed to raining during the flowering and early stages of fruit development. In case of extreme low temperature or cold spell in later spring, it is also easily infected with bacterial canker disease. Thus, it is recommended that this new cultivar should be cultivated in the condition of avoiding excessive rainfall.

Key words: Kiwifruit; New cultivar; Mantianhong No.2; Edible ornamental

选育和发展综合性状良好的早、中熟优质耐贮品种是猕猴桃持续高效生产的重要保障^[1]。猕猴桃属植物的花性状具有很高的遗传多样性,不仅表现在花器官的各部分形态、颜色差异较大,开花时间、开花期长短等都存在明显变异,是选育观赏型品种的优良资源库。在猕猴桃属中,开红色或粉红色花的有网脉猕猴桃(变种, *Actinidia cylindrica* var. *reticulata* C. F. Liang)、毛花猕猴桃 (*A. eriantha* Benth)、粉毛猕猴桃 (*A. farinose* C. F. Liang)、簇花猕猴桃 (*A. fasciculoides* C. F. Liang)、条叶猕猴桃 (*A. fortunei* Fin. et Gagnepain)、黄毛猕猴桃 (*A. fulvicoma* Hance)、密花猕猴桃 (*A. rufotricha* var. *glomerata* C. F. Liang)、浙江猕猴桃 (*A. zhejiangensis* C.F. Liang)等。目前,浙江园艺研究所已经通过野生资源选育了开红花的毛花猕猴桃华特^[2],中国科学院武汉植物园的研究人员也通过种间杂交获得了超红^[3]、江山娇^[4]等开红花的观赏品种,满天红^[5]可观赏与鲜食兼用。但观赏与鲜食兼用的大果型猕猴桃品种还较少,随着市场的不断需求,将可食用品种和观赏品种的特性结合起来,培育出既能观赏又能食用的猕猴桃特异新品种已成为新的育种目标之一。

1 选育过程

中国科学院武汉植物园于2009年10月,收集资源圃内开放授粉的毛花猕猴桃种子,同年12月温室

播种,2000年获得杂种实生苗28株,2001年3月2日按0.5 m株距全部定植,2004年有8个单株开花结果,其中5株开白花,3株开红花,开红花中编号为‘7-11-14’的单株由于果实偏小,2005年1月仅作为资源在资源圃1区嫁接保存5株,一直未关注。2010年8月,调查发现嫁接子代中编号为‘1-16-3-2’的单株果实比母株更大,花红色,花色稳定,且结果性好,果实长圆柱形,一致性好,当年9月采集果实进行品质分析,软熟后果肉黄色,可溶性固形物含量(w,后同)达16%,风味品质优。2011年1月取‘1-16-3-2’单株接穗高接5株,2012年开始结果,经2012—2013年连续2 a观察,嫁接后遗传性状稳定,丰产性和果实品质与母株基本一致,在武汉地区9月下旬成熟。2014年12月继续采集子代接穗在大树上高接10株,2015年开始结果,同时在湖北丹江口、宜昌、恩施等地种植,经过多年田间观察、DUS测试及果实品质分析,各地综合表现均要优于选育地武汉。2020年获得农业农村部植物新品种权(品种权号:CNA20172333.1),并命名为满天红2号(图1)。

2 主要性状

2.1 植物学特征

满天红2号为二倍体品种,树势中等偏强。枝、叶、果特性偏向中华猕猴桃,而花色比毛花猕猴桃更深。1年生枝阳面颜色为褐色,皮孔短梭形,皮孔密



图1 观赏与鲜食兼用猕猴桃新品种满天红2号
Fig.1 A new edible ornamental kiwifruit cultivar Mantianhong 2

度中等。成熟叶片形状为心脏形,正面绿色,叶片基部形状为心形,边缘有锯齿,叶柄正面花青苷显色较弱,叶柄长62.24 mm,幼叶顶端形状为渐尖,基部交叉情况为相接。花以单花为主,花柄长33.87 mm,花深红色,花冠直径平均42.91 mm,花瓣6~8枚,萼片6.75枚,柱头白色,分布不规则,平均35.65枚,花丝紫红色,约53.77枚,花药黄色(表1)。

2.2 果实经济性状

果实圆柱形,果肩方,果喙端形状平,果面密被褐色短茸毛。平均单果质量84.28 g,果柄长43.73 mm,

表1 满天红2号与对照品种满天红的花性状比较

Table 1 Comparison of flower characters between Mantianhong 2 and control Mantianhong

品种 Cultivar	花冠直径 Flower diameter/ mm	花柄长 Flower stalk/ mm	花瓣数 Petals number	萼片数 Sepals number	柱头数 Stigma number	花丝数 Filament number
满天红2号 Mantianhong 2	42.91	33.87	6.47	6.75	35.65	53.77
满天红 Mantianhong	37.94	51.10	7.88	6.58	42.43	49.05

注:表中数据为连续3a的平均值。下同。

Note: The data are the average values for three consecutive years. The same below.

果实纵径58.16 mm,横径45.99 mm,果形指数1.26;果肉黄色,汁多,果心较大,黄白色,椭圆形,果实采后常温下约15 d左右可食用,风味酸甜,浓郁;软熟果实可溶性固形物含量16.90%,总糖含量10.48%,可滴定酸含量1.31%,糖酸比为8,维生素C含量101 mg·100 g⁻¹,钾含量335 mg·kg⁻¹,钙含量46.5 mg·kg⁻¹。

2.3 生长结果习性

树势中等,成枝力较强。1年生枝萌芽率平均51.36%,花枝率87.46%~99.44%,以单花结果为主。在湖北武汉、宜昌及丹江口三地开展区域试验,经品质比较,果实成熟时间基本一致,果肉颜色稳定,在宜昌地区种植平均单果质量可达96.23 g,盛果期产量可达1230 kg·666.7 m⁻²;丹江口地区种植果实品质较好,可溶性固形物含量为18.25%,干物质含量为20.14%(表2)。

2.4 物候期

在湖北武汉地区,3月初萌芽,3月底开始现蕾,4月14日左右始花,盛花期在4月16日左右,4月22日左右谢花。果实成熟期在9月底,果实发育期约165 d,为中熟黄肉猕猴桃品种,与近似品种满天红成熟期接近。成年树一般在12月中下旬开始落叶。

表2 满天红2号与对照品种在湖北区域试验结果

Table 2 Production demonstration test results of Mantianhong 2 in Hubei province

地点 Test area	品种 Cultivar	成熟期 Maturing date	平均单果质量 Average fruit mass/g	w(可溶性固形物) Soluble solids content/%	w(干物质) Dry matter content/%	每666.7 m ² 产量 Yield per 666.7 m ² /kg
湖北武汉 Wuhan county, Hubei province	满天红2号 Mantianhong 2	9月下旬 Late Sept.	83.56	16.90	18.36	1050
	满天红 Mantianhong	9月下旬 Late Sept.	75.33	16.60	17.81	1026
湖北宜昌 Yichang county, Hubei province	满天红2号 Mantianhong 2	9月下旬 Late Sept.	96.23	17.10	18.76	1230
	满天红 Mantianhong	9月下旬 Late Sept.	85.39	16.50	17.89	1165
湖北丹江口 Danjiangkou county, Hubei province	满天红2号 Mantianhong 2	9月下旬 Late Sept.	82.68	18.25	20.14	1100
	满天红 Mantianhong	9月中旬 Mid. Sept.	80.65	17.33	18.45	1068

2.5 抗性和适应性

经多年多点实验表明,该品种适应性较强,耐热性比中华猕猴桃和美味猕猴桃差,特别适于冬暖夏凉区域种植。抗病性中等,如花期和幼果期遇连续阴雨,易感染果实软腐病,如遇极端低温或倒春寒逆境,易感染溃疡病。

3 分子标记鉴定

利用团队开发的SSR标记引物,对满天红2号在内的5个毛花或中华系列的品种进行分子鉴定分析,毛细管电泳结果表明,满天红2号在等位基因上与其他品种存在明显的差异(图2)。

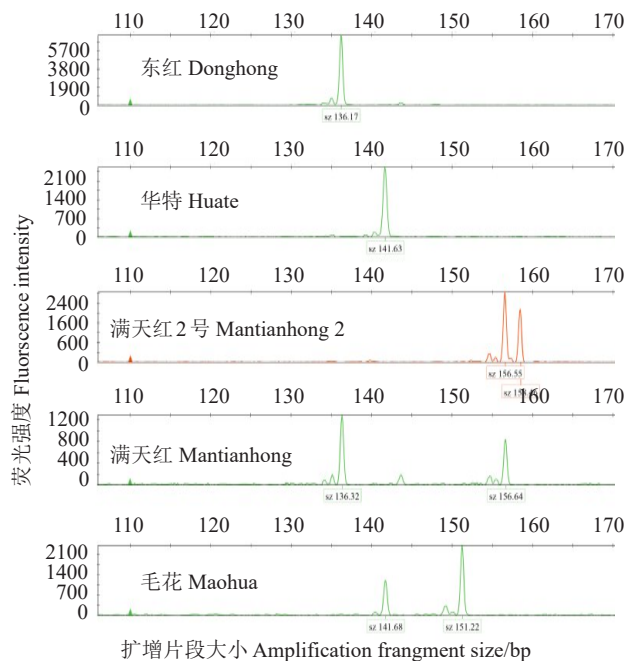


图2 引物1在5份猕猴桃材料中的毛细管电泳检测结果
Fig.2 Capillary electrophoresis results of primer 1 in five kiwifruit materials

4 栽培技术要点

4.1 建园和定植

满天红2号宜选择在低海拔区域,冬天最冷月平均温度在 -2°C 以内种植,极端低温不要超过 -5°C 。生产上宜采用平顶大棚架或T形棚架,采用单主干双主蔓树形培养;若作为庭院观赏,可作多种造形。定植行距4 m,株距(2.5~3.0)m,裸根苗可在落叶后定植,营养钵苗可在5月前定植即可,苗木定植后浇透水。

4.2 整形修剪

以夏季修剪为主,及时抹除位置不当的新梢,不计划作为下年结果母枝培养的枝条可在花后适当短

剪,增加园区采光;冬剪修剪为辅,剪去缠绕枝、病虫枝和过密的结果母枝,留下来的枝条根据粗度回剪至相应位置,修剪完成后针对2 cm以上伤口要及时涂抹伤口保护药剂,并及时清理修剪枝条。

4.3 土肥水管理

全年施肥2~3次,秋冬季在果实采收后及时施入冬肥,一般在11—12月施入,每株施入成品有机肥20~30 kg,磷肥0.5 kg,或等量的腐熟农家肥;春季萌芽前每株可施入复合肥0.5 kg,谢花坐果1周后每株施入高钾复合肥0.5 kg。冬季树体休眠时可用微型旋耕机对全园进行旋耕20 cm,增加土壤通透性。夏季注意土壤湿度,及时浇水。

5 综合评价及应用前景

与满天红相比,满天红2号花色更鲜艳,果实更大,果形一致性也更好,果实成熟后风味浓郁,是一个观赏与鲜食兼用的中熟黄肉新品种。适合在城郊农业发展或庭院种植,花期可赏花,果实成熟时可采摘,也可进行温室商业栽培。

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