果 树 学 报 2019,36(1):126-128
Journal of Fruit Science

DOI:10.13925/j.cnki.gsxb.20180311

草莓新品种‘越珠’的选育

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摘 要:‘越珠’是由‘章姬’×‘枥乙女’杂交选育出的早熟新品种。果实圆锥形或楔形,果面红色,富有光泽。果肉浅红色,细糯味浓,风味酸甜,富有浓郁的蜜桃香味;一级顶果平均单果质量46.23 g,各级序果平均单果质量17.86 g。可溶性固形物含量(*w*,后同)为11.80%,蔗糖含量20.04 mg·g^{-1},葡萄糖含量20.56 mg·g^{-1},果糖含量23.12 mg·g^{-1},有机酸含量5.31 mg·g^{-1},糖酸比12.02,果实硬度0.36 kg·cm^{-2};品质中上。在浙江省嘉兴市海宁市许村镇杨渡村(30.439 867 N,120.411 558 E)设施栽培,9月上中旬定植,12月下旬成熟,顶果发育期31 d;花序平均花数17.2。抗病性与红颜相似,易感炭疽病。该品种为设施栽培专用品种,不适合露地栽培。

关键词:草莓;新品种;‘越珠’;桃香味

中图分类号:S668.4 **文献标志码**:A **文章编号**:1009-9980(2019)01-0126-03

Breeding report of a new strawberry cultivar ‘Yuezhu’

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Abstract: ‘Yuezhu’ is a new strawberry (*Fragaria* × *ananassa*) cultivar which was developed from a cross between ‘Akihime’ and ‘Tochiotome’ in 2006 at experimental field. It was initially selected in 2006 for its bright color and peach flavor. Through artificial hybridization pollination, 332 hybrid seedlings were obtained. In 2006—2007, 14 plants with excellent fruit shape and good quality were selected. In 2007—2008, the 14 plantlets were further screened. The superior line ‘06-10-208’ was characterized by its bright color, rich flavor and peach flavor. From 2008 to 2010, the line was further evaluated in Yangdu. From 2010, regional adaptability testing was carried out in Fuyang and Jiande. The traits of ‘06-10-208’ line were stable, and the traits were consistent with those of Yangdu. It was finally selected in 2012. And it was authorized by New Variety Right in November 2015, receiving its patent number CNA20120590.8. The plant was semi erect gesture with a height of 14.20 cm and a crown diameter of 44.60 cm × 37.90 cm. Leaves are large with medium green in color, elliptic, and leaf margin is serrate obtuse. The leaf length is 8.11 cm and the leaf width is 6.30 cm. Flower is white, 1.20-1.45 across, bisexual, medium pollen content. The average number of flowers per inflorescence is 17.2. The development period of the first fruit is 31 d. The fruit is cone-shaped or wedge-shaped. The average fruit weight is 17.86 g and the apical fruit weight is 46.23 g. It has red peel and full of luster fruit surface. The flesh is light red and the fruit has aroma of peach. The content of soluble solids is 11.80%. The sucrose, glucose, fructose, and organic acid content is 20.04 mg· g^{-1}, 20.56 mg· g^{-1}, 23.12 mg· g^{-1}, and 5.31 mg· g^{-1}, respectively. The sugar and acid ratio is 12.02, and the fruit hardness is 0.36 kg· cm^{-2}. The disease resistance is similar to Benihoppe. It is susceptible to anthracnose. The plantlets usually planted in early September, and the fruit ripens in late December in the protected culture of Zhejiang province. ‘Yuezhu’ is a special cultivar for protected cultivation and is not suitable for open field cultivation. Orchard should choose neutral soil or with weak acidic which is flat and has ability of moisture and fertilizer retention. The cultivation technique of ‘Yuezhu’ is similar to that of common strawberry varieties. In the seedling-stage, special attention should be paid to the prevention and control of anthrax. The old or diseased

收稿日期:2018-08-21 接受日期:2018-09-27

基金项目:浙江省科技厅重点研发计划(2016C02052-8)

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leaves should be removed in time. And the gray mold，mites and aphids should be paid to attention in fruit period. Fruit should be harvested in 80% to 90% ripeness.

Key words：Strawberry; New cultivar; ‘Yuezhu’; Peach flavor

草莓是香味物质种类非常丰富的水果之一，不同挥发性物质给予果实不同的感官特性。目前草莓中已经鉴定出了300多种挥发性物质，主要包括酯类、酮类、醇类和酸类等，其中酯类和呋喃类普遍被认为是决定草莓香味的主要成分[1-4]。这些挥发性物质形成了花香、果香、玫瑰香、菠萝香、清香等不同香味的草莓[4]。日本草莓育种家用种间杂交加倍的技术获得了十倍体草莓‘桃薰’，果皮淡黄橙色，果肉白色，不仅外形像桃子，还具有浓郁的桃香味[5]。但是，‘桃薰’开花非常迟，江浙地区一般在春节后开始结果，3—4月份才上市。花量非常大，但不容易坐果，也极易形成畸形果。为了培育出能在12月份采收的具有桃香味的草莓，浙江省农业科学院利用栽培八倍体草莓进行了育种研究，最终选育出了具有桃香味的草莓新品种‘越珠’。

图1　草莓新品种‘越珠’

Fig. 1 A new strawberry cultivar ‘Yuezhu’

1　选育经过

2006年3月浙江省农业科学院园艺研究所以‘章姬’为母本、‘枥乙女’为父本在田间进行人工杂交授粉，获得实生苗332株。2006—2007年，选择出果形整齐，品质优的14个优株。2007—2008年对14个优株进行扩繁的无性种苗进行进一步筛选鉴定，优系‘06-10-208’表现为果面颜色艳丽，风味浓郁，富有桃香味。2008—2010年进一步鉴定、评价，同时开展配套栽培技术研究。2010年开始在富阳、建德等地进行区域栽培试验，优系‘06-10-208’性状表现稳定，且特征特性表现一致。2012年命名为‘越珠’（图1），同年7月申请了国家植物新品种权保护，2015年11月获得国家植物新品种权证书。

2　主要性状

2.1　植物学特征

植株半直立，株高14.20 cm，冠径44.60 cm×37.90 cm。叶片较大，椭圆形，叶缘锯齿钝，中等绿色。叶长8.11 cm，叶宽6.30 cm。叶柄长11.09 cm，叶柄粗3.03 mm，叶柄茸毛垂直于叶柄。花序平于叶面，花瓣重叠，5~7枚•朵$^{-1}$，白色，花径1.20~1.45 cm，两性花，花粉量中等。每花序花数17.2。

2.2　果实性状

一级果实顶果楔形，平均单果质量46.23 g，其他果实为圆锥形，各级平均单果质量17.86 g。果实较整齐，果面红色，富有光泽。种子黄绿色、红色兼有，分布均匀，密度中等，种子带极窄或无，凹或平于果面。果肉浅红色，细糯味浓，富有浓郁的蜜桃香味。髓心空洞小、浅红色。果实硬度中等，为0.36 kg·cm^{-2}，可溶性固形物含量（w，后同）为11.80%。蔗糖含量20.04 mg·g^{-1}，葡萄糖含量20.56 mg·g^{-1}，果糖含量23.12 mg·g^{-1}。有机酸含量5.31 mg·g^{-1}，糖酸比12.02（表1，表2）。

表1　主要果实性状比较

Table 1 Comparison of main fruit characteristics

品种 Cultivar	果形 Fruit shape	果面颜色 Fruit color	风味 Flavor	w（可溶性固形物）Content of soluble solids/%	硬度 Fruit firmness/(kg·cm^{-2})	平均单果质量 Average fruit mass/g	单株产量 Average yield per plant/g
越珠 Yuezhu	楔形、圆锥形 Wedge or conical	中等红 Medium red	酸甜、桃香味 Sweet with some peach flavor	11.80	0.36	17.86	164.43
红颜 Benihoppe	圆锥形 Conical	中等红 Medium red	酸甜 Sweet with some sour	12.48	0.44	15.32	224.73
章姬 Akihime	长圆锥形 Long conical	橙红 Orange red	甜 Sweet	11.61	0.29	17.95	277.26

表 2 二级序果可溶性糖和有机酸含量比较

Table 2 Comparison of sugar and organic acid content of the second grade fruit

品种 Cultivar	w/(mg·g⁻¹)					糖酸比 Ratio of sugar and acid
	蔗糖 Sucrose	葡萄糖 Glucose	果糖 Fructose	总糖 Total sugar conent	总有机酸 Total organic acid	
越珠 Yuezhu	20.04	20.56	23.12	63.72	5.31	12.02
红颜 Benihoppe	31.15	13.45	15.53	60.13	7.42	8.10
章姬 Akihime	25.00	14.02	17.13	56.15	6.12	9.17

2.3 物候期

在浙江省设施栽培，一般9月上中旬定植，第1花序11月底至12月初开花，12月下旬果实开始成熟，次年1月中旬进入盛果期，商品果可采收至次年5月份。

2.4 生长结果习性

植株长势较强、株型半开张，中心展开叶往外数第3叶叶柄与地面夹角62°。匍匐茎较易抽生、繁苗比较容易。生长结果性稳定，一级花序顶果多为楔形，果个大，其他果实为圆锥形。

2.5 适应性

该品种适合设施栽培。育苗技术与‘红颜’‘章姬’相似，均不抗炭疽病，繁殖系数40以上。生长结果期中感灰霉病，中抗白粉病。对蚜虫、红蜘蛛等虫害抗性与‘红颜’‘章姬’相似。

3 栽培技术要点

3.1 育苗

对土壤要求不严格，以酸性偏中性为宜，需要选择土质疏松肥沃、无病害或少病害发生、排灌方便的非草莓连作田块。3月下旬至4月上旬选取无病虫害生长健壮的生产苗或组培苗作母苗进行田间育苗。

育苗期间保持土壤湿润，间隔10~15 d追肥1次，每666.7 m²撒施三元复合肥6~10 kg，追肥次数视发苗情况而定。在雨水较多的南方地区，7月后要注意炭疽病的防治。

3.2 定植

在浙江及周边地区种植时，9月上中旬定植，一般为高垄双行定植。选择根系发达，根茎粗壮且粗度在6 mm以上，无病虫害，具4枚及以上展开叶的健壮子苗。双行三角形定植，使弓背向垄沟，做到深不埋心、浅不露根。株距20~25 cm，每666.7 m²种植6 000~7 000株。

3.3 栽后管理

定植后浇足定根水，覆盖遮阳网以提高成活率。草莓植株抽生新叶后，每666.7 m²追施三元复合肥8~10 kg。花期及时疏花疏果，有条件的放蜂进行辅助授粉，以降低畸形果率。果实膨大后，肥料以高钾型水溶性肥为主，结合喷药可追施叶面肥，补充中微量营养元素。整个生长季，要调节好棚内温、湿度，及时摘除老叶，清除病叶、病株，注意防治灰霉病、螨虫和蚜虫。3—5月注意防治白粉病。果实八九成着色时及时采收，切忌过度成熟变软时采摘。

参考文献 References:

[1] 姜远茂，彭福田，刘松忠，束怀瑞，李可昌 . 栽培草莓品种果实香气特性研究[J]. 分析测试学报，2004，23(2):56-60.
JIANG Yuanmao，PENG Futian，LIU Songzhong，SHU Huairui，LI Kechang. Characterization of the aroma of four cultivars of strawberry [J]. Journal of Instrumental Analysis，2004，23(2):56-60.

[2] 张运涛，王桂霞，董静，钟传飞，常琳琳，王丽娜 . 33 个欧美草莓品种果实挥发性物质的分析[J]. 果树学报，2011，28(3):438-442.
ZHANG Yuntao，WANG Guixia，DONG Jing，ZHONG Chuanfei，CHANG Linlin，WANG Lina. Analysis of volatile compounds in 33 euramerican strawberry cultivars [J]. Journal of Fruit Science，2011，28(3):438-442.

[3] 王玲，尹克林 . ‘达赛莱克特’草莓果实发育成熟过程中香气物质的变化及其特征成分的确定[J]. 果树学报，2018，35(4):433-441.
WANG Ling，YIN Kelin. Changes in aroma of ‘Darselect’ strawberry during development and characterization of the key aroma components [J]. Journal of Fruit Science，2018，35(4):433-441

[4] 王娟，孙瑞，王桂霞，常琳琳，孙健，钟传飞，董静，张运涛，ULRICH D. 8 个草莓品种(系)果实特征香气成分比较分析[J]. 果树学报，2018，35(8):967-976.
WANG Juan，SUN Rui，WANG Guixia，CHANG Linlin，SUN Jian，ZHONG Chuanfei，DONG Jing，ZHANG Yuntao，ULRICH D. A comparative analysis on fruit characteristic aroma compounds in eight strawberry varieties (strains) [J]. Journal of Fruit Science，2018，35(8):967-976.

[5] 野口裕司，森下昌三，室崇人，小島昭夫，板田好輝，山田朋宏，杉山慶太 . 芳香性イチゴ10 倍体種間雑種品種‘桃薫’の育成とその特性[R]. 野菜茶業研究所研究報告，2011:59-67.
NOGUCHI Y，MORISHITA M，MURO T，KOJIMA A，SAKATA Y，YAMADA T，SUGIYAMA K. ‘Tokun’: a new aromatic decaploid interspecific hybrid strawberry [R]. Bulletin of the National Institute of Vegetable and Tea Science，2011:59-67.