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Shaw et al.

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(54) **STRAWBERRY PLANT NAMED 'MERCED'**

(50) Latin Name: ***Fragaria×ananassa* Duch.**
Varietal Denomination: **Merced**

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USPC **Plt./208**

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(57) **ABSTRACT**

'Merced' is a short-day (June bearing) type cultivar that produces fruit over an extended period when treated appropriately in arid, sub-tropical climates. When treated with appropriate planting regimes, 'Merced' is similar to 'Camarosa' (U.S. Plant Pat. No. 8,708), but with greater productivity, higher quality fruit, less vigorous plant, and lighter colored fruit. It is also similar to 'Ventana' (U.S. Plant Pat. No. 13,469) and 'Benicia' (U.S. Plant Pat. No. 22,542) but having a more compact plant, later fruiting, superior fruit quality, and firmer, better flavored fruit.

5 Drawing Sheets

Genus and species: The strawberry cultivar of this invention is botanically identified as *Fragaria×ananassa* Duch.

Variety denomination: The variety denomination is 'Merced'.

BACKGROUND OF THE INVENTION

This invention relates to a new and distinctive short-day type cultivar designated as 'Merced'. The new cultivar was the result of a cross performed in 2007 between two unreleased germplasm accessions, Cal 3.92-8 (unpatented) and Cal 2.95-4 (unpatented). Accession Cal 3.92-8 was chosen as a parent due to its very high productivity, large, firm, and high quality fruit, and very high plant vigor. Accession Cal 2.95-4 was chosen as a parent due to its compact plant habit and firm, flavorful fruit.

'Merced' was first fruited at an experimental orchard near Winters, Calif., in 2008, where it was selected, originally designated Cal 7.132-3, and propagated asexually by runners. Following selection and during testing, the plant of this selection was designated 'C229'. It was later designated 'Merced' for introduction into commerce and for international registration and recognition. Asexual propagules from this original source have been tested at facilities in Watsonville, Calif., in Irvine, Calif., and to a limited extent in grower fields starting in 2009. The cultivar is stable and reproduces true to type in successive generations of asexual reproduction.

BRIEF SUMMARY OF THE INVENTION

'Merced' is a short-day (June bearing) type cultivar that produces fruit over an extended period when treated appropriately in arid, sub-tropical climates. When treated with appropriate planting regimes, 'Merced' is similar to 'Camarosa' (U.S. Plant Pat. No. 8,708), but with greater productivity, higher quality fruit, less vigorous plant, and lighter colored fruit. It is also similar to 'Ventana' (U.S. Plant Pat. No. 13,469) and 'Benicia' (U.S. Plant Pat. No. 22,542) but having a more compact plant, later fruiting, superior fruit quality, and firmer, better flavored fruit.

BRIEF DESCRIPTION OF THE DRAWINGS

The figures depict various characteristics of the 'Merced' cultivar.

FIG. **1** shows the general flowering and fruiting characteristics of the plant in a field planting.

FIG. **2** shows two typical leafs at mid-season.

FIG. **3** shows representative mid-season fruit.

FIG. **4** shows a cross-section of representative mid-season fruit.

FIG. **5** shows a top-view of representative mid-season fruit.

DETAILED DESCRIPTION OF THE INVENTION

'Merced' is typical of short-day strawberry cultivars and produces fruit over an extended period when treated appropriately in arid, subtropical climates. The production pattern for 'Merced' is similar to that for 'Camarosa' (U.S. Plant Pat. No. 8,708), although it is somewhat later to initiate fruiting with most cultural treatments. 'Merced' initiates fruiting substantially later than 'Ventana' (U.S. Plant Pat. No. 13,469) and 'Benicia' (U.S. Plant Pat. No. 22,542) when established in very early fall. 'Merced' will be of special interest for winter plantings, where 'Camarosa', 'Ventana', and 'Benicia' have been successful, and in summer plantings where 'Chandler' (U. S. Plant Pat. No. 5,262) and 'Camino Real' (U.S. Plant Pat. No. 13,079) have been successful.

Plants and foliage: With most cultural treatments, fruiting plants of 'Merced' are more open and erect that any of the comparison cultivars, and somewhat smaller than 'Ventana' and 'Benicia' throughout most of the production season. 'Merced' plants are similar in size to 'Camarosa' in most production environments. Comparative statistics of foliar characteristics near mid-season are given for 'Merced' and three comparison cultivars in Table 1. Individual leaflets for 'Merced' are smaller than any of the comparison cultivars, and are less elongated than 'Camarosa' and 'Ventana'. Further, leaves (including petioles) for 'Merced' are slightly shorter than for 'Ventana' and 'Camarosa', and substantially shorter than for 'Benicia'. Petioles for 'Merced' are generally longer and thinner than those of the comparison cultivars. The adaxial (upper) and abaxial (lower) surfaces of leaves for 'Merced' are similar in color to 'Camarosa' and 'Benicia', and darker and less yellow than 'Ventana' leaves at mid-season. Leaves of 'Merced' have consistently more concavity than 'Camarosa', and are similar to those for 'Ventana'. Serrations at mid-season are more pointed than for 'Benicia', but similar in shape and number to 'Ventana' and 'Camarosa'.

TABLE 1

Foliar and plant characteristics for 'Merced', 'Camarosa', 'Ventana', and 'Benicia'.

	Cultivar	
Foliar Character	'Camarosa'	'Ventana'
Plant height (mm)		
mean	227	277
range	190-320	250-300
Plant spread (mm)		
mean	368	425
range	300-465	375-525
Mid-tier leaflet Length (mm)		
mean	85	89
range	70-95	80-110
Width (mm)		
mean	79	77
range	65-90	70-90
Mid-tier leaf Length (mm)		
mean	120	118
range	110-140	100-140
Width (mm)		
mean	143	153
range	120-170	140-160
Leaf components		
Petiole length (mm)		
mean	110	113
range	90-150	80-120
Petiole diameter (mm)		
mean	3.6	5.3
range	3-4	4-7
Petiolule length (mm)		
mean	5.1	6.9
range	4-6	6-8
# leaflets/leaf	3	3
Leaf convexity	most flat to slight concave	flat to very concave

TABLE 1-continued

Foliar and plant characteristics for 'Merced', 'Camarosa', 'Ventana', and 'Benicia'.

Serrations		
number/leaf	20.8	20.6
range	19-23	18-25
shape	semi-pointed	semi-pointed
Leaf pubescence	light-moderate	moderate-heavy
Petiole pubescence		
density	heavy	moderate-heavy
direction	perpendicular	perpendicular to acropetal
Petiole color (Munsell)		
Stipule length (mm)	2.5 GY 8/9	7.5 GY 9/4
mean	27.2	24.0
range	20-34	20-30
Stipule color		
core	2.5 Y 6/8	2.5 GY 8/9
margins	7.5 Y 6/7	5 GY 8/8
Stolon base diameter (mm)	11.7	15.2
Stolons per nursery mother plant	22.7	18.8
Venation		
pattern	pinnate	pinnate
color	7.5 GY 8/7	7.5 GY 9/4
	Cultivar	
Foliar Character	'Benicia'	'Merced'
Plant height (mm)		
mean	245	261
range	220-260	240-290
Plant spread (mm)		
mean	414	374
range	360-500	335-400
Mid-tier leaflet Length (mm)		
mean	80	76
range	70-90	70-80
Width (mm)		
mean	80	77
range	75-80	70-80
Mid-tier leaf Length (mm)		
mean	128	114
range	110-150	90-140
Width (mm)		
mean	161	141
range	150-180	120-160
Leaf components		
Petiole length (mm)		
mean	136	163
range	110-160	140-180
Petiole diameter (mm)		
mean	4.9	4.2
range	4-6	3-5
Petiolule length (mm)		
mean	5.3	8.1
range	4-6	7-9
# leaflets/leaf	3, rarely 4 or 5	3
Leaf convexity	flat to concave	flat to concave

TABLE 1-continued

Foliar and plant characteristics for 'Merced', 'Camarosa', 'Ventana', and 'Benicia'.

Serrations		
number/leaf	20.5	21.0
range	18-23	19-24
shape	Round to semi-pointed	semi-pointed
Leaf pubescence	moderate-light	moderate-heavy
Petiole pubescence		
density	heavy	moderate-heavy
direction	perpendicular	perpendicular
Petiole color (Munsell)		
Stipule length (mm)	7.5 GY 8/10	7.5 GY 8/7
mean	31.1	25.1
range	25-40	18-29
Stipule color		
core	2.5 Y 9/4	2.5 GY 8/8
margins	5 GY 8/8	5 GY 8/8
Stolon base diameter (mm)	16.5	10.3
Stolons per nursery mother plant	22.9	12.1
Venation		
pattern	pinnate	pinnate
color	7.5 GY 8/7	5 GY 8/8

Disease and pest reaction: 'Merced' is moderately resistant to powdery mildew (*Sphaerotheca macularis*), but is moderately susceptible to Anthracnose crown rot (*Colletotrichum acutatum*), and susceptible to *Verticillium* wilt (*Verticillium dahliae*). It is resistant to *Phytophthora* crown rot (*Phytophthora cactorum*) and common leaf spot (*Ramularia tulasnei*) (Table 2). When treated properly, it has tolerance to two-spotted spider mites (*Tetranychus urticae*) equal to that of the comparison cultivars. 'Merced' is tolerant to strawberry viruses encountered in California.

TABLE 2

Disease resistance scores for 'Merced' and three comparison cultivars; *Phytophthora* and *Verticillium* scores were obtained in evaluations conducted in between 2011-2012; *Colletotrichum* was evaluated in 2009.

Genotype	*Phytophthora* Resistance Score (5 = best)	*Verticillium* Resistance Score (5 = best)	*Colletotrichum* Resistance Score (5 = best)
'Camarosa'	3.6	3.1	2.9
'Ventana'	2.5	3.1	3.2
'Benicia'	3.8	1.6	2.6
'Merced'	5.0	2.8	2.9

Flowering, fruiting, fruit, and production characteristics: 'Merced' is similar to other California short-day strawberry cultivars (e. g. 'Ventana', 'Camarosa', and 'Benicia') in that it will flower over an extended period and into spring or summer, given appropriate local temperature and horticultural conditions. With most planting treatments 'Merced' produces fruit later than 'Ventana' and 'Benicia' but earlier than 'Camarosa'. Comparative statistics for flower and fruit characters near mid-season are given for the four cultivars in Table 4. The primary flowers for 'Merced' are similar in size to 'Camarosa', with a calyx that is distinctly larger than the corolla on primary fruit. The flowers are smaller than for 'Benicia' and 'Ventana'. The calyx for 'Merced' varies in position but frequently has a slight indent early in the season. Each primary flower has 6-7 petals, similar to the comparison cultivars on average. The fruit shape for 'Merced' can vary but is typically medium to long conic, which is rarely flattened or slightly obovate. It is easily distinguished by fruit shape from 'Camarosa' (shortened and flattened conic), or 'Ventana' (medium symmetrical conic), and 'Benicia' (often flattened). External and internal fruit color for 'Merced' is lighter than that of 'Camarosa' and 'Benicia', and similar to that of 'Ventana' (Table 3). Achenes vary from yellow to dark red, and are even with the fruit surface or slightly extruded.

'Merced' has been tested under a variety of cultural regimes, and optimal performance is obtained when nursery treatments and nutritional programs similar to those of 'Camarosa', 'Ventana', and 'Benicia' are used. In general, plants of 'Merced' are similar in vigor to 'Camarosa', and less vigorous than 'Ventana' with very early season planting. 'Merced' retains excellent fruit quality in summer planting systems.

When treated with appropriate planting regimes, 'Merced' has larger fruit and produces individual-plant yields greater than any of the comparison cultivars (Table 5). Commercial appearance ratings have also been better than those for all of the comparison cultivars, especially in comparison with 'Camarosa'. Fruit from 'Merced' is substantially firmer than fruit from 'Ventana', but similar in firmness to the other comparison cultivars. Subjectively, 'Merced' has outstanding flavor. The fruit will be exceptional for both fresh market and processing, and will be useful for home gardening purposes.

TABLE 3

Foliar and fruit color characteristics for 'Merced' and three comparison cultivars.

	Cultivar			
Color Character	'Camarosa'	'Ventana'	'Benicia'	'Merced'
Leaf color (CIELAB) Adaxial				
L*				
mean	38.3	39.2	35.0	37.9
range	37.3-39.8	36.0-41.1	33.3-36.4	35.1-39.2
a*				
mean	−12.2	−14.3	−11.7	−13.5
range	−9.5-15.5	−12.9-16.7	−10.3-13.5	−10.9-15.8
b*				
mean	16.9	20.6	16.9	18.1
range	13.3-19.9	17.3-24.8	13.1-21.7	14.6-20.6
Munsell	5 GY 5/5	2.5 GY 6/8	5 GY 5/6	5 GY 5/6
Abaxial				
L*				
mean	52.5	53.2	48.5	50.2
range	51.3-54.6	51.8-54.6	41.7-52.3	40.0-53.8
a*				
mean	−13.1	−14.2	−13.5	−14.0
range	−11.4-14.9	−13.9-14.7	−11.9-16.8	−12.9-15.7
b*				
mean	20.5	21.7	20.0	21.3
range	18.9-22.4	20.3-23.3	17.9-21.9	19.1-23.8
Munsell	7.5 GY 8/7	10 GY 8/7	7.5 GY 5/7	10 GY 8/7

TABLE 3-continued

Foliar and fruit color characteristics for 'Merced' and three comparison cultivars.

	Cultivar			
Color Character	'Camarosa'	'Ventana'	'Benicia'	'Merced'
Fruit color (CIELAB)				
External				
L*				
mean	38.6	38.1	36.0	36.9
range	34.7-42.7	37.6-39.0	34.2-37.5	35.3-39.0
a*				
mean	34.4	33.4	31.2	33.0
range	33.6-36.2	29.4-38.7	26.6-36.3	30.1-35.1
b*				
mean	22.5	19.2	14.2	16.7
range	18.8-29.3	17.8-21.1	10.6-17.3	14.2-18.5
Munsell	7.5 R 4/11	5 R 4/12	2.5 R 4/0	5 R 3/7
Internal				
L*				
mean	50.2	48.6	44.0	52.1
range	46.6-53.3	46.2-52.3	40.8-47.0	45.5-56.6
a*				
mean	30.8	28.9	30.9	24.1
range	25.6-35.4	23.5-33.0	27.8-33.6	17.9-33.5
b*				
mean	30.1	31.3	27.5	29.8
range	28.0-32.0	30.6-32.5	24.6-28.8	25.2-33.5
Munsell	7.5 R 5/13	7.5 R 6/13	5 R 4/2	7.5 R 6/12
Achene color	2.5 Y 7/10	10 Y 8/11	5 R 3/7	5 R 3/7
Munsell				

TABLE 4

Flower and fruit characteristics for 'Merced' and three comparison cultivars.

	Cultivar	
Character	'Camarosa'	'Ventana'
Petal number		
mean	5.8	6.2
range	5-7	5-7
Petal shape		
apex	truncate to slightly	truncate to slightly
base	obtuse	obtuse
margin	attenuate	attenuate
	entire	entire
Petal length (mm)		
mean	11.5	13.3
range	10-13	11-15
Petal width (mm)		
mean	12.0	14.6
range	10-14	13-16
Flower position (relative to foliage)	most even some exposed	even to exposed
Calyx diam. (mm)		
mean	40.4	47.0
range	33-47	40-50

TABLE 4-continued

Flower and fruit characteristics for 'Merced' and three comparison cultivars.

Corolla diam. (mm)		
mean	26.1	39.0
range	23-31	35-45
Sepal length (mm)		
mean	14.3	16.6
range	12-18	14-19
Sepal width (mm)		
mean	8.3	8.4
range	7-10	7-10
Sepal color (Munsell)	5 GY 7/10	5 GY 5/5
Pedicel length (mm)		
mean	155	115
range	130-180	90-140
Pedicel diameter (mm)		
mean	2.7	3.5
range	2-4	3-4
Pedicel color	7.5 GY 8/7	5 GY 8/9
Fruit shape		
Fruit length (mm)		
mean	46.0	48.4
range	40-48	47-52
Fruit width (mm)		
mean	37.4	42.6
range	33-46	40-46
Length/width		
ratio	1.26	1.17
range	1.0-1.4	1.1-1.2
subjective	Obovate-flat	Medium conic
Primary/secondary fruit comparison		
size (subjective)	50-70%	55-75%
shape	similar shape, more conic	similar shape
Extent/size of hollow core	small-absent	Small
Calyx		
position	indented-neck	indent-reflexed
size relative to fruit	equal or less than fruit diameter	equal or less than fruit diameter
Seed position	indented-extruded	mostly even
Adherence of Calyx to Fruit	Weak	Intermediate

	Cultivar	
Character	'Benicia'	'Merced'
Petal number		
mean	6.1	5.9
range	5-7	5-7
Petal shape		
apex	truncate to slightly	truncate to slightly
base	obtuse	obtuse
margin	attenuate	attenuate
	entire	entire

TABLE 4-continued

Flower and fruit characteristics for 'Merced' and three comparison cultivars.

Petal length (mm)		
mean	11.7	13.6
range	8-13	10-15
Petal width (mm)		
mean	14.4	14.9
range	8-13	12-16
Flower position (relative to foliage)	even to exposed	even to exposed
Calyx diam. (mm)		
mean	50.8	39.1
range	47-53	33-45
Corolla diam. (mm)		
mean	39.6	27.4
range	39-41	24-31
Sepal length (mm)		
mean	16.4	13.5
range	13-20	10-17
Sepal width (mm)		
mean	8.4	8.0
range	7-10	6-9
Sepal color (Munsell)	10 GY 8/7	7.5 GY 4/4
Pedicel length (mm)		
mean	183	185
range	150-210	150-220
Pedicel diameter (mm)		
mean	3.7	3.5
range	3-5	2-5
Pedicel color	2.5 GY 8/9	2.5 GY 9/8
Fruit shape		
Fruit length (mm)		
mean	46.5	52.3
range	41-52	49-62
Fruit width (mm)		
mean	42.4	47.4
range	36-46	43-54

TABLE 4-continued

Flower and fruit characteristics for 'Merced' and three comparison cultivars.

Length/width		
ratio	1.08	1.15
range	1.0-1.2	1.0-1.2
subjective	Medium conic	Medium-long conic
Primary/secondary fruit comparison		
size (subjective)	55-65%	60-75%
shape	similar shape	similar shape
Extent/size of hollow core	small-absent	small-absent
Calyx		
position	even-indented	even-reflexed
size relative to fruit	equal or greater than fruit diameter	equal or greater than fruit diameter
Seed position	even-indented	even-extruded
Adherence of Calyx to Fruit	Weak	Weak

Flower and plant measurements were obtained in April 2012. Fruit measurements were obtained in between May 10-20, 2012.

TABLE 5

Performance of 'Merced' and three comparison cultivars were evaluated in Watsonville, CA, in between 2010-12. All plants for these trials were harvested from a commercial nursery near Macdoel, CA, in between October 15-16, and transplanted after 6-7 days to supplemental storage. Fruit harvest was initiated in early April and continued through the last week of August. (52" 2-row beds, 17,300 plants/acre).

Item	Yield (g/plant)	Appearance Score (5 = best)	Fruit Size (g/fruit)	Firmness
'Camarosa'	1,960	2.9	28.5	11.7
'Ventana'	2,112	3.2	31.3	10.4
'Benicia'	1,959	3.5	34.2	11.1
'Merced'	2,339	4.3	35.0	11.9

What is claimed is:

1. A new and distinct cultivar of strawberry plant having the characteristics substantially as described and illustrated herein.

* * * * *

FIG. 1

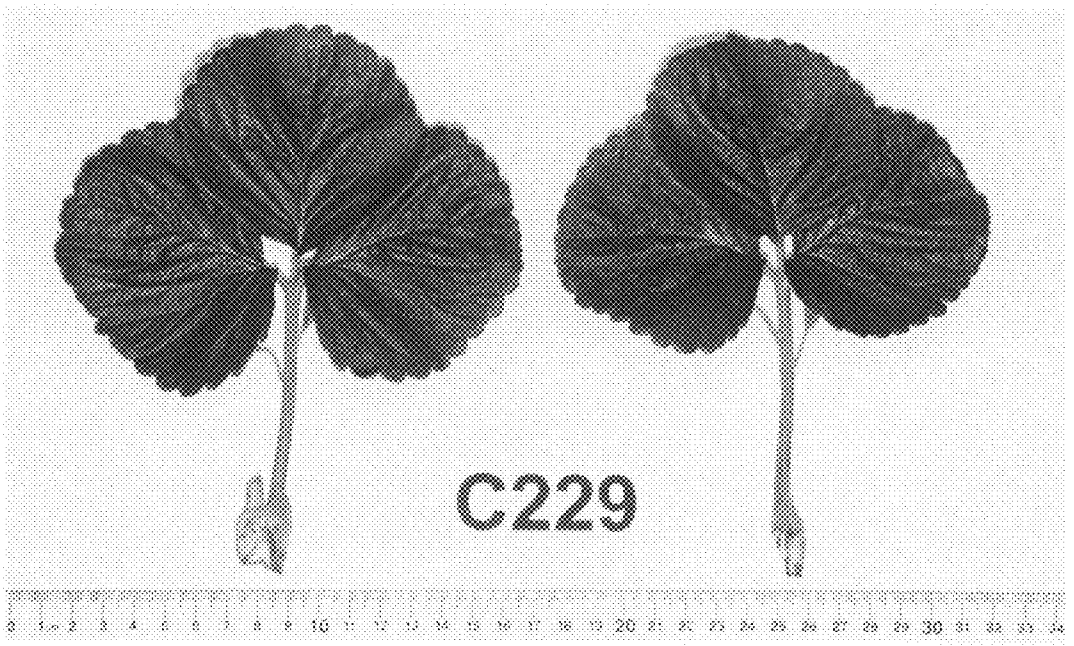

FIG. 2

FIG. 3

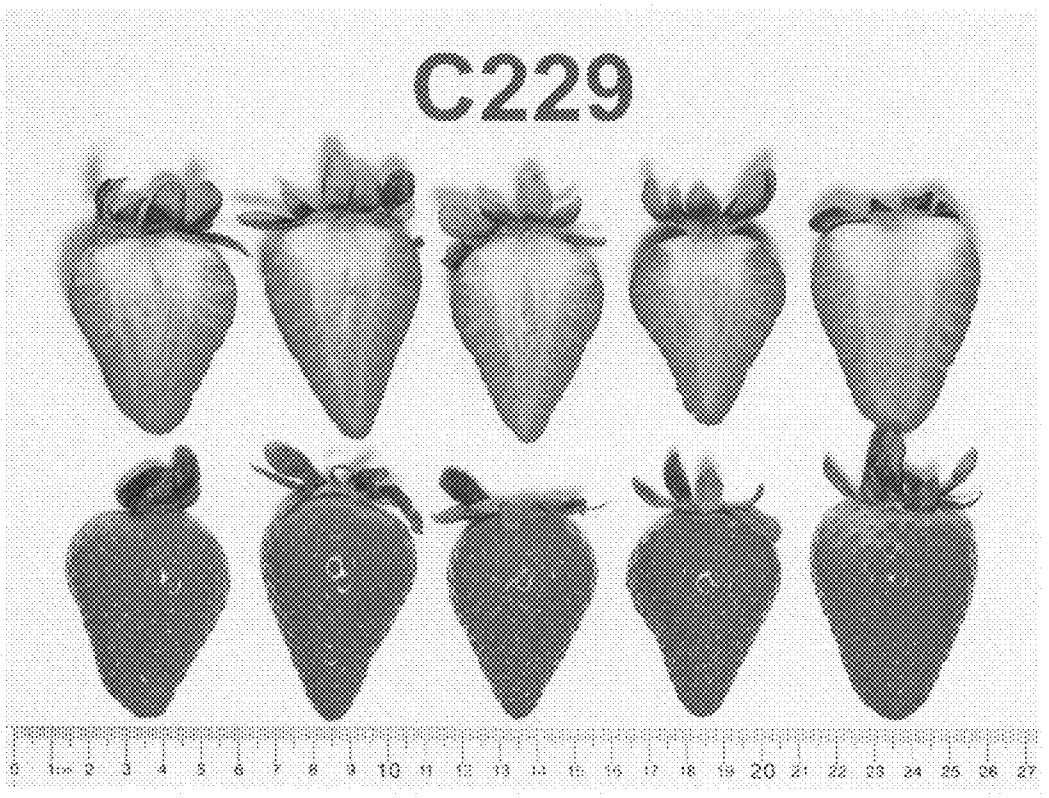

FIG. 4

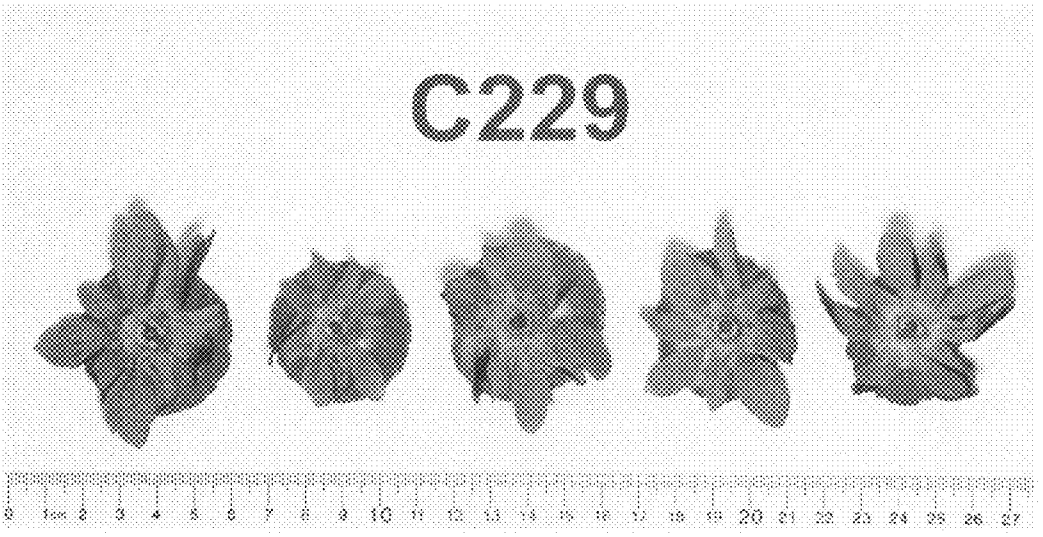

FIG. 5