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Shaw et al.

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

(50) Latin Name: *Fragaria×ananassa*
Varietal Denomination: **Palomar**

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(58) **Field of Classification Search** Plt./208, Plt./209
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(57) **ABSTRACT**

This invention relates to a new and distinctive short-day type cultivar designated as 'Palomar'. 'Palomar' is a short-day (June-bearing) cultivar similar to 'Camino Real' (U.S. Plant Pat. No. 13,079), but with higher quality fruit, lower cull rate and lighter colored fruit; it is similar to 'Ventana' (U.S. Plant Pat. No. 13,469), but with a more compact plant, superior fruit quality, and firmer, better flavored fruit.

4 Drawing Sheets

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

Variety denomination: The variety denomination is 'Palomar'.

BACKGROUND OF THE INVENTION

'Palomar' originated from a cross performed in 2000 between the cultivars 'Camino Real' (U.S. Plant Pat. No. 13,079) and 'Ventana' (U.S. Plant Pat. No. 13,469). Because 'Palomar' was isolated from pooled seed from a reciprocal cross, it is not known which parent is the maternal parent and which is the paternal parent. 'Palomar' was first fruited near Winters, Calif. in 2001, where it was selected, originally designated Cal 0.259-2, and propagated asexually by runners. Following selection and during testing, the plant was designated 'C221'. Asexual propagules from this original source have been tested in Watsonville, Calif., Irvine, Calif., and to a limited extent in grower fields starting in 2002. The properties of this variety were found to be transmissible by such asexual reproduction. The cultivar is stable and reproduces true to type in successive generations of asexual reproduction.

BRIEF SUMMARY OF THE INVENTION

This invention relates to a new and distinctive short-day type cultivar designated as 'Palomar'. 'Palomar' is a short-day (June bearing) cultivar similar to 'Camino Real' (U.S. Plant Pat. No. 13,079) but with higher quality fruit, lower cull rate and lighter colored fruit; it is similar to 'Ventana' (U.S. Plant Pat. No. 13,469) but with a more compact plant, superior fruit quality, and firmer, better flavored fruit.

BRIEF DESCRIPTION OF THE DRAWINGS

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

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

FIG. **2** shows a typical leaf at mid-season.

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

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

DETAILED DESCRIPTION OF THE INVENTION

This invention relates to a new and distinctive short-day type cultivar designated as 'Palomar'. 'Palomar' 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 'Palomar' is similar to that for 'Camarosa' (U.S. Plant Pat. No. 8,708) and 'Camino Real' (U.S. Plant Pat. No. 13,079), although it is somewhat earlier to initiate fruiting with most cultural treatments. 'Palomar' initiates fruiting somewhat earlier than 'Ventana' (U.S. Plant Pat. No. 13,469) when established in very early fall and somewhat later than 'Ventana' when established in mid to late fall. 'Palomar' will be of special interest for winter plantings, where 'Camarosa', 'Ventana' and 'Camino Real' have been successful, and in summer plantings where 'Pajaro' (U.S. Plant Pat. No. 4,538) and 'Chandler' (U.S. Plant Pat. No. 5,262) have been successful.

Plants and foliage: Fruiting plants of 'Palomar' are similar in morphology to 'Ventana' although slightly more erect and much smaller throughout most of the production season; 'Palomar' plants are slightly larger and less open than those of 'Camino Real' in most production environments. Comparative statistics for foliar characters near mid-season are given for 'Palomar' and three comparison cultivars in Table 1. Individual leaflets for 'Palomar' are smaller and less rounded than for 'Camarosa' or 'Camino Real', similar in shape to but smaller than for 'Ventana'. Leaves (including petioles) for 'Palomar' are shorter than those for the comparison cultivars, mostly due to shorter

petiole length. Petioles for 'Palomar' are generally thicker than those of the comparison cultivars relative to their length and tend to have moderate or heavy pubescence. The adaxial (upper) and abaxial (lower) surfaces of leaves for 'Palomar' are similar in color to 'Camarosa' and lighter than for 'Camino Real' leaves at mid season; they tend to remain darker and less yellow than those for 'Ventana' late in the harvest season. Leaves of 'Palomar' have consistently more concavity than 'Camarosa', less concavity than 'Camino Real' and are similar to those for 'Ventana'. Serrations at mid season are more pointed than for 'Camarosa', similar in shape and number to 'Ventana' and 'Camino Real'.

TABLE 1

Foliar and plant characteristics for 'Palomar', 'Camarosa', 'Camino Real', and 'Ventana'.

	Cultivar			
Foliar Character	'Camarosa'	'Camino Real'	'Ventana'	'Palomar'
Plant height (mm)				
mean	254	249	271	196
range	203-279	229-279	254-292	152-229
Plant spread (mm)				
mean	427	418	468	391
range	394-493	330-495	343-521	305-432
Mid-tier leaflet Length (mm)				
mean	83.5	79.5	87.2	75.5
range	70-100	70-95	70-110	70-100
Width (mm)				
mean	85.5	85	76.1	71.5
range	70-100	70-100	60-85	65-80
Mid-tier leaf Length (mm)				
mean	269	265	281	211
range	217-311	225-313	205-341	150-298
Width (mm)				
mean	132	133	156	122
range	115-150	110-145	140-170	90-175
Leaf components Petiole length (mm)				
mean	177	180	187	130
range	140-200	150-210	130-230	75-190
Petiole diameter (mm)				
mean	3.8	3.8	3.6	3.6
range	3-5	3-5	3-4	3-4
Petiolule length (mm)				
mean	9.3	6.4	6.9	6.3
range	7-11	5-8	5-9	5-8
# leaflets/leaf	3	3, rarely 4 or 5	3	3, rarely 4
Leaf convexity	flat-convex, most slightly concave	very concave	flat to very concave	concave to very concave
Serrations				
number/leaf	19.1	20.8	20.3	18.9
range	18-20	16-26	17-26	12-22

TABLE 1-continued

Foliar and plant characteristics for 'Palomar', 'Camarosa', 'Camino Real', and 'Ventana'.

	Cultivar			
Foliar Character	'Camarosa'	'Camino Real'	'Ventana'	'Palomar'
shape	rounded, some semi-pointed	semi-pointed	semi-pointed	semi-pointed
Leaf pubescence	light-moderate	light-moderate	moderate-light	moderate
Petiole pubescence				
density	heavy	moderate-heavy	heavy	moderate-heavy
direction	perpen-dicular	perpendicu-lar to acropetal	perpen-dicular	perpen-dicular
Petiole color (Munsell)	5 GY 8/8	5 GY 8/8	7.5 GY 8/7	5 GY 8/8
Stipule length (mm)				
mean	17.6	19.1	19.4	18.7
range	10-24	15-25	15-25	12-23
Stipule color				
core	7.5 GY 8/7	2.5 GY 5/5	2.5 GY 6/8	5 GY 8/8
margins	2.5 GY 8/9	2.5 GY 4/3	2.5 GY 6/8	2.5 GY 6/8
Stolon base diameter (mm)	3	3	2.4	2.6
Stolons per nursery mother plant	42.6	33.7	23.7	36.7
Venation				
pattern	pinnate	pinnate	pinnate	pinnate
color	5 GY 4/3	7.5 GY 4/3	2.5 GY 4/3	5 GY 4/3

Disease and pest reaction: 'Palomar' is moderately resistant to powdery mildew (*Sphaerotheca macularis*), Anthracnose crown rot (*Colletotrichum acutatum*), and *Verticillium* wilt (*Verticillium dahliae*); it is moderately susceptible 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 for the comparison cultivars. 'Palomar' is tolerant to strawberry viruses encountered in California.

TABLE 2

Disease resistance scores for 'Palomar' and three comparison cultivars; *Phytophthora* and *Verticillium* scores were obtained in evaluations conducted in 2004-2006, *Colletotrichum* was evaluated in 2005-2006.

Genotype	*Phytophthora* Resistance Score (5 = best)	*Verticillium* Resistance Score (5 = best)	*Colletotrichum* Resistance Score (5 = best
'Camarosa'	3.6	2.5	2.6
'Camino Real	4.4	4.2	3.1
'Ventana'	2.5	3.0	3.0
'Palomar'	2.4	3.3	3.2

Flowering, fruiting, fruit and production characteristics: 'Palomar' is similar to other California short-day strawberry cultivars (e.g., 'Ventana', 'Camarosa', and 'Camino Real') in that it will flower over an extended period and into spring or summer, given appropriate local temperature and horticultural conditions. With very early planta-

tion establishment (before October 1 in California) 'Palomar' produces fruit earlier than the comparison cultivars but with greater within-season variation than 'Ventana'. With later plantation establishment 'Palomar' initiates fruit later than 'Ventana' and is similar in production timing to 'Camino Real' and 'Camarosa'. Comparative statistics for flower and fruit characters near mid-season are given for the four cultivars in Table 3. The primary flowers for 'Palomar' are similar in size to the comparison cultivars with a calyx that is distinctly larger than the corolla on primary fruit; the sepals are similar in length and shape to 'Camarosa' and 'Ventana', but less wide than for 'Camino Real'. The calyx for 'Palomar' varies in position but is usually neither indented nor extended on the neck of the fruit; each primary flower has 5–7 petals. The petals are white on the upper and lower surfaces. The fruit shape for 'Palomar' can vary but is typically a short and symmetrical conic. It is easily distinguished by fruit shape from 'Camarosa' (shortened and flattened conic) or 'Ventana' (long conic); 'Palomar' usually has a greater proportion of symmetrical fruit than the comparison cultivars. External and internal fruit color for 'Palomar' is lighter than for 'Camarosa' and much lighter than for 'Camino Real', similar in color to 'Ventana' (Table 4). Achenes vary from yellow to dark red, and are even with the fruit surface or slightly indented (Table 6).

TABLE 3

Flower and fruit characters for 'Palomar' and three comparison cultivars.

Character	Cultivar 'Camarosa'	'Camino Real'	'Ventana'	'Palomar'
Petal number				
mean	5.5	6.4	6.3	5.8
range	5-7	5-7	5-7	5-7
Petal shape				
apex	truncate to slightly obtuse	truncate to slightly obtuse	truncate to slightly obtuse	truncate to slightly obtuse
base	attenuate	attenuate	attenuate	attenuate
margin	entire	entire	entire	entire
Petal length (mm)				
mean	15.2	17.7	18.5	16.4
range	7-19	15-20	15-20	15-19
Petal width (mm)				
mean	14.1	17.3	18.8	17.4
range	7-16	15-20	16-20	15-20
Flower position (relative to foliage)	most even some exposed	exposed	even to exposed	even to exposed
Calyx diam.(mm)				
mean	57.5	58.5	58	59
range	40-70	50-70	48-70	50-70
Corolla diam.(mm)				
mean	43.1	45.6	55.1	44.3
range	30-52	39-55	43-67	38-53
Sepal length (mm)				
mean	24	24.5	23	25.1

TABLE 3-continued

Flower and fruit characters for 'Palomar' and three comparison cultivars.

Character	Cultivar 'Camarosa'	'Camino Real'	'Ventana'	'Palomar'
range	13-30	20-35	20-25	20-30
Sepal width (mm)				
mean	12.8	15.3	11.1	12.8
range	5-20	8-20	8-15	10-17
Sepal color (Munsell)	2.5 GY 5/5	5 GY 5/6	5 GY 6/8	5 GY 5/6
Pedicel length (mm)				
mean	130	85	129	128
range	110-150	70-110	100-150	110-150
Pedicel diameter (mm)				
mean	3.7	3	3.7	3.7
range	3-4.5	2-4	3-5	3-4.5
Pedicel color	5 GY 6/8	2.5 GY 6/8	5 GY 5/6	5 GY 8/8
Fruit shape				
Fruit length (mm)				
mean	85	68	72.2	71.7
range	50-130	50-100	60-100	52-91
Fruit width (mm)				
mean	70	62	63.3	64.2
range	50-100	40-90	50-80	52-81
Length/width				
ratio	1.2	1.1	1.2	1.1
range	0.7-2.1	0.8-1.4	0.9-1.4	0.9-1.3
subjective	Obovate-flat	Short conic	Medium conic	Short conic
Primary/ secondary fruit comparison				
size (subjective)	40-60%	70-80%	50-60%	50-60%
shape	similar shape, more conic	similar shape	similar shape	similar shape
Extent/size of hollow core	small-absent	absent	small	small-absent
Calyx				
position	indented-neck	even-indented	even-reflexed	even-indented
size relative to fruit	equal or less than fruit diameter	equal or greater than fruit diameter	equal or less than fruit diameter	equal or greater than fruit diameter
Seed position	indented-extruded	even-indented	even-extruded	even-indented
Adherence of Calyx to Fruit	weak	strong	intermediate	weak

Flower measurements obtained on Mar. 21, 2005, fruit measurements on May 9, 2005.

TABLE 4

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

Color Character	Cultivar 'Camarosa'	'Camino Real'	'Ventana'	'Palomar'
Leaf color (CIELAB) Adaxial L*				
mean	34.5	29.7	33.8	32.2
range	31.6-37.9	27.3-31.5	31.4-35.9	30.6-34.9
a*				
mean	−11	−8	−11.2	−9.5
range	−9.2--12.4	−6.3--9.9	−9.1--13.7	−8.5--11.2
b*				
mean	16.7	10.2	15.5	12.4
range	12.8-18.5	8.2-12.5	12.4-19.7	10.9-15.0
Munsell	5 GY 4/3	5 GY 4/3	5 GY 5/6	5 GY 4/3
Abaxial L*				
mean	50.8	48	40	49.8
range	48.6-52.7	47.6-49.0	46.8-51.5	47.2-52.3
a*				
mean	−9.4	−9.4	−9	−9.3
range	−7.9--10.6	−8.2--10.1	−8.0--9.8	−8.0--9.8
b*				
mean	19.4	16.4	17.7	15.7
range	17.0-22.3	15.0-18.1	15.4-21.3	13.8-16.9
Munsell	5 GY 6/8	5 GY 6/8	7.5 GY 7/9	5 GY 7/10
Fruit color (CIELAB) External L*				
mean	39.2	33.7	38.4	39.3
range	37.1-42.4	29.0-39.4	34.4-42.9	36.5-44.8
a*				
mean	40.6	36.4	40.5	43.1
range	35.8-43.5	31.4-41.2	33.5-46.5	38.1-47.9
b*				
mean	25.6	20.2	25.7	27.4
range	22.1-28.9	13.6-27.5	19.7-29.5	21.7-34.1
Munsell	7.5 R3/6	5 R 3/7	5 R 3/7	7.5 R 4/11
Internal L*				
mean	60.4	56.6	61.4	59.1
range	53.9-67.8	49.2-61.6	54.7-68.8	46.5-64.1
a*				
mean	35.4	36.3	33.1	29.3
range	27.4-43.4	29.7-41.2	23.7-39.5	22.9-36.4
b*				
mean	36.3	35.8	34.1	30.9
range	27.4-45.7	30.6-40.9	27.6-40-2	24.3-37.4
Munsell	7.5 R 4/11	7.5 R 5/13	7.5 R 6/12	7.5 R 7/9
Achene color				
Munsell	7.5 R 3/6	5 R 3/7	5 R 4/12	5 R 3/7

*CIELAB is the abbreviation of the international color system known as "Commission Internationale de l'Eclairage" 1978. For recommendations concerning uniform color spaces, color difference equations, and psychometric color terms see Supplement No. 2 of CIE Publication No. 15, Paris.

'Palomar' has been tested under a variety of cultural regimes, and optimal performance is obtained when nursery treatments and nutritional programs similar to those for 'Camarosa', 'Ventana', and 'Camino Real' are used. In general, 'Palomar' is less vigorous than 'Camarosa' or 'Ventana' with very early season planting is less sensitive to excess chilling than 'Ventana'. 'Palomar' retains excellent fruit quality in summer planting systems.

When treated with appropriate planting regimes, 'Palomar' has larger fruit and produces individual-plant yields to similar to that of 'Camarosa'; it produces less fruit per plant but develops larger and higher quality fruit than 'Ventana' (Table 5). 'Palomar' has a similar production pattern to 'Camino Real' with most cultural treatments, although the production is less peaked and it is substantially more adapted to early-season winter planting. Commercial appearance ratings have been better than those for all of the comparison cultivars, especially 'Camarosa'; those superior appearance scores translate directly into a larger fraction of marketable fruit than is produced by the comparison cultivars. Fruit for 'Palomar' is substantially firmer than fruit from 'Ventana', similar in firmness to the other comparison cultivars. Subjectively, 'Palomar' has outstanding flavor. The fruit will be exceptional for both fresh market and processing, and will be useful for home garden purposes.

TABLE 5

Performance of 'Palomar' and three comparison cultivars evaluated at the Watsonville Research Facility in 2004-6. All plants for these trials were harvested from a commercial nursery near Macdoel, CA on October 15-16, and transplanted after 6-15 days 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'	2,086	3.1	26.1	9.9
'Camino Real'	2,086	3.5	31.3	9.8
'Ventana'	2,331	3.4	30.6	8.8
'Palomar'	2,031	3.7	30.2	10.2

*Fruit firmness ratings are the amount of force in tenths of pounds required to drive a 3 mm flat probe 1 cm into a ripe fruit. This is measured with a Hunter Force Guage.

TABLE 6

Achenes number per fruit and size for 'Palomar' and three comparison cultivars.

Cultivar	Sample	Weight (g)	Seed Count	Seed/g	Achene Size (mm)
'Camarosa'	1	45	427	9.49	
	2	47	577	12.28	
	3	47	502	10.68	
	Average	46.33	502.00	10.82	1.3 × 1.7
'Ventana'	1	44	441	10.02	
	2	41	471	11.49	
	3	54	491	9.09	
	Average	46.33	467.67	10.20	1.2 × 1.6
'Camino'	1	42	371	8.83	
	2	45	470	10.44	
	3	38	447	11.76	
	Average	41.67	429.33	10.35	1.3 × 1.75
'Palomar'	1	38	463	12.18	
	2	36	458	12.72	
	3	29	450	15.52	
	Average	34.33	457.00	13.47	1.2 × 1.4

* The seed count is the number of seed per fruit. The seed/g is the number of seeds per gram of fresh fruit weight because the fruit size differs. The averages may vary depending on culture conditions and regimen.

What is claimed is:

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

* * * * *

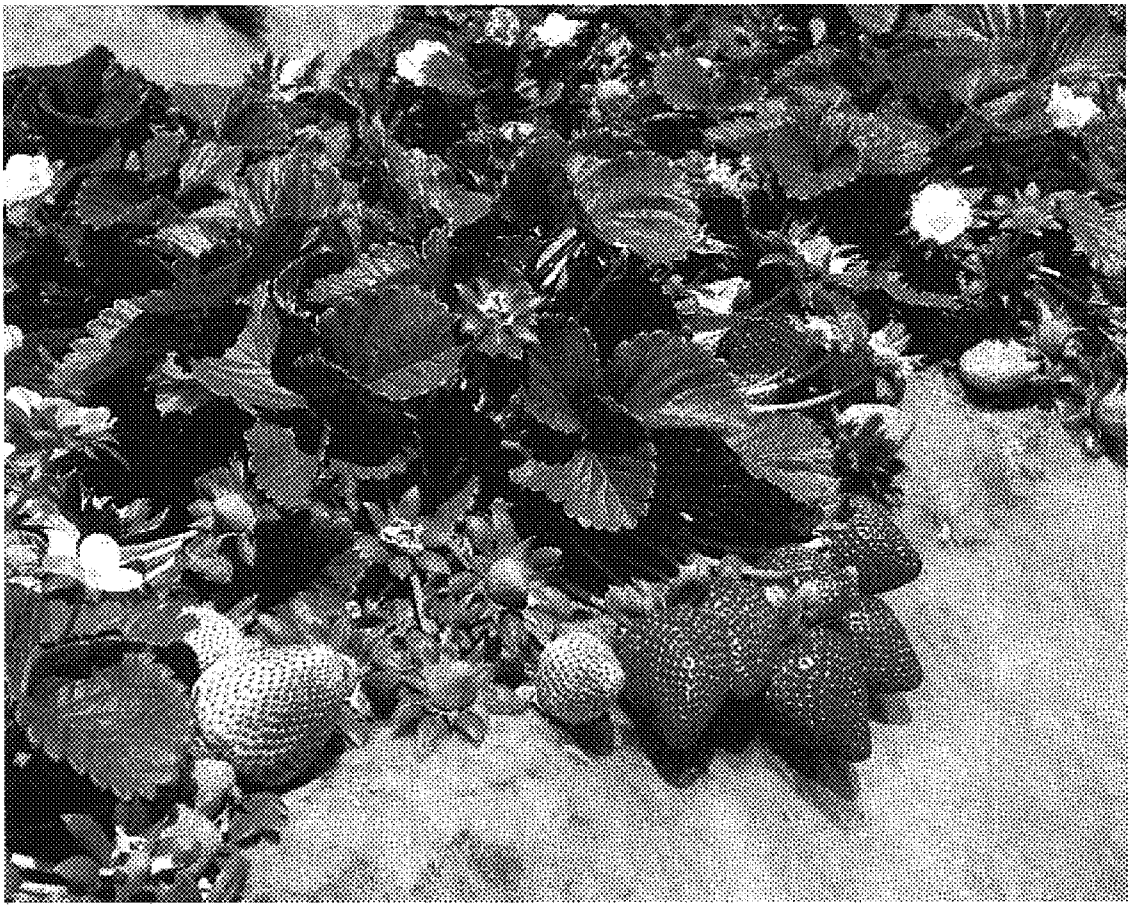

FIG. 1

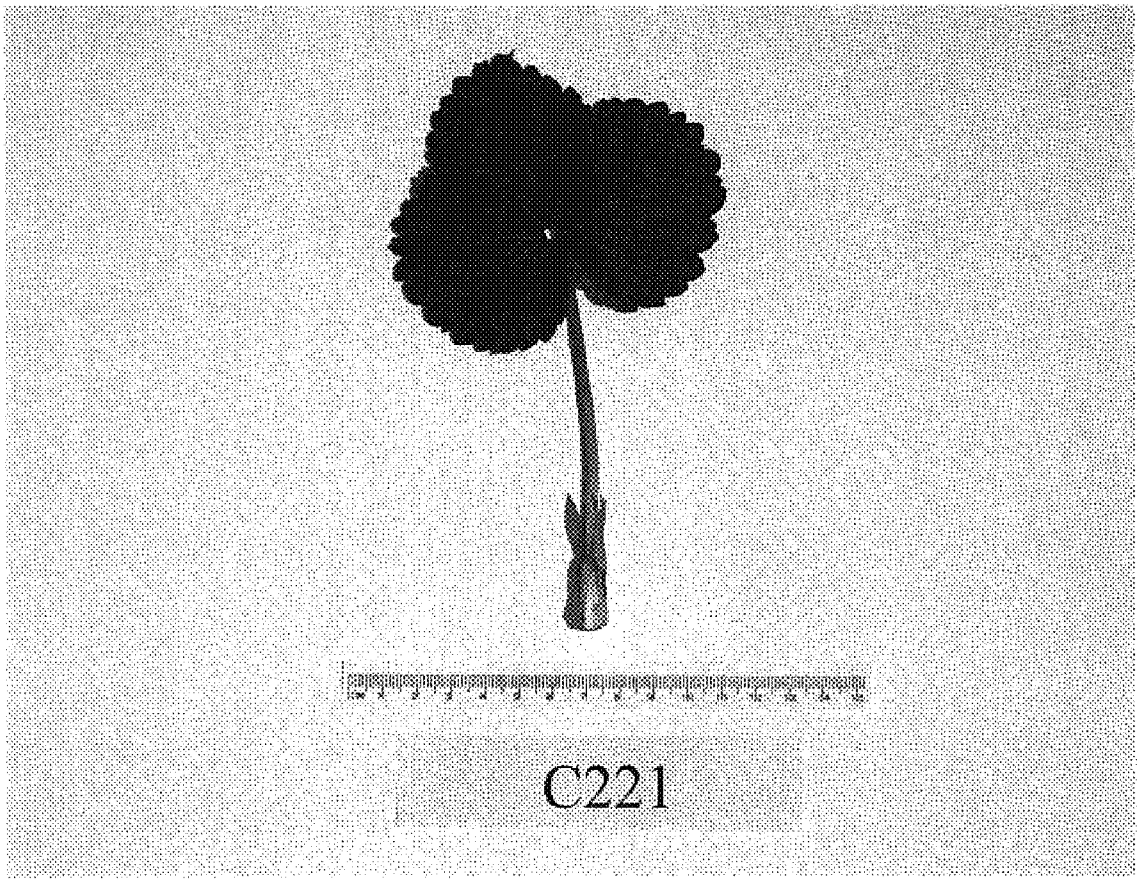

FIG. 2

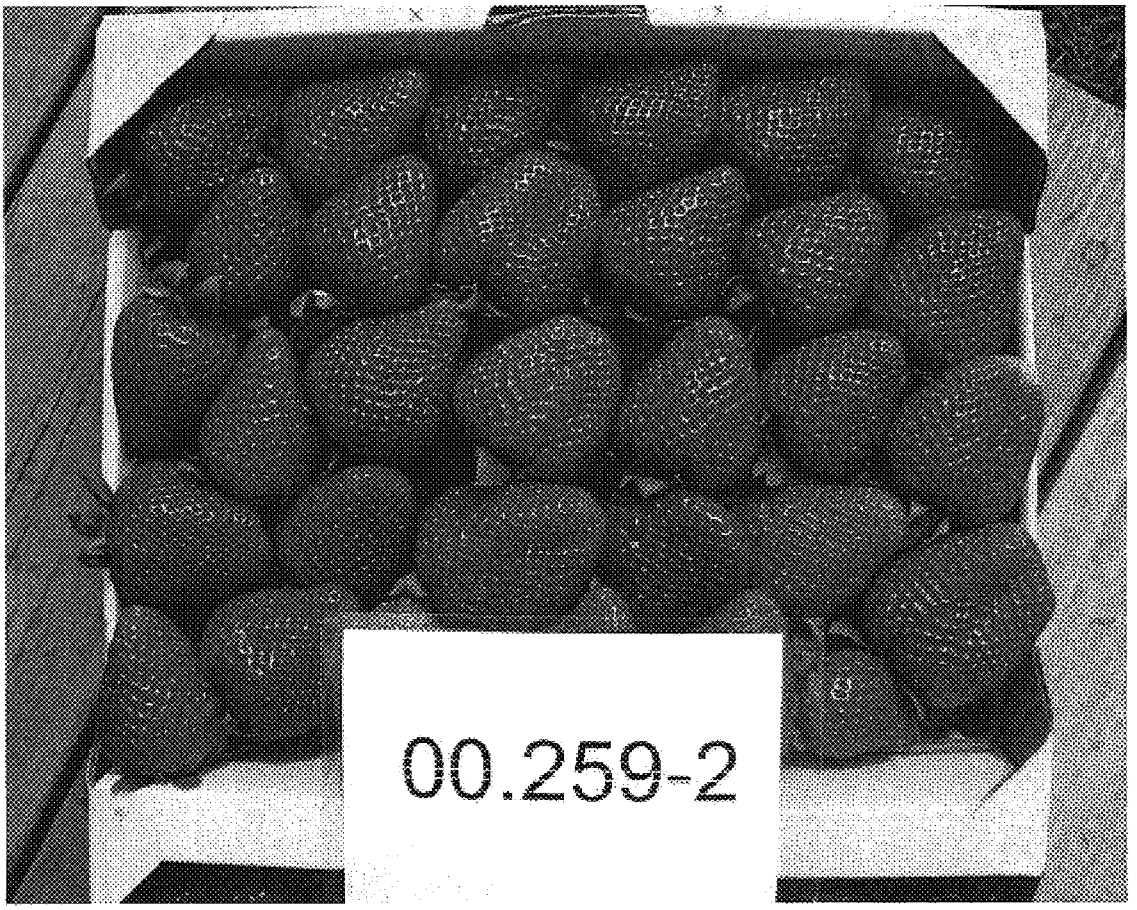

FIG. 3

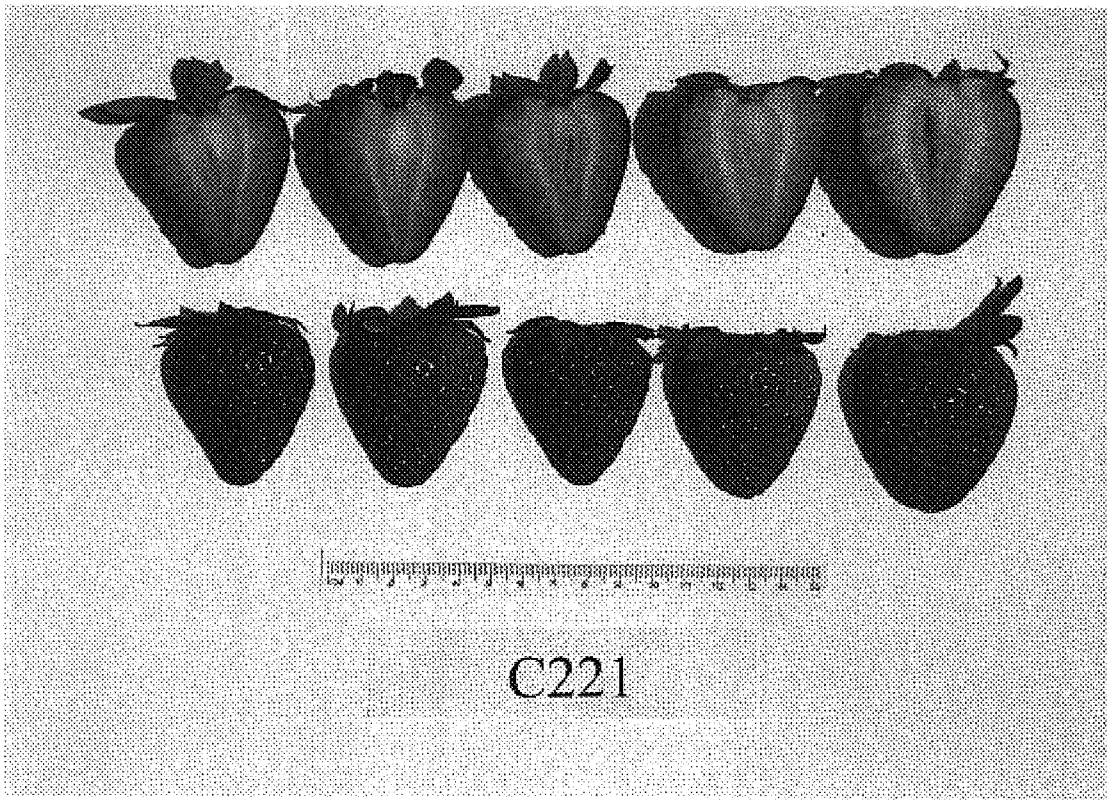

FIG. 4