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**Mowrey et al.**

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(54) **STRAWBERRY PLANT NAMED ‘SONORA’**

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(57) **ABSTRACT**

This invention relates to a new and distinct variety of strawberry named ‘Sonora’. The present variety is similar to the varieties ‘Commander’, ‘San Juan’ and ‘Ana Maria’. The present variety is fully everbearing, and is further distinguished from ‘Commander’, ‘San Juan’ and ‘Ana Maria’, in particular, by its flat globose habit, strong interveinal blistering, weak leaf glossiness, rounded terminal leaflet shape of base and teeth, sparse petiole pubescence, dense to very dense stolon pubescence, a position of inflorescence above the foliage, larger calyx diameter relative to the corolla, a semi-erect attitude of the fruiting truss at first picking, predominantly conical fruit, very slight to slight differences between shapes of primary and secondary fruits, very narrow to narrow band without achenes, very weak unevenness of surface of the fruit, weak to medium glossiness of the fruit, spreading to reflexed pose of the calyx segments, even flesh color of the fruit, and absent to small hollow center size.

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(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 3 days.

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(51) **Int. Cl.**<sup>7</sup> ..... **A01H 5/00**

(52) **U.S. Cl.** ..... **Plt./209**

(58) **Field of Search** ..... **Plt./209**

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**5 Drawing Sheets**

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**BACKGROUND OF THE INVENTION**

The new variety, ‘Sonora’, originated as a result of a controlled cross between the strawberry plants ‘33x257’ and ‘L2’ (both unpatented varieties of Driscoll Strawberry Associates, Inc.) in an ongoing breeding program, and was discovered as a seedling in a controlled breeding plot in Monterey County, Calif. The original seedling of the new cultivar was asexually propagated by stolons at a Nursery in McArthur, Shasta County, Calif. Propagules were transplanted to a controlled breeding plot in Monterey County, Calif., where the variety was identified and selected for further evaluation in May 1996. The new variety, ‘Sonora’, was subsequently asexually propagated and underwent further testing in the Monterey Bay area in California for five years. This propagation and testing has demonstrated that the combination of traits disclosed herein which characterize the new variety are fixed and are retained true to type through successive generations of asexual reproduction.

**SUMMARY OF THE INVENTION**

The present invention relates to a new and distinct variety of strawberry named ‘Sonora’. The variety is botanically identified as *Fragaria x ananassa*. The new variety is distinguished from other varieties by a number of characteristics as set forth in Tables 1–4.

**COMPARISON TO SIMILAR VARIETIES**

The varieties that we believe to be similar to ‘Sonora’ from those known to us are ‘Commander’ (U.S. Plant Pat. No. 7,024), ‘San Juan’ (U.S. plant application Ser. No. 09/524,581), and ‘Ana Maria’ (U.S. Plant Pat. No. 11,035). There are several characteristics of the new variety that are different from, or not possessed by, ‘Commander’, ‘San

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Juan’ and ‘Ana Maria’. The new variety is fully everbearing and has a flat globose habit, strong interveinal blistering, weak leaf glossiness, rounded terminal leaflet shape of base and teeth, sparse petiole pubescence, dense to very dense stolon pubescence, a position of inflorescence above the foliage, larger calyx diameter relative to the corolla, a semi-erect attitude of the fruiting truss at first picking, predominantly conical fruit, very slight to slight differences between shapes of primary and secondary fruits, very narrow to narrow band without achenes, very weak unevenness of surface of the fruit, weak to medium glossiness of the fruit, spreading to reflexed pose of the calyx segments, even flesh color of the fruit, and absent to small hollow center size.

**BRIEF DESCRIPTION OF THE DRAWINGS**

The accompanying photographs show typical specimens of the new variety, including fruit, foliage and flowers, in color as nearly true as reasonably possible in illustrations of this type.

FIG. 1 shows the whole plant.

FIG. 2 shows the leaves of the plant.

FIG. 3 shows the upperside and the underside of the flowers.

FIG. 4 shows a close-up view of the fruit.

FIG. 5 shows the fruit in longitudinal cross-section.

**DESCRIPTION OF THE NEW VARIETY**

The following detailed description of the new variety is based upon recorded observations of plants and fruit grown in Monterey County, Calif., U.S.A. Observations of ‘Commander’, ‘San Juan’ and ‘Ana Maria’ were taken side-by-side comparison in 2000. This description is in

accordance with terminology used by the International Union for the Protection of New Varieties of Plants (UPOV). Color designations, color descriptions, and other phenotypical descriptions may deviate from the stated values and descriptions depending upon variation in environmental, seasonal, climatic and cultural conditions. Where colors are described herein, the most similar color designations are provided from The Royal Horticultural Society (R.H.S) Colour Chart.

PROPAGATION

The new variety is principally propagated by way of stolons. Although propagation by stolons is presently preferred, other known methods of propagating strawberry plants may be employed.

CHARACTERISTICS OF THE NEW VARIETY

Information on the new variety is presented in Tables 1, 2, 3 and 4. The flowers described in the tables are secondary flowers except where indicated. The fruit described is the secondary fruit on one-year-old plants. Fruit and flower measurements are an average of both primary and secondary fruit and flowers. Additional characteristic of the fruit of 'Sonora' include a medium acidity, having an average titratable acidity of 1.13%, an average brix of 11.8%, and the vascular tissue in 'Sonora' fruit is white (155D) in color. Characteristics of the stolons are also included in the Tables. In 2001, 'Sonora' produced an average of 33 daughter plants per mother plant in a low-elevation nursery, while 'San Juan' produced an average of 61 daughters/mother plant, indicating fewer stolons were produced by 'Sonora'. The time of first flowering of 'Sonora' in the Watsonville area is late February to early March.

Table 1 provides information on the plant and fruit characteristics of the new variety 'Sonora' compared with characteristics of the varieties 'Commander', 'San Juan' and 'Ana Maria'. Table 2 provides additional information of the plant and fruit characteristics of the new variety 'Sonora' compared with characteristics of the varieties 'Commander', 'San Juan' and 'Ana Maria'. Table 3 provides the new variety's reactions to stress, pests, and diseases as compared to the varieties 'Commander', 'San Juan' and 'Ana Maria'.

In addition to morphological descriptions, the new cultivar 'Sonora' has been analyzed to obtain an indication of its genetic makeup to provide further means for identifying the new variety and distinguishing it from other somewhat similar and/or related strawberry varieties. Specifically, leaf samples of 'Sonora', 'Commander', 'San Juan' and 'Ana Maria' were analyzed by electrophoresis for isozyme patterns of the enzymes phosphoglucosomerase (PGI), leucine aminopeptidase (LAP) and phosphoglucomutase (PGM). See e.g., J. Amer. Soc. Hort. Sci. 106:684-687. Table 4 provides isozyme characteristics of the new variety as compared to the varieties 'Commander', 'San Juan' and 'Ana Maria'.

TABLE 1

Detailed comparison of 'Sonora', 'Commander', 'San Juan' and 'Ana Maria'				
	'Sonora'	'Com- mander'	'San Juan'	'Ana Maria'
<u>Plant Characteristics</u>				
Height of Plant (cm)	25.3	24.6	24.3	30.6
Spread of Plant (cm)	43.9	47.1	43.2	50.0
Number of Crowns	6.0	4.7	5.7	5.6

TABLE 1-continued

Detailed comparison of 'Sonora', 'Commander', 'San Juan' and 'Ana Maria'				
	'Sonora'	'Com- mander'	'San Juan'	'Ana Maria'
<u>Leaf Characteristics</u>				
Terminal Leaflet Length	6.0	7.5	7.5	8.0
Terminal Leaflet Width (cm)	6.4	7.4	7.6	8.2
Terminal Leaflet Length/Width Ratio	0.92	1.02	0.99	0.98
# Teeth/Terminal Leaflet	20.6	16.9	20.1	19.7
Color of upperside	147A medium to dark green	147A medium green	147A dark green	147A medium green
Color of underside	148B light gray green	148B light gray green	148C light gray green	148B light gray green
Petiole Length (cm)	18.8	20.2	21.7	21.9
Petiole Color	145A	145A	145A	145B
Bract Frequency	0%	20%	60%	50%
		Typically single	Typically paired	Typically paired
Stipule Length (cm)	3.1	3.1	3.8	3.4
Stipule Width (cm)	0.9	0.9	0.8	0.7
<u>Flower Characteristics</u>				
Petal Length (cm)	1.17	1.16	1.23	1.38
Petal Width (cm)	1.23	1.17	1.26	1.37
Petal Length/Width Ratio	0.95	0.99	0.98	1.01
Flower Diameter (cm)	2.99	2.94	3.05	3.40
Calyx Diameter (cm)	3.48	3.28	3.58	3.79
Flower Color	155C	155C	155D	155C
<u>Fruit Characteristics</u>				
Fruit Length (cm)	4.7	4.6	4.8	4.6
Fruit Width (cm)	4.0	4.1	4.3	3.7
Fruit Length/Width Ratio	1.17	1.12	1.12	1.24
Average Berry Weight (g)	22.4	23.9	26.1	19.3
External Color	53A dark red	45B orange red	46A red	46A red
Internal Color	45A dark red	44B orange red	44A medium red	44B orange red
Achene Coloration	53A and 17A dark red and yellow	46A and 14A dark red and yellow	46A and 16A dark red and yellow	46B and 16A dark red and yellow
Yield (g/plant)	1367	1400	1212	1327

TABLE 2

Characteristics of 'Sonora', 'Commander', 'San Juan' and 'Ana Maria'		
	'Sonora'	'Commander'
<u>Plant</u>		
Habit	flat globose	flat globose
Density	dense	medium
Vigor	medium	medium
<u>Leaf</u>		
Shape in cross section	concave	flat
Interveinal blistering	strong	weak
Glossiness	weak	medium to strong
Number of leaflets	3 only	3 only
Terminal leaflet margin profile	flat	revolute to flat
Terminal leaflet shape of base	rounded	rounded
Terminal leaflet shape of	rounded	rounded

TABLE 2-continued

Characterisitcs of 'Sonora', 'Commander', 'San Juan' and 'Ana Maria'		
teeth		
Stipule pubescence	sparse	medium dense
Petiole pubescence	sparse	medium
Petiole pose of hairs	outward	outward
<u>Stolon</u>		
Number	few to medium	medium to many
Anthocyanin coloration	medium	—
Thickness	medium	—
Pubescence	dense to very dense	—
<u>Inflorescence</u>		
Position relative to foliage	above	level with to above
Diameter of calyx relative to corolla on secondary flowers	larger	same size to larger
Diameter of inner calyx relative to outer on secondary flowers	same size	same size
Spacing of petals	overlapping	overlapping
<u>Fruiting Truss</u>		
Attitude at first picking	semi-erect	prostrate
Length (cm)	30.3	33.0
<u>Fruit</u>		
Predominant shape	conical	conical to bi-conical
Difference in shapes between primary and secondary fruits	very slight to slight	slight
Band without achenes	very narrow to narrow	narrow to medium
Unevenness of surface	very weak	weak
Evenness of color	even	slightly uneven
Glossiness	weak to medium	strong
Insertion of achenes	below to level with surface	level with surface
Insertion of calyx	level to in a basin	level
Pose of the calyx segments	spreading to reflexed	spreading
Size of calyx in relation to fruit on secondary fruit	same size to larger	same size
Adherence of calyx	strong	strong
Firmness of flesh	medium	medium
Evenness of flesh color	even	slightly uneven
Distribution of flesh color	marginal and central	marginal and central
Hollow center size	absent to small	medium
Sweetness	medium to strong	medium to strong
Texture when tasted	medium	medium
Acidity	medium	medium to weak
Time of Flowering	medium	early to medium
Harvest Interval	Mid-April to Early November	Mid-April to Early November
Type of Bearing	fully everbearing	partially everbearing
	'San Juan'	'Ana Maria'
<u>Plant</u>		
Habit	globose to flat globose	globose to upright
Density	medium	open
Vigor	medium	strong
<u>Leaf</u>		
Shape in cross section	flat to slightly convex	concave
Interveinal blistering	medium to strong	medium to strong
Glossiness	weak to medium	medium
	weak	

TABLE 2-continued

Characterisitcs of 'Sonora', 'Commander', 'San Juan' and 'Ana Maria'		
Number of leaflets	sometimes more than 3 leaflets (approx. 17% of leaves)	3 only
Terminal leaflet margin profile	revolute to flat	flat
Terminal leaflet shape of base	obtuse to rounded	rounded to slightly oblique
Terminal leaflet shape of teeth	rounded	obtuse
Stipule pubescence	medium dense	sparse
Petiole pubescence	medium	sparse
Petiole pose of hairs	outward to downward	outward
<u>Stolon</u>		
Number	medium to many	medium to many
Anthocyanin coloration	strong	strong
Thickness	medium	medium
Pubescence	medium	medium to dense
<u>Inflorescence</u>		
Position relative to foliage	beneath to level with	level with to above
Diameter of calyx relative to corolla on secondary flowers	larger	smaller to same size
Diameter of inner calyx relative to outer on secondary flowers	same size	smaller to same size
Spacing of petals	overlapping	overlapping
<u>Fruiting Truss</u>		
Attitude at first picking	prostrate	semi-erect
Length (cm)	28.5	33.3
<u>Fruit</u>		
Predominant shape	conical to almost cylindrical	conical
Difference in shapes between primary and secondary fruits	moderate	none to very slight
Band without achenes	narrow	narrow to medium
Unevenness of surface	medium	very weak to weak
Evenness of color	even	even
Glossiness	very strong	strong
Insertion of achenes	level with surface	below to level with surface
Insertion of calyx	level	level to set above
Pose of the calyx segments	spreading to reflexed	spreading
Size of calyx in relation to fruit on secondary fruit	same size	same size to larger
Adherence of calyx	strong	weak to medium
Firmness of flesh	firm	firm
Evenness of flesh color	slightly uneven to even	slightly uneven
Distribution of flesh color	marginal and central	marginal and central
Hollow center size	medium	small
Sweetness	medium to strong	medium to strong
Texture when tasted	medium	medium
Acidity	medium	medium
Time of Flowering	medium to late	medium to late
Harvest Interval	Mid-April to Early November	Mid-April to Early November
Type of Bearing	partially everbearing	partially everbearing

TABLE 3

Reactions to Stress, Pests, and Diseases for 'Sonora', 'Commander', 'San Juan' and 'Ana Maria'				
	'Sonora'	'Comm- ander'	'San Juan'	'Ana Maria'
<u>Reaction to Stress</u>				
high pH	moderately resistant	moderately resistant	moderately resistant	moderately resistant
high soil salt levels	moderately resistant	moderately resistant	moderately resistant	moderately resistant
<u>Reaction to Pests</u>				
<i>Tetranychus urticae</i>	moderately susceptible	moderately susceptible	moderately susceptible	moderately susceptible
Aphis spp.	susceptible	susceptible	susceptible	susceptible
<i>Lygus hesperus</i>	susceptible	susceptible	susceptible	susceptible
<u>Reaction To Diseases</u>				
Botrytis fruit rot	susceptible	susceptible	susceptible	susceptible
Powdery mildew	susceptible	moderately resistant	moderately resistant	moderately resistant
Verticillium wilt	moderately resistant	susceptible	susceptible	susceptible
Strawberry Mottle Virus	moderately resistant	moderately resistant	moderately resistant	moderately resistant

TABLE 3-continued

Reactions to Stress, Pests, and Diseases for 'Sonora', 'Commander', 'San Juan' and 'Ana Maria'				
	'Sonora'	'Comm- ander'	'San Juan'	'Ana Maria'
<i>Xanthomonas fragariae</i>	moderately resistant	moderately resistant	moderately resistant	moderately resistant

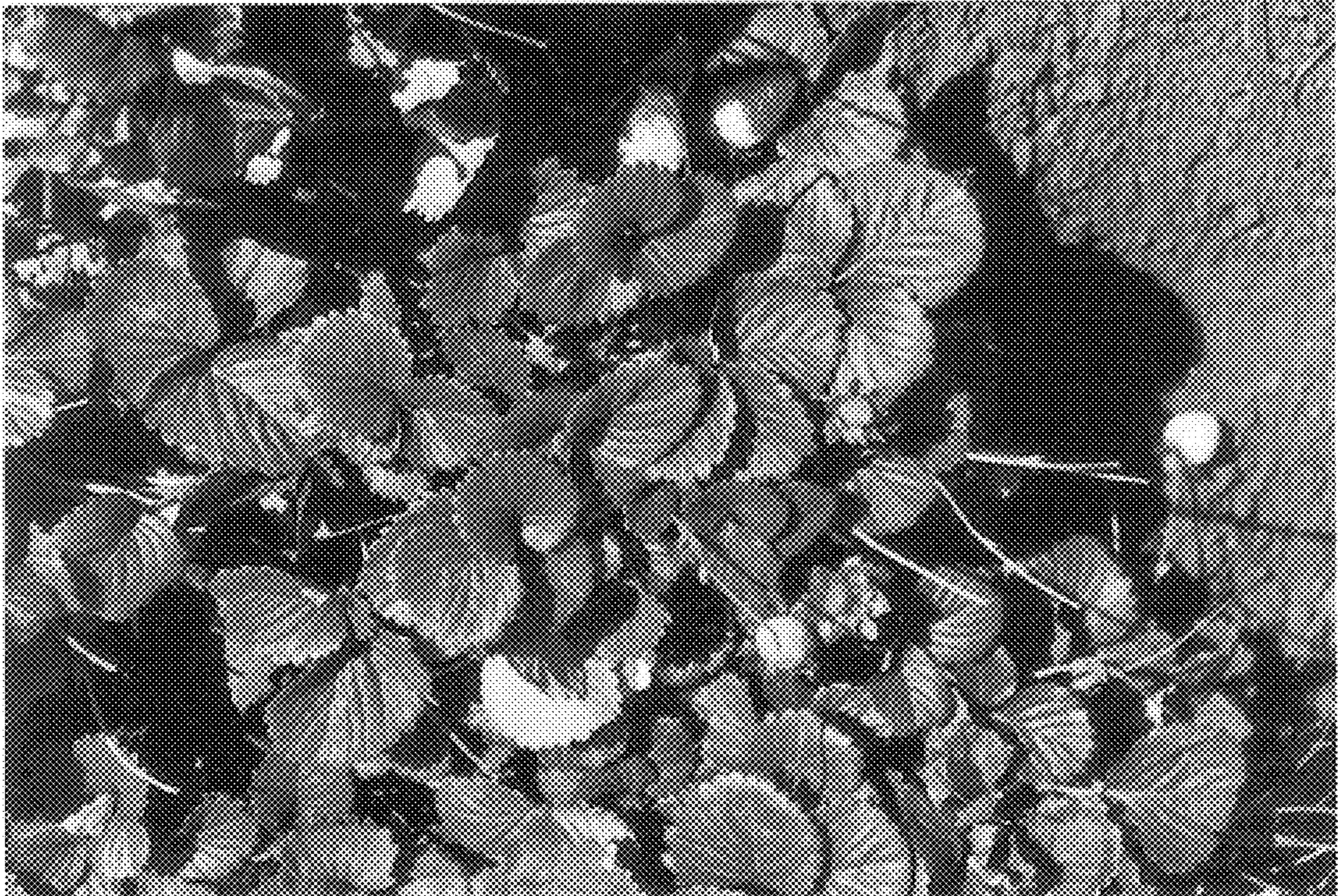
TABLE 4

Isozyme Analysis for 'Sonora', 'Commander', 'San Juan' and 'Ana Maria'				
Locus	'Sonora'	'Commander'	'San Juan'	'Ana Maria'
PGI	A2	A4	A2	A1
LAP	B3	B3	B3	B3
PGM	C4	C4	C4	C4

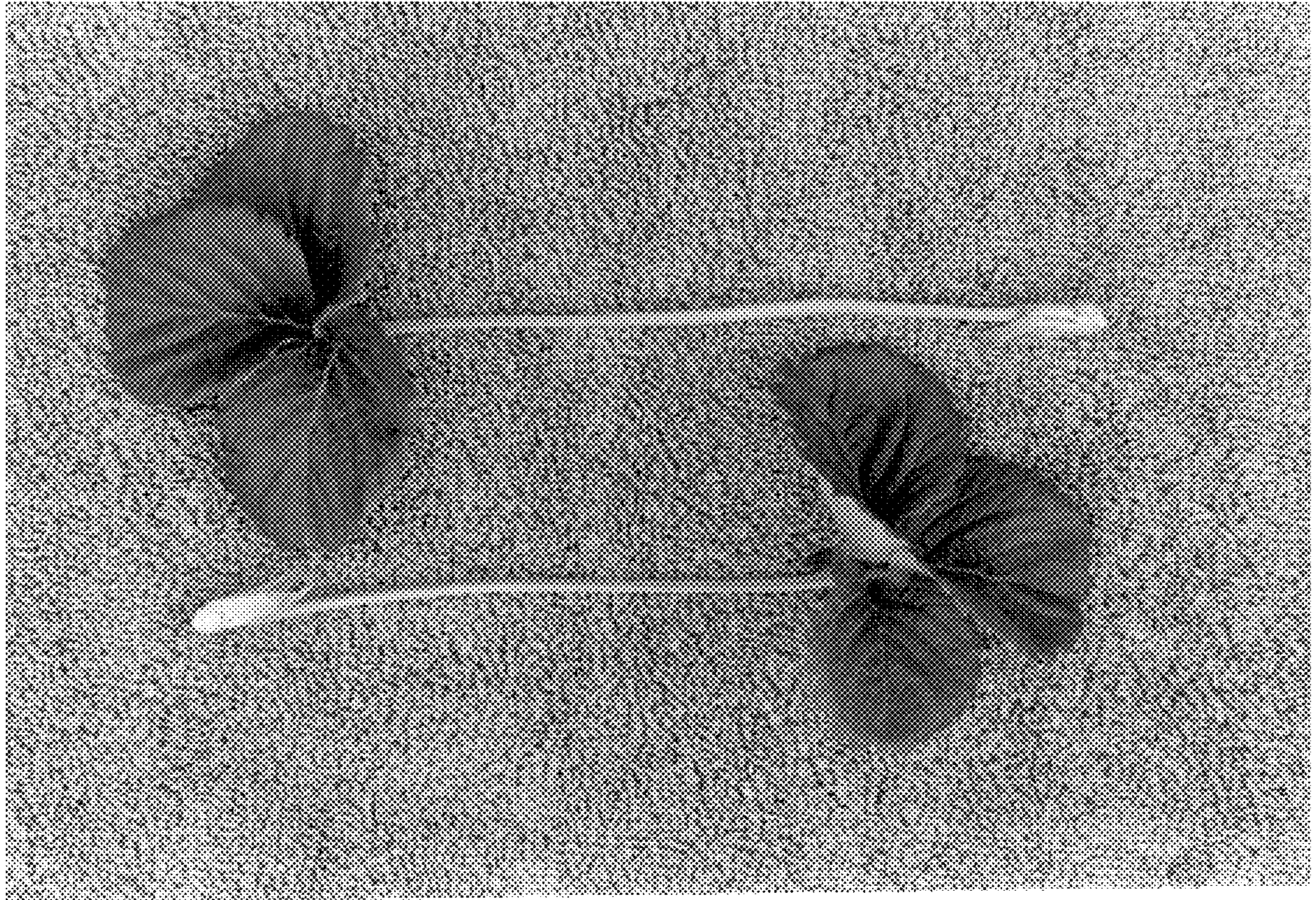
What is claimed is:

1. A new and distinct variety of strawberry plant, substantially as shown and described.

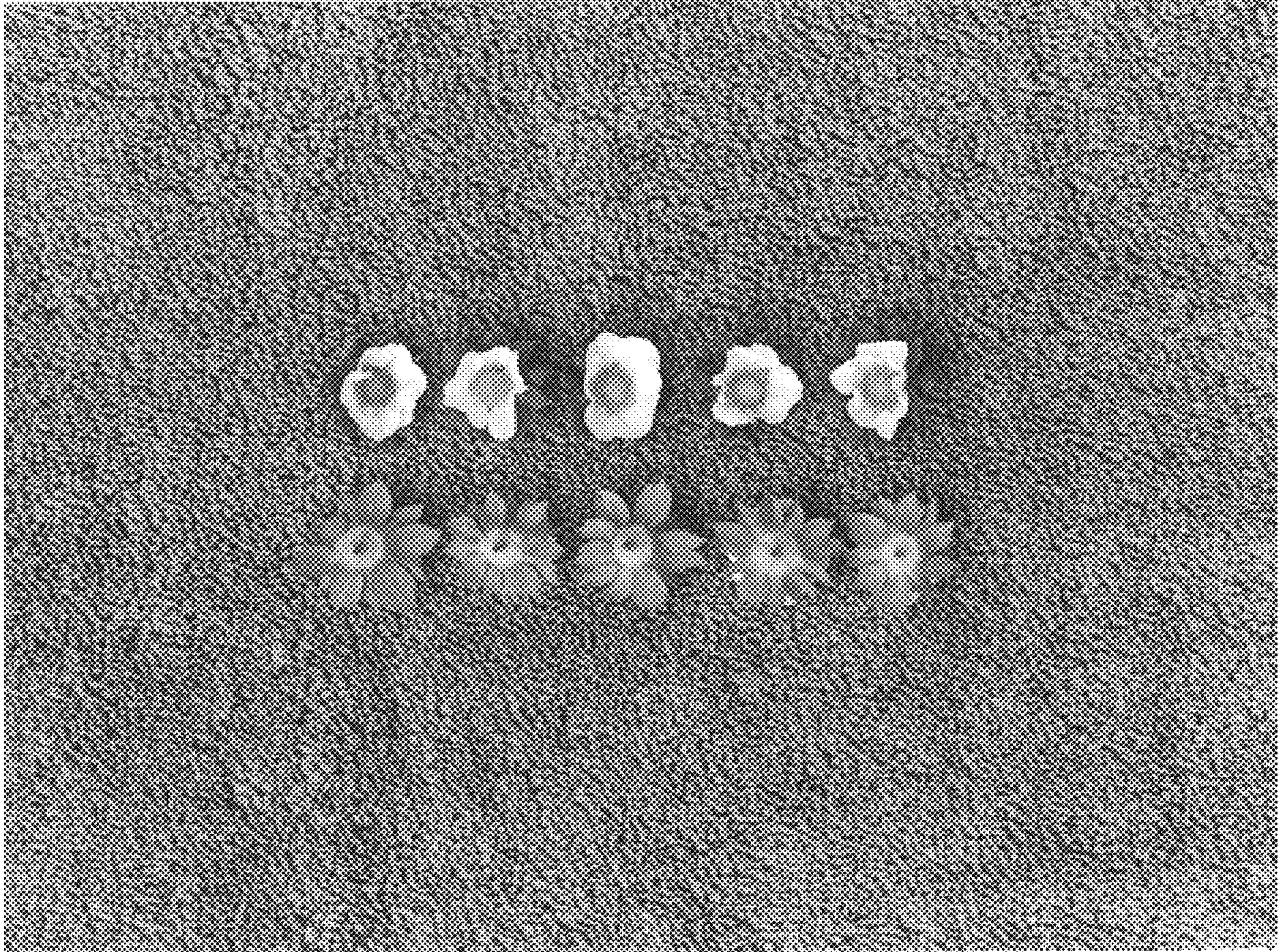
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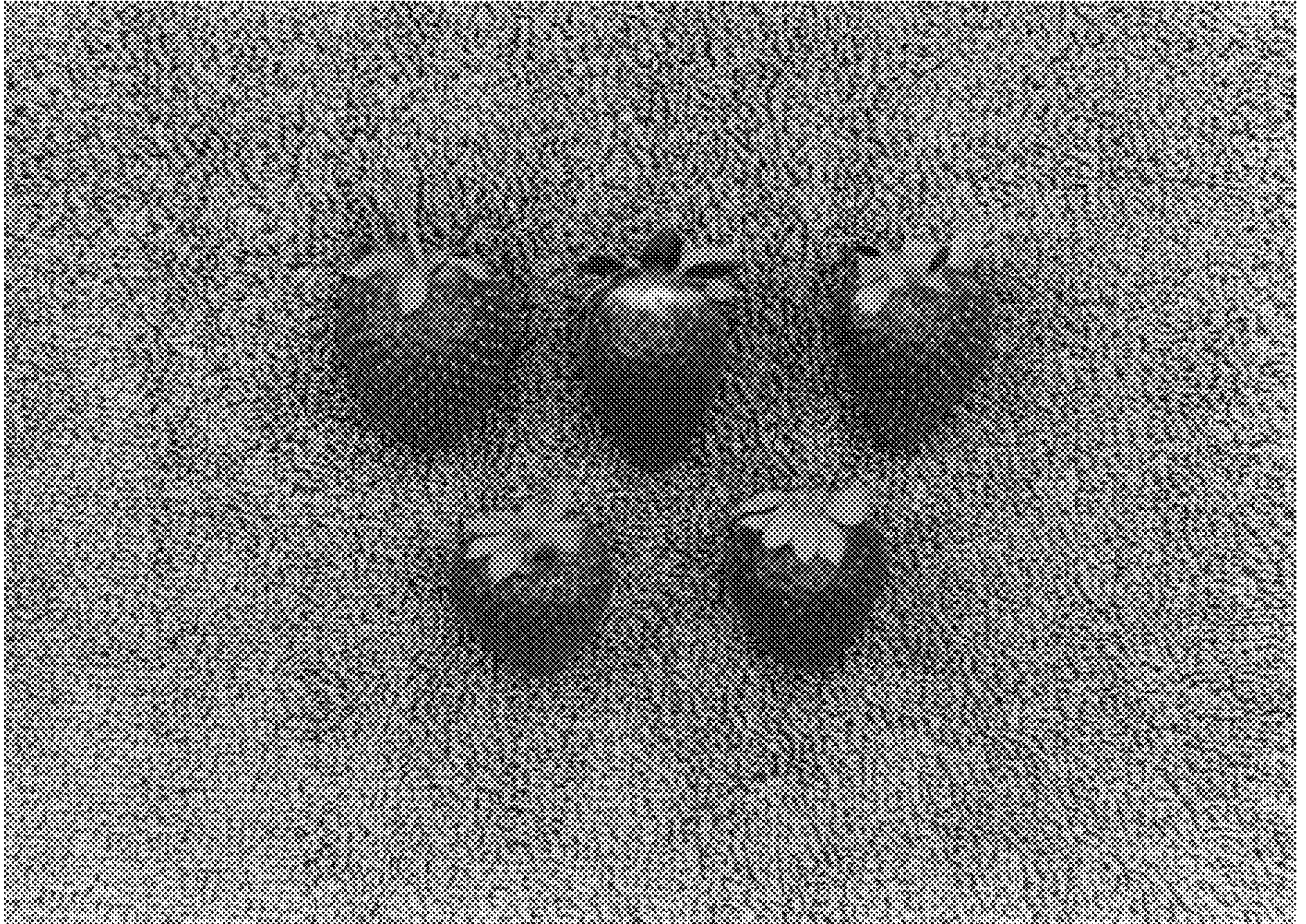
*Fig. 1*



*Fig. 2*



*Fig. 3*



*Fig. 4*





*Fig. 5*