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**Walker et al.**

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(54) **GRAPEVINE PLANT NAMED ‘ERRANTE NOIR’**

(50) Latin Name: *Vitis vinifera* L.  
Varietal Denomination: **Errante Noir**

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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 0 days.

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USPC ..... **Plt./205**  
CPC ..... *A01H 6/88* (2018.05)

(58) **Field of Classification Search**  
USPC ..... Plt./205  
CPC ..... A01H 5/0812  
See application file for complete search history.

(56) **References Cited**

**PUBLICATIONS**

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The May 18, 2017 Test Agreement for Grapevines (No. 2017-5009) between Novavine and the Regents of The University of California, 6 pages.  
The May 24, 2017 Test Agreement for Grapevines (No. 2017-5010) between Sutter Home Winery, Inc. and The Regents of the University of California, 7 pages.

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(57) **ABSTRACT**

A new and distinct variety of grapevine plant named ‘Errante Noir’, particularly selected for its high resistance to Pierce’s disease, as well as quality of fruit and wines produced is disclosed.

**6 Drawing Sheets**

Latin name:  
Botanical classification: *Vitis vinifera* L.  
Varietal denomination: The varietal denomination of the claimed variety of grapevine plant is ‘Errante Noir’.

**BACKGROUND OF THE INVENTION**

Pierce’s disease (PD) is common across the southern United States from Virginia to northern California. It is also common across Mexico and Central America. The disease is caused by the bacterium *Xylella fastidiosa*, which is hosted by a very wide range of native and ornamental plants. The bacterium is spread by xylem feeding insects as vectors, primarily sharpshooters. PD is one of the few diseases that rapidly kills wine, table, and raisin grape cultivars of the cultivated grape, *Vitis vinifera*. Vector populations can be limited with insecticides, but these are difficult to use near their typically riparian native habitat or in the ornamental landscapes in which they flourish. Breeding for PD resistance has been active for over 70 years, but progress has been very slow due to a poor understanding of the germplasm and the typically multigenic nature of the resistance in most of the resistant grape species. The two most commonly grown PD resistant varieties, ‘Blanc du Bois’ and ‘Lenoir’ (‘Lenoir’ is also known as ‘Black Spanish’ or ‘Jacquet’), are F<sub>1</sub> hybrids between *V. vinifera* cultivars and resistant American grape species from the southern United States, and are therefore only about 50% of *V. vinifera*. ‘Blanc du Bois’ and

‘Lenoir’ produce wines with lower quality than *V. vinifera* wine grape varieties, and they are tolerant of, rather than resistant to, *X. fastidiosa* infection, which results in their potential to expand areas damaged by PD due to their ability to act as host plants for the bacteria and vectors. Neither ‘Blanc du Bois’ nor ‘Lenoir’ are patented.

Grapevine is an important and valuable crop. Accordingly, there is a need for new varieties of grapevine plant. In particular, there is a need for improved varieties of grapevine plant that produce high quality fruit for winemaking and are resistant to Pierce’s disease.

**SUMMARY OF THE INVENTION**

In order to meet these needs, the present invention is directed to an improved variety of grapevine plant. In particular, the invention relates to a new and distinct variety of grapevine plant (*Vitis vinifera* L.), which has been denominated as ‘Errante Noir’. Grapevine plant variety ‘Errante Noir’ possesses very strong resistance to the bacterial causal agent of Pierce’s disease (PD), and produces very high quality fruit and wines therefrom that are indistinguishable from the widely grown European wine grape cultivars. Other PD resistant cultivars are known, but their fruit and winemaking quality are poor in comparison to ‘Errante Noir’ and their resistance is much lower.

In particular, grapevine plant variety ‘Errante Noir’ is a red wine grape selection that is about 97% *V. vinifera* (including 50% ‘Sylvaner’, 12.5% ‘Cabernet Sauvignon’, 12.5% ‘Carignane’, and 12.5% ‘Chardonnay’) and is highly resistant to PD in repeated greenhouse and field evaluations. In comparison, the two most commonly grown PD resistant varieties, ‘Blanc du Bois’ and ‘Lenoir’, are only about 50% of *V. vinifera*. ‘Errante Noir’ has a mid-season bloom and ripening period and has relatively large berries and loose clusters. It is highly productive. Wines made from fruit of ‘Errante Noir’ grown in Davis, Calif. may be described as: ‘dark-red purple color’; ‘complex fruit with herbs and earth’, ‘plum’, ‘big wine’, ‘dense’, ‘rich middle’, and ‘tannic yet balanced’. ‘Errante Noir’ is also deemed to have great blending potential with Cabernet Sauvignon. Wines made from fruit of ‘Errante Noir’ are also noted for their high levels of high quality tannin.

#### Pedigree and Breeding History

The development of this new grapevine variety is in part a result of the discovery of a single dominant gene for resistance to *Xylella fastidiosa*, the bacterial causal agent of Pierce’s disease (PD). The source of the PD resistance is a form of *V. arizonica* (‘b43-17’) that appears to have some *V. candicans* parentage and is from Monterrey, Mexico. ‘b43-17’ was crossed to the susceptible *V. rupestris* ‘A. de Serres’ to create the F8909 population. Neither ‘b43-17’ nor ‘A. de Serres’ are patented. The resistance from ‘b43-17’ was found to be inherited as a single dominant gene (locus), and this resistance gene, PdR1, was genetically mapped using the F8909 population by a grapevine breeding program. Tightly linked simple sequence repeat (SSR) markers were developed and were used in marker-assisted selection to exclude susceptible plants from evaluation in each round of selection. All the progeny with PdR1 were tested for PD resistance and only those with strong resistance were considered for use as parents. Potential parents were also screened for fruit quality over generations and only those with good quality fruit and that appeared like *V. vinifera* were selected.

Line ‘F8909-08’ from the F8909 population was crossed to ‘P79-101’, a highly susceptible, advanced *V. vinifera* table grape selection from a grape breeding program. The resulting ‘F8909-08’ X ‘P79-101’ F<sub>1</sub> generation and progeny thereof were screened with the SSR markers for resistance to *X. fastidiosa* under greenhouse conditions. A highly resistant selection from the ‘F8909-08’ X ‘P79-101’ cross, ‘00504-20’, was crossed to another *V. vinifera* table grape from a grape breeding program, ‘B52-89’, to create ‘A81-138’, which was also selected for its very high resistance to PD. ‘A81-138’ was then used to cross to *V. vinifera* wine grapes for several generations of modified backcrossing to obtain the candidate selection ‘09356-235’, which was later named as ‘Errante Noir’. None of the parents across the multiple backcross generations are patented. These backcrosses were modified because of the high heterozygosity and recessive load found in grapes. Hence, to avoid exposure of deleterious recessive alleles, each generation of backcrossing was to a different and unrelated high quality *V. vinifera* cultivar.

Accordingly, the parentage of ‘Errante Noir’ is ‘07371-019’ (‘F2-35’ (‘Cabernet Sauvignon’ X ‘Carignane’) X ‘U0502-26’ (‘A81-138’ X ‘Chardonnay’)) X *V. vinifera* ‘Sylvaner’. ‘Errante Noir’ was particularly selected for its high resistance to Pierce’s disease, as well as the quality of

its fruit and wines produced therefrom. It is distinguishable from its maternal parent, 07371-019, by its deeply lobed leaves, and from its paternal parent by its strong resistance to *Xylella fastidiosa*.

#### BRIEF DESCRIPTION OF THE DRAWINGS

This new grapevine plant variety is illustrated by the accompanying photographs. The colors shown are as true as can be reasonably obtained by conventional photographic procedures. The photographs are of plants that are five to seven years old. Colors referred to are in reference to The Royal Horticultural Society Colour Charts Edition V.

FIG. 1 shows simple sequence repeat (SSR) marker data establishing a DNA fingerprint for ‘Errante Noir’ with nine pure *Vitis vinifera* cultivars for comparison. Alleles for marker-assisted selection of the *Xylella fastidiosa* locus (PdR1) are shown in red.

FIG. 2 illustrates the upper surface of a leaf of grapevine plant variety ‘Errante Noir’.

FIG. 3 illustrates the lower surface of a leaf of grapevine plant variety ‘Errante Noir’.

FIG. 4 illustrates a section of a shoot tip of grapevine plant variety ‘Errante Noir’.

FIG. 5 illustrates clusters of berries of grapevine plant variety ‘Errante Noir’.

FIG. 6 illustrates a plant of grapevine plant variety ‘Errante Noir’.

#### DETAILED BOTANICAL DESCRIPTION

The following is a detailed description of the new grapevine plant variety designated as ‘Errante Noir’, including the key differentiating characteristics of this variety and comparisons of characteristics of ‘Errante Noir’ to other grapevine varieties. Unless otherwise indicated, evaluation data were taken from five to seven-year-old plants, grown in Davis, Calif.

##### Classification:

*Family*.—Vitaceae.

*Botanical name*.—*Vitis vinifera* L.

*Common name*.—Grapevine.

*Variety name*.—‘Errante Noir’.

##### Parentage:

*Female parent*.—‘07371-19’ (unpatented).

*Male parent*.—‘Sylvaner’ (unpatented).

##### Plant:

*Berries*.—Medium, spherical, purple black with grey bloom.

*Clusters*.—Large, long conical, well-filled, can be double.

*Leaves*.—Five-lobed cuneiform in outline, relatively deep cylindrical lateral sinuses and u-shaped petiolar sinus, short rounded teeth on leaf margin, glabrous adaxial leaf surface, short sparse tomentum on the abaxial surface, petioles red purple with color diffusing into the main veins.

*Shoot tips*.—Erect, green white with white shoot tip.

*Production*.—Mid-season bloom and ripening period, highly productive.

*Method of propagation*.—Vegetative propagation via woody or herbaceous cuttings, or budding and grafting to rootstock. ‘Errante Noir’ has been asexually reproduced since June 2009 at greenhouses at Orchard Park Dr. in Davis, Calif. from herbaceous cuttings. Any rootstock can be used with the variety.

Most often it will be grown on rootstocks that resist grape phylloxera and/or nematodes. In testing, selections were evaluated grafted on '1103P' rootstock, which is not patented. It was chosen for ease of propagation and because it is widely used in California. The variety has been grafted on many other rootstocks for testing in field trials as well.

'Errante Noir' has the highest form of resistance to *X. fastidiosa* coupled with the highest wine quality of any PD resistant wine grape yet produced. 'Errante Noir' is selected for very high resistance, not the more commonly found tolerance, to prevent the production of host plants capable of further spreading PD to surrounding vineyards.

'Errante Noir' has a very strong PD resistance and the highest wine quality of any currently used PD resistant wine grape. PD is one of the few diseases that kill susceptible grapevines. Two most popular PD resistant wine grape varieties, 'Blanc du Bois' and 'Lenoir' ('Lenoir' is also known as 'Black Spanish' or 'Jacquez'), were used as controls or standards in all testing so that the wine quality and resistance of the candidate variety could be compared to available PD resistant varieties used across the southern United States. It is noted that 'Blanc du Bois' and 'Lenoir' have relatively poor wine quality and are tolerant, not resistant, to PD. Neither 'Blanc du Bois' nor 'Lenoir' are patented.

'Errante Noir' has far better PD resistance and wine quality when compared with 'Blanc du Bois' and 'Lenoir'. In other words, 'Errante Noir' combines very strong resistance to *X. fastidiosa* with the wine quality of internationally acclaimed wine grape cultivars. 'Errante Noir' was selected as a variety that exhibits high resistance to *X. fastidiosa* and *V. vinifera*-like wine quality. The data presented below are intended to further characterize 'Errante Noir'. The appearance of 'Errante Noir' is illustrated in FIGS. 2-6, and further characteristics of 'Errante Noir' are shown in Tables 1-8.

FIG. 1 presents the DNA fingerprinting profile for 'Errante Noir' and nine pure *Vitis vinifera* cultivars for comparison with the standard set of internationally agreed-upon genetic markers. This SSR fingerprinting profile can be used for DNA-based identification.

Table 1 presents typical phenological data for 'Errante Noir'. These data are for 2016, but the ranking of the selections in regard to an early cultivar ('Pinot noir') and a late cultivar ('Cabernet Sauvignon') have been typical over years. In general, 'Errante Noir' is phenologically mid-season. Based upon the percentage of *V. vinifera* in the present variety and the data regarding its parents, the variety is expected to grow in USDA Hardiness Zone 6-7.

TABLE 1

Average phenological states for 'Errante Noir'. 'Cabernet Sauvignon' (late) and 'Pinot noir' (early) are included as comparisons.				
Cultivar	Budbreak	50% bloom	50% veraison	24 °Brix
'Errante Noir'	3/22	5/7	7/17	8/23
'Cabernet Sauvignon'	3/24	5/7	7/21	8/30
'Pinot Noir'	3/10	4/30	7/9	8/9

Table 2 presents the average cluster and berry data for 'Errante Noir' and averaged over multiple years.

TABLE 2

Average cluster and berry sizes of 'Errante Noir' and its comparison varieties. Data are averages over multiple years.						
Genotype	Number of Years	Avg. Cluster Wt. (g)	t-test Cluster Wt.	Avg. Berry Wt. (g)	t-test Berry Wt.	Berry Clusters
'Errante Noir'	5	329	a	1.3	abc	Well-filled
'Blanc du Bois'	6	148	d	1.5	a	Well-filled
'Cabernet Sauvignon'	6	132	d	1.2	c	Loose to well-filled
'Chardonnay'	6	196	cd	1.5	ab	Well-filled to compact
'Lenoir'	6	157	d	1.3	bc	Loose

Table 3 presents the average yield per vine data taken over 2016 to 2018.

TABLE 3

Average production data for 'Errante Noir' and its comparison varieties. Data are averages from three years (2016 to 2018).					
Genotype	Avg. Yield/Vine (kg)	Std. Dev. (kg)	t-test	Number of Years	
'Errante Noir'	10.5	4.5	a	3	
'Blanc du Bois'	12.7	1.8	a	3	
'Cabernet Sauvignon'	10.9	1.8	a	3	
'Chardonnay'	10.9	3.2	a	3	
'Lenoir'	20.0	6.8	b	3	

Mean berry juice data were also taken and Table 4 presents this data over a five-year period between 2014 and 2018. These values are consistent with cultivars that produce high quality wines.

TABLE 4

Average juice data for 'Errante Noir' and its comparison varieties. Data are averages from five years (2014 to 2018).				
Genotype	Avg. °Brix	t-test Avg. °Brix	Avg. pH	t-test Avg. pH
'Errante Noir'	25.4	b	3.69	bc
'Blanc du Bois'	23.5	c	3.58	bc
'Cabernet Sauvignon'	25.8	b	3.74	abc
'Chardonnay'	23.3	cd	3.68	bc
'Lenoir'	21.3	e	3.96	a

Genotype	Avg. titratable acidity (g/L)	t-test Avg. TA	Avg. L-malic acid (g/L)	t-test Avg. MA
'Errante Noir'	5.7	cde	2.6	b
'Blanc du Bois'	5.2	de	2.3	bcd
'Cabernet Sauvignon'	5.2	de	1.9	bcd
'Chardonnay'	5.9	cd	2.4	bc
'Lenoir'	9.1	a	4.5	a

*Xylella fastidiosa* susceptibility data are presented in Table 5, which presents the levels of *X. fastidiosa* in relationship to tolerant ('Blanc du Bois' and to a lesser extent, 'Lenoir') and susceptible ('Chardonnay' and 'Cabernet Sau-

vignon') cultivars. These are also mean data from repeated testing over seasons and greenhouses. Because of the high variation in greenhouse conditions, at least four standards (bio-controls) were always used: 'b43-17', 'Blanc du Bois', 'Lenoir', and 'Chardonnay' (and occasionally other *V. vinifera* cultivars), which allows the data to be compared across greenhouses, tests and seasons. These varieties tend to be very consistent in the amounts of bacteria they support as well as the severity of their disease expression. The cut-off between resistant and susceptible is usually between 75,000 and 250,000 colony forming units per milliliter (cfu/ml).

TABLE 5

*Xylella fastidiosa* concentrations based on ELISA readings and converted to colony forming units (cfu/ml). *Vitis arizonica* 'b43-17' is the source of resistance in the breeding program.

Cultivar	Geometric Mean cfu/ml	t-test	Least Sq. Mean	Std. Error	Number of Times Tested
'b43-17'	12423	a	9.4	0.2	11
'Errante Noir'	78958	b	11.3	0.4	4
'Blanc du Bois'	859096	c	13.7	0.2	11
'Lenoir'	2421748	d	14.7	0.6	2
'Chardonnay'	5197228	d	15.5	0.2	11
'Cabernet Sauvignon'	6582993	d	15.7	0.8	1

Table 6 presents the phenotype of 'Errante Noir'. The variety has normal hermaphroditic flowers and typical floral development as is found in commercial *V. vinifera* wine grapes.

'Errante Noir'	
Berry L, W	1.3 cm x 1.4 cm
Seed number, length and width typical for <i>V. vinifera</i> wine grapes, but not measured	2
Cluster L, W, 2 clusters/shoot	10.0 cm x 23.5 cm
Pruning weights	2.35 kg
Trunk width at 30 cm	4.6 cm
Trunk color and texture	Rough shaggy bark 178D
Woody shoots diameter above cluster/and internode length	1.0 cm/4.5 cm
Woody shoot texture and color	First year bark adheres but peels in strips in second year 164B
Active shoot color, internode color above the cluster zone/cluster zone shoot diameter/internode length (shoots same size as woody canes in the cluster zone)	142D N144C
Tendrils length, diameter	10.5 cm
Tendrils color, Opposite leaves and alternating 2 nodes skip 2 nodes skip	0.2 cm N144B
Seed color	165B
# Berries/cluster	355
Berry color skin and waxy bloom	203C 190D
Leaves L, W	24.0 cm x 20.0 cm
Leaf arrangement, leaf shape, and leaf color	Alternate, palmate with 5 lobes
Top/Bottom	141A/141D

-continued

'Errante Noir'	
Petiole L, diameter, texture	12.5 cm 0.4 cm smooth
Petiole color	70A
Shoot tip color (first opened leaf)	143C
Harvest date	Aug. 20
Peduncle L, diam., color, texture	1.5 cm 0.5 cm N144B Smooth

Flower Descriptions

The floral buds and flower clusters are formed within the latent (dormant) bud in the year before flowering. As the pre-formed nodes on the compressed stems within the latent bud expand and the flower clusters begin developing and the individual flowers on the panicle begin forming. They are very small 2-4 mm and closer to 2 mm with wine grapes.

Berry Descriptions

The variety is not a "slip-skin" type grape. They have skin that adheres to the flesh tightly. They are not firm at ripeness and are soft compared to modern era table grapes at harvest. The pedicels have normal attachment to the berries and are not distinguishable from other *V. vinifera* wine grapes in this or other morphological features, nor in juice and wine analysis.

Fruit and Juice Parameters

YAN is yeast assimilable nitrogen and helps predict fermentation success. Seed color is rated as green to brown for mature seeds.

Leaf Descriptions

Cuneiform leaves with deep open lateral sinuses, open U shaped petiolar sinus, short rounded teeth, moderately dense tomentum on adaxial surface, red purple (70A) petioles with color that diffuses into the main veins

Table 7 presents the wine characteristics of 'Errante Noir'.

	°Brix	TA (g/L)	pH	L-malic acid (g/L)	Potassium (mg/L)
'Errante Noir'	27.0	5.0	3.74	1.9	2380
	YAN (mg/L, as N)	Catechin (mg/L)	Tannin (mg/L)	Total anthocyanins (mg/L)	
'Errante Noir'	189	31	407	1638	

Table 8 presents the juice, fruit and phenotypes of 'Errante Noir'.

	Juice Hue	Juice Intensity	Juice Flavor	Skin Flavor
'Errante Noir'	red	med	cherry, berry	black plum, spicy,
	Skin Tannin (1 = low, 4 = high)	Seed Color (1 = gr, 4 = br)	Seed Flavor	Seed Tannin (1 = high, 4 = low)
'Errante Noir'	4	4	woody, bitter, metallic	1

5 'Errante Noir' has excellent PD resistance. However, it is highly susceptible to a wide range of pests and diseases in a manner similar to other *V. vinifera* cultivars, and thus it must be treated as a pure *V. vinifera* cultivars in terms of susceptibility to fungal diseases and pests. 'Errante Noir' has no known tolerance to adverse weather. Plants observed were found to be true to type through successive generations of asexual reproductions.

What is claimed is:

10 1. A new and distinct variety of grapevine plant designated 'Errante Noir' as shown and described herein.

\* \* \* \* \*

Marker Alleles for the International Set of SSR Loci for Fingerprinting Grape

Cultivar	VVMD5	VVMD7	VVS2	VfZAG79	VfZAG62	VVMD31	VVMD27	VVMD32	VVIP26	CHI4-77
Errante Noir	220	243	132	246	169	200	175	253	146	177
Riesling	226	235	134	242	184	202	183	237	160	178
Alicante Bouschet	220	233	128	238	184	208	188	247	154	178
Chenin blanc	220	235	128	240	192	212	183		160	178
Zinfandel	220	243	128	232	196	208	173	253	160	178
Touriga Nacional	220	235	138	240	184	200	183	237	140	168
Semillon	233	235	132	234	190	210	175	237	154	178
Palomino	220	239	128	250		200	173	253	154	178
Chardonnay	229	235	132	238	184	210	183	237	154	178
Cabernet Sauvignon	226	235	134	242	184	202	169	237	160	178

FIG. 1

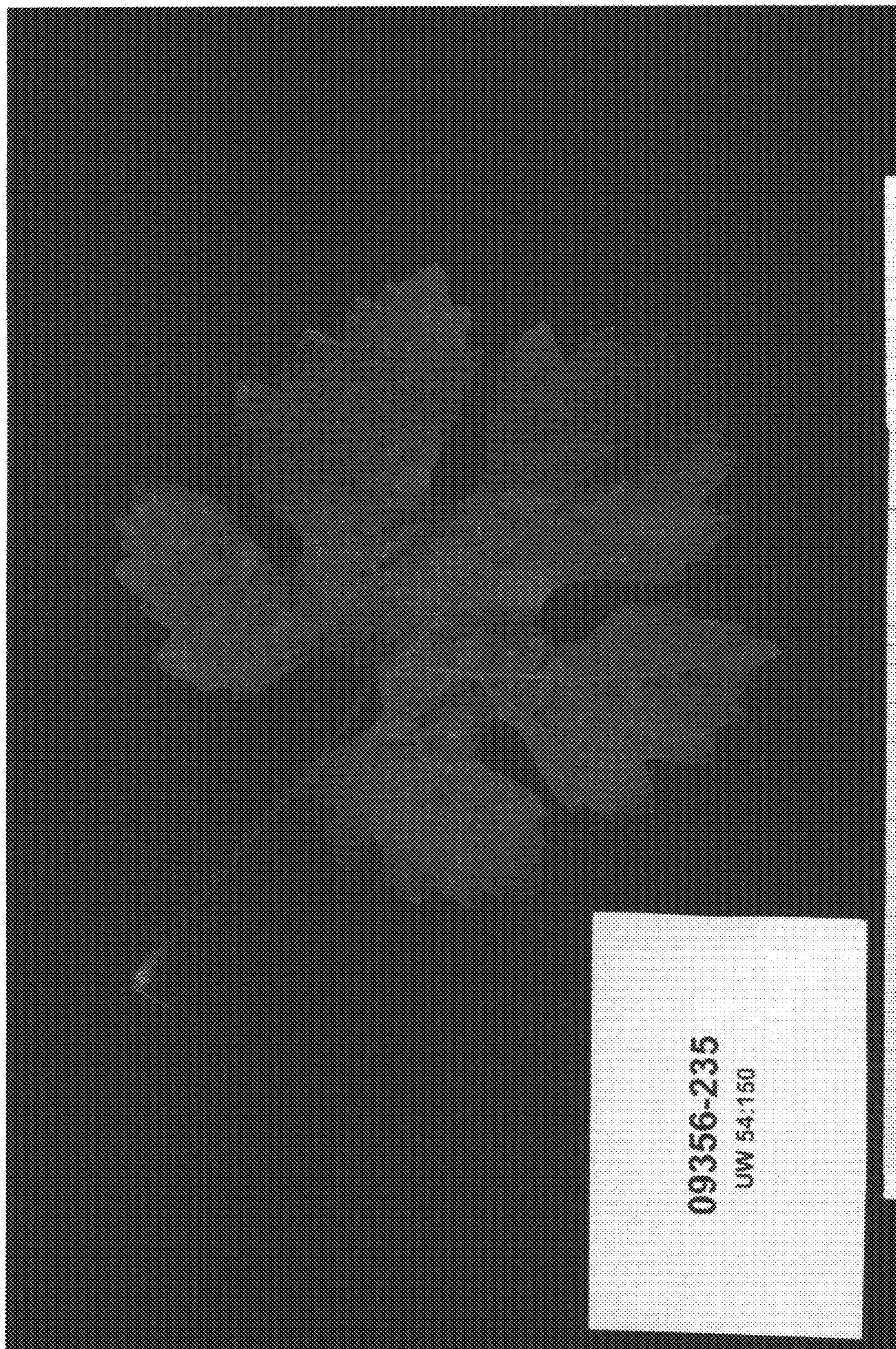


FIG. 2

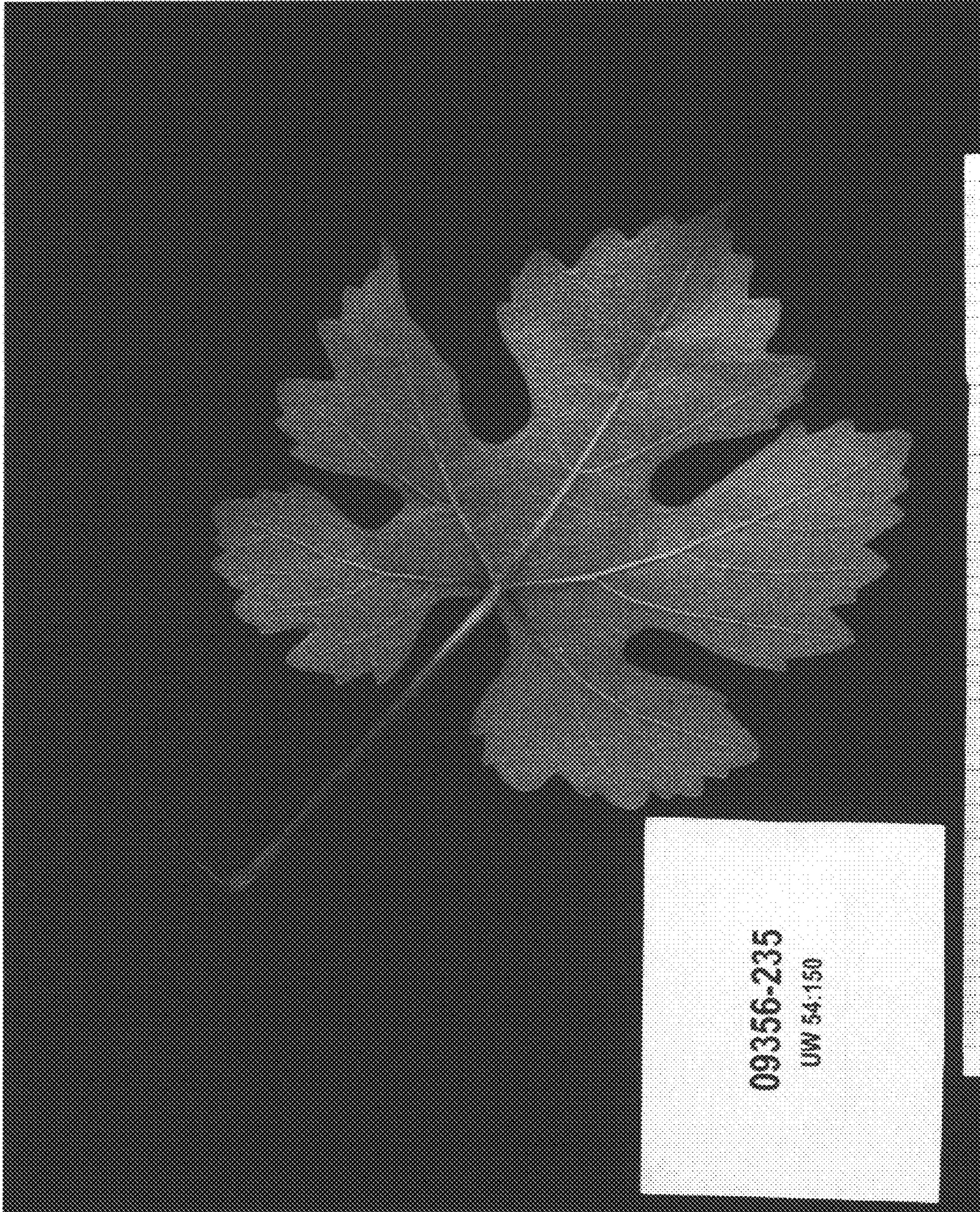


FIG. 3



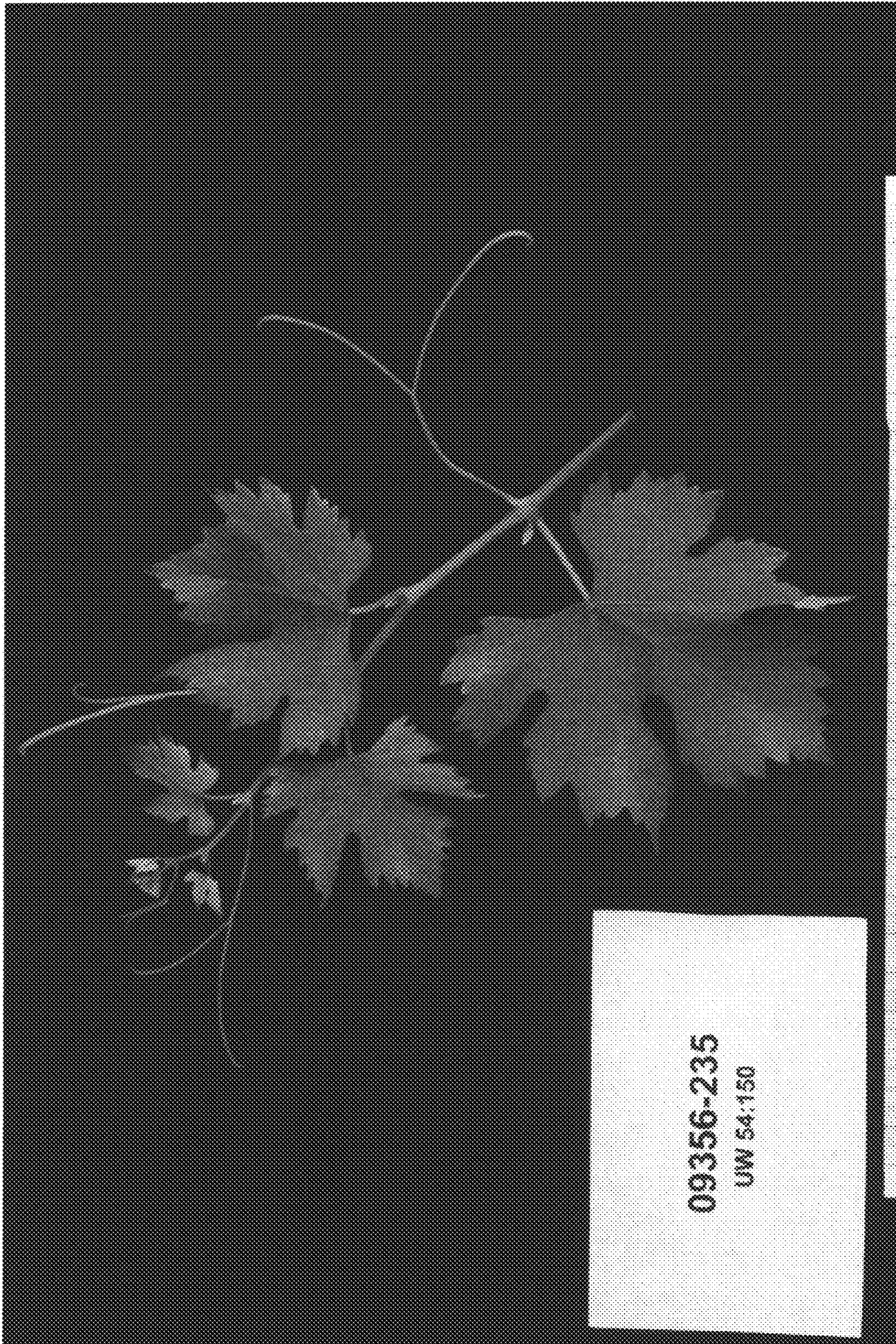


FIG. 4

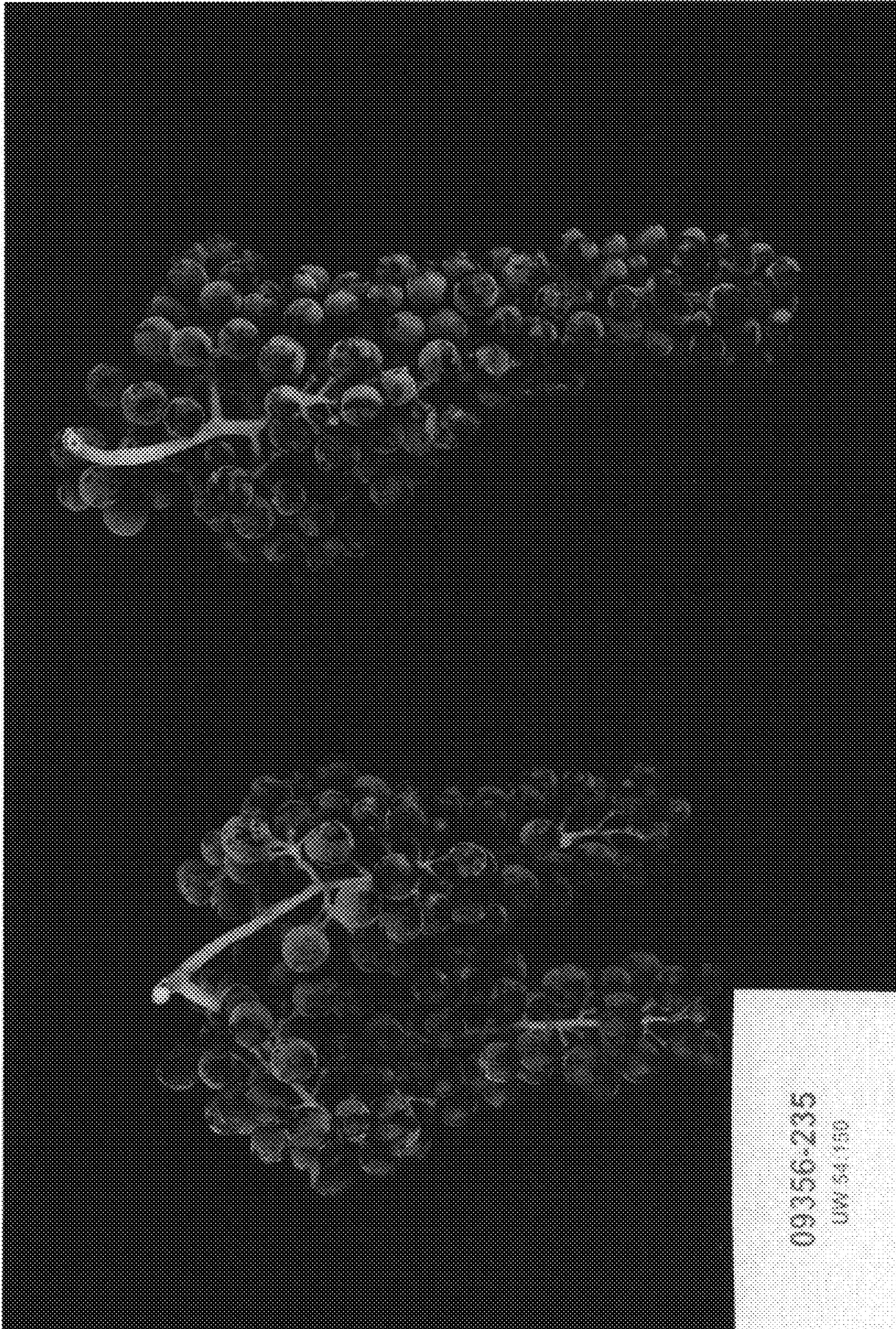


FIG. 5



FIG. 6