

[54] MACADAMIA NAMED "HIDDEN VALLEY A4"

[76] Inventors: Henry F. D. Bell; Margaret A. Bell; David J. D. Bell, all of Box 6, Beerwah, Queensland 4519, Australia

[21] Appl. No.: 344,279

[22] Filed: Apr. 26, 1989

[30] Foreign Application Priority Data

Apr. 26, 1988 [AU] Australia 88/001

[51] Int. Cl.⁵ A01H 5/00

[52] U.S. Cl. Plt./30
[58] Field of Search Plt. 30

Primary Examiner—Howard J. Locker
Attorney, Agent, or Firm—Quarles & Brady

[57] ABSTRACT

A new variety of Macadamia hybrid *Integrifolia* × *tetraphylla* has been identified that is particularly characterized by its high number of serrations per unit length on its leaf edge and a ratio of 1:1 between 3-leaf and 4-leaf whorls.

3 Drawing Sheets

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The present invention is directed to a new and distinct variety of Macadamia tree believed to be a cross of *Macadamia integrifolia* × *tetraphylla* which was identified in a cultivated area.

Among the distinct characteristics of this tree is a combination of an increase in leaf serrations per unit distance and a ratio of 1:1 between 3-leaf and 4-leaf whorls as sampled over a sample of a minimum 100 specimens.

Asexual reproduction of the new variety has been accomplished by grafting scion stock taken from the original seedling plant onto both seedling and mature rootstock of various other Macadamia varieties. The variety has maintained character regardless of rootstock, and exhibited the following characteristics and distinctions true to form through succeeding propagations.

DESCRIPTION OF DRAWINGS

FIG. 1 shows a typical tree specimen of the new variety, named "Hidden Valley A4".

FIG. 2 shows typical nut clusters of the new variety.

FIG. 3 shows a comparison of the leaves of the new variety with those of the known variety 'HAES 246'.

FIG. 4 shows a comparison of the kernel and nut of the new variety with the kernel and nut of the known variety 'HAES 246'.

FIG. 5 shows an enlarged view of the kernel and nut of the new variety.

The variety results from a seedling derived from the open pollination of a female parent of the variety Renown, itself a hybrid of *M. integrifolia* × *M. tetraphylla*. The seedling may have arisen from self-pollination or from cross-pollination with the nearest possible pollinators being of the varieties Own Choice, Keauhou, Kakea and N.R.G. Based on morphological comparison, the most likely pollen parent is Own Choice. The cultivar has been successfully and successively grafted onto a variety of rootstock yielding trees of consistent character and having good yield characteristics, while maintaining kernel quality and beneficial growth characteristics. The cultivar was discovered and propagated at Hidden Valley Plantations, Beerwah, Queensland, Australia.

The following is a detailed description of the new variety, with color terminology determined in accordance with The Royal Horticultural Society (R.H.S.)

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Colour Chart number. The characteristics and morphology listed below represents mean measurements from a minimum of one hundred specimens from trees grown in Beerwah, Queensland, Australia.

Tree: The tree is semi-erect in habit (more than Keauhou but less than Nutty Glen), moderately branched with a canopy of medium density (more dense than Hidden Valley A16 but less dense than Keauhou or Own Choice). The branches are more drooping than Keauhou. Leaves are found with both three and four leaves per node in a 1:1 ratio throughout the tree, unlike Keauhou and Kau which have predominantly three leaves per node and Renown which has predominantly four leaves per node. The grafted stock is strongly vigorous with shoots of medium thickness (thinner than Own Choice but thicker than Hidden Valley A16) with a mean of 42 mm between nodes, which sparse pubescence and weak anthocyanin coloration (R.H.S. color 152A) on new flushes. The tree has a relatively short juvenile phase (shorter than Keauhou or Kau) and a higher tolerance to *Cercospora* husk spot than observed for Own Choice.

Leaves: The leaves are narrow elliptical with a mean 3.69 times longer than wide, broader than Nutty Glen or Renown but narrower than Keauhou or Kau with an acutely pointed tip similar to Renown. The leaves are serrate with a mean 1.36 spines per cm which is characteristic and more than any known variety. Serrations are more shallow than Nutty Glen and spines are shorter than Renown. Leaves are only weakly undulated and weakly rolled compared with Keauhou. The young leaves are pale green (R.H.S. 137B) and mature leaves are dark green (R.H.S. 139A) and dull surfaced (similar to Nutty Glen) with distinctly lighter margins (R.H.S. 10A).

Mean leaf length.—144.54 mm with standard deviation (s.d.) of 22.6.

Mean leaf width.—39.23 mm with s.d. of 5.84.

Mean petiole length.—8.3 mm with s.d. of 1.48.

Flower: The racemes are cream colored, larger than Keauhou or Kau, and very dense on the tree. The tree has a shorter flowering period than Keauhou, which starts earlier and finishes later, but a longer flowering period than Hidden Valley A16. The tree has a tendency to have a second late flowering in seasons with favorable rainfall.

Fruit: The husk is of medium thickness (similar to Keauhou, thinner than Renown) with a medium hilum end point (smaller than Renown and larger than Kau) and a mildly shouldered pedicel (less than Own Choice). Husk dehiscence is partly on the tree (less than Nutty Glen and Renown) but mainly on the ground. There is an average of 1.7 nuts per raceme. There is no pre-germination on the tree observed (as in Nutty Glen) and very low incidence of fruit remaining on the tree or double embryo fruit as compared with Own Choice.

Mean fruit length.—50.05 mm with s.d. 2.82 (with pedicel and hilum).

Mean fruit width.—33.76 mm with s.d. 1.76.

Nut: The nuts are oval, 1.04 times longer than wider, less oval and more even than Renown but less round than Keauhou. The shell is light brown (R.H.S. 164A) with a smooth surface (smoother than Nutty Glen or Renown but more coarse than Kau) and a moderate sheen (more than Nutty Glen but less than Keauhou). The shell is thinner at the micropyle end (thinner than Kau but thicker than Nutty Glen). The suture is about the same color as the shell while the

micropyle is barely visible. No twin mark is evident. There is moderate (less than Renown or Nutty Glen) pale flecking (R.H.S. 165C) in radial streaks from the micropyle end.

Mean nut diameter.—26.27 mm (Range 22–30 mm) with s.d. 1.38.

Mean nut weight.—7.5 gm.

Kernel: The kernel is ovoid, creamy white with very little upper/lower color difference and a mean weight of 3.5 gm. The kernel averages about 45% of the weight of the nut at 1.5% moisture content. All kernels have an oil accumulation about above 72% (100% first grade floaters recorded).

Yield: Recorded nut yields to date have been estimated to be higher per unit area than for Keauhou or Own Choice. This is based on recording yield per tree divided by tree silhouette area.

The following Table 1 compares many of these features of Hidden Valley A4 (HVA4) with the other varieties Hidden Valley A16 (HVA16), Keauhou, Kau, Own Choice, Nutty Glen, and Renown.

TABLE 1

Character	HV A4	Keauhou	Kau	Own Choice	Nutty Glen	Renown
			TREE			
Growth habit	semi-erect	spreading	erect	spreading	semi-erect	semi-erect
Canopy density	medium low	medium	high	high	low	medium
Lower branch attitude	drooping	level	strongly rising	drooping	rising	drooping
Vigour, grafts	v-strong	medium	med-weak	strong		strong
Shoot thickness	medium	medium	med-thin	thin	med-thin	medium
Anthocyanin colouration	weak RHS 152A	absent	absent	weak		medium weak
Juvenile phase	v-short	medium	long	med-short		
LEAF						
No. per axis	3,4 (50%)	3	3	3	4	4
Shape	Narrow Elliptical	Obovate	Obovate	Narrow Elliptical	Narrow Obovate	Broad Lanceolate
Tip	acute pointed	obtuse rounded	obtuse pointed	obtuse rounded	acute either	acute pointed
Length/breadth	3.69	3.25	3.42	2.81	4.53	3.91
length (mm)	144.54	138.82	125.09	128.16	153.40	169.93
Petiole length (mm)	8.28	10.43	9.24	8.65	4.77	7.33
Marg:	1.36	0.12	0.17	0.09	0.90	0.78
Spines/cm						
Mid portion	weak	med-strong	med-weak	medium	weak	weak
Undulation						
Rolling	mid-weak	med-weak	med-weak	med strong	weak	med-weak
Mature colour	dark green	dark green	dark green	dark green	dark green	dark green
RHS Chart No.	139A	139A	139A	139A		137A
Immature colour	green	green	green	green	green	green
RHS Chart No.	137B	137A-B	141A	137B		143A
Margin colour	paler	paler	similar	paler	paler	paler
Leaf sheen	medium	med-high	med-high	low	medium	low-med
Vein colour	153 B or C	152D	152C	152D	153D	
			FLOWERING AND FRUIT			
Flowering time	med-late	medium	v-early	early	late	med-late
Duration	short	medium	long			
Nuts/raceme	1.7	1.5 (est)	2.5 (est)	2.0 (est)		1.5 (est)

TABLE 1-continued

Character	HV A4	Keauhou	Kau	Own Choice	Nutty Glen	Renown
Raceme density on tree	very dense	dense	medium	dense		med-dense
Raceme length	long	short	short-med	medium	long	long
Husk color	137A-B	137A	137B	137A		138A
Husk thickness	3.7 mm	3 mm	2.7 mm	3.2 mm	4.3 mm	4.4 mm
% nut diameter	14.1%	11.7%	10.6%	12.1%	15.4%	16.4%
Hilum endpoint	medium	medium	small	med-small	small	large
Pedicel shoulder	weak	absent		absent	absent	weak
Dehiscence (1-5)	off-tree 1	off-tree 1	off-tree 1	both 2		on-tree 3
Splitting (1-5)	both 3	off-tree 5	off-tree 5	off tree 4	on-tree 1	on-tree 2
NUTS						
Nut Shape	oval	round	round	round	round	oval
length/breadth	1.04	0.98	0.99	1.04	0.99	1.12
Nut diameter (mm)	26.27	25.55	25.00	25.96	28.04	26.85
Range (mm)	22-30	21-30	22-28	21-30	23-34	23-30
Std deviation (mm)	1.38	1.46	1.37	1.57	2.02	1.45
Kernel weight (gm)	3.6-3.8	2.3-2.7	2.2-2.5	2.5-2.7	4.0	3.2-3.6
% of Nut	43-47	34-38	32-34	33-36	46-47	39-41
Shell texture	smooth	mild-rough	smooth	smooth	rough	rough
Shell sheen	medium	dull	dull	dull	med-shiny	shiny
Shell flecking	moderate	slight	moderate	mod-heavy	mod-slight	mod-heavy
Micropyle	v-slight	obvious	v-slight	v-slight	v-slight	v-slight
Shell colour (dried)	164A	165B	165B	165A-B	165A-B	165B
Suture colour	same	same	lighter	same	same	lighter

We claim:

1. A new and distinct hybrid *Macadamia inte-*

grifolia × *tetraphylla* named Hidden Valley A4 substan-
tially as shown and described.

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FIGURE 1

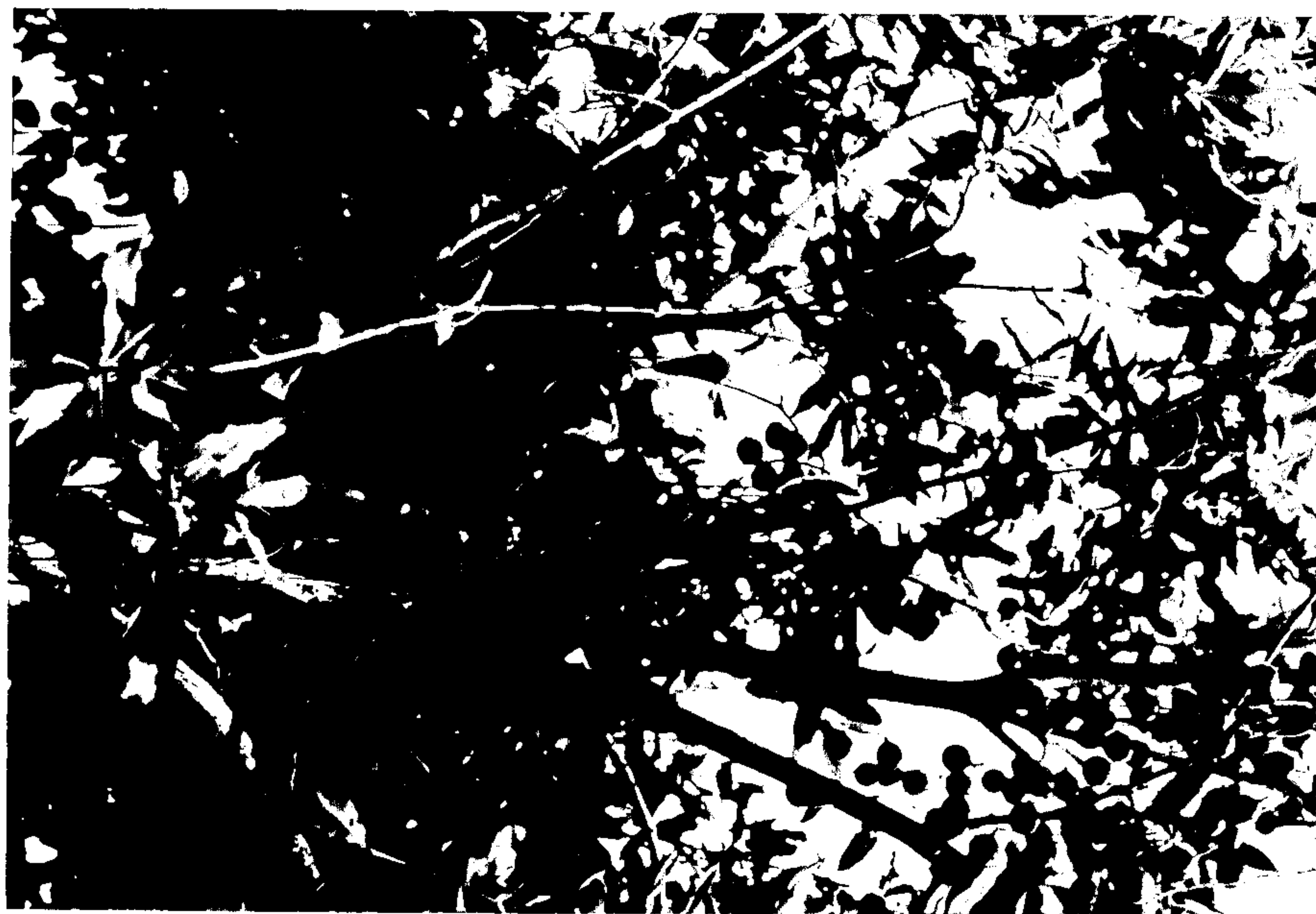


FIGURE 2

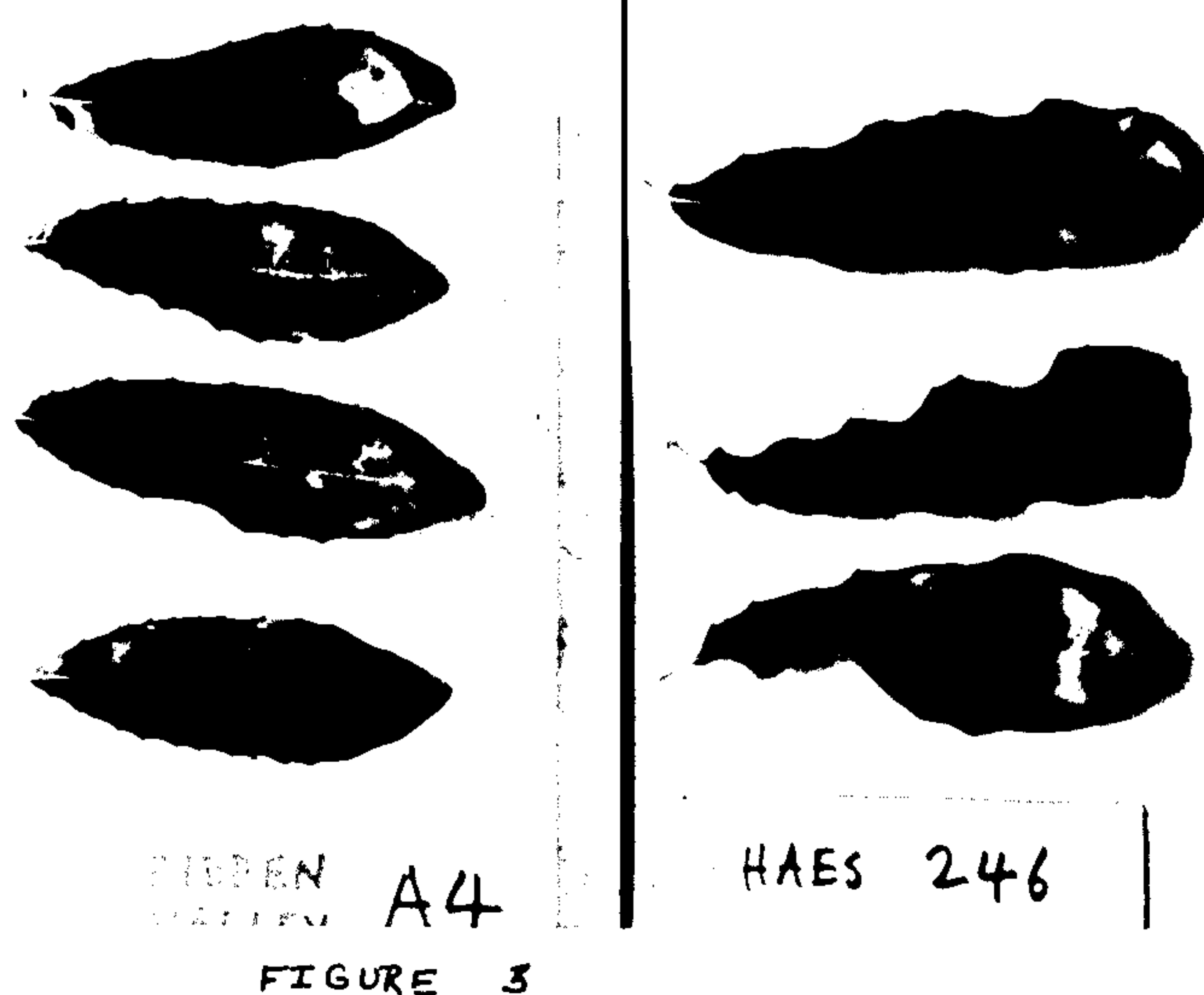


FIGURE 3

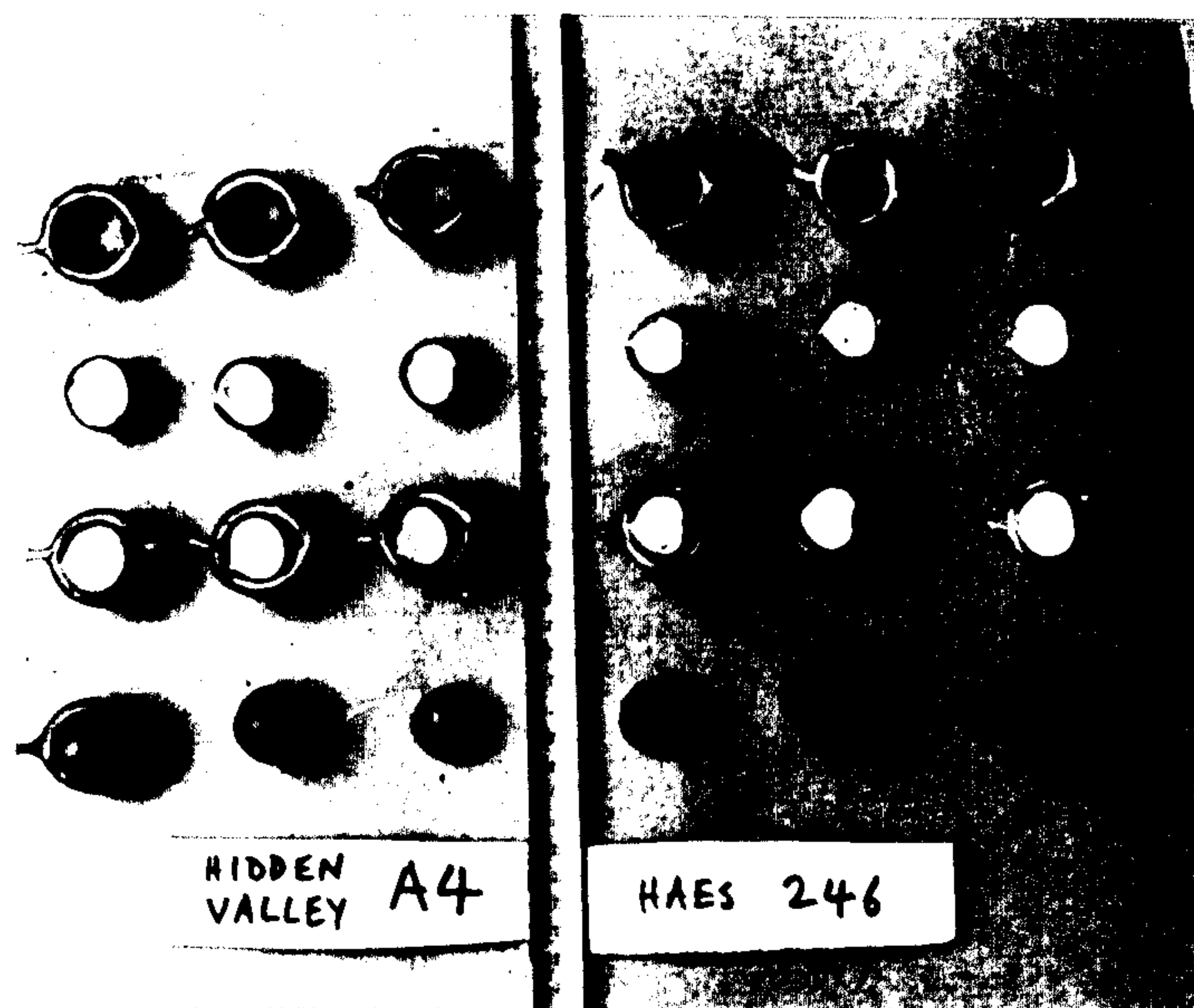


FIGURE 4

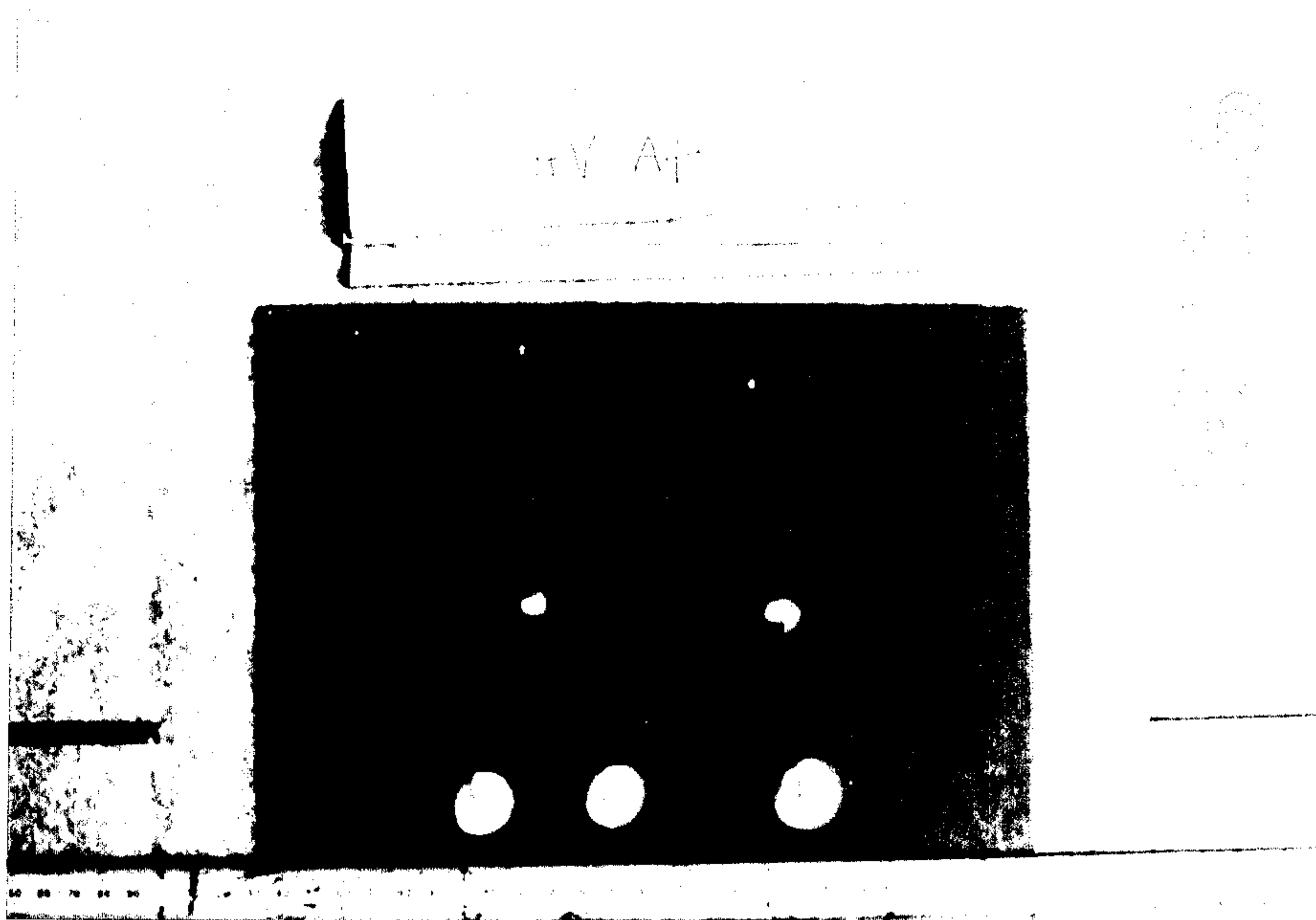


FIGURE 5