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[54] KIWI PLANT NAMED ‘HORT16A’

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[57] ABSTRACT

A new and distinct kiwi plant of the species *Actinidia chinensis* Planch. is described. The cultivar results from a controlled pollination using a male *A. chinensis* selection CK15_01 of unknown parentage, and a female *A. chinensis* selection CK01_01_01_01. Both named parents (CK15_01 and CK01_01_01_01) are unpatented cultivars. The new cultivar is distinguished by its short silky hair, protruding stylar end, golden flesh and sweet tropical taste.

4 Drawing Sheets

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BACKGROUND TO THE INVENTION

Kiwi plants in cultivation are deciduous vines of *A. deliciosa*. There are more than 50 species in the genus *Actinidia* originating in China and parts of Asia. The kiwi cultivar ‘Hayward’, developed in New Zealand, is the most widely grown cultivar because of its distinctive green flesh, good flavor and long storage life.

Less well known outside of mainland China is the species *A. chinensis*, closely related to *A. deliciosa*. Fruit can be as large as the kiwi, generally have much finer, softer hairs on the fruit skin, and can have either green or yellow flesh. Many Chinese prefer fruit of *A. chinensis* rather than the kiwi of commerce, considering the flavor to be superior. Like the kiwi, plants are dioecious, so male pollinizers are required as well as female plants to ensure fruit production.

A. chinensis plants grow vigorously in spring, and rapidly develop canes up to 4 m long if not managed correctly. Plants require a mild, warm-temperate climate, free from spring and early autumn frosts, and need well-drained soils to produce consistent heavy crops. Regular irrigation is necessary in dry spells. *A. chinensis* flowers in spring (mid-October to mid-November) in New Zealand. Harvest of *A. chinensis* fruit may occur between April and mid-May in New Zealand, depending on the selection and location of plantings.

SUMMARY OF THE INVENTION

The present invention relates to a new and distinctive kiwi plant having a generally ovoid shaped fruit which tapers towards the stylar end and which has soft, silky hair. More particularly, the new cultivar is designated ‘Hort16A’ and is derived from a controlled pollination of *A. chinensis* CK15_01, a male selection of unknown parentage, and *A. chinensis* female CK01_01_01. Both parents were derived from seedling plants grown from two introductions of seeds from China in 1981 and 1978 and are unpatented.

The new cultivar of kiwi was created in the course of a plant breeding program which was initiated during 1987 at Hort Research in Auckland, New Zealand. The cross made by Mark McNeilage in November 1987. Seed were sown in winter 1988 and 312 seedlings from this cross were planted out in the field at Te Puke Research Centre in spring, 1988. The seedlings first fruited in May 1990 and ‘Hort16A’

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(breeding code CK01_02_01_01) was selected, after storage and sensory evaluation in 1991 and 1992 by Russell Lowe and Hinga Marsh.

The new cultivar can be asexually reproduced as cuttings or by grafting or budding on to seedling or cutting-grown rootstocks of *A. deliciosa* or *A. chinensis*. Trial plantings on seedling rootstocks, established in 1992 at Te Puke, have shown that the unique combination of characteristics come true to form and are established and transmitted through succeeding asexual propagations.

‘Hort16A’ flowers four weeks ahead of the unpatented ‘Hayward’ variety, so the usual pollinizers used for ‘Hayward’ are ineffective as well as being of a different species and ploidy. Two new and unpatented early-flowering *A. chinensis* male pollinizers, designated Hortkiwi ‘Meteor’ and Hortkiwi ‘Sparkler’, have been selected as males for use in new plantings of ‘Hort16A’.

BRIEF DESCRIPTION OF THE ILLUSTRATIONS

FIG. 1 shows typical fruit of the cultivar ‘Hort16A’ on the vine

FIG. 2 shows typical fruit of the cultivar ‘Hort16A’

FIG. 3 shows ‘Hort16A’ fruit in cross-section and profile

FIG. 4 shows ‘Hayward’ fruit in cross-section and profile

FIG. 5 shows flowers of the cultivar ‘Hort16A’

FIG. 6 shows flowers of the cultivar ‘Hayward’

FIG. 7 shows mature leaves of ‘Hort16A’

FIG. 8 shows a mature leaf of ‘Hayward’

Photographs of fruit were taken after the normal harvest date. Colors may vary depending upon growing conditions under different climate, soil, and cultivation conditions and the fruit skin color may vary depending upon extent of exposure to direct sunlight.

COMPARISON TO CLOSEST CULTIVAR

The distinctive characteristics of this new kiwi cultivar, described in detail below, were observed in 1994 at Te Puke, New Zealand. The age of the plants was 3 years from the graft. Comparison ‘Hayward’ vines were grown in another block on the same orchard.

The fruit of ‘Hort16A’ is ovoid in shape and has a protruding distal end unlike ‘Hayward’ which has a rounded distal end. ‘Hort16A’ fruit are generally circular in cross-section although slightly flattened. ‘Hort16A’ fruit has a much smaller core than ‘Hayward’ and the flesh of ripe fruit is golden yellow whereas ‘Hayward’ flesh is green. The hairs on the skin of the fruit of ‘Hort16A’ are much finer, soft to the touch, and are very easily removed by rubbing or brushing to reveal a leathery, almost shiny skin. The skin color of ‘Hort16A’ fruit is a yellow-brown in contrast to that of ‘Hayward’ which is a medium brown color. ‘Hort16A’ fruit have a higher dry matter content at harvest and are much sweeter tasting than ‘Hayward’ fruit when ripe. While ‘Hort16A’ fruit soften more rapidly than ‘Hayward’ in coolstorage, fruit will stay at about 1 kg firmness for up to 3 months without further significant softening.

BOTANICAL DESCRIPTION OF THE PLANT

The new cultivar ‘Hort16A’ is pistillate, with imperfect flowers, i.e. the flowers produce only sterile pollen and thus require a pollinizer for fruit production. Two specific *A. chinensis* pollinizers, named Hortkiwi ‘Meteor’ and Hortkiwi ‘Sparkler’, have been developed for ‘Hort16A’. Characteristics of the new cultivar, in which it differs from the standard kiwi cultivar ‘Hayward’, include earlier flowering time, protruding stylar end on the fruit, silky easily-removed hairs on the skin, golden flesh when ripe, and yellow-brown colored skin.

TABLE OF CHARACTERISTICS		
Horticultural terminology is used in accordance with revised UPOV guidelines for kiwi.		
Characters of comparison cultivar ‘Hayward’ are noted opposite that character in [brackets] when significantly different.		
‘Hayward’ plants were observed in a planting on the same orchard, but not the same plot.		
All dimensions in millimeters unless otherwise stated, weights in grams.		
	Hort16A	Hayward
PLANT		
Plant: sex expression	female (flowers imperfect)	
Plant: ploidy	diploid (2n = 2x = 58)	[hexaploid]
Plant: vigor	strong	[medium]
Young shoot: hairs	present	
Young shoot: density of hairs	medium	
Young shoot: type of hairs	short	[hirsute]
Young shoot: anthocyanin coloration of growing tip	absent	[medium]
Young shoot: anthocyanin coloration of leaf axil	absent	
STEM		
Stem: coloration of leaf axil	absent	[weak]
Stem: diameter	medium - Mean 11.0 mm (Range 8.3–13.3 mm)	
Stem: dormant bud diameter	6.9 mm (4.9–8.3 mm)	
Stem: color on upper side of shoot	dark-brown	
Stem: character of bark	smooth	[medium]
Stem: hairs	present	
Stem: conspicuousness of lenticels	conspicuous	
Stem: number of lenticels	medium	
Stem: color of lenticels	brownish-white	[greyish-white]
Stem: size of bud support	medium	
Stem: visibility of bud (dormant canes)	visible	[almost buried]

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Characters of comparison cultivar ‘Hayward’ are noted opposite that character in [brackets] when significantly different.		
‘Hayward’ plants were observed in a planting on the same orchard, but not the same plot.		
All dimensions in millimeters unless otherwise stated, weights in grams.		
	Hort16A	Hayward
Stem: number of hairs visible on bud (dormant canes)	medium	
Stem: leaf scar	medium	
<u>LEAF (Mature)</u>		
Leaf: general shape of blade	very broadly ovate	
Leaf: length	170.3 mm (145–198 mm)	
Leaf: width	186.3 mm (159–217 mm)	
Leaf: petiole length	166.8 mm (100–250 mm)	
Leaf: shape of tip of blade	cuspidate	[mucronate]
Leaf: shape of base of blade	cordate	
Leaf: arrangement of leaf bases	overlapping	
Leaf: puckering/blistering on upper side of blade	weak	[medium]
Leaf: margin	ciliate	
Leaf: green color of upper side of blade	light-medium	
Leaf: glossiness of upper surface of blade	medium	
Leaf: color of lower side of blade	light green	
Leaf: glaucosity (lower side of blade)	absent	
Leaf: hairs on petiole	present	
Leaf: density of hairs on petiole	medium	
Leaf: anthocyanin coloration on upper side of petiole	medium	
<u>FLOWER</u>		
(Measurements are from a 20 flower sample)		
Inflorescence: predominant number of flowers	one	
Pedicel: length	medium - 42.0 mm (29.9–49.20 mm)	
Pedicel: hairs	present	
Pedicel: length of hairs	very short	
Flower: number of sepals	>5	
Flower: color of sepals	pale green	
Flower: diameter (terminal or king flower when fully open)	large - 47.9 mm (42.3–52.5 mm)	
Flower: petal length	23.1 mm (20.8–25.4 mm)	
Flower: petal width	17.7 mm (15.8–19.1 mm)	
Flower: petal length/width ratio	1.31 mm (1.14–1.45 mm)	
Flower: mean number of petals per flower	8 (6–10)	
Flower: number of flowers with more than six petals	17 out of 20 flowers	
Flower: arrangement of petals	overlapping	
Flower: petal shoulder	present	
Flower: primary color of petals (when fully open)	white	
Flower: type of coloration of petals	uniform color over whole petal	
Flower: style number	30.85 (26–36)	
Flower: attitude of styles	erect	[semi-erect]
Flower: curvature of styles	straight	[strongly curved]

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‘Hayward’ plants were observed in a planting on the same orchard, but not the same plot.		
All dimensions in millimeters unless otherwise stated, weights in grams.		
	Hort16A	Hayward
Flower: amount of hair on ovary	strongly expressed	
FRUIT		
(Measurements are from a 10 fruit sample)		
Fruit: overall size	large 98.3 g (43–176 g)	
Fruit: length	79.1 mm (76.0–84.2 mm)	
Fruit: width (max.)	53.1 mm (55.4–48.1 mm)	
Fruit: width (min.)	49.1 mm (47.0–51.2 mm)	
Fruit: core diameter (max.)	13.1 mm (9.3–17 mm)	
Fruit: core diameter (min.)	4.9 mm (4.1–6.1 mm)	
Fruit: locule number	34.5 (26–37)	
Fruit: peduncle length	48.3 mm (44.7–50.3 mm)	
Fruit: peduncle width	3.57 mm (3.22–4.28 mm)	
Fruit: general shape	ovoid	[cylindrical]
Fruit: cross-section at median	elliptic	
Fruit: general shape of stylar end	protruding	[flat]
Fruit: shape of shoulder on stalk end	rounded	
Fruit: skin color at harvest (fruit still hard)	yellow-brown	[brown]
Fruit: skin color change during ripening	absent	
Fruit: skin color at maturity for consumption	yellow-brown	[brown]
Fruit: hairs	present	
Fruit: density of hairs	medium	
Fruit: type of hair	pubescent	[hirsute]
Fruit: hair length	short	[medium]
Fruit: concentration of hairs	uniform	
Fruit: adherence of hairs to skin (when rubbed)	weak	[strong]
Fruit: core diameter (at largest diameter)	small	[large]
Fruit: core shape (in cross section)	elliptical	
Fruit: core woody spike	present	
Fruit: prominence of core woody spike	weak	[medium]
Fruit: outer pericarp color at maturity for consumption	golden yellow	[green]
Fruit: inner pericarp color (locules) at maturity for consumption	brownish-yellow	[green]
Fruit: core color at maturity	white	[greenish white]
Fruit: sweetness (Brix level) at maturity for consumption	15.6% (14.4–17.0%)	
Fruit: Vitamin C content	medium (125 mg/100 g fresh weight)	
Fruit: seed color at maturity	dark brown	
Fruit: seed color when dry	brown	
EVENTS (at Te Puke, New Zealand)		
Time of vegetative budbreak	late August to first week of September	
Time of beginning of flowering	late October to first week of November	

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All dimensions in millimeters unless otherwise stated, weights in grams.		
	Hort16A	Hayward
Time of maturity for harvest (at 10.0% SSC)	first-second week of May	

HORTICULTURAL CHARACTERISTICS

Details below relate to observations made on plants growing at Te Puke Research Centre, New Zealand. These plants were grafted on to *A. deliciosa* seedling rootstocks.

‘Hort16A’ vines can be grown on the same rootstocks as can ‘Hayward’. Rootstocks currently being used in New Zealand include *A.deliciosa* seedlings, ‘Hayward’ rooted cuttings and Hortkiwi ‘Kaimai’.

Cropping: young vines of ‘Hort16A’ carry higher yields than ‘Hayward’ when plants of equivalent ages are compared, although at maturity, yields are likely to be similar. The storage life of ‘Hort16A’ fruit is about 75% of that of ‘Hayward’ fruit under a coolstorage temperature of 0° C. ‘Hort16A’ fruit soften in coolstore more rapidly than ‘Hayward’ fruit initially, but will hold at a ready to eat firmness of about 1 kg for over two months after the initial softening period.

OTHER DATA

Fruit size: Data from a random harvest of 1940 fruit which were graded to measure fruit size in May 1995. Individual fruit weights collected electronically from the grader.

Mean fruit weight: 98.3 g.

Minimum.—43 g.

Maximum.—176 g.

Standard error of the mean (SEM): 0.574.

COLOR CHART RHS Colour Chart, the Royal Horticultural Society, London 1966.		
Flesh Color at maturity:		
Outer pericarp		
Hort16A	12C–12B	[Hayward 138B–138C]
Inner pericarp		
Hort16A	162A–162C	
Fruit core at harvest:		
Hort16A	159C	[Hayward 155A]
Seed color (in flesh):	200A	
Seed color (dry seed):	200D	
Fruit skin at maturity:	combination of	
Hort16A	199A plus 161A	
Leaf color:		
mature leaf after petal fall		
Upper side of leaf		
Hort16A	146A	[Hayward 147A]
Lower side of leaf		
Hort16A	147B	[Hayward 147C]
Flower petals:		
main body of petal	155D	
Plant stem:		
exposed side	200B–200C-165A	[Hayward 147C]

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We claim:
1. A new and distinct kiwi plant of the species *A. chinensis* substantially as described and illustrated, characterized by yellow flesh with a sweet, tropical taste, ovoid fruit shape

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with a protruding stylar end, and yellow brown skin with soft fine hairs.

* * * * *



FIG. 1

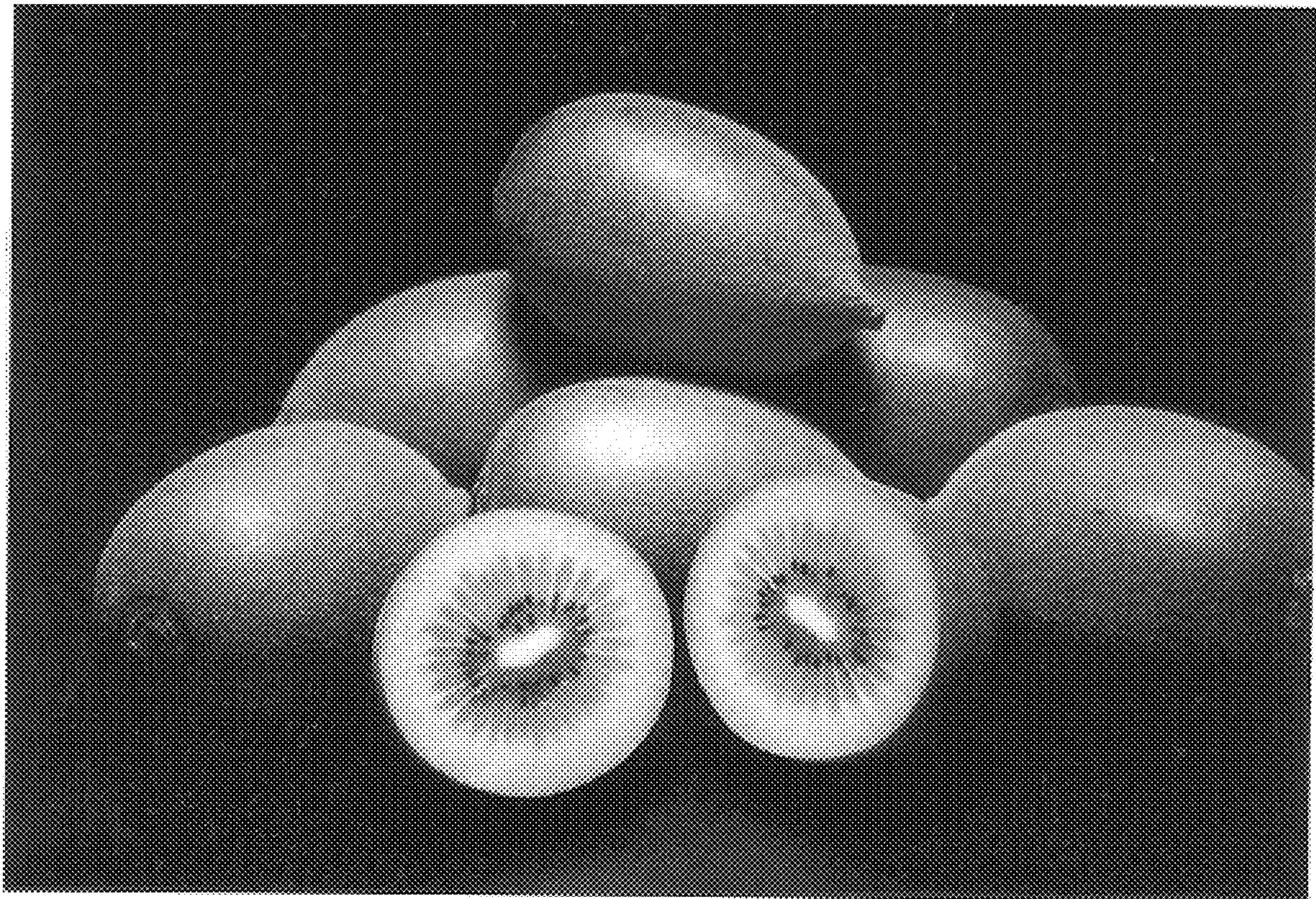


FIG. 2

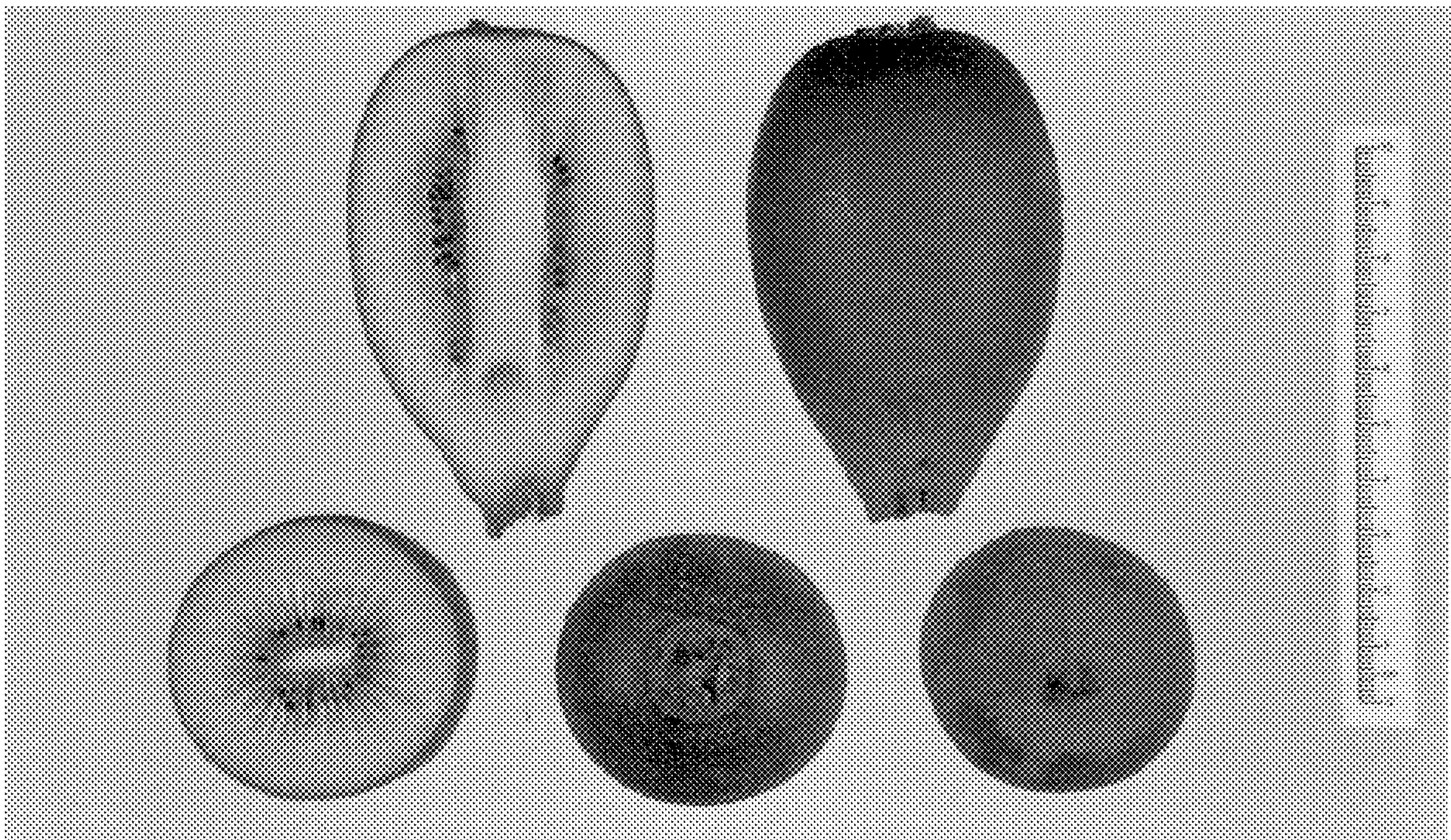


FIG. 3

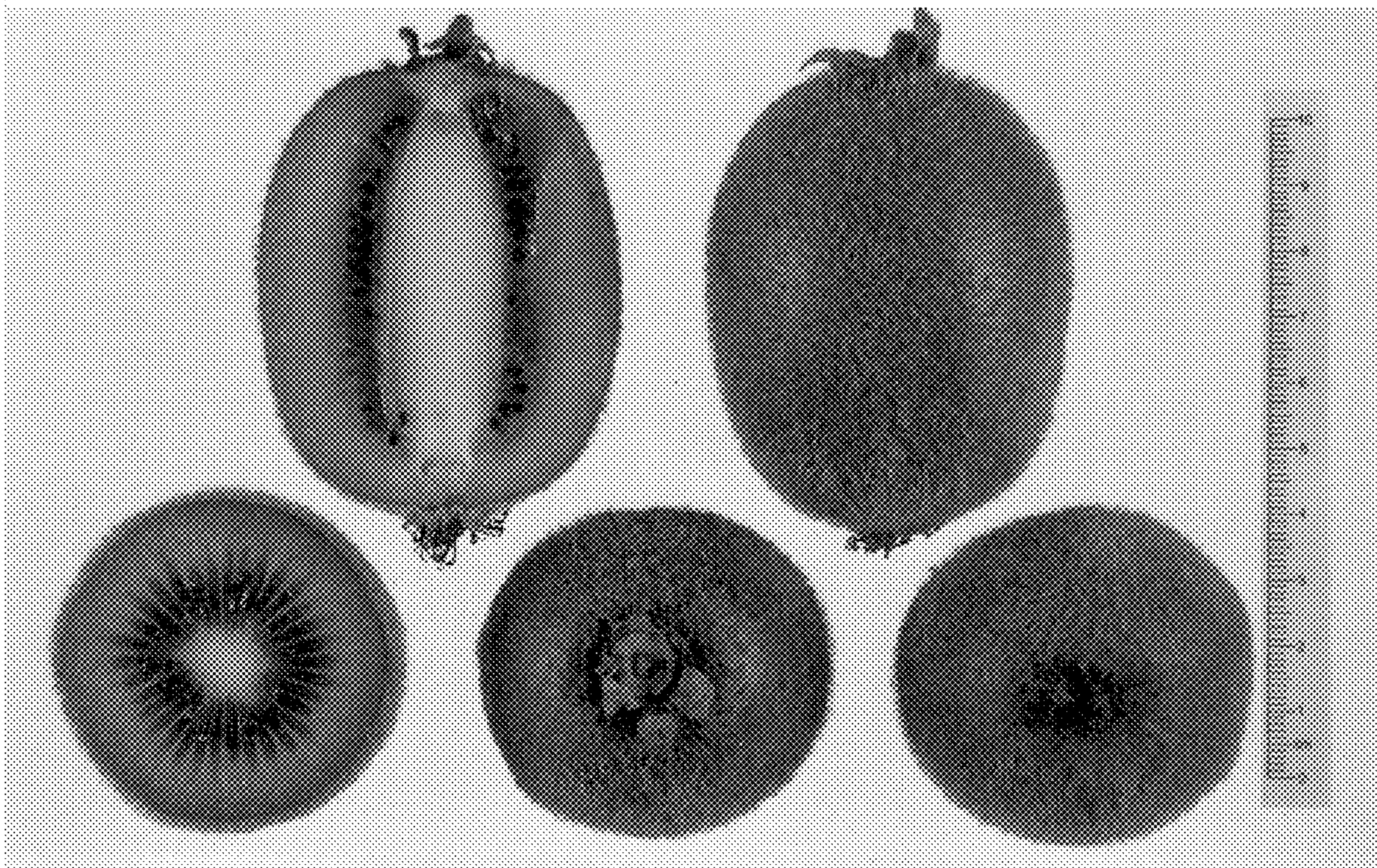


FIG. 4

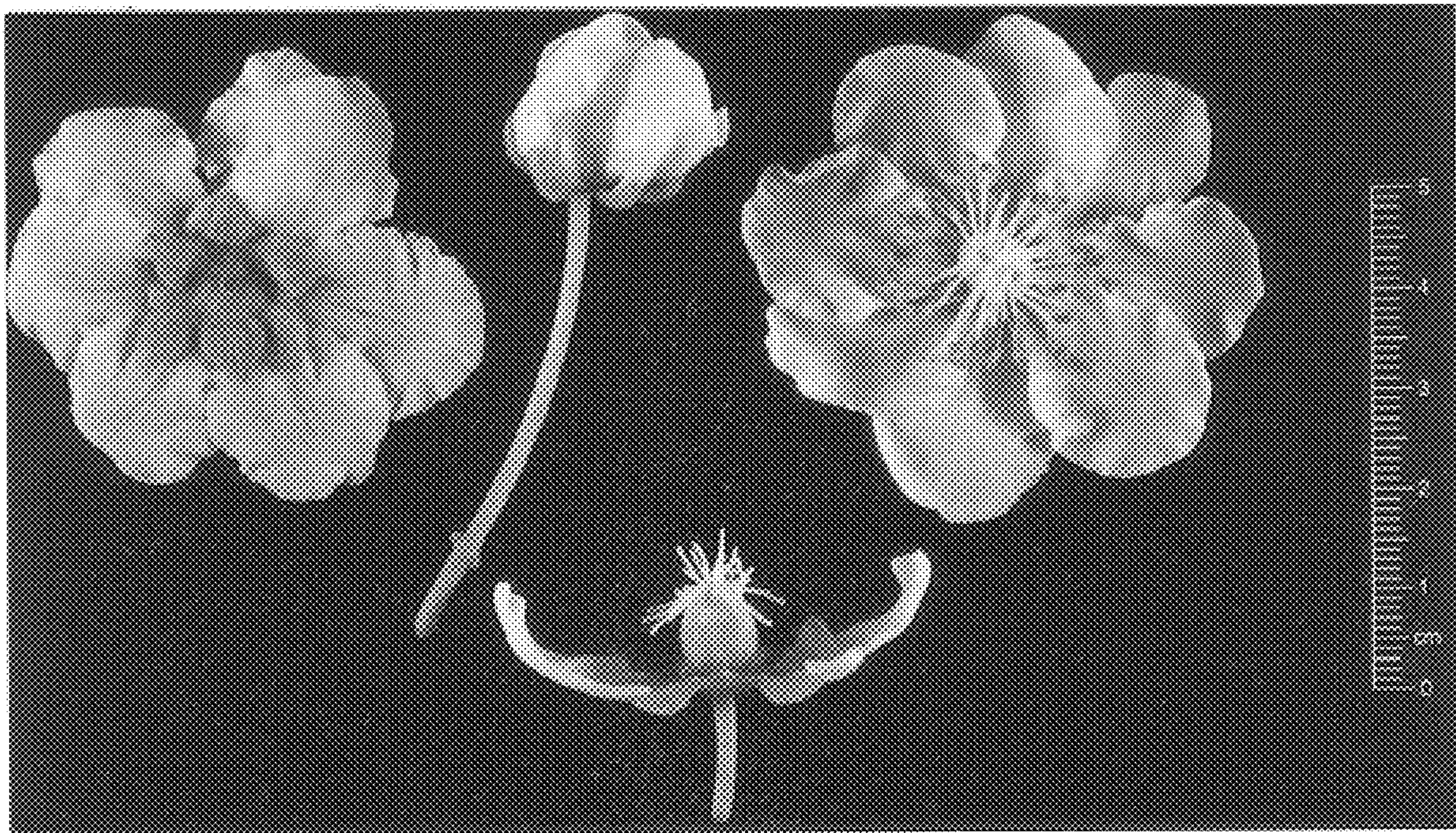


FIG. 5



FIG. 6

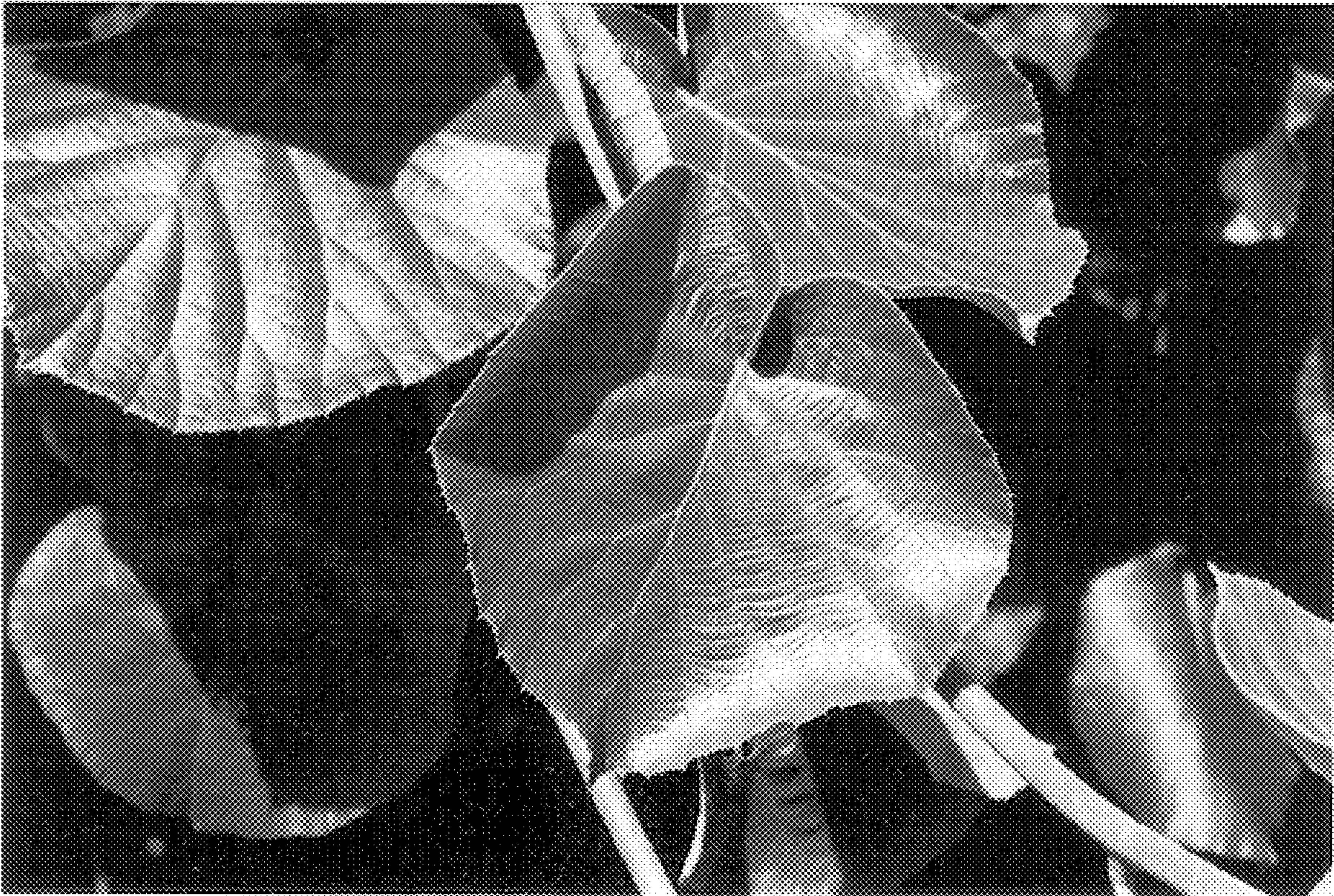


FIG. 7



FIG. 8