



Minimum descriptors for *Cucurbita* spp., cucumber, melon and watermelon

Developed by the ECPGR Working Group on Cucurbits

ECPGR Secretariat

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Note

These lists have been agreed by the Working Group on Cucurbits in October 2005 and were revised in June 2007. The *Cucurbita* spp. list is still under discussion.

The lists have been submitted for revision and approved by Bioversity.

Minimum list of descriptors for cultivated pumpkin, squash and gourds (*Cucurbita* spp.)

This list is under revision and discussion by the ECPGR Working Group on Cucurbits.

The descriptors from Bioversity (formerly IBPGR¹/IPGRI²) have been followed wherever possible for the elaboration of this descriptor list. Descriptor numbers are indicated in the table below, as relevant.

This descriptor list is aimed only at characterizing morphological traits of cultivated species of the *Cucurbita* genus if the species is known (*C. maxima*, *C. pepo*, *C. moschata*, *C. ficifolia* and *C. argyrosperma*).

Number	Descriptor number	Descriptor name	Descriptor state	Notes
Plant				
Observations must be made at least on 10 plants				
1	IBPGR 4.1.1	Plant growth habit	3 Bushy 5 Intermediate 7 Prostrate	
Fruit				
Observations must be made at least on 10 fruits				
2	IBPGR 4.2.1	Peduncle transectional shape	1 Round 2 Smoothly angled 3 Sharply angular	<i>To be observed at physiological maturity</i>
3	IBPGR 4.2.3	Fruit shape	1 Globular (round) 2 Flattened 3 Disk-shaped 4 Oblong blocky (cylindrical) 5 Elliptical (oval) 6 Acorn (heart-shaped) 7 Pyriform 8 Dumbbell (with neck) 9 Elongated 10 Turbinate superior 11 Crowned 12 Turbinate inferior 13 Curved 14 Crooked neck 99 Other (specify in descriptor 14, Notes)	<i>See Fig. 1. To be observed at physiological maturity</i>
4	IBPGR 4.2.4	Fruit ribs	0 Absent 3 Superficial 5 Intermediate 7 Deep	<i>To be observed at physiological maturity</i>

¹ Esquinas-Alcazar, J.T. and P.J. Gulick. 1983. Genetic resources of Cucurbitaceae: a global report. IBPGR Secretariat, Rome, Italy.

² IPGRI. 2003. Descriptors for melon (*Cucumis melo* L.). International Plant Genetic Resources Institute, Rome, Italy. (http://www.bioversityinternational.org/publications/pubfile.asp?ID_PUB=906).

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Number	Descriptor number	Descriptor name	Descriptor state	Notes
5	IBPGR 4.2.5 (modified)	Predominant fruit skin colour at maturity	1 White 2 Green 3 Blue 4 Cream 5 Yellow 6 Orange 7 Red 8 Pink 9 Brown 10 Grey 11 Black 99 Other (specify in descriptor 14, Notes)	<i>Predominant colour is the colour which covers the largest area of the fruit skin. In case two colours have the same surface, the lighter colour will be considered the predominant one. To be observed at physiological maturity</i>
6	IBPGR 4.2.6	Secondary fruit skin colour	0 No secondary skin 1 White 2 Green 3 Blue 4 Cream 5 Yellow 6 Orange 7 Red 8 Pink 99 Other (specify in descriptor 14, Notes)	<i>Secondary colour is the colour which covers the second largest area of the fruit skin. In case two colours have the same surface area, the darker colour will be considered the secondary one. To be observed at physiological maturity</i>
7	IBPGR 4.2.7	Secondary fruit skin colour pattern	0 No secondary fruit skin colour 1 Speckled (with spots < 0.5 cm) 2 Spotted, blotchy (with spots ≥ 0.5 cm) 3 Striped (with bands that run from peduncle to blossom scar) 4 Streaked (marks that are not continuous from one end of the fruit to the other) 5 Bisectonal 99 Other (specify in descriptor 14, Notes)	<i>Design produced by secondary fruit skin colour. To be observed at physiological maturity</i>
8	IBPGR 4.2.8	Fruit skin texture	1 Smooth 2 Grainy 3 Finely wrinkled 4 Shallowly wavy 5 Netted 6 With warts 7 With spines 99 Other (specify in descriptor 14, Notes)	<i>To be observed at physiological maturity</i>
9	IBPGR 4.2.11	Fruit weight [kg]		<i>To be observed at physiological maturity</i>
10	IBPGR 4.2.14	Flesh thickness [mm]		<i>To be measured at maximum fruit diameter. To be observed at physiological maturity</i>

Number	Descriptor number	Descriptor name	Descriptor state	Notes
11	IBPGR 4.2.15	Flesh colour	1 White 2 Green 3 Yellow 4 Orange 5 Salmon (pink-orange) 99 Other (specify in descriptor 14, Notes)	<i>To be observed at market stage and at physiological maturity</i>
11.1		Flesh colour observation stage	1 Market stage 2 Physiological maturity	
12	IBPGR 6.2.18	Flesh texture	1 Smooth-firm 2 Grainy-firm 3 Soft-spongy 4 Fibrous-gelatinous 5 Fibrous-dry	<i>To be observed at physiological maturity</i>
13		Seed hull	0 Absent 1 Present but rudimentary 2 Present with normal appearance	
Additional information				
14	IPGRI 7.9	Notes		<i>Any additional information, especially in the category of "Other" under various descriptors above may be specified here</i>
15		Photograph		<i>It is recommended to take a photograph of one or some fruits</i>

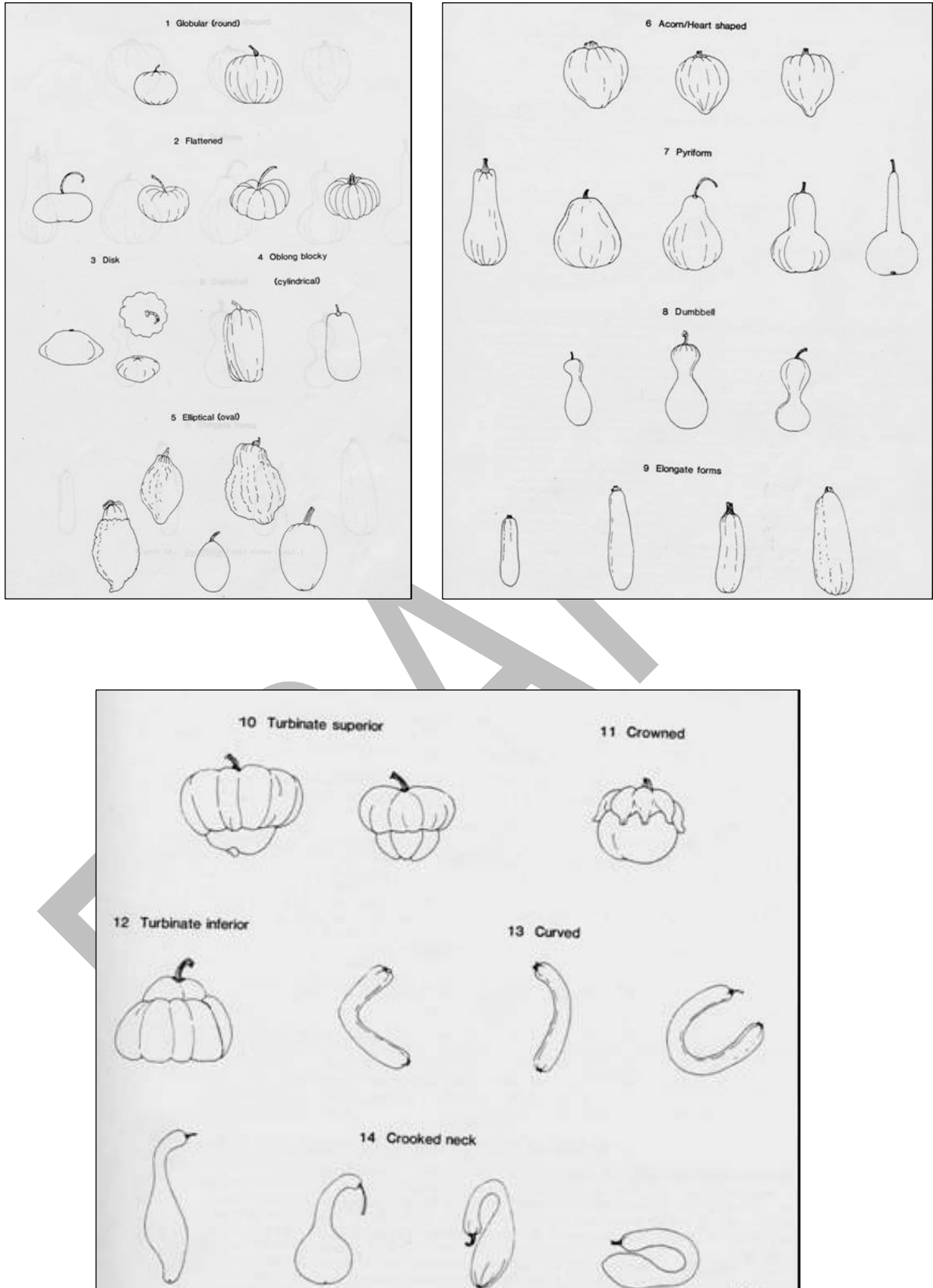


Fig. 1. *Cucurbita*: Fruit shape (descriptor 3).
(Source: Esquinas-Alcazar and Gulick 1983, Fig. 16).

Minimum list of descriptors for cucumber (*Cucumis sativus*)

The descriptors from UPOV³ and Bioversity (formerly IBPGR⁴/IPGRI⁵) have been followed wherever possible for the elaboration of this descriptor list. Descriptor numbers are indicated in the table below, as relevant.

This descriptor list is aimed only at characterizing morphological traits of cucumber.

Number	Descriptor number	Descriptor name	Descriptor state	Notes
Plant				
Observations must be made at least on 10 plants				
1	UPOV 1	Plant growth type	1 Determinate (main stem distinct, with shortened internodes) 2 Indeterminate (long main stem)	To be observed at physiological maturity
Leaf				
Observations must be made at least on 10 leaves				
2	IBPGR 6.1.2 (modified)	Leaf blade size	1 Small (leaf width < 10 cm) 2 Medium (leaf width ≥ 10 - < 20 cm) 3 Large (leaf width ≥ 20 cm)	To be observed on fully developed leaf from middle part of the plant at physiological maturity
3	UPOV 6	Leaf intensity of green colour	3 Light 5 Medium 7 Dark	To be observed on fully developed leaf from middle part of plant at physiological maturity. Compare with other plants in same plot
Fruit				
Observations must be made at least on 10 fruits				
4	IBPGR 4.2.11 (modified)	Fruit length [cm]		To be measured at maturity stage (table use)
5	IBPGR 4.2.12 (modified)	Fruit width [cm]		To be measured at maturity stage (table use) at the widest point of the fruit
6	UPOV 23	Fruit predominant shape at stem end	1 Necked 2 Acute 3 Obtuse 99 Other (specify in descriptor 12, Notes)	See Fig. 1. To be observed at maturity stage (table use)
7	IBPGR 4.2.7	Fruit spine colour	0 Absent spines 1 Black 2 Brown 3 White 99 Other (specify in descriptor 12, Notes)	To be observed at maturity stage (table use)

³ UPOV. 1996. Guidelines for the conduct of tests for distinctness, homogeneity and stability. Cucumber, gherkin (*Cucumis sativus* L.). (http://www.upov.int/en/publications/tg-rom/tg061/tg_61_6.pdf).

⁴ Esquinas-Alcazar, J.T. and P.J. Gulick. 1983. Genetic resources of Cucurbitaceae; a global report. IBPGR Secretariat, Rome, Italy.

⁵ IPGRI. 2003. Descriptors for melon (*Cucumis melo* L.). International Plant Genetic Resources Institute, Rome, Italy. (http://www.bioversityinternational.org/publications/pubfile.asp?ID_PUB=906).

Number	Descriptor number	Descriptor name	Descriptor state	Notes
8	UPOV 26	Predominant fruit skin colour	1 White 2 Yellow 3 Green 99 Other (specify in descriptor 12, Notes)	<i>To be observed at maturity stage (table use)</i>
9	UPOV 40	Predominant fruit skin colour at physiological ripening	1 White 2 Yellow 3 Green 4 Orange 5 Brown 99 Other (specify in descriptor 12, Notes)	<i>To be observed at physiological maturity</i>
10	UPOV 18 (modified)	Parthenocarpy	0 Absent 1 Present	<i>Isolate 3 female flower buds per plant</i>
Inflorescence				
Observations must be made at least on 10 plants				
11	IBPGR 4.2.1 (modified)	Reproductive system	1 Monoecious (male and female flowers on the same plant) 2 Hermaphroditic (hermaphrodite flowers only) 3 Androecious (male flowers on the same plant) 4 Gynoecious (female flowers on the same plant) 99 Other (specify in descriptor 12, Notes)	<i>To be observed on main stem at first fruit set</i>
Additional information				
12	IPGRI 7.9	Notes		<i>Any additional information, especially in the category of "Other" under various descriptors above may be specified here</i>
13		Photograph		<i>It is recommended to take a photograph of one or some fruits at market and physiological maturity</i>

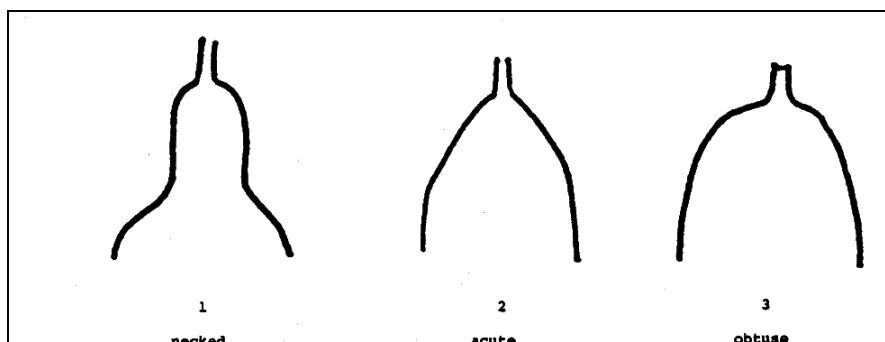


Fig. 1. *Cucumis sativus*: Fruit predominant shape at stem end (descriptor 6). (Source: UPOV 1996).

Minimum list of descriptors for cultivated melon (*Cucumis melo* L.)

The descriptors from Bioversity (formerly IPGRI⁶) have been followed wherever possible for the elaboration of this descriptor list. Descriptor numbers are indicated in the table below, as relevant.

This descriptor list is aimed only at characterizing morphological traits of cultivated melon.

Number	Descriptor number	Descriptor name	Descriptor state	Notes
Inflorescence				
Observations must be made at least on 10 plants				
1	7.6.1	Sex type	1 Monoecious (male and female flowers on the same plant) 2 Andromonoecious (male/female and male flowers on the same plant) 3 Gynoecious (female flowers on the same plant) 4 Male sterile 5 Female sterile 99 Other (specify in descriptor 13, Notes)	<i>To be observed on main stem at first fruit set</i>
Fruit				
Unless specified, fruit characteristics should be measured when fruits are ripe, not overripe. Observations must be made at least on 10 fruits				
2	7.7.1	Fruit shape	1 Globular (round) 2 Flattened 3 Oblate 4 Elliptical 5 Pyriform (pear-like) 6 Ovate 7 Acorn 8 Elongated 9 Scallop (like a scallop shell) 99 Other (specify in descriptor 13, Notes)	<i>See Fig. 1</i>
3	7.7.10	Predominant fruit skin colour	1 White 2 Light-yellow 3 Cream 4 Pale green 5 Green 6 Dark green 7 Blackish-green 8 Orange 9 Brown 10 Grey 99 Other (specify in descriptor 13, Notes)	<i>Predominant colour is the colour that covers the largest surface area of the fruit. In case the two colours have the same surface area, the lighter colour will be considered the predominant one</i>

⁶ IPGRI. 2003. Descriptors for melon (*Cucumis melo* L.). International Plant Genetic Resources Institute, Rome, Italy.
(http://www.bioversityinternational.org/publications/pubfile.asp?ID_PUB=906).

Number	Descriptor number	Descriptor name	Descriptor state	Notes
4	7.7.11	Secondary fruit skin colour	1 White 2 Light-yellow 3 Cream 4 Pale green 5 Green 6 Dark green 7 Blackish-green 8 Orange 9 Brown 10 Grey 99 Other (specify in descriptor 13, Notes)	<i>Secondary fruit colour is the colour that covers the second largest area of the fruit. In case two colours have the same surface area the darker colour will be considered the secondary one</i>
5	7.7.15 (modified)	Secondary fruit skin colour pattern	0 No secondary fruit skin colour 1 Speckled (spots < 0.5 cm) 2 Spotted, blotchy (spots ≥ 0.5 cm) 3 Stripped (bands that run from peduncle to blossom scar) 4 Short streaked (elongated marks that are continuous from one end to the other and < 4 cm in length) 5 Long streaked (as 4 but ≥ 4 cm) 99 Other (specify in descriptor 13, Notes)	<i>See Fig. 2. Design produced by secondary fruit skin colour</i>
6	7.7.16	Fruit surface	1 Smooth 2 Grainy 3 Finely wrinkled 4 Deeply wrinkled 5 Shallowly wavy 6 Rare warts 7 Numerous warts 8 Lightly corked/netted 9 Heavily corked/netted 10 Sutures 99 Other (specify in descriptor 13, Notes)	
7	7.7.21 (modified)	Fruit ribbing	0 Absent 3 Superficial 5 Intermediate 7 Deep	
8	7.7.40	Flesh main colour	1 White 2 Yellow 3 Cream 4 Pale green 5 Green 6 Pale orange 7 Orange (yellow-red) 8 Salmon (pink-red) 99 Other (specify in descriptor 13, Notes)	
9	7.7.50	Flesh thickness [mm]		<i>Measured at maximum fruit diameter in 10 fruits</i>

Number	Descriptor number	Descriptor name	Descriptor state	Notes
10	7.8.5	Predominant seed coat colour	1 White 2 Yellow-white 3 Cream yellow 4 Yellow 5 Light brown or tan 6 Brown 99 Other (specify in descriptor 13, Notes)	
11	8.1.10	Fruit weight [g]		
12	8.2.5	Soluble solids [%]		<i>Measured in a homogenized sample of flesh and recorded as percentage solids read directly from a Brix Scale superimposed over the refractive index scale</i>
Additional information				
13	7.9	Notes		<i>Any additional information, especially in the category of "Other" under various descriptors above may be specified here</i>
14		Photograph		<i>It is recommended to take a photograph of one or some fruits(whole fruit and cross section)</i>

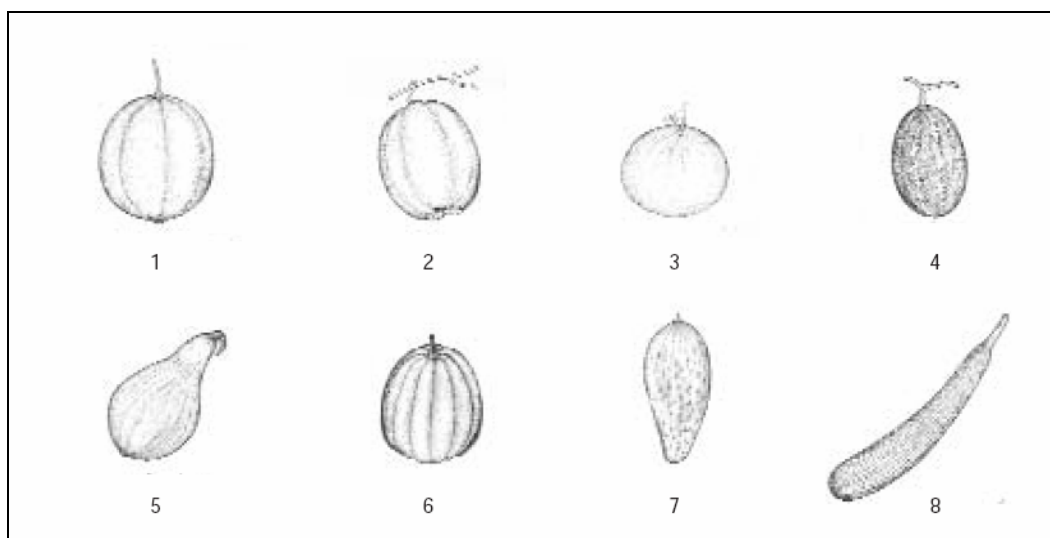


Fig. 1. *Cucumis melo*: Fruit shape (descriptor 2).
(Source: IPGRI 2003, Fig. 5).

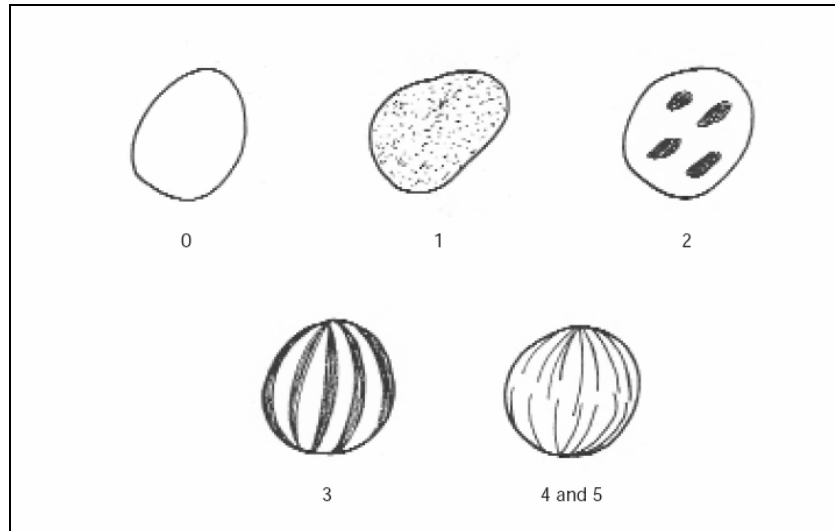


Fig. 2. *Cucumis melo*: Secondary skin colour pattern (descriptor 5).
(Source: IPGRI 2003, Fig. 6).

Minimum list of descriptors for cultivated watermelon (*Citrullus lanatus*)

The USDA/ARS/GRIN Descriptors for watermelon⁷ and the UPOV descriptors⁸ have been followed wherever possible for the elaboration of this descriptor list.

This descriptor list is aimed only at characterizing morphological traits of cultivated watermelons.

Number	Descriptor name	Descriptor state	Notes
Plant			
Observations must be made at least on 10 plants			
1	Plant growth habit	1 Bushy 2 Runner	
Leaf			
Observations must be made at least on 10 leaves			
2	Leaf blade: degree of secondary lobing	3 Weak 5 Intermediate 7 Strong	<i>See Fig. 1. The incisions should be observed at the largest leaf between the fifteenth and twentieth node of the main stem</i>
Flower			
Observations must be made at least on 10 flowers			
3	Hermaphroditic flowers	0 Absent 1 Present	
Fruit			
Observations must be made at least on 10 fruits			
4	Fruit weight [kg]		<i>To be recorded at maturity stage (table use)</i>
5	Fruit shape	1 Flattened 2 Round 3 Broad elliptical 4 Elliptical 5 Pyriform 6 Oblong	<i>See Fig. 2</i>
6	Predominant (or ground) fruit skin colour	1 Light green 2 Medium green 3 Dark green 4 White 5 Yellow 6 Brown 99 Other (specify in descriptor 13, Notes)	<i>To be observed at physiological maturity</i>
7	Secondary fruit skin colour pattern	0 No secondary fruit skin colour 1 Solid 2 Striped 3 Spotted 4 Mixed 99 Other (specify in descriptor 13, Notes)	<i>Design produced by secondary fruit skin colour. To be observed at physiological maturity</i>

⁷ USDA/ARS/GRIN. 2006. [NPGS descriptors. Watermelon]. Germplasm Resources Information Network (GRIN)/National Plant Germplasm System (NPGS). (<http://www.ars-grin.gov/npgs/descriptors/watermelon>).

⁸ UPOV. 2004. Watermelon (*Citrullus lanatus* (Thunb.) Matsum. et Nakai). Guidelines for the conduct of tests for distinctness, homogeneity and stability. TG/142/4. (http://www.upov.int/en/publications/tg-rom/tg142/tg_142_4.pdf).

Number	Descriptor name	Descriptor state	Notes
8	Fruit skin stripe colour	1 Light green 2 Medium green 3 Dark green 4 White 5 Yellow 6 Brown 99 Other (specify in descriptor 13, Notes)	<i>To be observed at physiological maturity</i>
9	Flesh colour	1 Red 2 Pink 3 Canary yellow 4 Salmon yellow 5 White 6 Mixed 7 Orange 8 Green 99 Other (specify in descriptor 13, Notes)	<i>Colour of ripe fruit flesh</i>
10	Thickness of pericarp [mm]		<i>See Fig. 3. Measured at maturity stage</i>
11	Distribution of grooves	0 Absent 1 At basal half 2 At apical half 3 On whole fruit	
12	Fruit bitterness	0 Absent 1 Slightly bitter 2 Bitter	
Additional information			
13	Notes		<i>Any additional information, especially in the category of "Other" under various descriptors above may be specified here</i>
14	Photograph		<i>It is recommended to take a photograph of one or some fruits</i>

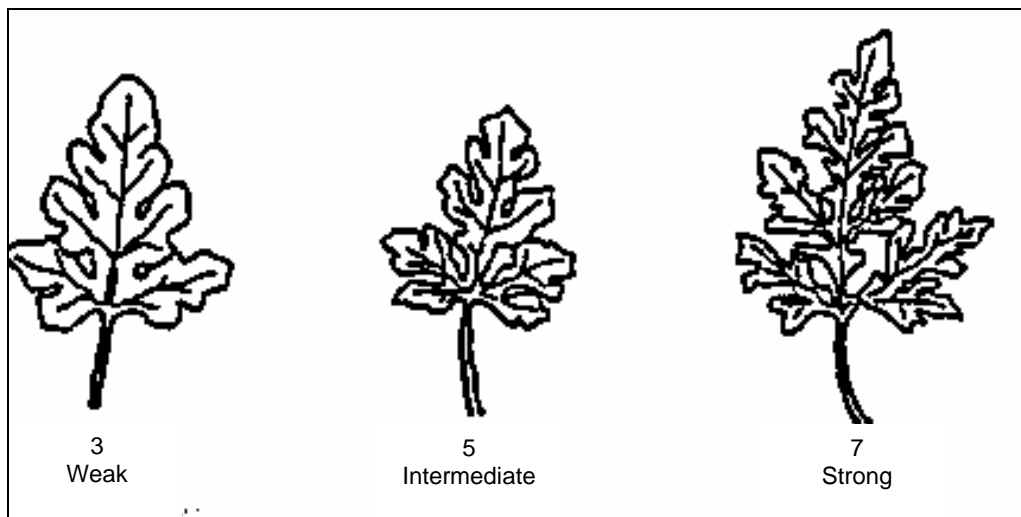


Fig. 1. *Citrullus lanatus*: Leaf blade: degree of secondary lobing (descriptor 2).
(Adapted from: UPOV 2004).

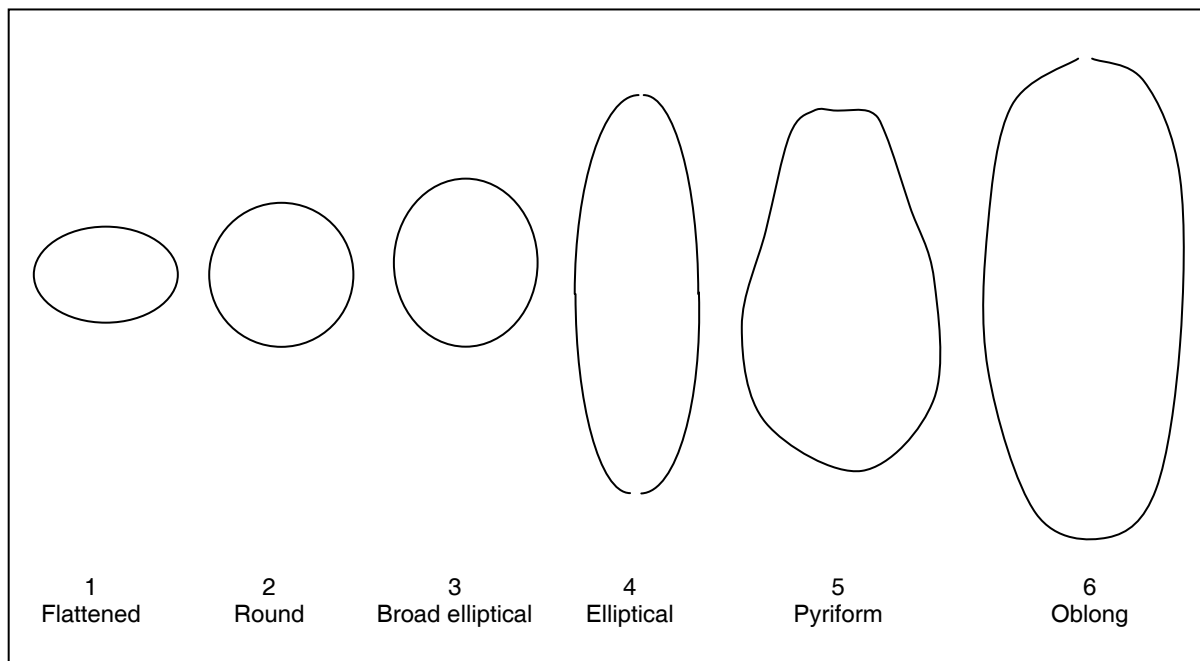


Fig. 2. *Citrullus lanatus*: Fruit shape (descriptor 5).
(Adapted from: UPOV 2004).

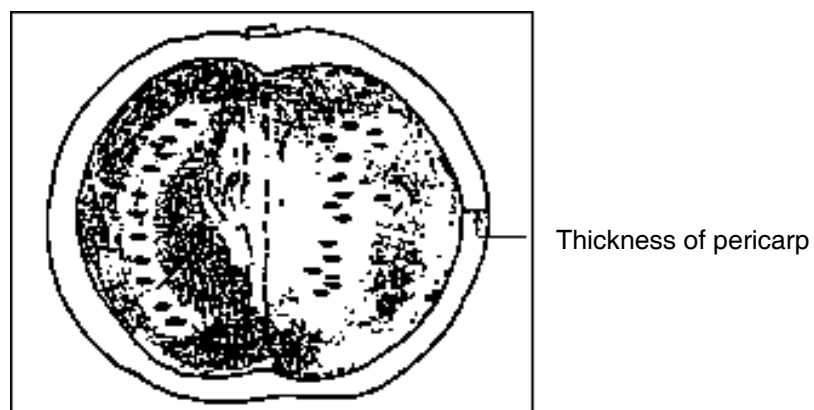


Fig. 3. *Citrullus lanatus*: Thickness of pericarp (descriptor 10).
(Adapted from: UPOV 2004).