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**INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS**  
GENEVA

**ACEROLA**

UPOV Code: MALPI\_EMA

*Malpighia emarginata* DC.

**GUIDELINES**

**FOR THE CONDUCT OF TESTS**

**FOR DISTINCTNESS, UNIFORMITY AND STABILITY**

Alternative Names:\*

<i>Botanical name</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Malpighia emarginata</i> DC., <i>Malpighia punicifolia</i> auct. non L.	Acerola, Barbados cherry, West Indian-cherry	Cerise de Cayenne, Cerisier de Barbade, Cerisier des Antilles	Barbadoskirsche, Westindische Kirsche	Acerola, Semeruco

The purpose of these guidelines (“Test Guidelines”) is to elaborate the principles contained in the General Introduction (document TG/1/3), and its associated TGP documents, into detailed practical guidance for the harmonized examination of distinctness, uniformity and stability (DUS) and, in particular, to identify appropriate characteristics for the examination of DUS and production of harmonized variety descriptions.

**ASSOCIATED DOCUMENTS**

These Test Guidelines should be read in conjunction with the General Introduction and its associated TGP documents.

\* These names were correct at the time of the introduction of these Test Guidelines but may be revised or updated. [Readers are advised to consult the UPOV Code, which can be found on the UPOV Website ([www.upov.int](http://www.upov.int)), for the latest information.]

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## 1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Malpighia emarginata* DC..

## 2. Material Required

2.1 The competent authorities decide on the quantity and quality of the plant material required for testing the variety and when and where it is to be delivered. Applicants submitting material from a State other than that in which the testing takes place must ensure that all customs formalities and phytosanitary requirements are complied with.

2.2 The material is to be supplied in the form of budsticks with sufficient buds to propagate 5 trees (to be sent at budding time), dormant shoots grafted on a rootstock selected by the testing authority or one-year-old trees grafted on a rootstock selected by the testing authority.

2.3 The minimum quantity of plant material, to be supplied by the applicant, should be:

- 5 budsticks or
- 5 dormant shoots or
- 5 one-year-old trees

2.4 The plant material supplied should be visibly healthy, not lacking in vigor, nor affected by any important pest or disease.

2.5 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If it has been treated, full details of the treatment must be given.

## 3. Method of Examination

### 3.1 *Number of Growing Cycles*

3.1.1 The minimum duration of tests should normally be two independent growing cycles. In particular, it is essential that the trees produce a satisfactory crop of fruit in each of the two growing cycles.

3.1.2 The growing cycle is considered to be the duration of a single growing season, beginning with bud burst, flowering and fruit harvest and concluding when the following dormant period ends with the swelling of new season buds.

### 3.2 *Testing Place*

Tests are normally conducted at one place. In the case of tests conducted at more than one place, guidance is provided in TGP/9 "Examining Distinctness".

### 3.3 *Conditions for Conducting the Examination*

The tests should be carried out under conditions ensuring satisfactory growth for the expression of the relevant characteristics of the variety and for the conduct of the

examination. Trees should only be pruned in the year of planting to ensure good branch formation.

### *3.4 Test Design*

3.4.1 Each test should be designed to result in a total of at least 5 trees.

3.4.2 The design of the tests should be such that plants or parts of plants may be removed for measurement or counting without prejudice to the observations which must be made up to the end of the growing cycle.

### *3.5 Additional Tests*

Additional tests, for examining relevant characteristics, may be established.

## 4. Assessment of Distinctness, Uniformity and Stability

### *4.1 Distinctness*

#### *4.1.1 General Recommendations*

It is of particular importance for users of these Test Guidelines to consult the General Introduction prior to making decisions regarding distinctness. However, the following points are provided for elaboration or emphasis in these Test Guidelines.

#### *4.1.2 Consistent Differences*

The differences observed between varieties may be so clear that more than one growing cycle is not necessary. In addition, in some circumstances, the influence of the environment is not such that more than a single growing cycle is required to provide assurance that the differences observed between varieties are sufficiently consistent. One means of ensuring that a difference in a characteristic, observed in a growing trial, is sufficiently consistent is to examine the characteristic in at least two independent growing cycles.

#### *4.1.3 Clear Differences*

Determining whether a difference between two varieties is clear depends on many factors, and should consider, in particular, the type of expression of the characteristic being examined, i.e. whether it is expressed in a qualitative, quantitative, or pseudo-qualitative manner. Therefore, it is important that users of these Test Guidelines are familiar with the recommendations contained in the General Introduction prior to making decisions regarding distinctness.

#### *4.1.4 Number of Plants / Parts of Plants to be Examined*

Unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 5 plants or parts taken from each of 5 plants and any other observations made on all plants in the test, disregarding any off-type plants. In the case of observations of parts taken from single plants, the number of parts to be taken from each of the plants should be 2.

#### 4.1.5 Method of Observation

The recommended method of observing the characteristic for the purposes of distinctness is indicated by the following key in the second column of the Table of Characteristics (see document TGP/9 “Examining Distinctness”, Section 4 “Observation of characteristics”):

MG: single measurement of a group of plants or parts of plants

MS: measurement of a number of individual plants or parts of plants

VG: visual assessment by a single observation of a group of plants or parts of plants

VS: visual assessment by observation of individual plants or parts of plants

Type of observation: visual (V) or measurement (M)

“Visual” observation (V) is an observation made on the basis of the expert’s judgment. For the purposes of this document, “visual” observation refers to the sensory observations of the experts and, therefore, also includes smell, taste and touch. Visual observation includes observations where the expert uses reference points (e.g. diagrams, example varieties, side-by-side comparison) or non-linear charts (e.g. color charts). Measurement (M) is an objective observation against a calibrated, linear scale e.g. using a ruler, weighing scales, colorimeter, dates, counts, etc.

Type of record: for a group of plants (G) or for single, individual plants (S)

For the purposes of distinctness, observations may be recorded as a single record for a group of plants or parts of plants (G), or may be recorded as records for a number of single, individual plants or parts of plants (S). In most cases, “G” provides a single record per variety and it is not possible or necessary to apply statistical methods in a plant-by-plant analysis for the assessment of distinctness.

In cases where more than one method of observing the characteristic is indicated in the Table of Characteristics (e.g. VG/MG), guidance on selecting an appropriate method is provided in document TGP/9, Section 4.2.

## 4.2 *Uniformity*

4.2.1 It is of particular importance for users of these Test Guidelines to consult the General Introduction prior to making decisions regarding uniformity. However, the following points are provided for elaboration or emphasis in these Test Guidelines:

4.2.2 For the assessment of uniformity, a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 5 plants, no off-types are allowed.

## 4.3 *Stability*

4.3.1 In practice, it is not usual to perform tests of stability that produce results as certain as those of the testing of distinctness and uniformity. However, experience has demonstrated that, for many types of variety, when a variety has been shown to be uniform, it can also be considered to be stable.

4.3.2 Where appropriate, or in cases of doubt, stability may be further examined by testing a new plant stock to ensure that it exhibits the same characteristics as those shown by the initial material supplied.

## 5. Grouping of Varieties and Organization of the Growing Trial

5.1 The selection of varieties of common knowledge to be grown in the trial with the candidate varieties and the way in which these varieties are divided into groups to facilitate the assessment of distinctness are aided by the use of grouping characteristics.

5.2 Grouping characteristics are those in which the documented states of expression, even where produced at different locations, can be used, either individually or in combination with other such characteristics: (a) to select varieties of common knowledge that can be excluded from the growing trial used for examination of distinctness; and (b) to organize the growing trial so that similar varieties are grouped together.

5.3 The following have been agreed as useful grouping characteristics:

- (a) Leaf blade: ratio length/width (characteristic 8)
- (b) Petal: intensity of pink color (characteristic 16)
- (c) Fruit: ratio length/diameter (characteristic 19)
- (d) Fruit: weight (characteristic 20)
- (e) Fruit: acidity (characteristic 30)

5.4 Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the General Introduction and document TGP/9 "Examining Distinctness".

## 6. Introduction to the Table of Characteristics

### 6.1 *Categories of Characteristics*

#### 6.1.1 Standard Test Guidelines Characteristics

Standard Test Guidelines characteristics are those which are approved by UPOV for examination of DUS and from which members of the Union can select those suitable for their particular circumstances.

#### 6.1.2 Asterisked Characteristics

Asterisked characteristics (denoted by \*) are those included in the Test Guidelines which are important for the international harmonization of variety descriptions and should always be examined for DUS and included in the variety description by all members of the Union, except when the state of expression of a preceding characteristic or regional environmental conditions render this inappropriate.

## 6.2 *States of Expression and Corresponding Notes*

6.2.1 States of expression are given for each characteristic to define the characteristic and to harmonize descriptions. Each state of expression is allocated a corresponding numerical note for ease of recording of data and for the production and exchange of the description.

6.2.2 In the case of qualitative and pseudo-qualitative characteristics (see Chapter 6.3), all relevant states of expression are presented in the characteristic. However, in the case of quantitative characteristics with 5 or more states, an abbreviated scale may be used to minimize the size of the Table of Characteristics. For example, in the case of a quantitative characteristic with 9 states, the presentation of states of expression in the Test Guidelines may be abbreviated as follows:

State	Note
small	3
medium	5
large	7

However, it should be noted that all of the following 9 states of expression exist to describe varieties and should be used as appropriate:

State	Note
very small	1
very small to small	2
small	3
small to medium	4
medium	5
medium to large	6
large	7
large to very large	8
very large	9

6.2.3 Further explanation of the presentation of states of expression and notes is provided in document TGP/7 “Development of Test Guidelines”.

## 6.3 *Types of Expression*

An explanation of the types of expression of characteristics (qualitative, quantitative and pseudo-qualitative) is provided in the General Introduction.

## 6.4 *Example Varieties*

Where appropriate, example varieties are provided to clarify the states of expression of each characteristic.

6.5 *Legend*

(\*) Asterisked characteristic – see Chapter 6.1.2

QL Qualitative characteristic – see Chapter 6.3

QN Quantitative characteristic – see Chapter 6.3

PQ Pseudo-qualitative characteristic – see Chapter 6.3

MG, MS, VG, VS – see Chapter 4.1.5

(a)-(d) See Explanations on the Table of Characteristics in Chapter 8.1

(+) See Explanations on the Table of Characteristics in Chapter 8.2



7. Table of Characteristics/Tableau des caractères/Merkmalstabelle/Tabla de caracteres

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
<b>1. VG</b>	<b>Plant: growth habit</b>	<b>Plante : port</b>	<b>Pflanze: Wuchsform</b>	<b>Planta: porte</b>		
(*) (+)						
<b>PQ</b>	(a) upright	dressé	aufrecht	erguido	Maunawili	1
	spreading	étalé	breitwüchsig	extendido	Hawaiian Queen, Rubra	2
	drooping	retombant	überhängend	colgante	Cabocla, Sertaneja	3
<b>2. VG</b>	<b>Plant: vigor</b>	<b>Plante : vigueur</b>	<b>Pflanze: Wuchsstärke</b>	<b>Planta: vigor</b>		
(+)						
<b>QN</b>	(a) weak	faible	gering	débil		3
	medium	moyenne	mittel	medio	Tropical Ruby	5
	strong	forte	stark	fuerte	Maunawili	7
<b>3. VG</b>	<b>Plant: density of branches</b>	<b>Plante : densité des ramifications</b>	<b>Pflanze: Dichte der Verzweigung</b>	<b>Planta: densidad de las ramas</b>		
(*)						
<b>QN</b>	(a) sparse	lâche	locker	baja		3
	medium	moyenne	mittel	media	Cabocla, Maunawili, Rubra	5
	dense	dense	dicht	alta	Tropical ruby	7
<b>4. MS/ VG</b>	<b>One-year-old shoot: length of internode</b>	<b>Rameau d'un an : longueur de l'entre-noeud</b>	<b>Einjähriger Trieb: Länge des Internodiums</b>	<b>Rama de un año: longitud del internudo</b>		
(*)						
<b>QN</b>	(a) short	court	kurz	corto	Tropical ruby	3
	medium	moyen	mittel	mediano	Maunawili	5
	long	long	lang	largo		7
<b>5. MS/ VG</b>	<b>One-year-old shoot: thickness</b>	<b>Rameau d'un an : épaisseur</b>	<b>Einjähriger Trieb: Dicke</b>	<b>Rama de un año: grosor</b>		
(*)						
<b>QN</b>	(a) thin	mince	dünn	delgado	Hawaiian Queen	3
	medium	moyen	mittel	medio	Maunawili	5
	thick	épais	dick	grueso	Tropical ruby	7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
<b>6.</b>	<b>VG</b>	<b>Young shoot: pubescence</b>	<b>Jeune rameau : pilosité</b>	<b>Jungtrieb: Behaarung</b>	<b>Rama joven: pubescencia</b>	
<b>QN</b>	<b>(a)</b>	sparse	faible	locker	dispersa	Maunawili 1
		medium	moyenne	mittel	media	Hawaiian Queen 2
		dense	forte	dicht	densa	3
<b>7.</b>	<b>MS/ (* VG (+)</b>	<b>Leaf blade: length</b>	<b>Limbe : longueur</b>	<b>Blattspreite: Länge</b>	<b>Limbo: longitud</b>	
<b>QN</b>	<b>(b)</b>	short	court	kurz	corto	3
		medium	moyen	mittel	mediano	Tropical Ruby 5
		long	long	lang	largo	Maunawili 7
<b>8.</b>	<b>MS/ (* VG (+)</b>	<b>Leaf blade: ratio length/width</b>	<b>Limbe : rapport longueur/largeur</b>	<b>Blattspreite: Verhältnis Länge/Breite</b>	<b>Limbo: relación longitud/anchura</b>	
<b>QN</b>	<b>(b)</b>	moderately elongated	modérément allongé	mäßig langgezogen	moderadamente alargado	Maunawili 3
		medium	moyen	mittel	medio	Hawaiian Queen 5
		moderately compressed	modérément comprimé	mäßig zusammengedrückt	moderadamente comprimido	7
<b>9.</b>	<b>VG (* (+)</b>	<b>Leaf blade: position of broadest part</b>	<b>Limbe : position de la partie la plus large</b>	<b>Blattspreite: Position der breitesten Stelle</b>	<b>Limbo: posición de la parte más ancha</b>	
<b>QN</b>	<b>(b)</b>	toward base	vers la base	zur Basis hin	hacia la base	1
		at middle	au milieu	in der Mitte	en el medio	Maunawili 2
		toward apex	vers le sommet	zur Spitze hin	hacia el ápice	3
<b>10.</b>	<b>VG (* (+)</b>	<b>Leaf blade: undulation of margin</b>	<b>Limbe : ondulation du bord</b>	<b>Blattspreite: Randwellung</b>	<b>Limbo: ondulación del margen</b>	
<b>QN</b>	<b>(b)</b>	weak	faible	gering	débil	Okinawa 1
		medium	moyenne	mittel	media	Cabocla, Sertaneja 3
		strong	forte	stark	fuerte	5

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
<b>11. VG</b> (+)	<b>Leaf blade: shape of apex</b>	<b>Limbe : forme du sommet</b>	<b>Blattspreite: Form der Spitze</b>	<b>Limbo: forma del ápice</b>		
<b>PQ</b> (b)	acute	aigu	spitz	agudo	Maunawili	1
	obtuse	obtus	stumpf	obtus	Hawaiian Queen	2
	rounded	arrondi	abgerundet	redondeado		3
<b>12. VG</b> (*)	<b>Leaf blade: intensity of green color on upper side</b>	<b>Limbe : intensité de la couleur verte sur la face supérieure</b>	<b>Blattspreite: Intensität der Grünfärbung der Oberseite</b>	<b>Limbo: intensidad del color verde de la cara superior</b>		
<b>QN</b> (b)	light	claire	hell	claro	Flor Branca	1
	medium	moyenne	mittel	medio	Cabocla	3
	dark	foncée	dunkel	oscuro	Maunawili, Rubra	5
<b>13. VG</b> (*)	<b>Flower: position of stigma in relation to anthers</b>	<b>Fleur : position du stigmate par rapport aux étamines</b>	<b>Blüte: Stellung der Narbe im Vergleich zu den Antheren</b>	<b>Flor: posición del estigma en relación con las anteras</b>		
<b>QN</b> (c)	below	au-dessous	unterhalb	por debajo		1
	same level	au même niveau	auf gleicher Höhe	al mismo nivel	Cabocla, Rubra	2
	above	au-dessus	oberhalb	por encima		3
<b>14. VG</b> (+)	<b>Flower: curvature of style</b>	<b>Fleur : courbure du style</b>	<b>Blüte: Biegung des Griffels</b>	<b>Flor: curvatura del estilo</b>		
<b>QN</b> (c)	straight	nulle	gerade	recto	Sanmi-kei	1
	slightly curved	légère	schwach gebogen	ligeramente curvado	Okinawa	2
	strongly curved	forte	stark gebogen	muy curvado	NRA309	3
<b>15. VG</b> (+)	<b>Petal: undulation of margin</b>	<b>Pétale : ondulation du bord</b>	<b>Blütenblatt: Randwellung</b>	<b>Pétalo: ondulación del margen</b>		
<b>QN</b> (c)	weak	faible	gering	débil		1
	medium	moyenne	mittel	media		3
	strong	forte	stark	fuerte	Hawaiian Queen	5

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
<b>16. (*)</b>	<b>VG</b>	<b>Petal: intensity of pink color</b>	<b>Pétale : intensité de la couleur rose</b>	<b>Blütenblatt: Intensität der Rosafärbung</b>	<b>Pétalo: intensidad del color rosa</b>	
<b>QN</b>	<b>(c)</b>	light	claire	hell	claro	1
		medium	moyenne	mittel	medio	Manuawili 2
		dark	foncée	dunkel	oscuro	Hawaiian Queen 3
<b>17. (*)</b>	<b>MS/ VG</b>	<b>Fruit: length</b>	<b>Fruit : longueur</b>	<b>Frucht: Länge</b>	<b>Fruto: longitud</b>	
<b>QN</b>	<b>(a)</b>	short	court	kurz	corto	Flor blanca 3
		medium	moyen	mittel	medio	Hawaiian Queen 5
		long	long	lang	largo	Red Jumbo 7
<b>18. (*)</b>	<b>MS/ VG</b>	<b>Fruit: diameter</b>	<b>Fruit : diamètre</b>	<b>Frucht: Durchmesser</b>	<b>Fruto: diámetro</b>	
<b>QN</b>	<b>(a)</b>	small	petit	klein	pequeño	Sertaneja 3
		medium	moyen	mittel	mediano	Rubra 5
		large	grand	groß	grande	Cabocla 7
<b>19. (*)</b>	<b>MS/ VG</b>	<b>Fruit: ratio length/diameter</b>	<b>Fruit : rapport longueur/diamètre</b>	<b>Frucht: Verhältnis Länge/Durchmesser</b>	<b>Fruto: relación longitud/diámetro</b>	
<b>QN</b>	<b>(a)</b>	elongated	allongé	langgezogen	alargado	Maunawili 1
		medium	moyen	mittel	medio	2
		compressed	compressé	zusammengedrückt	comprimido	3
<b>20. (*)</b>	<b>MG</b>	<b>Fruit: weight</b>	<b>Fruit : poids</b>	<b>Frucht: Gewicht</b>	<b>Fruto: peso</b>	
<b>QN</b>	<b>(a)</b>	low	petit	gering	ligero	Maunawili, Sertaneja 3
		medium	moyen	mittel	medio	Hawaiian Queen, Rubra 5
		high	élevé	hoch	pesado	Cabocla, C.F.Rehnborg 7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
<b>21.</b>	<b>VG</b>	<b>Fruit: shape</b>	<b>Fruit : forme</b>	<b>Frucht: Form</b>	<b>Fruto: forma</b>	
(*)						
(+)						
<b>PQ</b>	<b>(a)</b>	oblong	oblong	rechteckig	oblonga	1
		circular	rond	kreisförmig	circular	Maunawili
		oblate	aplatis	breitrund	achatada	Hawaiian Queen
		ovate	ovale	eiförmig	ovado	Tropical Ruby
<b>22.</b>	<b>VG</b>	<b>Fruit: depth of grooves</b>	<b>Fruit : profondeur des cannelures</b>	<b>Frucht: Tiefe der Furchen</b>	<b>Fruto: profundidad de los surcos</b>	
(*)						
(+)						
<b>QN</b>	<b>(a)</b>	shallow	peu profondes	flach	poco profundos	Maunawili, Rubra
		medium	moyennement profondes	mittel	media	Cereja, Olivier
		deep	profondes	tief	profundos	Cabocla
<b>23.</b>	<b>VG</b>	<b>Fruit: depth of basin</b>	<b>Fruit : profondeur de la cuvette</b>	<b>Frucht: Tiefe der Grube</b>	<b>Fruto: profundidad de la cavidad</b>	
(*)						
(+)						
<b>QN</b>	<b>(a)</b>	shallow	peu profonde	flach	poco profunda	Maunawili
		medium	moyennement profonde	mittel	media	Tropical Ruby
		deep	profonde	tief	profunda	
<b>24.</b>	<b>VG</b>	<b>Fruit: width of basin</b>	<b>Fruit : largeur de la cuvette</b>	<b>Frucht: Breite der Grube</b>	<b>Fruto: anchura de la cavidad</b>	
(*)						
(+)						
<b>QN</b>	<b>(a)</b>	narrow	étroite	schmal	estrecha	Maunawili
		medium	moyenne	mittel	media	Tropical Ruby
		broad	large	breit	ancha	Hawaiian Queen
<b>25.</b>	<b>VG</b>	<b>Fruit: depth of stalk cavity</b>	<b>Fruit : profondeur de la dépression pédonculaire</b>	<b>Frucht: Tiefe der Stielhöhle</b>	<b>Fruto: profundidad de la cavidad peduncular</b>	
(*)						
(+)						
<b>QN</b>	<b>(a)</b>	shallow	peu profonde	flach	poco profunda	Maunawili
		medium	moyennement profonde	mittel	media	
		deep	profonde	tief	profunda	Hawaiian Queen

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
<b>26.</b>	<b>MS/ VG (*) (+)</b>	<b>Fruit: length of stalk</b>	<b>Fruit : longueur du pédoncule</b>	<b>Frucht: Länge des Stiels</b>	<b>Fruto: longitud del pedúnculo</b>	
<b>QN</b>	<b>(a)</b>	short	court	kurz	corto	Maunawili 3
		medium	moyen	mittel	medio	Hawaiian Queen 5
		long	long	lang	largo	Red Jumbo 7
<b>27.</b>	<b>VG (*) (+)</b>	<b>Fruit: width of stalk cavity</b>	<b>Fruit : largeur de la dépression pédonculaire</b>	<b>Frucht: Breite der Stielhöhle</b>	<b>Fruto: anchura de la cavidad peduncular</b>	
<b>QN</b>	<b>(a)</b>	narrow	étroite	schmal	estrecha	3
		medium	moyenne	mittel	media	Maunawili 5
		broad	large	breit	ancha	Hawaiian Queen 7
<b>28.</b>	<b>VG (*)</b>	<b>Fruit: main color of skin</b>	<b>Fruit : couleur principale de la peau</b>	<b>Frucht: Hauptfarbe der Schale</b>	<b>Fruto: color principal de la piel</b>	
<b>PQ</b>	<b>(a)</b>	yellow	jaune	gelb	amarillo	CMF025 1
		light red	rouge clair	hellrot	rojo claro	2
		medium red	rouge moyen	mittelrot	rojo medio	Cabocla, Rubra 3
		dark red	rouge foncé	dunkelrot	rojo oscuro	Maunawili 4
<b>29.</b>	<b>VG (*)</b>	<b>Fruit: color of flesh</b>	<b>Fruit : couleur de la chair</b>	<b>Frucht: Farbe des Fleisches</b>	<b>Fruto: color de la pulpa</b>	
<b>PQ</b>	<b>(a)</b>	yellow	jaune	gelb	amarillo	Red Jumbo 1
		orange	orange	orange	anaranjado	Cabocla 2
		pink	rose	rosa	rosa	Maunawili 3
		red	rouge	rot	rojo	C.F.Rehnborg 4
<b>30.</b>	<b>MG (*) (+)</b>	<b>Fruit: acidity</b>	<b>Fruit : acidité</b>	<b>Frucht: Säure</b>	<b>Fruto: acidez</b>	
<b>QN</b>	<b>(a)</b>	low	faible	gering	baja	Rubra 3
		medium	moyenne	mittel	media	Cabocla, Maunawili 5
		high	forte	hoch	alta	Sertaneja 7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
<b>31. VG (*)</b>	<b>Fruit: juiciness</b>	<b>Fruit : succulence</b>	<b>Frucht: Saftigkeit</b>	<b>Fruto: jugosidad</b>		
<b>QN (a)</b>	low	faible	gering	baja	Florida Sweet, Red Jumbo	1
	medium	moyenne	mittel	media	Maunawili	3
	high	forte	hoch	alta	Cabocla	5
<b>32. VG (*)</b>	<b>Stone: size</b>	<b>Noyau :taille</b>	<b>Stein: Größe</b>	<b>Hueso: tamaño</b>		
<b>QN (a)</b>	small	petit	klein	pequeño	Sertaneja	1
	medium	moyen	mittel	medio	Cabocla, Okinawa	3
	large	gros	groß	grande	Rubra	5
<b>37. VG</b>	<b>Stone: intensity of brown color</b>	<b>Noyau : intensité de la couleur brune</b>	<b>Stein: Intensität der Braunfärbung</b>	<b>Hueso: intensidad del color marrón</b>		
<b>QN (a)</b>	light	claire	hell	claro	Maunawili	1
	medium	moyenne	mittel	medio	Tropical Ruby	2
	dark	foncée	dunkel	oscuro		3

8. Explanations on the Table of Characteristics

8.1 *Explanations covering several characteristics*

Characteristics containing the following key in the second column of the Table of Characteristics should be examined as indicated below:

- (a) Observations should be made at physiological ripeness, when the color change of the fruit is complete.
- (b) Leaf blade: All observations on the leaf blade should be made on fully developed leaves. Leaves should be taken from the middle third of one-year-old shoot.
- (c) Flower: All observations on the flower should be made within the day its flower bloomed.

8.2 *Explanations for individual characteristics*

Ad. 1: Plant: growth habit



1  
upright



2  
spreading



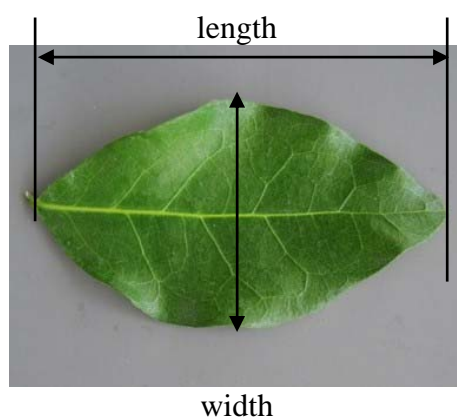
3  
drooping

Ad. 2: Plant: vigor

The vigor of the plant should be considered as the overall abundance of vegetative growth.

Ad. 7: Leaf blade: length

Ad. 8: Leaf blade: ratio length/width





Ad. 8: Leaf blade: ratio length/width



3  
moderately elongated



5  
medium



7  
moderately compressed

Ad. 9: Leaf blade: position of broadest part



1  
toward base



2  
at middle



3  
toward apex

Ad. 10: Leaf blade: undulation of margin



1  
weak



3  
medium

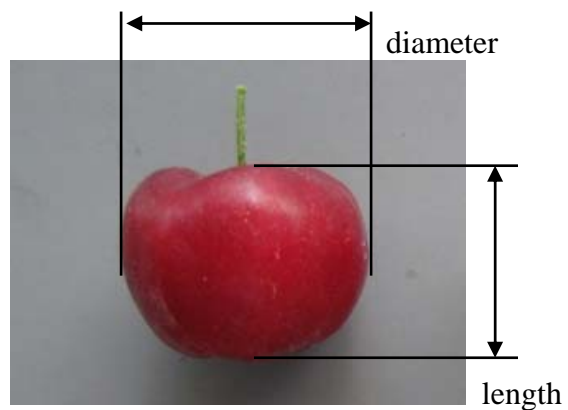


5  
strong



Ad. 17: Fruit: length

Ad. 18: Fruit: diameter



Ad. 19: Fruit: ratio length/diameter



1  
elongated



2  
medium

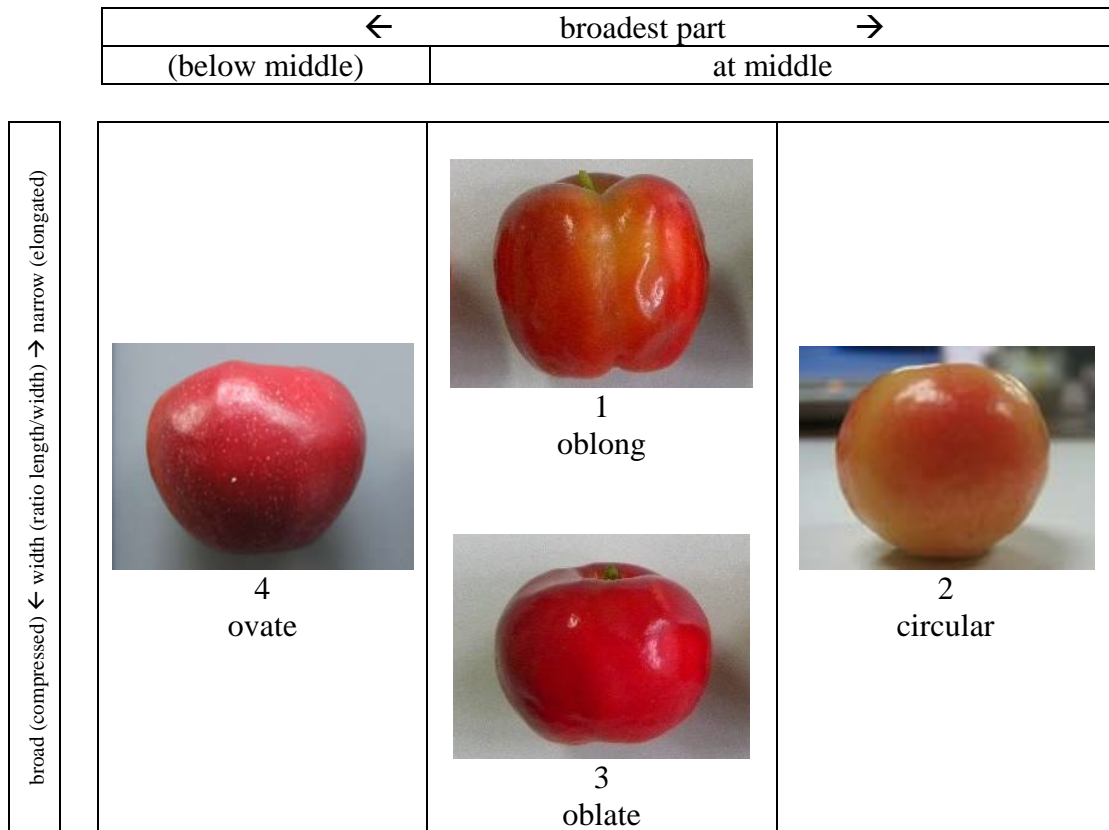


3  
compressed

Ad. 20: Fruit: weight

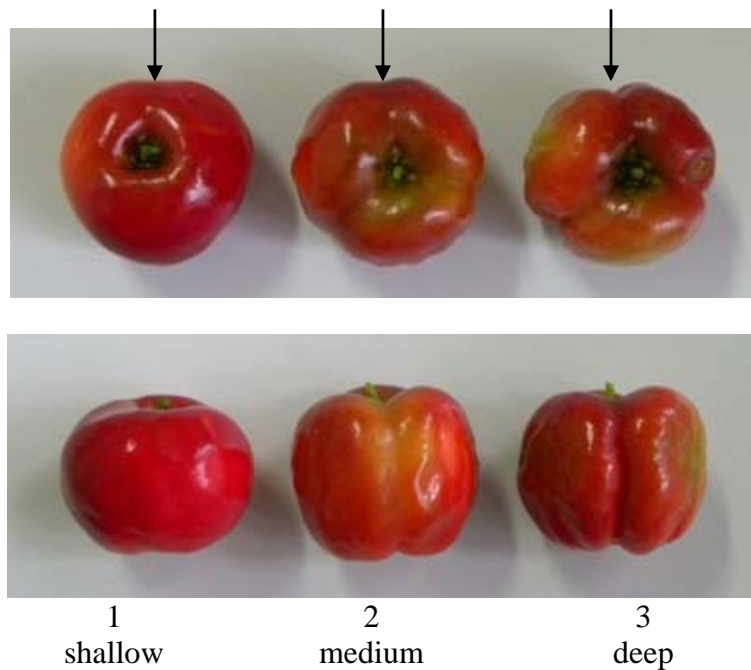
The weight of 10 fruits should be observed.

Ad. 21: Fruit: shape



\* The base is the end nearest to the stalk: however, the photographs were taken with the stalk (base) uppermost.

Ad. 22: Fruit: depth of grooves



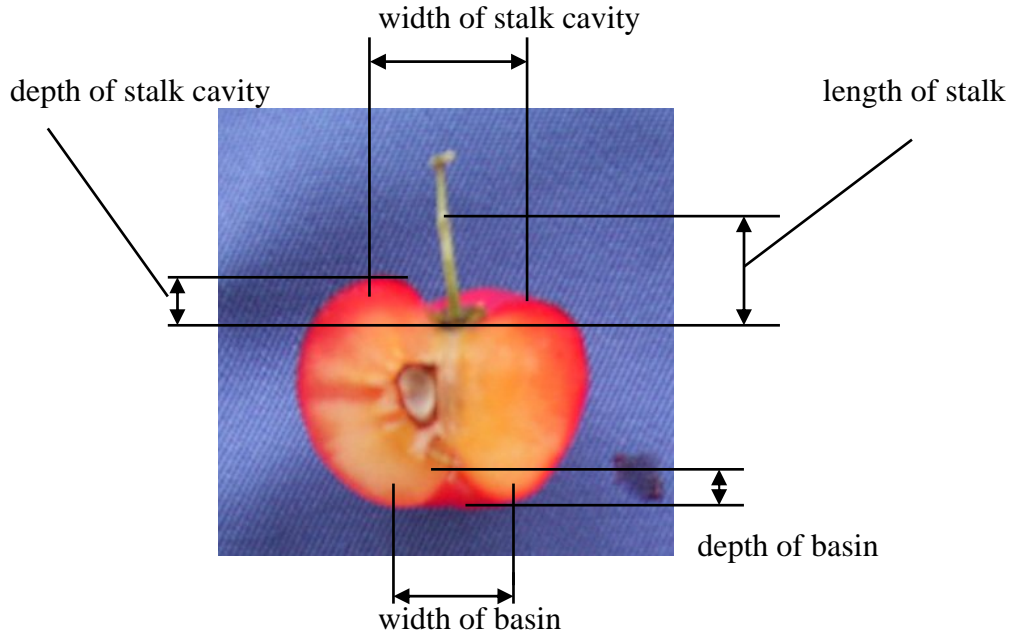
Ad. 23: Fruit: depth of basin

Ad. 24: Fruit: width of basin

Ad. 25: Fruit: depth of stalk cavity

Ad. 26: Fruit: length of stalk

Ad. 27: Fruit: width of stalk cavity



Ad. 30: Fruit: acidity

The acidity should be measured with a pH meter.

## 9. Literature

Asenjo, C.F., 1980: Tropical and subtropical fruits. Eds. Nagay, S., and P. E. Shaw. AVI publishing. Connecticut, US, pp. 341 to 374

Munsell, H. E. et al., 1950: Composition of food plants of Central America. III. Guatemala. Food Res. 15: 34-52.

Chowdhury, A. K., Yonemoto, Y., Kato, H., Malid Macha, M. M., 2005: Classification of some acerola (*Malpighia glabra* Linn.) cultivars using morphometric descriptors and RAPD markers. J. Trop. Agr. 49: 255-263.

Nakasone, H. Y., Paul, R. E., 1998: Acerola. Tropical Fruits. CAB International l. pp. 377 to 378

Vivaldi, J. L., 1984: New taxa of *Malpighia* from Mexico and West Indies

Silva de Freitas, C. A. et al., 2006: Acerola: Production, Composition, Nutritional Aspect and Products. R. Bras. Agrociencia, 12(4): 395-400.

Ishihata, Kiyotake et al., 2000: Acerola, Tropical fruit, The encyclopedia of fruit horticulture, v.17, JP, pp.1 to 15

Ishihata, K. 2001: The new production technique of tropical and sub-tropical fruits: 18, 19, 20, Agriculture and Horticulture, v. 76: Yokendo Ltd., JP, pp. 715 to 721, pp. 829 to 831, pp. 933 to 934

10. Technical Questionnaire

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
		Application date: (not to be filled in by the applicant)
<b>TECHNICAL QUESTIONNAIRE</b> to be completed in connection with an application for plant breeders' rights		
1. Subject of the Technical Questionnaire		
1.1 Botanical name	<input type="text" value="Malpighia emarginata DC."/>	
1.2 Common name	<input type="text" value="Acerola"/>	
2. Applicant		
Name	<input type="text"/>	
Address	<input type="text"/>	
Telephone No.	<input type="text"/>	
Fax No.	<input type="text"/>	
E-mail address	<input type="text"/>	
Breeder (if different from applicant)	<input type="text"/>	
3. Proposed denomination and breeder's reference		
Proposed denomination (if available)	<input type="text"/>	
Breeder's reference	<input type="text"/>	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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#4. Information on the breeding scheme and propagation of the variety

4.1 Breeding scheme

Variety resulting from:

4.1.1 Crossing

(a) controlled cross  [ ]  
(please state parent varieties)

(.....) x (.....)  
female parent male parent

(b) partially known cross  [ ]  
(please state known parent variety(ies))

(.....) x (.....)  
female parent male parent

4.1.2 Mutation  [ ]  
(please state parent variety)

4.1.3 Discovery and development  [ ]  
(please state where and when discovered and how developed)

4.1.4 Other  [ ]  
(please provide details)

# Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire.



4.2 Method of propagating the variety

4.2.1 Vegetative propagation

- (a) cuttings
- (b) *in vitro* propagation
- (c) other (state method)

4.2.2 Seed

4.2.3 Other   
(please provide details)

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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5. Characteristics of the variety to be indicated (the number in brackets refers to the corresponding characteristic in Test Guidelines; please mark the note which best corresponds).

Characteristics	Example Varieties	Note
<b>5.1 Leaf blade: ratio length/width (8)</b>		
very elongated		1[ ]
very elongated to moderately elongated		2[ ]
moderately elongated	Maunawili	3[ ]
moderately elongated to medium		4[ ]
medium	Hawaiian Queen	5[ ]
medium to moderately compressed		6[ ]
moderately compressed		7[ ]
moderately compressed to very compressed		8[ ]
very compressed		9[ ]
<b>5.2 Petal: intensity of pink color (16)</b>		
light		1[ ]
medium	Manuawili	2[ ]
dark	Hawaiian Queen	3[ ]
<b>5.3 Fruit: ratio length/diameter (19)</b>		
elongated	Maunawili	1[ ]
medium		2[ ]
compressed		3[ ]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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Characteristics	Example Varieties	Note
<b>5.4 Fruit: weight (20)</b>		
very low		1[ ]
very low to low		2[ ]
low	Maunawili, Sertaneja	3[ ]
low to medium		4[ ]
medium	Hawaiian Queen, Rubra	5[ ]
medium to high		6[ ]
high	Cabocla, C.F.Rehnborg	7[ ]
high to very high		8[ ]
very high		9[ ]
<b>5.5 Fruit: acidity (30)</b>		
very low		1[ ]
very low to low		2[ ]
low	Rubra	3[ ]
low to medium		4[ ]
medium	Cabocla, Maunawili	5[ ]
medium to high		6[ ]
high	Sertaneja	7[ ]
high to very high		8[ ]
very high		9[ ]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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6. Similar varieties and differences from these varieties

*Please use the following table and box for comments to provide information on how your candidate variety differs from the variety (or varieties) which, to the best of your knowledge, is (or are) most similar. This information may help the examination authority to conduct its examination of distinctness in a more efficient way.*

Denomination(s) of variety(ies) similar to your candidate variety	Characteristic(s) in which your candidate variety differs from the similar variety(ies)	Describe the expression of the characteristic(s) for the <b>similar</b> variety(ies)	Describe the expression of the characteristic(s) for <b>your</b> candidate variety
<i>Example</i>	<i>Fruit color</i>	<i>light red</i>	<i>medium red</i>

Comments:

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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#7. Additional information which may help in the examination of the variety

7.1 In addition to the information provided in sections 5 and 6, are there any additional characteristics which may help to distinguish the variety?

Yes [ ] No [ ]

(If yes, please provide details)

7.2 Are there any special conditions for growing the variety or conducting the examination?

Yes [ ] No [ ]

(If yes, please provide details)

7.3 What is this variety used for?

Fruit [ ] Ornamental [ ]

7.4 Other information

A representative color image of the variety should accompany the Technical Questionnaire.

8. Authorization for release

(a) Does the variety require prior authorization for release under legislation concerning the protection of the environment, human and animal health?

Yes [ ] No [ ]

(b) Has such authorization been obtained?

Yes [ ] No [ ]

If the answer to (b) is yes, please attach a copy of the authorization.

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# Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire.

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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9. Information on plant material to be examined or submitted for examination.

9.1 The expression of a characteristic or several characteristics of a variety may be affected by factors, such as pests and disease, chemical treatment (e.g. growth retardants or pesticides), effects of tissue culture, different rootstocks, scions taken from different growth phases of a tree, etc.

9.2 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If the plant material has undergone such treatment, full details of the treatment must be given. In this respect, please indicate below, to the best of your knowledge, if the plant material to be examined has been subjected to:

- |   |         |        |
|---|---------|--------|
| (a) Microorganisms (e.g. virus, bacteria, phytoplasma)    | Yes [ ] | No [ ] |
| (b) Chemical treatment (e.g. growth retardant, pesticide) | Yes [ ] | No [ ] |
| (c) Tissue culture  | Yes [ ] | No [ ] |
| (d) Other factors   | Yes [ ] | No [ ] |

Please provide details for where you have indicated “yes”.

.....

10. I hereby declare that, to the best of my knowledge, the information provided in this form is correct:

Applicant's name

Signature

Date

[End of document]