

PN-ABC-145

DESCRIPTORS **IBPGR** 
FOR PAPAYA

INTERNATIONAL
BOARD FOR
PLANT
GENETIC
RESOURCES

DESCRIPTORS FOR PAPAYA

IBPGR
ROME 1988

The International Board for Plant Genetic Resources (IBPGR) is an autonomous international scientific organization under the aegis of the Consultative Group on International Agricultural Research (CGIAR). IBPGR was established by the CGIAR in 1974. The basic function of IBPGR is to promote and coordinate an international network of genetic resources centres to further the collection, conservation, documentation, evaluation and use of plant germplasm and thereby contribute to raising the standard of living and welfare of people throughout the world. Financial support for the core programme is provided by the Governments of Australia, Austria, Belgium, Canada, China, Denmark, France, FRG, India, Italy, Japan, the Netherlands, Norway, Spain, Sweden, Switzerland, the UK and the USA as well as the World Bank.

Citation:

IBPGR. 1988. Descriptors for Papaya. International Board for Plant Genetic Resources, Rome

ISBN 92-9043-129-6

**IBPGR Headquarters
c/o FAO
Via delle Terme di Caracalla
00100 Rome
Italy**

© International Board for Plant Genetic Resources, 1988

b

CONTENTS

| | |
|---|----|
| PREFACE | v |
| DESCRIPTOR LIST FOR PAPAYA | 1 |
| PASSPORT | 3 |
| 1. Accession data | 3 |
| 2. Collection data | 4 |
| CHARACTERIZATION AND PRELIMINARY EVALUATION | 9 |
| 3. Site data | 9 |
| 4. Plant data | 10 |
| FURTHER CHARACTERIZATION AND EVALUATION | 19 |
| 5. Site data | 19 |
| 6. Plant data | 20 |
| 7. Stress susceptibility | 28 |
| 8. Pest and disease susceptibility | 29 |
| 9. Alloenzyme composition | 33 |
| 10. Cytological characters and identified genes | 33 |
| 11. Notes | 33 |
| APPENDIX I. List of contributors | 34 |

PREFACE

This IBPGR descriptor list for papaya (*Carica papaya* L.) was prepared in consultation with a number of experts on the crop, the major contributors being Dr P.J. Ito of the University of Hawaii, and Dr T. Badra, formerly of the National Horticultural Research Institute, Ibadan, Nigeria. A complete list of contributors is provided in the appendix.

IBPGR encourages the collection of data on the first four categories of this list: 1. Accession; 2. Collection; 3. and 4. Characterization and preliminary evaluation. IBPGR endorses the information in categories 1-4 as the minimum that ideally should be available for any one accession. Other descriptors are given in categories 5 onwards that will enable the simple encoding of further characterization and evaluation data and which can serve as examples for the creation of additional descriptors in the IBPGR form by any user.

Although the suggested coding should not be regarded as the definitive scheme, this format has the full backing of IBPGR and is promoted worldwide. The descriptor list given here provides an international format and thereby produces a universally understood 'language' for all plant genetic resources data. The adoption of this scheme for all data encoding, or at least the production of a transformation method to convert other schemes to the IBPGR format, will produce a rapid, reliable and efficient means for information storage, retrieval and communication. This will greatly assist the utilization of germplasm throughout the international network of plant genetic resources. It is recommended, therefore, that information should be produced by closely following the descriptor list with regard to: ordering and numbering descriptors; using the descriptors specified; and using the descriptor states recommended.

Any suggestions for modifications will be welcomed by IBPGR Headquarters, Rome.

DESCRIPTOR LIST FOR PAPAYA

IBPGR now uses the following definitions in genetic resources documentation:

- (i) passport (accession identifiers and information recorded by collectors);
- (ii) characterization (consists of recording those characters which are highly heritable, can be easily seen by the eye and are expressed in all environments);
- (iii) preliminary evaluation (consists of recording a limited number of additional traits thought desirable by a consensus of users of the particular crop).

Characterization and preliminary evaluation will be the responsibility of the curators, while further characterization and evaluation should be carried out by the plant breeder. The data from further evaluation should be fed back to the curator who will maintain a data file.

The following internationally accepted norms for the scoring or coding of descriptor states should be followed as indicated below:

- (a) measurements are made according to the SI system. The units to be applied are given in square brackets following the descriptor;
- (b) many descriptors which are continuously variable are recorded on a 1-9 scale. The authors of this list have sometimes described only a selection of the states, e.g. 3, 5 and 7 for such descriptors. Where this has occurred the full range of codes is available for use by extension of the codes given or by interpolation between them - e.g. in Section 8 (Pest and disease susceptibility) 1 = extremely low susceptibility and 8 = high to extremely high susceptibility;
- (c) presence/absence of characters are scored as + (present) and 0 (absent);
- (d) for descriptors which are not generally uniform throughout the accession (e.g. mixed collection, genetic segregation) mean and standard deviation could be reported where the descriptor is continuous or mean and 'x' where the descriptor is discontinuous;

2 DESCRIPTORS FOR PAPAYA

- (e) when the descriptor is inapplicable, '0' is used as the descriptor value, e.g. if an accession does not form flowers, 0 would be scored for the following descriptor

Flower colour

| | |
|---|--------|
| 1 | White |
| 2 | Yellow |
| 3 | Red |
| 4 | Purple |

- (f) blanks are used for information not yet available;
- (g) standard colour charts, e.g. Royal Horticultural Society Colour Chart, Methuen Handbook of Colour, Munsell Color Charts for Plant Tissues are strongly recommended for all ungraded colour characters (the precise chart used should be specified in the NOTES descriptor, 11):
- (h) dates should be expressed numerically in the format DDMMYYYY, where

DD - 2 digits to represent the day
MM - 2 digits to represent the month
YYYY- 4 digits to represent the year

PASSPORT

1. ACCESSION DATA

1.1 ACCESSION NUMBER

This number serves as a unique identifier for accessions and is assigned by the curator when an accession is entered into his collection. Once assigned this number should never be reassigned to another accession in the collection. Even if an accession is lost, its assigned number is still not available for re-use. Letters should occur before the number to identify the genebank or national system (e.g. MG indicates that an accession comes from the genebank at Bari, Italy; PI indicates an accession within the USA system; ILL Indicates an accession in the ICARDA lentil collection)

1.2 DONOR NAME

Name of institution or individual responsible for donating the germplasm

1.3 DONOR IDENTIFICATION NUMBER

Number assigned to accession by the donor

1.4 OTHER NUMBERS ASSOCIATED WITH THE ACCESSION

(other numbers can be added as 1.4.3 etc.)

Any other identification number known to exist in other collections for this accession, e.g. USDA Plant Inventory number (not collection number, see 2.1)

1.4.1 Other number 1

1.4.2 Other number 2

1.5 SCIENTIFIC NAME

1.5.1 Genus

1.5.2 Species

1.5.3 Subspecies

1.6 PEDIGREE/CULTIVAR NAME

Nomenclature and designations assigned to breeder's material

4 DESCRIPTORS FOR PAPAYA

1.7 ACQUISITION DATE

The date on which the accession entered the collection

1.8 DATE OF LAST REGENERATION OR MULTIPLICATION

1.9 ACCESSION SIZE

Approximate number of seeds of accession in collection

1.10 NUMBER OF TIMES ACCESSION REGENERATED

Number of regenerations or multiplications since original collection

1.11 TYPE OF MAINTENANCE

- 1 Vegetative
- 2 Seed
- 3 Both
- 4 Tissue culture

2. COLLECTION DATA

2.1 COLLECTOR'S NUMBER

Original number assigned by collector of the sample normally composed of the name or initials of the collector(s) followed by a number. This item is essential for identifying duplicates held in different collections and should always accompany sub-samples wherever they are sent

2.2 COLLECTING INSTITUTE

Institute or person collecting/sponsoring the original sample

2.3 DATE OF COLLECTION OF ORIGINAL SAMPLE

2.4 COUNTRY OF COLLECTION OR COUNTRY WHERE CULTIVAR/VARIETY BRED

Use the 3 letter abbreviations supported by the Statistical Office of the United Nations. Copies of these abbreviations are available from the IBPGR Secretariat and have been published in the FAO/IBPGR Plant Genetic Resources Newsletter number 49

2.5 PROVINCE/STATE

Name of the administrative subdivision of the country in which the sample was collected

2.6 LOCATION OF COLLECTION SITE

Number of kilometres and direction from nearest town, village or map grid reference (e.g. TIMBUKTU 7S means 7 km south of Timbuktu)

2.7 LATITUDE OF COLLECTION SITE

Degrees and minutes followed by N (north) or S (south), e.g. 1030S

2.8 LONGITUDE OF COLLECTION SITE

Degrees and minutes followed by E (east) or W (west), e.g. 7625W

2.9 ALTITUDE OF COLLECTION SITE [m]

Elevation above sea level

2.10 COLLECTION SOURCE

- 1 Wild
- 2 Farm land
- 3 Farm store
- 4 Backyard
- 5 Village market
- 6 Commercial market
- 7 Institute
- 8 Other (specify in the NOTES descriptor, 11)

2.11 STATUS OF SAMPLE

- 1 Wild
- 2 Weedy
- 3 Breeder's line
- 4 Primitive cultivar/landrace
- 5 Advanced cultivar (bred)
- 6 Other (specify in the NOTES descriptor, 11)

6 DESCRIPTORS FOR PAPAYA

2.12 LOCAL/VERNACULAR NAME

Name given by farmer to cultivar/landrace/weed

2.13 NUMBER OF PLANTS SAMPLED

Approximate number of plants collected in the field to produce this accession

2.14 PHOTOGRAPH

Was a photograph taken of the accession at the time of collection?

0 No
+ Yes

2.15 TYPE OF SAMPLE

1 Vegetative
2 Seed
3 Both

2.16 HERBARIUM SPECIMEN

Was a herbarium specimen collected? If so, provide any identification number in the NOTES descriptor, 11

0 No
+ Yes

2.17 DISTRIBUTION

The general distribution in the areas of collection

3 Limited
7 Widely distributed

2.18 GENETIC EROSION

Estimate of the rate at which genetic erosion of the species is occurring in the region of collection

0 No erosion
3 Slow
5 Intermediate
7 Rapid

2.19 TREE TYPE

- 1 Female
- 2 Hermaphrodite
- 3 Male

2.20 TOPOGRAPHY

- 1 Mountainous
- 2 Hilly
- 3 Level plain
- 4 Other (specify in the NOTES descriptor, 11)

2.21 RAINFALL

Average annual rainfall [mm]

2.22 SOIL TYPE

- 1 Clay
- 2 Clay-silt
- 3 Silt
- 4 Loam
- 5 Silt-sand
- 6 Sand
- 7 Highly organic

2.23 CROP USAGE

2.23.1 Leaf usage

- 1 Vegetable
- 2 Medicinal
- 3 Combinations of the above
- 4 Other (specify in the NOTES descriptor, 11)

2.23.2 Fruit usage

- 1 Vegetable
- 2 Dessert
- 3 Flavouring
- 4 Food preparations
- 5 Medicinal
- 6 Latex production for use in pharmaceutical, leather, tanning, textile, food and cosmetics
- 7 Combinations of the above (specify in the NOTES descriptor, 11)
- 8 Other (specify in the NOTES descriptor, 11)

2.23.3 Seed usage

- 1 Medicinal
- 2 Production of oil
- 3 Production of pharmaceuticals
- 4 Other (specify in the NOTES descriptor, 11)

2.24 OTHER NOTES FROM COLLECTOR

Collectors will record ecological information. For cultivated crops, cultivation practices, such as irrigation, season of sowing etc. will be recorded

CHARACTERIZATION AND PRELIMINARY EVALUATION

3. SITE DATA

3.1 COUNTRY OF CHARACTERIZATION AND PRELIMINARY EVALUATION

3.2 SITE (RESEARCH INSTITUTE)

3.3 NAME OF PERSON(S) IN CHARGE OF CHARACTERIZATION

3.4 SOWING DATE

3.5 PERCENTAGE GERMINATION

3.6 NUMBER OF DAYS TO 50% GERMINATION

3.7 TRANSPLANTING DATE

3.8 TREE SITE IN THE FIELD

Give, block, strip and/or row numbers as applicable

3.9 SPACING IN THE FIELD

3.10 SOIL TYPE

- | | |
|---|----------------|
| 1 | Clay |
| 2 | Clay-silt |
| 3 | Silt |
| 4 | Loam |
| 5 | Silt-sand |
| 6 | Sand |
| 7 | Highly organic |

3.11 WATERING

- | | |
|---|-----------|
| 1 | Irrigated |
| 2 | Rainfed |

3.12 FIRST HARVEST DATE

3.13 LAST HARVEST DATE IN FIRST PRODUCTION YEAR

3.14 LAST HARVEST DATE

4. PLANT DATA

4.1 VEGETATIVE

4.1.1 Tree habit

- 1 Single stem
- 2 Multiple stems

4.1.2 Number of nodes to first flower

4.1.3 Length of middle internode on tree [cm]

Mean of 5 measurements

4.1.4 Stem colour (adult trees)

- 1 Greenish or light grey
- 2 Greyish brown
- 3 Green and shades of red-purple (pink)
- 4 Red-purple (pink)
- 5 Other (specify)

4.1.5 Stem pigmentation

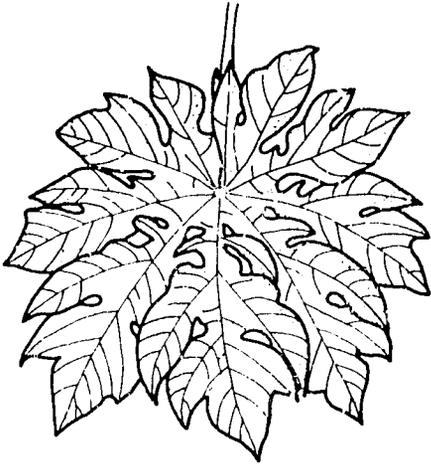
- 1 Only or mostly basal
- 2 Only or mostly lower
- 3 Only or mostly median
- 4 Only or mostly upper
- 5 Indiscriminate

4.1.6 Colour of mature leaf petiole

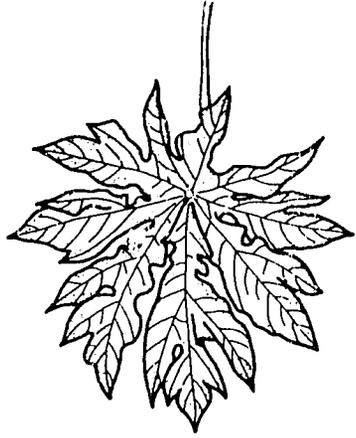
- 1 Pale green
- 2 Normal green
- 3 Dark green
- 4 Green and shades of red-purple
- 5 Red-purple
- 6 Other (specify in the NOTES descriptor, 11)

4.1.7 Leaf shape

See Fig. 1



1.



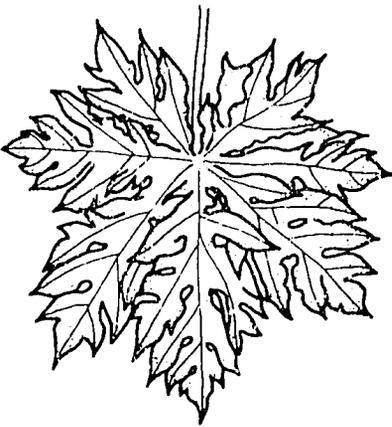
2.



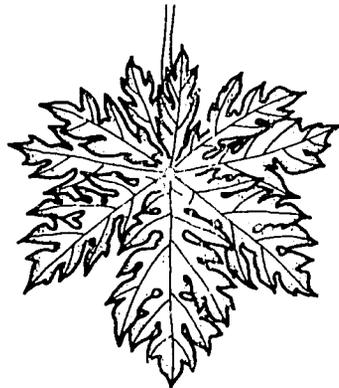
3.



4.

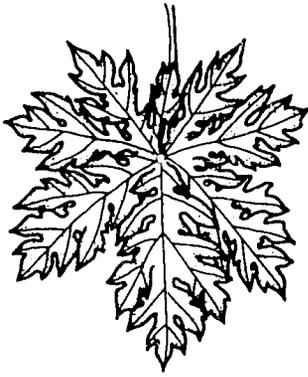


5.

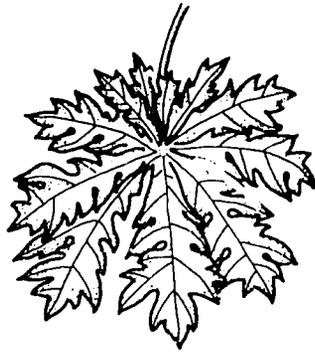


6.

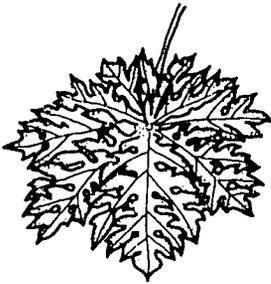
Fig. 1. Leaf shape



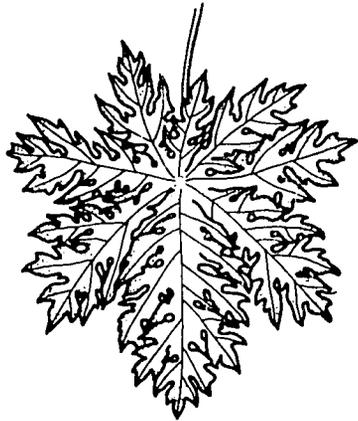
7.



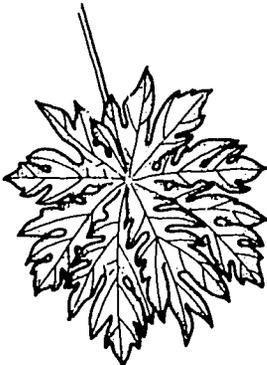
8.



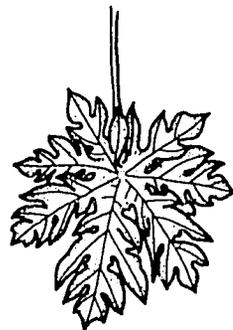
9.



10.



11.



12.

Fig. 1. Leaf shape, continued

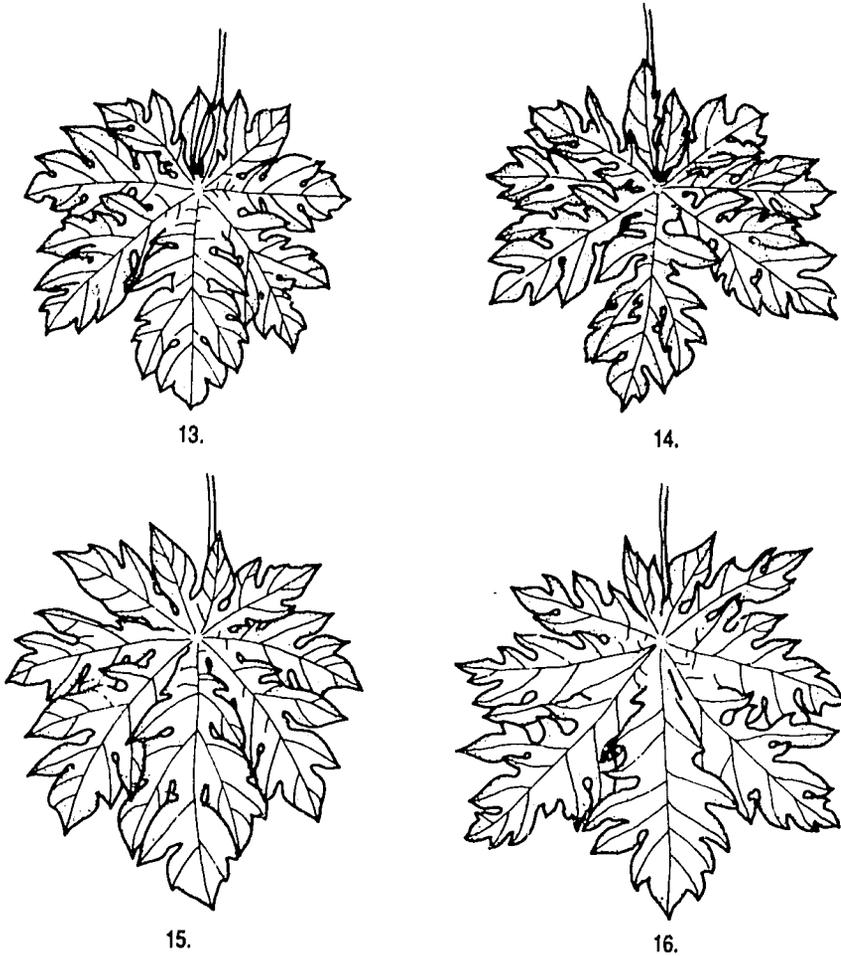


Fig. 1. Leaf shape, continued

4.2 INFLORESCENCE AND FRUIT

4.2.1 Type of tree hermaphroditism

- 1 Staminate flowers and a few hermaphrodite flowers
- 2 A few staminate flowers and many hermaphrodite flowers
- 3 A few staminate flowers, many hermaphrodite flowers and a few pistillate flowers
- 4 Hermaphrodite flowers only
- 5 Hermaphrodite flowers and a few pistillate flowers
- 6 A few hermaphrodite flowers and many pistillate flowers

4.2.2 Type of flowering

- 1 Flowers solitary (singly borne)
- 2 Inflorescences
- 3 Both

4.2.3 Colour of inflorescence stalk

- 1 Greenish
- 2 Purplish/pinkish
- 3 Dark red-purple/pink
- 4 Other (specify in the NOTES descriptor, 11)

4.2.4 Predominant inflorescence size

- 3 Small
- 5 Intermediate
- 7 Large

4.2.5 Flower size (specify sex)

Observed on completely developed open flowers

- 3 Generally small
- 5 Generally intermediate
- 7 Generally large

4.2.6 Corolla tube colour of male flower

Observed on completely developed open flowers

- 1 White
- 2 White yellow (cream)
- 3 Yellow
- 4 Deep yellow to orange
- 5 Greenish
- 6 Dark green
- 7 Yellow/green and red-purple shades
- 8 Red purplish (pinkish)
- 9 Dark red-purple (pink)
- 10 Other (specify in the NOTES descriptor, 11)

4.2.7 Corolla lobes colour of male flower

Observed on completely developed open flowers

- 1 White
- 2 White yellow (cream)
- 3 Yellow
- 4 Deep yellow to orange
- 5 Greenish
- 6 Dark green
- 7 Yellow/green and red-purple shades
- 8 Red purplish (pinkish)
- 9 Dark red-purple (pink)
- 10 Other (specify in the NOTES descriptor, 11)

4.2.8 Colour of female flower

Observed on completely developed open flowers

- 1 White
- 2 White yellow (cream)
- 3 Yellow
- 4 Deep yellow to orange
- 5 Greenish
- 6 Dark green
- 7 Yellow/green and red-purple shades
- 8 Red purplish (pinkish)
- 9 Dark red-purple (pink)
- 10 Other (specify in the NOTES descriptor, 11)

4.2.9 Colour of hermaphrodite flower

Observed on completely developed open flowers

- 1 White
- 2 White yellow (cream)
- 3 Yellow
- 4 Deep yellow to orange
- 5 Greenish
- 6 Dark green
- 7 Yellow/green and red-purple shades
- 8 Red purplish (pinkish)
- 9 Dark red-purple (pink)
- 10 Other (specify in the NOTES descriptor, 11)

4.2.10 Fruit shape (fruits from hermaphrodite flowers)

Scored at full development. See Fig. 2

- 1 Globular
- 2 Round
- 3 High round
- 4 Elliptic
- 5 Oval
- 6 Oblong
- 7 Oblong-ellipsoid
- 8 Oblong-blocky
- 9 Elongate
- 10 Lengthened cylindrical
- 11 Pear shaped (pyriform)
- 12 Club
- 13 Blossom end tapered
- 14 Acron (heart shaped)
- 15 Reniform
- 16 Turbinate inferior
- 17 Plum shaped
- 18 Other (specify/describe)

4.2.11 Fruit shape (fruits from female flowers)

Scored at full development. See Fig. 2

- 1 Globular
- 2 Round
- 3 High round
- 4 Elliptic
- 5 Oval
- 6 Oblong
- 7 Oblong-ellipsoid
- 8 Oblong-blocky
- 9 Elongate
- 10 Lengthened cylindrical
- 11 Pear shaped (pyriform)
- 12 Club
- 13 Blossom end tapered
- 14 Acron (heart shaped)
- 15 Reniform
- 16 Turbinate inferior
- 17 Plum shaped
- 18 Other (specify/describe)

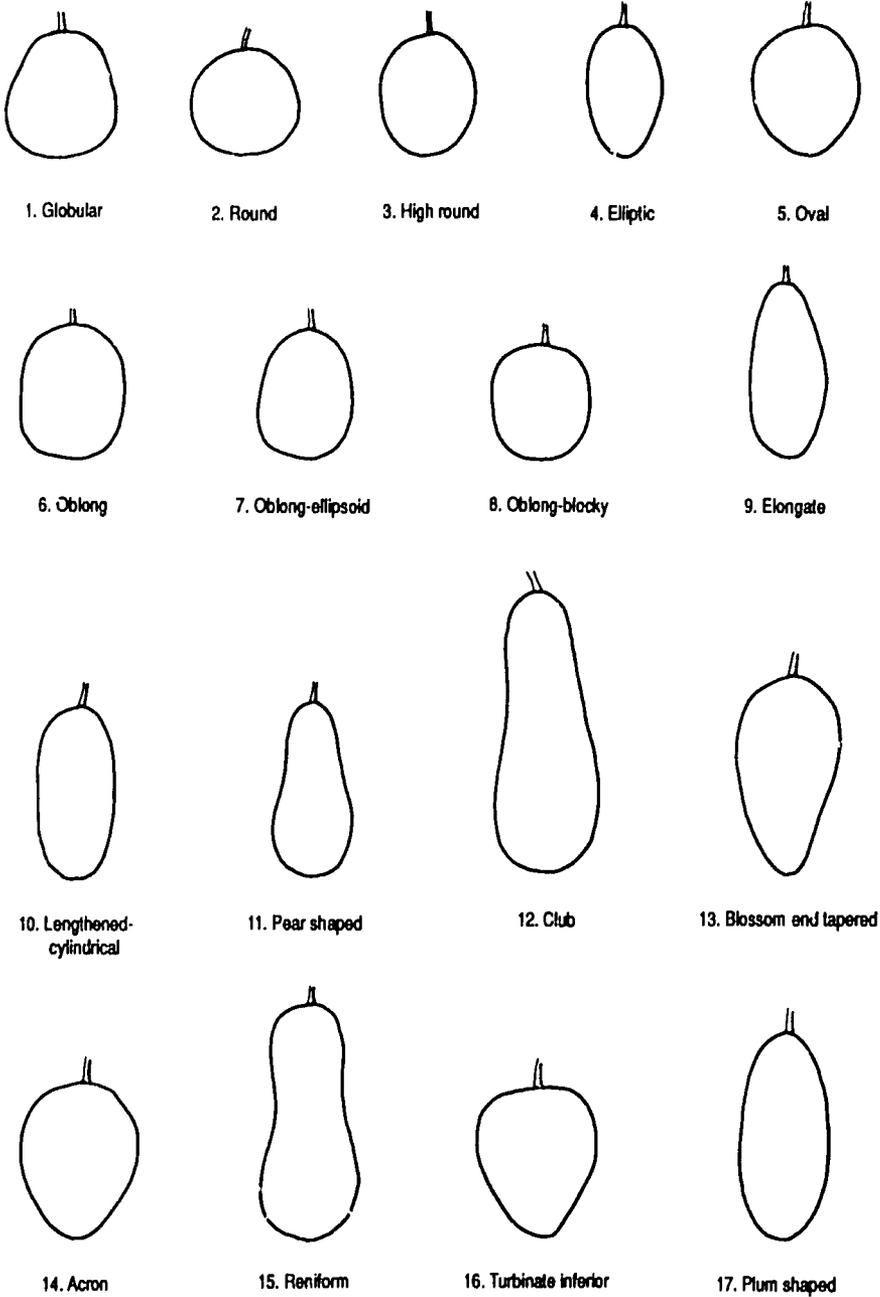


Fig. 2. Fruit shapes

4.2.12 Fruit skin colour

Overall colour of the skin of ripe fruits

- 1 Yellow
- 2 Deep yellow to orange
- 3 Red/purple
- 4 Yellowish green
- 5 Green
- 6 Other (specify in the NOTES descriptor, 11)

4.2.13 Fruit flesh colour

Observe on ripe fruits

- 1 Light yellow
- 2 Bright yellow
- 3 Deep yellow to orange
- 4 Reddish orange
- 5 Scarlet
- 6 Other (specify in the NOTES descriptor, 11)

4.2.14 Tree fruit productivity [kg per annum]

- 3 Low (approximately 20 kg)
- 5 Intermediate (approximately 50 kg)
- 7 High (approximately 80 kg)
- 9 Extremely high (approximately 120 kg)

4.3 SEED

4.3.1 Seed colour

- 1 Generally tan
- 2 Generally grey-yellow
- 3 Generally grey
- 4 Generally brown black
- 5 Generally black
- 6 Variable

4.3.2 Seed germinating in ripe fruit

- 0 Absent
- +

4.3.3 100 seed weight [g]

FURTHER CHARACTERIZATION AND EVALUATION

5. SITE DATA

5.1 COUNTRY OF FURTHER CHARACTERIZATION AND EVALUATION

5.2 SITE (RESEARCH INSTITUTE)

5.3 NAME OF PERSON(S) IN CHARGE OF CHARACTERIZATION

5.4 SOWING DATE

5.5 PERCENTAGE GERMINATION

5.6 NUMBER OF DAYS TO 50% GERMINATION

5.7 TRANSPLANTING DATE

5.8 TREE SITE IN THE FIELD

Give, block, strip and/or row numbers as applicable

5.9 SPACING IN THE FIELD

5.10 SOIL TYPE

- | | |
|---|----------------|
| 1 | Clay |
| 2 | Clay-silt |
| 3 | Silt |
| 4 | Loam |
| 5 | Silt-sand |
| 6 | Sand |
| 7 | Highly organic |

5.11 WATERING

- | | |
|---|-----------|
| 1 | Irrigated |
| 2 | Rainfed |

5.12 FIRST HARVEST DATE

5.13 LAST HARVEST DATE IN FIRST PRODUCTION YEAR

5.14 LAST HARVEST DATE

6. PLANT DATA

Unless otherwise noted, descriptors should be evaluated in the first year of production

6.1 VEGETATIVE

6.1.1 Tree height

Measured from the ground to apical meristem at first harvest

- 3 Short (<1 m)
- 5 Intermediate
- 7 Tall (>2 m)

6.1.2 Tree diameter [mm]

To be measured 10 cm above the ground

6.1.3 Height to first fruit

- 3 Low bearing (<1.0 m)
- 5 Intermediate
- 7 High bearing (>1.5 m)

6.1.4 Length of mature leaf petiole [cm]

Average of 5 middle leaves

6.1.5 Length of mature leaf [cm]

Average of same 5 leaves, and measured from base of middle leaflet midrib to tip

6.1.6 Width of mature leaf [cm]

Average of the same 5 leaves, and measured at maximum breadth

6.1.7 General shape of mature leaf teeth

See Fig. 3

- 1 Straight
- 2 Convex
- 3 Concave
- 4 Other (specify in the NOTES descriptor, 11)

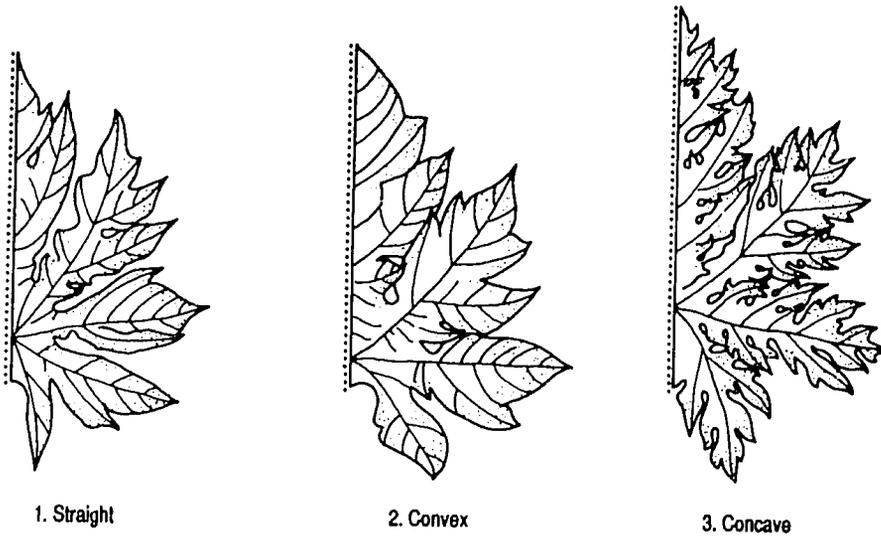


Fig. 3. Shape of mature leaf teeth

6.1.8 Leaf waxiness

- 0 Absent
- + Present

6.1.9 Leaf pubescence

- 0 Absent
- + Present

6.1.10 General shape of petiole sinus

See Fig. 4

- 1 Open
- 2 Slightly open
- 3 Slightly closed
- 4 Strongly closed
- 5 Other (specify in the NOTES descriptor, 11)

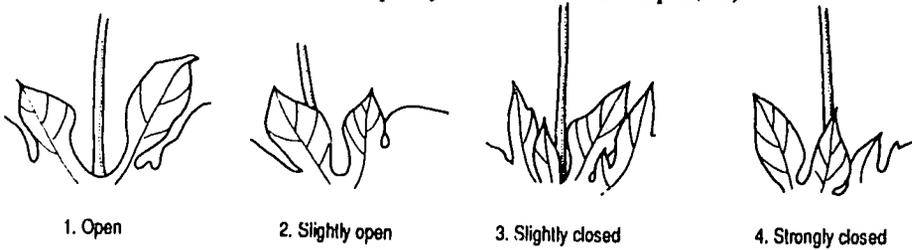


Fig. 4. Shape of petiole sinus

6.2 INFLORESCENCE AND FRUIT

6.2.1 Density of inflorescences on trunk

Observe several trees before scoring

- 3 Sparse (few inflorescences)
- 5 Intermediate
- 7 Dense (many inflorescences)

6.2.2 Inflorescence density

Density of flowers within tree inflorescences

- 3 Sparse (few flowers)
- 5 Intermediate
- 7 Dense (many flowers)

6.2.3 Length of inflorescence main axis [cm]

Average of 5 basal (old) inflorescences

6.2.4 Corolla length of male flowers [cm]

Observe variability of several male flowers before scoring

- 3 Generally short
- 7 Generally long

6.2.5 Corolla length of hermaphrodite flowers [cm]

Observe several hermaphrodite flowers before scoring

- 3 Generally short
- 7 Generally long

6.2.6 Corolla length of female flowers [cm]

Observe several female flowers before scoring

- 3 Generally short
- 7 Generally long

6.2.7 Sex change of flowers during growth: male to hermaphrodite

- 0 No
- + Yes

6.2.8 Sex change of flowers during growth: hermaphrodite to male

- 0 No
- + Yes

6.2.9 Sex change of flowers during growth: hermaphrodite to female

- 0 No
- + Yes

6.2.10 Number of flowers per node

6.2.11 Number of fruits per node

6.2.12 Uniformity of fruit distribution

- 0 Not uniform
- + Uniform

6.2.13 Number of fruits on trunk

An average of 5 plants should be taken from a 2-3 year fruiting season

6.2.14 Length of peduncle [cm]

Average of 5 plants

6.2.15 Skin colour of immature fruits

- 1 Yellow
- 2 Light green
- 3 Green
- 4 Other (specify in the NOTES descriptor, 11)

6.2.16 Stalk end fruit shape

See Fig. 5

- 1 Depressed
- 3 Flattened
- 5 Inflated
- 7 Pointed

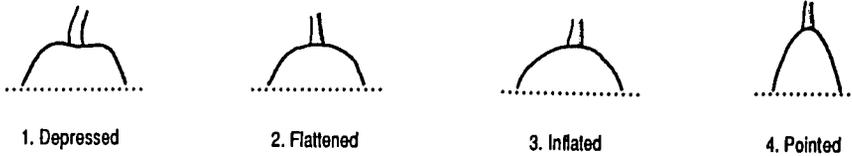


Fig. 5. Stalk-end fruit shape

6.2.17 Size of blossom end scar

- 3 Small (< 0.5 cm)
- 5 Intermediate
- 7 Large (> 1.0 cm)

6.2.18 Fruit skin texture when ripe

- 3 Smooth
- 5 Intermediate
- 7 Rough (ridged)

6.2.19 Ridging on fruit surface

- 3 Superficial (low depression)
- 5 Intermediate (moderate depression)
- 7 Deep (usually 5 distinct ridges)

6.2.20 Fruit weight [g]

Average of 5 fruits

6.2.21 Fruit length [cm]

To be measured from base of calyx to tip of fruit. Average of 5 fruits

6.2.22 Fruit diameter [cm]

To be measured at broadest part. Average of 5 fruits

6.2.23 Shape of central cavity

To be determined as fruit cut open (cross-section) at maximum diameter

See Fig. 6

- 1 Irregular
- 2 Round
- 3 Angular
- 4 Slightly star shaped
- 5 Star shaped
- 6 Other (specify in the NOTES descriptor, 11)



1. Irregular



2. Round



3. Angular



4. Slightly star shaped



5. Star shaped

Fig. 6. Shape of central cavity

6.2.24 Central cavity diameter [cm]

Measured at maximum diameter. Average of 5 fruits

6.2.25 Thickness of fruit skin

- 3 Thin
- 5 Intermediate
- 7 Thick

6.2.26 Flesh aroma

- 3 Mild
- 5 Intermediate
- 7 Strong

6.2.27 Flesh density

- 1 Very low (spongy)
- 3 Low (crumbly)
- 5 Intermediate
- 7 Dense (crisp)
- 9 Very dense (firm)

6.2.28 Flesh fibrousness

- 0 Absent
- + Present

6.2.29 Placental tissue

- 3 Little
- 5 Intermediate
- 7 Much

6.2.30 Eating quality (dessert)

A combined assessment of flavour, sweetness and aroma when ripe

- 3 Poor
- 5 Intermediate
- 7 Good
- 9 Excellent

6.3 SEED

6.3.1 Fresh weight of seeds per fruit [g]

Average of 5 fruits

6.3.2 Seed surface lustre

- 3 Generally dull
- 5 Generally intermediate
- 7 Generally glossy

6.3.3 Seed shape

- 1 Generally round
- 2 Generally spherical or ovoid
- 3 Other (specify in the NOTES descriptor, 11)

6.3.4 Seed surface type:

- 1 Generally translucent
- 2 Generally opaque

6.3.5 Seed mucilage

- 1 Almost absent
- 3 Small amount
- 5 Intermediate amount
- 7 Large amount

6.4 TREE YIELD DATA

Specify tree age

6.4.1 Leaf yield per tree [kg]

Total fresh weight of leaves harvested over one season (or year)

6.4.2 Total dry papain yield per tree [kg]

Total weight from leaves, trunks and unripe fruits over one season (or year)

6.4.3 Total number of harvested fruits per season (or year)6.4.4 Total weight of harvested fruits per season (or year) [kg]6.4.5 Total number of harvests per season (or year)6.4.6 Total dry seed yield per season (or year) [kg]

6.5 CHEMICAL DATA

6.5.1 Percentage leaf dry matter [%]6.5.2 Leaf protein content [%]

Measured as percentage of fresh weight

6.5.3 Leaf mineral content [%]

Measured as percentage of leaf dry matter

6.5.4 Papain oxidation

6.5.5 Refractometer reading of fruit juice

6.5.6 Total soluble solids of fruit flesh [%]

Expressed as percentage of fresh weight of mature fruit flesh

6.5.7 Percentage of ash in fruit flesh [%]

6.5.8 Percentage of acids in fruit flesh [%]

6.5.9 Percentage of protein in fruit flesh [%]

6.5.10 Percentage of total sugars in fruit flesh [%]

6.5.11 Percentage of fat in fruit flesh [%]

6.5.12 Percentage of fibre in fruit flesh [%]

6.5.13 Percentage oil content of seed [%]

7. STRESS SUSCEPTIBILITY

To be scored on a 1-9 scale where:

- 1 Very low susceptibility
- 3 Low susceptibility
- 5 Medium susceptibility
- 7 High susceptibility
- 9 Very high susceptibility

7.1 REACTION TO LOW TEMPERATURE (FROST SUSCEPTIBILITY)

7.2 REACTION TO DROUGHT

7.3 REACTION TO HIGH SOIL MOISTURE (WATERLOGGING)

8. PEST AND DISEASE SUSCEPTIBILITY

To be scored on a 1-9 scale where:

- 1 Very low susceptibility
- 3 Low susceptibility
- 5 Medium susceptibility
- 7 High susceptibility
- 9 Very high susceptibility

8.1 PESTS

- 8.1.1 Aphis gossypii Glover Cotton or melon aphid
- 8.1.2 Aphis craccivora Koch Cowpea aphid
- 8.1.3 Aphis middletonii Erigeron root aphid
Thomas
- 8.1.4 Aphis spiraeicola
- 8.1.5 Heteromyzus lactucae L. Sonchus aphid
(= Amphorophora sonchi
Oestlund)
- 8.1.6 Macrosiphum euphorbiae Potato aphid
Thomas
- 8.1.7 Neomyzus circumflexus Crescent-marked
Buckton lily aphid
- 8.1.8 Myzus persicae Sulzer Green peach aphid
- 8.1.9 Rhopalosiphum maidis Corn leaf aphid
Fitch
- 8.1.10 Exillis lepidus Jordan Fungus weevil
- 8.1.11 Rhabdoscelus obscurus New Guinea
Boisduval sugarcane weevil
- 8.1.12 Ceratitis capitata Mediterranean fruit fly
Weidemann
- 8.1.13 Dacus cucurbitae Melon fly
Coquillet

- 8.1.14 Dacus tryoni Froggatt Queensland fruit fly
- 8.1.15 Dacus cucuminis French Cucumber fly
- 8.1.16 Dacus neohumeralis Hardy Lesser Queensland fruit fly
- 8.1.17 Dacus dorsalis Hendel Oriental fruit fly
- 8.1.18 Chrysoma megacephala Fabricius Oriental blowfly
- 8.1.19 Neoxaireta spinigera Weidemann Blue soldier fly
- 8.1.20 Volucella obesa Fabricius Green syrphid fly
- 8.1.21 Toxotrypana curvicauda Papaya fruit fly
- 8.1.22 Nezara viridula L. Southern green stink bug
- 8.1.23 Amblypelta butescens Distant banana spotting bug
- 8.1.24 Empoasca solana DeLong Southern garden leafhopper
- 8.1.25 Empoasca papaya Papaya leafhopper
- 8.1.26 Agrotis ipsilon Aufnagel Black cutworm
- 8.1.27 Heliiothis hawaiiensis Quaintance Hawaiian budmoth
- 8.1.28 Heliiothis zea Boddie Corn earworm
- 8.1.29 Heliiothis punctigera Wallengren Native budworm
- 8.1.30 Othreis fallonia Clerck Fruit sucking moth
- 8.1.31 Othreis materna L. Fruit sucking moth
- 8.1.32 Eudocima salamina Cramer Fruit sucking moth
- 8.1.33 Dichocrocis punctiferalis Guinée Yellow peach moth

- 8.1.34 Cryptoblastes aliena
- 8.1.35 Aspidiotus destructor Coconut scale
Signoret
- 8.1.36 Coccus elongatus Long brown soft scale
Signoret
- 8.1.37 Coccus hesperidum L. Brown soft scale
- 8.1.38 Howardia biclavis Mining scale
Comstock
- 8.1.39 Pseudoparlatoria ostriata
- 8.1.40 Pseudococcus obscurus Obscure mealybug
Essig
- 8.1.41 Thrips tabaci Lindeman Onion thrips
- 8.1.42 Trialeurodes Greenhouse whitefly
vaporariorum Westwood
- 8.1.43 Bemisia spp. Whitefly
- 8.1.44 Brevipalpus phoenicis Red and black flat mites
Geijskes
- 8.1.45 Eutetranychus banksii Texas citrus mite
McGregor
- 8.1.46 Panonychus citri Citrus red mite
McGregor
- 8.1.47 Tetranychus cinnabarinus Carmine mite
Boisduval
- 8.1.48 Tetranychus urticae Koch Two spotted mite
- 8.1.49 Hemitarsonemus latus Broad mite
Banks
- 8.1.50 Tuckerella ornata Tucker Ten-tailed tuckerellid
- 8.1.51 Tuckerella pavoniformis Twelve-tailed
McGregor tuckerellid

- 8.1.52 Tenuipalpus bioculatus
- 8.1.53 Meloidogyne spp. Root-knot nematodes
- 8.1.54 Other (specify in the NOTES descriptor, 11)

8.2 FUNGI

- 8.2.1 Alternaria spp. Alternaria rot
- 8.2.2 Ascochyta caricae Papaya leaf and fruit spot
- 8.2.3 Ascochyta spp. Ascochyta rot
- 8.2.4 Asperisporium caricae Papaya leaf blight
- 8.2.5 Cercospora papayae Black spot
- 8.2.6 Cladosporium spp. Blossom-end rot
- 8.2.7 Colletotrichum gloeosporioides Anthracnose
- 8.2.8 Corynespora cassicola Leaf spot
- 8.2.9 Fusarium spp. Stem end rot
- 8.2.10 Glomerella cingulata Fruit rot
- 8.2.11 Oidium caricae Powdery mildew
- 8.2.12 Phytophthora parasitica/ P. palmivora Phytophthora fruit rot
- 8.2.13 Pythium spp./ Phytophthora parasitica/ P. palmivora Collar and root rot
- 8.2.14 Rhizoctonia spp. Damping-off
- 8.2.15 Other (specify in the NOTES descriptor, 11)

8.3 BACTERIA

Specify in the NOTES descriptor, 11

8.4 VIRUS AND MYCOPLASMA

- 8.4.1 Papaya mosaic
- 8.4.2 Papaya ringspot
- 8.4.3 Papaya bunchy top
- 8.4.4 Yellow crinkle
- 8.4.5 Tomato big bud organism
- 8.4.6 Other (specify in the NOTES descriptor, 11)

8.5 OTHER DISORDERS

- 8.5.1 Freckles
- 8.5.2 Boron deficiency
- 8.5.3 Dieback (unknown cause)
- 8.5.4 Other (specify in the NOTES descriptor, 11)

9. ALLOENZYME COMPOSITION**10. CYTOLOGICAL CHARACTERS AND OTHER IDENTIFIED GENES****11. NOTES**

Give additional information where the descriptor state is noted

APPENDIX I. LIST OF CONTRIBUTORS

Dr T. Badra, c/o The Boyes, 5634 McCallum Road, Agassiz, British Colombia VOM1AO, Canada

Ing. Vidal Bautista C. (Director) and Ing. Jorge Bermudez R. (Asistente), Universidad Nacional Agraria, la Molina, Lima, Peru

Dr K.L. Chadha, Director, Indian Institute for Horticultural Research, 255 Upper palace, Orchards, Bangalore-562113, India

Mr Fransisco R. Ferreira and Eduardo Alberto Vilela Morales, EMBRAPA, Centro Nacional de Recursos Genéticos, S.A.I.N., Parque Rural, C.P. 10.2372, CEP 70.000, Brasilia, Brazil

Dr P.J. Ito, University of Hawaii, College of Tropical Agriculture and Human Resources, 461 W. Lanikaula Street, Hilo, Hawaii 96720-4094, USA

Mr C. Y. Kwok, Malaysian Agricultural Research and Development Institute, IBU Pejabat Mardi, Bag Berkunci No:202, Pejibat Pos Universiti Pertanian Malaysia, Serdang, Selangor, Malaysia

Mr Francis N. Rivera, University of the Philippines at los Baños, College of Agriculture, Laguna, Philippines

Dr L. Seidowitz, Institut für Pflanzenbau und Pflanzenzuchtung der Bundesforschungsanstalt für Landwirtschaft Braunschweig-Völkenrode (FAL), Bundesallee 50, D-3300 Braunschweig, Federal Republic of Germany

Dr C. W. Winks, Senior Plant Breeder, Department of Primary Industries, Maroochy Horticultural Research Station, P.O. Box 83, Nambour, QLD 4560, Australia