

Descriptors for

Durian

(Durio zibethinus Murr.)



List of Descriptors

<i>Allium</i> (E, S)	2001	Pearl millet (E/F)	1993
Almond (Revised) * (E)	1985	Pepino (E)	2004
Apple (E)	1982	<i>Phaseolus acutifolius</i> (E)	1985
Apricot * (E)	1984	<i>Phaseolus coccineus</i> * (E)	1983
Avocado (E/S)	1995	<i>Phaseolus lunatus</i> (P)	2001
Bambara groundnut (E, F)	2000	<i>Phaseolus vulgaris</i> * (E, P)	1982
Banana (E, S, F)	1996	Pigeonpea (E)	1993
Barley (E)	1994	Pineapple (E)	1991
<i>Beta</i> (E)	1991	Pistachio (A, R, E, F)	1997
Black pepper (E/S)	1995	<i>Pistacia</i> (excluding <i>Pistacia vera</i>) (E)	1998
<i>Brassica</i> and <i>Raphanus</i> (E)	1990	Plum * (E)	1985
<i>Brassica campestris</i> L. (E)	1987	Potato variety * (E)	1985
Buckwheat (E)	1994	Quinoa * (E)	1981
<i>Capsicum</i> (E/S)	1995	Rambutan (E)	2003
Cardamom (E)	1994	Rice * (E)	1980
Carrot (E, S, F)	1998	Rocket (E, I)	1999
Cashew (E)	1986	Rye and Triticale * (E)	1985
<i>Chenopodium</i> (S)	2005	Safflower * (E)	1983
Cherry * (E)	1985	Sesame (Revised) (E)	2004
Chickpea (E)	1993	<i>Setaria italica</i> and <i>S. pumilla</i> (E)	1985
<i>Citrus</i> (E, F, S)	1999	Shea tree (E)\	2006
Coconut (E)	1995	Sorghum (E/F)	1993
Coffee (E, S, F)	1996	Soybean * (E/C)	1984
Cotton (Revised) (E)	1985	Strawberry (E)	1986
Cowpea (E)	1983	Sunflower * (E)	1985
Cultivated potato * (E)	1977	Sweet potato (E/S/F)	1991
Date palm (F)	2005	Taro (E, F, S)	1999
<i>Echinochloa</i> millet * (E)	1983	Tea (E, S, F)	1997
Eggplant (E/F)	1990	Tomato (E, S, F)	1996
Faba bean * (E)	1985	Tropical fruits * (E)	1980
Fig (E)	2003	Ulluco (S)	2003
Finger millet (E)	1985	<i>Vigna aconitifolia</i> and <i>V. trilobata</i> (E)	1985
Forage grass * (E)	1985	<i>Vigna mungo</i> and <i>V. radiata</i> (Revised)*(E)	1985
Forage legume * (E)	1984	Walnut (E)	1994
Grapevine (E, S, F)	1997	Wheat (Revised) * (E)	1985
Groundnut (E/S/F)	1992	Wheat and <i>Aegilops</i> * (E)	1978
Jackfruit (E)	2000	White Clover (E)	1992
Kodo millet * (E)	1983	Winged Bean * (E)	1979
<i>Lathyrus</i> spp. (E)	2000	Xanthosoma (E)	1989
Lentil * (E)	1985	Yam (E, S, F)	1997
Lima bean * (E)	1982		
Litchi (E)	2002		
Lupin * (E/S)	1981		
Maize (E/S/F, P)	1991		
Mango (Revised) (E)	2006		
Mangosteen (E)	2003		
<i>Medicago</i> (Annual) * (E/F)	1991		
Melon (E)	2003		
Mung bean * (E)	1980		
Oat * (E)	1985		
Oca * (S)	2001		
Oil palm (E)	1989		
<i>Panicum miliaceum</i> and <i>P. sumatrense</i> (E)	1985		
Papaya (E)	1988		
Peach * (E)	1985		
Pear * (E)	1983		

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Durian

(Durio zibethinus Murr.)

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PREFACE

Descriptors for Durian (*Durio zibethinus* Murr.) were developed by Drs Songpol Somsri, Alfredo T. Corpuz, Salma Idris and Bhag Mal. Dr Bhag Mal coordinated the development of this descriptor list. A draft version prepared in the internationally accepted Bioversity format for descriptor lists was subsequently sent to a number of international experts for their comments and amendments. A full list of the names and addresses of those involved is given in 'Contributors'.

Bioversity encourages the collection of data for all five types of descriptors (see Definitions and Use of Descriptors), whereby data from the first four categories—*Passport, Management, Environment and Site* and *Characterization*—should be available for any accession. The number of descriptors selected in each of the categories will depend on the crop and the importance of the crop's description. Descriptors listed under Evaluation allow for a more extensive description of accession, but generally require replicated trials over a period of time.

Although the suggested coding should not be regarded as the definitive scheme, this format represents an important tool for a standardized characterization system and it is promoted by Bioversity throughout the world.

This descriptor list provides an international format and thereby produces a universally understood 'language' for plant genetic resources data. The adoption of this scheme for data encoding, or at least the production of a transformation method to convert other schemes to the Bioversity format, will produce a rapid, reliable and efficient means for information storage, retrieval and communication, and will assist with the utilization of germplasm. 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.

This descriptor list is intended to be comprehensive for the descriptors that it contains. This approach assists with the standardization of descriptor definitions. Bioversity does not, however, assume that each curator will characterize accessions of their collection utilizing all descriptors given. Descriptors should be used when they are useful to the curator for the management and maintenance of the collection and/or to the users of the plant genetic resources. However, highly discriminating descriptors are highlighted in the text to facilitate selection of descriptors.

Multicrop passport descriptors were developed jointly by Bioversity (ex IPGRI) and FAO, to provide consistent coding schemes for common passport descriptors across crops. They are marked in the text as [MCPD]. Please note that owing to the generic nature of the multicrop passport descriptors, not all descriptor states for a particular descriptor will be relevant to a specific crop. In Annex I, the reader will find a collecting form for durian that will facilitate data collecting.

Any suggestions for improvement on the Descriptors for Durian will be highly appreciated by Bioversity.

DEFINITIONS AND USE OF THE DESCRIPTORS

Bioversity uses the following definitions in genetic resources documentation:

Passport descriptors: These provide the basic information used for the general management of the accession (including the registration at the genebank and other identification information) and describe parameters that should be observed when the accession is originally collected.

Management descriptors: These provide the basis for the management of accessions in the genebank and assist with their multiplication and regeneration.

Environment and site descriptors: These describe the environmental and site-specific parameters that are important when characterization and evaluation trials are held. They can be important for the interpretation of the results of those trials. Site descriptors for germplasm collecting are also included here.

Characterization descriptors: These enable an easy and quick discrimination between phenotypes. They are generally highly heritable, can be easily seen by the eye and are equally expressed in all environments. In addition, these may include a limited number of additional traits thought desirable by a consensus of users of the particular crop.

Evaluation descriptors: The expression of many of the descriptors in this category will depend on the environment and, consequently, special environmental designs and techniques are needed to assess them. Their assessment may also require complex biochemical or molecular characterization methods. This type of descriptors includes characters such as yield, agronomic performance, stress susceptibilities and biochemical and cytological traits. They are generally the most interesting traits in crop improvement.

Characterization will normally be the responsibility of genebank curators, while evaluation will typically be carried out elsewhere (possibly by a multidisciplinary team of scientists). The evaluation data should be fed back to the genebank, which will maintain a data file.

Highly discriminating descriptors are highlighted in the text.

The following internationally accepted norms for the scoring, coding and recording of descriptors states should be followed:

- (a) the *Système International d'Unités* (SI) is used;
- (b) the units to be applied are given in square brackets following the descriptor name;

- (c) standard colour charts, e.g. Royal Horticultural Society Colour Chart, Methuen Handbook of Colour, or Munsell Color Chart for Plant Tissues, are strongly recommended for all ungraded colour characters (the precise chart used should be specified in the section where it is used);
- (d) the three-letter abbreviations from the International Standard (ISO) Codes for the representation of names of countries are used;
- (e) many quantitative characters, which are continuously variable, are recorded on a 1–9 scale, where:

1	Very low	6	Intermediate to high
2	Very low to low	7	High
3	Low	8	High to very high
4	Low to intermediate	9	Very high
5	Intermediate		

is the expression of a character. 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 10 (Biotic stress susceptibility), 1 = very low susceptibility and 9 = very high susceptibility;

- (f) when a descriptor is scored using a 1–9 scale, such as in (e), '0' would be scored when (i) the character is not expressed, and (ii) a descriptor is inapplicable. In the following example, '0' will be recorded if an accession does not have a central leaf lobe:

Shape of central leaf lobe

1	Toothed
2	Elliptic
3	Linear

- (g) absence/presence of characters is scored as in the following example:

Terminal leaflet

0	Absent
1	Present

- (h) blanks are used for information not yet available;
- (i) for accessions which are not generally uniform for a descriptor (e.g. mixed collection, genetic segregation), the mean and standard deviation could be reported where the descriptor is continuous. Where the descriptor is discontinuous, several codes in the order of frequency could be recorded, or other publicized methods can be utilized, such

as Rana *et al.* (1991), or van Hintum (1993), that clearly state a method for scoring heterogeneous accessions;

- (j) dates should be expressed numerically in the format YYYYMMDD, where
- | | | |
|------|---|---------------------------------|
| YYYY | – | 4 digits to represent the year |
| MM | – | 2 digits to represent the month |
| DD | – | 2 digits to represent the day |
- .

PASSPORT

All descriptors listed under Passport, belonging to the multicrop passport descriptors category, are indicated in the text as [MCPD]

1. Accession descriptors

1.1 Institute code [MCPD]

Code of the institute where the accession is maintained. The codes consist of 3-letter ISO 3166 country code of the country where the institute is located plus a number. The current set of Institute Codes is available from the FAO website (<http://apps3.fao.org/wiews/>).

1.2 Accession number [MCPD]

This number serves as a unique identifier for accessions within a genebank collection, and is assigned when a sample is entered into the genebank collection. Once assigned, this number should never be reassigned to another accession in the collection. Even if an accession is lost, its assigned number should never be re-used. Letters should be used before the number to identify the genebank or national system (e.g. IDG indicates an accession that comes from the genebank at Bari, Italy; CGN indicates an accession from the genebank at Wageningen, The Netherlands; PI indicates an accession within the USA system).

1.2.1 Local plant number

This identifies a single plant within a population of plants having the same accession number. It may be any combination of plot identity, row number, or tree position within the row

1.3 Donor name

Name of the institution or individual responsible for donating the germplasm

1.4 Donor institute code [MCPD]

Code for the donor institute. It follows the Institute code standard

1.5 Donor accession number [MCPD]

Number assigned to an accession by the donor. It follows the Accession Number standard.

1.6 Curator's name

Name of the officer responsible for maintaining the genetic resources material held at the institute specified in descriptor **1.1 Institute code**

1.7 Other identification (numbers) associated with the accession [MCPD]

Any other identification (numbers) known to exist in other collections for this accession. Use the following system: INSTCODE: ACCENUMB; INSTCODE: ACCENUMB; INSTCODE and ACCENUMB follow the standard described above and are separated by

a colon. Pairs of INSTCODE and ACCENUMB are separated by a semicolon without space. When the institute is not known, the number should be preceded by a colon.

1.8 Scientific name

1.8.1 Genus [MCPD]
Genus name for taxon. Initial uppercase letter required.

1.8.2 Species [MCPD]
Specific epithet portion of the scientific name in lowercase letters. Following abbreviation is allowed: 'sp.'

1.8.2.1 Species authority [MCPD]
Provide the authority for the species name.

1.8.3 Subtaxon [MCPD]
Subtaxon can be used to store any additional taxonomic identifier.

1.8.3.1 Rank name
The rank of the subtaxon name. The following abbreviations are allowed: 'subsp.' (for subspecies); 'convar.' (for convariety); 'var.' (for variety); 'f.' (for form).

1.8.3.2 Subtaxon name [MCPD]
The infraspecific epithet of the scientific name, i.e. the epithet following the indication of the infraspecific rank in the name string (trinomial)

1.8.3.3 Subtaxon authority [MCPD]
Provide the subtaxon authority at the most detailed taxonomic level.

1.9 Ancestral data

Information about either pedigree or other description of ancestral information (i.e. parent variety in case of mutant or selection). For example, a pedigree 'Hanna/7*Atlas//Turk/8*Atlas' or a description 'mutation found in Hanna', 'selection from Irene' or 'cross involving amongst others Hanna and Irene'

1.9.1 Female parent

1.9.2 Male parent

1.10 Cultivar origin

- 1 Selection from open pollination
- 2 Selection from artificial pollination
- 3 Clonal selection

1.11 Accession**1.11.1 Accession name** [MCPD]

Either a registered or other formal designation assigned to the accession. First letter uppercase. Multiple names separated with semicolon without space. For example: Rheinische Vorgebirgstrauben; Emma; Avlon

1.11.2 Synonyms

Include here any previous identification other than the current name. Collecting number or newly assigned station names are frequently used as identifiers

1.11.3 Common crop name [MCPD]

Name of the crop in colloquial language, preferably English (i.e. 'malting barley', 'cauliflower', or 'white cabbage')

1.12 Acquisition date [YYYYMMDD] [MCPD]

Date on which the accession entered the collection where YYYY is the year MM is the month, and DD is the day. Missing data (MM or DD) should be indicated with hyphens. Leading zeros are required.

1.13 Accession size

Number or weight of seeds, seedlings, budsticks, *in vitro* plants, etc. of an accession in the genebank

1.14 Type of material received

- 1 Seed/seedling
- 2 Scion
- 3 *In vitro* culture
- 99 Other (e.g. more than one type, specify in descriptor **1.16 Remarks**)

1.15 Previous locations

Register other known previous locations of the accession, from the most recent to the oldest known location

1.16 Remarks

The remarks field is used to add notes or to elaborate on descriptors with value 99 or 999 (= Other).

2. Collecting descriptors

2.1 Collecting institute code [MCPD]

Code of the institute collecting the sample. If the holding institute has collected the material, the collecting institute code (COLLCODE) should be the same as the holding institute code (INTCODE). It follows the Institute code standard.

2.2 Site number

Number assigned to the physical site by the collector

2.3 Collecting number [MCPD]

Original number assigned by the collector(s) 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.

2.4 Collecting date of original sample [YYYYMMDD] [MCPD]

Collecting date of the samples where YYYY is the year, MM is the month and DD is the day. Missing data (MM or DD) should be indicated with hyphens. Leading zeros are required.

2.5 Country of origin [MCPD]

Code of the country in which the sample was originally collected. Use the three-letter ISO 3166 extended country codes.

2.6 Province/State

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

2.7 Department/County

Name of the secondary administrative subdivision (within a Province/State) of the country in which the sample was collected

2.8 Location of collecting site [MCPD]

Location information below the country level that describes where the accession was collected. This might include the distance in kilometers and direction from the nearest town, village or map grid reference point (e.g. 7 km south of Curitiba in the state of Parana).

2.8.1 Nearest place

Name of place nearest to site. This also refers to places that may not have proper names (i.e. road junctions).

2.8.2 Distance from nearest place [km]

Distance from the nearest named place to site.

2.8.3 Direction from nearest place

Direction of site from nearest place in degrees relative to North.

2.9 Latitude of collecting site¹

[MCPD]

Degree (2 digits), minutes (2 digits), and seconds (2 digits) followed by N (North) or S (South) (e.g. 103020S). Every missing digit (minutes or seconds) should be indicated with a hyphen. Leading zeros are required (e.g. 10 - - - S; 011530N; 4531 - - S).

2.10 Longitude of collecting site¹

[MCPD]

Degree (3 digits), minutes (2 digits), and seconds (2 digits) followed by E (East) or W (West) (e.g. 07625 low). Every Missing digit (minutes or seconds) should be indicated with a hyphen. Leading zeros are required. (e.g. 076 - - - W).

2.11 Elevation of collecting site [m asl]

[MCPD]

Elevation of collecting site expressed in metres above mean sea level. Negative values are allowed.

2.12 Collecting/acquisition source

[MCPD]

The coding scheme proposed can be used at two different levels of detail: either by using the general codes (in boldface) such as 0, 1, 2, 3, 4, or by using the more detailed coding such as 1.1, 1.2, 1.3, etc.

- 10 Wild habitat
 - 11 Forest/woodland
 - 12 Shrubland
 - 13 Grasslands
 - 14 Desert/tundra
- 20 Farm
 - 21 Field
 - 22 Orchard
 - 23 Garden
 - 24 Fallow
 - 25 Pasture
 - 26 Store
- 30 Market
 - 31 Town
 - 32 Village
 - 33 Urban area (around city)
 - 34 Other exchange system
- 40 Institute/Research organization
- 99 Other (specify in descriptor **2.24 Collector's notes**)

1 To convert from longitude and latitude in degrees (°) minutes (') and a hemisphere (North or South and East or West) to decimal degrees, the following formula should be used:

$$d^{\circ}m's''=h*(d+m/60 + s/3600)$$

where h=1 for Northern and Eastern hemispheres and -1 for the Southern and Western hemispheres, i.e., 30°30'0"S = -30.5 and 30°15'55"N=30.265.

2.13 Breeding institute code [MCPD]

Institute code of the institute that has bred the material. If the holding institute has bred the material, the breeding institute code should be the same as the holding institute code. It follows the Institute code standard.

2.14 Collecting source environment

Use descriptors 6.1.1. to 6.2 in section 6

2.15 Type of sample

Type of sample collected. If different types of material were collected from the same source, each sample type should be designated with a unique collecting number and a corresponding unique accession number:

- 1 Fruit
- 2 Seed
- 3 Seedling/sapling
- 4 Shoot/budwood/stem cutting
- 5 *In vitro* plantlet
- 99 Other (specify which part of the plant is used in descriptor **2.24 Collector's notes**)

2.16 Number of plants sampled**2.17 Biological status of accession** [MCPD]

- 100 Wild
 - 110 Natural
 - 120 Semi-natural/wild
- 200 Weedy
- 300 Traditional cultivar/landrace
- 400 Breeding/research material
 - 410 Breeder's line
 - 411 Synthetic population
 - 412 Hybrid
 - 413 Founder stock/base population
 - 414 Inbred line (parent of hybrid cultivar)
 - 415 Segregating population
 - 420 Mutant/genetic stock
- 500 Advanced/improved cultivar
- 999 Other (specify in descriptor **2.24 Collector's notes**)

2.18 Ethnobotanical data**2.18.1 Ethnic group**

Name of the ethnic group/community of the farmer donating the sample or of the people living in the area of collecting

2.18.2 Local/vernacular name

Name given by farmer to the crop and cultivar/landrace. State language and dialect if the ethnic group is not provided

2.18.3 Translation

Provide translation of the local name into English, if possible

2.18.4 Durian varietal name meaning

Does the durian name have a meaning? If yes, describe it briefly in descriptor

2.24 Collector's notes

- 0 No
- 1 Yes

2.18.5 History of plant use

- 1 Ancestral/indigenous (record association with the place and community)
- 2 Introduced (but in unknown distant past)
- 3 Introduced (record time and details known about introduction)

2.18.6 Parts of the plant used

- 1 Seed
- 2 Root
- 3 Trunk
- 4 Bark
- 5 Leaf
- 6 Flower
- 7 Fruit
- 8 Rind
- 9 Latex
- 99 Other (specify in descriptor **2.24 Collector's notes**)

2.18.7 Plant uses

- 1 Food
- 2 Forage
- 3 Fuel
- 4 Medicine
- 5 Wood/timber
- 99 Other (specify in descriptor **2.24 Collector's notes**)

2.18.8 Method of use

- 1 Fresh fruit
- 2 Juice
- 3 Preserved
- 4 Processed product
- 99 Other (specify in descriptor **2.24 Collector's notes**)

2.18.9 Special uses

- 1 Feasts
- 2 Religious purpose
- 3 Chiefs
- 4 Aesthetic
- 99 Other (specify in descriptor **2.24 Collector's notes**)

2.18.10 Cultural characteristics

Is there folklore associated with the collected durian type (e.g. taboos, stories and/or superstitions)? If so, describe it briefly in descriptor **2.24 Collector's notes**)

2.18.11 Durian popularity

Is the variety popular and widely grown? If yes, describe briefly the reasons in descriptor **2.24 Collector's notes**

- 0 No
- 1 Yes

2.18.12 Preferred growing conditions

If yes, describe farmers' perceptions on hardness of the variety in relation to main stresses in descriptor **2.24 Collector's notes**

- 0 No
- 1 Yes

2.18.13 Prevailing stresses

Information on main associated biotic (pests and diseases) and abiotic (drought) stresses

2.18.14 Cultural methods**2.18.14.1 Cropping system**

- 1 Monoculture (specify spacing in descriptor **2.24 Collector's notes**)
- 2 Intercropping (specify spacing and type of intercrop in descriptor **2.24 Collector's notes**)
- 3 Natural cropping (i.e. wild types topworked with cultivar/self-sown trees retained in homesteads)
- 99 Other (specify in descriptor **2.24 Collector's notes**)

2.18.14.2 Propagation method

Method used to produce trees

- 1 Seed
- 2 Grafting (specify type of grafting and the species, hybrid and/or clone used as rootstock, in descriptor **2.24 Collector's notes**)
- 3 Cutting
- 4 Budding
- 5 Layering
- 6 Stooling
- 7 Tissue culture (specify which part of plant used, in descriptor **2.24 Collector's notes**)
- 99 Other (specify in descriptor **2.24 Collector's notes**)

2.18.14.3 Irrigation

- 1 Rainfed
- 2 Irrigated (specify average annual amount of water supplied per hectare)
- 99 Other (specify in descriptor **2.24 Collector's notes**)

2.18.14.4 Status of plantation

- 1 Backyard (indicate number of trees)
- 2 Smallholding (<5 ha)
- 3 Mid-size holding (5–10 ha)
- 4 Large plantation (>10 ha)

2.18.15 Associated flora

Other dominant crop/plant species, including other durian species, found in and around the collecting site

2.18.16 Seasonality

- 1 Available only in main season
- 2 Available in off-season
- 3 Available throughout the year

2.18.17 Market information

Specify if any premium price was assigned to the type of durian

- 0 No
- 1 Yes

2.18.18 Type of market

- 1 Local (village, city, county, district, province)
- 2 National
- 3 Regional
- 4 International

2.19 Collecting site population structure**2.19.1 Number of trees sampled****2.19.2 Frequency of plants at collecting site**

- 3 Low
- 5 Intermediate
- 7 High

2.20 Plant population density

Number of trees per unit area (specify orchard or homestead)

2.21 Genetic erosion

Estimate the rate of genetic erosion of the species occurring in the region of collection

- 1 Slow
- 2 Moderate
- 3 High
- 4 Very high

2.22 Herbarium specimen

Was a herbarium specimen collected? If so, indicate the plant part used and provide an identification number and indicate in which place (Herbarium) the specimen was deposited, in descriptor **2.24 Collector's notes**

- 0 No
- 1 Yes

2.23 Photograph

Was photograph(s) taken of the accession or habitat at the time of collecting? If so, provide an identification number(s) in descriptor **2.24 Collector's notes**

- 0 No
- 1 Yes

2.24 Collector's notes

Additional information recorded by the collector or any specific information on any state in any of the above descriptors

MANAGEMENT

3. Management descriptors

3.1 Accession number [Passport 1.2]

3.1.1 Local plant number [Passport 1.2.1]

This identifies a single plant within a population of plants having the same accession number. It may be any combination of plot identity, row number, or tree position within the row

3.2 Population identification [Passport 2.4]

Collecting number, pedigree, cultivar name etc., depending on the population type

3.2.1 Availability for exchange

0 No
1 Yes

3.2.2 Import procedures

3.2.2.1 Import permit needed

0 No
1 Yes

3.2.2.2 Phytosanitary certificate needed

0 No
1 Yes

3.2.2.3 Quarantine required

0 No
1 Yes

3.2.3 Export procedures

3.2.3.1 Import permit from receiving country needed

0 No
1 Yes

3.2.3.2 Export permit needed

0 No
1 Yes
99 Other (specify in descriptor 3.12 Notes)

3.2.4 Pre- and post-movement activities

3.2.4.1 Treatment of sample during the transit

Note all relevant information on how the sample was treated between its collection and the deposit at its destination

3.2.4.2 Destination of the accession sample

Note where the sample is sent after it has been collected. Specify the institution, the name of the collection or station, the address and country

- 1 Final destination of sample
- 2 Intermediate holding station

3.3 Accession location in orchard

Each separate block designations, row numbers and tree numbers within the row for each duplicate tree of each accession, if each tree is not identified with a unique local plant number (see descriptor 3.1.1)

3.3.1 Block designation

3.3.2 Row number

3.3.3 Tree number within the row

3.4 Storage address

Building, room, shelf number(s)/field location where stored/maintained

3.5 Storage date [YYYYMMDD]

3.6 Sowing/planting date [YYYYMMDD]

Specify the date on which sowing/planting was done

3.7 Plants/propagules establishment [%]

3.8 Type of germplasm storage

[MCPD]

If germplasm is maintained under different types of storage, multiple choices are allowed, separated by a semicolon (e.g. 20; 30). (Refer to FAO/IPGRI Genebank Standards 1994 for details on storage type.)

- 10 Seed collection
- 20 Field collection
- 30 *In vitro* collection (slow growth)
- 40 Cryopreserved collection
- 99 Other (Specify in descriptor 3.12 Notes)

3.9 Location of safety duplicates

[MCPD]

Code of the institute where a safety duplicate of the accession is maintained. It follows the Institute code standard.

3.10 *In vitro* conservation**3.10.1 Type of explant**

- 1 Seed
- 2 Zygotic embryo
- 3 Apical or axillary meristem
- 4 Apical or axillary shoot tip
- 5 Somatic embryo
- 6 Callus
- 7 Cell suspension
- 99 Other (specify in descriptor 3.12 Notes)

3.10.2 Date of introduction *in vitro* [YYYYMMDD]**3.10.3 Type of subculture material**

- 1 Seed
- 2 Zygotic embryo
- 3 Apical or axillary meristem
- 4 Apical or axillary shoot tip
- 5 Somatic embryo
- 6 Callus
- 7 Cell suspension
- 99 Other (specify in descriptor 3.12 Notes)

3.10.4 Regeneration process

- 1 Organogenesis
- 2 Somatic embryogenesis
- 99 Other (specify in descriptor 3.12 Notes)

3.10.5 Number of genotypes introduced *in vitro***3.10.6 Number of replicates per genotype****3.10.7 Last subculture date [YYYYMMDD]****3.10.8 Medium used at the last subculture****3.10.9 Number of plants at the last subculture****3.10.10 Location after the last subculture****3.10.11 Next subculture date [YYYYMMDD]**

3.11 Cryopreservation

3.11.1 Type of material for cryopreservation

- 1 Seed
- 2 Zygotic embryo
- 3 Apical or axillary meristem
- 4 Apical or axillary shoot tip
- 5 Somatic embryo
- 6 Callus
- 7 Cell suspension
- 8 Ovule
- 99 Other (specify in descriptor 3.12 Notes)

3.11.2 Introduction date in liquid nitrogen [YYYYMMDD]

3.11.3 Number of samples introduced in liquid nitrogen

3.11.4 End of storage period [YYYYMMDD]

3.11.5 Number of samples taken from liquid nitrogen

3.11.6 Type of subcultured material for recovery

(After liquid nitrogen)

- 1 Seed
- 2 Zygotic embryo
- 3 Apical or axillary meristem
- 4 Apical or axillary shoot tip
- 5 Somatic embryo
- 6 Callus
- 7 Cell suspension
- 8 Ovule
- 99 Other (specify in descriptor 3.12 Notes)

3.11.7 Regeneration process

- 1 Organogenesis
- 2 Somatic embryogenesis
- 99 Other (specify in descriptor 3.12 Notes)

3.11.8 Number of recovered samples

3.11.9 Location after the last subculture

3.12 Notes

Any additional information may be specified here

4. Multiplication/regeneration descriptors

4.1 Accession number [Passport 1.2]

4.2 Population identification [Passport 2.3]
Collecting numbers, pedigree, cultivar name, etc. depending on the population type

4.3 Field plot number

4.4 Multiplication/regeneration site locations

4.5 Collaborator

4.6 Regeneration year [YYYY]
Year (estimated) when tree should be propagated for regeneration

4.7 Propagation method
Method used to produce trees

1	Seed
2	Grafting
3	Layering
4	Cutting
5	Budding
6	Stooling
7	Tissue culture
99	Other (specify in descriptor 4.13 Notes)

4.8 Sowing/grafting/planting date [YYYYMMDD]

4.9 Harvesting date [YYYYMMDD]

4.10 Cultural practices

4.10.1 Planting density
Number of trees established per hectare

4.10.2 Fertilizer application
Specify type, doses, frequency of each and method of application

4.10.3 Irrigation
Specify amount, frequency and method

4.11 Previous multiplication and/or regeneration**4.11.1 Location****4.11.2 Plot number****4.11.3 Sowing/planting date [YYYYMMDD]****4.12 Number of times accession regenerated**

Since the date of acquisition

4.13 Notes

Any additional information may be specified here

ENVIRONMENT AND SITE

5. Characterization and/or evaluation site descriptors

5.1 Country of characterization and/or evaluation

(See instructions in descriptor 2.5 Country of origin)

5.2 Site (Research Institute)

5.2.1 Name and address of farm or institute/station/centre

5.2.2 Latitude

5.2.3 Longitude

5.2.4 Elevation [m asl]

5.2.5 Planting site in the field

Give block, strip and/or row/plot numbers as applicable, plants/plot, replication

5.3 Evaluator's name and address

5.4 Sowing/grafting/budding/layering/stooling date [YYYYMMDD]

5.5 Harvest date [YYYYMMDD]

5.6 Evaluation environment

Environment in which characterization/evaluation was carried out

- 1 On site
- 2 Field genebank
- 3 Screenhouse
- 4 Glasshouse
- 5 Laboratory
- 99 Other (specify in descriptor 5.18 Notes)

5.7 Age of tree [Y]

Record the age of tree at the time of characterization/evaluation.

5.8 Condition/status of tree

Record the condition of the tree at the time of characterization/evaluation

- | | | | |
|---|-------------------------|---|---------------------------|
| 1 | Young – not yet bearing | 5 | Healthy – cropping poorly |
| 2 | Mature – vigorous | 6 | Healthy – cropping well |
| 3 | Mature – non-vigorous | 7 | Old – declining |
| 4 | Mature – diseased | 8 | Dying |

5.9 Seed germination [%]

Specify number of days over which germination is measured

5.10 Grafting/budding/layering/Inarching/stooling success percentage

Specify number of days over which the success is recorded. Indicate the rootstock

5.11 Number of days to planting after grafting/layering [d]**5.12 Field establishment [%]****5.13 Sowing/planting site in the field****5.14 Field spacing****5.14.1 Distance between trees in a row [m]****5.14.2 Distance between rows [m]****5.14.3 Cropping system/pattern**
(See descriptor 2.18.14.1)**5.15 Fertilizer**

Specify types used, doses, frequency of each and method of application

5.16 Plant protection

Specify pesticides used, doses, frequency of each and method of application

5.17 Environmental characteristics of site

Use descriptors 6.1.1 to 6.2 in section 6

5.18 Notes

Any other site-specific information

6. Collecting and/or characterization/evaluation site environment descriptors

6.1 Site environment

6.1.1 Topography

(Adapted from FAO 1990)

This refers to the profile in elevation of the land surface on a broad scale.

1	Flat	0–0.5%
2	Almost flat	0.6–2.9%
3	Gently undulating	3.0–5.9%
4	Undulating	6.0–10.9%
5	Rolling	11.0–15.9%
6	Hilly	16.0–30.0%
7	Steeply dissected	>30%, moderate elevation range
8	Mountainous	>30%, great elevation range (>300 m)
99	Other (specify in the appropriate section's Notes)	

6.1.2 Land element and position

(Adapted from FAO 1990)

Description of the geomorphology of the immediate surroundings of the collecting site (Fig. 1).

1	Plain level	17	Interdunal depression
2	Escarpment	18	Mangrove
3	Interfluvial	19	Upper slope
4	Valley	20	Mid slope
5	Valley floor	21	Lower slope
6	Channel	22	Ridge
7	Levee	23	Beach
8	Terrace	24	Beach ridge
9	Floodplain	25	Rounded summit
10	Lagoon	26	Summit
11	Pan	27	Coral atoll
12	Caldera	28	Drainage line (bottom position in flat or almost-flat terrain)
13	Open depression	29	Coral reef
14	Closed depression	99	Other (specify in appropriate section's Notes)
15	Dune		
16	Longitudinal dune		

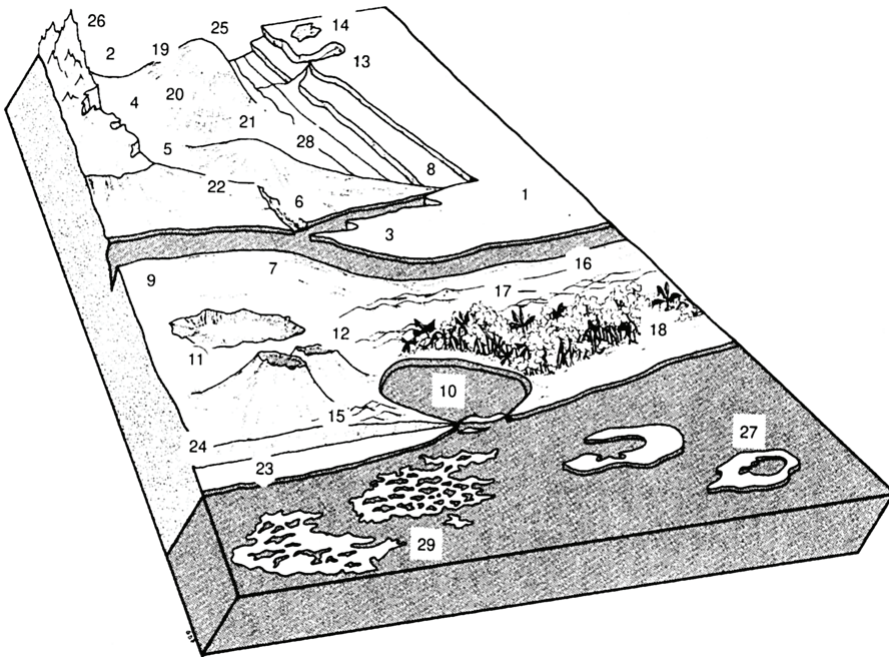


Fig. 1. Land element and position

6.1.3 Slope [°]

Estimated slope of the collecting site in degrees

6.1.4 Slope aspect

The direction that the slope on which the accession was collected faces. Describe the direction with symbols N, S, E, W (e.g. a slope that faces a south-western direction has an aspect of SW)

6.1.5 Overall vegetation surrounding the collecting site

(Adapted from FAO 1990)

- 1 Herbaceous
 - 1.1 Grassland
 - 1.2 Forbland
- 2 Closed forest (continuous tree layer, crowns overlapping, large number of tree and shrub species in distinct layers)
- 3 Woodland (continuous tree layer, crowns usually not touching, understorey may be present)
- 4 Shrub
- 5 Dwarf shrub
- 99 Other (specify in appropriate section's **Notes**)

6.1.6 Stoniness/rockiness/hardpan/cementation

- 1 Tillage unaffected
- 2 Tillage affected
- 3 Tillage difficult
- 4 Tillage impossible
- 5 Essentially paved

6.1.7 Soil drainage

(Adapted from FAO 1990)

- 3 Poorly drained
- 5 Moderately drained
- 7 Well drained

6.1.8 Soil salinity (dissolved salts)

- 1 <160 ppm
- 2 161–240 ppm
- 3 241–480 ppm
- 4 481–800 ppm
- 5 >800 ppm

6.1.9 Groundwater quality

- 1 Saline
- 2 Brackish
- 3 Fresh
- 4 Polluted
- 5 Oxygenated
- 6 Stagnating

6.1.10 Soil depth to groundwater table

(Adapted from FAO 1990)

The depth to the groundwater table, if present, as well as an estimate of the approximate annual fluctuation, should be given. The maximum rise of the groundwater table can be inferred approximately from changes in profile colour in many, but not all, soils

- 1 0–25 cm
- 2 25.1–50 cm
- 3 50.1–100 cm
- 4 100.1–150 cm
- 5 >150 cm

6.1.11 Soil moisture

(Adapted from FAO 1990)

Moisture conditions prevailing in the soil at the time of collecting should be given together with the depth. Attention should be paid to unusual moisture conditions caused by unseasonal weather, prolonged exposure of the profile, flooding, etc.

- | | |
|---|----------------|
| 3 | Dry |
| 5 | Slightly moist |
| 7 | Moist |
| 9 | Wet |

6.1.12 Soil matrix colour

(Adapted from FAO 1990)

The colour of the soil matrix material in the root zone around the accession is recorded in the moist condition (or both dry and moist condition, if possible) using the notation for hue, value and chroma as given in the Munsell Soil Color Charts (Munsell Color 1975). If there is no dominant soil matrix colour, the horizon is described as mottled and two or more colours are given and should be registered under uniform conditions. Early morning and late evening readings are not accurate. Provide depth of measurement [cm]. If colour chart is not available, the following states may be used:

- | | | | |
|---|-----------------|----|-----------------|
| 1 | White | 9 | Yellow |
| 2 | Red | 10 | Reddish yellow |
| 3 | Reddish | 11 | Greenish, green |
| 4 | Yellowish red | 12 | Grey |
| 5 | Brown | 13 | Greyish |
| 6 | Brownish | 14 | Blue |
| 7 | Reddish brown | 15 | Bluish black |
| 8 | Yellowish brown | 16 | Black |

6.1.13 Soil organic matter content

- | | |
|---|---|
| 1 | Nil (as in arid zones) |
| 3 | Low (as in long-term cultivation in a tropical setting) |
| 5 | Medium (as in recently cultivated but not yet much depleted) |
| 7 | High (as in never cultivated, and in recently cleared forest) |
| 9 | Peaty |

6.1.14 Soil pH

Actual pH value of the soil at appropriate root depth around the accession.

6.1.14.1 Root depth [cm]

Indicate the root depth at which the soil pH is measured

6.1.15 Soil erosion

- 3 Low
- 5 Intermediate
- 7 High

6.1.16 Soil texture classes

(Adapted from FAO 1990)

For convenience in determining the texture classes of the following list, particle size classes are given for each of the fine earth fraction listed below (Fig. 2).

- | | |
|--------------------|-------------------------|
| 1 Clay | 12 Coarse sandy loam |
| 2 Loam | 13 Loamy sand |
| 3 Clay loam | 14 Loamy very fine sand |
| 4 Silt | 15 Loamy fine sand |
| 5 Silt clay | 16 Loamy coarse sand |
| 6 Silt clay loam | 17 Very fine sand |
| 7 Silt loam | 18 Fine sand |
| 8 Sandy clay | 19 Medium sand |
| 9 Sandy clay loam | 20 Coarse sand |
| 10 Sandy loam | 21 Sand, unsorted |
| 11 Fine sandy loam | 22 Sand, unspecified |

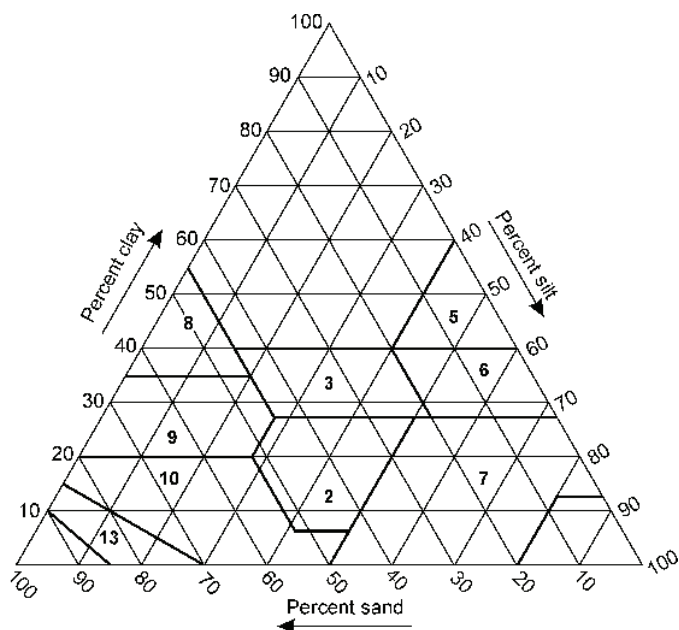


Fig. 2. Soil texture classes

6.1.17 Soil particle size classes

(Adapted from FAO 1990)

1	Clay	< 2 μm
2	Fine silt	3–20 μm
3	Coarse silt	21–63 μm
4	Very fine sand	64–125 μm
5	Fine sand	126–200 μm
6	Medium sand	201–630 μm
7	Coarse sand	631–1250 μm
8	Very coarse sand	1251–2000 μm

6.1.18 Water availability

- 1 Rainfed
- 2 Irrigated
- 3 Flooded
- 4 River banks
- 5 Sea coast
- 99 Other (specify in appropriate section's **Notes**)

6.1.19 Soil fertility

General assessment of the soil fertility based on existing vegetation

- 3 Low
- 5 Moderate
- 7 High

6.1.20 Climate of the site

Should be assessed as close to the site as possible (state number of recorded years)

6.1.20.1 Temperature [$^{\circ}\text{C}$]

Provide either the monthly or the annual mean

6.1.20.2 Rainfall [mm]

Provide either the monthly or the annual mean (state number of recorded years)

6.1.20.3 Wind

Annual average (state number of years recorded)

6.1.20.3.1 Frequency of typhoons or hurricane force winds

- 3 Low
- 5 Intermediate
- 7 High

6.1.20.3.2 Date of most recent typhoons or hurricane force winds [YYYYMMDD]

6.1.20.3.3 Annual maximum wind velocity [m/s]

6.1.20.4 Frost

6.1.20.4.1 Date of most recent frost [YYYYMMDD]

6.1.20.4.2 Minimum temperature [°C]

Specify seasonal average and minimum survival temperature

6.1.20.4.3 Duration of temperature below 0°C [d]

6.1.20.5 Relative humidity

6.1.20.5.1 Relative humidity diurnal range [%]

6.1.20.5.2 Relative humidity seasonal range [%]

6.1.20.6 Light

1 Shady

2 Sunny

6.1.20.7 Day length [h]

Provide either the monthly (mean, maximum, minimum) or the seasonal (mean, maximum, minimum)

6.2 Notes

Indicate here any other site and environment-specific information

CHARACTERIZATION

7. Plant descriptors

Average of at least two 'on-years' (production years) data recorded on ten trees, unless otherwise stated. For all colour descriptors, it is recommended to use the Royal Horticultural Society (RHS) Colour Chart codes, if available .

List of minimum discriminating descriptors for Durian

Bioversity Descriptor number	Name
7.1.12	Tree growth habit
7.2.1	Leaf upper surface colour
7.2.2	Leaf lower surface colour
7.2.5	Leaf attitude
7.2.11	Leaf blade shape
7.2.12	Leaf apex shape
7.2.13	Leaf base shape
7.2.16	Leaf upper surface glossiness
7.3.6	Flower bud shape
7.3.8	Calyx shape
7.3.9	Calyx tooth apex shape
7.3.16	Petal shape
7.3.24	Style shape
7.3.26	Stigma shape
7.4.10	Fruit shape
7.4.11	Shape of fruit apex
7.4.12	Shape of fruit base
7.4.14	Fruit stalk length
7.4.17	Fruit spininess
7.4.18	Fruit spine shape
7.4.20	Spine density
7.4.30	Aril texture
7.4.36	Flesh colour
7.4.38	Number of carpels per fruit
7.5.9	Seed shape
7.5.10	Seed coat colour

7.1 Growth descriptors**7.1.1 Tree age [y]****7.1.2 Tree type**

- 1 Seedling/seeding
- 2 Grafted/rootstock type
- 3 Clonal

7.1.3 Tree vigour

- 3 Low
- 5 Medium
- 7 High

7.1.4 Tree height [m]

From ground level to the top of the tree (if grafted, record also height of graft union and rootstock name). Evaluate only unpruned trees

7.1.5 Trunk height [m]

Record from the base of the tree to the point of emergence of first branch.

7.1.6 Trunk circumference [cm]

Recorded at 50 cm above ground level for trees raised through seeding/seedling/air layering and at 10 cm above grafting point for trees raised through grafting

7.1.7 Trunk surface

- 1 Smooth
- 2 Rough
- 3 Very rough
- 4 Flaky

7.1.8 Trunk growth habit

- 1 Straight
- 2 Twisted

7.1.9 Buttress root

- 0 Absent
- 1 Present

7.1.10 Crown diameter [m]

Measured as the mean diameter using two directions (North-South and East-West)

7.1.11 Crown shape

(See Fig. 3)

- 1 Pyramidal
- 2 Oblong
- 3 Spherical
- 4 Semi-circular
- 5 Elliptical
- 6 Irregular
- 99 Other (specify in descriptor 7.6 Notes)

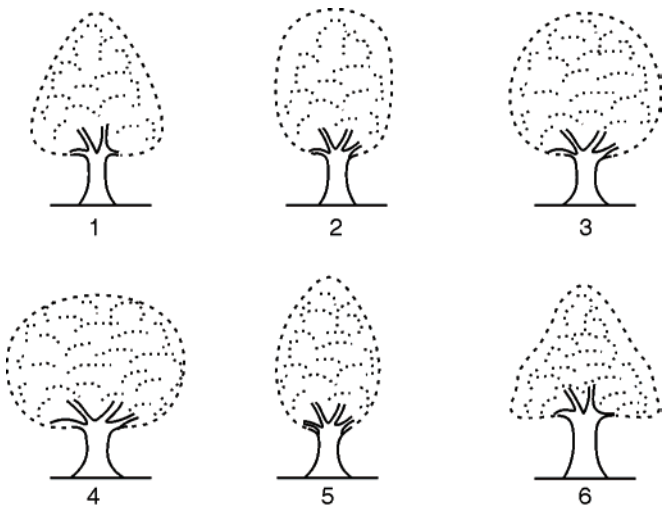


Fig. 3. Crown shape

7.1.12 Tree growth habit

(See Fig. 4)

- 1 Erect
- 2 Intermediate
- 3 Spreading
- 99 Other (specify in descriptor 7.6 Notes)

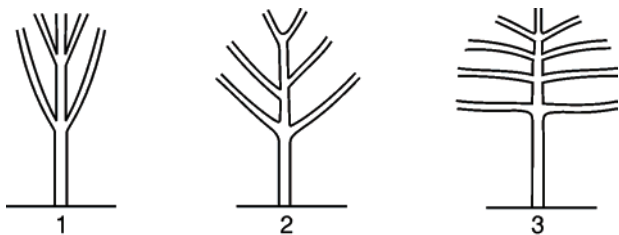


Fig. 4. Tree growth habit

7.1.13 Branching density

- 3 Sparse
- 5 Medium
- 7 Dense

7.1.14 Young shoot pubescence

- 1 Glabrous
- 2 Pubescent

7.1.15 Bark colour

- 1 Grey
- 2 Brown
- 3 Dark brown
- 99 Other (specify in descriptor 7.6 Notes)

7.2 Leaf descriptors

Average of 10 fully expanded representative healthy leaves, collected from the middle of the shoot from three trees when shoots are lignified. For qualitative characteristics, indicate the predominant one (use the first pair of leaflets from terminal leaflet).

7.2.1 Leaf upper surface colour

Evaluated at mature stage

- 1 Light green
- 2 Green
- 3 Dark green
- 4 Brownish green
- 99 Other (specify in descriptor 7.6 Notes)

7.2.2 Leaf lower surface colour

Evaluated at mature stage

- 1 Silvery brown
- 2 Coppery brown
- 99 Other (specify in descriptor 7.6 Notes)

7.2.3 Leaf density

- 3 Sparse
- 5 Medium
- 7 Dense

7.2.4 Arrangement of leaves

- 1 Alternate
- 2 Opposite

7.2.5 Leaf attitude

(See Fig. 5)

- 1 Semi-erect
- 2 Drooping at 45°
- 3 Drooping vertically

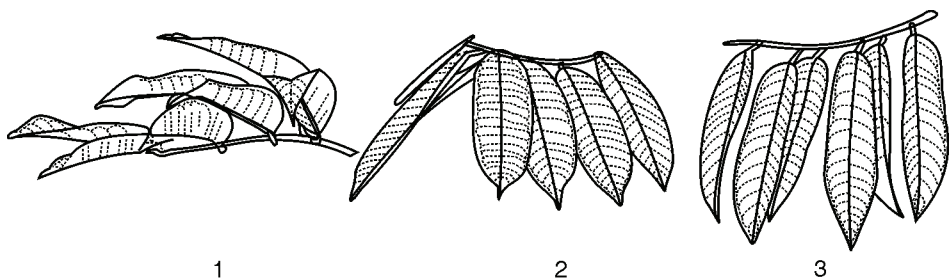


Fig. 5. Leaf attitude

7.2.6 Petiole length [mm]

Measured from the rachis to the base of the leaf blade

7.2.7 Petiole width [mm]

Measured at the widest point

7.2.8 Petiole condition

- 1 Normal
- 2 Swollen

7.2.9 Leaf blade length

Measured from the base to the tip of the leaf blade

- 1 Short (< 10.0 cm)
- 2 Intermediate (10.1–15.0 cm)
- 3 Long (15.1–25.0 cm)
- 4 Very long (> 25.0 cm)

7.2.10 Leaf blade width

Measured at the widest point

- 1 Narrow (< 3.0 cm)
- 2 Intermediate (3.1–6.0 cm)
- 3 Wide (6.1–9.0 cm)
- 4 Very wide (> 9.0 cm)

7.2.11 Leaf blade shape

(See Fig. 6)

- 1 Obovate-lanceolate
- 2 Oblong
- 3 Linear-oblong
- 4 Elliptic
- 5 Ovate
- 6 Obovate
- 99 Other (specify in descriptor 7.6 Notes)

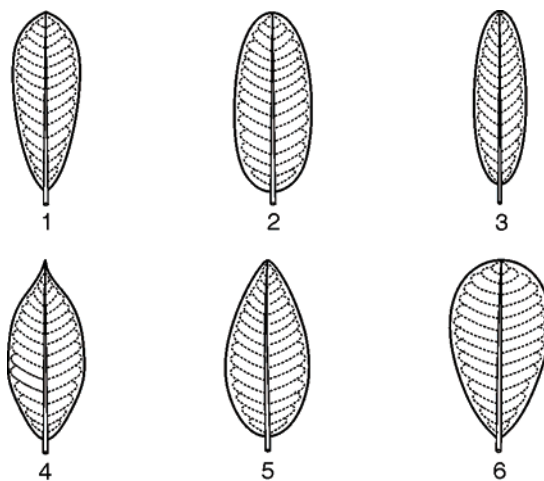


Fig. 6. Leaf blade shape

7.2.12 Leaf apex shape

(See Fig. 7)

- 1 Acute
- 2 Acuminate
- 3 Long acuminate
- 4 Caudate
- 5 Cuspidate
- 99 Other (specify in descriptor 7.6 Notes)

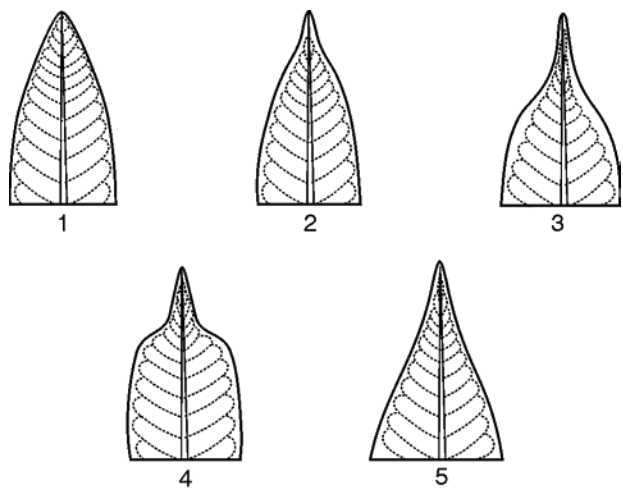


Fig. 7. Leaf apex shape

7.2.13 Leaf base shape
(See Fig. 8)

- 1 Round
- 2 Obtuse
- 3 Acute
- 4 Cuneate
- 5 Cordate
- 99 Other (specify in descriptor 7.6 Notes)

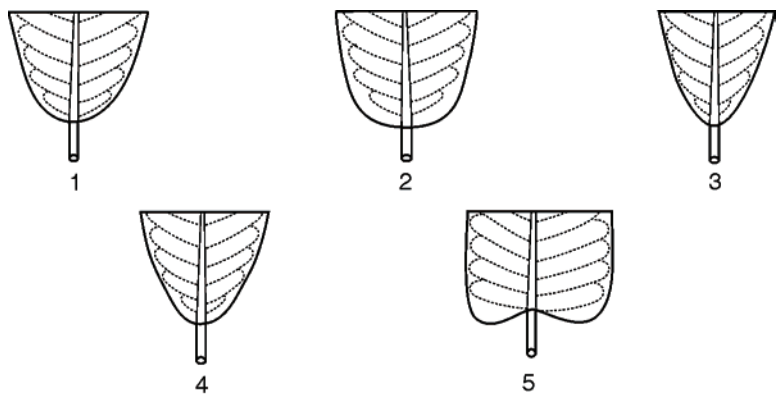


Fig. 8. Leaf base shape

7.2.14 Leaf blade margin

(See Fig. 9)

- 1 Entire
- 2 Undulate



Fig. 9. Leaf blade margin

7.2.15 Leaf texture

- 1 Papery
- 2 Leathery
- 3 Very leathery

7.2.16 Leaf upper surface glossiness

- 0 Not glossy
- 1 Glossy

7.2.17 Leaf lower surface glossiness

- 0 Not glossy
- 1 Glossy

7.2.18 Leaf midrib appearance

- 0 Not prominent
- 1 Slightly prominent
- 2 Prominent

7.2.19 Waxiness on adaxial leaf surface

- 1 Matt
- 2 Shiny

7.3 Inflorescence/flower descriptors

Average of at least two 'on year' data. Recorded at bloom period.

7.3.1 Position of inflorescence

- 1 Terminal
- 2 Axillary
- 3 On branches
- 4 On trunk
- 99 Other (specify in descriptor 7.6 Notes)

7.3.2 Flowering regularity

- 1 Regular (one or two regular seasons/year)
- 2 Irregular (occasional year round)

7.3.3 Duration of flowering [d]

Number of days recorded from first flower opening to the last flower opening

7.3.4 Flower clustering habit

- 1 One flower per cluster
- 2 Combination of 1 and 2 flowers per cluster
- 3 Combination of 1, 2, 3 or more flowers per cluster
- 99 Other (specify in descriptor 7.6 Notes)

7.3.5 Density of flowers

- 3 Sparse
- 5 Intermediate
- 7 Dense

7.3.6 Flower bud shape

(See Fig. 10)

- 1 Globose
- 2 Ovoid
- 3 Oblong
- 4 Ellipsoid
- 99 Other (specify in descriptor 7.6 Notes)

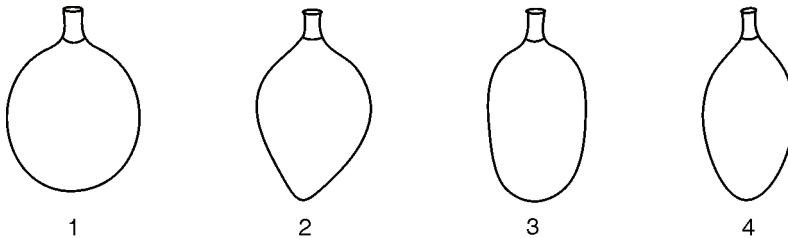


Fig. 10. Flower bud shape

7.3.6.1 Flower bud apex shape

- 1 Rounded
- 2 Acute

7.3.7 Apical bud colour

- 1 Brown
- 2 Greenish

7.3.8 Calyx shape

(See Fig. 11)

- 1 Ovate
- 2 Ellipsoid
- 3 Campanulate

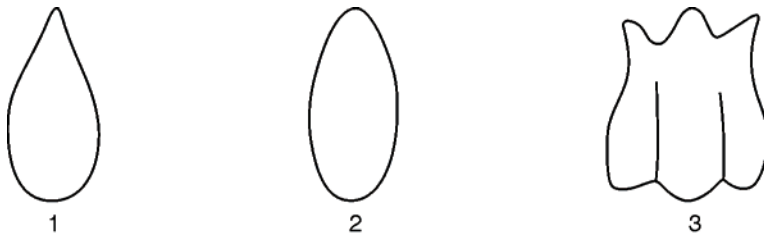


Fig. 11. Calyx shape

7.3.9 Calyx tooth apex shape

(See Fig. 12)

- 1 Round
- 2 Pointed
- 3 Triangular

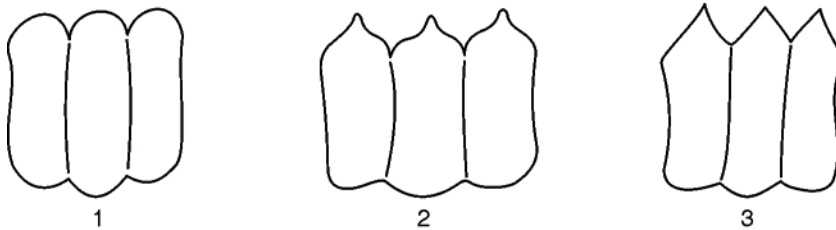


Fig. 12. Calyx tooth apex shape

7.3.10 Number of sepals

7.3.11 Sepal colour

- 1 Light yellow
- 2 Yellow
- 3 Yellow green
- 4 Green
- 5 Yellow with red margin
- 99 Other (Specify in descriptor 7.6 Notes)

7.3.12 Flower size

Based on the average equatorial diameter of 10 flowers one day before anthesis

- | | | |
|---|--------|----------------|
| 1 | Small | (< 15.0 mm) |
| 2 | Medium | (15.1–20.0 mm) |
| 3 | Large | (< 20.0 mm) |

7.3.13 Pedicel length [cm]

Measured from the branch to the base of flower

7.3.14 Number of petals**7.3.15 Petal colour**

- | | |
|----|---|
| 1 | White |
| 2 | Cream |
| 3 | Yellow green |
| 4 | Yellow |
| 5 | Pink |
| 6 | Red |
| 99 | Other (Specify in descriptor 7.6 Notes) |

7.3.15.1 Petal colour intensity

- | | |
|---|-------|
| 1 | Light |
| 2 | Dark |

7.3.15.2 Petal margin colour

- | | |
|---|-------|
| 1 | Red |
| 2 | Pink |
| 3 | Green |

7.3.16 Petal shape

(See Fig. 13)

- | | |
|----|--------------------------------------|
| 1 | Linear |
| 2 | Narrow spatulate |
| 3 | Spatulate |
| 4 | Broad spatulate |
| 5 | Oblong |
| 99 | Other (specify descriptor 7.6 Notes) |

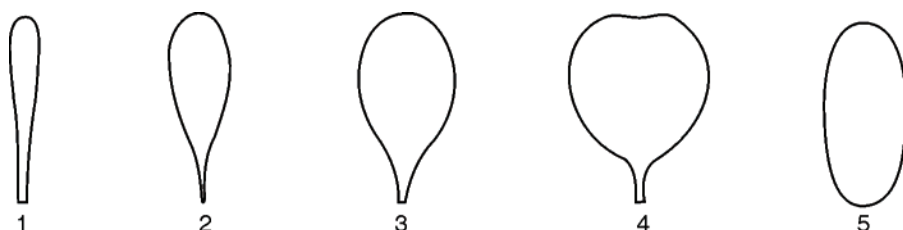


Fig. 13. Petal shape

7.3.17 Inner surface hairiness of petal

- 1 Glabrous
- 2 Sparsely hairy
- 3 Densely hairy

7.3.18 Outer surface hairiness of petal

- 1 Glabrous
- 2 Sparsely hairy
- 3 Densely hairy

7.3.19 Type of stamen

- 1 Free
- 2 Phalanx
- 3 Tubular

7.3.20 Stamen exsertion relative to stigma

- 3 Short
- 5 Medium
- 7 Long

7.3.21 Anther shape

- 1 Round
- 2 Discoid
- 3 Reniform

7.3.22 Anther dehiscence

- 1 Apical
- 2 Longitudinal
- 3 Circumventral

7.3.23 Style length [cm]

Average of 10 styles

7.3.24 Style shape

(See Fig. 14)

- 1 Straight
- 2 Curved
- 3 Wavy
- 4 Straight and hooked

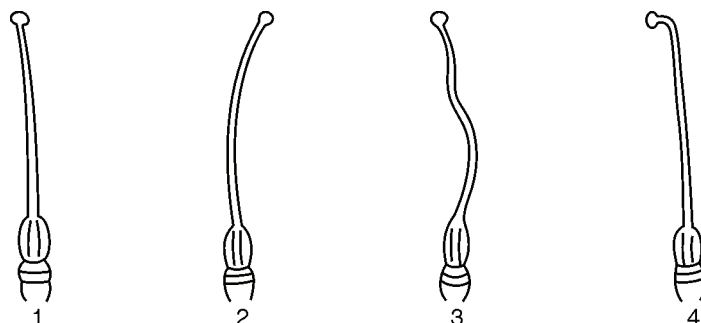


Fig. 14. Style shape

7.3.25 Hairiness on style

- 1 Distal
- 2 Basal
- 3 Distal and basal
- 4 Upper half
- 5 Throughout

7.3.26 Stigma shape

(See Fig. 15)

- 1 Turbinate
- 2 Capitate, not lobed
- 3 Capitate, 5-lobed

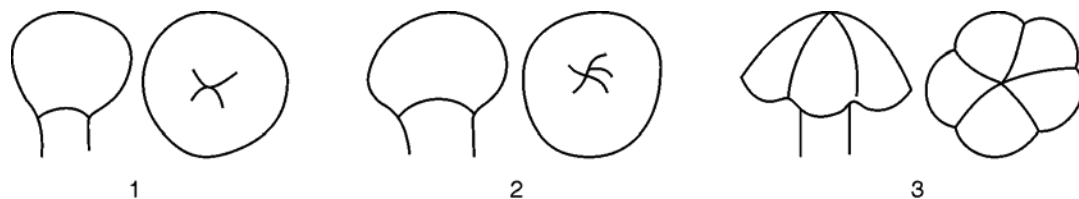


Fig. 15. Stigma shape

7.3.27 Stigma colour

- 1 Yellow
- 2 Orange
- 99 Other (specify in descriptor 7.6 Notes)

7.3.27.1 Stigma colour intensity

- 1 Light
- 2 Dark

7.3.28 Upper surface of stigma

(See Fig. 16)

- 1 Smooth
- 2 Grooved

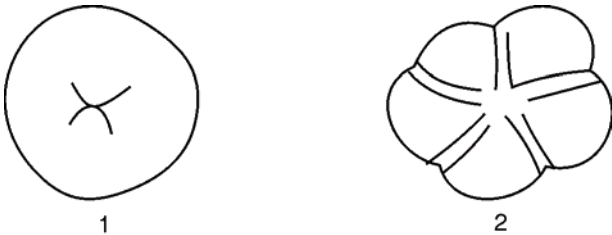


Fig. 16. Upper surface of stigma

7.4 Fruit descriptors

Recorded on 10 well developed fruits at harvest time, unless otherwise specified

7.4.1 Number of years to first fruiting after sowing/planting [y]

7.4.2 Number of days from fruit set to fruit maturity [d]

7.4.3 Date of fruit setting [YYYYMMDD]

7.4.4 Date of harvesting [YYYYMMDD]

7.4.5 Fruit maturity

7.4.5.1 Start of fruit maturity [YYYYMMDD]

7.4.5.2 End of fruit maturity [YYYYMMDD]

7.4.6 Fruit ripening

- 1 Synchronous
- 2 Non-synchronous

7.4.7 Fruit dehiscence

- 0 No
- 1 Yes

7.4.8 Fruit bearing habit

- 1 Annual (regular)
- 2 Biennial (alternate years)
- 3 Irregular
- 99 Other (specify in descriptor 7.6 Notes)

7.4.9 Fruit clustering habit

Specify number of trees evaluated per accession

- 1 One fruit per cluster
- 2 Two fruits per cluster
- 3 Combination of 1, 2, 3, 4 up to 12 fruits per cluster
- 99 Other (specify in descriptor 7.6 Notes)

7.4.10 Fruit shape

Indicate the number of well developed fruits evaluated.

(See Fig. 17)

- 1 Oblate
- 2 Globose
- 3 Oval
- 4 Oblong
- 5 Elliptic
- 6 Obovoid
- 7 Ovoid
- 99 Other (specify in descriptor 7.6 Notes)

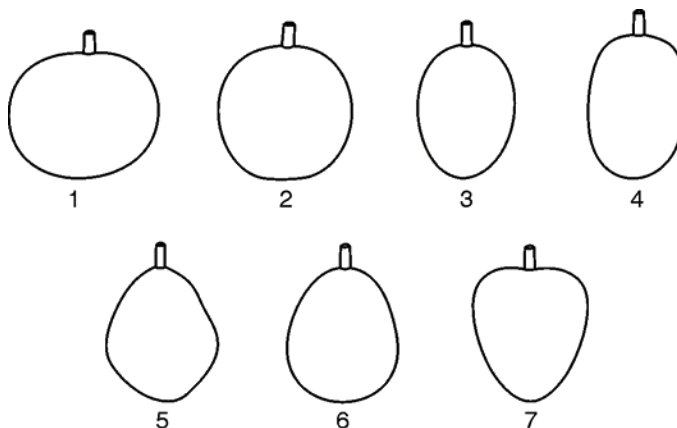


Fig. 17. Fruit shape

7.4.11 Shape of fruit apex

Recorded at maturity

(See Fig. 18)

- 1 Pointed
- 2 Convex
- 3 Mammiform
- 4 Truncate
- 5 Depressed
- 99 Other (specify in descriptor 7.6 Notes)

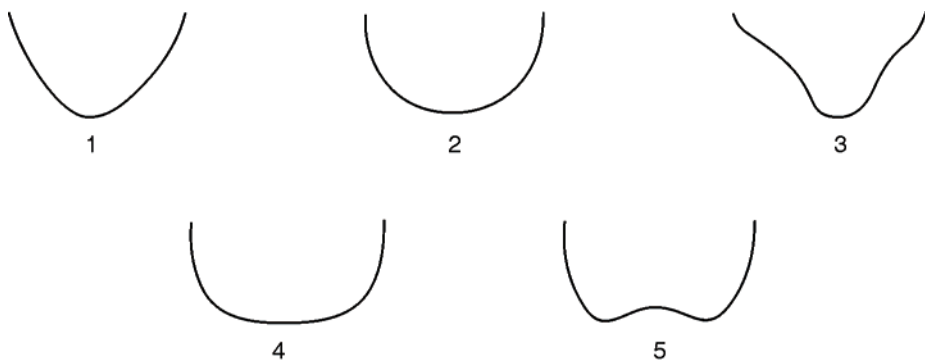


Fig. 18. Shape of fruit apex

7.4.12 Shape of fruit base

The shape of fruit base recorded at maturity

(See Fig. 19)

- 1 Depressed
- 2 Necked
- 3 Convex
- 4 Truncate
- 5 Concave
- 6 Acute
- 99 Other (specify in descriptor 7.6 Notes)

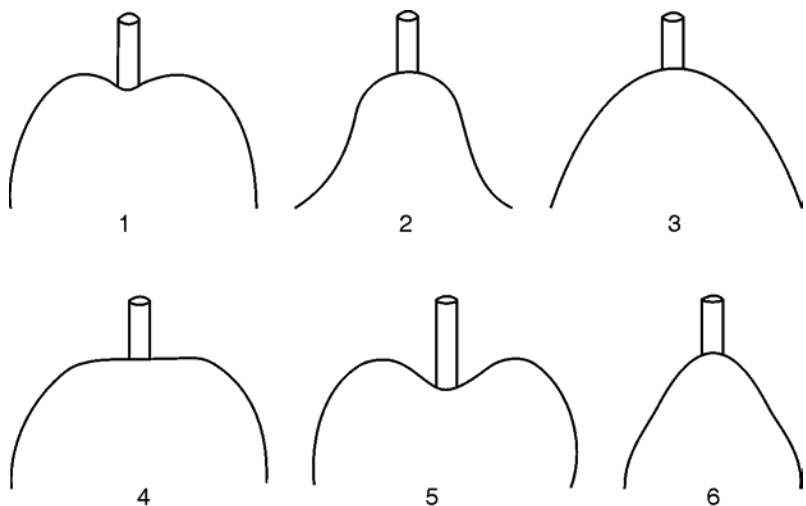


Fig. 19. Shape of fruit base

7.4.13 Blossom end

No-spine area in fruit apex

- 1 Small
- 2 Large

7.4.14 Fruit stalk length

Measured from the base of the pedicel to the base of fruit at maturity

- 1 Short (< 4.0 cm)
- 2 Medium (4.1–8.0 cm)
- 3 Long (> 8.0 cm)

7.4.15 Fruit stalk attachment

- 1 Weak
- 2 Strong

7.4.16 Fruit stalk colour

- 1 Green
- 2 Greenish brown
- 3 Brown
- 99 Other (specify in descriptor 7.6 Notes)

7.4.17 Fruit spininess

- 0 Spineless
- 1 Spiny

7.4.18 Fruit spine shape

Recorded at maturity

(See Fig. 20)

- 1 Hooked
- 2 Convex
- 3 Pointed-convex
- 4 Concave
- 5 Pointed-concave
- 6 Conical
- 7 Pyramidal
- 99 Other (specify in descriptor 7.6 Notes)

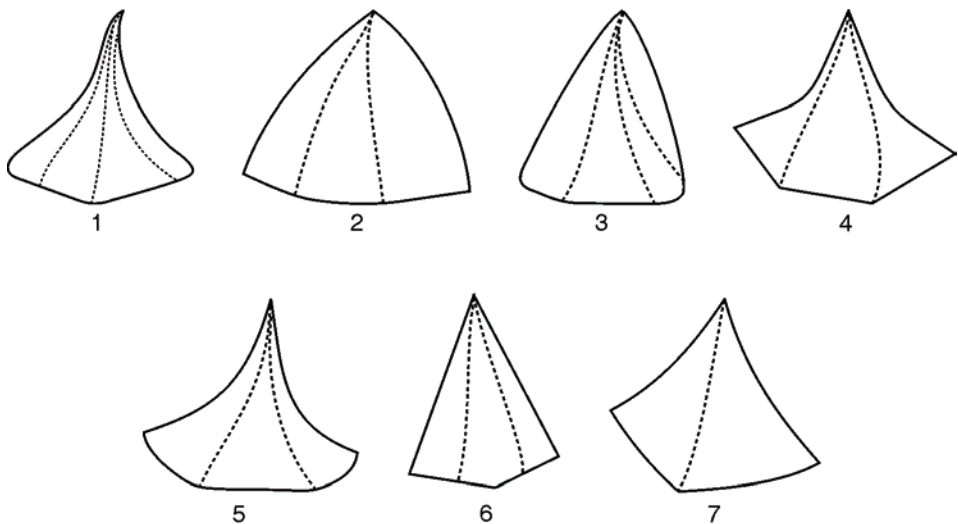


Fig. 20. Fruit spine shape

7.4.19 Surface of spine

- 1 Glabrous
- 2 Densely scaly

7.4.20 Fruit spine density

- 3 Sparse
- 5 Intermediate
- 7 Dense

7.4.21 Fruit spine length

- 1 Short (<1.0 cm)
- 2 Intermediate (1.1–1.5 cm)
- 3 Long (>1.5 cm)

7.4.22 Fruit length [cm]

Average of 10 representative and healthy fruits; measured from base to the tip of fruit

7.4.23 Fruit diameter [cm]

Measured at the widest point. Average of 10 fruits

7.4.24 Fruit weight

Average weight of 10 representative and healthy fruits

1	Very light	(< 0.8 kg)
2	Light	(0.9–1.5 kg)
2	Medium	(1.6–2.5 kg)
3	Heavy	(2.6–4.0 kg)
5	Very heavy	(> 4.0 kg)

7.4.25 Fruit rind thickness

3	Thin
5	Medium
7	Thick
9	Very thick

7.4.26 Number of fruit segments/locules

Average of 10 representative and healthy fruits

7.4.27 Fruit skin/rind colour

Recorded at maturity.

1	Green
2	Brownish green
3	Yellowish green
4	Greenish yellow
5	Yellow
6	Orange yellow
7	Orange
8	Pink
9	Red
99	Other (specify in descriptor 7.6 Notes)

7.4.27.1 Fruit skin/rind colour intensity

1	Light
2	Dark

7.4.28 Shelf life [d]

Number of days fruit remains in good condition under storage at room temperature

7.4.29 Aril thickness

Measured at the widest point

- | | | |
|---|--------|--------------|
| 1 | Thin | (< 0.5 cm) |
| 2 | Medium | (0.6–2.0 cm) |
| 3 | Thick | (> 2.0 cm) |

7.4.30 Aril texture

Recorded on fully ripe fruits

- | | |
|---|--------------|
| 1 | Soft |
| 2 | Intermediate |
| 3 | Firm |

7.4.31 Aril juiciness

- | | |
|---|-----------|
| 1 | Juicy |
| 2 | Non-juicy |

7.4.32 Presence of fibre

- | | |
|---|--------|
| 0 | Absent |
| 3 | Low |
| 5 | Medium |
| 7 | High |

7.4.33 Flesh creaminess

- | | |
|---|--------------|
| 1 | Poor |
| 2 | Fair |
| 3 | Intermediate |
| 4 | Strong |

7.4.34 Flesh taste

- | | |
|----|---|
| 1 | Slightly sweet |
| 2 | Sweet |
| 3 | Bitter sweet |
| 4 | Bland |
| 5 | Sweet with bitter after-taste |
| 99 | Other (specify in descriptor 7.6 Notes) |

7.4.35 Flesh aroma

- | | |
|---|----------|
| 1 | Mild |
| 2 | Moderate |
| 3 | Strong |

7.4.36 Flesh colour

- 1 Creamy white
- 2 Lemon Yellow
- 3 Yellow
- 4 Yellowish orange
- 5 Orange
- 6 Reddish orange
- 7 Scarlet/red
- 8 Pink
- 99 Other (specify in descriptor 7.6 Notes)

7.4.36.1 Flesh colour intensity

- 1 Light
- 2 Dark

7.4.37 Number of rows of pulp units per locule

- 1 Single row
- 2 Double row

7.4.38 Number of carpels per fruit

- 1 Three
- 2 Four
- 3 Five
- 4 Six
- 99 Other (specify in descriptor 7.6 Notes)

7.4.39 Edible flesh content [% FW recovery]

Ratio of pulp to fruit weight (fresh weight basis)

7.4.40 Persistence of calyx

- 0 No
- 1 Yes

7.4.41 Persistence of stamen

- 0 No
- 1 Yes

7.4.42 Easiness of splitting

- 1 Easy
- 2 Intermediate
- 3 Difficult

7.4.43 Flesh stickiness

Stickiness of flesh to finger

- 0 No stickiness
- 1 Slightly sticky
- 2 Intermediate
- 3 Strongly sticky

7.5 Seed descriptors

Recorded on 10 healthy representative seeds

7.5.1 Seed length [cm]

7.5.2 Seed width [cm]

Recorded at the widest point

7.5.3 Seed thickness [cm]

7.5.4 Number of mature seeds per fruit

Average of 10 representative and healthy fruits

- 1 Few (< 10)
- 2 Intermediate (11–20)
- 3 Many (> 20)

7.5.5 Number of immature seeds per fruit

Average of 10 representative and healthy fruits

7.5.6 Number of aborted seeds per fruit

Average of 10 representative and healthy fruits

7.5.7 Seeds per carpel

Average of 10 representative and healthy fruits

- 1 Few (< 3)
- 2 Intermediate (4–6)
- 3 Many (> 6)

7.5.8 Seed weight [g]

7.5.9 Seed shape

(See Fig. 21)

- 1 Spheroid
- 2 Ellipsoid
- 3 Oblong
- 4 Ovoid
- 5 Obovoid
- 99 Other (specify in descriptor **7.6 Notes**)

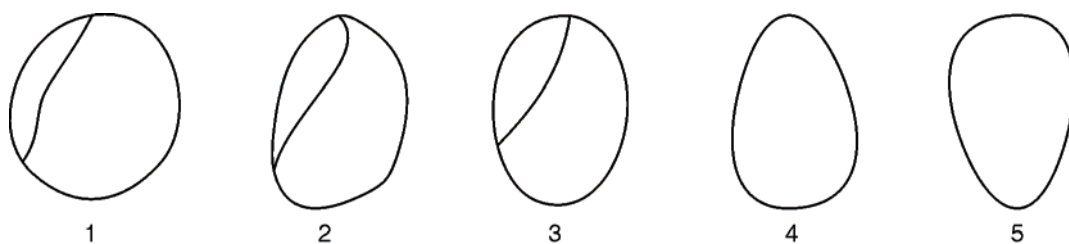


Fig. 21. Seed shape

7.5.10 Seed coat colour

- 1 Yellow-brown
- 2 Brown
- 3 Black
- 4 Grey orange
- 99 Other (specify in descriptor 7.6 Notes)

7.5.11.1 Seed coat colour intensity

- 1 Light
- 2 Dark

7.6 Notes

Any additional information may be specified here

EVALUATION

8. Plant descriptors

8.1 Growth

8.1.1 Tree height [m]

Recorded from the ground level to the highest point of canopy

8.1.2 Flowering precocity [y]

Specify number of years from budding/layering/grafting/seed sowing to first flower (i.e. 4 B/L/G/S indicates first flower produced four years after field establishment from the date of budding/layering/grafting/seed sowing, respectively)

8.1.3 Date of first flowering [YYYYMMDD]

8.1.4 Date of last flowering [YYYYMMDD]

8.1.5 Flowering density

- 3 Sparse
- 5 Intermediate
- 7 Profuse

8.2 Fruit

8.2.1 Yield per tree [kg/year]

Average of five trees per accession

8.2.2 Number of fruits per tree

Average of five trees per accession

8.2.3 Fruit availability [d]

Number of days from the first to the last harvest date

8.2.4 Fruiting season

- 1 Early (< 120 days after flower opening)
- 2 Medium (121–135 days after flower opening)
- 3 Late (> 135 days after flower opening)

8.2.5 Fruit bearing intensity

Recorded for at least 3 fruiting seasons

3	Poor	(< 25 fruits/tree)
5	Medium	(25–80 fruits/tree)
7	High	(>80 fruits/tree)

8.2.6 Fruit storage life [d]

Number of days of storage of ripe fruits under ambient conditions after harvest

8.2.7 Fruit productivity [kg/m²]

Average of 5 trees per accession. Yield relative to tree canopy size calculated from length and width

8.3 Aril**8.3.1 Aril nutritive value**

Recorded on fully ripe fruits

8.3.1.1 Total sugars [%]**8.3.1.2 Total starch [%]****8.3.1.3 Total soluble solids [°Brix]**

1	Low	(< 15.0)
2	Intermediate	(15.1–20.0)
3	High	(> 20.0)

8.3.1.4 Vitamin A [mg/100 g pulp]**8.3.1.5 Vitamin C [mg/100 g pulp]****8.3.1.6 Acidity [%]****8.3.1.7 Ascorbic acid [mg/100g]****8.3.2 Aril weight**

Recorded as percentage of fruit weight

1	Low	(< 20.0 %)
2	Medium	(21.0–30.0 %)
3	High	(> 30.0 %)

8.4 Notes

Specify here any other additional information

9. Abiotic stress susceptibility

Scored under artificial and/or natural conditions, which should be clearly specified. These are coded on a susceptibility scale from 1 to 9, viz.:

- 1 Very low or no sign of susceptibility
- 3 Low
- 5 Intermediate
- 7 High
- 9 Very high

9.1 Reaction to higher temperature**9.2 Reaction to lower temperature****9.3 Reaction to salinity**

- 1 Soil salinity
- 2 Water salinity

9.4 Reaction to mineral toxicity

- 1 Boron
- 2 Zinc
- 3 Chloride
- 4 Copper
- 5 Calcium
- 6 Iron
- 99 Other (specify in descriptor 9.10 Notes)

9.5 Reaction to mineral deficiency

- 1 Nitrogen
- 2 Phosphorus
- 3 Potassium
- 4 Boron
- 5 Copper
- 6 Molybdenum

9.6 Reaction to water logging**9.7 Reaction to drought****9.8 Reaction to wind****9.9 Observation on gamboges (physiological disorder)**

Heavy and compact soil (lack of aeration)

9.10 Notes

Specify here any additional information

10. Biotic stress susceptibility

In each case, it is important to state the origin of the infestation or infection, i.e. natural, field inoculation, and laboratory. Also specify the causal organism and the corresponding symptoms. Record such information in descriptor 10.4 Notes. These are coded on a susceptibility scale from 1 to 9, viz.:

- 1 Very low or no visible sign of susceptibility
- 3 Low
- 5 Intermediate
- 7 High
- 9 Very high

10.1 Pests

Causal organism

10.1.1 *Allocaridara malayensis*

10.1.2 *Aphis gossypii*

10.1.3 *Aprosterna pallida*

10.1.4 *Archips machlopiis*

10.1.5 *Coccus* sp.

10.1.6 *Conogethes punctiferalis*

10.1.7 *Heliothis armigera*

10.1.8 *Homona eductana*

10.1.9 *Hypomeces squamosus*

10.1.10 *Mudaria magniplaga*

Mudaria luteileprosa

10.1.11 *Orgyia turbatar*

10.1.12 *Pseudococcus* sp.

10.1.13 *Saissetia* sp.

10.1.14 *Scirtothrips dorsalis*

10.1.15 *Thrips hawaiiensis*

10.1.16 *Tirathaba ruptilinea*

10.1.17 *Toxoptera ruptilinea*

10.1.18 *Toxoptera aurantii*

10.1.19 *Xyleborus fornicatus*

Common name

Durian psyllid

Cotton aphid

Leaf eating beetle

Leaf eating beetle

Scale insect

Yellow peach moth/Fruit borer

Cotton bollworm

Leaf-roller

Green weevil

Seed borer

Leaf eating caterpillar

Mealy bug

Scale insect

Chili thrips

Thrips

Fruit borer

Citrus borer

Citrus aphid

Stem borer

10.2 Fungi

10.2.1	<i>Cephaleuros virescens</i>	Alga spot
10.2.2	<i>Colletotichum</i> sp.	Leaf anthracnose
10.2.3	<i>Corticium salmonicolor</i>	Pink disease
10.2.4	<i>Meliola durionis</i>	Sooty mould
10.2.5	<i>Oidium zibethii</i>	Powdery mildew
10.2.6	<i>Phomopsis</i> sp.	Fruit blight/leaf spot/fruit rot
10.2.7	<i>Phyllosticta durionis</i>	Leaf rim blight/leaf spot
10.2.8	<i>Phytophthora palmivora</i>	Fruit rot/bud rot
10.2.9	<i>Rhizoctonia</i> sp.	Leaf spot/crown rot
10.2.10	<i>Rhizopus</i> sp.	Soft rot

10.3 Nematodes

10.3.1	<i>Pratylenchus coffeae</i>	Root rot
---------------	-----------------------------	----------

10.4 Notes

Specify here any additional information

11. Biochemical markers

Specify methods used and cite reference(s). Refer to *Descriptors for Genetic Marker Technologies*, available in PDF (portable format document) from the Bioversity Web site (www.bioversityinternational.cgiar.org) or by email request to: Bioversity-publications@cgiar.org

12. Molecular markers

Refer to *Descriptors for Genetic Marker Technologies*, available in PDF (portable format document) from the Bioversity Web site (www.bioversityinternational.org) or by email request to: Bioversity-publications@cgiar.org

13. Cytological characters**13.1 Chromosome number****13.2 Ploidy level**

(2x, 3x, 4x, etc. and aneuploidy)

13.3 Meiosis chromosome associations

Average of 50 microscope mother cells, observed during metaphase 1

13.4 Other cytological characters**14. Identified genes**

Describe any known specific mutant present in the accession

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Annex I. Collecting form for Durian (*Durio zibethinus* Murr.)

SAMPLE IDENTIFICATION

COLLECTING INSTITUTE CODE (2.1):

COLLECTING No. (2.3):

PHOTOGRAPH (2.23):

COLLECTING DATE OF SAMPLE (2.4):

GENUS (1.8.1):

SPECIES (1.8.2):

COLLECTING SITE LOCATION

COUNTRY OF ORIGIN (2.5):

PROVINCE/STATE (2.6):

DEPARTMENT/COUNTY (2.7):

LOCATION (2.8):

km:

direction:

from:

LATITUDE (2.9):

LONGITUDE (2.10):

ELEVATION (2.11): m asl

COLLECTING SITE ENVIRONMENT

COLLECTING/AQUISITION SOURCE (2.12):

10. Wild habitat

20. Farm or cultivated habitat

30. Market

40. Institute/research organization

99 Other (specify):

SLOPE [°] (6.1.3):

SLOPE ASPECT (6.1.4):

(code N, S, E, W)

SOIL FERTILITY (6.1.19):

(code: 3 – Low; 5 – Moderate; 7 – High)

SOIL TEXTURE CLASSES (6.1.16):

State class (e.g. Clay, Loam, Silt)

WATER AVAILABILITY (6.1.18):

1. Rainfed

2. Irrigated

3. Flooded

4. River banks

5. Sea coast

99. Other (specify):

RAINFALL (6.1.20.2):

Annual mean: mm

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Monthly mean (mm):												

TEMPERATURE (6.1.20.1):

Annual mean: °C

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Monthly mean (°C):												

SAMPLE

BIOLOGICAL STATUS OF ACCESSION (2.17):

100. Wild

200. Weedy

300. Traditional cultivar/landrace

400. Breeding/research material

500. Advanced/improved cultivar

999. Other (specify)

TYPE OF SAMPLE (2.15):

1. Fruit

2. Seed

3. Seedling/sapling

4. Shoot/budwood/stem cutting

5. *In vitro* plantlet

99. Other (specify)

PREVAILING STRESSES (2.18.13):

Mention the types of major stresses, i.e. abiotic (drought), biotic (pests, diseases, etc.)

ETHNOBOTANICAL DATA

LOCAL/VERNACULAR NAME (2.18.2):

ETHNIC GROUP (2.18.1)

PARTS OF PLANTS USED (2.18.6)

1. Seed	2. Root	3. Trunk	4. Bark
5. Leaf	6. Flower	7. Fruit	8. Rind
9. Latex	99. Other (specify)		

PLANT USES (2.18.7)

1. Food (fruit, juice)	2. Forage	3. Fuel
4. Medicine	5. Wood/timber	99. Other (specify)

ASSOCIATED FLORA (2.18.15)

MANAGEMENT

ACCESSION No. (3.1)

GERMPLASM STORAGE (3.8)

10. Seed collection	20. Field collection	30. <i>In vitro</i> collection
40. Cryopreserved collection	99. Other (specify)	

CHARACTERIZATION

GROWTH

Tree growth habit (7.1.12)	Branching density (7.1.13)
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LEAF

Leaf upper surface colour (7.2.1)	Leaf lower surface colour (7.2.2)	Leaf attitude (7.2.5)
Leaf blade length (7.2.9)	Leaf blade width (7.2.10)	Leaf blade shape (7.2.11)
Leaf apex shape (7.2.12)	Leaf base shape (7.2.13)	Leaf blade margin (7.2.14)

INFLORESCENCE

Flower bud shape (7.3.6)	Calyx shape (7.3.8)	Calyx tooth apex shape (7.3.9)
Petal shape (7.3.16)	Style shape (7.3.24)	Stigma shape (7.3.26)

FRUIT

Fruit shape (7.4.10)	Fruit apex shape (7.4.11)	Fruit base shape (7.4.12)
Fruit spininess (7.4.17)	Fruit spine shape (7.4.18)	Fruit spine density (7.4.20)
Aril texture (7.4.30)	Flesh colour (7.4.36)	No. of carpels per fruit (7.4.38)

SEED

Seed length (7.5.1)	Seed width (7.5.2)	Seed shape (7.5.9)
Seed coat colour (7.5.10)		

EVALUATION

FRUIT BEARING INTENSITY (8.2.5):

3. Poor	5. Medium	7. High
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COLLECTOR'S NOTES



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