IPGRI

Descriptors for

Pepino

(*Solanum muricatum*)

COMAV

Centro de Conservación y Mejora de la Agrodiversidad Valenciana

List of Descriptors

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

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Descriptors for

Pepino

(*Solanum muricatum*)

The Centro de Conservación y Mejora de la Agrodiversidad Valenciana (COMAV) was established in 1999 as a multidisciplinary research center of the Universidad Politécnica de Valencia (UPV). Its objectives are the recovery, conservation and utilization of plant genetic resources in order to broaden the genetic base of vegetable crops production, to contribute to a more sustainable agriculture and to preserve the associated cultural heritage. Research focuses on Solanaceae and Cucurbitaceae vegetable crops.

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PREFACE

Descriptors for Pepino (*Solanum muricatum*) were developed by Dr Jaime Prohens, Prof. Dr Gregory J. Anderson, Dr Adrián Rodríguez-Burruezo, Prof. Dr Charles B. Heiser and Prof. Dr Fernando Nuez. These descriptors have been produced within the framework of a project funded by the European Commission [Project RESGEN PL 98-113: 'Management, conservation, and valorisation of eggplants (*Solanum* species)] and of EGGNET (Eggplant genetic resources network). A draft version prepared in the internationally accepted IPGRI 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'.

IPGRI encourages the collecting 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 on their importance to the crop's description. Descriptors listed under *Evaluation* allow for a more extensive description of the 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 is promoted by IPGRI 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 into the IPGRI 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 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 it contains. This approach assists with the standardization of descriptor definitions. IPGRI, however, does not assume that curators 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. Highly discriminating descriptors are highlighted in the text.

Multicrop passport descriptors were developed jointly by 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. A key for the most important species of pepino is given in Annex I, which will help in their identification. In Annex II, the reader will find a Collecting form for pepino that will facilitate data collection.

Any suggestions for improvement of the Descriptors for pepino will be highly appreciated by IPGRI and COMAV.

AN INTRODUCTION TO PEPINO

The text that follows is a general introduction to pepino and close wild relatives and is directed to those who are not familiar with this crop. Readers can consult Nuez and Ruiz (1996), Prohens *et al*. (1996) and Prohens *et al*. (2000) for information on cultivated pepino and Correll (1962), Heiser (1964), Anderson and Bernardello (1991), *Anderson et al.* (1996), Anderson and Jansen (1998) and Prohens *et al*. (2003) for information on wild species of *Solanum* section *Basarthrum* and their use in pepino breeding.

The pepino (*Solanum muricatum* Aiton) is a domesticate of Andean origin vegetatively propagated by stem cuttings and esteemed for its edible fruit, a berry that is juicy, scented, mild sweet, and that can be highly variable in shape and colour. The pepino has been grown for thousands of years in the Andean region, and it was an important crop during the times of the Inca Empire. However, until recently, concurrent with increasing interest in international markets, the pepino has been grown largely for local consumption.

An impressive variation of cultivars and cultivated types exists for pepino, and contrary to other domesticates, this variation is also matched by a high variation at the molecular level, as demonstrated in studies with DNA markers (Anderson *et al*., 1996; Rodríguez-Burruezo *et al.*, 2003). Most of the cultivated pepino is represented by endangered local cultivars, although there are some modern cultivars, such as 'El Camino', 'Toma', 'Kawi', 'Sweet Long', 'Sweet Round' or 'Puzol', that have been produced through breeding programmes (Dawes *et al*., 1984; Ruiz *et al*., 1997; Prohens *et al*., 2002).

The pepino is evolutively linked to the tomato (Spooner *et al*., 1993) and the growing techniques commonly used for tomato can be used for pepino cultivation. Nonetheless, several important peculiarities of pepino must be considered: (a) because the pepino is highly heterozygous; seeds obtained from fruits of a cultivar do not breed true, therefore, it has to be vegetatively reproduced, either by cuttings taken from healthy mother plants or by *in vitro* micropropagation techniques; (b) the pepino needs more time to mature than other widely known Solanaceae vegetable crops, such as the tomato, pepper and eggplant, and in many seasonal climates the summer season is not long enough for this crop; as a consequence, in many cases, pepinos are grown as a greenhouse crop; (c) the pepino has luxurious vegetative growth, which may compete with fruit set; it is thus advantageous, especially for greenhouse cultivation, to either prune the plants by removing the lateral side-shots and training them in a one to several leaders system, or to trellis them between double horizontal wires in a hedge-like manner; also, nitrogen fertilization should be limited to avoid excessive vegetative growth; d) fruit quality, and especially sugar concentration, is greatly influenced by temperatures during ripening; that is, when maximum temperatures during ripening exceed 30ºC, a considerable reduction in the sugar content takes place; as a consequence, if premium organoleptic fruit quality is desired, growing cycles for pepinos, either outdoors or in greenhouses, should be planned to avoid high temperatures during ripening.

Taxonomically, pepino is placed within *Solanum* subgenus *Potatoe* section *Basarthrum* (Correll, 1962, Anderson and Bernardello, 1991; Anderson *et al*., 1996). This section, characterized by the basal pedicel articulation (i.e. flowers fall off with pedicels attached, leaving only scars on the inflorescence axis), includes 11 species, the cultivated pepino and 10

wild species distributed through Central and South America. The wild species are characterized by green fruits, 1 to 5 cm in length and typically ovate or round. Species from *Solanum* section *Basarthrum* are distributed among four series: series *Muricata*, of which pepino (*Solanum muricatum*) is the only member; series *Caripensia*, which includes eight species (*Solanum basendopogon* Bitter, *Solanum caripense* Humb. & Bonpl. *ex* Dunal, *Solanum cochoae* G. J. Anderson & Bernardello; *Solanum filiforme* Ruiz López & Pavón; *Solanum fraxinifolium* Dunal in DC; *Solanum heiseri* G. J. Anderson; *Solanum tabanoense Correll* and *Solanum trachycarpum* Bitter & Sodiro); series *Suaveolentia*, whose only member is *Solanum suaveolens* Kunth and Bouché; and series *Canensa*, also with a single species, *Solanum canense* Rydb.

Wild species from *Solanum* section *Basarthrum* represent invaluable genetic resources for pepino breeding. In particular, fertile hybrids with several species of section *Caripensia* are easily obtained and the introgression of genes into the pepino for high sugar content has been carried out via the backcross method. Furthermore, because interspecific somatic hybrids between tomato and pepino have been obtained (Sakamoto and Taguchi, 1991), the genetic resources of the pepino also represent genetic resources that can be useful to improve tomatoes.

The pepino has different common names, depending on the language. The most common are the following:

Aymara	cachuma
Chinese	xiang gua quie
Danish	pepino, melonpaere
Dutch	pepino, appelmeloen, meloen peer, peermeloen
English	pepino, pepino dulce, melon pear, melon shrub, pear melon, Peruvian pepino, tree melon, sweet cucumber, sweet pepino, mellowfruit
French	pépino, melon poire, poire melon
German	pepino, melonenbirne
Italian	pepino, pera-melone
Japanese	pepiino
Portuguese	pepino doce, pera melâo, tomateiro francés
Quechua	cachum
Spanish	pepino dulce, mataserrano, melón pera, pepino amarillo, pepino de agua, pepino de chupar, pepino de fruta, pepino mango, pepino morado, pepino redondo, pera melon

DEFINITIONS AND USE OF THE DESCRIPTORS

IPGRI uses the following definitions in genetic resources documentation:

Passport descriptors: These provide the basic information used for the general management of the accession (including 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 experimental designs and techniques are needed to assess them. Their assessment may also require complex biochemical or molecular characterization methods. These types of descriptors include 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 indicated as highlighted text.

The following internationally accepted norms for the scoring, coding and recording of descriptor 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* is 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; (ii) a descriptor is inapplicable. In the following example, '0' will be recorded if an accession does not have a lateral leaflet:

Shape of lateral leaflet
1 Elongate
2 Lanceolate
3 Ovate

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

Presence of additional fruit colour at commercial ripeness
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 the 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 FAO website (**http://apps3.fao.org/wiews/**). If new Institute Codes are required, they can be generated online by national WIEWS administrators

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 in Bari, Italy; CGN indicates an accession from the genebank in Wageningen, the Netherlands; PI indicates an accession within the USA system)

1.3 Donor institute code [MCPD]

Code for the donor institute. (See instructions under Institute Code, **1.1**)

1.4 Donor accession number [MCPD]

Number assigned to an accession by the donor. (See instructions under Accession Number, **1.2**)

1.5 Other identification number(s) 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

1.6 Genus [MCPD]

Genus name for taxon. Initial uppercase letter required

1.7 Species [MCPD]

Specific epithet portion of the scientific name in lowercase letters. The following abbreviation is allowed: 'sp.'

1.7.1 Species authority [MCPD]

Provide the authority for the species name

1.8 Subtaxa [MCPD]

Subtaxa can be used to store any additional taxonomic identifier. The following abbreviations are allowed: 'subsp.' (for subspecies); 'convar.' (for convariety); 'var.' (for variety); 'f.' (for form)

1.8.1 Subtaxa authority [MCPD]

Provide the subtaxa authority at the most detailed taxonomic level

1.9 Ancestral data [MCPD]

Information about either pedigree or other description of ancestral information (i.e. parent variety in the case of mutant or selection)

1.10 Accession name [MCPD]

Either a registered or other formal designation given to the accession. First letter uppercase. Multiple names separated with semicolon without space

1.10.1 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 Common crop name [MCPD]

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

1.12 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(s) collecting the sample. If the holding institute has collected the material, the collecting institute code should be the same as the holding institute code. (See instructions under Institute Code, **1.1**)

2.2 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 number is essential for identifying duplicates held in different collections

2.3 Collecting date of sample [YYYYMMDD] [MCPD]
Collecting date of the sample where YYYY is the year, MM is the month and DD is the day. Missing data (MM or DD) should be indicated by hyphens. Leading zeros are required

2.4 Country of origin [MCPD]
Code of the country in which the sample was originally collected. Use the three-letter abbreviations from the *International Standard (ISO) Codes for the representation of names of countries*. The ISO 3166-1: Code List can be obtained from IPGRI [ipgri-mcpd@cgiar.org]

2.5 Breeding Institute code [MCPD]
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. Follows the Institute Code standard

2.6 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)

2.7 Latitude of collecting site[1] [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)

2.8 Longitude of collecting site [MCPD]
Degree (3 digits), minutes (2 digits) and seconds (2 digits) followed by E (East) or W (West) (e.g. 0762510W). Every missing digit (minutes or seconds) should be indicated with a hyphen. Leading zeros are required (e.g. 076 ----W)

2.9 Elevation of collecting site [m asl] [MCPD]
Elevation of collecting site expressed in meters above sea level. Negative values are allowed

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

dº m´ s´´ = h * (d + m / 60 + s / 3600)

where h=1 for the Northern and Eastern hemispheres and –1 for the Southern and Western hemispheres, i.e. 30º30´0´´ S = –30.5 and 30º15´55´´ N = 30.265.

2.10 Collecting /acquisition source [MCPD]

The coding scheme proposed can be used at 2 different levels of detail: either by using the general codes, such as 10, 20, 30, 40 or by using more specific codes such as 11, 12 etc.

- 10 Wild habitat
  - 11 Forest/woodland
  - 12 Shrubland
  - 13 Grassland
  - 14 Desert/tundra
  - 15 Aquatic habitat
- 20 Farm or cultivated habitat
  - 21 Field
  - 22 Orchard
  - 23 Backyard, kitchen or home garden (urban, peri-urban or rural)
  - 24 Fallow land
  - 25 Pasture
  - 26 Farm store
  - 27 Threshing floor
  - 28 Park
- 30 Market or shop
- 40 Institute, Experimental station, Research organization, Genebank
- 50 Seed company
- 60 Weedy, disturbed or ruderal habitat
  - 61 Roadside
  - 62 Field margin
- 99 Other (elaborate in descriptor **2.22 Remarks**)

2.11 Biological status of accession [MCPD]

The coding scheme proposed can be used at 3 different levels of detail: either by using the general codes such as 100, 200, 300, 400 or the more specific codes such as 110, 120 etc.

- 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 (elaborate in descriptor **2.22 Remarks**)

2.12 Collecting source environment
Use descriptors 6.1 to 6.2 in section **6**

2.13 Type of sample
Type of material collected. If different types of material have been collected from the same source, each sample (type) should be designated with a unique collecting number and a corresponding unique accession number

1 Vegetative
2 Seed
99 Other (specify which part of the plant in descriptor **2.22 Remarks**)

2.14 Number of plants sampled
Appropriate number of plants collected in the field to produce this accession

2.15 Number of seeds collected

2.16 Number of cuttings collected

2.17 General appearance of population
Provide a subjective assessment of the general appearance of the population

3 Poor
5 Medium
7 Good

2.18 Population isolation [km]
Straight line distance between two adjacent collecting sites

2.19 Ethnobotanical data

2.19.1 Ethnic group
Name of the ethnic group of the donor of the sample or of the people living in the collecting area

2.19.2 Local vernacular name
Name given by farmer to crop and cultivar/landrace/clone/wild form. State local language and/or dialect if the ethnic group is not provided

2.19.2.1 Translation
Provide translation of the local name into English, if possible

2.19.3 History of plant use

1 Ancestral/indigenous
(always associated with the place and community)
2 Introduced (but in unknown distant past)
3 Introduced (time of introduction known)

2.19.4 Uses of the accession

1 Dessert fruit
2 Salad
3 Cooked
4 Medicinal
5 Ornamental
99 Other (specify in descriptor **2.22 Remarks**)

2.19.5 Ripening stage of the fruit at consumption

1 Ripe
2 Unripe but physiologically mature
3 Unripe but physiologically immature

2.19.6 Cultural characteristics

Is there any folklore associated with the collected *Solanum* type (e.g. taboos, stories and/or superstitions)? If so, describe it briefly in descriptor **2.22 Remarks**

0 No
1 Yes

2.19.7 Prevailing stresses

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

2.19.8 Cultural practices

2.19.8.1 Sowing date [YYYYMMDD]

2.19.8.2 First harvest date [YYYYMMDD]

2.19.8.3 Last harvest date [YYYYMMDD]

2.19.9 Cropping system

1 Monoculture
2 Intercropped (specify other crops in descriptor **2.22 Remarks**)

2.19.10 Mode of reproduction

1 Vegetative
2 Seed
3 Both

2.19.11 Associated flora

Other dominant crop/or wild plant species, including other *Solanum* species, found in and around the collecting site

2.19.12 Seasonality

1 Available only in season/at particular period
2 Available throughout the year

2.20 Photograph

Was a photograph(s) taken of the accession or habitat at the time of collecting? If so, provide an identification number(s) in the descriptor **2.22 Remarks**

0 No
1 Yes

2.21 Herbarium specimen

Was an herbarium specimen collected? If so, provide an identification number in descriptor **2.22 Remarks**

0 No
1 Yes

2.22 Remarks

Specify here any additional information recorded by the collector or any specific information on descriptors with value "99" or "999" (=Other)

MANAGEMENT

3. Management descriptors

3.1 Accession number (Passport 1.2)

3.2 Population identification (Passport 2.3)
Collecting number pedigree, cultivar name etc., depending on the population type

3.3 Storage address
Building, room, shelf number/location in medium-term and/or long-term storage

3.4 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
- 11 Short term
- 12 Medium term
- 13 Long term

20 Field collection
30 *In vitro* collection (Slow growth)
40 Cryopreserved collection
99 Other (specify in **3.18 Remarks**)

3.5 Accession size
Approximate number or weight of seeds or plants of an accession in the genebank

3.6 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

3.7 Location of safety duplicates [MCPD]
Code of the institute where a safety duplicate of the accession is maintained. It follows the Institute Code standard. See instructions under **1.1** Institute Code

3.8 Storage date [YYYYMMDD]

3.9 Germination at storage [%]
For seed propagated accessions

3.10 Date of last germination test [YYYYMMDD]
For seed propagated accessions

3.11 Germination at the last test [%]
For seed propagated accessions

3.12 Date of last regeneration [YYYYMMDD]

3.13 Date of next germination test [YYYYMMDD]
For seed propagated accessions, the date (estimate) when the accession should next be tested

3.14 Date of next regeneration [YYYYMMDD]
The date (estimate) when the accession should next be regenerated

3.15 Seed moisture content at harvest [%]
For seed propagated accessions

3.16 Seed moisture content at storage (initial) [%]
For seed propagated accessions

3.17 Number of seeds, cuttings or other propagation material in storage

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

4.3 Field plot number

4.4 Collaborator(s) name
Name(s) and address(es) of the person(s) in charge of the multiplication/regeneration

4.5 Propagation

1 Seed
2 Vegetative (cuttings)
3 Vegetative (*in vitro* culture)

4.6 Substrate/medium for propagation
Indicate the substrate or *in vitro* growing medium used for propagation

4.7 Percentage of germination [%]
For seed reproduced accessions

4.8 Percentage of cuttings/explants rooting and giving plantlets [%]
For vegetatively reproduced accessions

4.9 Number of plants used as seed/cuttings/explants source for each regeneration

4.10 Cultural practices

4.10.1 Sowing or vegetative propagation date [YYYYMMDD]

4.10.2 Transplanting date [YYYYMMDD]

4.10.3 Harvest date [YYYYMMDD]

4.10.4 Irrigation
Specify frequency

4.10.5 Field spacing

4.10.5.1 Distance between plants in a row [m]

4.10.5.2 Distance between rows [m]

4.10.6 Fertilizer application [g/m^2]
Indicate the type of fertilizer used and the number of applications made

4.11 Type of plant training
1 Untrained
2 Trained but not pruned
3 Trained and pruned
99 Other (specify in desccriptor **4.20 Remarks**)

4.12 Breeding method

(Clonal)

1 Vegetative propagation

(Self)

2 Bulk
3 Mass selection
4 Pedigree selection
5 Single seed descent

(Outcrossing)

6 Bulk
7 Mass selection
8 Selection with progeny testing
9 Recurrent selection

(Combination)

99 Other (specify in desccriptor **4.20 Remarks**)

4.13 Type of pollination

1 Artificial
2 Natural
3 Both

4.14 Pollination method

1 Self-pollinated
2 Mixed
3 Cross-pollinated

4.15 Pollen viability

3 Low
5 Intermediate
7 High

4.16 Previous multiplication and/or regeneration

4.16.1 Location

4.16.2 Transplanting/*in vitro* culture date [YYYYMMDD]

4.17 Date of last regeneration or multiplication [YYYYMMDD]

4.18 Number of times accession regenerated

Since the date of acquisition

4.19 Standard cultivars used

Other cultivars could be added, if necessary

4.19.1 Cultivar 1

4.19.2 Cultivar 2

4.20 Remarks

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 **2.4 Country of origin**)

5.2 Site

5.2.1 Latitude

5.2.2 Longitude

5.2.3 Elevation [m asl]

5.3 Evaluator's name and address

5.4 Sowing date [YYYYMMDD]

5.5 Transplanting date [YYYYMMDD]

5.6 Harvest date [YYYYMMDD]

5.7 Evaluation environment
Environment in which characterization/evaluation was carried out

1 Field
2 Screenhouse
3 Greenhouse
4 Laboratory
99 Other (specify in descriptor **5.9 Remarks**)

5.8 Environmental characteristics of site
Use descriptors **6.1.1 to 6.2** in section **6**

5.9 Remarks
Any other site-specific information

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

6.1 Site environment

6.1.1 Topography

This refers to the profile in elevation of the land surface on a broad scale. (From FAO 1990)

1	Flat	0–0.5%
2	Almost flat	0.6–2.9%
3	Gently undulating	3–5.9%
4	Undulating	6–10.9%
5	Rolling	11–15.9%
6	Hilly	16–30%
7	Steeply dissected	>30%, moderate elevation range
8	Mountainous	>30%, great elevation range (>300 m)
99	Other	(specify in appropriate descriptor **Remarks**)

6.1.2 Higher level landform (general physiographic features)

The landform refers to the to the shape of the land surface in the area in which the site is located (adapted from FAO 1990)

1 Plain
2 Basin
3 Valley
4 Plateau
5 Upland
6 Hill
7 Mountain

6.1.3 Slope [°]

Estimated slope of the site

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 southwestern direction has an aspect of SW)

6.1.5 Crop agriculture

(From FAO, 1990)

1 Annual field cropping
2 Perennial field cropping

6.1.6 Overall vegetation surrounding and at the site

(Adapted from FAO, 1990)

1 Grassland (Grasses, subordinate forbs, no woody species)
2 Forbland (Herbaceous plants predominant)
3 Forest (Continuous tree layer, crowns overlapping, large number of tree and shrub species in distinct layers)
4 Woodland (Continuous tree layer, crowns usually not touching, understorey may be present)
5 Shrubland (Continuous layer of shrubs, crowns touching)
6 Savanna (Grasses with a discontinuous layer of trees or shrubs)
99 Other (specify in appropriate descriptor **Remarks**)

6.1.7 Soil drainage

(Adapted from FAO, 1990)

3 Poorly drained
5 Moderately drained
7 Well drained

6.1.8 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 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
2 Red
3 Reddish
4 Yellowish red
5 Brown
6 Brownish
7 Reddish brown
8 Yellowish brown
9 Yellow
10 Reddish yellow
11 Greenish, green
12 Grey
13 Greyish
14 Blue
15 Bluish-black
16 Black

6.1.9 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 below. (See Fig. 1)

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	Silty clay	16	Loamy coarse sand
6	Silty clay loam	17	Very fine sand
7	Silty 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

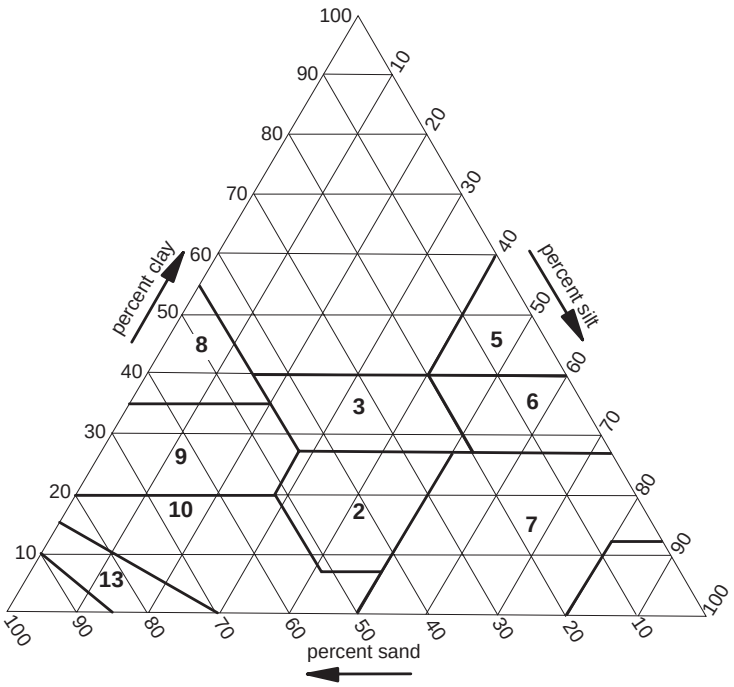

Fig. 1. Soil texture classes

6.1.10 Soil organic matter content

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

6.1.11 Water availability

1 Rain-fed
2 Irrigated
3 Flooded
4 River banks
5 Sea coast
99 Other (specify in appropriate descriptor **Remarks**)

6.1.12 Soil fertility

General assessment of the soil fertility based on existing vegetation

3 Low
5 Moderate
7 High

6.1.13 Climate of the site

Should be assessed as close to the site as possible

6.1.13.1 Temperature [°C]

Provide either the monthly or the annual mean

6.1.13.2 Dry season length [d]

6.1.13.3 Rainfall [mm]

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

6.2 Remarks

Provide here any additional information related to the site (i.e. if data collected refers to collecting or to characterization/evaluation sites)

CHARACTERIZATION

7. Plant descriptors

Records should be taken on five plants at least, when the fruits of the 1st truss are ripened

7.1 Vegetative

7.1.1 Rooting capacity

For vegetatively propagated accessions. Records should be taken on stem cuttings (10–20 cm long) after cuttings have been placed for 10–15 days in a wet substrate (e.g. peat or vermiculate)

3 Low (roots scattered, thin and short, mainly less than 1.5 cm long, and appearing around the nodes)
5 Medium
7 High (many roots of several cm long appearing both in the nodes and internode part of the stem)

7.1.2 Plant growth habit

The overall growth habit is strongly affected by growing conditions including spacing, so the standard cultivar(s) should be used for comparison

3 Upright
5 Intermediate (e.g. cv. 'Sweet Long')
7 Prostrate (e.g. *Solanum caripense*)

7.1.3 Plant size

Visual estimation of the whole plot: this is strongly affected by growing conditions including spacing, so the standard cultivar(s) should be used for comparison

3 Small
5 Intermediate (e.g. cv. 'Sweet Long')
7 Large (e.g. cv. 'Puzol')

7.1.4 Stem length at the first inflorence [cm]

Measured as the total length of the stem, from the stem base to the point of insertion of the first inflorescence in the stem, at the time of flowering of the first inflorescence

7.1.5 Vigour of the plant

3 Weak
5 Intermediate
7 Strong

7.1.6 Degree of ramification

3 Low
5 Intermediate
7 High

7.1.7 Intensity of anthocyanin of shoot tip

0 Absent
3 Weak
5 Intermediate
7 Strong

7.1.8 Root protuberances at the nodes

0 Absent
3 Few
5 Intermediate
7 Many

7.1.9 Stem pubescence density

0 Glabrous
3 Sparse
5 Intermediate
7 Dense

7.1.10 Stem colour

1 Green
2 Greenish with purple spots
3 Greenish purple
4 Purple
5 Dark purple

7.1.11 Internode length [cm]

Measured at a middle distance between the top and the base of the main stem

7.1.12 Petiole length [mm]

7.1.13 Petiole colour

1 Green
2 Greenish with purple spots
3 Greenish purple
4 Purple
5 Dark purple

7.1.14 Foliage density

3 Sparse
5 Intermediate
7 Dense

7.1.15 Leaf attitude

1 Semi-erect
2 Horizontal
3 Dropping

7.1.16 Leaf lamina length [cm]

7.1.17 Leaf lamina width [cm]

7.1.18 Position of the widest part of the leaf blade

1 Base
3 Bottom 1/3
5 Middle
7 Top 1/3

7.1.19 Leaf blade length/width ratio

7.1.20 Type of leaves

Predominant type of leaves observed in an adult plant

1 Simple
2 Compound

7.1.21 Number of leaflets

Average number of leaflets in the predominant type of leaves observed in an adult plant

7.1.22 Leaf or terminal leaflet shape

Indicate the shape of the leaf for accessions with simple leaves and of the terminal leaflet for accessions with compound leaves. (See Fig. 2)

1 Elongated
2 Lanceolate
3 Ovate
4 Obovate
5 Cordiform
6 Elliptic
7 Rounded

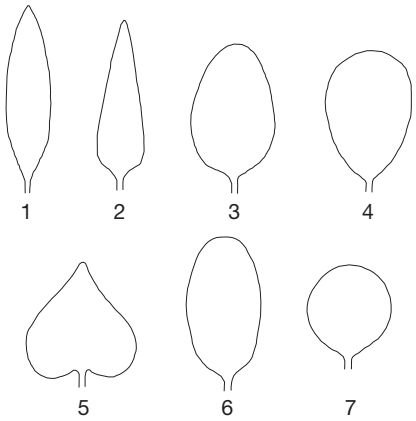

Fig. 2. Leaf or terminal leaflet shape

7.1.23 Terminal leaflet lamina length [cm]

7.1.24 Terminal leaflet lamina width at widest point [cm]

7.1.25 Terminal leaflet lamina length/width ratio

7.1.26 Leaf or terminal leaflet apex shape

Indicate the shape of the apex of the leaf for accessions with simple leaves and of the terminal leaflet for accessions with compound flowers

1 Acute
2 Intermediate
3 Obtuse

7.1.27 Lateral leaflet shape

(See fig. 2)

1 Elongated
2 Lanceolate
3 Ovate
4 Obovate
5 Cordiform
6 Elliptic
7 Rounded

7.1.28 Variability in leaflet size

3 Low
5 Medium
7 High

7.1.29 Leaf colour

Observed on the adaxial surface

1 Light green
2 Green
3 Dark green
4 Greenish purple
5 Purple

7.1.30 Anthocyanin coloration of leaf veins

3 Green
5 Main veins purple and the rest green
7 Purple

7.1.31 Leaf hairiness type

Observed on abaxial side

1 Glabrous
2 Puberulent
3 Velutinous
4 Pilose
5 Hirsute

7.1.32 Leaf surface attitude

3 Flat
5 Intermediate
7 Very convex

7.2 Inflorescence descriptors

Unless otherwise indicated, all observations on the fruit should be taken, when possible, on the 1st truss at flowering (for inflorescence descriptors)

7.2.1 Number of leaves from ground to first inflorescence

7.2.2 Inflorescence type

1 Generally uniparous
2 Both (partly uniparous, partly multiparous)
3 Generally multiparous

7.2.3 Number of flowers per inflorescence

7.2.4 Corolla shape

(See Fig. 3)

1 Stellate
2 Semi-stellate
3 Rotate

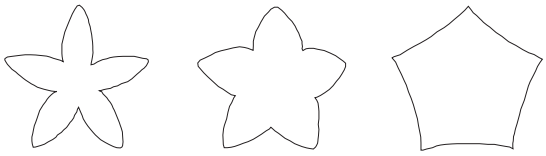

Fig. 3. Corolla shape

7.2.5 Corolla lobe length [mm]

From attachment to tip of lobes

7.2.6 Corolla sinus length [mm]

From attachment to shallowest point of sinus

7.2.7 Corolla lobe length/sinus length ratio

7.2.8 Corolla colour

1 White
2 Stripped (white >75% and purple <25%)
3 Stripped (white 50–75% and purple 25–50%)
4 Stripped (white 25–50% and purple 50–75%)
5 Stripped (white < 25% and purple >75%)
6 Purple

7.2.9 Sepal length [mm]

7.2.10 Stamen length [mm]

7.2.11 Style exsertion [mm]

Beyond anther cone

7.2.12 Pollen production

0 None
3 Low
5 Medium
7 High

7.3 Fruit descriptors

Records should be taken of fruits of at least five different plants. Unless otherwise indicated, all observations of the fruit should be taken, when possible, on the 1st truss at full maturity stage. Record the average of 10 fruits from different plants

7.3.1 Number of fruits per infructescence

Mean number of fruits for the first three trusses

7.3.2 Number of fruits per plant

7.3.3 Fruit yield per plant [g]

7.3.4 Mean fruit weight [g]

7.3.5 Fruit size uniformity

3 Low
5 Intermediate
7 High

7.3.6 Fruit length [cm]

7.3.7 Fruit width [cm]

7.3.8 Position of the widest part of the fruit

3 Less than 1/4 way from base to tip
5 Between 1/4 and 1/2 way from base to tip
7 More than 1/2 way from base to tip

7.3.9 Fruit length/width ratio

7.3.10 Fruit curvature

(See Fig. 4)

0 None (fruit straight)
3 Slightly curved
5 Curved
7 Sickle shaped

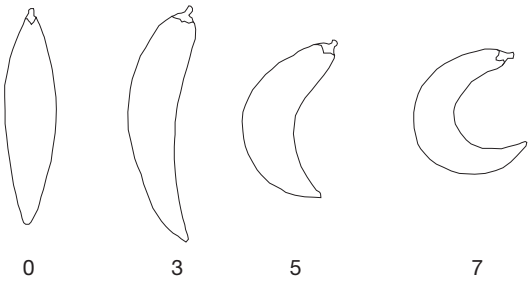

Fig. 4. Fruit curvature

7.3.11 Fruit cross section shape

(See Fig. 5)

1 Circular
2 Elliptic
3 Ovate
4 Triangular
5 Irregular

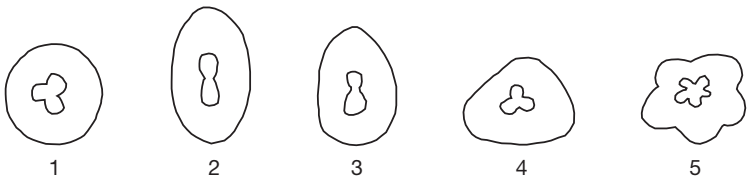

Fig. 5. Fruit cross section shape

7.3.12 Predominant fruit shape

(See Fig. 6)

1 Flattened
2 Rounded
3 Ellipsoid
4 Obovate
5 Ovate
6 Cordiform
7 Conical
8 Elongate
99 Other (specify in descriptor **7.4 Notes**)

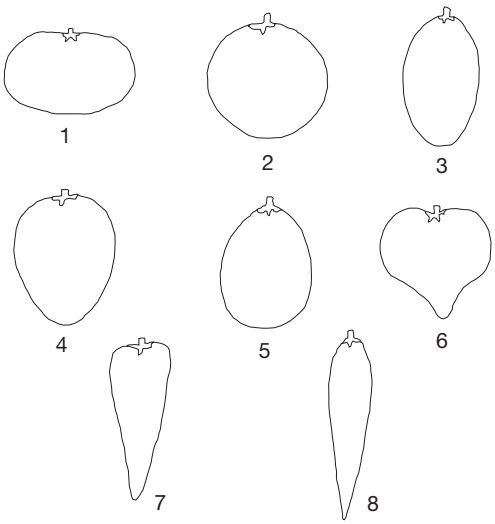

Fig. 6. Predominant fruit shape

7.3.13 Fruit surface

1 Smooth
2 Rough
3 Verrucose

7.3.14 Fruit apex shape

(See Fig. 7)

3 Protruded
5 Rounded
7 Depressed

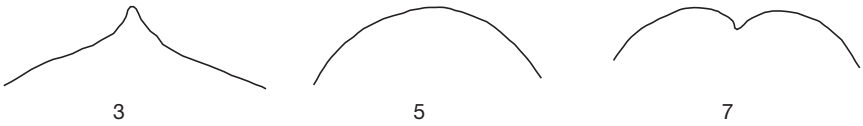

Fig. 7. Fruit apex shape

7.3.15 Fruit shoulder shape

(See Fig. 8)

1 Flat
3 Slightly depressed
5 Moderately depressed
7 Strongly depressed

Fig. 8. Fruit shoulder shape

7.3.16 Fruit pedicel length [mm]

7.3.17 Immature fruit colour

1 White
2 Green
3 Green with dark green stripes
4 Green with purple stripes

7.3.18 Fruit predominant colour at commercial ripeness

1 Dark green
2 Light green
3 Milk white
4 Pale yellow
5 Golden yellow
6 Orange yellow
7 Lilac
8 Purple
9 Purple black

7.3.19 Fruit secondary colour at commercial ripeness

0 Absent
1 Dark green
2 Light green
3 Milk white
4 Pale yellow
5 Golden yellow
6 Orange yellow
7 Lilac
8 Purple
9 Purple black

7.3.20 Fruit secondary colour distribution at commercial ripeness

1 Mottled
2 Network
3 Stripped

7.3.21 Fruit surface covered by fruit additional colour

1 Less than 10%
2 Between 10 and 30%
3 Between 30 and 50%

7.3.22 Fruit epidermis glossiness

3 Dull
5 Intermediate
7 Bright

7.3.23 Fruit firmness in broadest part

3 Soft
5 Intermediate
7 Firm

7.3.24 Number of locules per fruit

7.3.25 Inner placental area length [cm]

7.3.26 Inner placental breadth [cm]

7.3.27 Inner placental length/breadth ratio

7.3.28 Fruit flesh density

1 Very loose
3 Loose
5 Intermediate
7 Dense
9 Very dense

7.3.29 Fruit flesh colour

1 Dark green
2 Light green
3 White
4 Pale yellow
5 Golden yellow
6 Orange yellow
7 Orange
8 Salmon

7.3.30 Fruit flesh colour intensity

3 Light
5 Intermediate
7 Dark

7.3.31 Fruit flavour

1 Very acidic
3 Acidic
5 Moderately sweet
7 Sweet
9 Very sweet

7.3.32 Presence of bitter off-flavour

0 Absent
3 Weak
5 Intermediate
7 Strong

7.3.33 Fruit sensitivity (susceptibility) to bruising

3 Sensitive
5 Intermediate
7 Resistant

7.3.34 Fruit peel ability

3 Easy
5 Intermediate
7 Difficult

7.3.35 Soluble solids content [%]

7.4 Seed

7.4.1 Number of seeds per fruit

1 Very few (1–5)
2 Few (6–25)
3 Intermediate (26–75)
4 Many (76–250)
5 Very many (>250)

7.4.2 Seed colour

1 White
2 Light yellow
3 Grey yellow
4 Brownish yellow
5 Brown
6 Brown black
7 Black

7.4.3 Seed diameter

1 Small (<1.5 mm)
2 Intermediate (1.5–2.5 mm)
3 Large (>2.5 mm)

7.4.4 Type of seed

1 Not winged
2 Intermediate
3 Winged

7.4.5 100 seed weight [g]

7.5 Notes

Specify here any additional information

EVALUATION

8. Plant descriptors

8.1 Agronomic characters

All agronomic characteristics observed in at least five plants

8.1.1 **Number of days to flowering** [d]

From transplanting until 50% of the plants have at least one open flower

8.1.2 **Number of days to maturity** [d]

From transplanting until 50% of the plants have at least one fruit ripened

8.1.3 **Ripening uniformity of the whole plot**

3 Poor
5 Intermediate
7 Good

8.1.4 **Number of nodes between inflorescences**

8.1.5 **Pollen viability**

Indicate the method used for estimating viability in decimals in descriptor **8.4 Remarks**

1 Very low or sterile (0–10%)
2 Low (10–30%)
3 Moderate (30–70%)
4 High (70–90%)
5 Very high (90–100%)

8.1.6 **Self-compatibility**

1 Self-compatible
2 Self-incompatible
3 Unknown (sterile)

8.1.7 **Parthenocarpic (seedless) fruits** [%]

8.2 Fruit characteristics

All fruit characteristics should be evaluated in at least 10 ripe fruits from at least five different plants

8.2.1 Sunscald

0 Absent
3 Slight
5 Intermediate
7 Severe

8.2.2 Fruit cracking

0 Absent
3 Slight
5 Intermediate
7 Severe

8.2.3 Fruit fasciation

0 Absent
3 Slight
5 Intermediate
7 Severe

8.2.4 Presence of corky flesh

0 Absent
3 Slight
5 Intermediate
7 Severe

8.3 Chemical composition

8.3.1 Fruit dry matter percentage [% DM]

8.3.2 Fruit sugar content [g/100g FW]

8.3.2.1 Glucose content [g/100g FW]

8.3.2.2 Fructose content [g/100]

8.3.2.3 Sucrose content [g/100g FW]

8.3.3 Titratable acidity [g of citric acid/100 g FW]

8.3.4 Fruit juice pH

8.3.5 Ratio sugar content/Titratable acidity

8.3.6 Ascorbic acid content [g/100 g FW]

8.3.7 Aromatic compounds
Specify the aromatic compounds detected and, if measured, their amount

8.4 Remarks
Specify any additional information here

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 visible sign of susceptibility
3 Low
5 Intermediate
7 High
9 Very high

9.1 Reaction to low temperature

9.2 Reaction to high temperature

9.3 Reaction to drought

9.4 Reaction to high soil moisture

9.5 Reaction to salinity
Specify water conductivity ($dS \cdot m^{-1}$) and main salt involved (NaCl, Na_2CO_3, $CaCl_2$, etc.)

9.6 Reaction to soil acidity
Specify soil pH

9.7 Reaction to soil alkalinity
Specify soil pH

9.8 Remarks
Specify any additional information here

10. Biotic stress susceptibility

In each case, it is important to state the origin of the infestation or infection, i.e. natural, field inoculation, laboratory. Record such information in descriptor **10.6 Remarks**. These are coded on a susceptibility scale from 1 to 9, viz:

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

Asterisks (*) indicate the organisms considered most important by breeders and pathologists.

10.1 Pests

	Causal Organism	Pest or common name
10.1.1	**Aphis gossypii*	Aphids
	**Myzus persicae*	
10.1.2	**Bemisia tabaci*	White flies
	**Trialeurodes vaporariorum*	
10.1.3	Birds	
10.1.4	**Chrysodeixis chalcites*	Golden twin spot moth
10.1.5	*Frankliniella occidentalis*	Thrips
	Thrips tabaci	
10.1.6	*Leptinotarsa decemlineata*	Colorado potato beetle
10.1.7	**Lyriomiza trifolii*	Serpentine leaf miner
10.1.8	*Polyphagotarsonemus latus*	Mites
	**Tetranychus urticae*	
10.1.9	*Rhagoletis ochraspis*	Pepino fly
10.1.10	Rodents	
10.1.11	*Sceliodes* sp.	Stem borers
	Symmetrischema plaesiosema	
10.1.12	Snails	
10.1.13	Slugs	

10.2 Nematodes

10.2.1	*Meloidogyne* spp.	Root-knot nematode

10.3 Fungi

10.3.1	*Altenaria* spp.	Early blight
10.3.2	*Fusarium* spp.	*Fusarium* wilt
10.3.3	*Phytophtora infestans*	*Phytophtora* root rot

10.4 Viruses and viroids

10.4.1 *Alfalfa mosaic virus* (AMV)
10.4.2 *Cucumber mosaic virus* (CMV)
10.4.3 **Pepino mosaic virus* (PepMV)
10.4.4 *Potato spindle tuber viroid* (PSTVd)
10.4.5 *Potato leaf roll virus* (PLRV)
10.4.6 *Potato virus* S (PVS)
10.4.7 *Tobacco mosaic virus* (TMV)
10.4.8 **Tomato mosaic virus* (ToMV)
10.4.9 *Tomato spotted wilt virus* (TSWV)

10.5 Parasitic plants

10.5.1 *Cuscuta* sp. Dodder

10.6 Remarks

Specify any additional information here

11. Biochemical markers

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

12. Molecular markers

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

13. Cytological characters

13.1 Haploid chromosome number

13.2 Ploidy level

(2*x*, 3*x*, 4*x*, etc.)

13.3 Trisomics

13.4 Monosomics

14. Identified genes

Describe any known specific mutant present in the accession

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ANNEX I: Basic list of minimum discriminating descriptors for pepino

Descriptor IPGRI

Number	Name
7.1.7	Intensity of anthocyanin of shoot tip
7.1.10	Stem colour
7.1.20	Type of leaves
7.1.21	Number of leaflets
7.1.22	Leaf or terminal leaflet shape
7.1.27	Lateral leaflet shape
7.2.2	Inflorescence shape
7.2.3	Number of flowers per inflorescence
7.2.4	Corolla type
7.2.11	Style exsertion
7.3.4	Mean fruit weight
7.3.9	Fruit length/width ratio
7.3.10	Fruit curvature
7.3.12	Predominant fruit shape
7.3.17	Immature fruit colour
7.3.18	Fruit predominant colour at commercial ripeness
7.3.19	Fruit secondary colour at commercial ripeness
7.3.20	Fruit secondary colour distribution at commercial ripeness
7.3.29	Fruit flesh colour
7.3.35	Soluble solids content
7.4.1	Number of seeds per fruit

Annex II. COLLECTING FORM for pepino

SAMPLE IDENTIFICATION

COLLECTING INSTITUTE (2.1):

COLLECTING No. (2.2): PHOTOGRAPH No. (2.20)

COLLECTING DATE OF SAMPLE (2.3):

SPECIES (1.7): SUBTAXA (1.8) COMMON CROP NAME (1.11):

COLLECTING SITE LOCATION

COUNTRY OF ORIGIN (2.4): PROVINCE/STATE (2.6):

LOCATION (2.6): km: direction: from:

LATITUDE (2.7): LONGITUDE (2.8) ELEVATION (2.9): m asl

COLLECTING SITE ENVIRONMENT

COLLECTING/ACQUISITION SOURCE (2.10):
10 Wild habitat 20 Farm or cultivated habitat 30 Market or shop
40 Institute/Exp. station/Research Organization/Genebank 50 Seed company
60 Weedy, disturbed or ruderal habitat 99 Other (specify):

HIGHER LEVEL LANDFORM (6.1.2)
1 Plain 2 Basin 3 Valley 4 Plateau 5 Upland 6 Hill 7 Mountain

SLOPE [°] (6.1.3): SLOPE ASPECT (6.1.4): (code N,S,E,W)

OVERALL VEGETATION SURROUNDING AND AT THE SITE (6.1.6):
1 Grassland 2 Forbland 3 Forest 4 Woodland 5 Shrubland 6 Savanna 99 Other (specify)

SOIL DRAINAGE (6.1.7):
3 Poorly drained 5 Moderately drained 7 Well drained

RAINFALL (6.1.10): Annual mean: |___| mm

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Monthly mean [mm]:	|___|	|___|	|___|	|___|	|___|	|___|	|___|	|___|	|___|	|___|	|___|

TEMPERATURE (6.1.12): Seasonal mean: |___| °C

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Monthly mean [°C]:	|___|	|___|	|___|	|___|	|___|	|___|	|___|	|___|	|___|	|___|	|___|

SAMPLE

BIOLOGICAL STATUS OF SAMPLE (2.12):
100 Wild 200 Weedy 300 Traditional cultivar/Landrace
400 Breedling/Research material 500 Advanced/improved cultivar 999 Other (specify):

TYPE OF SAMPLE (2.13):
1 Vegetative 2 Seed 99 Other (specify)

NUMBER OF PLANTS SAMPLED (2.14):

NUMBER OF SEEDS COLLECTED (2.15):

NUMBER OF CUTTINGS COLLECTED (2.16):

GENERAL APPEARANCE OF THE POPULATION (2.17): 3 Poor 5 Medium 7 Good

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POPULATION ISOLATION (2.18): km

PREVAILING STRESSES (2.19.7):
Mention the types of major stresses, i.e. abiotic (drought, salinity, etc.), biotic (pests, diseases, etc.)

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ETHNOBOTANICAL DATA

LOCAL/VERNACULAR NAME (2.19.2)

ETHNIC GROUP (2.19.1):

HISTORY OF PLANT USES (2.19.3):
1 Ancestral/indigenous 2 Introduced (but in unknown past) 3 Introduced (time of introduction known)

USES OF THE ACCESSION (2.19.4)
1 Dessert fruit 2 Salad 3 Cooked 4 Medicinal 5 Ornamental 99 Other (specify)

RIPENING STAGE OF FRUIT AT CONSUMPTION (2.19.5):
1 Ripe 2 Unripe but physiologically mature 3 Unripe but physiologically immature

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CULTURAL CHARACTERISTICS (2.19.6):
If yes, specify if there is any folklore (i.e. taboos, stories, etc. associated with the accession)
0 No 1 Yes

SOWING DATE [YYYYMMDD] (2.19.8.1):

FIRST HARVEST DATE [YYYYMMDD] (2.19.8.2):

LAST HARVEST DATE [YYYYMMDD] (2.19.8.3):

CROPPING SYSTEM (2.19.9): 1 Monoculture 2 Intercropped (specify crop/s)

MODE OF REPRODUCTION (2.19.10): 1 Vegetative 2 Seed 3 Both

SEASONALITY (2.19.12):
1 Available only in season/at particular period (specify) 2 Available throughout the year

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ASSOCIATED FLORA (2.19.11):
Mention other dominant crop/plant species, found in and around the collecting site

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CHARACTERIZATION

Stem colour (7.1.10): Type of leaves (7.1.20): Inflorescence type (7.2.2):
Corolla shape (7.24): Mean fruit weight [g] (7.3.4): Fruit length/width ratio (7.39):
Predominant fruit shape (7.3.12): Fruit predominant colour at commercial ripeness (7.3.18):
Fruit secondary colour at commercial ripeness (7.3.19):
Fruit secondary colour distribution at commercial ripeness (7.3.20): Fruit flesh colour (7.3.29):

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Collector's notes:

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