Descriptors for

Tree tomato
and wild relatives

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**List of Descriptors**

<table>
<thead>
<tr>
<th>Descriptor</th>
<th>Year</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allium (E/S)</td>
<td>2000</td>
<td><em>Panicum miliaceum</em> and <em>P. sumatrense</em> (E) 1985</td>
</tr>
<tr>
<td>Almond (revised) * (E)</td>
<td>1985</td>
<td>Papaya (E) 1988</td>
</tr>
<tr>
<td>Apple * (E)</td>
<td>1982</td>
<td>Peach * (E) 1985</td>
</tr>
<tr>
<td>Apricot * (E)</td>
<td>1984</td>
<td>Pear * (E) 1983</td>
</tr>
<tr>
<td>Avocado (E/S)</td>
<td>1995</td>
<td><em>Phaseolus acutifolius</em> (E) 1985</td>
</tr>
<tr>
<td>Bambara groundnut (E/F)</td>
<td>2000</td>
<td>Pepino (E) 2004</td>
</tr>
<tr>
<td>Banana (E/S/F)</td>
<td>1996</td>
<td><em>Phaseolus vulgaris</em> (E/P) 1982</td>
</tr>
<tr>
<td>Barley (E)</td>
<td>1994</td>
<td><em>Phaseolus cocineus</em> (E) 1983</td>
</tr>
<tr>
<td>Beta (E)</td>
<td>1991</td>
<td><em>Phaseolus lunatus</em> (P) 2001</td>
</tr>
<tr>
<td>Black pepper (E/S)</td>
<td>1995</td>
<td><em>Phaseolus vulgaris</em> (E/P) 1982</td>
</tr>
<tr>
<td>Brassica and Raphanusus (E)</td>
<td>1990</td>
<td>Pigeonpea (E) 1993</td>
</tr>
<tr>
<td>Brassica campestris L. (E)</td>
<td>1987</td>
<td>Pineapple (E) 1991</td>
</tr>
<tr>
<td>Buckwheat (E)</td>
<td>1994</td>
<td><em>Pistacia</em> (excluding <em>P. vera</em>) (E) 1998</td>
</tr>
<tr>
<td>Capsicum * (E/S)</td>
<td>1995</td>
<td><em>Pistacia</em> (excluding <em>P. vera</em>) (E) 1998</td>
</tr>
<tr>
<td>Cardamom (E)</td>
<td>1994</td>
<td>Plum * (E) 1985</td>
</tr>
<tr>
<td>Carrot (E/S/F)</td>
<td>1999</td>
<td>Potato varieties * (E) 1985</td>
</tr>
<tr>
<td>Cashew * (E)</td>
<td>1986</td>
<td>Quinua * (S) 1981</td>
</tr>
<tr>
<td>Chenopodium pallidicaule (S)</td>
<td>2005</td>
<td>Rambutan (E) 2003</td>
</tr>
<tr>
<td>Cherimoya (E/S)</td>
<td>2008</td>
<td>Rice * (E/P) 2007</td>
</tr>
<tr>
<td>Cherry * (E)</td>
<td>1985</td>
<td>Rocket (E/I) 1999</td>
</tr>
<tr>
<td>Chickpea (E)</td>
<td>1993</td>
<td>Rye and <em>Triticale</em> * (E) 1985</td>
</tr>
<tr>
<td>Citrus (E/F/S)</td>
<td>1999</td>
<td><em>Safflower</em> * (E) 1983</td>
</tr>
<tr>
<td>Coconut (E)</td>
<td>1992</td>
<td>Sesame * (E) 2004</td>
</tr>
<tr>
<td>Coffee (E/S/F)</td>
<td>1996</td>
<td><em>Setaria italica</em> and <em>S. pumila</em> (E) 1985</td>
</tr>
<tr>
<td>Cotton * (Revised) (E)</td>
<td>1985</td>
<td><em>Sorghum</em> (E/F) 1993</td>
</tr>
<tr>
<td>Cowpea * (E)</td>
<td>1983</td>
<td><em>Sorghum</em> (E/F) 1993</td>
</tr>
<tr>
<td>Cultivated potato * (E)</td>
<td>1977</td>
<td>Soyabean * (E/C) 1984</td>
</tr>
<tr>
<td>Date palm (F)</td>
<td>2005</td>
<td>Strawberry (E) 1986</td>
</tr>
<tr>
<td>Echinochloa Millet * (E)</td>
<td>1983</td>
<td>Sunflower * (E) 1985</td>
</tr>
<tr>
<td>Eggplant (E/F)</td>
<td>1990</td>
<td>Sweet potato (E/S/F) 1991</td>
</tr>
<tr>
<td>Faba bean * (E)</td>
<td>1985</td>
<td>Taro (E/F/S) 1999</td>
</tr>
<tr>
<td>Fig (E)</td>
<td>2003</td>
<td>Tea (E/S/F) 1997</td>
</tr>
<tr>
<td>Finger millet * (E)</td>
<td>1985</td>
<td>Tomato (E/S/F) 1996</td>
</tr>
<tr>
<td>Forage grass * (E)</td>
<td>1985</td>
<td>Tropical fruit * (E) 1980</td>
</tr>
<tr>
<td>Forage legumes * (E)</td>
<td>1984</td>
<td>Ulluco (S) 2003</td>
</tr>
<tr>
<td>Grapevine (E/S/F)</td>
<td>1997</td>
<td><em>Vigna aconitifolia</em> and <em>V. trilobata</em> (E) 1985</td>
</tr>
<tr>
<td>Groundnut (E/S/F)</td>
<td>1992</td>
<td><em>Vigna mungo</em> and <em>V. radiata</em> (Revised) * (E) 1985</td>
</tr>
<tr>
<td>Hazelnut (E)</td>
<td>2008</td>
<td>Walnut (E) 1994</td>
</tr>
<tr>
<td>Jackfruit (E)</td>
<td>2000</td>
<td>Wheat (Revised) * (E) 1985</td>
</tr>
<tr>
<td>Kodo millet * (E)</td>
<td>1983</td>
<td>Wheat and <em>Aegilops</em> * (E) 1978</td>
</tr>
<tr>
<td>Lathyrus spp. (E)</td>
<td>2000</td>
<td>White clover (E) 1992</td>
</tr>
<tr>
<td>Lentil * (E)</td>
<td>1985</td>
<td>Winged bean * (E) 1979</td>
</tr>
<tr>
<td>Lima bean * (E)</td>
<td>1982</td>
<td><em>Xanthosoma</em> * (E) 1989</td>
</tr>
<tr>
<td>Litchi (E)</td>
<td>2002</td>
<td><em>Yam</em> (E/S/F) 1997</td>
</tr>
<tr>
<td>Lupin * (E/S)</td>
<td>1981</td>
<td>Biodiversity publications are available free of charge to the libraries of genebanks, university departments, research institutions, etc., in the developing world. E, F, S, C, P, I, R, and A indicate English, French, Spanish, Chinese, Portuguese, Italian, Russian and Arabic, respectively. When separated by a slash sign (/), they indicate multilingual titles. Titles marked with an asterisk are out of print, but are available as Adobe Acrobat portable document format (PDF) on request (send E-mail to: <a href="mailto:bioversity-publications@cgiar.org">bioversity-publications@cgiar.org</a>).</td>
</tr>
</tbody>
</table>
Descriptors for Tree tomato and wild relatives
**Bioversity International** is a world leading research-for-development non-profit organization, working towards a world in which smallholder farming communities in developing countries are thriving and sustainable. Bioversity International’s purpose is to investigate the use and conservation of agricultural biodiversity in order to achieve better nutrition, improve smallholders’ livelihoods and enhance agricultural sustainability. Bioversity International works with a global range of partners to maximize impact, to develop capacity and to ensure that all stakeholders have an effective voice.

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**The Departamento de Ciencias Agropecuarias y de Alimentos** is an educational and research centre of the Universidad Técnica Particular de Loja, Ecuador (UTPL). Its main research objective is to contribute to the improvement of agricultural and food production and natural resource conservation through applied research including management and conservation of phylogenetic resources.

**The Instituto de Conservación y Mejora de la Agrodiversidad Valenciana** (COMAV) was established in 1999 as a multidisciplinary research centre 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. Its research focuses on *Solanaceae* and *Cucurbitaceae* vegetable crops.

**Citation**

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Tree tomato
PREFACE

The ‘Descriptors for tree tomato (Solanum betaceum Cav.) and wild relatives’ were developed by Dr. Pablo Geovanny Acosta-Quezada, Eng. Tania Elizabeth Riofrío-Cuenca, Prof. Dr. Juan Bautista Martínez-Laborde, and Prof. Dr. Jaime Prohens. They have been produced as an output of the PhD research work of Dr. Acosta-Quezada¹ (2011) and subsequent investigations on the diversity of tree tomato by the authors. Information on wild species characteristics for the elaboration of the descriptors has been mostly based on the personal experience of the authors and the research findings of L. Bohs (1994). The draft document was enriched with valuable research inputs from Drs. Clara Ines Medina Cano and Mario Lobo Arias (Medina and Lobo, 2006) from CORPOICA, Colombia. The scientific overview of this document was provided by Dr. Stefano Padulosi, and the technical advice by Adriana Alercia from Bioversity.

A draft version prepared in the Bioversity internationally accepted format for descriptor lists was circulated among a number of international experts for their comments. A full list of the names and addresses of those involved in the production of this publication is given in the Contributors section.

Bioversity International (formerly known as IPGRI) encourages the collecting of data for all five types of descriptors (see Definitions and Use of the Descriptors), whereby data from the first four categories—Passport, Management, Environment and Site, and Characterization—should be made available for any accession. The number of descriptors selected in each of the categories will depend on the crop and their importance to the crop’s description. Descriptors listed under Evaluation allow for a more extensive description of the accession, but generally require repeated 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 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 into the Bioversity format, will produce a rapid, reliable, and efficient means for information storage, retrieval and communication, and will assist with the use 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 it contains. This approach assists with the standardization of descriptor definitions. Bioversity does not, however, assume that curators will characterize accessions of their collection using all descriptors given. Descriptors should be used when they are useful to curators for the management and maintenance of the collection or to the users of plant genetic resources, or both. To this end, highly discriminating descriptors are listed at the beginning of the Characterization section and are highlighted in the text to facilitate selection of descriptors.

¹ Morphological and molecular characterization of tree tomato, Solanum betaceum Cav. (Solanaceae)
The ‘List of Multi-crop Passport Descriptors’ (FAO/Bioversity, 2012) was developed to provide consistent coding schemes for common passport descriptors across crops. They are marked in the text as [MCPD]. 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 ‘List of synonymies between *Solanum* and *Cyphomandra* names’ is given in Annex I. In Annex II, the reader will find a ‘Collecting form for tree tomato’ that will facilitate data collection.

Any suggestions for improvement of the ‘Descriptors for tree tomato and wild relatives’ will be highly appreciated by Bioversity, Departamento de Ciencias Agropecuarias y de Alimentos, and COMAV.

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2 Contact: Adriana Alercia at a.alercia@cgiar.org
The tree tomato or tamarillo (*Solanum betaceum* Cav.) is a neglected Andean crop (Sánchez-Vega, 1992), which nonetheless is quite popular in local markets of South America especially for being consumed in juices and as a fresh fruit. This crop represents an important alternative for diversification of fruit production both in its region of origin and also in other areas of the world. In this respect, important efforts have been made for the development of the crop in Colombia, Ecuador and New Zealand, where production and exports have increased markedly in the last decades (Bohs, 1994; Espinal *et al*., 2005; Acosta-Quezada, 2011; Scotsmans *et al*., 2011). In addition, it is considered as a promising crop for some regions characterized by a Mediterranean climate (Prohens & Nuez, 2000).

The tree tomato is native to the subtropical Andes and is only known in a cultivated state; it is believed that its domestication and cultivation predate the discovery of the Americas (Bohs, 1989; Sánchez-Vega, 1992). Regarding its area of origin, Bohs (1991) and Bohs & Nelson (1997) suggest that *S. betaceum* could be native to Bolivia, as *S. betaceum* is closely related to *S. unilobum*, *S. roseum*, and in particular to *S. maternum*, all of which are found in Bolivia in wild status (Bohs, 1994, 1995; Lester & Hawkes, 2001; Bohs & Nelson, 1997). Little information is available on the domestication of the tree tomato, and at present it is unknown when and where this process took place. In any case, representations of the tree tomato plant on pottery discovered in Peru (Towle, 1961) correspond only to modern pre-Columbian cultures, which may suggest a relatively recent domestication of this crop.

The tree tomato is related to a group of species that were included in the former genus *Cyphomandra* (see Annex I for synonymies). However, on the basis of morphological and molecular evidence, the species in genus *Cyphomandra* were transferred to the genus *Solanum*, subgenus *Bassovia* (D’Arcy, 1991; Bohs, 1994; Bohs, 1995). Nowadays, the *Solanum* names are used by the scientific community to refer to the tree tomato and wild relatives.

Apart from the cultigen, some of the wild species of the *Cyphomandra* group, such as *S. circinatum*, *S. sibundoyense* and *S. cajanumanse*, produce edible fruits, which are harvested on occasion from the wild. Other wild species of this group are used for medicines and dyes. This indicates that this group of plants has a great potential for several purposes, which should be explored (Bohs, 1989).

The study of the tree tomato and wild relatives is very important for the conservation of plant genetic resources, for their use and, in the case of the tree tomato, for its genetic improvement (Acosta-Quezada *et al*., 2011). In this regard, the descriptors for tree tomato and related species of the *Cyphomandra* group reported in this work follow the international standardized documentation system for the characterization and study of the genetic resources as promoted by Bioversity (Bioversity International, 2007; Gotor *et al*., 2008).

This work is expected to contribute to studies focusing on the analysis of genetic diversity, germplasm management, the definition of new varieties, and the search for markers of agronomic traits for crop management and improvement, besides being aimed at the common goal of enhancing the use and conservation of plant genetic resources (González-Andrés 2001; Engels & Visser, 2003, Colin *et al*., 2010).
Different common names can be found in literature, depending on the language. The most common are the following:

<table>
<thead>
<tr>
<th>Language</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dutch</td>
<td>boomtomaat</td>
</tr>
<tr>
<td>English</td>
<td>tamarillo, tree tomato</td>
</tr>
<tr>
<td>French</td>
<td>tomate d’arbre</td>
</tr>
<tr>
<td>German</td>
<td>Baumtomate</td>
</tr>
<tr>
<td>Indonesian</td>
<td>Térong blanda</td>
</tr>
<tr>
<td>Italian</td>
<td>pomodoro arboreo</td>
</tr>
<tr>
<td>Portuguese</td>
<td>tomate de érvore, tomate francês</td>
</tr>
<tr>
<td>Spanish</td>
<td>tomate de árbol, tomate de ají, lima tomate, pepino de árbol, tomate de palo, tomate extranjero, tamarillo, sachatomate, chilto, tomate andino.</td>
</tr>
</tbody>
</table>
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 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 highlighted in the text and are listed at the beginning of the Characterization section.

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

(a) the Système International d’Unités (SI);

(b) the units to be applied are given in square brackets following the descriptor name;
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);

the three-letter abbreviations from the *International Standard (ISO) Codes for the representation of names of countries* are used (http://unstats.un.org/unsd/methods/m49/m49alpha.htm);

quantitative characters, i.e. those that are continuously variable, should preferably be measured quantitatively. Alternatively, in cases where it is difficult to measure quantitatively, it is acceptable to score instead on a 1–9 scale, where:

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Very low</td>
<td>6</td>
<td>Intermediate to high</td>
</tr>
<tr>
<td>2</td>
<td>Very low to low</td>
<td>7</td>
<td>High</td>
</tr>
<tr>
<td>3</td>
<td>Low</td>
<td>8</td>
<td>High to very high</td>
</tr>
<tr>
<td>4</td>
<td>Low to intermediate</td>
<td>9</td>
<td>Very high</td>
</tr>
<tr>
<td>5</td>
<td>Intermediate</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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;

when a descriptor is scored using a 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 leaf hairs:

**Leaf hairiness**

Observed on abaxial side

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Absent (glabrous)</td>
</tr>
<tr>
<td>1</td>
<td>Puberulent</td>
</tr>
<tr>
<td>2</td>
<td>Pubescent</td>
</tr>
<tr>
<td>3</td>
<td>Pilose</td>
</tr>
<tr>
<td>4</td>
<td>Tomentose</td>
</tr>
</tbody>
</table>

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

**Presence of stone cell aggregates in mesocarp**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Absent</td>
</tr>
<tr>
<td>1</td>
<td>Present</td>
</tr>
</tbody>
</table>

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 recorded numerically as YYYYMMDD, where

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

If the month or days are missing, this should be indicated with hyphens or ‘00’ [double zero]. (e.g. 1975----, 19750000; 197506--, 19750600).
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

FAO WIEWS 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 http://apps3.fao.org/wiews/wiews.jsp

1.2 Accession number

This number serves as a unique identifier for accessions within a genebank, 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 reused. Letters should be used before the number to identify the genebank or national system (e.g. CGN indicates an accession from the genebank in Wageningen, the Netherlands; PI indicates an accession within the USA system)

1.3 Donor institute code

FAO WIEWS code of the donor institute. (See instructions under Institute code, 1.1)

1.3.1 Donor institute name

Name of the donor institute (or person). This descriptor should be used only if DONORCODE cannot be filled because the FAO WIEWS code for this institute is not available.

1.4 Donor accession number

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

1.5 Other identifiers associated with the accession

Any other identifiers known to exist in other collections for this accession. Use the following format: INSTCODE:ACCENUMB;INSTCODE:identifier;… INSTCODE and identifier are separated by a colon without space. Pairs of INSTCODE and identifier are separated by a semicolon without space. When the institute is not known, the identifier should be preceded by a colon.

1.6 Genus

Genus name for taxon. Initial uppercase letter required
1.7 Species
Specific epithet portion of the scientific name in lowercase letters. Only the following abbreviation is allowed: ‘sp.’

1.7.1 Species authority
Provide the authority for the species name

1.8 Subtaxon
Subtaxon 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); ‘Group’ (for ‘cultivar group’)

1.8.1 Subtaxon authority
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 the case of mutant or selection)

1.10 Accession

1.10.1 Accession name
Either a registered or other designation given to the material received other than the Donor accession number, 1.4 or Collecting number, 2.2. First letter uppercase. Multiple names are separated by a semicolon without space. Example: Accession name: Bogatyr;Symphony;Emma.

1.10.2 Synonyms
Include here any names other than the current one. Newly assigned station names are frequently used as synonyms

1.10.3 Common crop name

1.11 Acquisition date [YYYYMMDD]
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 or double zero.

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

FAO WIEWS 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. Multiple values are separated by a semicolon without space. (See instructions under Institute code, 1.1)

2.1.1 Collecting institute name

Name of the institute collecting the sample. This descriptor should be used only if Collecting institute code cannot be filled because the FAO WIEWS code for this institute is not available. Multiple values are separated by a semicolon without space.

2.1.1.1 Collecting institute address

Address of the institute collecting the sample. This descriptor should be used only if Collecting institute code cannot be filled since the FAO WIEWS code for this institute is not available. Multiple values are separated by a semicolon without space.

2.2 Collecting number

Original identifier assigned by the collector(s) of the sample, normally composed of the name or initials of the collector(s) followed by a number (e.g. ‘FM9909’). This identifier is essential for identifying duplicates held in different collections. It should be unique and always accompany subsamples wherever they are sent.

2.3 Collecting date of sample [YYYYMMDD]

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 with hyphens or double zero [00].

2.4 Collecting mission identifier

Identifier of the collecting mission used by the Collecting institute 2.1 or 2.1.1 (e.g. ‘CIATFOR-052’, ‘CN426’).

2.5 Country of origin

Three-letter ISO 3166-1 code of the country in which the sample was originally collected (e.g. landrace, crop wild relative, farmers’ variety), bred or selected (breeding lines, GMOs, segregating populations, hybrids, modern cultivars, etc.).
2.6 Breeding institute code [MCPD]
FAO WIEWS 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. Follow the Institute code 1.1 standard. Multiple values are separated by a semicolon without space.

2.6.1 Breeding institute name [MCPD]
Name of the institute (or person) that bred the material. This descriptor should be used only if BRED_CODE cannot be filled because the FAO WIEWS code for this institute is not available. Multiple names are separated by a semicolon without space.

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

Geographical coordinates

- For latitude and longitude descriptors, two alternative formats are proposed, but the one reported by the collecting mission should be used

- Latitude and longitude in decimal degree format with a precision of four decimal places corresponds to approximately 10 m at the Equator and describes the point-radius representation of the location, along with geodetic datum and coordinate uncertainty in metres.

The following two mutually exclusive formats can be used for latitude and longitude:

2.8 Latitude of collecting site [DDMMSSH] [MCPD]
Degrees (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)

2.8a Latitude of collecting site [-/+DD.DDDD] [MCPD]
Latitude expressed in decimal degrees. Positive values are North of the Equator; negative values are South of the Equator (e.g. -44.6975)

2.9 Longitude of collecting site [DDDDMMSSH] [MCPD]
Degrees (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)
2.9a Longitude of collecting site [-/+DDD.DDDD] [MCPD]
Longitude expressed in decimal degrees. Positive values are East of the Greenwich Meridian; negative values are West of the Greenwich Meridian (e.g. +120.9123).

2.10 Coordinate uncertainty [m] [MCPD]
Uncertainty associated with the coordinates in metres. Leave the value empty if the uncertainty is unknown.

2.11 Coordinate datum [MCPD]
The geodetic datum or spatial reference system upon which the coordinates given in decimal latitude and decimal longitude are based (e.g. WGS84, ETRS89, NAD83). The GPS uses the WGS84 datum.

2.12 Georeferencing method [MCPD]
The georeferencing method used (GPS, determined from map, gazetteer, or estimated using software). Leave the value empty if georeferencing method is not known.

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

2.14 Collecting /acquisition source [MCPD]
The coding scheme proposed can be used at 2 different levels of detail: either by using the general codes (in boldface) such as 10, 20, 30, 40, etc., or by using the more specific codes, such as 11, 12, etc.

10 Wild habitat
11 Forest or woodland
12 Shrubland
13 Grassland
14 Desert or tundra
15 Aquatic habitat

20 Farm or cultivated area
21 Field
22 Orchard
23 Backyard, kitchen or home garden (urban, periurban 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
### 2.15 Biological status of accession

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

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td><strong>Wild</strong></td>
</tr>
<tr>
<td>110</td>
<td>Natural</td>
</tr>
<tr>
<td>120</td>
<td>Semi-natural/wild</td>
</tr>
<tr>
<td>130</td>
<td>Semi-natural/sown</td>
</tr>
<tr>
<td>200</td>
<td><strong>Weedy</strong></td>
</tr>
<tr>
<td>300</td>
<td><strong>Traditional cultivar/landrace</strong></td>
</tr>
<tr>
<td>400</td>
<td><strong>Breeding/research material</strong></td>
</tr>
<tr>
<td>410</td>
<td>Breeder’s line</td>
</tr>
<tr>
<td>411</td>
<td>Synthetic population</td>
</tr>
<tr>
<td>412</td>
<td>Hybrid</td>
</tr>
<tr>
<td>413</td>
<td>Founder stock/base population</td>
</tr>
<tr>
<td>414</td>
<td>Inbred line (parent of hybrid cultivar)</td>
</tr>
<tr>
<td>415</td>
<td>Segregating population</td>
</tr>
<tr>
<td>416</td>
<td>Clonal selection</td>
</tr>
<tr>
<td>420</td>
<td>Genetic stock</td>
</tr>
<tr>
<td>421</td>
<td>Mutant (e.g. induced/insertion mutants, tilling populations)</td>
</tr>
<tr>
<td>422</td>
<td>Cytogenetic stocks (e.g. chromosome addition/substitution, aneuploids, amphiploids)</td>
</tr>
<tr>
<td>423</td>
<td>Other genetic stocks (e.g. mapping populations)</td>
</tr>
<tr>
<td>500</td>
<td><strong>Advanced/improved cultivar</strong> (conventional breeding methods)</td>
</tr>
<tr>
<td>600</td>
<td><strong>GMO</strong> (by genetic engineering)</td>
</tr>
<tr>
<td>999</td>
<td><strong>Other</strong> (elaborate in descriptor 2.25 Remarks)</td>
</tr>
</tbody>
</table>

### 2.16 Collecting source environment

Use descriptors 6.1 to 6.2 in section 6

### 2.17 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.

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vegetative</td>
</tr>
<tr>
<td>2</td>
<td>Seed</td>
</tr>
<tr>
<td>99</td>
<td>Other (specify which part of the plant in descriptor 2.25 Remarks)</td>
</tr>
</tbody>
</table>
2.18 **Number of plants sampled**
Appropriate number of plants collected in the field to produce this accession

2.19 **Number of seeds collected**

2.20 **General appearance of population**
Provide a subjective assessment of the general appearance of the population

<table>
<thead>
<tr>
<th>Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Poor</td>
</tr>
<tr>
<td>5</td>
<td>Medium</td>
</tr>
<tr>
<td>7</td>
<td>Good</td>
</tr>
</tbody>
</table>

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

2.22 **Ethnobotanical data**
Information on traditional attributes of the sample in place for collecting runs (community): uses, methods of preparation, native names, healing properties, cultural beliefs and other characteristics.

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

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

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

2.22.3 **History of plant use**

<table>
<thead>
<tr>
<th>Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ancestral/indigenous (always associated with the place and community)</td>
</tr>
<tr>
<td>2</td>
<td>Introduced (but in unknown distant past)</td>
</tr>
<tr>
<td>3</td>
<td>Introduced (time of introduction known)</td>
</tr>
</tbody>
</table>

2.22.4 **Parts of the plant used**

<table>
<thead>
<tr>
<th>Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fruit</td>
</tr>
<tr>
<td>2</td>
<td>Seed</td>
</tr>
<tr>
<td>3</td>
<td>Leaf</td>
</tr>
</tbody>
</table>
| 99     | Other (specify in descriptor **2.25 Remarks**)**
2.22.5 Plant use
1 Fresh fruit
2 Juice
3 Dessert fruit
4 Salad
5 Cooked
6 Medicinal
7 Industrial
99 Other (specify in descriptor 2.25 Remarks)

2.22.6 Cultural characteristics
Is there any folklore associated with the collected Solanum species (e.g. taboos, stories and/or superstitions)? If so, describe it briefly in descriptor 2.25 Remarks
0 No
1 Yes

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

2.22.8 Cultural practices

2.22.8.1 Sowing date [YYYYMMDD]

2.22.8.2 First harvest date [YYYYMMDD]

2.22.8.3 Last harvest date [YYYYMMDD]

2.22.9 Cropping system
1 Monoculture
2 Intercropped (specify other crops in descriptor 2.25 Remarks)

2.22.10 Mode of reproduction
1 Vegetative
2 Seed
3 Both

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

2.22.12 Seasonality
1 Available only in season/at particular period
2 Available throughout the year
2.23  Photograph
Was a photograph(s) taken of the sample or habitat at the time of collecting? If so, provide an identification number(s) in the descriptor 2.25 Remarks

- 0  No
- 1  Yes

2.24  Herbarium specimen
Was a herbarium specimen collected? If so, provide an identification number in descriptor 2.25 Remarks and indicate in which place (herbarium) the tree tomato specimen was deposited

- 0  No
- 1  Yes

2.25  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

3.2 Population identification
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
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
40 Cryopreserved collection
50 DNA collection
99 Other (elaborate in 3.17 Remarks)

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

3.6 Acquisition date [YYYYMMDD]
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 or 00 [double zero]

3.7 Location of safety duplicates
FAO WIEWS code of the institute(s) where a safety duplicate of the accession is maintained. Multiple values are separated by a semicolon without space. It follows 1.1 Institute code
3.7a Institute maintaining safety duplicates [MCPD]
Name of the institute where a safety duplicate of the accession is maintained. This descriptor should be used only if INSTCODE cannot be filled because the FAO WIEWS code for this institute is not available. Multiple values are separated by a semicolon without space.

3.8 MLS status of the accession [MCPD]
The status of an accession with regard to the Multilateral System (MLS) of the International Treaty on Plant Genetic Resources for Food and Agriculture. Leave the value empty if the status is not known

0 No (not included)
1 Yes (included)
99 Other (elaborate in Remarks field, e.g. ‘under development’)

3.9 Storage date [YYYYMMDD]

3.10 Seed germination at storage [%]

3.11 Date of last seed germination test [YYYYMMDD]

3.12 Seed germination at the last test [%]

3.13 Date of last regeneration [YYYYMMDD]

3.14 Date of next seed germination test [YYYYMMDD]
(Estimate)

3.15 Date of next regeneration [YYYYMMDD]
(Estimate)

3.16 Seed moisture content at harvest [%]

3.17 Seed moisture content at storage (initial) [%]

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 2.2]
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 seed germination [%]

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 Pruning date
Specify frequency

4.10.6 Mounding
Specify frequency

4.10.7 Field spacing

4.10.7.1 Distance between plants in a row [m]

4.10.7.2 Distance between rows [m]
4.10.8 **Fertilizer application** [g/m2]
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 descriptor 4.19 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 descriptor 4.19 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**
Estimated using pollen viability tests (e.g. X-Gal test, MTT enzymatic test, acetocarmine stainability test, etc.)
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  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 2.5 Country of origin)

5.2 Site (research institute)

5.2.1 Latitude
(See format under 2.8/2.8a)

5.2.2 Longitude
(See format under 2.9/2.9a)

5.2.3 Elevation [m asl]

5.2.4 Name of farm or institute

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 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)

<table>
<thead>
<tr>
<th>Topography</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flat</td>
<td>0–0.5%</td>
</tr>
<tr>
<td>Almost flat</td>
<td>0.6–2.9%</td>
</tr>
<tr>
<td>Gently undulating</td>
<td>3–5.9%</td>
</tr>
<tr>
<td>Undulating</td>
<td>6–10.9%</td>
</tr>
<tr>
<td>Rolling</td>
<td>11–15.9%</td>
</tr>
<tr>
<td>Hilly</td>
<td>16–30%</td>
</tr>
<tr>
<td>Steeply dissected</td>
<td>&gt;30%, moderate elevation range</td>
</tr>
<tr>
<td>Mountainous</td>
<td>&gt;30%, great elevation range (&gt;300 m)</td>
</tr>
<tr>
<td>Other (specify in descriptor 6.2 Remarks)</td>
<td></td>
</tr>
</tbody>
</table>

6.1.2 Higher level landform (general physiographic features)
The landform refers to the shape of the land surface in the area in which the site is located (adapted from FAO 1990)

<table>
<thead>
<tr>
<th>Landform</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plain</td>
</tr>
<tr>
<td>Basin</td>
</tr>
<tr>
<td>Valley</td>
</tr>
<tr>
<td>Plateau</td>
</tr>
<tr>
<td>Upland</td>
</tr>
<tr>
<td>Hill</td>
</tr>
<tr>
<td>Mountain</td>
</tr>
</tbody>
</table>
6.1.3 **Land element and position**
Description of the geomorphology of the immediate surroundings of the site (adapted from FAO 1990). (See Fig. 1)

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

Fig. 1. Land element and position
6.1.4 Slope [°]
Estimated slope of the site

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

6.1.6 Crop agriculture
(From FAO, 2006)
1 Annual field cropping
2 Perennial field cropping
3 Tree and shrub cropping

6.1.7 Overall vegetation surrounding and at the site
(Adapted from FAO, 2006)
10 Herbaceous
11 Grassland
12 Forb land
20 Closed forest (continuous tree layer, crowns overlapping, large number of tree and shrub species in distinct layers)
30 Woodland (continuous tree layer, crowns usually not touching, understory may be present)
40 Scrubland
50 Dwarf shrubs
99 Other (specify in appropriate descriptor Remarks)

6.1.8 Soil drainage
(Adapted from FAO, 2006)
3 Poorly drained
5 Moderately drained
7 Well drained
6.1.9 Soil matrix colour
(Adapted from FAO, 2006)
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  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

6.1.10 Soil texture classes
(Adapted from FAO, 2006). For convenience in determining the texture classes of the following list, particle size classes are given for each of the fine earth fractions listed below. (See Fig. 2).

   1 Clay
   2 Loam
   3 Clay loam
   4 Silt
   5 Silt clay
   6 Silt clay loam
   7 Silt loam
   8 Sandy clay
   9 Sandy clay loam
  10 Sandy loam
     10.1 Fine sandy loam
     10.2 Coarse sandy loam
  11 Loamy sand
     11.1 Loamy very fine sand
     11.2 Loamy fine sand
     11.3 Loamy coarse sand
  12 Sand (unspecified)
     12.1 Very fine sand
     12.2 Fine sand
     12.3 Medium sand
     12.4 Coarse sand
6.1.11 **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

6.1.12 **Water availability**
1 Rainfed
2 Irrigated
3 Flooded
4 River banks
5 Sea coast
99 Other (specify in appropriate descriptor **Remarks**)

6.1.13 **Soil fertility**
General assessment of the soil fertility based on existing vegetation
3 Low
5 Moderate
7 High
6.1.14 Climate of the site
Should be assessed as close to the site as possible

6.1.14.1 Temperature [°C]
Provide either the monthly or the annual mean

6.1.14.1.1 Number of recorded years

6.1.14.2 Duration of the dry season [d]

6.1.14.3 Rainfall [mm]
Provide either the monthly or the annual mean (state number of recorded years)

6.1.14.3.1 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 from five plants at least, when fruit ripening is at its peak. Young individuals are considered those being one year old and mature individuals those being 4-6 years old. To ensure consistent recording of colour states, the use of a standard colour chart is recommended. The Royal Horticultural Society (RHS) Colour Chart codes are provided in parentheses besides descriptors colour states.

**List of minimum discriminating descriptors for tree tomato**

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1.1</td>
<td>Plant height</td>
</tr>
<tr>
<td>7.2.2</td>
<td>Type of leaves in the crown</td>
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<td>7.2.6</td>
<td>Leaf blade shape</td>
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<td>7.2.15</td>
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<td>7.4.14</td>
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<td>7.4.16</td>
<td>Fruit mesocarp colour</td>
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<tr>
<td>7.4.17</td>
<td>Seed-mucilage colour</td>
</tr>
</tbody>
</table>
7.1 Tree

### 7.1.1 Plant height [m]
Measured from ground level to tree top in mature individuals

- 1 Short \((\leq 3.0)\)
- 2 Intermediate \((3.1 \text{ – } 4.5)\)
- 3 Tall \((4.6 \text{ – } 6.0)\)
- 4 Very tall \((> 6.0)\)

### 7.1.2 Stem length [cm]
Measured from the stem base to first branching in mature individuals

### 7.1.3 Stem diameter [cm]
Measured at 30 cm above ground level in mature individuals

### 7.1.4 Stem internode length [cm]
Measure length between the first and second nodes in young individuals

### 7.1.5 Tree crown diameter [cm]
Measure the crown diameter of the horizontal projection on the ground in mature individuals

### 7.1.6 Stem ramification
Measured in mature individuals

- 3 Low
- 5 Intermediate
- 7 High

### 7.1.7 Angle of branches with stem
Measured in the basal crown branches of mature individuals

- 1 Acute
- 2 Obtuse

### 7.1.8 Foliage density
Measured in mature individuals

- 3 Sparse
- 5 Intermediate
- 7 Dense
7.2 Leaf descriptors
Unless otherwise indicated, evaluated in full sized crown leaves of mature individuals

7.2.1 Type of leaves in the stem
Predominant type of leaves observed in a young plant
1 Simple
2 Compound
3 Both

7.2.2 Type of leaves in the crown
Predominant type of leaves observed in an adult plant
1 Simple
2 Compound
3 Both

7.2.3 Number of leaflets
Average number of leaflets in the predominant type of compound leaf. Score one (1) for simple leaves

7.2.4 Colour of young leaf
Measured at juvenile stage
1 Light green (138A, 144A, 146A)
2 Green (139A)
3 Dark green (189A, N189A)
4 Purple (77A, N77AB, 79BCD, N79AB)
99 Other (specify in descriptor 7.6 Notes)

7.2.5 Colour of fully developed leaf
1 Light green (RHS 138A, 144A, 146A)
2 Green (RHS 139A)
3 Dark green (189A, N189A)
99 Other (specify in descriptor 7.6 Notes)

7.2.6 Leaf blade shape
(See Fig. 3)
1 Cordate
2 Ovate
3 Obovate
4 Elliptic
5 Lanceolate
6 Oblique
99 Other (specify in descriptor 7.6 Notes)
7.2.7 Leaf apex shape

(See Fig. 4)

1. Acuminate
2. Acute
3. Apiculate
4. Obtuse

Fig. 3. Leaf blade shape

Fig. 4. Leaf apex shape
### 7.2.8 Leaf base shape

(See Fig. 5)

1. Cordate
2. Cuneate
3. Oblique
4. Obtuse
5. Subcordate

![Fig. 5. Leaf base shape](image_url)

### 7.2.9 Leaf margin

(See Fig. 6)

1. Entire
2. Crenate
3. Lobed
7.2.10 Leaf hairiness
Observed on abaxial side
0 Glabrous (i.e. without hairs)
1 Puberulent (i.e. covered with down or fine hairs)
2 Pubescent (i.e. covered with very short soft dense hairs)
3 Pilose (i.e. covered with short, thin hairs)
4 Tomentose (i.e. covered with short, dense, matted hairs)

7.2.11 Anthocyanin pigmentation of the leaf veins
0 Absent
1 Present

7.2.12 Leaf central vein length [cm]
Measured from the petiole insertion to the apex. (See Fig. 7.a)

7.2.13 Leaf lobe length [cm]
Measured as the difference between the lamina length and the leaf central vein length. (See Fig. 7.b). Score as 0 if no leaf lobes are present.

7.2.14 Leaf width at the petiole insertion [cm]
Measured at the petiole insertion point. (See Fig. 7.c)

7.2.15 Leaf maximum width [cm]
(See Fig. 7.d)
7.2.16 **Leaf petiole anthocyanin pigmentation**
0 Absent
1 Present

7.2.17 **Leaf petiole shape**
1 Cylindrical
2 Flattened
99 Other (specify in the Notes descriptors)

7.2.18 **Leaf petiole pubescence**
0 Absent
1 Present

7.2.19 **Leaf petiole length [cm]**
Measured from petiole base to leaf lamina base

7.2.20 **Leaf petiole diameter [mm]**
Measured in the middle part of the petiole
7.3 Inflorescence/flower descriptors

All flower observations should be taken when flowering is at its peak if possible, unless otherwise indicated. Record the average of at least five inflorescences/flowers from each of five different plants.

7.3.1 Inflorescence branching

(See Fig. 8)

1. Branched (like in *S. betaceum*)
2. Unbranched (like in *S. latiflorum*)
3. Forked (like in *S. roseum*)

Fig. 8. Inflorescence type
7.3.2 Inflorescence length [cm]
Measured as the distance from the inflorescence base to the apex

7.3.3 Inflorescence peduncle length [cm]

7.3.4 Inflorescence rachis internode length [cm]
Measured as the distance between the first and second nodes of the inflorescence rachis

7.3.5 Number of flowers per inflorescence

7.3.6 Flower pedicel length [cm]

7.3.7 Petal length [cm]

7.3.8 Petal width [cm]

7.3.9 Corolla diameter [cm]
Measured at the largest point

7.3.10 Corolla shape
(See Fig. 9)
1 Urceolate
2 Campanulate
3 Stellate

7.3.11 Corolla colour
1 Whitish
2 Yellowish
3 Yellowish-green
4 Greenish
5 Pinkish
6 Lavender
7 Reddish
8 Purplish
9 Violet
7.3.12 **Anther length** [cm]

7.3.13 **Anther thecae shape**
1. Oblong
2. Ovate
3. Lanceolate
4. Elliptic
5. Triangular

7.3.14 **Anther thecae colour**
1. White
2. Pale yellow
3. Yellow
4. Pinkish
5. Purplish
6. Violet

---

**Fig. 9. Corolla shape**
### 7.3.15 Anther connective colour
1. White
2. Pale yellow
3. Yellow
4. Pinkish
5. Purplish
6. Violet

### 7.3.16 Style length [cm]

### 7.3.17 Presence of leafy bracts
Report the presence of leafy bracts within the inflorescence
- 0 Absent
- 1 Present

### 7.3.18 Flower pubescence
- 0 Glabrous
- 1 Low
- 2 Intermediate
- 3 High

### 7.3.19 Ovary pubescence
- 0 Glabrous
- 1 Low
- 2 Intermediate
- 3 High

### 7.3.20 Flower odour
Recorded at anthesis
- 0 Absent
- 1 Mild
- 2 Strong

### 7.4 Fruit descriptors
Record the average of ten fruits from five different plants, at least. Unless otherwise indicated, all observations on the fruit should be taken when fruit ripening is at its peak, if possible

### 7.4.1 Number of fruits per plant
### 7.4.2 Number of fruits per infructescence

### 7.4.3 Immature fruit colour
1. Green
2. Green with green or greyish longitudinal stripes
3. Green mottled with dark green stripes
4. Light green with darker green stripes
5. Green spotted with white

### 7.4.4 Mature fruit colour
1. White
2. Green
3. Yellow
4. Orange
5. Red
6. Dark red
7. Purple
8. Blackish

### 7.4.5 Stripes in the mature fruit
0. Absent
1. Green
2. Purple
3. Deep purple

### 7.4.6 Fruit shape
(See Fig. 10)
1. Rounded
2. Ovate elongate
3. Ovoid
4. Elliptic
5. Fusiform
99. Other (specify in descriptor 7.6 Notes)
7.4.7 **Fruit apex shape**

(See Fig. 11)

1. Acuminate
2. Acute
3. Obtuse
99. Other (specify in descriptor 7.6 Notes)

7.4.8 **Fruit apex angle** [degrees]

Measured as the angle formed by the berry edges at 2 cm of the apex

7.4.9 **Fruit length** [cm]

Measured from the proximal to the distal part of the berry

7.4.10 **Fruit width** [cm]

Measured as the maximum width of the berry
7.4.11 **Fruit size uniformity**
3 Low
5 Intermediate
7 High

7.4.12 **Fruit pedicel length [cm]**

7.4.13 **Diameter of the internal cavity of the fruit [cm]**
Measured as the width of the cavity formed by the lobules

7.4.14 **Fruit weight [g]**

7.4.15 **Fruit hairiness**
0 Glabrous
1 Pubescent

7.4.16 **Fruit mesocarp colour**
1 Light green
2 Pale yellow
3 Orange yellow
4 Orange

7.4.17 **Seed-mucilage colour**
1 Orange
2 Purple

7.4.18 **Fruit skin thickness [mm]**

7.4.19 **Fruit surface**
1 Smooth
2 Slightly rough
7.4.20  **Fruit attractiveness**  
Combined assessment of shape, size and appearance, coloration, etc.  
1  Poor  
2  Average  
3  Good  
4  Excellent

7.4.21  **Fruit flavour**  
1  Very acidic  
3  Acidic  
5  Moderately sweet  
7  Sweet

7.4.22  **Bitter off-flavour**  
0  Absent  
3  Weak  
5  Intermediate  
7  Strong

7.4.23  **Pulp juiciness**  
1  Slightly juicy  
2  Juicy  
3  Very juicy

7.4.24  **Pulp aroma**  
1  Mild  
2  Intermediate  
3  Strong

7.4.25  **Fruit epidermis glossiness**  
3  Dull  
5  Intermediate  
7  Bright

7.4.26  **Fruit peeling**  
3  Easy  
5  Intermediate  
7  Difficult

7.4.27  **Stone cell aggregates in mesocarp**  
0  Absent  
1  Present
7.5 Seed

7.5.1 Number of seeds per fruit

7.5.2 100-seed weight [g]

7.5.3 Seed colour
1 Brown
2 Light brown
3 Dark brown

7.5.4 Seed length [mm]

7.5.5 Seed width [mm]

7.5.6 Seed hairiness
0 Absent
1 Present

7.6 Notes
Specify here any additional information
8. Plant descriptors

8.1 Agronomic characters
Agronomic characteristics should be observed on 10 plants at least

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 Flowering duration [d]
Number of days from first flower opening until end of flowering

8.1.3 Secondary/off-season flowering
0 Absent
1 Rare
2 Intermediate
3 Frequent

8.1.4 Regularity of flowering
1 Regular
2 Irregular

8.1.5 Number of nodes between inflorescences

8.1.6 Number of days to maturity [d]
From transplanting until 50% of the plants have at least one fruit ripened

8.1.7 Ripening uniformity
3 Poor
5 Intermediate
7 Good

8.1.8 Fruit storage life [d]
Number of days of storage of ripe fruits under ambient conditions after harvest

8.1.9 Self-compatibility
1 Self-compatible
2 Self-incompatible
3 Unknown (sterile)
8.1.10 Parthenocarpic (seedless) fruits [%]
Indicate in descriptor 8.4 Notes if the parthenocarpy may be attributed to lack of pollinators or to other factors

8.2 Fruit characteristics
All fruit characteristics should be evaluated on ten ripe fruits from five different plants, at least

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 susceptibility to bruising
3 Sensitive
5 Intermediate
7 Resistant

8.2.4 Juice yield (%)
Ratio of juice weight to fruit weight after extraction with a domestic juice extractor

8.3 Chemical composition

8.3.1 Fruit sugar content [g/100g FW]

8.3.1.1 Fructose content [g/100g FW]

8.3.1.2 Glucose content [g/100g FW]

8.3.1.3 Sucrose content [g/100g FW]

8.3.2 Soluble solids content [%]

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

8.3.4 Ratio sugar content/titratable acidity
8.3.5 Ascorbic acid content [g/100 g FW]

8.3.6 Total acidity [g of malic acid/100 g]

8.3.7 Fruit juice pH

8.3.8 Antioxidant activity [µmol TEAC/100g FW]

8.3.9 Phenolics compounds content [g GAE/100g FW]

8.3.10 Carotenoids content [g/100g FW]

8.3.11 Total chlorophylls content [g/100g FW]

8.3.12 Alkaloid content

8.3.12.1 Type of alkaloid

8.3.12.2 Part of the plant used
   1 Fruit
   2 Leaf
   3 Root
   99 Other (specify in descriptor 8.4 Notes)

8.4 Notes
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 frost

9.2 Reaction to high temperature
9.3 Reaction to wind

9.4 Reaction to drought

9.5 Reaction to waterlogging

9.6 Reaction to high soil moisture

9.7 Reaction to salinity
Specify water conductivity (dS·m⁻¹) and main salt involved (NaCl, Na₂CO₃, CaCl₂, etc.)

9.8 Reaction to soil acidity
Specify soil pH

9.9 Reaction to soil alkalinity
Specify soil pH

9.10 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 10.5 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

The organisms considered most important by breeders and pathologists are indicated by asterisks (*) and boldface
10.1 Pests

<table>
<thead>
<tr>
<th>Causal organism</th>
<th>Common name</th>
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<td>10.1.1 Agrotis sp.</td>
<td>Cutworms</td>
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<tr>
<td>10.1.2 Anastrepha sp.</td>
<td>Fruit flies</td>
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<td>10.1.3 Carpelonchaea pendula</td>
<td>Grass gruber beetle</td>
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<tr>
<td>10.1.4 Chrysodeixis sp.</td>
<td>Green looper caterpillar</td>
</tr>
<tr>
<td>*10.1.5 Leptoglossus zonatus</td>
<td>Leaf-footed bug</td>
</tr>
<tr>
<td>*10.1.6 Myzus sp.</td>
<td>Aphids</td>
</tr>
<tr>
<td>10.1.7 Neoleucinodes elegantalis</td>
<td>Tomato fruit borer</td>
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<tr>
<td>10.1.8 Nezara viridula</td>
<td>Southern green stink bug</td>
</tr>
<tr>
<td>10.1.9 Thrips sp.</td>
<td>Thrips</td>
</tr>
<tr>
<td>Frankliniella occidentalis</td>
<td>Western flower thrips</td>
</tr>
<tr>
<td>*10.1.10 Trialeurodes vaporariorum</td>
<td>Greenhouse white-fly</td>
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</tbody>
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10.2 Nematodes

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<th>Common name</th>
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<tr>
<td>*10.2.1 Meloidogyne incognita</td>
<td>Root-knot nematode</td>
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<tr>
<td>*Meloidogyne java</td>
<td></td>
</tr>
<tr>
<td>*Meloidogyne hapla</td>
<td></td>
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<tr>
<td>10.2.2 Pratylenchus crenatus</td>
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</table>

10.3 Fungi

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<thead>
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<th>Fungi</th>
<th>Common name</th>
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</thead>
<tbody>
<tr>
<td>10.3.1 Alternaria alternata</td>
<td>Fruit rot</td>
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<tr>
<td>10.3.2 Alternaria sp.</td>
<td>Early blight</td>
</tr>
<tr>
<td>*10.3.3 Colletotrichum sp.</td>
<td>Anthracnose</td>
</tr>
<tr>
<td>10.3.4 Fusarium solani</td>
<td>Stem black lesion</td>
</tr>
<tr>
<td>10.3.5 Glomerella cingulata</td>
<td>Anthracnose</td>
</tr>
<tr>
<td>*10.3.6 Oidium sp.</td>
<td>Powdery mildew</td>
</tr>
<tr>
<td>*10.3.7 Phytophthora infestans</td>
<td>Phytophthora root rot</td>
</tr>
<tr>
<td>10.3.8 Phoma exigua</td>
<td>Tamarillo leaf spot</td>
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</table>

10.4 Viruses

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<th>Virus</th>
<th>Common name</th>
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<td>10.4.1 Alfalfa mosaic virus (AMV)</td>
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<td>10.4.3 Cucumber mosaic virus (CMV)</td>
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<td>10.4.4 Potato aucuba mosaic virus (PAMV)</td>
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<td>10.4.5 Potato leaf roll virus (PLRV)</td>
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<td>10.4.6 Potato virus Y (PVY)</td>
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</tr>
<tr>
<td>*10.4.7 Tamarillo mosaic virus (TaMV)</td>
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<td>10.4.8 Tobacco streak virus (TSV)</td>
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</tr>
<tr>
<td>10.4.9 Tomato aspermy virus (TAV)</td>
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</tr>
<tr>
<td>*10.4.10 Tomato spotted wilt virus (TSWV)</td>
<td></td>
</tr>
<tr>
<td>*10.4.11 Tomato ringspot virus (ToRSV)</td>
<td></td>
</tr>
</tbody>
</table>
10.5 Remarks
Specify any additional information here

11. Biochemical markers
Specify methods used and cite reference(s). Refer to Descriptors for genetic marker technologies, available in PDF format from Bioversity International web site (http://www.bioversityinternational.org/) or by email request to bioversityinternational-publications@cgiar.org.

12. Molecular markers
Refer to Descriptors for genetic marker technologies, available in PDF format from Bioversity International web site (http://www.bioversityinternational.org/) or by email request to bioversityinternational-publications@cgiar.org.

13. Cytological characters

  13.1 Chromosome number
  The chromosome count of normal diploid individuals is 2n=24

  13.2 Ploidy level

  13.3 Trisomics

  13.4 Monosomics

  13.5 Other cytological characters

14. Identified genes
Describe any known specific mutant present in the accession


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Tree tomato
ANNEX I. List of synonymies between *Solanum* and *Cyphomandra* names

Because *Cyphomandra* names are still used in many germplasm collections, the synonymies between *Solanum* and *Cyphomandra* names for the tree tomato and wild relatives (according to Bohs, 1995) are given below:

### Solanum names
- *Solanum betaceum* Cav.
- *Solanum cacosmum* Bohs
- *Solanum cajanumense* Kunth
- *Solanum calidum* Bohs
- *Solanum cinnatum* Bohs
- *Solanum corymbiflorum* (Sendtn.) Bohs
- *Solanum diploconos* (Mart.) Bohs
- *Solanum diversifolium* Dunal
- *Solanum endopogon* (Bitter) Bohs
- *Solanum exiguum* Bohs
- *Solanum fallax* Bohs
- *Solanum fortunense* Bohs
- *Solanum latiflorum* Bohs
- *Solanum melissarum* Bohs
- *Solanum obliquum* Ruiz & Pav.
- *Solanum occultum* Bohs
- *Solanum ovum-fringillae* (Dunal) Bohs
- *Solanum oxyphyllum* C.V. Morton
- *Solanum paralum* Bohs
- *Solanum pendulum* Ruiz & Pav.
- *Solanum pinetorum* (L.B. Sm. & Downs) Bohs
- *Solanum premnifolium* (Miers) Bohs
- *Solanum proanthum* Bohs
- *Solanum rojasianum* (Standl. & Steyerm.) Bohs
- *Solanum roseum* Bohs
- *Solanum sciadostylis* (Sendtn.) Bohs
- *Solanum sibundoyense* (Bohs) Bohs
- *Solanum sycocarpum* Mart. & Sendtn.
- *Solanum tegore* Aubl.
- *Solanum tenuisetosum* (Bitter) Bohs
- *Solanum tobagense* (Sandwith) Bohs
- *Solanum unilobum* (Rusby) Bohs

### Cyphomandra names
- *Cyphomandra betacea* (Cav.) Sendtn.
- *Cyphomandra foetida* Bohs
- *Cyphomandra cajanumensis* (Kunth) Walp.
- *Cyphomandra pilosa* Bohs
- *Cyphomandra hartwegii* (Miers) Walp.
- *Cyphomandra corymbiflora* Sendtn.
- *Cyphomandra diploconos* (Mart.) Sendtn.
- *Cyphomandra diversifolia* (Dunal) Bitter
- *Cyphomandra endopogon* Bitter
- *Cyphomandra benensis* Britton
- *Cyphomandra hypomalaca* Bitter
- *Cyphomandra dolichocarpa* Bitter
- *Cyphomandra calycina* Sendtn.
- *Cyphomandra divaricata* (Mart.) Sendtn.
- *Cyphomandra obliqua* (Ruiz & Pav.) Sendtn.
- *Cyphomandra stellata* Bohs
- *Cyphomandra ovum-fringillae* Dunal
- *Cyphomandra fragilis* Bohs
- *Cyphomandra heterophylla* Taub.
- *Cyphomandra pendula* (Ruiz & Pav.) Sendtn.
- *Cyphomandra pinetorum* L.B. Sm. & Downs
- *Cyphomandra premnifolia* (Miers) Dunal
- *Cyphomandra oblongifolia* Bohs
- *Cyphomandra rojasiana* Standl. & Steyerm.
- *Cyphomandra acuminata* Rusby
- *Cyphomandra sciadostylis* Sendtn.
- *Cyphomandra sibundoyensis* Bohs
- *Cyphomandra sycocarpa* (Mart. & Sendtn.) Sendtn.
- *Cyphomandra tegore* (Aubl.) Walp.
- *Cyphomandra tenuisetosa* Bitter
- *Cyphomandra tobagensis* Sandwith
- *Cyphomandra uniloba* Rusby
Tree tomato
## ANNEX II. COLLECTING FORM for tree tomato

### SAMPLE IDENTIFICATION

<table>
<thead>
<tr>
<th>COLLECTING INSTITUTE CODE (2.1):</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>COLLECTING NUMBER (2.2):</td>
<td></td>
</tr>
<tr>
<td>PHOTOGRAPH No. (2.23):</td>
<td>HERBARIUM SPECIMEN (2.24):</td>
</tr>
<tr>
<td>COLLECTING DATE OF SAMPLE [YYYYMMDD] (2.3):</td>
<td></td>
</tr>
<tr>
<td>GENUS (1.6):</td>
<td>SPECIES (1.7):</td>
</tr>
<tr>
<td>COMMON CROP NAME (1.10.3):</td>
<td></td>
</tr>
</tbody>
</table>

### COLLECTING SITE LOCATION

<table>
<thead>
<tr>
<th>COUNTRY OF ORIGIN (2.5):</th>
<th>LOCATION (2.7): km: direction: from:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LATITUDE (2.8/a): LONGITUDE (2.9/a): ELEVATION (2.13): m asl</td>
</tr>
</tbody>
</table>

Additional notes:

### COLLECTING SITE ENVIRONMENT

<table>
<thead>
<tr>
<th>COLLECTING/ACQUISITION SOURCE (2.14):</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.Wild habitat</td>
</tr>
<tr>
<td>20.Farm or cultivated habitat</td>
</tr>
<tr>
<td>30.Market or shop</td>
</tr>
<tr>
<td>40.Institute, Experimental station, Research Org., Genebank</td>
</tr>
<tr>
<td>50.Seed company</td>
</tr>
<tr>
<td>60.Weedy, disturbed or ruderal habitat</td>
</tr>
<tr>
<td>99.Other (specify):</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HIGHER LEVEL LANDFORM (6.1.2):</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.Plain</td>
</tr>
<tr>
<td>2.Basin</td>
</tr>
<tr>
<td>3.Valley</td>
</tr>
<tr>
<td>4.Plateau</td>
</tr>
<tr>
<td>5.Upland</td>
</tr>
<tr>
<td>6.Hill</td>
</tr>
<tr>
<td>7.Mountain</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SLOPE [*] (6.1.4): SLOPE ASPECT (6.1.5): (code N, S, E, W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.Grassland</td>
</tr>
<tr>
<td>12.Forbland</td>
</tr>
<tr>
<td>20.Closed forest</td>
</tr>
<tr>
<td>30.Woodland</td>
</tr>
<tr>
<td>40.Scrubland</td>
</tr>
<tr>
<td>50.Dwarf shrubs</td>
</tr>
<tr>
<td>99.Other (specify):</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OVERALL VEGETATION SURROUNDING AND AT THE SITE (6.1.7):</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.Grassland</td>
</tr>
<tr>
<td>12.Forbland</td>
</tr>
<tr>
<td>20.Closed forest</td>
</tr>
<tr>
<td>30.Woodland</td>
</tr>
<tr>
<td>40.Scrubland</td>
</tr>
<tr>
<td>50.Dwarf shrubs</td>
</tr>
<tr>
<td>99.Other (specify):</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOIL DRAINAGE (6.1.8):</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.Poorly drained</td>
</tr>
<tr>
<td>5.Moderately drained</td>
</tr>
<tr>
<td>7.Well drained</td>
</tr>
</tbody>
</table>

### SAMPLE

<table>
<thead>
<tr>
<th>BIOLOGICAL STATUS OF ACCESSION (2.15):</th>
</tr>
</thead>
<tbody>
<tr>
<td>100.Wild</td>
</tr>
<tr>
<td>200.Weedy</td>
</tr>
<tr>
<td>300.Traditional cultivar/landrace</td>
</tr>
<tr>
<td>400.Breeding/research material</td>
</tr>
<tr>
<td>500.Advanced/improved cultivar (conventional breeding)</td>
</tr>
<tr>
<td>600.GMO (by genetic engineering)</td>
</tr>
<tr>
<td>999.Other (specify):</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TYPE OF SAMPLE (2.17):</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.Vegetative</td>
</tr>
<tr>
<td>2.Seed</td>
</tr>
<tr>
<td>99.Other (specify):</td>
</tr>
<tr>
<td><strong>No. PLANTS SAMPLED (2.18):</strong></td>
</tr>
<tr>
<td>--------------------------------</td>
</tr>
</tbody>
</table>

**GENERAL APPEARANCE OF POPULATION (2.20):**
- 3. Poor
- 5. Medium
- 7. Good

**POPULATION ISOLATION (2.21):** km

**PREVAILING STRESSES (2.22.7):** Information on main associated biotic (pests and diseases) and abiotic (drought, salinity, temperature) stresses

---

**ETHNOBOTANICAL DATA**

**LOCAL/VERNACULAR NAME (2.22.2):**

**ETHNIC GROUP (2.22.1):**

**HISTORY OF PLANT USE (2.22.3):**
- 1. Ancestral/indigenous (always associated with the place and community)
- 2. Introduced (but in unknown distant past)
- 3. Introduced (time of introduction unknown)

**PARTS OF THE PLANT USED (2.22.4):**
- 1. Fruit
- 2. Seed
- 3. Leaf
- 99. Other (specify):

**PLANT USE (2.22.5):**
- 1. Fresh fruit
- 2. Juice
- 3. Dessert fruit
- 4. Salad
- 5. Cooked
- 6. Medicinal
- 7. Industry
- 99. Other (specify):

**CULTURAL CHARACTERISTICS (2.22.6):** Mention if there is any folklore (i.e., taboos, stories and/or superstitions)
- 0. No
- 1. Yes: specify in REMARKS (2.25)

**CULTURAL PRACTICES (2.22.8):**

- Sowing date [YYYYMMDD] (2.22.8.1):
- First harvest date [YYYYMMDD] (2.22.8.2):
- Last harvest date [YYYYMMDD] (2.22.8.3):

**CROPPING SYSTEM (2.22.9):**
- 1. Monoculture
- 2. Intercropped (specify other crops in REMARKS (2.25))

**MODE OF REPRODUCTION (2.22.10):**
- 1. Vegetative
- 2. Seed
- 3. Both

**SEASONALITY (2.22.12):**
- 1. Available only in season/at particular period
- 2. Available throughout the year

**ASSOCIATED FLORA (2.22.11):**
- Other dominant crop/or wild plant species, including other *Solanum* species, found in and around the collecting site

**REMARKS (2.25):**
Descriptors for Tree tomato and wild relatives

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