

# Proposal for a MAP Descriptor List

## Preliminary remarks

The following list of descriptors has been developed based on other Descriptor Lists produced by Bioversity International (formerly the International Plant Genetic Resources Institute, IPGRI). It has been adapted according to the decisions made at the First Meeting of the ECPGR Working Group on Medicinal and Aromatic Plants (MAPs)<sup>1</sup> and further discussions held at the Second and Third Meetings of the Working Group<sup>2</sup>.

The descriptors included here belong to the following Bioversity categories:

**I. Passport descriptors (accession descriptors + collecting 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.

**II. Management descriptors (management descriptors + multiplication/regeneration descriptors):** these provide the basis for the management of accessions in the genebank and assist with their multiplication and regeneration.

**III. 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 these trials. Site descriptors for germplasm collecting are also included here.

The descriptors belonging to the FAO/IPGRI *Multi-crop passport descriptors*<sup>3</sup> are indicated in the text as [MCPD]. These 27 descriptors are mandatory to ensure compatibility with the EURISCO format and are not to be modified.

Characterization and Evaluation descriptors are developed on a crop-specific level and are not included in the present document. Characterization and Evaluation Descriptor Lists are under development for the priority species identified by the MAP Working Group and will be uploaded on the MAP Working Group's Web page ([http://www.ecpgr.cgiar.org/Workgroups/Med\\_aromatic/med\\_aromatic.htm](http://www.ecpgr.cgiar.org/Workgroups/Med_aromatic/med_aromatic.htm)).

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<sup>1</sup> Baričević D, Bernáth J, Maggioni L, Lipman E, compilers. 2004. Report of a Working Group on Medicinal and Aromatic Plants. First Meeting, 12-14 September 2002, Gozd Martuljek, Slovenia. International Plant Genetic Resources Institute, Rome, Italy.

<sup>2</sup> Lipman, E, editor. 2009. Report of a Working Group on Medicinal and Aromatic Plants. Second Meeting, 16-18 December 2004, Strumica, Macedonia FYR / Third Meeting, 26-28 June 2007, Olomouc, Czech Republic. Bioversity International, Rome, Italy.

<sup>3</sup> Alercia A, Diulgheroff S, Metz T. 2001. List of Multicrop Passport Descriptors. FAO (Food and Agricultural Organization of the United Nations)/IPGRI (International Plant Genetic Resources Institute) ([http://www.bioversityinternational.org/publications/publications/publication/publication/multicrop\\_passport\\_descriptors.html](http://www.bioversityinternational.org/publications/publications/publication/publication/multicrop_passport_descriptors.html)).

# I. PASSPORT DESCRIPTORS

## 1. Accession descriptors

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- 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 the FAO Web site (<http://apps3.fao.org/wiews/>).
- 1.2 Accession number** [MCPD]  
This number serves as a unique identifier for accessions within a genebank collection, and is assigned when a sample is entered into the genebank collection. Once assigned, this number should never be reassigned to another accession in the collection. Even if an accession is lost, its assigned number should never be re-used. Letters should be used before the number to identify the genebank or national system (e.g. IDG indicates an accession that comes from the genebank in Bari, Italy; CGN indicates an accession from the genebank in Wageningen, The Netherlands; PI indicates an accession within the US 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.

**1.11 Common crop name** [MCPD]  
Name of the crop in colloquial language, preferably English (i.e. 'malting barley', 'cauliflower' or 'white cabbage').

**1.12 Species Red List Assessment in the country**  
(Red List assessment using IUCN Red List Categories and Criteria – IUCN 2001)

- 1 Extinct (EX)
- 2 Extinct in the Wild (EW)
- 3 Critically Endangered (CR)
- 4 Endangered (EN)
- 5 Vulnerable (VU)
- 6 Near Threatened (NT)
- 7 Least Concern (LC)
- 8 Data Deficient (DD)
- 9 Not Evaluated (NE)

**1.13 Protection of the species according to national legislation**  
0 No  
1 Yes (provide reference of the document in 1.14 Remarks)

**1.14 Remarks**  
The Remarks field is used to add notes (e.g. for 1.13).

## **2. Collecting descriptors**

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**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 the 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 3-letter ISO 3166-1 extended country codes (<http://unstats.un.org/unsd/methods/m49/m49alpha.htm>).

**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 code. 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 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).

**2.7 Latitude of collecting site** [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.

**2.10 Collecting/acquisition source**

(Adapted from Devillers and Devillers-Terschuren 1996)

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 the more specific codes such as 11, 12 etc.

10 Wild habitat

- 11 Coastal and halophytic communities
- 12 Non-marine waters
- 13 Scrub and grassland
- 14 Forests
- 15 Bogs and marshes
- 16 Inland rocks, screes and sands
- 17 Other (specify in 2.25 Remarks)

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

**2.11 Collecting source environment**

Use descriptors 6.4.1 to 6.4.13 in section 6.

## 2.12 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 by using 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 (specify in 2.25 Remarks)

## 2.13 Developmental stage of specimen

- 1 Vegetative stage
- 2 Budding
- 3 Beginning of blooming
- 4 Full blooming
- 5 After blooming
- 6 Seed maturity
- 7 Other (specify in 2.25 Remarks)

**2.14 Foreseen period of flowering** (specify month, for example: August<sub>mid</sub> – August<sub>end</sub> 2010)

**2.15 Foreseen period of seed sampling** (specify month, for example: September<sub>end</sub> 2010)

## 2.16 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 2.25 Remarks)

## 2.17 Number of plants sampled

Number of plants collected in the field to produce this accession.

## 2.18 Number of seeds collected

## 2.19 Number of vegetative propagules collected

## 2.20 General appearance of population

Provide an assessment of the frequency of individuals of the population (according to Braun-Blanquet scale)

- 1 rare or very rare individuals, covering very small area
- 2 1 – 12 %
- 3 13 – 25%
- 4 26 – 50 %
- 5 51 – 75%
- 6 76 – 100%

## 2.21 Associated flora

Other dominant crop/plant species, found in and around the collecting site.  
(Floristic releve with coverage assessment according to Braun-Blanquet scale).

## 2.22 Photograph

Were photograph(s) taken of the accession or habitat at the time of collecting?

- 0 No
- 1 Yes (provide identification number(s) in descriptor 2.25 Remarks)

## 2.23 Herbarium specimen

Was a herbarium specimen collected?

- 0 No
- 1 Yes (provide an identification number in descriptor 2.25 Remarks)

## 2.24 Ethnobotanical data

### 2.24.1 Ethnic group

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

### 2.24.2 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.

#### 2.24.2.1 Translation

Provide translation of the local name into English, if possible.

### 2.24.3 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)

### 2.24.4 Uses of the plant in the area of sampling

- 1 Medicinal
- 2 Spice
- 3 Aromatic
- 4 Ornamental
- 99 Other (specify in descriptor 2.25 Remarks)

#### **2.24.5 Parts of the plant used**

- 1 Seed
- 2 Fruit
- 3 Root/rhizome
- 4 Bulb/clove
- 5 Leaf sheath/pseudostem
- 6 Leaf blade
- 7 Scape
- 8 Flower/inflorescence
- 9 Trunk
- 99 Other (specify in descriptor 2.25 Remarks)

#### **2.24.6 Cultural characteristics**

Is there any folklore associated with the collected accession (e.g. taboos, stories and/or superstitions)?

- 0 No
- 1 Yes (describe it briefly in descriptor 2.25 Remarks)

#### **2.24.7 Major threats**

Information on main causes of species decline; threats could be in the past and/or present and/or future, using a time frame of three generations or 10 years, whichever is longer (IUCN 2001)

- 10 No threats
- 20 Habitat loss/degradation (human-induced) due to
  - 21 Agriculture
  - 22 Land management of non-agricultural areas
  - 23 Extraction
  - 24 Infrastructure development
  - 25 Invasive alien species (directly impacting habitat) (competitors, predators, pathogens/parasites)
  - 26 Change in native species dynamics (directly impacting habitat)
  - 27 Fires
  - 28 Other causes (specify in 2.25 Remarks)
  - 29 Unknown
- 30 Harvesting (gathering)
- 40 Destruction
  - 41 Chemical pest control
  - 42 Other (specify in 2.25 Remarks)
  - 43 Unknown
- 50 Pollution
  - 51 Atmospheric pollution
  - 52 Land pollution
  - 53 Water pollution
  - 54 Other (specify in 2.25 Remarks)
- 60 Natural disasters
  - 61 Drought
  - 62 Storms/flooding
  - 63 Temperature extremes
  - 64 Other (specify in 2.25 Remarks)
  - 65 Unknown

## **2.24.8 Collection and cultivation practices**

**2.24.8.1 Sowing date** [YYYYMMDD]

**2.24.8.2 First harvest date** [YYYYMMDD]

**2.24.8.3 Last harvest date** [YYYYMMDD]

## **2.24.9 Mode of reproduction**

- 1 Vegetative
- 2 Seed
- 3 Both

## **2.24.10 Seasonality**

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

## **2.25 Remarks**

Specify here any additional information recorded by the collector or any specific information on descriptors recorded with the category "Other".



## II. MANAGEMENT DESCRIPTORS

### 3. Accession management descriptors

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**3.1 Accession number** (Passport 1.2)

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

**3.3 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 descriptor 3.16 Remarks)

**3.4 Accession size**

Designates the stock of propagation material of defined accession of one species in genebank.

- Approximate number of seeds of accession in the genebank  
(WG suggested following standard: self-pollinated species 4000 seeds, cross-pollinated or unknown 12 000 seeds)
- Number of plants of an accession in the genebank
- Number of cuttings or other propagation material in storage
- Weight of seeds under conservation in the genebank [g]

**3.5 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.

**3.6 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.

**3.7 Storage date** [YYYYMMDD]

**3.8 Viability or germination at storage** [%]

For seed-propagated accessions

**3.9 Date of last germination test** [YYYYMMDD]

For seed-propagated accessions

**3.10 Germination at the last test [%]**

For seed-propagated accessions

**3.11 Date of next germination test [YYYYMMDD]**

For seed-propagated accessions, the date (estimate) when the accession should next be tested

**3.12 Seed moisture content at harvest [%]**

For seed-propagated accessions

**3.13 Seed moisture content at storage (initial) [%]**

For seed-propagated accessions

**3.14 *In vitro* conservation**

**3.14.1 Type of source explant/introduction method**

- 1 Seed or zygotic embryo
- 2 Meristem
- 3 Shoot tip
- 4 Somatic embryo
- 5 Other organ via callus or suspension culture
- 99 Other (specify in descriptor 3.16 Remarks)

**3.14.2 Date of introduction in vitro [YYYYMMDD]**

**3.14.3 Type of subcultured material**

- 1 Apical or axillary bud
- 2 Somatic embryo
- 99 Other (specify in descriptor 3.16 Remarks)

**3.14.4 Regeneration process**

- 1 Organogenesis
- 2 Somatic embryogenesis
- 99 Other (specify in descriptor 3.16 Remarks)

**3.14.5 Number of individuals introduced in vitro**

**3.14.6 Number of replicates per genotype**

**3.14.7 Last subculture date [YYYYMMDD]**

**3.14.8 Medium used at the last subculture**

**3.14.9 Number of plants at the last subculture**

**3.14.10 Location after the last subculture**

**3.14.11 Next subculture date [YYYYMMDD]**

### **3.15 Cryopreservation**

#### **3.15.1 Type of material for cryopreservation**

- 1 Seed
- 2 Apical or axillary bud
- 3 Somatic embryo
- 99 Other (specify in descriptor 3.16 Remarks)

#### **3.15.2 Introduction date in liquid nitrogen [YYYYMMDD]**

#### **3.15.3 Number of samples introduced in liquid nitrogen**

#### **3.15.4 End of storage period [YYYYMMDD]**

#### **3.15.5 Number of samples taken from liquid nitrogen**

#### **3.15.6 Type of subcultured material for recovery**

(After liquid nitrogen)

- 1 Seed
- 2 Apical or axillary bud
- 3 Somatic embryo
- 99 Other (specify in descriptor 3.16 Remarks)

#### **3.15.7 Regeneration process**

- 1 Organogenesis
- 2 Somatic embryogenesis
- 99 Other (specify in descriptor 3.16 Remarks)

#### **3.15.8 Number of recovered samples**

#### **3.15.9 Location after the last subculture**

### **3.16 Remarks**

Specify here any additional information recorded or any specific information on descriptors recorded with the category "Other"

## **4. Multiplication/regeneration descriptors**

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### **4.1 Accession number**

(Passport 1.2)

### **4.2 Multiplication/regeneration environment**

- 1 Field
- 2 Screenhouse
- 3 Glasshouse
- 4 Laboratory
- 99 Other (specify in descriptor 4.16 Remarks)

### **4.3 Collaborator(s) name**

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

#### **4.4 Propagation**

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

#### **4.5 Substrate/medium for propagation**

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

#### **4.6 Percentage of germination [%]**

For seed reproduced accessions

#### **4.7 Percentage of vegetative propagules/explants rooting and giving plantlets [%]**

For vegetatively reproduced accessions

#### **4.8 Number of plants used as seed/vegetative propagules/explants source for each regeneration**

#### **4.9 Cultivation practices**

**4.9.1 Sowing or vegetative propagation date [YYYYMMDD]**

**4.9.2 Transplanting date [YYYYMMDD]**

**4.9.3 Harvest date [YYYYMMDD]**

**4.9.4 Irrigation**

Specify frequency

**4.9.5 Field spacing**

**4.9.5.1 Distance between plants in a row [m]**

**4.9.5.2 Distance between rows [m]**

**4.9.5.3 Form of isolation**

**4.9.6 Fertilizer application [g/m<sup>2</sup>]**

Indicate the type of fertilizer used and the number of applications made

#### **4.10 Type of pollination**

- 1 Artificial
- 2 Natural
- 3 Both

#### **4.11 Pollination method**

- 1 Self-pollinated (i.e. more than 80% without isolation)
- 2 Intermediate (or often cross-pollinated i.e. up to 60 to 80% with isolation)
- 3 Cross-pollinated (i.e. < 60% with isolation)
- 4 Unknown (with isolation)

#### **4.12 Data on last multiplication and/or regeneration**

**4.12.1 Date of last regeneration** [YYYYMMDD]

**4.12.2 Location**

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

#### **4.13 Number of times accession regenerated**

Since the date of acquisition

#### **4.14 Standard cultivars used**

WG considers necessary to use as reference cultivar a cultivar, defined in crop-specific descriptors. Other cultivars could be added, if necessary.

**4.14.1 Cultivar 1**

**4.14.2 Cultivar 2**

#### **4.15 Date of next regeneration** [YYYYMMDD]

The date (estimate) when the accession should next be regenerated

#### **4.16 Remarks**

Specify here any additional information recorded or any specific information on descriptors recorded with the category "Other".

### III. ENVIRONMENT AND SITE DESCRIPTORS

#### 5. *Ex situ* characterization and/or evaluation

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**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]**

**5.2.4 Name of locality**

**5.3 Evaluator's name and address**

**5.3.1 Date of characterization/evaluation**

**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
- 5 Other (specify in descriptor 5.14 Remarks)

**5.8 Field establishment [%]**

**5.9 Planting site in the field**

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

**5.10 Field spacing [%]**

**5.10.1 Distance between plants in row [m]**

**5.10.2 Distance between rows [m]**

**5.11 Environmental characteristics of site**

Use descriptors 6.4.1 to 6.4.13 in section 6.

## 5.12 Fertilizer

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

## 5.13 Plant protection

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

## 5.14 Remarks

Specify here any other site-specific information or any specific information on descriptors recorded with the category "Other".

## **6. Collecting and/or *in situ* characterization and or/evaluation**

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\* Descriptors preceded by an asterisk are recorded during surveying (collecting).

### \*6.1 Country of characterization and/or evaluation

(See instructions in descriptor 2.4 Country of origin)

### \*6.2 Site

6.2.1 Latitude (Passport 2.7)

6.2.2 Longitude (Passport 2.8)

6.2.3 Elevation [m] (Passport 2.9)

6.2.4 Name of locality

### \*6.3 Evaluator's name and address

6.3.1 Characterization/evaluation date

### \*6.4 Site environment

#### 6.4.1 Topography

This refers to the profiles in elevation of the land surface on a broad scale. The reference is 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)
9 Other	(specify in 6.4.15 Remarks)

#### 6.4.2 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)

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

#### 6.4.3 Second level landform

Adapted from FAO 1990.

- 1 Alluvial plain (A plain formed from the deposition of alluvium usually adjacent to a river that periodically overflows (aggraded valley plain, river plain, wash plain, waste plain))
- 2 Coastal plain
- 3 Lacustrine plain
- 4 Glacial plain
- 5 Peneplain (Base-leveled plain) (Any land surface changed almost to a plain by subaerial erosion)
- 6 Pediment (A piedmont slope formed from a combination of mainly erosional processes; the surface is chiefly bare rock but may have a covering veneer of alluvium or gravel (conoplain, piedmont interstream flat))
- 7 Volcano
- 8 Dune field
- 9 Delta
- 10 Tidal flat (A marshy, sandy, or muddy nearly horizontal coastal flatland which is alternately covered and exposed as the tide rises and falls)
- 11 Playa (A small, generally sandy land area at the mouth of a stream or along the shore of a bay)
- 12 Cay (A flat coral island)
- 13 Other (Specify in 6.4.15 Remarks))

#### 6.4.4 Slope [°]

Estimated slope of the site.

#### 6.4.5 Slope form

It refers to the general shape of the slope in both the vertical and horizontal directions (FAO 1990).

- 1 Straight
- 2 Concave
- 3 Convex
- 4 Terraced
- 5 Complex (irregular)



#### 6.4.6 Slope aspect

The direction that the slope faces. Describe the direction with symbols N, S, E, W (e.g. a slope that faces a southwestern direction has an aspect of SW).

#### 6.4.7 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        | 16 Longitudinal dune  |
| 2 Escarpment         | 17 Interdunal depression  |
| 3 Interfluve         | 18 Mangrove   |
| 4 Valley             | 19 Upper slope  |
| 5 Valley floor       | 20 Midslope   |
| 6 Channel            | 21 Lower slope  |
| 7 Levee              | 22 Ridge  |
| 8 Terrace            | 23 Sea coast  |
| 9 Floodplain         | 24 Beachridge   |
| 10 Lagoon            | 25 Rounded summit   |
| 11 Pan               | 26 Summit   |
| 12 Caldera           | 27 Coral atoll  |
| 13 Open depression   | 28 Drainage line (bottom position in flat or almost-flat terrain) |
| 14 Closed depression | 29 Coral reef   |
| 15 Dune              | 30 Other (specify in 6.4.15 Remarks)                              |

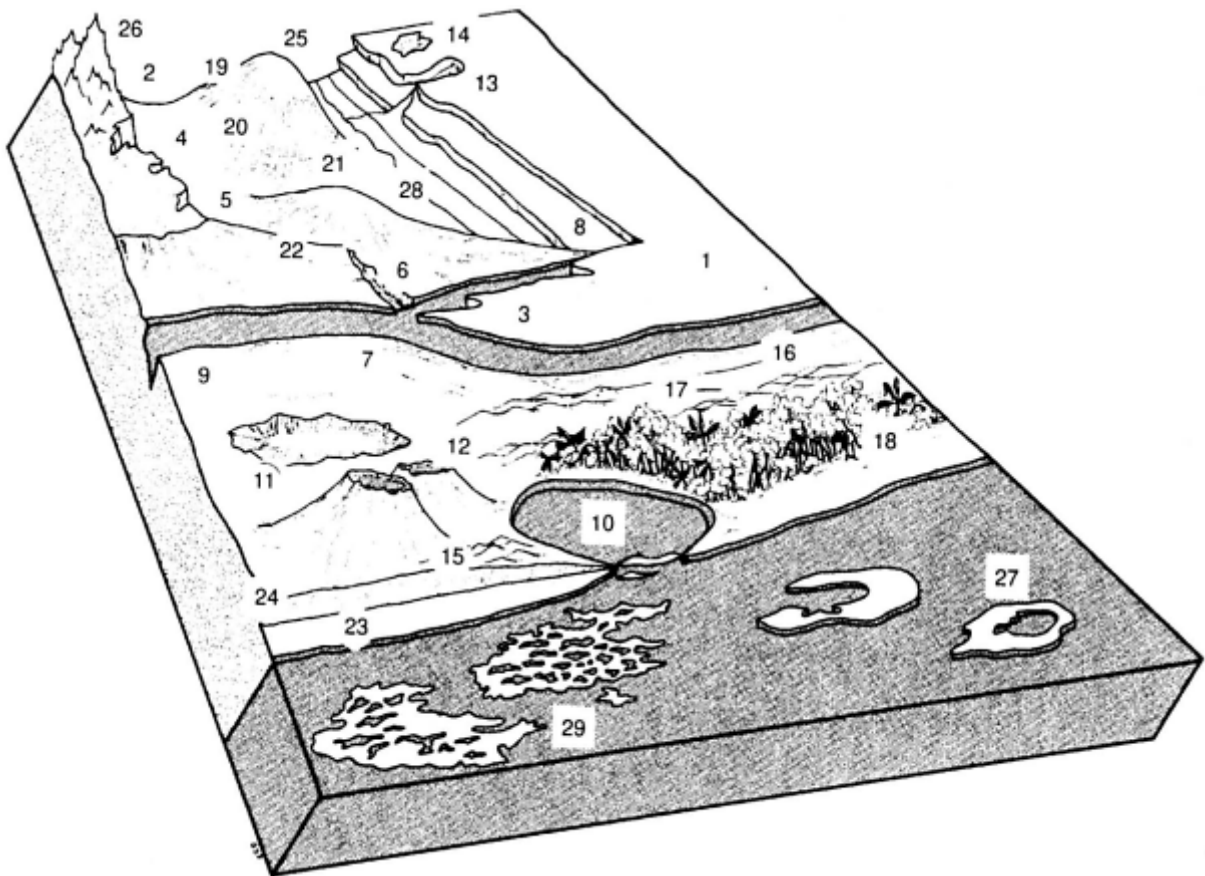


Fig. 1. Land element and position

#### 6.4.8 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, under storey may be present)                      |
| 5 | Scrubland           | (Continuous layer of shrubs, crowns touching)  |
| 6 | Scrub and grassland | (Grasses with a discontinuous layer of trees or shrubs)  |
| 7 | Other               | (Specify in 6.4.15 Remarks)  |

#### \*6.4.9 Possible sources of contamination

- 1 Industry
- 2 Agriculture
- 3 Infrastructure
- 4 Urbanisation
- 5 Other (specify in 6.4.15 Remarks)

#### 6.4.10 Degree of endangerment of population/habitat

- 1 None
- 2 Low
- 3 Medium
- 4 High

#### 6.4.11 Factors causing endangerment of population/habitat

- 1 Collecting/harvesting
- 2 Grazing
- 3 Fertilization
- 4 Urbanization
- 5 Agricultural measures
- 6 Other (specify in 6.4.15 Remarks)

#### 6.4.12 Soil characteristics at the site

##### 6.4.12.1 Location of soil sampling (Gaus Krieger Coordinates)

##### 6.4.12.2 Code of soil sample

##### 6.4.12.3 Soil parent material

(Adapted from FAO 1990)

Two lists of examples of parent material and rock are given below. The reliability of the geological information and the knowledge of the local lithology will determine whether a general or a specific definition of the parent material can be given. Saprolite is used if the *in situ* weathered material is thoroughly decomposed, clay-rich but still showing rock structure. Alluvial deposits and colluvium derived from a single rock type may be further specified by that rock type.

#### 6.4.12.3.1 Unconsolidated material

- |                                  |                                      |
|----------------------------------|--------------------------------------|
| 1 Aeolian deposits (unspecified) | 10 Volcanic ash                      |
| 2 Aeolian sand                   | 11 Loess                             |
| 3 Littoral deposits              | 12 Pyroclastic deposits              |
| 4 Lagoonal deposits              | 13 Glacial deposits                  |
| 5 Marine deposits                | 14 Organic deposits                  |
| 6 Lacustrine deposits            | 15 Colluvial deposits                |
| 7 Fluvial deposits               | 16 <i>In situ</i> weathered          |
| 8 Alluvial deposits              | 17 Saprolite                         |
| 9 Unconsolidated (unspecified)   | 18 Other (specify in 6.4.15 Remarks) |

#### 6.4.12.3.2 Rock type

- |                                  |                                      |
|----------------------------------|--------------------------------------|
| 1 Acid igneous/metamorphic rock  | 16 Limestone                         |
| 2 Granite                        | 17 Dolomite                          |
| 3 Gneiss                         | 18 Sandstone                         |
| 4 Granite/gneiss                 | 19 Quartzitic sandstone              |
| 5 Quartzite                      | 20 Shale                             |
| 6 Schist                         | 21 Marl                              |
| 7 Andesite                       | 22 Travertine                        |
| 8 Diorite                        | 23 Conglomerate                      |
| 9 Basic igneous/metamorphic rock | 24 Siltstone                         |
| 10 Ultra basic rock              | 25 Tuff                              |
| 11 Gabbro                        | 26 Pyroclastic rock                  |
| 12 Basalt                        | 27 Evaporite                         |
| 13 Dolerite                      | 28 Gypsum rock                       |
| 14 Volcanic rock                 | 29 Other (specify in 6.4.15 Remarks) |
| 15 Sedimentary rock              | 30 Not known                         |

#### 6.4.12.4 Stoniness/rockiness/hardpan/cementation

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

#### 6.4.12.5 Soil drainage

(Adapted from FAO 1990)

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

#### **6.4.12.6 Flooding (estimated)**

(Adapted from FAO 1990)

Flooding or temporary inundation is described according to its estimated frequency, duration and sampling depth. Information may be obtained from records of past flooding or from local enquiry. The frequency and duration classes should give an indication of the average occurrence of inundation

#### **6.4.12.7 Soil salinity: expressed as electroconductivity** (measured in microsiemens/cm; $\mu\text{S}/\text{cm}$ ; EC units)

- 1 0 – 800
- 2 800 – 1500
- 3 1500 – 5000
- 4 >5000

#### **6.4.12.8 Physiological soil depth**

The depth to which mostly of roots expand.

- 1 very shallow (< 30 cm)
- 2 shallow (30 – 50 cm)
- 3 medium deep (50 – 70 cm)
- 4 deep (70 – 100 cm)
- 5 very deep (>100 cm)

#### **6.4.12.9 Soil depth to groundwater table**

(Adapted from FAO 1990)

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

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

#### **6.4.12.10 Soil moisture**

Moisture conditions prevailing in the soil at the time of the collecting should be given together with the depth. Attention should be paid to unusual moisture conditions caused by unseasonable weather, prolonged exposure of the profile, flooding, etc. (from FAO 1990).

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

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

#### **6.4.12.12 Soil pH**

Actual value of the soil within the following root depths around the accession (pH measurement according to CaCl<sub>2</sub> method).

##### **6.1.12.11.1 pH at 10-15 cm**

##### **6.1.12.11.2 pH at 30-60 cm**

##### **6.1.12.11.3 pH at 60-90 cm**

#### **6.4.12.13 Soil organic matter content in upper layer (10 cm) – A horizon and B1 horizon (if present)**

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

#### **6.4.12.14 Rock fragments**

(Adapted from FAO 1990)

Large rock and mineral fragments (>2mm) are described according to abundance.

- 1 0 – 2%
- 2 2.1 – 5%
- 3 5.1 – 15%
- 4 15.1 – 40%
- 5 40.1 – 80%
- 6 >80%

#### **6.4.12.15 Soil erosion**

- 3 Low
- 5 Intermediate
- 7 High

#### 6.4.12.16 Soil texture class

(Adapted from FAO 1990).

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

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

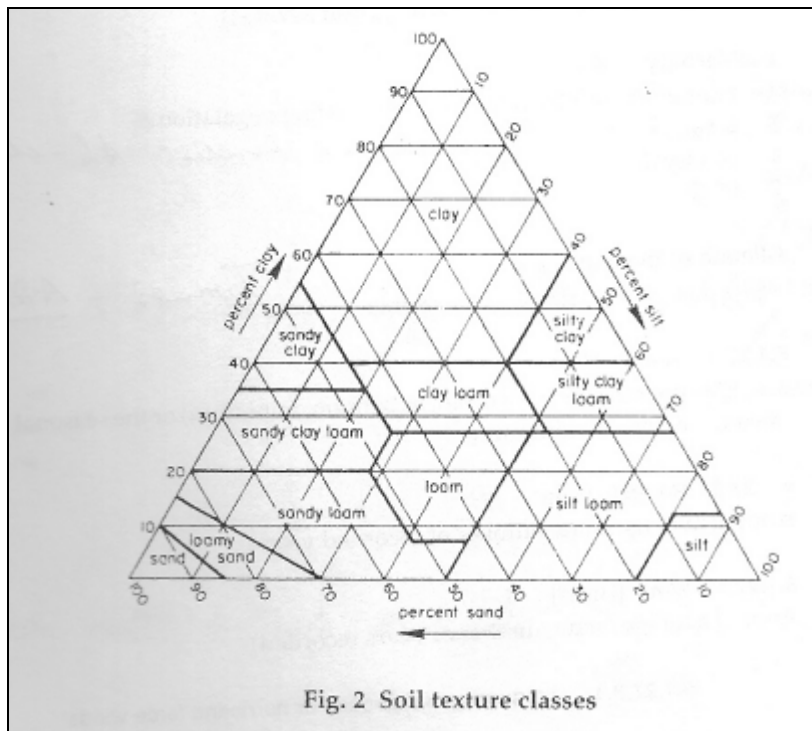


Fig. 2 Soil texture classes

#### 6.4.12.17 Soil particle size classes

(Adapted from FAO 1990)

1	Clay	<2 $\mu\text{m}$
2	Fine silt	2 – 20 $\mu\text{m}$
3	Coarse silt	21 – 63 $\mu\text{m}$
4	Very fine sand	64 – 125 $\mu\text{m}$
5	Fine sand	126 – 200 $\mu\text{m}$
6	Medium sand	201 – 630 $\mu\text{m}$
7	Coarse sand	631 – 1250 $\mu\text{m}$
8	Very coarse sand	1250 – 2000 $\mu\text{m}$

#### **6.4.12.18 Soil taxonomic classification**

As detailed a classification as possible should be given. This may be taken from a soil survey map. State class (e.g. Alfisos, Spodosos, Vertisos, etc.).

#### **6.4.12.19 Water availability**

- 1 Rain fed
- 2 Irrigated
- 3 Flooded
- 4 River banks
- 5 Sea coast
- 6 Other (specify in 6.4.15 Remarks)

#### **6.4.12.20 Soil fertility**

General assessment of the soil fertility based on existing vegetation.

- 3 Low
- 5 Moderate
- 7 High

#### **6.4.13 Climate of the site**

Should be assessed as close to the site as possible

##### **6.4.13.1 Temperature [°C]**

Provide average (20 years) of month (mean, maximum, minimum) and of annual extreme (maximum, minimum) temperatures.

##### **6.4.13.2 Rainfall [mm]**

Provide average (20 years) month (state number of 20 recorded years) rainfall.

##### **6.4.13.3 Wind [km/s]**

Annual average (state number of 20 years recorded)

**6.4.13.3.1 Provide average (20 years) month mean and maximum wind velocity [km/s]**

**6.4.13.3.2 Frequency of typhoons or hurricane force winds**

**6.4.13.3.3 Date of most recent typhoons or hurricane force winds [DDMMYYYY]**

##### **6.4.13.4 Frost**

**6.4.13.4.1 Date of the most recent frost [DDMMYYYY]**

**6.4.13.4.2 Lowest temperature [°C]**

Specify seasonal average and minimum survived

**6.4.13.4.3 Duration of temperature below freezing [d]**

#### **6.4.13.5 Relative humidity**

**6.4.13.5.1 Provide average (20 years) of month (mean, maximum, minimum) relative humidity [%]**

**6.4.13.5.2 Relative humidity diurnal range [%]**

#### **6.4.13.6 Light**

- 1 Shady
- 2 Sunny

**6.4.14 Other environmental characteristic that has been registered**  
(Specify in 6.4.15 Remarks)

#### **6.4.15 Remarks**

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

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#### **References**

- Devillers P, Devillers-Terschuren J. 1996. A classification of Palaearctic habitats. Nature and Environment 78. Council of Europe Publishing, Strasbourg, France.
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