

Key access and utilization descriptors for cultivated potato genetic resources

This list consists of an initial set of characterization and evaluation descriptors for cultivated potato utilization. This strategic set of descriptors, together with passport data, will become the basis for the global accession level information portal being developed by Bioversity International with the financial support of the Global Crop Diversity Trust. It will facilitate access to and utilization of cultivated potato accessions held in genebanks and does not preclude the addition of further descriptors, should data subsequently become available.

Based on the comprehensive 'Descriptors for the Cultivated Potato' published by the International Potato Center (CIP) and IBPGR (now Bioversity International) in 1977, the list was subsequently compared and harmonized, wherever possible, with minimum descriptors listed in 'Descriptores de la Papa' (CIP, 1994), with the 'Guía para las Caracterizaciones Morfológicas Básicas en Colecciones de Papas Nativas' (René Gómez, CIP, 2000), and those for which data were available. It also builds on the Global Public Goods (GPG2) activity.

This minimal set defines a first priority set of descriptors to describe, to access and to utilize cultivated potato genetic resources. A worldwide distribution of experts involved in an online survey was assured and the list was afterwards validated by a Core Advisory Group (see 'Contributors') led by Dr David Tay of CIP.

Biotic and abiotic stresses included in the list were chosen because of their wide geographic occurrence and significant economic impact at a global level.

Numbers in parentheses on the right-hand side are the corresponding descriptor numbers listed in the 1977 descriptors. Descriptors with numbers ending in 'letters' are new descriptors that were added during the development of the list below.

PLANT DATA

Ploidy level (3.1.2)

Count of the zygotic (2n) number of chromosomes

Predominant tuber skin colour (3.2.1)

Code indicating the colour which covers most of the surface of the tuber, expressed as:

- 1 White-cream
- 2 Yellow
- 3 Orange
- 4 Brownish
- 5 Pink
- 6 Red
- 7 Purplish-red
- 8 Purple
- 9 Dark purple-black (Blackish)

Intensity of predominant tuber skin colour (3.2.1a)

- 1 Light
- 2 Intermediate
- 3 Intense

Secondary tuber skin colour (3.2.2)

Code describing a secondary colour on the surface of the tuber, expressed as:

- 0 Absent
- 1 White-cream
- 2 Yellow
- 3 Orange
- 4 Brownish
- 5 Pink
- 6 Red
- 7 Purplish-black
- 8 Purple
- 9 Dark purple-black (Blackish)

Distribution of secondary tuber skin colour (3.2.3)

Code representing the pattern of distribution of the secondary colour on the surface of the tuber, expressed as:

- 0 Absent
- 1 Eyes – when the secondary colour is confined to the eyes only
- 2 Eyebrows – when the secondary colour is present in the eyebrows only
- 3 Splashed – when the secondary colour is confined to areas around the eyes
- 4 Scattered – when the secondary colour is distributed at random in one or more areas around the tuber
- 5 Spectacled – when areas around the eyes do not show secondary colour and the remainder of the tuber is pigmented
- 6 Stippled – when the surface of the tuber is more or less uniform covered with spots
- 99 Other (specify in the **Notes** descriptor)

Predominant tuber flesh colour (3.2.5)

Code indicating the flesh colour present in most of the tuber, expressed as:

- 1 White
- 2 Cream
- 3 Yellow-cream
- 4 Yellow
- 5 Red
- 6 Violet
- 7 Purple
- 99 Other (specify in the **Notes** descriptor)

Secondary tuber flesh colour (3.2.6)

Code representing a secondary flesh colour in the tuber, expressed as:

- 0 Absent
- 1 White
- 2 Cream
- 3 Yellow-cream
- 4 Yellow
- 5 Red
- 6 Violet
- 7 Purple
- 99 Other (specify in the **Notes** descriptor)

Tuber outline (shape) (3.2.8)

Code describing the tuber outline, expressed as:

- 1 Compressed (oblate) – major axis is the shortest axis
- 2 Round – an almost circular outline
- 3 Ovate – an outline resembling an egg. The broadest part is within 1/3 of the distance from the stolon end
- 4 Obovate – an outline which is inversely ovate and broadest within 1/3 of the distance from the apical end (rose or eye end)
- 5 Elliptic – an outline showing the same breadth when measured at equal distance from both the stolon and apical ends. The outline is slightly acute at each end
- 6 Oblong – an almost rectangular outline with the sides nearly parallel but the corners are rounded. The length/breadth ratio should not be more than 3/2
- 7 Long-oblong – an oblong outline with a length/breadth ratio closer to 2/1
- 8 Elongate – a long rectangular outline with a length/breadth ratio equal to or more than 3/1

Odd tuber shapes (3.2.9)

Code representing those variants of tuber shape which cannot be described under tuber outline shape. It is expressed as follows:

- 0 Absent
- 1 Flattened – when the length of a transverse section, at any point of the tuber, is more than three times longer than its breadth
- 2 Clavate – resembling an elongated club, thickened at one end
- 3 Reniform – shaped like a kidney
- 4 Fusiform – spindle-shaped, tapering gradually at both ends
- 5 Falcate – curved or shaped like a sickle or horseshoe
- 6 Spiral – long and coiled
- 7 Digitate – resembling a hand or a fist
- 8 Concertina-shaped – resembling a concertina
- 9 Tuberosed – covered with few or many small lumps and tubers. It includes those shaped like a pineapple, a cluster of grapes, and raised internodes

Depth of tuber eyes (3.2.10)

Code indicating the depth of the eyes in the tuber, expressed as:

- 1 Protruding
- 2 Shallow
- 3 Medium
- 4 Deep
- 5 Very deep

Tuber sprout colour (3.3.1)

Code describing the colour which covers most of the surface of the sprout, expressed as:

- 1 White-green
- 2 Pink
- 3 Red
- 4 Violet
- 5 Purple
- 99 Other (specify in the **Notes** descriptor)

Stem pigmentation (3.3.4)

Code indicating the colour of the stems, expressed as:

- 1 Green only
- 2 Red-brown only
- 3 Purple only
- 4 Cream with some red-brown
- 5 Cream with purple
- 6 Red-brown with some green
- 7 Purple with some green
- 99 Other (specify in the **Notes** descriptor)

Stem wing shape (3.3.6)

Code for the presence and shape of the stem wing, expressed as:

- 0 Absent
- 1 Straight
- 2 Undulate
- 3 Dentate

Lateral leaflet numbers (3.4.1a)

- 0 Absent
- 1 One pair
- 2 Two pairs
- 3 Three pairs
- 4 Four pairs
- 5 Five pairs
- 6 Six pairs
- 7 Seven or more pairs

Interjected leaflets number in the rachis among lateral leaflets (3.4.1b)

- 0 Absent
- 1 One pair
- 2 Two pairs
- 3 Three pairs
- 4 Four or more pairs

Flower colour (3.5.4)

Code indicating the colour present in most of the corolla, expressed as:

- 1 White
- 2 Light red
- 3 Intense red
- 4 Light blue
- 5 Intense blue
- 6 Light purple
- 7 Intense purple
- 8 Yellow

Flowering degree (3.5.14)

Code describing the degree of flowering which should be recorded at the peak of the flowering period, expressed as:

- 0 No buds
- 1 Bud abortion
- 3 Scarce flowering
- 5 Moderate flowering
- 7 Profuse flowering

Plant growth habit (3.6.1)

Code indicating the type of growth habit at the beginning of flowering of the accession expressed as:

- 1 Erect
- 2 Semi-erect
- 3 Decumbent, when the stems trail on the ground but they rise at the apex
- 4 Prostrate, when the stems trail on the ground
- 5 Semi-rosette
- 6 Rosette, when all or most leaves arranged at the base of the stem are close to the soil surface

High tuber yield (7.a)

ABIOTIC STRESSES

Drought (5.2)

The method of evaluating is in the process of being defined and the following descriptor states are expected to be used:

- 1 Very low or no visible sign of susceptibility (Highly tolerant)
- 3 Low (Tolerant)
- 5 Intermediate (or Slightly tolerant)
- 7 High (Non-tolerant)

Soil salinity (5.a)

BIOTIC STRESSES

Foliar blight (*Phytophthora* spp.) (6.1.1.1)

NOTES

Any additional information may be specified here, particularly that referring to the category 'Other' present in some of the descriptors above.

CONTRIBUTORS

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