



LENTIL DESCRIPTORS

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INTERNATIONAL BOARD FOR PLANT GENETIC RESOURCES
(IBPGR)

and

INTERNATIONAL CENTER FOR AGRICULTURAL RESEARCH IN THE DRY AREAS
(ICARDA)

LENTIL DESCRIPTORS

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The International Board for Plant Genetic Resources (IBPGR) and the International Center for Agricultural Research in the Dry Areas (ICARDA) are autonomous, international, scientific organizations under the aegis of the Consultative Group on International Agricultural Research (CGIAR).

The basic function of the IBPGR is to promote and coordinate an international network of genetic resources centres to further the collection, conservation, documentation, evaluation and use of plant germplasm and thereby contribute to raising the standard of living and welfare of people throughout the world. The Consultative Group mobilizes financial support from its members to meet the budgetary requirements of the Board.

The principal objectives of ICARDA are to conduct research into and develop improved cropping, livestock, and cropping-livestock systems; to serve as an international center for the improvement of barley, lentils, and faba beans; to serve as a regional center, in cooperation with other appropriate international agricultural research centers, for the improvement of other major crops in the region, such as wheat and chickpeas; to collaborate with and foster cooperation and communications among other national, regional, and international institutions in the development of adaptation, testing and demonstration of improved crops, farming, and livestock systems; and to provide and foster research and other activities to further its objectives.

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PREFACE

This descriptor list has been prepared in an IBPGR standard format following advice on descriptors and descriptor states arising from a meeting held at ICARDA on May 10-11 1982, and subsequently from crop experts throughout the world (see Appendix I). The IBPGR encourages the collection of data on the first four categories of this list; 1. Accession; 2. Collection; 3. and 4. Characterization and preliminary evaluation. The IBPGR endorses the information in categories 1-4 as the minimum that ideally should be available for any one accession. Other descriptors are given in categories 5 onwards that will enable the simple encoding of further characterization and evaluation data and which can serve as examples for the creation of additional descriptors in the IBPGR form by any user.

Although the suggested coding should not be regarded as the definitive scheme, this format has the full backing of the IBPGR and is promoted worldwide. The descriptor list given here provides an international format and thereby produces a universally understood 'language' for all plant genetic resources data. The adoption of this scheme for all data encoding, or at least the production of a transformation method to convert other schemes to the IBPGR format, will produce a rapid, reliable and efficient means for information storage, retrieval and communication. This will greatly assist the utilization of germplasm throughout the international plant genetic resources network. It is recommended, therefore, that information should be produced by closely following this descriptor list with regard to: ordering and numbering descriptors; using the descriptor specified; and using the descriptor states recommended.

Any suggestions for modifications will be welcomed by the IBPGR Secretariat, Rome.

DESCRIPTOR LIST FOR LENTIL

The IBPGR now uses the following definitions in genetic resources documentation:

- i) passport (accession identifiers and information recorded by collectors);
- ii) characterization (consists of recording those characters which are highly heritable, can be easily seen by the eye and are expressed in all environments);
- iii) preliminary evaluation (consists of recording a limited number of additional traits thought desirable by a consensus of users of the particular crop).

Characterization and preliminary evaluation will be the responsibility of the curators, while further characterization and evaluation should be carried out by the plant breeder. The data from further evaluation should be fed back to the curator who will maintain a data file.

The following internationally accepted norms for the scoring or coding of descriptor states should be followed as indicated below:

- a) measurements are made according to SI system. The units to be applied are given in square brackets following the descriptor;
- b) many descriptors which are continuously variable are recorded on a 1-9 scale. 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 8 (Pest and disease susceptibility) 1 = extremely low susceptibility and 8 = high to extremely high susceptibility;
- c) presence/absence of characters are scored as + (present) and 0 (absent);
- d) for descriptors which are not generally uniform throughout the accession (e.g. mixed collection, genetic segregation) mean and standard deviation could be reported where the descriptor is continuous or mean and 'x' where the descriptor is discontinuous;

- e) when the descriptor is inapplicable, '0' is used as the descriptor value, e.g. if an accession does not form flowers, 0 would be scored for the following descriptor

Flower colour

- 1 White
- 2 Yellow
- 3 Red
- 4 Purple

- f) blanks are used for information not yet available;
- g) standard colour charts e.g. Royal Horticultural Society Colour Chart, Methuen Handbook of Colour, Munsell Color Charts for Plant Tissues are strongly recommended for all ungraded colour characters (the precise chart used should be specified in the NOTES descriptor, 11);
- h) dates should be expressed numerically in the format DDMMYY, where

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

PASSPORT

1. ACCESSION DATA

1.1 ACCESSION NUMBER

This number serves as a unique identifier for accessions and is assigned by the curator when an accession is entered into his collection. Once assigned this number should never be reassigned to another accession in the collection. Even if an accession is lost, its assigned number is still not available for re-use. Letters should occur before the number to identify the genebank or national system (e.g. MG indicates an accession comes from the genebank at Bari, Italy; PI indicates an accession within the USA system; ILL indicates an accession in the ICARDA lentil collection)

1.2 DONOR NAME

Name of institution or individual responsible for donating the germplasm

1.3 DONOR IDENTIFICATION NUMBER

Number assigned to accession by the donor

1.4 OTHER NUMBERS ASSOCIATED WITH THE ACCESSION (other numbers can be added as 1.4.3 etc.)

Any other identification number known to exist in other collections for this accession, e.g. USDA Plant Inventory number (not collection number, see 2.1)

1.4.1 Other number 1

1.4.2 Other number 2

1.5 SCIENTIFIC NAME

1.5.1 Genus

1.5.2 Species

1.5.3 Subspecies

1.6 PEDIGREE/CULTIVAR NAME

Nomenclature and designations assigned to breeders' material

1.7 ACQUISITION DATE

The date in which the accession entered the collection

1.8 DATE OF LAST REGENERATION OR MULTIPLICATION

1.9 ACCESSION SIZE

Approximate number of seeds of accession in collection

1.10 NUMBER OF TIMES ACCESSION REGENERATED

Number of regenerations or multiplications since original collection

2. COLLECTION DATA

2.1 COLLECTOR'S NUMBER

Original number assigned by collector of the sample normally composed of the name or initials of the collector(s) followed by a number. This item is essential for identifying duplicates held in different collections and should always accompany sub-samples wherever they are sent

2.2 COLLECTING INSTITUTE

Institute or person collecting/sponsoring the original sample

2.3 DATE OF COLLECTION OF ORIGINAL SAMPLE

2.4 COUNTRY OF COLLECTION OR COUNTRY WHERE CULTIVAR/VARIETY BRED

Use the 3 letter abbreviations supported by the Statistical Office of the United Nations. Copies of these abbreviations are available from the IBPGR Secretariat and have been published in the FAO/IBPGR Plant Genetic Resources Newsletter number 49

2.5 PROVINCE/STATE

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

2.6 LOCATION OF COLLECTION SITE

Number of kilometres and direction from nearest town, village or map grid reference (e.g. TIMBUKTU7S means 7 km south of Timbuktu)

2.7 LATITUDE OF COLLECTION SITE

Degrees and minutes followed by N (north) or S (south), e.g. 1030S

2.8 LONGITUDE OF COLLECTION SITE

Degrees and minutes followed by E (east) or W (east), e.g. 7625W

2.9 ALTITUDE OF COLLECTION SITE [m]

Elevation above sea level

2.10 COLLECTION SOURCE

- 1 Wild
- 2 Farm land
- 3 Farm store
- 4 Backyard
- 5 Village market
- 6 Commercial market
- 7 Institute
- 8 Other (specify in the NOTES descriptor, 11)

2.11 STATUS OF SAMPLE

- 1 Wild
- 2 Weedy
- 3 Breeders' line
- 4 Primitive cultivar/landrace
- 5 Advanced cultivar (bred)
- 6 Other (specify in the NOTES descriptor, 11)

2.12 LOCAL/VERNACULAR NAME

Name given by farmer to cultivar/landrace/weed

2.13 NUMBER OF PLANTS SAMPLED

Approximate number of plants collected in the field to produce this accession

2.14 PHOTOGRAPH

Was a photograph taken of the accession or environment at collection?

0 No
+ Yes

2.15 TYPE OF SAMPLE

1 Vegetative
2 Seed
3 Both

2.16 ORGANS USED AS PRIMARY PRODUCTS

1 Whole plant
2 Green pod
3 Seed
4 Other (specify in the NOTES descriptor, 11)

2.17 OTHER NOTES FROM COLLECTOR

Collectors will record ecological information. For cultivated crops, cultivation practices such as irrigation, season of sowing, etc. will be recorded

CHARACTERIZATION AND PRELIMINARY EVALUATION

3. SITE DATA

3.1 COUNTRY OF CHARACTERIZATION AND PRELIMINARY EVALUATION

3.2 SITE (RESEARCH INSTITUTE)

3.3 NAME OF PERSON IN CHARGE OF CHARACTERIZATION

3.4 SOWING DATE

3.5 HARVEST DATE

4. PLANT DATA

4.1 VEGETATIVE

4.1.1 Seedling stem pigmentation

0 Absent
+ Present

4.1.2 Leaf pubescence

To be observed before maturity

- 0 Absent
- 3 Slight
- 7 Dense

4.1.3 Leaflet size

To be observed on fully expanded leaves on the lower flowering nodes. See Fig. 1

- 3 Small
- 5 Medium
- 7 Large

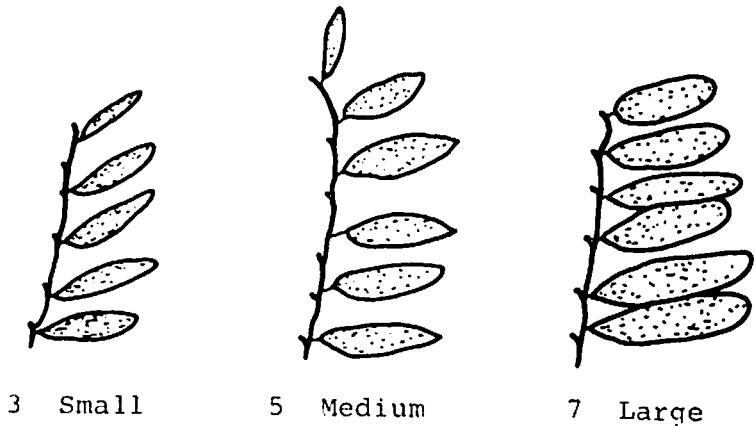


Fig. 1. Leaflet size

4.1.4 Plant height [cm]

Height of plant in late pod-filling stage, measured from the ground to the tip of the extended foliage. Mean of 10 plants

4.1.5 Tendrill length

To be observed during pod filling

- 1 Rudimentary
- 2 Prominent

4.2 INFLORESCENCE AND FRUIT

4.2.1 Time to flowering

Time in days from sowing to when 50% of the plants are in flower. However, in dry land areas when planting in dry soils, it is counted from the first day of rainfall or irrigation, which is sufficient for germination

4.2.2 Time to maturity

Time in days from sowing to when 90% of the pods are golden brown. See 4.2.1 for planting in dry soils

4.2.3 Flower ground colour

Ground colour of standard petal (flag)

- 1 White
- 2 White with blue veins
- 3 Blue
- 4 Violet
- 5 Pink
- 6 Other (specify in the NOTES descriptor, 11)

4.2.4 Pod pigmentation

- 0 Absent
- + Present

4.3 SEED

4.3.1 Number of seeds per pod

Measured as a mean of 10 dry pods

4.3.2 100 seed weight [g]

Average weight of 2 samples of 100 randomly chosen seeds

4.3.3 Ground colour of testa ^{1/}

To be observed on seed less than 3 months old

- 1 Green 2D4
- 2 Grey 5C4
- 3 Brown 7D6
- 4 Black -
- 5 Pink 6B5

4.3.4 Pattern of testa

See Fig. 2

- 0 Absent
- 1 Dotted
- 2 Spotted
- 3 Marbled
- 4 Complex (any combinations of 1,2 and 3)

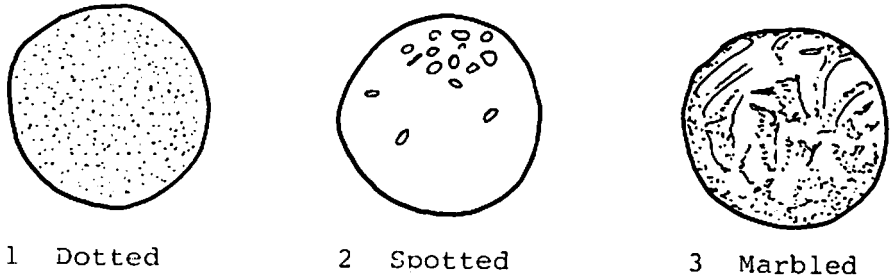


Fig. 2 Pattern of testa

4.3.5 Colour of pattern on testa ^{1/}

To be observed on seed less than 3 months old

- 0 Absent
- 1 Olive 2F7 to 3F5
- 2 Grey 6D3
- 3 Brown 6E4
- 4 Black -

4.3.6 Cotyledon colour ^{1/}

To be observed in seed less than 3 months old

- 1 Yellow 4B6
- 2 Orange/red 6A7
- 3 Olive-green 1D8

^{1/} Reference to Methuen book of Colour

FURTHER CHARACTERIZATION AND EVALUATION

5. SITE DATA

5.1 COUNTRY OF FURTHER CHARACTERIZATION AND EVALUATION

5.2 SITE (RESEARCH INSTITUTE)

5.3 NAME OF PERSON IN CHARGE OF EVALUATION

5.4 SOWING DATE

5.5 HARVEST DATE

6. PLANT DATA

6.1 VEGETATIVE

6.1.1 Lodging susceptibility

Scored at maturity (see 4.2.2) on a scale 1-9, where

0 None (all plants standing)

3 Low

5 Medium

7 High

6.1.2 Biological yield [g/m²]

Yield of dried, mature plants after pulling

6.2 INFLORESCENCE AND FRUIT

6.2.1 Number of flowers per peduncle

Maximum number of flowers per peduncle on 10 representative plants

6.2.2 Height of lowest pod [cm]

Estimate of the average height above ground of the lowest pod on unlodged plants at harvest

6.2.3 Pod shedding

Scored after or during harvesting a week after maturity (see 4.2.2) on a scale 1-9, where

- 0 None
- 3 Low
- 5 Medium
- 7 High

6.2.4 Pod dehiscence

Scored a week after maturity on a scale 1-9, where

- 0 None
- 3 Low
- 5 Medium
- 7 High

6.3 SEED

6.3.1 Seed yield [g/m²]

Yield of seed after drying

6.3.2 Protein content [%]

Percentage dry weight at seed moisture equal to or less than 12%. Use the conversion factor of N x 6.25

6.3.3 Methionine and other sulphur containing amino acids [mg/g N]

Measured at seed moisture equal to or less than 12%

6.3.4 Cooking time

The time in minutes for cooking unsoaked seed to softness in boiling distilled water at atmospheric pressure

7. STRESS SUSCEPTIBILITY

Scored on a scale 1-9, where

- 3 Low susceptibility
- 5 Medium susceptibility
- 7 High susceptibility

7.1 LOW TEMPERATURE

7.1.1 Winter kill

Proportion of the plants emerged prior to winter which survive through winter

7.1.2 Low temperature damage

Damage caused to aerial plant parts. Not associated with winter kill

7.2 HIGH TEMPERATURE

7.3 DROUGHT

7.4 HIGH SOIL MOISTURE

7.5 SALINITY

8. PEST AND DISEASE SUSCEPTIBILITY

Scored on a scale 1-9, where

3 Low susceptibility
5 Medium susceptibility
7 High susceptibility

8.1 PESTS

- | | | |
|-------|--|-----------|
| 8.1.1 | <u>Aphis craccivora Koch</u> | Aphid |
| 8.1.2 | <u>Sitona spp.</u> | Weevil |
| 8.1.3 | <u>Bruchus spp.</u> | Weevil |
| 8.1.4 | <u>Etiella zinckenella Treit.</u> | Pod borer |
| 8.1.5 | <u>Other</u> (specify in the NOTES descriptor, 11) | |

8.2 FUNGI

- | | | |
|-------|---|---------------|
| 8.2.1 | <u>Uromyces fabae (Pers.) de Bary</u> | Rust |
| 8.2.2 | <u>Ascochyta spp.</u> | Blight |
| 8.2.3 | <u>Fusarium oxysporum f.sp. lentis</u>
<u>(Vasudeva & Srinivasan) Gordon</u> | Vascular wilt |
| 8.2.4 | <u>Peronospora lentis Gaum.</u> | Downy mildew |
| 8.2.5 | <u>Other</u> (specify in the NOTES descriptor, 11) | |

8.3 BACTERIA

8.4 VIRUS

8.5 PARASITIC WEED (Orobanche spp.)

9. ALLOENZYME COMPOSITION

This may prove to be a useful tool for identifying duplicate accessions

10. CYTOLOGICAL CHARACTERS AND IDENTIFIED GENES

11. NOTES

Give additional information where descriptor state is noted as 'Other' as, for example, in descriptors 2.10, 4.2.3, etc. Also include here any further relevant information

APPENDIX I

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