

# PROTOCOL FOR TESTS ON DISTINCTNESS, UNIFORMITY AND STABILITY

Berberis L.

excluding *Berberis aquifolium* Pursh, *Berberis bealei* Fortune, *Berberis japonica* (Thunb.) Spreng., *Berberis napaulensis* (DC.) Spreng., *Berberis oiwakensis* (Hayata) Laferr., *Berberis pumila* Greene, *Berberis repens* Lindl. and hybrids between these species and other *Berberis* species

# BERBERIS

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## 1. SUBJECT OF THE PROTOCOL AND REPORTING

#### 1.1 Scope of the technical protocol

This Technical Protocol applies to all varieties of *Berberis* L., excluding *Berberis aquifolium* Pursh, *Berberis bealei* Fortune, *Berberis japonica* (Thunb.) Spreng., *Berberis napaulensis* (DC.) Spreng., *Berberis oiwakensis* (Hayata) Laferr., *Berberis pumila* Greene, *Berberis repens* Lindl. and hybrids between these species and other *Berberis* species

The protocol describes the technical procedures to be followed in order to meet the requirements of Council Regulation 2100/94 on Community Plant Variety Rights. The technical procedures have been agreed by the Administrative Council and are based on documents agreed by the International Union for the Protection of New Varieties of Plants (UPOV), such as the General Introduction to DUS (UPOV Document TG/1/3 http://www.upov.int/export/sites/upov/resource/en/tg 1 3.pdf), its associated TGP documents (http://www.upov.int/tgp/en/) and the relevant UPOV Test Guideline TG/068/4 dated 23/09/2022 (https://www.upov.int/edocs/tgdocs/en/tg068.pdf) for the conduct of tests for Distinctness, Uniformity and Stability.

# 1.2 Entry into Force

The present protocol enters into force on **28.11.2023**. Any ongoing DUS examination of candidate varieties started before the aforesaid date will not be affected by the approval of the Technical Protocol. Technical examinations of candidate varieties are carried out according to the TP in force when the DUS test starts. The starting date of a DUS examination is considered to be the due date for submitting of plant material for the first growing cycle.

In cases where the Office requests to take-over a DUS report for which the technical examination has either been finalized or which is in the process to be carried out at the moment of this request, such report can only be accepted if the technical examination has been carried out according to the CPVO TP which was in force at the moment when the technical examination started.

## 1.3 Reporting between Examination Office and CPVO and Liaison with Applicant

#### 1.3.1 <u>Reporting between Examination Office and CPVO</u>

The Examination Office shall deliver to the CPVO a preliminary report ("the preliminary report") no later than four weeks after the date of the request for technical examination by the CPVO and in any case preferably before the submission period of the plant material.

The Examination Office shall also deliver to the CPVO a report relating to each growing period ("the interim report") and, when the Examination Office considers the results of the technical examination to be adequate to evaluate the variety or the CPVO so requests, a report relating to the examination ("the final report").

The final report shall state the opinion of the Examination Office on the distinctness, uniformity and stability of the variety. Where it considers those criteria to be satisfied, or where the CPVO so requests, a description of the variety shall be added to the report.

If a report is negative the Examination Office shall set out the detailed reasons for its findings.

The interim and the final reports shall be delivered to the CPVO as soon as possible and no later than on the deadlines as laid down in the designation agreement.

#### 1.3.2 Informing on problems in the DUS test

In cases where the Examination Office identifies issues during the course of the technical examination that may lead to a negative report, the Examination Office shall inform the CPVO and in urgent cases the applicant/holder as soon as such issues become obvious.

#### 1.3.3 <u>Sample keeping in case of problems</u>

As far as feasible the Examination Office shall keep a representative sample of any relevant testing material of the candidate variety and reference variety(ies) if the technical examination has resulted in a negative report. As soon as possible, the CPVO shall inform the Examination Office when the material can be destroyed.

# 2. MATERIAL REQUIRED

### 2.1 Plant material requirements

Information with respect to the agreed closing dates and submission requirements of plant material for the technical examination of varieties can be found on <a href="https://public.plantvarieties.eu/publication">https://public.plantvarieties.eu/publication</a> in the special issue S2/S3 of the Official Gazette of the Office. General requirements on submission of samples are also to be found following the same link.

## 2.2 Informing the applicant of plant material requirements

The CPVO informs the applicant that:

- he is responsible for ensuring compliance with any customs and plant health requirements.
- the plant material supplied should be visibly healthy, not lacking in vigour, nor affected by any important pest or disease.
- the plant material should not have undergone any treatment which would affect the expression of the characteristics
  of the variety, unless the competent authorities allow or request such treatment. If it has been treated, full details
  of the treatment must be given.

#### 2.3 Informing about problems on the submission of material

The Examination Office shall report to the CPVO immediately in cases where the test material of the candidate variety has not arrived in time or in cases where the material submitted does not fulfil the conditions laid down in the request for submission of plant material issued by the CPVO.

In cases where the examination office encounters difficulties to obtain plant material of reference varieties the CPVO should be informed in writing.

## 3. METHOD OF EXAMINATION

#### 3.1 Number of growing cycle

- 3.1.1 The minimum duration of tests should normally be a single growing cycle.
- 3.1.2 The testing of a variety may be concluded when the entrusted examination office can determine with certainty the outcome of the test.

## 3.2 Testing Place

Tests are normally conducted at one place. In the case of tests conducted at more than one place, guidance is provided in TGP/9 "Examining Distinctness" <u>http://www.upov.int/edocs/tqpdocs/en/tqp\_9.pdf.</u>

### 3.3 Conditions for Conducting the Examination

- 3.3.1 The tests should be carried out under conditions ensuring satisfactory growth for the expression of the relevant characteristics of the variety and for the conduct of the examination.
- 3.3.2 Because daylight varies, colour determinations made against a colour chart should be made either in a suitable cabinet providing artificial daylight or in the middle of the day in a room without direct sunlight. The spectral distribution of the illuminant for artificial daylight should conform with the CIE Standard of Preferred Daylight D 6500 and should fall within the tolerances set out in the British Standard 950, Part I. These determinations should be made with the plant part placed against a white background. The colour chart and version used should be specified in the variety description.

## 3.4 Test design

- 3.4.1 Each test should be designed to result in a total of at least 6 plants.
- 3.4.2 The design of the tests should be such that plants or parts of plants may be removed for measurement or counting without prejudice to the observations which must be made up to the end of the growing cycle.

# 3.5 Special tests for additional characteristics

In accordance with Article 23 of Implementing Rules N° 874/2009 an applicant may claim either in the Technical Questionnaire or during the test that a candidate has a characteristic which would be helpful in establishing distinctness. If such a claim is made and is supported by reliable technical data, a special test may be undertaken providing that a technically acceptable test procedure can be devised.

Special tests will be undertaken, with the agreement of the President of CPVO, where distinctness is unlikely to be shown using the characteristics listed in the protocol.

#### 3.6 Constitution and maintenance of a variety collection

The process for the constitution and the maintenance of a variety collection can be summarized as follows:

Step 1: Making an inventory of the varieties of common knowledge;

Step 2: Establishing a collection ("variety collection") of varieties of common knowledge which are relevant for the examination of distinctness of candidate varieties;

Step 3: Selecting the varieties from the variety collection which need to be included in the growing trial or other tests for the examination of distinctness of a particular candidate variety.

#### 3.6.1 Forms of variety collection

The variety collection shall comprise variety descriptions and may comprise living plant material. The variety description shall be produced by the EO unless special cooperation exists between EOs and the CPVO. The variety collection shall comprise images (e.g., photographs, illustrations or digitalized images) of representative parts of the plants of each variety, produced by the respective EO. The descriptive and pictorial information produced by the EO shall be held and maintained in a form of a database.

#### 3.6.2 Living Plant Material

The EO may only obtain living plant material of reference varieties as and when those varieties need to be included in growing trials or other tests.

Living plant material of reference varieties identified to be included in the growing trial may be taken from the EO's collection in case there is one or shall be obtained specifically for the growing trial or other tests.

#### 3.6.3 Making an inventory of varieties of common knowledge for inclusion in the variety collection

The inventory shall include varieties protected under National and Community PBR, varieties in trade or in commercial registers.

The inventory shall take into account the list of varieties which are the subject of an on-going application for protection or official registration (candidate varieties).

In addition to the above, the inventory shall be extended to the appropriate to

- relevant example varieties referred to in the technical protocols;
- any commercial document in which varieties are marketed as propagating or harvested material, especially when there is no official registration system;
- any list including varieties which are publicly available within plant collections (varieties included in genetic resource collections, collection of old varieties, etc.);
- information provided by relevant plant experts.

## 3.6.4 Maintenance and renewal/update of a living variety collection

The EO shall maintain the variety collection under appropriate growing conditions (e.g., glasshouse, orchard, in vitro), where it shall be ensured that the plants are adequately irrigated, fertilised, pruned and protected from harmful pests and diseases.

Living material in variety collections representing varieties for which a DUS test was carried out at that EO shall be renewed after verification in a side-by-side comparison. In case where no living material is available anymore in the collection, such verification could be done with any other test that has proven to give similar results between the material in the collection and the new material.

## 4. ASSESSMENT OF DISTINCTNESS, UNIFORMITY AND STABILITY

The prescribed procedure is to assess distinctness, uniformity and stability in a growing trial.

### 4.1 Distinctness

#### 4.1.1 General recommendations

It is of particular importance for users of this Technical Protocol to consult the UPOV-General Introduction to DUS (link in chapter 1 of this document) and TGP 9 'Examining Distinctness' (<u>http://www.upov.int/edocs/tgpdocs/en/tgp 9.pdf</u>) prior to making decisions regarding distinctness. However, the following points are provided for elaboration or emphasis in this Technical Protocol.

Further guidance is provided in documents TGP/9 "Examining Distinctness" and TGP/8 "Trial Design and Techniques Used in the Examination of Distinctness, Uniformity and Stability".

#### 4.1.2 Consistent differences

The differences observed between varieties may be so clear that more than one growing cycle is not necessary. In addition, in some circumstances, the influence of the environment is not such that more than a single growing cycle is required to provide assurance that the differences observed between varieties are sufficiently consistent. One means of ensuring that a difference in a characteristic, observed in a growing trial, is sufficiently consistent is to examine the characteristic in at least two independent growing cycles.

# 4.1.3 <u>Clear differences</u>

Determining whether a difference between two varieties is clear depends on many factors, and should consider, in particular, the type of expression of the characteristic being examined, i.e., whether it is expressed in a qualitative, quantitative, or pseudo-qualitative manner. Therefore, it is important that users of these Technical Protocols are familiar with the recommendations contained in the UPOV-General Introduction to DUS prior to making decisions regarding distinctness.

#### 4.1.4 Number of plants/parts of plants to be examined

Unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 5 plants or parts taken from each of 5 plants and any other observations made on all plants in the test, disregarding any off-type plants.

## 4.1.5 <u>Method of observation</u>

The recommended method of observing the characteristic for the purposes of distinctness is indicated by the following key in the third column of the Table of Characteristics (see document TGP/9 "Examining Distinctness", Section 4 "Observation of characteristics"):

- MG: single measurement of a group of plants or parts of plants
- MS: measurement of a number of individual plants or parts of plants
- VG: visual assessment by a single observation of a group of plants or parts of plants
- VS: visual assessment by observation of individual plants or parts of plants

#### Type of observation: visual (V) or measurement (M)

"Visual" observation (V) is an observation made on the basis of the expert's judgment. For the purposes of this document, "visual" observation refers to the sensory observations of the experts and, therefore, also includes smell, taste and touch. Visual observation includes observations where the expert uses reference points (e.g., diagrams, example varieties, sideby-side comparison) or non-linear charts (e.g., colour charts). Measurement (M) is an objective observation against a calibrated, linear scale e.g., using a ruler, weighing scales, colorimeter, dates, counts, etc.

#### Type of record: for a group of plants (G) or for single, individual plants (S)

For the purposes of distinctness, observations may be recorded as a single record for a group of plants or parts of plants (G) or may be recorded as records for a number of single, individual plants or parts of plants (S). In most cases, "G" provides a single record per variety, and it is not possible or necessary to apply statistical methods in a plant-by-plant analysis for the assessment of distinctness.

In cases where more than one method of observing the characteristic is indicated in the Table of Characteristics (e.g., VG/MG), guidance on selecting an appropriate method is provided in document TGP/9, Section 4.2.

# 4.2 Uniformity

- 4.2.1 It is of particular importance for users of this Technical Protocol to consult the UPOV-General Introduction to DUS (link in chapter 1 of this document) and TGP 10 'Examining Uniformity' (<u>http://www.upov.int/edocs/tgpdocs/en/tgp\_10.pdf</u>) prior to making decisions regarding uniformity. However, the following points are provided for elaboration or emphasis in this Technical Protocol:
- 4.2.2 This Technical Protocol has been developed for the examination of vegetatively propagated varieties. For varieties with other types of propagation the recommendations in the UPOV-General Introduction to DUS and document TGP/13 "Guidance for new types and species", Section 4.5 "Testing Uniformity" should be followed.
- 4.2.3 For the assessment of uniformity of vegetatively propagated varieties, a population standard of 1% and an acceptance probability of at least 95 % should be applied. In the case of a sample size of 6 plants, 1 off-type is allowed.

### 4.3 Stability

It is of particular importance for users of this Technical Protocol to consult the UPOV-General Introduction to DUS (link in chapter 1 of this document) and TGP 11 'Examining Stability' (<u>http://www.upov.int/edocs/tgpdocs/en/tgp 11.pd</u>)

In practice, it is not usual to perform tests of stability that produce results as certain as those of the testing of distinctness and uniformity. However, experience has demonstrated that, for many types of variety, when a variety has been shown to be uniform, it can also be considered to be stable.

Where appropriate, or in cases of doubt, stability may be further examined by testing a new plant stock to ensure that it exhibits the same characteristics as those shown by the initial material supplied.

# 5. GROUPING OF VARIETIES AND ORGANISATION OF THE GROWING TRIAL

- **5.1** The selection of varieties of common knowledge to be grown in the trial with the candidate varieties and the way in which these varieties are divided into groups to facilitate the assessment of distinctness are aided by the use of grouping characteristics.
- **5.2** Grouping characteristics are those in which the documented states of expression, even where produced at different locations, can be used, either individually or in combination with other such characteristics: (a) to select varieties of common knowledge that can be excluded from the growing trial used for examination of distinctness; and (b) to organise the growing trial so that similar varieties are grouped together.
- **5.3** The following have been agreed as useful grouping characteristics:
  - a) Plant: type (characteristic 1)
  - b) Plant: growth habit (characteristic 2)
  - c) Plant: height in relation to width (characteristic 4)
  - d) Stem: type of spines (characteristic 8)
  - e) Leaf blade: main colour (characteristic 16) with the following groups:
    - Gr. 1: green
    - Gr. 2: yellow
    - Gr. 3: red
  - f) Leaf blade: secondary colour (characteristic 17)
  - g) Floral type (characteristic 24)
  - h) Fruit: shape in lateral view (characteristic 29)
- **5.4** If characteristics other than those mentioned in the list of grouping characteristics and/or from the table of characteristics and/or from the Technical Questionnaire sections 5 and 7. are used for the selection of varieties to be included into the growing trial, the EO shall inform the CPVO and seek the prior consent of the CPVO before using these characteristics.
- **5.5** Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the UPOV-General Introduction to DUS and document TGP/9 "Examining Distinctness".

# 6. INTRODUCTION TO THE TABLE OF CHARACTERISTICS

### 6.1 Characteristics to be used

The characteristics to be used in DUS tests and preparation of descriptions shall be those referred to in the table of characteristics. All the characteristics shall be used, providing that observation of a characteristic is not rendered impossible by the expression of any other characteristic, or the expression of a characteristic is prevented by the environmental conditions under which the test is conducted or by specific legislation on plant health. In the latter case, the CPVO should be informed.

The Administrative Council empowers the President, in accordance with Article 23 of Commission Regulation N°874/2009, to insert additional characteristics and their expressions in respect of a variety.

## 6.2. States of expression and corresponding notes

States of expression are given for each characteristic to define the characteristic and to harmonize descriptions. Each state of expression is allocated a corresponding numerical note for ease of recording of data and for the production and exchange of the description. All relevant states of expression are presented in the characteristic.

Further explanation of the presentation of states of expression and notes is provided in UPOV document TGP/7 "Development of Test Guidelines".

## 6.3 Example Varieties

Where appropriate, example varieties are provided to clarify the states of expression of each characteristic.

#### 6.4 Legend

For column 'C	<u>PVO N°'</u> :	
G	Grouping characteristic	-see Chapter 5
QL	Qualitative characteristic	
QN	Quantitative characteristic	
PQ	Pseudo-qualitative characteristic	
(+)	Explanations for individual characteristics	-see Chapter 8.2

For column 'UPOV Nº':

The numbering of the characteristics is provided as a reference to the UPOV guideline.

(*)	UPOV Asterisked characteristic	5	- Characteristics that are important for
			the international harmonization of variety
			descriptions.

For colum	<u>n 'Stage, method':</u>	
MG, MS, V	G, VS	-see Chapter 4.1.5
(a)-(f)	Explanations covering several Characteristics	-see Chapter 8.1

# 7. TABLE OF CHARACTERISTICS

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
1.	1. (*)	VG	Plant: type		
PQ			deciduous	Helmond Pillar	1
			semi-evergreen	Parkjuweel	2
G			evergreen	Tottenham	3
2. (+)	2. (*)	VG	Plant: growth habit		
PQ			upright	Helmond Pillar, Redtorch	1
			irregularly rounded	Electra, Orange Dream, STARBUST	2
			compact rounded	Admiration, Lutin Rouge, Tiny Gold	3
G			spreading	Green Ornament	4
3.	3. (*)	MG/MS /VG	Plant: height		
QN		(a)	very short	Fireball	1
			very short to short		2
			short	Admiration	3
			short to medium		4
			medium	Orange Rocket	5
			medium to tall		6
			tall	Fireflame	7
			tall to very tall		8
			very tall	Decora	9
4.	4. (*)	VG	Plant: height in relation to width		
QN		(a)	taller than broad	Helmond Pillar, Redtorch	1
			as tall as broad	Electra, Orange Dream, STARBUST	2
G			broader than tall	Admiration, Green Ornament, Lutin Rouge, Tiny Gold	3

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
5. (+)	5. (*)	VG	Branch: attitude		
QN		(a)	erect	Helmond Pillar, Lutin Rouge, Redtorch, Tiny Gold	1
			semi-erect	Admiration	2
			horizontal	Electra, Green Ornament, STARBUST	3
			drooping	Autumnalis, Orange Dream	4
6.	6.	VG	Young shoot: stem colour		
PQ		(a), (b)	green	Graciella	1
			yellow	Golden Rocket	2
			orange	Tiny Gold	3
			red	Lutin Rouge	4
			purple	Decora	5
7.	7. (*)	VG	Young shoot: leaf colour		
PQ		(a), (b)	green	Graciella	1
			yellow	Golden Rocket	2
			orange	Orange Ice	3
			red	Lutin Rouge	4
			pink		5
			purple	Redtorch	6
8. (+)	8. (*)	VG	Stem: type of spines		
QL		(c)	simple	Redtorch	1
G			trifid	Lombarts purple, Red Tears	2

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
9.	9. (*)	VG	Stem: length of spines		
QN		(c)	short	Golden Torch	1
			short to medium		2
			medium	Tottenham	3
			medium to long		4
			long	Dart's Superb	5
10. (+)	10. (*)	MG/VG	Stem: leaves per node		
PQ			one to three	Golden Rocket	1
			four to six	Electra	2
			more than six	Dart's Superb	3
11.	11. (*)	MG/MS /VG	Leaf: length		
QN		(d)	very short	Crawley Gem	1
			very short to short		2
			short	Lutin Rouge	3
			short to medium		4
			medium	Select	5
			medium to long		6
			long	Decora	7
			long to very long		8
			very long	Dart's Superb	9

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
12.	12. (*)	MG/MS /VG	Leaf: width		
QN		(d)	very narrow	Irwinii	1
			very narrow to narrow		2
			narrow	Tiny Gold	3
			narrow to medium		4
			medium	Forescate	5
			medium to broad		6
			broad	Decora	7
			broad to very broad		8
			very broad	Red Tears	9
13. (+)	13. (*)	VG	Leaf: shape		
PQ		(d)	ovate		1
			circular		2
			broad elliptic		3
			narrow elliptic		4
			linear		5
			obovate		6
			oblanceolate		7
			spatulate		8
14. (+)	14. (*)	VG	Leaf: spines		
PQ		(d)	absent	Golden Rocket	1
			only on apex	Suzanne	2
			on apex and margin	Red Tears	3
15. (+)	15. (*)	VG	Leaf: shape of apex		
PQ		(d)	acute	Irwinii, Dart's Superb	1
			obtuse	Suzanne	2
			rounded	Golden Rocket	3

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
16.	16. (*)	VG	Leaf blade: main colour		
PQ G		(d), (e)	RHS Colour Chart (indicate reference number)		
17.	17. (*)	VG	Leaf blade: secondary colour		
PQ		(d), (e)	none		1
			whitish		2
			green		3
			yellow		4
			orange		5
			pink		6
			red		7
G			purple		8
18. (+)	18. (*)	VG	Leaf blade: distribution of secondary colour		
QL		(d), (e)	on margin	Admiration	1
			irregular	Hoho 1, Silver Pillar	2
19.	19. (*)	VG	Leaf blade: tertiary colour		
PQ		(d), (e)	none		1
			whitish		2
			green		3
			yellow		4
			orange		5
			pink		6
			red		7
			purple		8

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
20.	20. (*)	VG	Leaf blade: quaternary colour		
PQ		(d), (e)	none		1
			whitish		2
			green		3
			yellow		4
			orange		5
			pink		6
			red		7
			purple		8
21.	21.	VG	Leaf blade: glossiness		
QN		(d)	absent or weak	Fireball	1
			medium	Dart's Improvement	2
			strong	Lutin Rouge	3
22. (+)	22. (*)	VG	Leaf: profile in cross-section		
PQ			flat or weakly convex	Golden Rocket	1
			moderately convex	Latifolia	2
			revolute	Irwinii	3
23. (+)	23. (*)	VG	Leaf: undulation of margin		
QN			absent or very weak	Golden Rocket	1
			very weak to weak		2
			weak	Parkjuweel	3
			weak to medium		4
			medium	Dart's Improvement	5
			medium to strong		6
			strong	Terra Nova	7
			strong to very strong		8
			very strong	Thunderbolt	9

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
24. (+)	24. (*)	VG	Floral type		
QL			solitary	Crawley Gem	1
			umbel	Red Rocket	2
			raceme	Red Tears	3
G			panicle	Barbarossa	4
25. (+)	25. (*)	VG	Flower bud: colour		
PQ			light yellow		1
			dark yellow		2
			orange		3
			red		4
26.	26. (*)	VG	Petal: main colour		
PQ			RHS Colour Chart (indicate reference number)		
27. (+)	27.	VG	Petal: shape of apex		
PQ			acute		1
			rounded		2
			emarginate		3
28. (+)	28. (*)	VG	Plant: number of fruits		
QN		(f)	absent or few	Erecta, Golden Torch, Kobold, Orange Ice	1
			medium	Orange Dream, Unique	2
			many	Forescate, Red Tears	3
29. (+)	29. (*)	VG	Fruit: shape in lateral view		
PQ		(f)	ovate	Sibbertoft Coral	1
			circular	Irwinii	2
			elliptic	Orange Rocket	3
G			oblong	Dart's Superb	4

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
30.	30.	VG	Fruit: bloom of skin		
QN		(f)	absent or weak		1
			medium	Bunch of Grapes	2
			strong	Dart's Improvement	3
31. (+)	31. (*)	VG	Fruit: colour of skin		
PQ		(f)	RHS Colour Chart (indicate reference number)		

# 8. EXPLANATIONS ON THE TABLE OF CHARACTERISTICS

### 8.1 Explanations covering several characteristics

Unless otherwise indicated, observations should be made at the time of full flowering.

Characteristics containing the following key in the third column of the Table of Characteristics should be examined as indicated below:

- a) Observations should be made just before flowering.
- b) Observations should be made on current's year shoots.
- c) Observations should be made on fully expanded spines from the middle third of the stem.
- d) Observations should be made on the upper side of fully expanded leaves from the middle third of the stem.
- e) The main colour is the colour with the largest surface area. In cases, where the areas of the main and secondary colours are too similar to reliably decide which colour has the largest area, the darker colour is considered to be the main colour. The same classification rules should be used for the secondary, tertiary, and the quaternary colours.
- f) Observations should be made on fully developed fruits from the middle third of the stem.

# 8.2 Explanations for individual characteristics

Ad. 2: Plant: growth habit



upright









compact rounded

spreading

# Ad. 5: Branch: attitude











# Ad. 8: Stem: type of spines



Ad. 10: Stem: leaves per node

Observations should be made on fully expanded leaves from the middle third of the stem.

# Ad. 13: Leaf: shape



# Ad. 14: Leaf: spines



1 absent



only on apex



3 on apex and margin









rounded

# Ad. 18: Leaf blade: distribution of secondary colour





irregular

# Ad. 22: Leaf: profile in cross-section

Observations should be made on fully expanded leaves from the middle third of the stem.



# Ad. 23: Leaf: undulation of margin

Observations should be made on fully expanded leaves from the middle third of the stem.

# Ad. 24: Floral type



# Ad. 25: Flower bud: colour

Observations on the flower should be made on the middle third of the stem just before flower opening.

### Ad. 27: Petal: shape of apex





Observations should be made on the number of fruits, independently from the number of flowers.

# Ad. 29: Fruit: shape in lateral view



# Ad. 31: Fruit: colour of skin

Observations should be made after removal of bloom on fruit.

### 9. LITERATURE

Cadic Alain, 2012: *Berberis à feuillage pourpre: son origine. Jardin de France,* n°618- *Le Japon : influences et confluences,* July-August 2012. *Société Nationale d'Horticulture de France (SNHF).* Paris, FR

Caduc Alain, 2017: *Inflorescences des Berberis, une diversité de formes. Jardin de France,* n°647-*La ville en vert et avec tous,* September-November 2017. *Société Nationale d'Horticulture de France (SNHF).* Paris, FR

# 10. TECHNICAL QUESTIONNAIRE

The Technical Questionnaire is available on the <u>CPVO website</u> under the following reference: CPVO/TQ-068/1 – *Berberis* L. – berberis

Link to e-TQ:

https://online.plantvarieties.eu/backOfficeFormQuestions?viewFormId=15165&viewFormType=TQ&viewFormLang=E N&speciesIds=BER01&status=1,2&order=formName