



PROTOCOL FOR TESTS ON DISTINCTNESS, UNIFORMITY AND STABILITY

***Plectranthus* L'Hér.
excluding *P. scutellarioides***

PLECTRANTHUS

UPOV Code: PLECT

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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 *Plectranthus* L'Hér. excluding *P. scutellarioides*.

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/en/publications/intro_dus.htm), its associated TGP documents (<http://www.upov.int/en/publications/tgp/>) and the relevant UPOV Test Guideline TG/315/1 dated 16/03/2016 (<http://www.upov.int/edocs/tgdocs/en/tg315.pdf>) for the conduct of tests for Distinctness, Uniformity and Stability.

1.2 Entry into Force

The present protocol enters into force on **04.10.2016**. 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 test period.

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 Reporting between Examination Office and CPVO

The Examination Office shall deliver to the CPVO a preliminary report ("the preliminary report") no later than two weeks after the date of the request for technical examination by the CPVO.

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

If problems arise during the course of the test the CPVO should be informed immediately so that the information can be passed on to the applicant. Subject to prior permanent agreement, the applicant may be directly informed at the same time as the CPVO particularly if a visit to the trial is advisable.

1.3.3 Sample keeping in case of problems

If the technical examination has resulted in a negative report, the CPVO shall inform the Examination Office as soon as possible in case that a representative sample of any relevant testing material shall be kept.

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 <http://www.cpvo.europa.eu/main/en/home/documents-and-publications/s2-gazette> in the special issue S2 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 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.

3. METHOD OF EXAMINATION

3.1 Number of growing cycles

Single growing cycle

The minimum duration of tests should normally be a single growing cycle.

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"

http://www.upov.int/export/sites/upov/en/publications/tgp/documents/tgp_9_1.pdf.

3.3 Conditions for Conducting the Examination

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.

Observation of colour by eye

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

Single plots

Each test should be designed to result in a total of at least 10 plants.

3.5 Additional tests

In accordance with Article 83(3) of Council Regulation No. 2100/94 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, an additional test may be undertaken providing that a technically acceptable test procedure can be devised.

Additional tests will be undertaken, with the agreement of the President of CPVO, where distinctness is unlikely to be shown using the characters 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 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

Vegetatively propagated agricultural and vegetable species and ornamental species

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

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' (http://www.upov.int/export/sites/upov/en/publications/tgp/documents/tgp_9_1.pdf) prior to making decisions regarding distinctness.

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 Clear differences

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. In the case of observations of parts taken from single plants, the number of parts to be taken from each of the plants should be 1.

4.1.5 Method of observation

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, side-by-side comparison) or non-linear charts (e.g. color 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

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’ (http://www.upov.int/export/sites/upov/en/publications/tgp/documents/tgp_10_1.pdf) prior to making decisions regarding uniformity. However, the following points are provided for elaboration or emphasis in this Technical Protocol:

Uniformity assessment by off-types (all characteristics observed on the same sample size)

Technical Protocols covering only varieties with uniformity assessed by off-types

“For the assessment of uniformity, a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 10 plants, 1 off-type is allowed.

4.3 Stability

4.3.1 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 11 ‘Examining Stability’

(http://www.upov.int/export/sites/upov/en/publications/tgp/documents/tgp_11_1.pdf)

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.

4.3.2 **Technical Protocols covering only vegetatively propagated varieties**

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 ORGANIZATION 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 organize the growing trial so that similar varieties are grouped together.

5.3 The following have been agreed as useful grouping characteristics.

- a) Plant: height (characteristic 2)
- b) Leaf blade: variegation (characteristic 9)
- c) Leaf blade: anthocyanin coloration of lower side (characteristic 12)
- d) Flower: main colour (characteristic 20) with the following groups:
 - Gr. 1: white
 - Gr. 2: pink
 - Gr. 3: reddish purple
 - Gr. 4: purple
 - Gr. 5: violet
 - Gr. 6: violet blue

5.4 If other characteristics than those from the TP 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.

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.

In the case of disease resistance characteristics, only those resistances marked with an asterisk (*) in the CPVO column are compulsory.

States of expression and corresponding notes

In the case of qualitative and pseudo-qualitative characteristics, all relevant states of expression are presented in the characteristic. However, in the case of quantitative characteristics with 5 or more states, an abbreviated scale may be used to minimize the size of the Table of Characteristics. For example, in the case of a quantitative characteristic with 9 states, the presentation of states of expression in the Test Guidelines may be abbreviated as follows:

State	Note
small	3
medium	5
large	7

However, it should be noted that all of the following 9 states of expression exist to describe varieties and should be used as appropriate:

State	Note
very small	1
very small to small	2
small	3
small to medium	4
medium	5
medium to large	6
large	7
large to very large	8
very large	9

6.2 Example Varieties

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

6.3 Legend

G	Grouping characteristic	– see Chapter 5
(*)	Asterisked characteristic	– see Chapter 6.1.2
MG, MS, VG, VS	– see Chapter 4.1.5	
QL	Qualitative characteristic	
QN	Quantitative characteristic	
PQ	Pseudo-qualitative characteristic	
(a)-(d)	See Explanations on the Table of Characteristics in Chapter 8.1	
(+)	See Explanations on the Table of Characteristics in Chapter 8.	

7. TABLE OF CHARACTERISTICS

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
1.	1.	VG	Plant: growth habit		
(+)			upright	Erma	1
QN			semi-upright	Cloud Nine	3
			spreading	Amanda, Verandah Jacaranda	5
			semi-trailing		7
			trailing	Variegated Cape GC	9
2.	2.	MS/VG	Plant: height		
(+)	(*)		short	Hadi Variegated	3
QN			medium	Chimanimani	5
G			tall	Erma	7
3.	5.	MS/VG	Leaf blade: length		
QN	(*)	(a)	short	Chimanimani	3
			medium	Jaws	5
			long	Erma, Trish	7
4	6.	MS/VG	Leaf blade: width		
QN	(*)	(a)	very narrow		1
			narrow	Chimanimani	3
			medium	Jazz Purple	5
			broad	Erma	7
			very broad	Trish	9
5.	7.	VG	Leaf blade: ratio length/width		
(+)		(a)	low	Chimanimani	1
QN			medium	Jazz Purple	2
			high	Tommy White	3

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
6.	9.	VG	Leaf blade: shape of base		
(+)	(*)	(a)	acute	Amanda, Erma	1
PQ			obtuse	Plepalila	2
			rounded	Cloud Nine, Jazz Purple	3
			truncate	Coral Cloud, Jaws	4
7.	10.	VG	Leaf blade: shape of apex		
(+)	(*)	(a)	acute	Guru's Choice	1
PQ			obtuse	Coral Cloud	2
			rounded	Amanda, Trish	3
8.	11.	VG	Leaf blade: position of broadest part		
QN		(a)	at middle	P 00 06 07	1
			slightly towards base	Jazz Purple	2
			moderately towards base	Variegated Cape GC	3
9.	12.	VG	Leaf blade: variegation		
QL	(*)	(a)	absent	Jaws, Jazz Purple	1
G			present	Variegated Cape GC	9
10.	13.	VG	Leaf blade: intensity of green colour of upper side		
(+)	(*)	(a)	light	Easy Gold, Jaws	1
QN			medium	Amanda	2
			dark	Erma	3
11.	14.	VG	Leaf blade: anthocyanin coloration of upper side		
QN		(a)	absent or weak		1
			medium		2
			strong		3

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
12.	15.	VG	Leaf blade: anthocyanin coloration of lower side		
QN	(*)	(a)	absent or very weak	Cloud Nine	1
			weak	Tommy White	3
			medium	Jazz Blush Pink	5
			strong	Jazz Purple	7
G			very strong		9
13.	16.	VG	Leaf blade: distribution of anthocyanin coloration of lower side		
PQ	(*)	(a)	between veins	Verandah Jacaranda	1
			on veins only	Coral Cloud	2
			throughout	Amanda, P 00 06 07	3
14.	17.	VG	Leaf blade: type of incisions of margin		
(+)	(*)	(a)	biserrate	Tommy White	1
PQ			serrate	Erma	2
			serrate to dentate	Jazz Blush Pink	3
			dentate	Variegated Cape GC	4
			dentate to crenate	Amanda	5
			crenate	Cloud Nine	6
15.	18.	VG	Leaf blade: depth of incisions of margin		
(+)	(*)	(a)	very shallow	Hadi Variegated	1
QN			shallow	Erma	2
			medium	Variegated Cape GC	3
			deep	Tommy White	4
			very deep	Jaws	5

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
16.	20.	VG	Leaf blade: pubescence		
QN	(*)	(a)	absent or very sparse	Erma	1
			sparse	P 00 06 07	2
			medium	Tommy White	3
			dense	Plepalila	4
			very dense	Jaws	5
17.	21.	VG	Flowering branch: density of flowers		
QN		(b)	very sparse	Jazz Pink	1
			sparse	Jazz Purple	3
			medium	Jazz Variegated White	5
			dense	Chimanimani	7
			very dense		9
18.	22.	VG	Flowering branch: pubescence		
(*)		(b)	absent or very sparse	Jazz Purple	1
QN			sparse	Chimanimani	2
			medium	Variegated Cape GC	3
			dense		4
			very dense	Jaws	5
19.	23.	VG	Flowering branch: anthocyanin coloration		
QN		(b)	absent or very weak	Guru's Choice	1
			weak		2
			medium	Coral Cloud	3
			strong		4
			very strong	Amanda	5

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
20.	24.	VG	Flower: main colour		
(+)	(*)	(c)	white	Jazz Variegated White	1
PQ		(d)	pink	Jazz Blush Pink	2
			reddish purple	P 00 06 07	3
			purple	Amanda	4
			violet	Jazz Purple	5
G			violet blue	Hadi Variegated	6
21.	25.	MS/VG	Corolla: length		
(+)	(*)	(d)	very short	Chimanimani	1
QN			short	Jazz Variegated White	3
			medium	Jazz Blush Pink	5
			long	Jazz Purple	7
			very long		9
22.	26.	MS/VG	Corolla: height		
(+)		(d)	low		1
QN			medium		3
			high		5
23.	27.	MS/VG	Corolla tube: length		
(+)	(*)	(d)	very short	Coral Cloud	1
QN			short	Amanda	3
			medium	Guru's Choice	5
			long	Cloud Nine	7
			very long		9

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
24.	28.	MS/VG	Corolla tube: height		
(+)	(*)	(d)	very low	Chimanimani	1
QN			low	Coral Cloud, Jazz Variegated White	3
			medium	Jazz Pink	5
			high	Guru's Choice	7
			very high		9
25.	29.	VG	Corolla tube: ratio length/height		
(+)	(*)	(d)	low		1
QN			medium		2
			high		3
26.	30.	VG	Corolla tube: longitudinal curving		
(+)		(d)	absent or weak	Cloud Nine	1
QN			medium	Variegated Cape GC	2
			strong	Guru's Choice	3
27.	31.	VG	Corolla tube: main colour of outer side		
	(*)				
PQ		(c) (d)	RHS Colour Chart (indicate reference number)		
28.	32.	VG	Upper corolla lobe: main colour of outer side		
(+)	(*)				
PQ		(c) (d)	RHS Colour Chart (indicate reference number)		
29.	33.	VG	Upper corolla lobe: main colour of inner side		
(+)	(*)				
PQ		(c) (d)	RHS Colour Chart (indicate reference number)		
30.	34.	VG	Upper corolla lobe: prominence of purple spots or markings		
(+)	(*)	(d)	absent or weak	Jazz Blush Pink	1
QN			medium	Tommy White	2
			strong	P 00 06 07	3

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
31.	35.	VG	Lower corolla lobe: main colour of outer side		
(+)	(*)	(c)	white	Guru's Choice	1
PQ		(d)	pink	Jazz Blush Pink	2
			reddish purple	P 00 06 07	3
			purple	Amanda	4
			violet	Coral Cloud, Jazz Purple	5
			violet blue	Hadi Variegated	6

8. EXPLANATIONS ON THE TABLE OF CHARACTERISTICS

8.1 Explanations covering several characteristics

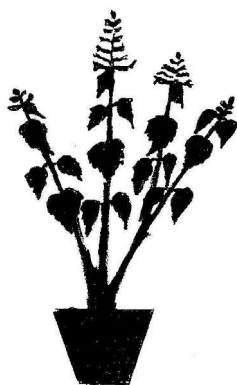
Unless otherwise indicated, observations should be made at the time of full flowering.

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

- a) Observations on the leaf should be made on fully developed leaves from the middle part of the plant.
- b) Observations on the flowering branch should be made on the highest flowering branch. Pubescence and anthocyanin coloration of the flowering branch should be assessed on the middle third of the rachis.
- c) The main colour is the colour with the largest surface area. In cases where the areas of the main and secondary colour are too similar to reliably decide which colour has the largest area, the darker colour is considered to be the main colour.
- d) Observations on the flower and flower parts should be made on fresh, fully open flowers.

8.2 Explanations for individual characteristics

Ad 1: Plant: growth habit



1
upright



3
semi-upright



5
spreading

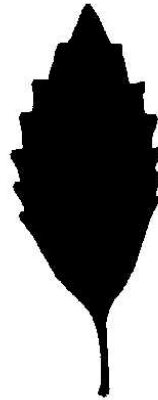


9
trailing

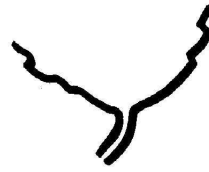
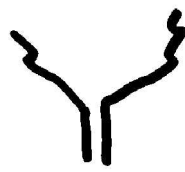
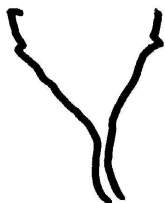
Ad 2: Plant: height



Ad 5: Leaf blade: ratio length/width



Ad 6: Leaf blade: shape of base



Ad 7: Leaf blade: shape of apex



1
acute



2
obtuse



3
rounded

Ad 10: Leaf blade: intensity of green colour of upper side

To be observed excluding variegation.

Ad 14: Leaf blade: type of incisions of margin



1
biserrate



2
serrate

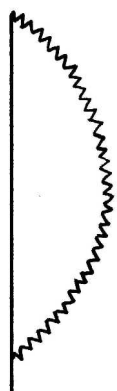


4
dentate

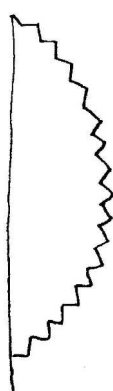


6
crenate

Ad 15: Leaf blade: depth of incisions of margin



2
shallow



3
medium

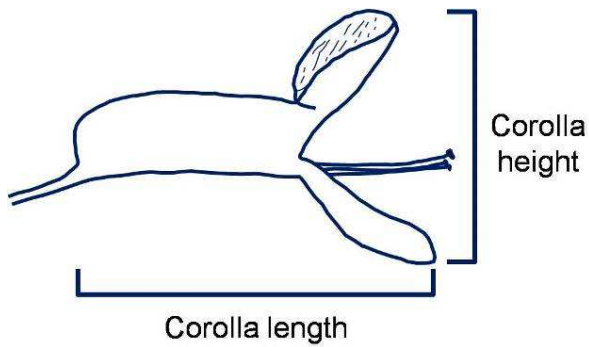


4
deep

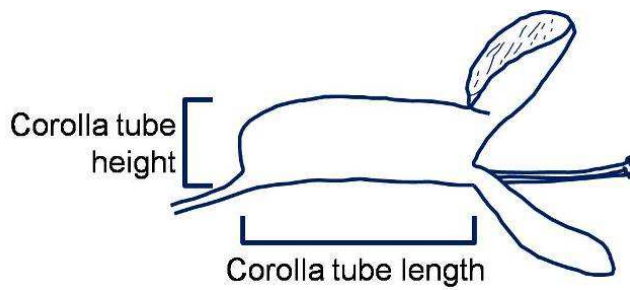
Ad 20: Flower: main colour

This characteristic refers to the general colour impression of the flowers, and should be observed while standing one or two steps away from the plants.

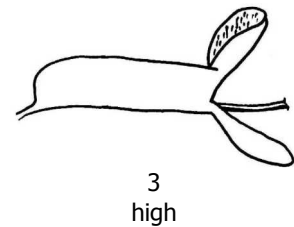
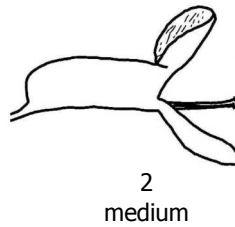
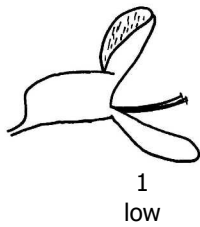
Ad 21: Corolla: length
Ad 22: Corolla: height



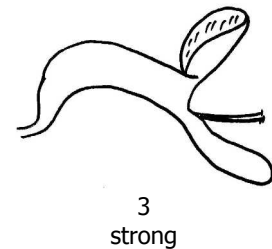
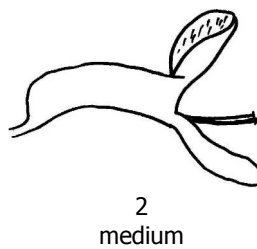
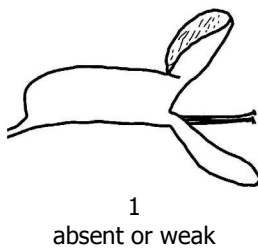
Ad 23: Corolla tube: length
Ad 24: Corolla tube: height



Ad 25: Corolla tube: ratio length/height



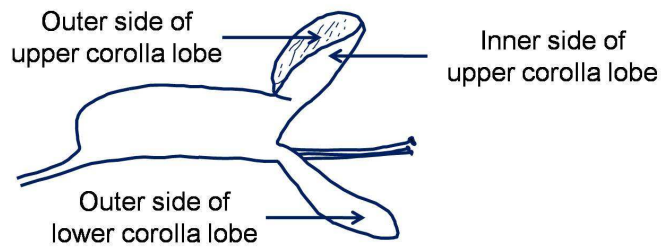
Ad 26: Corolla tube: longitudinal curving



Ad 28: Upper corolla lobe: main colour of outer side

Ad 29: Upper corolla lobe: main colour of inner side

Ad 31: Lower corolla lobe: main colour of outer side



Ad 30: Upper corolla lobe: prominence of purple spots or markings

The prominence is determined by the colour contrast.

9. LITERATURE

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10. TECHNICAL QUESTIONNAIRE

The Technical Questionnaire is available on the CPVO website under the following reference: CPVO-TQ/315/1.