CPVO · OCVV
Community Plant Variety Office
Office Communautaire des Variétés Végétales

# PROTOCOL FOR TESTS ON DISTINCTNESS, UNIFORMITY AND STABILITY

## *Campanula* L.

## CAMPANULA

UPOV Code: CAMPA

**Adopted on 04/10/2016**

**Entry into force on 04/10/2016**

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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 ***Campanula*** **L.**.

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/305/1 dated 25/03/2015 (http://www.upov.int/edocs/tgdocs/en/tg305_1.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 on-going 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 vigor, 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

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.

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 10 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 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
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.

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 and varieties in trade or in commercial registers. In addition to the above, the inventory shall be extended to the appropriate to

- 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;
- relevant example varieties referred to in the technical protocols for the examination of distinctness.

## 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. However, the following points are provided for elaboration or emphasis in this Technical Protocol.

To assess distinctness of hybrids, a pre-screening system on the basis of the parental lines and the formula may be established according to the following recommendations:

(i) description of parental lines according to the Technical Protocols;

(ii) check of the distinctness of the parental lines in comparison with the reference collection, based on the characteristics in the table of characteristics in order to screen the closest inbred lines;

(iii) check of the distinctness of the hybrid formula in comparison with those of the hybrids in common knowledge, taking into account the closest inbred lines;

(iv) assessment of the distinctness at the hybrid level of varieties with a similar formula.

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 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

Alternative 1: "Unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 9 plants or parts taken from each of 9 plants and any other observations made on all plants in the test, disregarding any off-type plants."

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:

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 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 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: growth habit (characteristic 1)

b) Plant: height (characteristic 2)

c) Leaf blade: main colour (characteristic 13)

d) Flower: attitude (characteristic 20)

e) Flower: type (characteristic 21)

f) Corolla: number of whorls (characteristic 25)

g) Corolla: main colour of outer side (characteristic 28)
   Gr. 1: white
   Gr. 2: pink
   Gr. 3: red purple
   Gr. 4: purple
   Gr. 5: blue

h) Corolla: main colour of inner side (characteristic 34)
   Gr. 1: white
   Gr. 2: pink
   Gr. 3: red purple
   Gr. 4: purple
   Gr. 5: blue

i) Corolla: spots on inner side (characteristic 37)

**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.

**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)-(c) | See Explanations on the Table of Characteristics in Chapter 8.1 | |
| (+) | See Explanations on the Table of Characteristics in Chapter 8.2 | |

## 7. TABLE OF CHARACTERISTICS

| CPVO N° | UPOV N° | Stage, Method | Characteristics | Examples | Note |
|---|---|---|---|---|---|
| **1.** | **1.** | **VG** | **Plant: growth habit** | | |
| **(+)** | **(*)** | | upright | La Bello | 1 |
| **PQ** | | | semi-upright | Sarastro | 2 |
| | | | spreading | PKMP05 | 3 |
| | | | horizontal | Blue Rivulet | 4 |
| **G** | | | drooping | Camp trailbule | 5 |
| **2.** | **2.** | **VG/ MG/MS** | **Plant: height** | | |
| **(+)** | **(*)** | | extremely short | Puck | 1 |
| **QN** | | | very short | Samantha | 3 |
| | | | short | Caroline | 5 |
| | | | medium | Sarastro | 7 |
| | | | tall | Kent Belle | 9 |
| | | | very tall | | 11 |
| **G** | | | extremely tall | Aida | 13 |
| **3.** | **3.** | **VG/ MG/MS** | **Plant: width** | | |
| **(+)** | | | very narrow | | 1 |
| **QN** | | | narrow | Napoli Blue | 3 |
| | | | medium | PKMP05 | 5 |
| | | | broad | Sarastro | 7 |
| | | | very broad | Blue Rivulet | 9 |
| **4.** | **4.** | **VG** | **Plant: density** | | |
| **(+)** | | | very sparse | PKM01 | 1 |
| **QN** | | | sparse | Caroline | 3 |
| | | | medium | Samantha | 5 |
| | | | dense | PKMP05 | 7 |
| | | | very dense | PKMP01 | 9 |

| CPVO N° | UPOV N° | Stage, Method | Characteristics | Examples | Note |
|---|---|---|---|---|---|
| **5.** | **5.** | **VG** | **Stem: colour** | | |
| **(+)** | | | yellow green | Blue Eyed Blonde | 1 |
| **PQ** | | | light green | PKMP05 | 2 |
| | | | medium green | Sarastro | 3 |
| | | | dark green | PKM01 | 4 |
| | | | grey green | PKMFOR168 | 5 |
| | | | green tinged with red purple | Blue Rivulet | 6 |
| | | | red purple | Silver Bells | 7 |
| **6.** | **6. (*)** | **VG/ MG/MS** | **Leaf blade: length** | | |
| **QN** | | **(a)** | very short | PKMP05 | 1 |
| | | | short | Napoli Blue | 3 |
| | | | medium | Blue Rivulet | 5 |
| | | | long | Caroline | 7 |
| | | | very long | Elizabeth | 9 |
| **7.** | **7.** | **VG/ MG/MS** | **Leaf blade: width** | | |
| **(+)** | **(*)** | **(a)** | very narrow | Pink Octopus | 1 |
| **QN** | | | narrow | Blue Eyed Blonde | 3 |
| | | | medium | Caroline | 5 |
| | | | broad | Silver Bells | 7 |
| | | | very broad | Sarastro | 9 |
| **8.** | **8.** | **VG/ MG/MS** | **Leaf blade: length/width ratio** | | |
| **(+)** | **(*)** | **(a)** | low | Caroline | 3 |
| **QN** | | | medium | Pink Octopus | 5 |
| | | | high | Blue Eyed Blond | 7 |

| CPVO N° | UPOV N° | Stage, Method | Characteristics | Examples | Note |
|---|---|---|---|---|---|
| **9.** | **9.** | **VG** | **Leaf blade: position of broadest part** | | |
| **(+)** | | **(a)** | strongly towards base | | 1 |
| **QN** | | | moderately towards base | | 2 |
| | | | at middle | | 3 |
| | | | towards apex | | 4 |
| **10.** | **10.** | **VG** | **Leaf blade: shape of apex** | | |
| **(+)** | | **(a)** | acuminate | | 1 |
| **PQ** | | | acute | | 2 |
| | | | obtuse | | 3 |
| **11.** | **11.** | **VG** | **Leaf blade: shape of base** | | |
| **(+)** | | **(a)** | attenuate | | 1 |
| **PQ** | | | acute | | 2 |
| | | | obtuse | | 3 |
| | | | rounded | | 4 |
| | | | truncate | | 5 |
| | | | cordate | | 6 |
| **12.** | **12. (*)** | **VG** | **Leaf blade: variegation** | | |
| **QL** | | **(a)** | absent | Pink Octopus | 1 |
| | | | present | Kifu | 9 |
| **13.** | **13.** | **VG** | **Leaf blade: main colour** | | |
| **(+)** | **(*)** | **(a)** | whitish | | 1 |
| **PQ** | | | yellow | Kifu | 2 |
| | | | yellow green | Blue Eyed Blonde | 3 |
| | | | light green | Caroline | 4 |
| | | | medium green | Sarastro | 5 |
| | | | dark green | PKM01 | 6 |
| | | | grey green | Silver Bells | 7 |
| **G** | | | green tinged with purplish red | Blue Rivulet | 8 |

| CPVO N° | UPOV N° | Stage, Method | Characteristics | Examples | Note |
|---|---|---|---|---|---|
| **14.** | **14.** | **VG** | **Leaf blade: rugosity** | | |
| **QN** | | **(a)** | absent or very weak | PKM01 | 1 |
| | | | weak | Pink Octopus | 2 |
| | | | medium | Sarastro | 3 |
| | | | strong | Elizabeth | 4 |
| | | | very strong | Hot Lips | 5 |
| **15.** | **15.** | **VG** | **Leaf blade: glossiness** | | |
| **QN** | | **(a)** | absent or very weak | PKM01 | 1 |
| | | | weak | Pink Octopus | 2 |
| | | | medium | Caroline | 3 |
| | | | strong | Silver Bells | 4 |
| **16.** | **16.** | **VG** | **Leaf blade: pubescence** | | |
| **QN** | **(*)** | **(a)** | absent or very sparse | PKM01 | 1 |
| | | | sparse | Pink Octopus | 2 |
| | | | medium | Sarastro | 3 |
| | | | dense | Caroline | 4 |
| | | | very dense | PKMFOR168 | 5 |
| **17.** | **17.** | **VG** | **Leaf blade: indentations of margin** | | |
| **(+)** | | **(a)** | absent or very few | PKM01 | 1 |
| **QN** | | | few | Napoli Blue | 2 |
| | | | medium | Sarastro | 3 |
| | | | many | Caroline | 4 |
| | | | very many | Elizabeth | 5 |

| CPVO N° | UPOV N° | Stage, Method | Characteristics | Examples | Note |
|---|---|---|---|---|---|
| **18.** | **18.** | **VG** | **Leaf blade: depth of indentations of margin** | | |
| **(+)** | | **(a)** | very shallow | PKM01 | 1 |
| **QN** | | | shallow | Caroline | 2 |
| | | | medium | Pink Octopus | 3 |
| | | | deep | Camp trailbule | 4 |
| | | | very deep | Sarastro | 5 |
| **19.** | **19.** | **VG** | **Leaf blade: undulation of margin** | | |
| **(+)** | | **(a)** | absent or very weak | Sarastro | 1 |
| **QN** | | | weak | Caroline | 2 |
| | | | medium | Elizabeth | 3 |
| | | | strong | PKMFOR168 | 4 |
| | | | very strong | Hot Lips | 5 |
| **20.** | **20.** | **VG** | **Flower: attitude** | | |
| **(+)** | **(*)** | **(b)** | upwards | Samantha | 1 |
| **QN** | | | slightly outwards | PKMP05 | 2 |
| | | | strongly outwards | Blue Eyed Blonde | 3 |
| | | | slightly downwards | Pink Octopus | 4 |
| **G** | | | strongly downwards | Sarastro | 5 |
| **21.** | **21.** | **VG** | **Flower: type** | | |
| **(+)** | **(*)** | **(b)** | tubular | Sarastro | 1 |
| **PQ** | | | campanulate | PKMH01 | 2 |
| | | | rotate | Samantha | 3 |
| **G** | | | stellate (with strap-shaped lobes) | Pink Octopus | 4 |
| **22.** | **22.** | **VG** | **Calyx: petaloid lobes** | | |
| **(+)** | **(*)** | **(b)** | absent | Kent Belle | 1 |
| **QL** | | | present | Pantaloons | 9 |

| CPVO N° | UPOV N° | Stage, Method | Characteristics | Examples | Note |
|---|---|---|---|---|---|
| **23.** | **23.** | **VG** | **<u>Only varieties with calyx: petaloid lobes present</u>: Calyx lobe: colour of outer side** | | |
| **PQ** | | **(b)** | RHS Colour Chart<br>(indicate reference number) | | |
| **24.** | **24.** | **VG** | **Calyx: position of lobes** | | |
| **(+)** | | **(b)** | adpressed to corolla | | 1 |
| **QN** | | | moderately spreading | | 3 |
| | | | horizontal | | 5 |
| | | | moderately reflexed | | 7 |
| | | | strongly reflexed | | 9 |
| **25.** | **25.** | **VG** | **Corolla: number of whorls** | | |
| **(+)** | **(*)** | **(b)** | very few | PKMH01 | 1 |
| **QN** | | | few | Havidb701 | 2 |
| | | | medium | White Ball | 3 |
| **G** | | | many | La Bello | 4 |
| **26.** | **26.** | **VG/ MG/MS** | **Corolla: length** | | |
| **(+)** | **(*)** | **(b)** | very short | Blue Rivulet | 1 |
| **QN** | | | short | Jelly Bells | 3 |
| | | | medium | Caroline | 5 |
| | | | long | Pantaloons | 7 |
| | | | very long | Sarastro | 9 |
| **27.** | **27.** | **VG/ MG/MS** | **Corolla: diameter** | | |
| **(+)** | **(*)** | **(b)** | very small | | 1 |
| **QN** | | | small | PKMP05 | 3 |
| | | | medium | Sarastro | 5 |
| | | | large | Blue Eyed Blonde | 7 |
| | | | very large | Pink Octopus | 9 |

| CPVO N° | UPOV N° | Stage, Method | Characteristics | Examples | Note |
|---|---|---|---|---|---|
| **28.** | **28. (*)** | **VG** | **Corolla: main colour of outer side** | | |
| **PQ G** | | **(b) (c)** | RHS Colour Chart (indicate reference number) | | |
| **29.** | **29.** | **VG** | **Corolla: distribution of secondary colour of outer side** | | |
| **(+)** | | **(b)** | none | | 1 |
| **PQ** | | **(c)** | distal quarter | | 2 |
| | | | basal half | | 3 |
| | | | basal quarter | | 4 |
| | | | at base | | 5 |
| | | | marginal zone | | 6 |
| | | | midribs | | 7 |
| | | | midribs and marginal zone | | 8 |
| | | | along veins | | 9 |
| **30.** | **30. (*)** | **VG** | **Corolla: secondary colour of outer side** | | |
| **PQ** | | **(b) (c)** | RHS Colour Chart (indicate reference number) | | |
| **31.** | **31.** | **VG** | **Corolla: spots on outer side** | | |
| **QL** | **(*)** | **(b)** | absent | Sarastro | 1 |
| | | | present | Pink Chimes | 9 |

| CPVO N° | UPOV N° | Stage, Method | Characteristics | Examples | Note |
|---|---|---|---|---|---|
| **32.** | **32.** | **VG** | **Corolla: distribution of spots on outer side** | | |
| **(+)** | | **(b)** | mainly in basal quarter | | 1 |
| **PQ** | | | mainly in basal half | | 2 |
| | | | mainly in basal three quarters | | 3 |
| | | | throughout | | 4 |
| | | | mainly along basal quarter of midribs | | 5 |
| | | | mainly along basal half of midribs | | 6 |
| | | | mainly along basal three quarters of midribs | | 7 |
| | | | mainly along entire length of midribs | | 8 |
| **33.** | **33.** | **VG** | **Corolla: density of spots on outer side** | | |
| **QN** | | **(b)** | very sparse | | 1 |
| | | | sparse | Silver Bells | 3 |
| | | | medium | Elizabeth | 5 |
| | | | dense | Pink Chimes | 7 |
| | | | very dense | | 9 |
| **34.** | **34. (*)** | **VG** | **Corolla: main colour of inner side** | | |
| **PQ G** | | **(b) (c)** | RHS Colour Chart (indicate reference number) | | |

| CPVO N° | UPOV N° | Stage, Method | Characteristics | Examples | Note |
|---|---|---|---|---|---|
| **35.** | **35.** | **VG** | **Corolla: distribution of secondary colour of inner side** | | |
| **(+)** | | **(b)** | none | | 1 |
| **PQ** | | **(c)** | distal quarter | | 2 |
| | | | basal half | | 3 |
| | | | basal quarter | | 4 |
| | | | at base | | 5 |
| | | | marginal zone | | 6 |
| | | | midribs | | 7 |
| | | | longitudinal zone | | 8 |
| | | | along veins | | 9 |
| **36.** | **36. (*)** | **VG** | **Corolla: secondary colour of inner side** | | |
| **PQ** | | **(b) (c)** | RHS Colour Chart (indicate reference number) | | |
| **37.** | **37.** | **VG** | **Corolla: spots on inner side** | | |
| **QL** | **(*)** | **(b)** | absent | La Bello | 1 |
| **G** | | | present | Pink Octopus | 9 |
| **38.** | **38.** | **VG** | **Corolla: distribution of spots on inner side** | | |
| **(+)** | | **(b)** | mainly in basal quarter | | 1 |
| **PQ** | | | mainly in basal half | | 2 |
| | | | mainly in basal three quarters | | 3 |
| | | | throughout | | 4 |
| | | | mainly along basal quarter of midribs | | 5 |
| | | | mainly along basal half of midribs | | 6 |
| | | | mainly along basal three quarters of midribs | | 7 |
| | | | mainly along entire length of midribs | | 8 |

| CPVO N° | UPOV N° | Stage, Method | Characteristics | Examples | Note |
|---|---|---|---|---|---|
| **39.** | **39.** | **VG** | **Corolla: density of spots on inner side** | | |
| **QN** | | **(b)** | very sparse | | 1 |
| | | | sparse | Silver Bells | 3 |
| | | | medium | Pink Octopus | 5 |
| | | | dense | Pink Chimes | 7 |
| | | | very dense | Hot Lips | 9 |
| **40.** | **40.** | **VG** | **Corolla: colour of spots on inner side** | | |
| **PQ** | | **(b)** | RHS Colour Chart<br>(indicate reference number) | | |
| **41.** | **41.** | **VG** | **Corolla: pubescence of inner side** | | |
| **QL** | **(*)** | **(b)** | absent | Caroline | 1 |
| | | | present | Pink Octopus | 9 |
| **42.** | **42.** | **VG/ MG/MS** | **Corolla: length of fused part** | | |
| **(+)** | | **(b)** | absent or extremely short | Pink Octopus | 1 |
| **QN** | | | very short | PKM01 | 3 |
| | | | short | Caroline | 5 |
| | | | medium | Kent Belle | 7 |
| | | | long | Pantaloons | 9 |
| | | | very long | Elizabeth | 11 |
| | | | extremely long | Sarastro | 13 |
| **43.** **(+)** | **43.** **(*)** | **VG** | **Corolla: relative length of fused part compared to total corolla length** | | |
| **QN** | | **(b)** | absent or very short | | 1 |
| | | | short | | 3 |
| | | | medium | | 5 |
| | | | long | | 7 |
| | | | very long | | 9 |

| CPVO N° | UPOV N° | Stage, Method | Characteristics | Examples | Note |
|---|---|---|---|---|---|
| **44.** | **44.** | **VG/ MG/MS** | **Corolla: diameter of fused part** | | |
| **(+)** | | **(b)** | absent or very small | | 1 |
| **QN** | | | small | | 3 |
| | | | medium | | 5 |
| | | | large | | 7 |
| | | | very large | | 9 |
| **45. (+)** | **45. (*)** | **VG** | **Corolla: profile of fused part in longitudinal section** | | |
| **PQ** | | **(b)** | converging | | 1 |
| | | | parallel | | 2 |
| | | | very weakly diverging | | 3 |
| | | | weakly diverging | | 4 |
| | | | moderately diverging | | 5 |
| | | | strongly diverging | | 6 |
| | | | very strongly diverging | | 7 |
| **46.** | **46.** | **VG** | **Corolla lobe: shape** | | |
| **(+)** | **(*)** | **(b)** | triangular | | 1 |
| **PQ** | | | ovate | | 2 |
| | | | elliptic | | 3 |
| | | | oblong | | 4 |
| **47.** | **47.** | **VG/ MG/MS** | **Corolla lobe: length** | | |
| **(+)** | **(*)** | **(b)** | very short | Jelly Bells | 1 |
| **QN** | | | short | PKMP05 | 3 |
| | | | medium | Blue Eyed Blonde | 5 |
| | | | long | | 7 |
| | | | very long | | 9 |
| | | | extremely long | Pink Octopus | 11 |

| CPVO N° | UPOV N° | Stage, Method | Characteristics | Examples | Note |
|---|---|---|---|---|---|
| **48.** | **48.** | **VG/ MG/MS** | **Corolla lobe: width** | | |
| **(+)** | | **(b)** | very narrow | Blue Rivulet | 1 |
| **QN** | | | narrow | Caroline | 3 |
| | | | medium | Kent Belle | 5 |
| | | | broad | La Bello | 7 |
| | | | very broad | Blue Eyed Blonde | 9 |
| **49.** | **49.** | **VG** | **Corolla lobe: curvature** | | |
| **(+)** | **(*)** | **(b)** | very weakly incurving | | 1 |
| **QN** | | | straight | | 2 |
| | | | very weakly reflexing | | 3 |
| | | | weakly reflexing | | 4 |
| | | | moderately reflexing | | 5 |
| | | | strongly reflexing | | 6 |
| | | | very strongly reflexing | | 7 |
| **50.** | **50.** | **VG** | **Corolla lobe: shape of apex** | | |
| **(+)** | | **(b)** | acuminate | | 1 |
| **PQ** | | | acute | | 2 |
| | | | obtuse | | 3 |
| | | | rounded | | 4 |
| | | | truncate | | 5 |
| **51.** | **51.** | **VG** | **Pollen: colour** | | |
| **PQ** | | **(b)** | whitish | Pink Octopus | 1 |
| | | | greenish | | 2 |
| | | | yellowish | Caroline | 3 |
| | | | purplish | June Bell | 4 |
| | | | bluish | PKM01 | 5 |

## 8. EXPLANATIONS ON THE TABLE OF CHARACTERISTICS

### 8.1 Explanations covering several characteristics

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

(a) Observations on the leaf blade should be made on fully expanded leaves from the middle third of a flowering stem, excluding the inflorescence. Observations are not made on the basal leaves of the plant. The upper side of the leaf should always be observed unless otherwise stated.
(b) Observations on the calyx and corolla should be made on new fully open flowers.
(c) The main colour is the colour with the largest surface area, excluding any spots that may be present. The colour with the second largest area is the secondary colour, excluding any spots that may be present. In cases where the areas of the main and secondary colour are too similar to reliably decide which colour has the largest area, the darkest colour is considered to be the main colour. The guideline makes provision for two colours; if more colours are present, those with the smallest area should not be observed.

### 8.2 Explanations for individual characteristics

Ad. 1: Plant: growth habit

The plants should be grown in containers to observe the plant growth habit.

1
upright

2
semi-upright

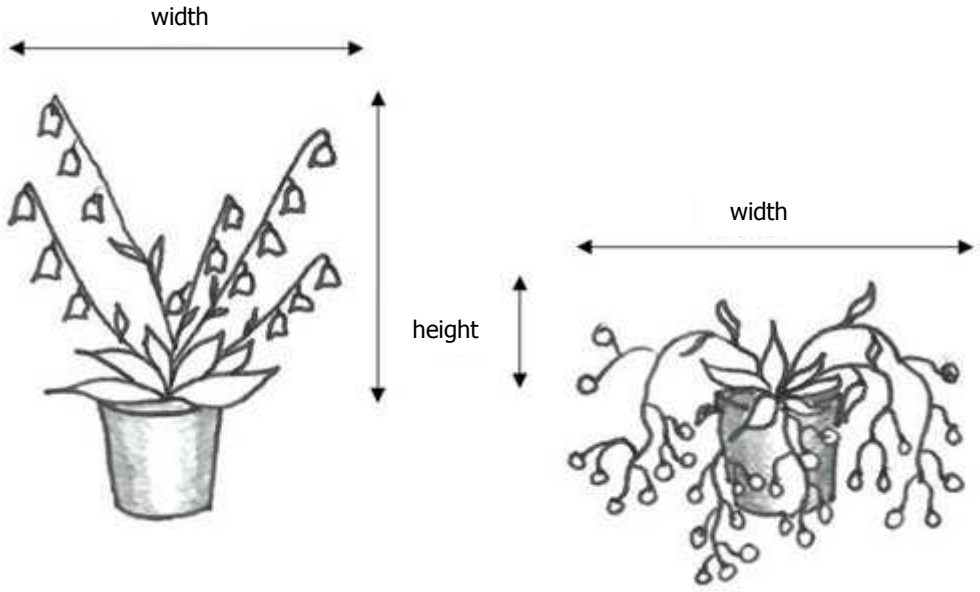
3
spreading

4
horizontal

5
drooping

Ad. 2: Plant: height
Ad. 3: Plant: width

The natural height of the plant should be assessed from the surface of the growing medium. The natural width of the plants should be observed.




Ad. 4: Plant: density

This is an overall assessment of the density of the whole plant, including flowers and leaves.

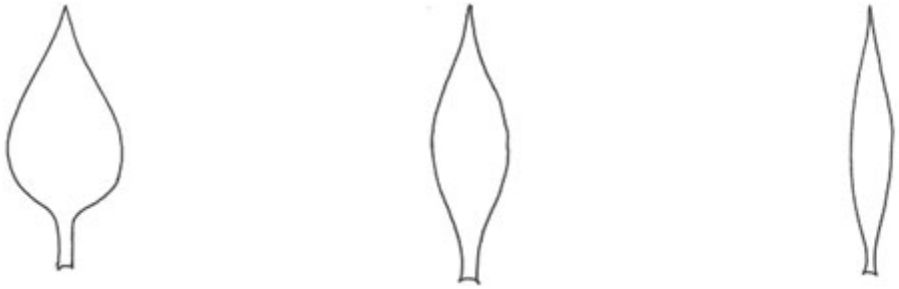
Ad. 5: Stem: colour

To be observed in the middle third of the flowering stem, excluding the flowering part.

Ad. 7: Leaf blade: width

To be observed at the broadest part of the leaf blade.

Ad. 8: Leaf blade: length/width ratio



3
low

5
medium

7
high

Ad. 9: Leaf blade: position of broadest part

1 strongly towards base | 2 moderately towards base | 3 at middle | 4 towards apex

Ad. 10: Leaf blade: shape of apex

1 acuminate | 2 acute | 3 obtuse

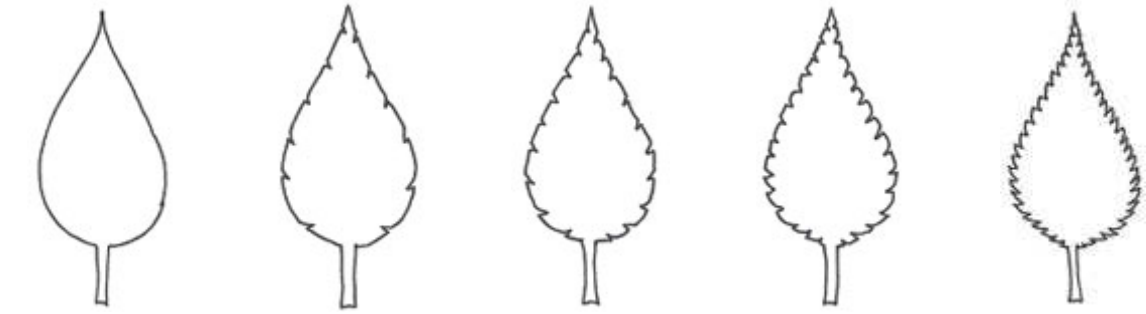
Ad. 11: Leaf blade: shape of base

1 attenuate | 2 acute | 3 obtuse | 4 rounded | 5 truncate | 6 cordate

Ad. 13: Leaf blade: main colour

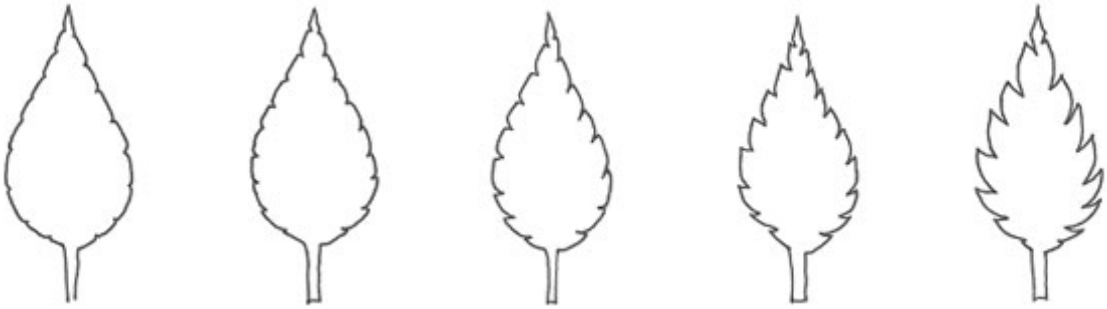
The main colour is the colour with the largest surface area. In cases where the areas of the main and secondary colours are too similar to reliably decide which colour has the largest area, the darkest colour is considered to be the main colour.

Ad. 17: Leaf blade: indentations of margin



1 absent or very few | 2 few | 3 medium | 4 many | 5 very many

Ad. 18: Leaf blade: depth of indentations of margin



1
very shallow

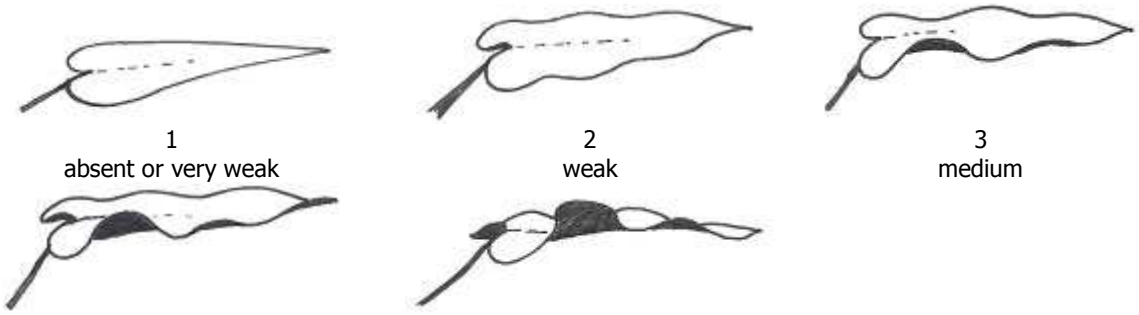
2
shallow

3
medium

4
deep

5
very deep

Ad. 19: Leaf blade: undulation of margin



1
absent or very weak

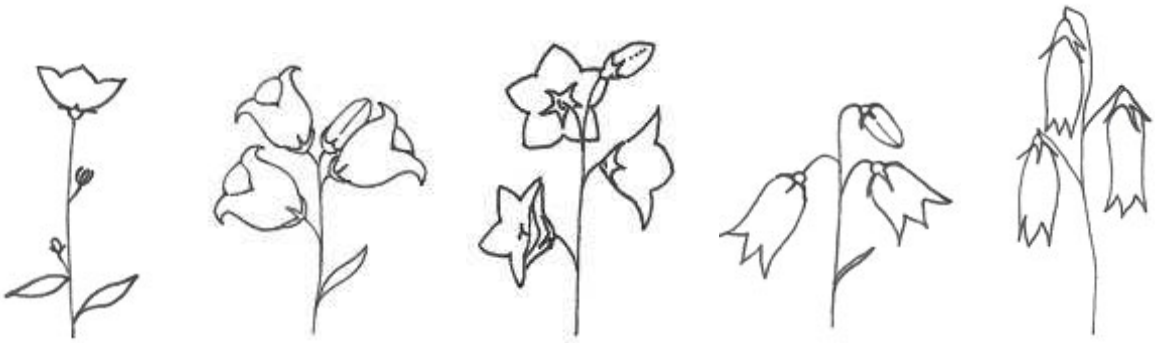
2
weak

3
medium

4
strong

5
very strong

Ad. 20: Flower: attitude



1
upwards

2
slightly outwards

3
strongly outwards

4
slightly downwards

5
strongly downwards

Ad. 21: Flower: type

1
tubular

2
campanulate

3
rotate

4
stellate (with strap-shaped lobes)

Ad. 22: Calyx: petaloid lobes

1
absent

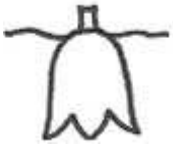
9
present

Ad. 24: Calyx: position of lobes

The observation is on the lobe of the calyx and excludes any appendage that might be present between the lobes.

1
upwards

2
slightly outwards



3
strongly outwards

4
slightly downwards

5
strongly downwards

Ad. 25: Corolla: number of whorls

This does not include the petaloid calyx where present.

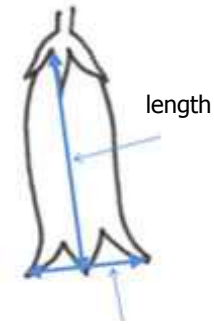
1
very few

2
few

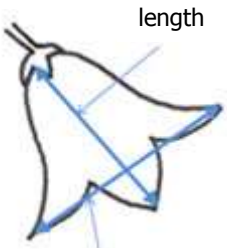
3
medium

4
many

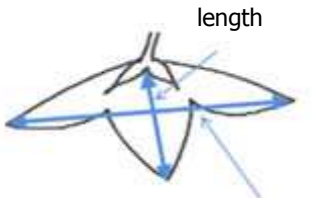
Ad. 26: Corolla: length
Ad. 27: Corolla: diameter



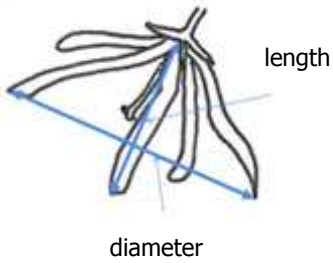

Flower type: tubular




Flower type: campanulate




Flower type: rotate




Flower type: stellate (with strap-shaped lobes)

Ad. 29: Corolla: distribution of secondary colour of outer side

1
none

2
distal quarter

3
basal half

4
basal quarter

5
at base

6
marginal zone

7
midribs

8
midribs and marginal zone

9
along veins
(including midribs)

Ad. 32: Corolla: distribution of spots on outer side

1
mainly in basal quarter

2
mainly in basal half

3
mainly in basal three quarters

4
throughout

5
mainly along basal quarter of midribs

6
mainly along basal half of midribs

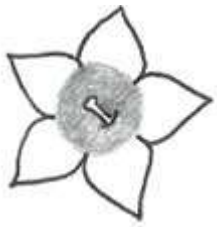
7
mainly along basal three quarters of midribs

8
mainly along entire length of midribs

Ad. 35: Corolla: distribution of secondary colour of inner side

1
none

2
distal quarter

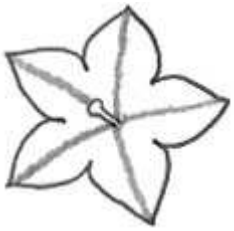


3
basal half

4
basal quarter

5
at base

6
marginal zone

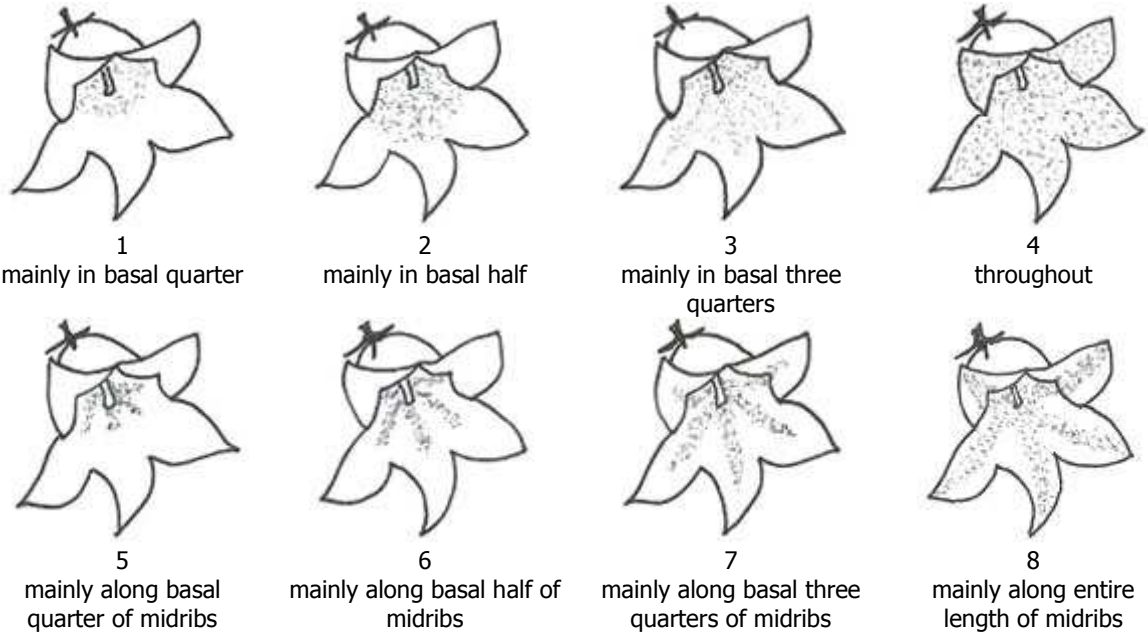


7
midribs

8
longitudinal zone (lobe sinus to base)

9
along veins

Ad. 38: Corolla: distribution of spots on inner side



1
mainly in basal quarter

2
mainly in basal half

3
mainly in basal three quarters

4
throughout

5
mainly along basal quarter of midribs

6
mainly along basal half of midribs

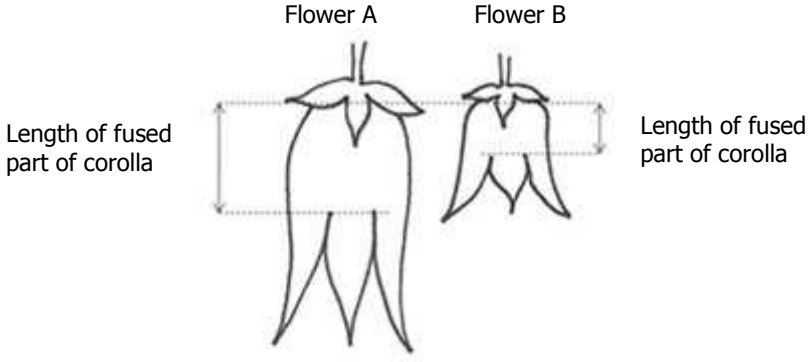
7
mainly along basal three quarters of midribs

8
mainly along entire length of midribs

Ad. 42: Corolla: length of fused part
Ad. 43: Corolla: relative length of fused part compared to total corolla length

The length of the fused part of the corolla can be expressed in absolute terms in characteristic 42, or as a proportion of the total length of the corolla in characteristic 43. The expression of the two characteristics is independent as shown in the two examples below.

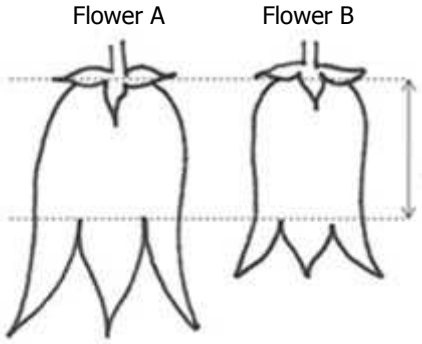
Example 1




Characteristic 42 – the note observed for the absolute length of the fused part of the corolla for flower A would be different from flower B as A is twice the length of B.

Characteristics 43 – the note observed would be the same for flower A and flower B as the proportion of the corolla made up of the fused part is 'medium' for both.

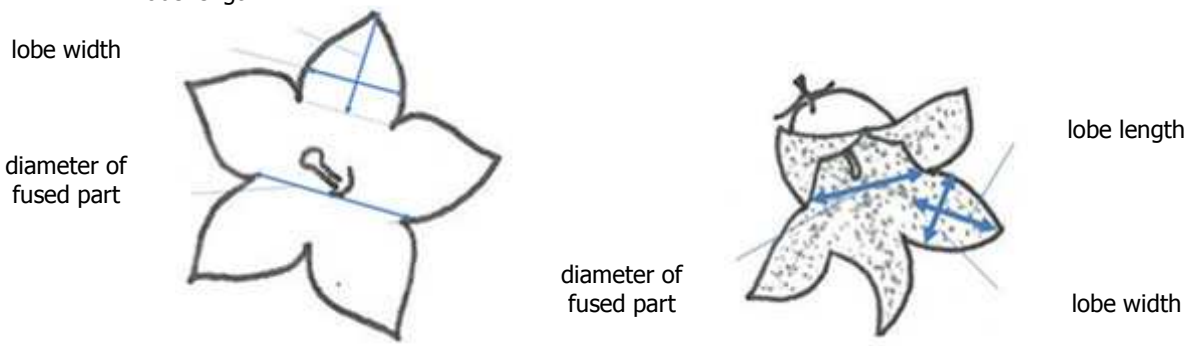
Example 2




Characteristic 42 – the note observed for the absolute length of flower C would be the same as flower D.
Characteristic 43 – the note observed for flower C would be 5 (medium) and for flower D it would be 7 (long), this is because the proportion of the corolla made up of the fused part is different.

Ad. 43: Corolla: relative length of fused part compared to total corolla length

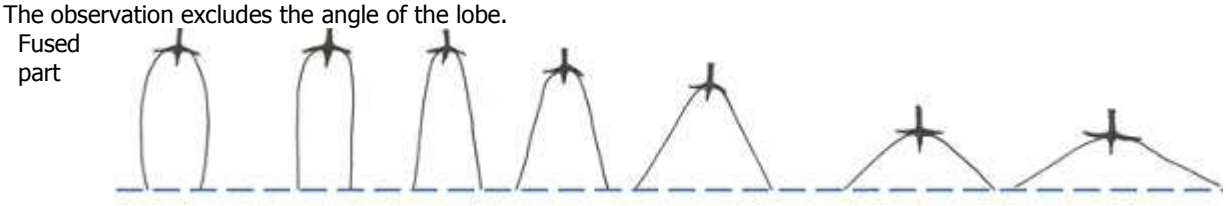

Ad. 44: Corolla: diameter of fused part
Ad. 47: Corolla lobe: length
Ad. 48: Corolla lobe: width



Ad. 45: Corolla: profile of fused part in longitudinal section

Only to be observed on varieties where Characteristic 43 "Corolla: relative length of fused part compared to total corolla length", has been observed to be equal to or greater than note 5.

The observation excludes the angle of the lobe.



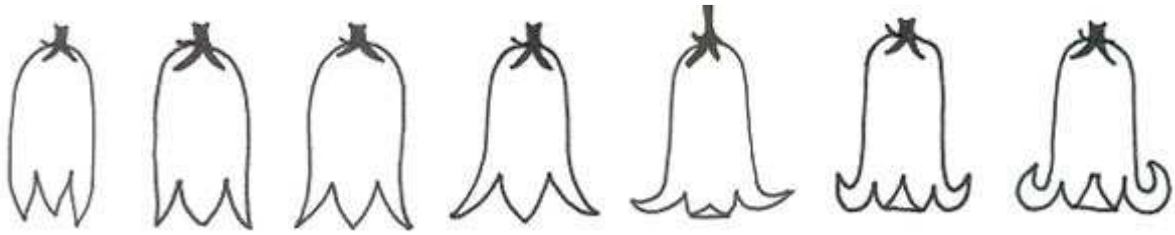

1 converging | 2 parallel | 3 very weakly diverging | 4 weakly diverging | 5 moderately diverging | 6 strongly diverging | 7 very strongly diverging

Ad. 46: Corolla lobe: shape

The lobe is the unfused part of the corolla.

1 triangular | 2 ovate | 3 elliptic | 4 oblong

Ad. 49: Corolla lobe: curvature



1 very weakly incurving | 2 straight | 3 very weakly reflexing | 4 weakly reflexing | 5 moderately reflexing | 6 strongly reflexing | 7 very strongly reflexing

Ad. 50: Corolla lobe: shape of apex

1 acuminate | 2 acute | 3 obtuse | 4 rounded | 5 truncate

## 9. LITERATURE

Brickell, C.,(ed.)., 1996: The Royal Horticultural Society A-Z Encyclopedia of Garden Plants. Dorling Kindersley Ltd.. London, GB, 219-223

Huxley, A., (ed.), Griffiths, M., (ed.), Levy, M., (ed.), 1999: The Royal Horticultural Society Dictionary of Gardening. McMillan Reference Ltd.. London, GB, 1: 485-495

Lewis, P., Lynch, M., 1989: Campanulas. Christopher Helm Ltd. Bromley, Kent, GB

Nicholls, G., 2006: Dwarf Campanulas and Associated Genera. Timber Press Inc. Oregon, US

## 10. TECHNICAL QUESTIONNAIRE

The Technical Questionnaire is available on the CPVO website under the following reference: CPVO-TQ/305/1.