

## **PROTOCOL FOR DISTINCTNESS, UNIFORMITY AND STABILITY TESTS**

***Kalanchoe blossfeldiana* Poelln. and its hybrids**

**KALANCHOE**

UPOV Code: KALAN\_BLO

**Adopted on 28/11/2012**

**Entered into force on 01/01/2012**

## **I SUBJECT OF THE PROTOCOL**

The protocol describes the technical procedures to be followed in order to meet the requirement of Council Regulation (EC) N°2100/94 on Community Plant Variety Rights. The technical procedures have been agreed by the Administrative Council and are based on general UPOV Document TG/1/3 and UPOV Guideline TG/78/4 Rev. dated 28 March 2012 for the conduct of tests for Distinctness, Uniformity and Stability and conclusions of the Ornamental meeting of 5 October 2011. This protocol applies to all varieties of ***Kalanchoe blossfeldiana Poelln*** as well as to hybrids between that species and other species of ***Kalanchoë Adans.***

## **II SUBMISSION OF PLANT MATERIAL**

### 1. The Community Plant Variety Office (CPVO) is responsible for informing the applicant of

- the closing date for the receipt of plant material;
- the minimum amount and quality of plant material required;
- the Examination Office to which material is to be sent.

The applicant is responsible for ensuring compliance with any customs and plant health requirements.

### 2. Final dates for receipt of documentation and material by the Examination Office

The final dates for receipt of requests, technical questionnaires and the final date or submission period for plant material will be decided by the CPVO and each Examination Office chosen.

The Examination Office is responsible for immediately acknowledging the receipt of requests for testing, and technical questionnaires. If no or unsatisfactory plant material is submitted the CPVO should be informed as soon as possible.

### 3. Plant material requirements

Information with respect to closing dates and submission requirements of plant material for the technical examination of varieties can be found on the CPVO website ([www.cpvo.europa.eu](http://www.cpvo.europa.eu)) in the special Issue S2 of the Official Gazette of the Office.

Quality: ..... The plant material supplied should be visibly healthy, not lacking in vigor or affected by any important pest or disease, especially viruses, as laid down in Council Directive 2000/29/EC and its amendments, or organisms impairing quality as indicated in Council Directive 98/56/EEC and Commission Directive 93/49/EEC and their amendments.

The plant material must not have undergone any treatment unless the CPVO and the Examination Office allow or request such treatment. If it has been treated, full details of the treatment must be given.

Labeling of sample: ..... - Species  
- File number of the application allocated by the CPVO  
- Breeder's reference  
- Examination reference (if known)  
- Name of applicant  
- The phrase "On request of the CPVO"

### **III CONDUCT OF TESTS**

#### 1. Variety collection

A variety collection will be maintained for the purpose of establishing distinctness of the candidate varieties in test. A variety collection may contain both living material and descriptive information. A variety will be included in a variety collection only if plant material is available to make a technical examination.

Pursuant to Article 7 of Council Regulation (EC) No. 2100/94, the basis for a collection should be the following:

- varieties listed or protected at the EU level or at least in one of the EEA Member States;
- varieties protected in other UPOV Member States;
- any other variety in common knowledge.

It is the responsibility of Examination Office to keep the variety collection up to date.

#### 2. Material to be examined

Candidate varieties will be directly compared with other candidates for Community plant variety rights tested at the same Examination Office, and with appropriate varieties in the variety collection. When necessary an Examination Office may also include other candidates and varieties.

#### 3. Characteristics to be used

The characteristics to be used in DUS tests and preparation of descriptions shall be those referred to in Annex 1. 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. In the latter case, the CPVO should be informed. In addition the existence of some other regulation e.g. plant health, may make the observation of the characteristic impossible.

The Administrative Council empowers the President, in accordance with Article 23 of Commission Regulation (EC) No. 874/2009, to insert additional characteristics and their expressions in respect of a variety.

#### 4. Grouping of varieties

The varieties and candidates to be compared will be divided into groups to facilitate the assessment of distinctness. Characteristics which are suitable for grouping purposes are those which are known from experience not to vary, or to vary only slightly, within a variety and which in their various states of expression are fairly evenly distributed throughout the collection. In the case of continuous grouping characteristics overlapping states of expression between adjacent groups is required to reduce the risks of incorrect allocation of candidates to groups. The characters used for grouping are the following:

- a) Flower: type (characteristic 18)
- b) Corolla lobe: number of colours of upper side (characteristic 29)
- c) Corolla lobe: main colour of upper side (characteristic 30) with the following groups:
  - Gr. 1: white
  - Gr. 2: yellow
  - Gr. 3: orange
  - Gr. 4: red
  - Gr. 5: purple red
  - Gr. 6: purple
  - Gr. 7: blue pink

d) Corolla lobe: secondary colour of upper side (characteristic 31) with the following groups:

- Gr. 1: white
- Gr. 2: yellow
- Gr. 3: orange
- Gr. 4: red
- Gr. 5: purple red
- Gr. 6: blue pink

#### 5. Trial designs and growing conditions

The minimum duration of tests will normally be one growing cycle if the results on distinctness and uniformity are conclusive. Tests will be carried out under conditions ensuring normal growth. The size of the plots will be such that plants or parts of plants may be removed for measuring and counting without prejudice to the observations which must be made up to the end of the growing period.

The test design is as follows:

As a minimum, each test should include a total of 20 plants. Separate plots for observation and for measuring can only be used if they have been subject to similar environmental conditions.

For vegetatively propagated varieties, all observations on single plants determined by measurement or counting should be made on 10 plants or parts taken from each of 10 plants and any other observations made on all plants in the test.

The test should normally be conducted at one place.

The test should be carried out in the greenhouse under conditions ensuring normal growth.

#### 6. Special tests

In accordance with Article 83(3) of Council Regulation (EC) No. 2100/94 an applicant may claim either in the Technical Questionnaire or during the examination that a candidate variety 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 characters listed in the protocol.

#### 7. Standards for decisions

##### a) **Distinctness**

A candidate variety will be considered to be distinct if it meets the requirements of Article 7 of Council Regulation (EC) No. 2100/94.

##### b) **Uniformity**

For the assessment of uniformity a population standard of 2% with an acceptance probability of at least 95% should be applied.

For a sample size between 19 and 41 plants for vegetatively propagated varieties, only 2 off-types are allowed.

##### c) **Stability**

A candidate will be considered to be sufficiently stable when there is no evidence to indicate that it lacks uniformity.

#### **IV REPORTING OF RESULTS**

After each growing cycle the results will be summarized and reported to the CPVO in the form of a UPOV model interim report in which any problems will be indicated under the headings distinctness, uniformity and stability. Candidates may meet the DUS standards after one growing cycle but in some cases two or more growing cycles may be required. When tests are completed the results will be sent by the Examination Office to the CPVO in the form of a UPOV model final report.

If it is considered that the candidate complies with the DUS standards, the final report will be accompanied by a variety description in the format recommended by UPOV. If not the reasons for failure and a summary of the test results will be included with the final report.

The CPVO must receive interim reports and final reports from the Examination Office by the date agreed between the CPVO and the Examination Office.

Interim reports and final examination reports shall be signed by the responsible member of the staff of the Examination Office and shall expressly acknowledge the exclusive rights of disposal of CPVO.

#### **V LIAISON WITH THE APPLICANT**

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 agreement, the applicant may be directly informed at the same time as the CPVO particularly if a visit to the trial is advisable.

The interim report and final report shall be sent by the Examination Office to the CPVO.

#### **VI ENTRY INTO FORCE**

The present protocol enters into force on **01/01/2012**. Any ongoing DUS examination of candidate varieties started before the aforesaid date will not be affected by the approval of the new TP. 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.

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## ANNEXES TO FOLLOW

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<u>Legend:</u>	
QL	Qualitative characteristic
QN	Quantitative characteristic
PQ	Pseudo-qualitative characteristic
G	Grouping characteristic
(a) – (d)	See explanations on the Table of characteristics
(+)	See explanations on the Table of characteristics
(*)	Important characteristic to be included in the UPOV variety description
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## ANNEX I

**TABLE OF CHARACTERISTICS TO BE USED IN DUS-TEST AND PREPARATION OF DESCRIPTION**

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note		
<b>1.</b>	<b>1.</b>		<b>Plant: height (including inflorescence)</b>				
			(*)	very short	Avalon	1	
			<b>QN</b>	short	Rarakoe	3	
				medium	Amy	5	
				tall	Taos	7	
				very tall	Petero	9	
<b>2.</b>	<b>2.</b>		<b>Plant: width</b>				
			<b>QN</b>	narrow	Sumaco	3	
				medium	Amy	5	
				broad	Pago	7	
<b>3.</b>	<b>3.</b>		<b>Leaf: length</b>				
			(*)	short	Dark Cora	3	
			<b>QN</b>	<b>(a)</b>	medium	Amy	5
					long	Avalon	7
<b>4.</b>	<b>4.</b>		<b>Leaf: width</b>				
			(*)	narrow	Arina	3	
			<b>QN</b>	<b>(a)</b>	medium	Sumaco	5
					broad	Avalon	7
<b>5.</b>	<b>5.</b>		<b>Leaf: shape</b>				
			(+)	ovate		1	
			<b>PQ</b>	<b>(a)</b>	elliptic		2
					rounded		3
					linear		4
					obovate		5
					tripartite pinnate		6

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note	
6.	6.		<b>Leaf: variegation</b>			
			(*)	absent	Rarakoe	1
			QL (a)	present	Debora	9
7.	7.		<b>Leaf: intensity of green colour of upper side</b>			
			QN (a)	light		3
				medium	Taos	5
				dark	Arina	7
8.	8.		<b>Leaf: anthocyanin coloration of upper side</b>			
			(*)	absent or very weak	Amy	1
			QN (a)	weak	Banda	3
				medium	Misunpink	5
				strong	Axrose	7
9.	9.		<b>Leaf: cross section</b>			
			(+)	strongly concave	Dark Cora	1
			QN (a)	flat	Fonda	3
				strongly convex		5
10.	10.		<b>Leaf: number of incisions of margin</b>			
			(+)	absent or very few		1
			QN (a)	few		3
				medium		5
				many		7
11.	11.		<b>Leaf: depth of incisions of margin</b>			
			(+)	very shallow		1
			QN (a)	shallow	Amy	3
				medium	Pago	5
				deep	Axrose	7



CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note	
12.	12.	(a)	<b>Leaf: attitude of apex</b>			
			(+)	strongly incurving	Rachel	1
			QN	straight	Sumaco	3
			strongly recurving	Hakon	5	
13.	13.		<b>Flowering shoot: number of flowers of highest pleiochasium</b>			
			(+)	few	Amrum	3
			QN	medium	Fonda	5
			many	Pago	7	
14.	14.		<b>Flowering shoot: width of highest pleiochasium</b>			
			(+)	narrow	Don Ramon	3
			QN	medium	Sumaco	5
			broad	Pago	7	
15.	15.	(b)	<b>Young flower: number of colours of upper side of corolla lobes</b>			
			(+)	one		1
		QL	two or more		2	
16.	16.	(b)	<b>Young flower: main colour of upper side of corolla lobes</b>			
			PQ	RHS Colour Chart (indicate reference number)		
		(c)				
17.	17.	(b)	<b>Young flower: secondary colour of upper side of corolla lobes</b>			
			PQ	RHS Colour Chart (indicate reference number)		
		(c)				
18.	18. (*)		<b>Flower: type</b>			
			(+)	single	Dark Cora	1
G	QL		double	Pago	2	

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
19.	19.		<b><u>Only varieties with single flowers:</u></b> <b>Flower: number of corolla lobes</b>		
		QN	only 4	Dark Cora	1
			4 to 5	Parina	2
			only 5		3
20.	20.		<b><u>Only varieties with double flowers:</u></b> <b>Flower: number of corolla lobes</b>		
		(*)	few	RB 56141	3
		QN	medium	Naomi	5
			many	Yazmin	7
21.	21.		<b>Flower: diameter</b>		
		(*)	small	Arina	3
		QN	medium	Amy	5
			large	Jodie	7
22.	22.		<b><u>Only varieties with single flowers:</u></b> <b>Corolla lobe: attitude</b>		
		(+)	upwards	Runa	1
		QN	(d) horizontal	Goldie	2
			downwards	Ingrid	3
23.	23.		<b>Corolla lobe: rolling of margin</b>		
		(+)	absent	Irmin	1
		QL	(d) present	Jackie	9
24.	24.		<b>Corolla lobe: incisions of margin</b>		
		(+)	absent	Irmin	1
		QL	(d) present	Krystle	9
25.	25.		<b>Corolla lobe: shape of apex</b>		
		(+)	acute	Jackie	1
		PQ	(d) apiculate	Impromeru	2
			acuminate	White Cora	3

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
26.	26.		<b><u>Only varieties with single flowers:</u></b> <b>Corolla lobe: length</b>		
		(*)	short	Debora	3
		QN (d)	medium	Amy	5
			long	Jackie	7
27.	27.		<b><u>Only varieties with single flowers:</u></b> <b>Corolla lobe: width</b>		
		(*)	narrow	Debora	3
		QN (d)	medium	Parina	5
			broad	Dark Cora	7
28.	28.		<b><u>Only varieties with single flowers:</u></b> <b>Corolla lobe: ratio length/width</b>		
		QN (d)	small		3
			medium		5
			large		7
29.	29. (+)		<b>Corolla lobe: number of colours of upper side</b>		
		(*)	one	Amy	1
		QL (d)	two	Graciosa	2
G			more than two	Oberon	3
30.	30. (*)		<b>Corolla lobe: main colour of upper side</b>		
		PQ (c)	RHS Colour Chart (indicate reference number)		
G		(d)			
31.	31. (*)		<b>Corolla lobe: secondary colour of upper side</b>		
		PQ (c)	RHS Colour Chart (indicate reference number)		
G		(d)			

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note	
32.	32.		<b>Corolla lobe: distribution of secondary colour</b>			
		(*)	(d)	at margin only	Alcedo	1
		(+)		at margin and at base	Mipinkstar	2
		PQ		at base only	Impromeru	3
				at base and in median stripe	Milos	4
				median stripe only		5
				mainly on one half	Rewiros	6
				dotted	Greco	7
				brindled		8
		at apex only		9		
33.	33.		<b>Only varieties with single flowers: Corolla lobe: colour of <u>lighter</u> part of lower side</b>			
		PQ	(d)	RHS Colour Chart (indicate reference number)		
34.	34.		<b>Only varieties with single flowers: Corolla lobe: colour of <u>darker</u> part of lower side</b>			
		PQ	(d)	RHS Colour Chart (indicate reference number)		
35.	35.		<b>Only varieties with double flowers: Outer corolla lobe: number of colours of upper side</b>			
		(*)		one		1
		QL	(d)	two		2
more than two				3		
36.	36. (*)		<b>Only varieties with double flowers: Outer corolla lobe: main colour of upper side</b>			
		PQ	(c)	RHS Colour Chart (indicate reference number)		
		(d)				

CPVO N°	UPOV N°	Stage, Method	Characteristics	Examples	Note
37.	37.		<b><u>Only varieties with double flowers: Outer corolla lobe: secondary colour of upper side</u></b>		
		PQ	(c)	RHS Colour Chart (indicate reference number)	
		(d)			
38.	38.		<b><u>Only varieties with double flowers: Outer corolla lobe: distribution of secondary colour</u></b>		
		(+)		at margin only	1
		PQ	(c)	at margin and at base	2
				at base only	3
				at base and in median stripe	4
				median stripe only	5
				mainly on one half	6
				dotted	7
				brindled	8
				at apex	9
39.	39.		<b><u>Time of beginning of flowering</u></b>		
		QN	early	3	
			medium	5	
			late	7	

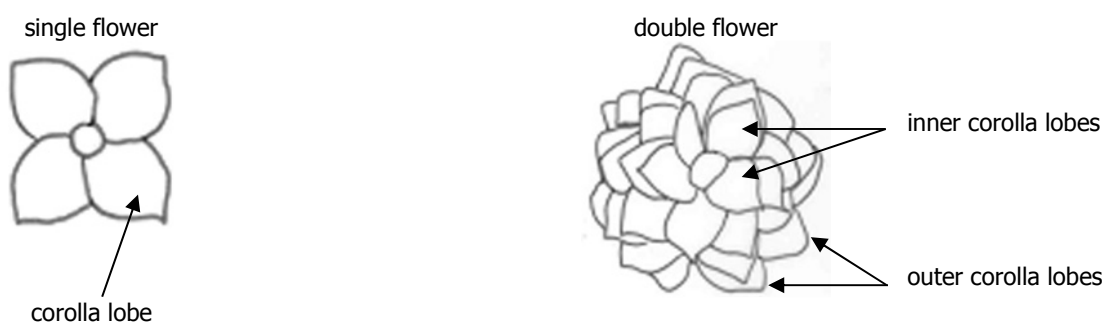
## EXPLANATIONS ON THE TABLE OF CHARACTERISTICS

### *Explanations covering several characteristics*

The optimum stage of development for the assessment of the characteristics is when three quarters of the flowers per plant are fully open.

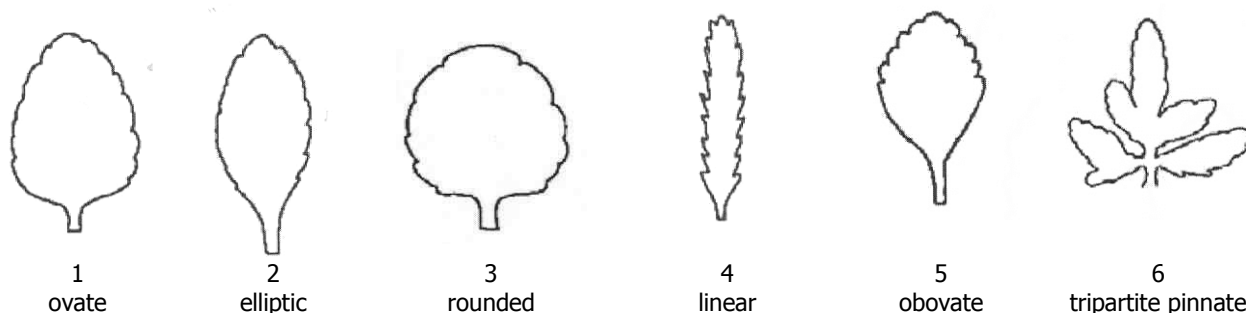
Characteristics containing the following key in the second column of the Table of characteristics should be examined as indicated below:

- (a) Observations on the leaf should be made on a fully developed leaf from the middle part of the plant.
- (b) Observations on the young flower of varieties with single flowers should be made when the corolla lobes have just opened. Observations on the young flower of varieties with double flowers should be made on the inner corolla lobes when these have just opened.
- (c) The main colour is the colour with the largest area and the secondary colour is the colour with the second largest area: in cases where the area of the main and secondary colours is nearly equal, the darker colour should be considered to be the main colour.
- (d) Observations on the corolla lobes should be made on a fully developed flower. Unless otherwise indicated observations on the corolla lobes of double flowers should be made on the inner corolla lobes.

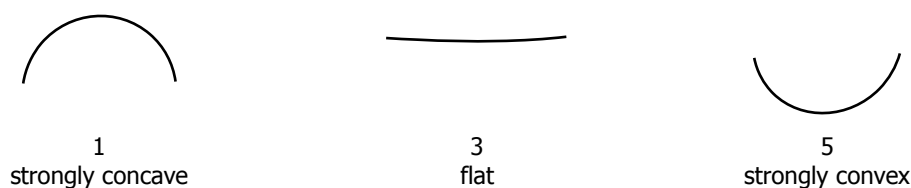


### *Explanations for individual characteristics*

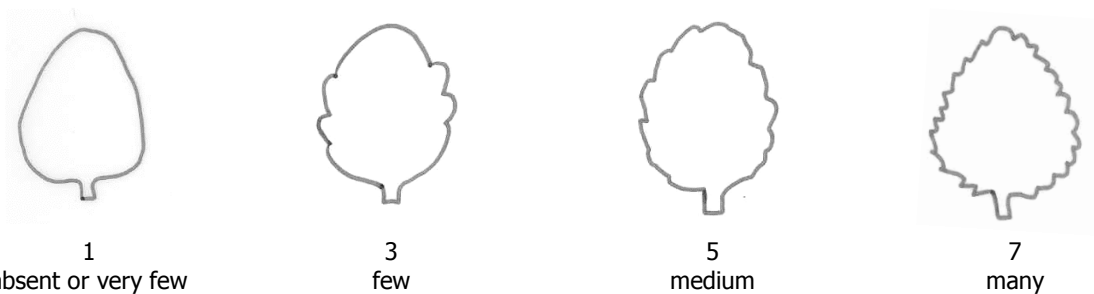
#### Ad. 5: Leaf: shape



#### Ad. 9: Leaf: cross section

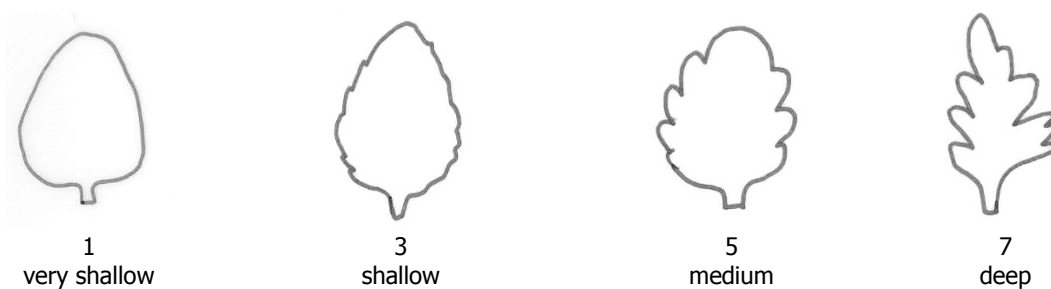


Ad. 10: Leaf: number of incisions of margin



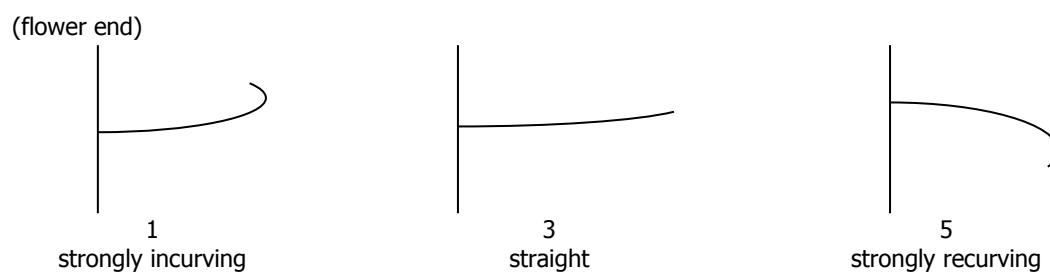
In the case of pinnate leaves, the top lobe should be observed.

Ad. 11: Leaf: depth of incisions of margin



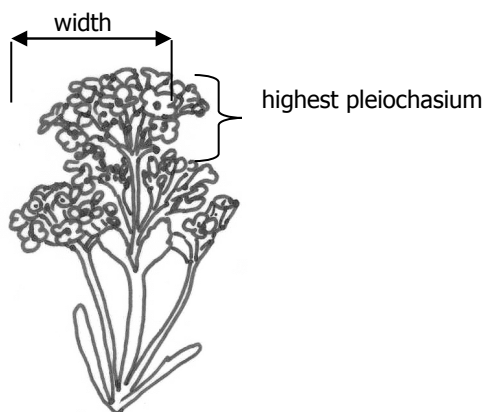
In the case of pinnate leaves, the top lobe should be observed.

Ad. 12: Leaf: attitude of apex

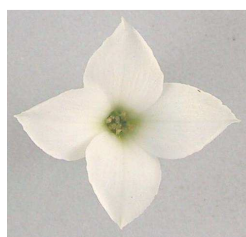


Ad. 13: Flowering shoot: number of flowers of highest pleiochasium

Ad. 14: Flowering shoot: width of highest pleiochasium



Ad. 15: Young flower: number of colours of upper side of corolla lobes



1  
one



2  
two

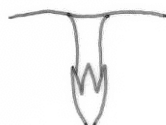
Ad. 18: Flower: type

A single flower has four or five corolla lobes only. A double flower has more than five corolla lobes.

Ad. 22: Only varieties with single flowers: Corolla lobe: attitude



1  
upwards



2  
horizontal

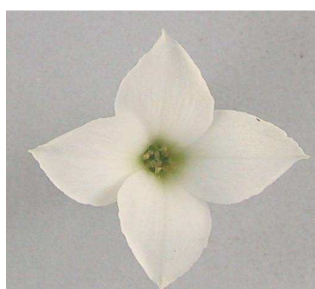


3  
downwards

Ad. 23: Corolla lobe: rolling of margin

On corolla lobes with a rolled margin present, the colour of the lower side of the corolla lobes can be seen when viewing the flower from the upper side.

Ad. 24: Corolla lobe: incisions of margin



1  
absent



9  
present



Ad. 25: Corolla lobe: shape of apex



1  
acute

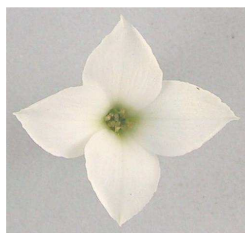


2  
apiculate



3  
acuminate

Ad. 29: Corolla lobe: number of colours of upper side



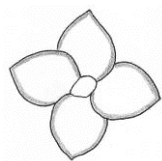
1  
one



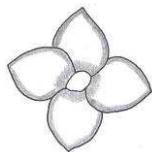
2  
two

Ad. 32: Corolla lobe: distribution of secondary colour

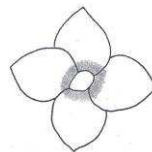
Ad. 38: Only varieties with double flowers: outer corolla lobe: distribution of secondary colour



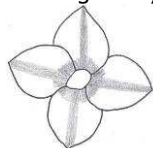
1  
at margin only



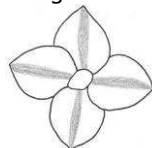
2  
at margin and base



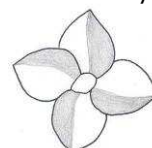
3  
at base only



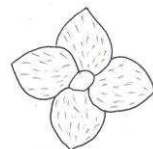
4  
at base and in median stripe



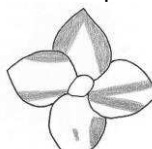
5  
median stripe only



6  
mainly on one half



7  
dotted



8  
brindled



9  
at apex

(Illustrations are of single-flower varieties)

## LITERATURE

Sajeva, M., Costanzo, M., 1997: Succulents, The Illustrated Dictionary. Timber Press.

Urs, E., 1994: Sukkulanten. Ulmer, Stuttgart.

Urs, E., 2003: Illustrated Handbook of Succulent Plants. Springer.

## **ANNEX II**

The Technical Questionnaire is available on the CPVO website under the following reference:  
CPVO-TQ/078/3