



European Union
Community Plant Variety Office

PROTOCOL FOR DISTINCTNESS, UNIFORMITY AND STABILITY TESTS

Zantedeschia Spreng.

ZANTEDESCHIA

UPOV Species Code: ZANTE

Adopted on 27th March 2003

I - SUBJECT OF THE PROTOCOL

The protocol describes the technical procedures to be followed in order to meet the Council Regulation 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/177/3 dated 4th April 2001 for the conduct of tests for Distinctness, Uniformity and Stability. This protocol applies to all varieties of *Zantedeschia Spreng.*

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

Survey of final dates for request for technical examination and sending of Technical Questionnaire by the CPVO as well as submission date of plant material by the applicant, and quantity of plant material to be supplied by the applicant in one sample.

Examination Office in:	Request of examination	Plant material	
The Netherlands a)	01/12	between 01/03 and 31/03	30 rhizomes, size 15-18
The Netherlands b)	01/12	between 01/03 and 31/03	500 seeds and 100 1-year-old tubers/rhizomes (C2 material)

- a) vegetatively propagated varieties
b) seed propagated varieties

Quality: The plant material supplied should be visibly healthy, not lacking in vigour or affected by any important pest or disease, especially virus.

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.

Labelling 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 reference collection only if plant material is available to make a technical examination.

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

- varieties listed or protected at the EU level;
- 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 N° 1239/95, 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) Plant: type (characteristic 1)
- b) Leaf blade: spots on upper side (characteristic 15)
- c) Spathe: main colour of inner side (excluding throat spot colour, if present) (characteristic 27) with the following groups:

Group 1: white

Group 2: cream

Group 3: yellow

Group 4: yellow brown

Group 5: yellow orange

Group 6: orange

Group 7: orange red

Group 8: red

Group 9: purple red

Group 10: pink

Group 11: red pink

Group 12: purple

d) Spathe: presence of throat spot (characteristic 31)

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 for vegetatively propagated varieties should include a total of 20 plants, 10 plants planted in the greenhouse and 10 planted outside. As a minimum, each test for seed propagated varieties should include a total of 90 plants, 30 plants planted in the greenhouse and 60 planted outside. Separate plots for observation and for measuring can only be used if they have been subject to similar environmental conditions.

All observations determined by measurement or counting should be made on 10 plants or parts taken from each of 10 plants.

All observations should be made on plants that have flowers of maximum size, during the peak of flowering time.

All observations on the leaf should be made on fully developed leaves from flowering shoots. The width of the leaf blade should be measured at the broadest part, which would sometimes include the lobes.

Unless otherwise indicated, all observations on the flower should be made at the beginning of anther dehiscence.

All observations on fading, intensifying and greening of the flower colour with age should be made two to three weeks after pollen shed.

The test should normally be conducted at one place.

The test should be carried out in the greenhouse under the following growing conditions:

Planting time.....	March / April
Substrate	very well-drained substrate rich in humus
Fertilization.....	low nitrogen for deciduous varieties. Trace elements may be added
Irrigation	deciduous varieties: keep moist but not wet. <i>Zantedeschia aethiopica</i> : prefers more water
Temperature.....	preferably between 15-25 °C
Air humidity	deciduous varieties prefer less humidity than <i>Zantedeschia aethiopica</i> .
Shading	without or with 40% shade cloth

6. Special 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, 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 No. 2100/94.

b) **Uniformity**

For the assessment of uniformity for vegetatively propagated varieties, a population standard of 1% with an acceptance probability of at least 95% should be applied. The candidate will be considered to be sufficiently uniform if the number of off-types does not exceed 1 in 20 plants examined.

For the assessment of uniformity of seed propagated open pollinated and hybrid varieties, relative uniformity standards should be applied.

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 summarised 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 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.

ANNEXES TO FOLLOW

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Technical questionnaire

ANNEX I

TABLE OF CHARACTERISTICS

CPVO N°	UPOV N°	Characteristics	Examples	Note	
1.	1.	Plant: type	deciduous	1	
			semi-deciduous	2	
			evergreen	3	
2.	2.	Plant: height	short	Hope Cross	3
			medium	Black Magic	5
			tall	Green Tip	7
3.	3.	Deciduous varieties only: Plant: total number of shoots	few	Pink Persuasion	3
			medium	Inspiration	5
			many	Celeste	7
4.	4.	Young shoot: colour	yellow green	Black Magic	1
			green	Pink Persuasion	2
			red purple		3
5.	5.	Petiole: length	short	Hope Cross	3
			medium	Pink Persuasion	5
			long	Green Tip	7
6.	6.	Petiole: colour of lower part	yellow green	Schwarzwaldler	1
			light green	Heidi	2
			medium green	Inspiration	3
			dark green	Majestic Red	4
			brown red	Black Magic	5
			purple		6

CPVO N°	UPOV N°	Characteristics	Examples	Note	
7.	7.	Leaf blade: attitude	erect	1	
			semi-erect	2	
			horizontal	3	
8.	8.	Leaf blade: length (excluding lobes)	very short	1	
			short	Goldilocks	3
			medium	Majestic Red	5
			long	Schwarzwald	7
			very long	Green Tip	9
9.	9.	Leaf blade: width	narrow	Celeste	1
			narrow to medium	Inspiration	3
			medium	Majestic Red	5
			medium to broad	Cameo	7
			broad	Green Tip	9
10.	10.	Leaf blade: position of broadest part	in middle	1	
			slightly below middle	Celeste	2
			far below middle	Black Magic	3
11.	11.	Leaf blade: lobes	absent	Hope Cross	1
			present	Black Magic	9
12. (+)	12. (+)	Leaf blade: length of lobe	short	Pink Persuasion	3
			medium	Black Magic	5
			long	Green Tip	7

CPVO N°	UPOV N°	Characteristics	Examples	Note	
13.	13.	Leaf blade: shape at apex (excluding caudate tip)	acute	Celeste	1
			right-angled	Red Soxs	2
			obtuse	Green Tip	3
14.	14.	Leaf blade: intensity of green colour of <u>upper</u> side	light	Black Magic	3
			medium	Hope Cross	5
			dark	Red Soxs	7
15.	15.	Leaf blade: spots on upper side	absent	Hope Cross	1
			present	Majestic Red	9
16.	16.	Leaf blade: size of spots on upper side	small	Inspiration	3
			medium	Majestic Red	5
			large	Black Magic	7
17.	17.	Leaf blade: number of spots on upper side	very few	Aries	1
			few	Pixie	3
			medium	Majestic Red	5
			many	Black Magic	7
			very many		9
18.	18.	Leaf blade: undulation of margin	absent or very weakly expressed		1
			weakly expressed	Black Magic	2
			strongly expressed	Inspiration	3
19.	19.	Scape: thickness	thin	Scarlet Pimpernel	3
			medium	Black Magic	5
			thick	Red Soxs	7
20.	20.	Scape: red colouration	absent or very weak	Majestic Red	1

CPVO N°	UPOV N°	Characteristics	Examples	Note	
			weak	3	
			medium	5	
			strong	7	
			very strong	9	
21.	21.	Scape: mottling at basal part	absent or very weakly expressed	Red Soxs	1
			weakly expressed	Black Magic	2
			strongly expressed	Sensation	3
22. (+)	22. (+)	Spathe: natural height	low	Scarlet Pimpernel	1
			low to medium	Hope Cross	3
			medium	Black Magic	5
			medium to high	Majestic Red	7
			high	Green Tip	9
23. (+)	23. (+)	Spathe: natural length (viewed from above)	short	Celeste	1
			short to medium	Pink Persuasion	3
			medium	Schwarzwald	5
			medium to long		7
			long	Green Tip	9
24. (+)	24. (+)	Spathe: natural width (viewed from above)	narrow	Schwarzwald	1
			narrow to medium	Inspiration	3
			medium	Pink Persuasion	5
			medium to broad		7
			broad		9
25. (+)	25. (+)	Spathe: height of overlapping part	low	Green Tip	3
			medium	Majestic Red	5

CPVO N°	UPOV N°	Characteristics	Examples	Note
			high Cameo	7
26.	26.	Spathe: natural shape of distal part (excluding caudate tip)	acute Inspiration obtuse Black Magic rounded Green Tip	1 2 3
27.	27.	Spathe: main colour of inner side (excluding throat spot colour, if present)	RHS Colour Chart (indicate reference number)	
28.	28.	Spathe: secondary colour of inner side (excluding the throat spot colour)	dark green red orange red orange pink pink red pink purple pink blue pink red purple dark red purple	1 2 3 4 5 6 7 8 9 10
29.	29.	Spathe: gradual colour change from base to apex (inner side, excluding varieties with throat spot)	strongly shading off Pixie weakly shading off Inspiration no change or very little Celeste, Schwarzwald weakly intensifying Elmaro strongly intensifying Red Soxs	1 2 3 4 5

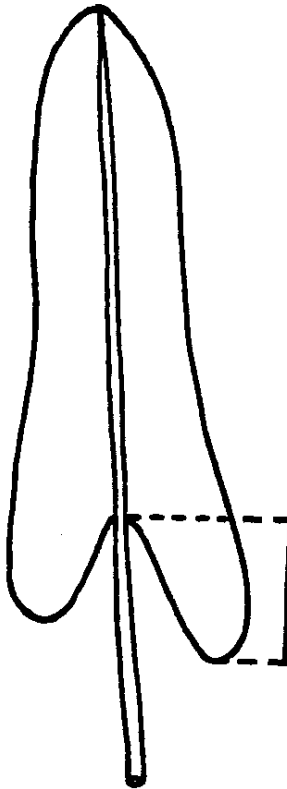
CPVO N°	UPOV N°	Characteristics	Examples	Note	
30.	30.	Spathe: size of unchanged colour area at base (as for 29)	small	Scarlet Pimpernel	3
			medium	Inspiration	5
			large	Dominique	7
31.	31.	Spathe: presence of throat spot	absent	Inspiration	1
			present	Black Magic	9
32.	32.	Spathe: size of throat spot	small	Treasure	3
			medium	Cameo	5
			large		7
33.	33.	Spathe: colour of throat spot	pink		1
			purple		2
34.	34.	Spathe: main colour of outer side	white	Green Tip	1
			greenish white	Green Goddess	2
			light yellow	Pink persuasion	3
			medium yellow	Black Magic	4
			yellow orange	Fandango	5
			red orange	Treasure	6
			yellow red	Sensation	7
			red pink	Aries	8
			purple pink	Hope Cross	9
			red purple	Majestic Red	10
			brown purple	Scarlet Pimpernel	11
			purple	Schwarzwald	12
35.	35.	Spathe: recurving of margin	weak	Black Magic	3

CPVO N°	UPOV N°	Characteristics	Examples	Note	
			medium	Inspiration	5
			strong	Aries	7
36.	36.	Spadix: length	short	Cameo	3
			medium	Pink Persuasion	5
			long		7
37.	37.	Spadix: width at middle of male part	narrow	Black Magic	3
			medium	Sensation	5
			broad	Majestic Red	7
38.	38.	Spadix: main colour just before pollen shed	white		1
			yellow green		2
			light yellow	Cameo	3
			medium yellow	Pink Persuasion	4
			yellow orange	Majestic Red	5
			orange brown	Elmaro	6
			orange red		7
			pink	Green Tip	8
			purple red	Schwarzwalder	9
			purple		10
39.	39.	Degree of fading of flower colour with age	absent or very weakly expressed	Schwarzwalder	1
			weakly expressed	Hope Cross	2
			strongly expressed	Sensation	3
40.	40.	Colour change with age	strongly fading	Sensation	1
			weakly fading	Hope Cross	2
			no change or very little	Dominique , Schwarzwalder	3

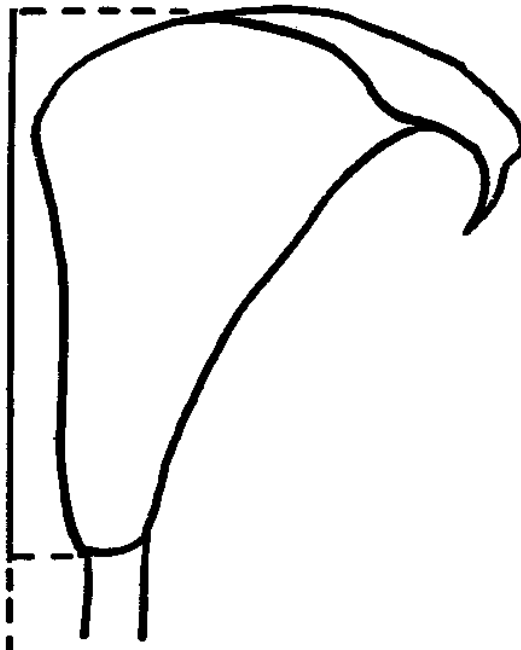
CPVO N°	UPOV N°	Characteristics	Examples	Note
		weakly intensifying	Pixie	4
		strongly intensifying	Inspiration	5

EXPLANATIONS ON THE TABLE OF CHARACTERISTICS

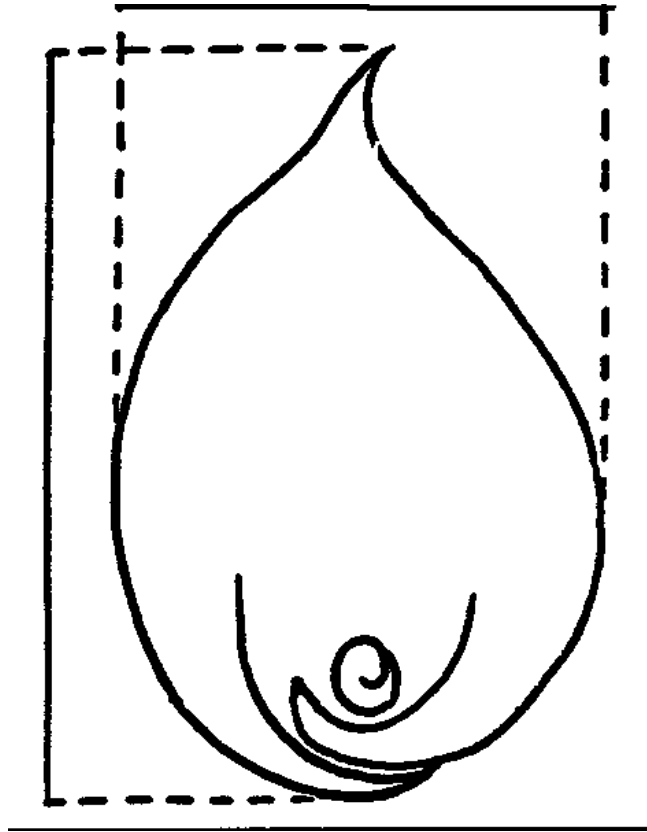
Ad. 12: Leaf blade: length of lobe



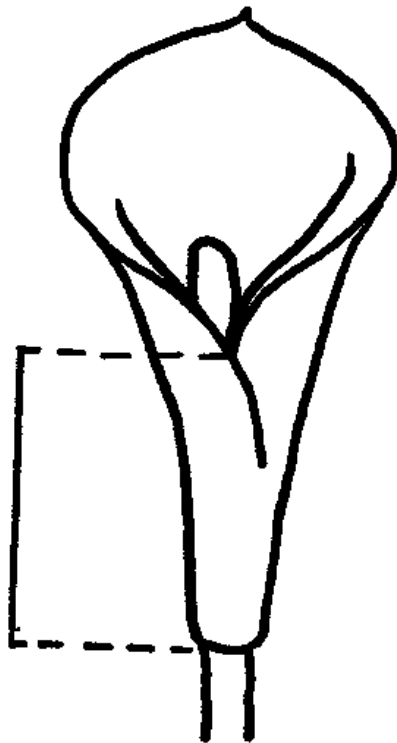
Ad. 22: Spathe: natural height



Ad. 23 and 24: Spathe: natural length (viewed from above) (23) and natural width (viewed from above) (24)



Ad 25: Spathe: height of overlapping part



LITERATURE

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ANNEX II

The Technical Questionnaire is available on the CPVO website under the following reference:
CPVO-TQ/177/1