TG/ANUBI(proj.3)
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UPOV

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

DRAFT

ANUBIAS

UPOV Code: ANUBI_HET; ANUBI_BAR_BAR; ANUBI_BAR_NAN

Anubias heterophila Engler;
Anubias barteri var. *barteri* Schott;
Anubias barteri var. *nana* Engler

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by experts from Singapore

to be considered by the
Technical Working Party for Ornamental Plants and Forest Trees
at its forty-first session, to be held in Wageningen, Netherlands, from June 9 to 13, 2008

Alternative Names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Anubias heterophila Engler; *Anubias barteri var. barteri* Schott; *Anubias barteri* var. *nana* Engler	Anubias	.....	.....	.....

The purpose of these guidelines ("Test Guidelines") is to elaborate the principles contained in the General Introduction (document TG/1/3), and its associated TGP documents, into detailed practical guidance for the harmonized examination of distinctness, uniformity and stability (DUS) and, in particular, to identify appropriate characteristics for the examination of DUS and production of harmonized variety descriptions.

ASSOCIATED DOCUMENTS

These Test Guidelines should be read in conjunction with the General Introduction and its associated TGP documents.

* These names were correct at the time of the introduction of these Test Guidelines but may be revised or updated. [Readers are advised to consult the UPOV Code, which can be found on the UPOV Website (www.upov.int), for the latest information.]

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1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Anubias heterophila* Engler, *Anubias barteri* var. *barteri* Schott and *Anubias barteri* var. *nana* Engler, of the family *Araceae*, and their hybrids.

2. Material Required

2.1 The competent authorities decide on the quantity and quality of the plant material required for testing the variety and when and where it is to be delivered. Applicants submitting material from a State other than that in which the testing takes place must ensure that all customs formalities and phytosanitary requirements are complied with.

2.2 The material is to be supplied in the form of three-month-old rooted cuttings.

2.3 The minimum quantity of plant material, to be supplied by the applicant, should be:

40 plants

2.4 The plant material supplied should be visibly healthy, not lacking in vigor, nor affected by any important pest or disease.

2.5 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.

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”.

3.3 Conditions for Conducting the Examination

3.3.1 The tests should be carried out under conditions ensuring satisfactory growth for the expression of the relevant characteristics of the variety and for the conduct of the examination.

3.3.2 The optimum stage of development for the assessment of each characteristic is indicated by a number in the second column of the Table of Characteristics. The stages of development denoted by each number are described in Section 8.

3.3.3 Type of observation
The recommended method of observing the characteristic is indicated by the following key in the second column of the Table 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.

3.4 Test Design

3.4.1 Each test should be designed to result in a total of at least 30 plants, which should be divided between at least 2 replicates.

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 Number of Plants / Parts of Plants to be Examined

Unless otherwise indicated, all observations determined by measurement or counting should be made on 10 plants or parts taken from each of 10 plants.

3.6 *Additional Tests*

Additional tests, for examining relevant characteristics, may be established.

4. Assessment of Distinctness, Uniformity and Stability

4.1 Distinctness

4.1.1 General Recommendations

It is of particular importance for users of these Test Guidelines to consult the General Introduction prior to making decisions regarding distinctness. However, the following points are provided for elaboration or emphasis in these Test Guidelines.

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 Test Guidelines are familiar with the

recommendations contained in the General Introduction prior to making decisions regarding distinctness.

4.2 Uniformity

4.2.1 It is of particular importance for users of these Test Guidelines to consult the General Introduction prior to making decisions regarding uniformity.

4.2.2 For assessment of vegetatively propagated varieties, a population standard of 1% with an acceptance probability of at least 95% should be applied. In the case of a sample size of 30 plants, 1 off-type is allowed.

4.3 *Stability*

4.3.1 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 tested, either by growing a further generation, or by testing a new seed or plant stock to ensure that it exhibits the same characteristics as those shown by the previous 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) Leaf: blade length (characteristic 2)
(b) Leaf: petiole length (characteristic 3)
(c) Leaf: blade width (characteristic 5)
(d) Leaf blade: shape of apex (characteristic 7)
(b) Leaf blade: shape of base (characteristic 8)
(c) Leaf blade: rippling (characteristic 10)
(d) Leaf blade: color of young leaf (characteristic 12)
(e) Inflorescence: curvature of spathe on maturity (characteristic 19)

5.4 Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the General Introduction.

6. Introduction to the Table of Characteristics

6.1 Categories of Characteristics

6.1.1 Standard Test Guidelines Characteristics

Standard Test Guidelines characteristics are those which are approved by UPOV for examination of DUS and from which members of the Union can select those suitable for their particular circumstances.

6.1.2 Asterisked Characteristics

Asterisked characteristics (denoted by *) are those included in the Test Guidelines which are important for the international harmonization of variety descriptions and should always be examined for DUS and included in the variety description by all members of the Union, except when the state of expression of a preceding characteristic or regional environmental conditions render this inappropriate.

6.2 States of Expression and Corresponding Notes

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

6.3 Types of Expression

An explanation of the types of expression of characteristics (qualitative, quantitative and pseudo-qualitative) is provided in the General Introduction.

6.4 *Example Varieties*

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

6.5 Legend

(*) Asterisked characteristic – see Chapter 6.1.2

QL: Qualitative characteristic – see Chapter 6.3
QN: Quantitative characteristic – see Chapter 6.3
PQ: Pseudo-qualitative characteristic – see Chapter 6.3

MG, MS, VG, VS: See chapter 3.3.3

(H): varieties of *Anubias heterophila*
(B): varieties of *Anubias barteri* var. *barteri*
(N): varieties of *Anubias barteri* var. *nana*

(a)-(g) 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/Tableau des caractères/Merkmalstabelle/Tabla de caracteres

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
1. (+)	**VG/ MS**	**Stem: width of rhizome**					
QN	**(a)**	thin				Gold (N)	3
		medium				(H)	5
		thick					7
2. (*) (+)	**VG/ MS**	**Leaf: blade length**					
QN	**(d)**	short				Petite (N), Wavy (B)	3
		medium				Lanceolata (H), Oriental Green (B), Wrinkled (N)	5
		long				(H)	7
3. (*) (+)	**VG/ MS**	**Leaf: petiole length**					
QN	**(d)**	short				Broad Leaf (B), Petite (N)	3
		medium				Gold (N), Lanceolata (H), Marble (B)	5
		long				(H)	7
4.		**Leaf: ratio blade length / petiole length**					
QN		small				Gold (N), (H)	3
		medium				Broad leaf (B), Marble (N)	5
		large				Wrinkled (N)	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
5. (*) (+)	**VG/ MS**	**Leaf: blade width**					
QN	**(d)**	narrow				Petite (N), Wavy (B),	3
		medium				Gold (N), Lanceolata (H), Oriental Green (B)	5
		broad				Broad Leaf (B), (H), Round Leaf (N)	7
6.		**Leaf: ratio blade length / blade width**					
QN		small					3
		medium				Broad leaf (B), Wrinkled (N)	5
		large				Lanceolata (H), Marble (B)	7
7. (*) (+)	**VG**	**Leaf blade: shape of apex**					
QL	**(d)**	acute				Broad Leaf (B), Lanceolata (H), Petite (N)	1
		obtuse				Oriental Green (B) Round Leaf (N)	2
8. (*) (+)	**VG**	**Leaf blade: shape of base**					
QL	**(d)**	cordate				Broad Leaf (B), (N)	1
		round				Round Leaf (N)	2
		obtuse				Gold (N), Lanceolata (H), Marble (B)	3

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
9. **(+)**	**VG**	**Leaf blade: undulation of margin**					
QL	**(d)**	absent				Broad Leaf (B), Lanceolata (H), Petite (N)	1
		weakly expressed				Oriental Green (B), (H), Round Leaf (N)	2
		strongly expressed				Wavy (B)	3
10. **(*)**	**VG**	**Leaf blade: rippling**					
QL	**(d)**	weak				Lanceolata (H), Oriental (B), Petite (N)	3
		medium				Broad Leaf (B), Variegated (N)	5
		strong				(H), Wavy (B)	7
11.	**VG**	**Leaf blade: depressions**					
QL	**(a)**	absent				(H), (B)	1
		present				Wrikled (N)	9
12. **(*)**	**VG**	**Leaf blade: color of young leaf**					
PQ	**(c)**	yellowish green				Gold (N)	1
	(e)	green				Lanceolata (H), Petite (N)	2
		brownish green				Round Leaf (N), Wavy (B)	3

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
13.	**VG**	**Leaf blade: color of mature leaf**					
PQ	**(d)**	yellowish green				Gold (N)	1
	(e)	green				(N), Lanceolata (H)	2
		dark green				Broad Leaf (B), Petite (N)	3
14. (+)	**VG**	**Leaf blade: mottling of mature leaf**					
QN	**(d)**	absent or very small				(H)	1
	(e)	small				Marble (B), Marble (N)	3
		medium					5
		large				Variegated (N)	7
15. (+)	**VG/ MS**	**Inflorescence: length of peduncle**					
QN		short				(H)	3
		medium				Broad leaf (B)	5
		long				Gold (N), Variegated (B)	7
16. (+)	**VG/ MS**	**Inflorescence: length of spathe**					
QN	**(f)**	short				Gold (N), (H)	3
		medium				Oriental green (B)	5
		long				Variegated (B)	7

		English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note/ Nota
17. **(+)**	**VG/ MS**	**Inflorescence: width of spathe**					
QN	**(f)**	narrow				Gold (N)	3
		medium					5
		broad					7
18.	**VG**	**Inflorescence: colour of spathe**					
PQ	**(g)**	yellowish green					1
		green					2
		brownish green					3
19. **(+)**	**VG**	**Inflorescence: curvature of spathe on maturity**					
QL	**(f)**	straight				(H)	1
		curved				(B), (N)	2
20. **(+)**	**VG/ MS**	**Inflorescence: length of spadix**					
QN		short.					3
		medium					5
		long					7
21. **(+)**	**VG/ MS**	**Inflorescence: width of spadix**					
QN		thin					3
		medium					5
		thick					7

8. Explanations on the Table of Characteristics

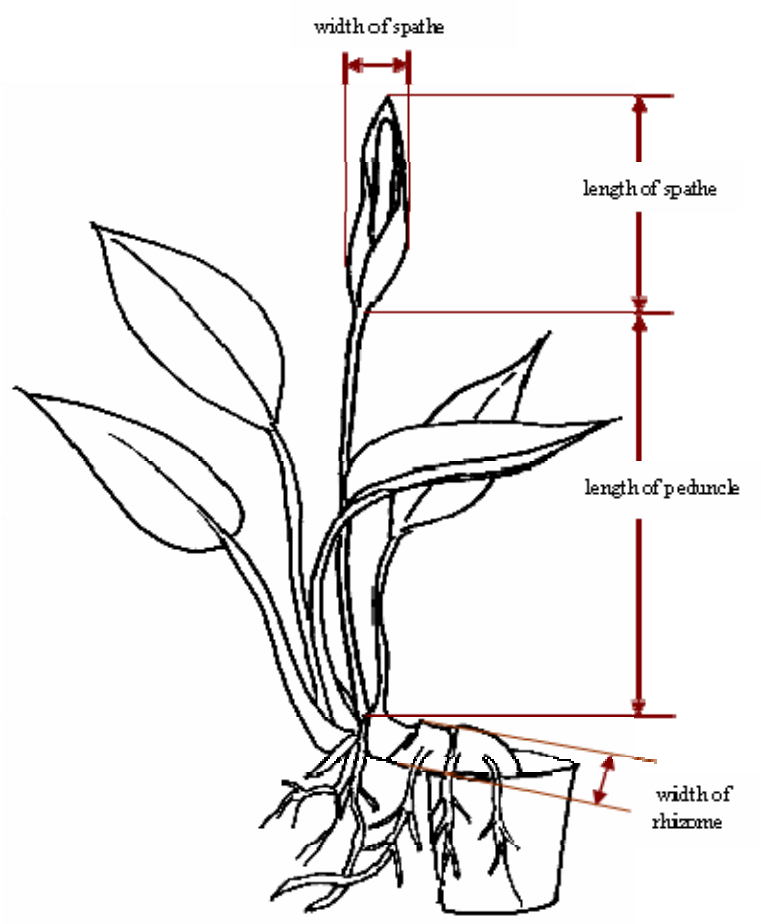
8.1 Explanations covering several characteristics

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

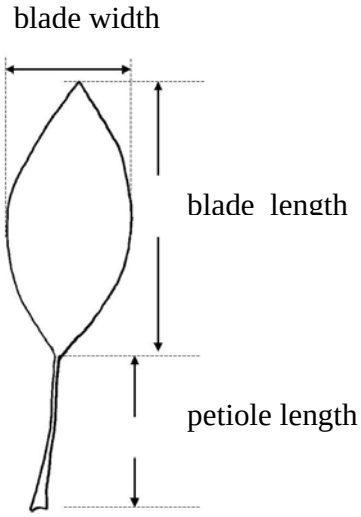
(a) All observations on the rhizome stem is made at the base of the oldest leaf.
(b) The optimum stage of development for the assessment of all characteristics is plants or plant parts of about 3-6 months old.
(c) All observations on the young leaf should be made near the distal part of the shoots as soon as they have unfolded completely.
(d) All observations on the mature leaf should be made on the 4^{th} leaf from the tip or the leaf at the middle part of the horizontal rhizome.
(e) The leaf blade color should be observed from the upper side.
(f) The size of the spathe is observed at maturity (before pollination).
(g) Only the outside color of the spathe is observed.

8.2 Explanations for individual characteristics

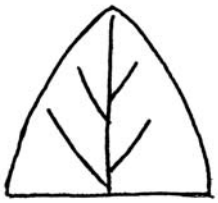
Ad.1: Stem: width of rhizome
Ad. 15: Inflorescence: length of peduncle
Ad. 16: Inflorescence: length of spathe
Ad. 17: Inflorescence: width of spathe



Ad. 2: Leaf: blade length
Ad. 3: Leaf: petiole length
Ad. 5: Leaf: blade width



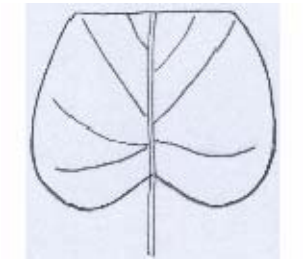
Ad. 7: Leaf blade: shape of apex



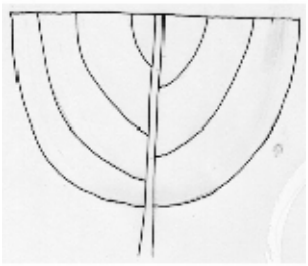
1
acute

2
obtuse

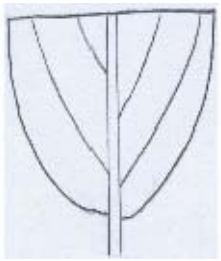
Ad. 8: Leaf blade: shape of base



1
cordate



2
round



3
obtuse

Ad.9: Leaf blade: undulation of margin

1
absent

2
weakly
expressed

3
strongly
expressed

Ad. 14: Leaf blade: mottling of mature leaf

[to be provided]

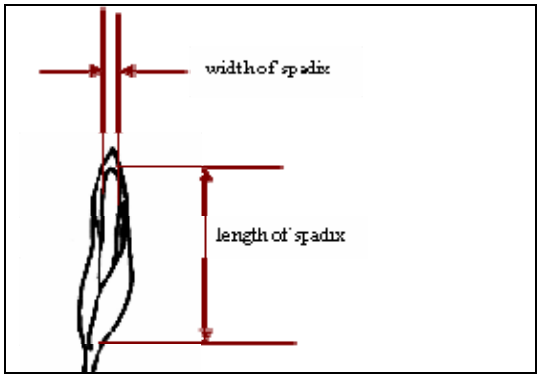
absent or very small	small	medium	large
1	3	5	7

Ad. 19: Inflorescence: curvature of spathe on maturity

1
straight

2
curved

Ad. 20: Inflorescence: length of spadix
Ad. 21: Inflorescence: width of spadix



9. Literature

Crusio, W.,1979: A revision of *Anubias* Schott (Araceae). Meded, Landbouwhogeschool Wageningen 79(14)

Kasselmann, C., 2003: Aquarium Plants. Krieger Publishing Company. Malabar, Florida,US, pp. 98 to110

Rataj, K., Horeman, T J., 1977: Aquarium Plants – Their identification, cultivation and ecology. T.F.H. Publications Inc. Neptune, New Jersey, 448 pp.

10. Technical Questionnaire

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

	Application date: (not to be filled in by the applicant)

TECHNICAL QUESTIONNAIRE
to be completed in connection with an application for plant breeders' rights

1. Subject of the Technical Questionnaire

1.1 Botanical Name	*Anubias*
1.2 Common Name	Anubias

2. Applicant

Name	
Address	
Telephone No.	
Fax No.	
E-mail address	
Breeder (if different from applicant)	

3. Proposed denomination and breeder's reference

Proposed denomination (if available)	
Breeder's reference	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

[#]4. Information on the breeding scheme and propagation of the variety

4.1 Breeding scheme (indicate female component in first position):

Variety resulting from: [please "tick"]

4.1.1 Crossing

(a) controlled cross [ ]
(please state parent varieties)
(b) partially known cross [ ]
(please state known parent variety(ies))
(c) unknown cross [ ]

4.1.2 Mutation [ ]
(please state parent variety)

4.1.3 Discovery and development [ ]
(please state where and when discovered and how developed)

4.1.4 Other [ ]
(please provide details)

4.2 Method of propagating the variety

4.2.1 Vegetative propagation
(a) cuttings [ ]
(b) in vitro propagation [ ]
(c) other (state method) [ ]

4.2.2 Seed

4.2.3 Other
(please provide details)

[#] Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire.

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

5. Characteristics of the variety to be indicated (the number in brackets refers to the corresponding characteristic in Test Guidelines; please mark the note which best corresponds).

	Characteristics	Example Varieties	Note
5.1 (2)	**Leaf: blade length**		
	short	Petite (N), Wavy (B),	3 [ ]
	medium	Lanceolata (H),Oriental Green (B), Wrinkled (N)	5 [ ]
	long	(H)	7 [ ]
5.2 (3)	**Leaf: petiole length**		
	short	Broad Leaf (B), Petite (N),	3 [ ]
	medium	Gold (N), Lanceolata (H), Marble (N)	5 [ ]
	long	(H)	7 [ ]
5.3 (5)	**Leaf: blade width**		
	narrow	Petite (N), Wavy (B)	3 [ ]
	medium	Golden (N), Lanceolata (H), Oriental Green (B)	5 [ ]
	broad	Broad Leaf (B), (H), Round Leaf (N)	7 [ ]
5.4 (7)	**Leaf blade: shape of apex**		
	acute	Broad Leaf (B), Lanceolata (H), Petite (N)	1 [ ]
	obtuse	Oriental Green (B), Round Leaf (N)	2 [ ]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

	Characteristics	Example Varieties	Note
5.5 (8)	**Leaf blade: shape of base**		
	cordate	Broad Leaf (B), (N)	1 [ ]
	round	Round Leaf(N)	2 [ ]
	obtuse	Gold (N), Lanceolata (H), Marble (B)	3 [ ]
5.6 (10)	**Leaf blade: rippling**		
	weak	Lanceolata (H), Oriental (B), Petite (N)	3 [ ]
	medium	Broad Leaf (B), Variegated (N)	5 [ ]
	strong	(H), Wavy (B)	7 [ ]
5.7 (12)	**Leaf blade: color of young leaf**		
	yellowish green	Golden (N)	1 [ ]
	green	Lanceolata (H), Petite (N)	2 [ ]
	brownish green	Round Leaf (N), Wavy (B)	3 [ ]
5.8 (19)	**Inflorescence: curvature of spathe on maturity**		
	straight	(H)	1 [ ]
	curved	(B), (N)	2 [ ]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

6. Similar varieties and differences from these varieties

Please use the following table and box for comments to provide information on how your candidate variety differs from the variety (or varieties) which, to the best of your knowledge, is (or are) most similar. This information may help the examination authority to conduct its examination of distinctness in a more efficient way.

Denomination(s) of variety(ies) similar to your candidate variety	Characteristic(s) in which your candidate variety differs from the similar variety(ies)	Describe the expression of the characteristic(s) for the **similar** variety(ies)	Describe the expression of the characteristic(s) for **your** candidate variety
Example	*[eg. Petiole: length]*	*[e.g. short]*	*[e.g. long]*

Comments:

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

[#]7. Additional information which may help in the examination of the variety

7.1 In addition to the information provided in sections 5 and 6, are there any additional characteristics which may help to distinguish the variety?

Yes [ ] No [ ]

(If yes, please provide details)

7.2 Are there any special conditions for growing the variety or conducting the examination?

Yes [ ] No [ ]

(If yes, please provide details)

7.3 Other information

7.3.1 Representative color photographs of the variety should accompany the Technical Questionnaire.

I) The specifications are:

i. The photographs should measure at least 15cm x 10cm.
ii. The size of the image or object in question should cover as much area of the photograph as possible.
iii. Printed photographs should have a non-glossy, matt finish.
iv. Instant photographs taken with a polaroid camera are not acceptable.
vi. Photographs should be taken against a dark or black background, in sufficient light to prevent or minimise distortion to the natural color of the plant or part(s) of the plant.
vii. Printed photographs are to be submitted in a water-proof envelope or bag
viii. Photographs must be clearly labelled with the Applicant's name, Contact Number, Proposed Denomination of the new variety, and Date of Application.

II) The following images are required:

i. Close-up picture of a single inflorescence (if applicable; taken against a scale ruler)
ii. A picture of the whole plant (taken against a standard 30cm scale ruler)
iii. Any other picture(s) of the plant or part(s) of plant that will distinguish the variety from other varieties.

7.3.2 Main use of the variety

[ ] Fully submerged aquarium / pond plant
[ ] Partially submerged aquarium / pond plant
[ ] Floating aquarium / pond plant
[ ] Dry terrarium plant

[ ] Other (please provide details):

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

8. Authorization for release

(a) Does the variety require prior authorization for release under legislation concerning the protection of the environment, human and animal health?

Yes [ ] No [ ]

(b) Has such authorization been obtained?

Yes [ ] No [ ]

If the answer to (b) is yes, please attach a copy of the authorization.

9. Information on plant material to be examined or submitted for examination.

9.1 The expression of a characteristic or several characteristics of a variety may be affected by factors, such as pests and disease, chemical treatment (e.g. growth retardants or pesticides), effects of tissue culture, different rootstocks, scions taken from different growth phases of a tree, etc.

9.2 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 the plant material has undergone such treatment, full details of the treatment must be given. In this respect, please indicate below, to the best of your knowledge, if the plant material to be examined has been subjected to:

(a) Microorganisms (e.g. virus, bacteria, phytoplasma) Yes [ ] No [ ]

(b) Chemical treatment (e.g. growth retardant, pesticide) Yes [ ] No [ ]

(c) Tissue culture Yes [ ] No [ ]

(d) Other factors Yes [ ] No [ ]

Please provide details for where you have indicated “yes”.

……

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

10. I hereby declare that, to the best of my knowledge, the information provided in this form is correct:

Applicant's name

Signature Date

[End of document]