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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

DRAFT

GINSENG

UPOV code: PANAX_

Panax L.

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

*prepared by an expert from the Republic of Korea**to be considered by the**Technical Working Party for Vegetables at its thirty-eighth session**to be held in Seoul, from June 7 to 11, 2004**and**Technical Working Party for Agricultural Crops at its thirty-third session**to be held in Poznan, Poland, from June 28 to July 2, 2004*

Alternative Names:*

<i>Botanical name</i>	<i>English</i>	<i>French</i>	<i>German</i>	<i>Spanish</i>
<i>Panax L.</i>	Ginseng	Ginseng	Ginseng	Ginseng

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.

* 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.]

ASSOCIATED DOCUMENTS

These guidelines (“Test Guidelines”) should be read in conjunction with document TG/1/3, “General Introduction to the Examination of Distinctness, Uniformity and Stability and the Development of Harmonized Descriptions of New Varieties of Plants” (hereinafter referred to as the “General Introduction”) and its associated “TGP” documents.

Other associated UPOV documents:

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1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Panax* L. (*Panax ginseng* C.A. Meyer, *Panax quinquefolium* L., *Panax notoginseng* Brukill, *Panax japonicum* C. A. Meyer (Nees), *Panax trifolius* C.A. Meyer)

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 seed.

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

200g or 0.4 liters of seed.

2.4 The seed should meet the minimum requirements for germination, species and analytical purity, health and moisture content, specified by the competent authority. In cases where the seed is to be stored, the germination capacity should be as high as possible and should, be stated by the applicant.

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

2.6 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.

ASW 3

(i) The growing cycle is considered to be the duration of a single growing season, beginning with bud burst (flowering and/or vegetative), flowering and fruit harvest and concluding when the following dormant period ends with the swelling of new season buds.

(ii) The growing cycle is considered to be the period ranging from the beginning of active vegetative growth or flowering, continuing through active vegetative growth or flowering and fruit development and concluding with the harvesting of fruit.

3.2 *Testing Place*

3.2.1 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”.

3.2.2 Soil should be fumigated if the testing takes place in the field which has been used for Ginseng cultivation.

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 In order to ensure appropriate growth the testing field should be shaded in such a way that only 15% of sunlight reaches the plants. It is recommended to use a field which has lain fallow for ten years after the cultivation of ginseng.

3.3.3 Stage of development for the assessment

All observations should be made on 4-year-old plants.

3.3.4 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 60 plants, which should be divided between three 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 on single plants should be made on 20 plants or parts taken from each of 20 plants and any other observations made on all plants in the test.

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. However, the following points are provided for elaboration or emphasis in these Test Guidelines:

4.2.2. For the assessment of uniformity, a population standard of 5 % and an acceptance probability of at least 90 % should be applied. In the case of a sample size of 60 plants, 8 off-types are allowed.

(4.2.3) Relative tolerance limits, for the range of variation, are set by comparison with comparable varieties, or types, already known.

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 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) Stem: anthocyanin coloration (characteristic 3)
- (b) Leaflet: shape (characteristic 13)
- (c) Berry: maturity (characteristic 21)
- (d) Berry: color (at full maturity) (characteristic 22)

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.

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6.4 *Example Varieties*

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

6.4.2 The species for the example varieties are indicated by the following codes presented in brackets after the variety:

- *Panax ginseng* C.A. Meyer : PG
- *Panax quinquefolium* L. : PQ
- *Panax notoginseng* Brukill : PN
- *Panax japonicum* C. A. Meyer(Nees). : PJ
- *Panax trifolius* C.A. Meyer : PT

6.5 *Legend*

(*) Asterisked characteristic – see Chapter 6 (Section 6.1.2)

QL Qualitative characteristic – see Chapter 6 (Section 6.3)

QN Quantitative characteristic – see Chapter 6 (Section 6.3)

PQ Pseudo-qualitative characteristic – see Chapter 6 (Section 6.3)

MG: single measurement of a group of plants or parts of plants – see Section 3.3.4

MS: measurement of a number of individual plants or parts of plants - see Section 3.3.4

VG: visual assessment by a single observation of a group of plants or parts of plants - see Section 3.3.4

VS: visual assessment by observation of individual plants or parts of plants - see Section 3.3.4

(a)-(b) 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.	MS	Plant: length of main stem				
(+)						
QN	short				Yunpoong	3
	medium				Gumpoong, Mimaki	5
	long				Chunpoong	7
2	VS	Stem: number of plants with more than two stems				
(+)						
QN	1 stem only				Chunpoong	1
	2 stems					2
	3 stems				Yunpoong	3
3.	VG	Stem: anthocyanin coloration				
(*)						
QL	absent				Gumpoong	1
	present				Chunpoong, Gopoong	9
4.	VG	Stem: distribution of anthocyanin coloration				
(+)						
QL	on lower part only				Chunpoong	1
	on upper part only					2
	on lower and upper part					3
	along the whole stem				Gopoong	4
5.	MS	Petiole: length				
(+)						
QN	(a) short					3
	medium				Mimaki	5
	long					7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note Nota
6.	Petiole: attitude in relation to main axis					
(+)						
QN	(a)	erect			Chunpoong	1
		semi erect			Yunpoong	3
		spreading				5
7.	MS	Leaf: number of leaves per stem				
(+)						
QN	(a)	few				3
		medium			Chunpoong, Mimaki	5
		many				7
8.	VG	Leaf: occurrence of stipules				
(+)						
QN	(a)	absent or very few			Chunpoong	1
		moderate				2
		strong			Yunpoong	3
9.	VG	Leaf: blistering of surface				
QN	(a)	weak				3
		medium				5
		strong				7
10.	VG	Leaf: intensity of green color				
QN	(a)	light			Chunpoong	3
		medium			Mimaki, Yunpoong	5
		dark			Gumpoong	7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note Nota
11	VG Leaflet: length of blade					
	(b) short				Yunpoong	3
	medium				Chunpoong, Mimaki	5
	long				Gumpoong	7
12.	VG Leaf: width of blade of widest part					
	(+)					
QN	(a) narrow				Yunpoong	3
	medium				Chunpoong, Mimaki	5
	broad				Gumpoong	7
13.	VG Leaflet: shape					
	(*)					
	(+)					
PQ	(b) broad elliptic					1
	medium elliptic				Chunpoong	2
	spatulate					3
14.	VG Leaflet: shape in cross section					
	(+)					
QN	(b) concave				Chunpoong	3
	plane				Sunpoong	5
	convex				Yunpoong	7
15.	VG Leaflet: serration of margin					
	(*)					
QN	(b) absent or very weakly developed					1
	moderately developed				Chunpoong	2
	strongly developed					3

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note Nota
16. VG	Leaf: color at maturity					
PQ	(a) yellow				Gumpoong	1
	orange				Chunpoong	2
	red				Yunpoong	3
17.	Time of flowering					
(*) (+)	early					3
QN	medium				Mimaki	5
	late					7
18. VG	Flower stalk: length					
(*) (+)						
QN	short				Yunpoong	3
	medium				Gumpoong, Kaishusan, Mimaki	5
	long				Sunpoong	7
19. VG	Inflorescence: type					
(*) (+)						
QL	Type 1					1
	Type 2					2
	Type 3					3
20. VS	Flower spike: attitude					
(*) (+)						
QN	semi-erect				Gopoong	3
	horizontal				Chunpoong	5
	semi-recurved				Yunpoong	7
21. VS	Berry: maturity					
(*) (+)						
QN	early					3
	medium				Yunpoong	5
	late				Chunpoong	7

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note Nota
22.	VG Berry: color (at full maturity)					
(*)						
(+)						
PQ	yellow				Gumpoong	1
	orange				Chunpoong,	2
	red				Kaishusan, Mimaki, Yunpoong	3
23.	VG Berry: shape (as for 22)					
(+)						
QL	compressed					1
	globose					2
	twin globose				Mimaki	3
24.	MS Main root: width					
(*)						
(+)						
QN	(c) thin					3
	medium				Chunpoong, Mimaki,	5
	thick				Kaishusan, Yunpoong	7
25.	MS Main root: length					
(*)						
(+)						
QN	(c) short					3
	medium				Gopoong, Kaishusan, Mimaki	5
	long				Chunpoong	7
26.	VG Main root: skin color					
PQ	(c) white				Chunpoong, Kaishusan, Mimaki	1
	creamy				Yunpoong (PG)	2
	yellow					3
27.	VG Rhizome: presence of stolon					
(+)						
QL	absent					1
	present				Mimaki (PG), Kaishusa (PG)	9

	English	français	deutsch	español	Example Varieties/ Exemples/ Beispielssorten/ Variedades ejemplo	Note Nota
28.	MS Root: ethanol extract					
	(+) QN					
	low					3
	medium				Mimaki, Kaishusan	5
	high					7
29.	MS Root: presence of ginsenoside Rg1					
	(+) QN					
	absent					1
	present				Mimaki, Kaishusan	9
30	MS Root: dry matter percentage					
	QN					
	low					3
	medium				Mimaki	5
	high					7

8. Explanations on the Table of Characteristics

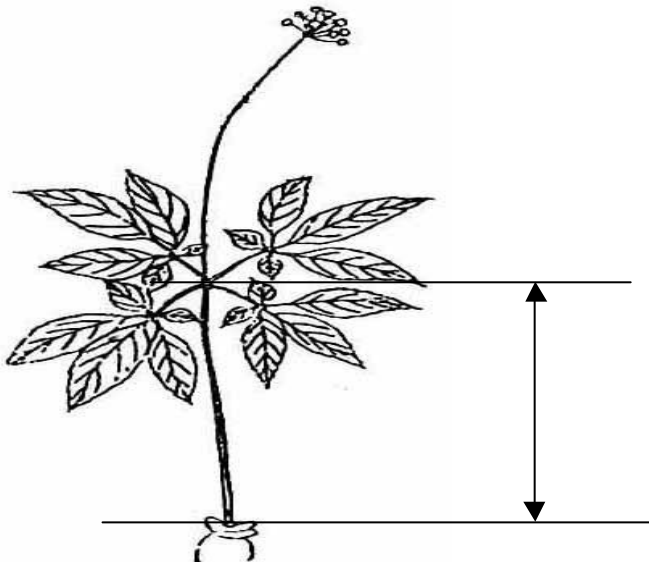
8.1 *Explanations covering several characteristics*

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

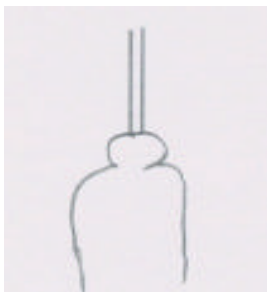
- (a) Leaf: All observations on the leaf should be made on fully developed petiole.
- (b) Leaflet: All observations on the leaflet should be made on the central leaflet
- (c) Main Root: All observations on the main root should be made after harvest.

8.2 *Explanations for individual characteristics*

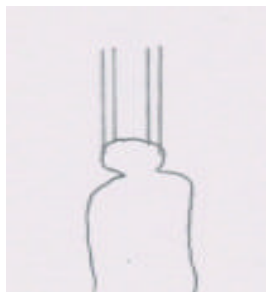
Ad. 1: Plant: length of main stem



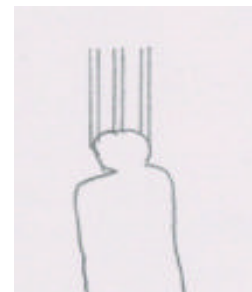
Ad. 2: Stem: number of plants with more than two stems



1
stem only



2
2 stems



3
3 stems

Ad. 4: Stem: distribution of anthocyanin coloration

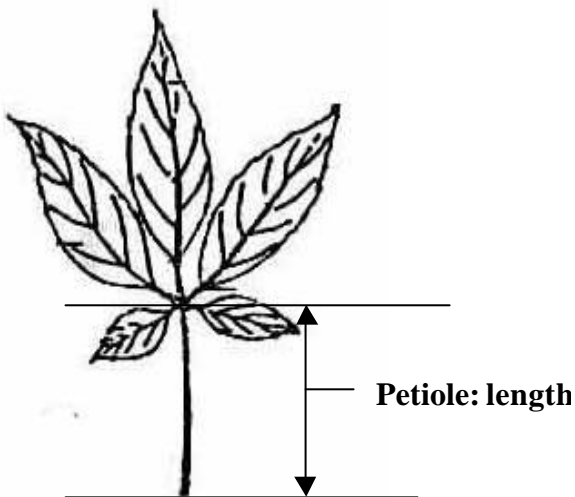


1
on lower part only

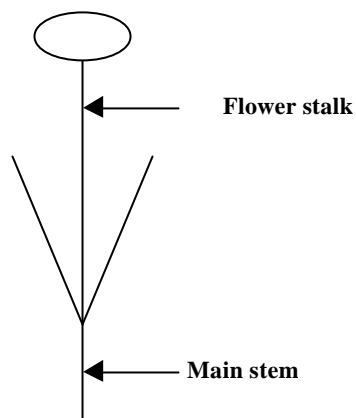


2
on upper part only

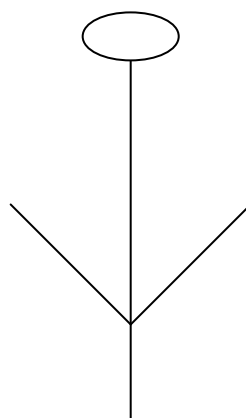
Ad. 5: Petiole: length



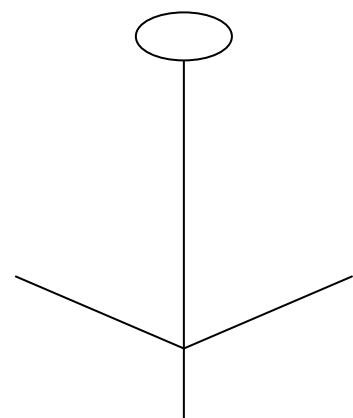
Ad. 6: Petiole: attitude in relation to flower stalk



1
erect

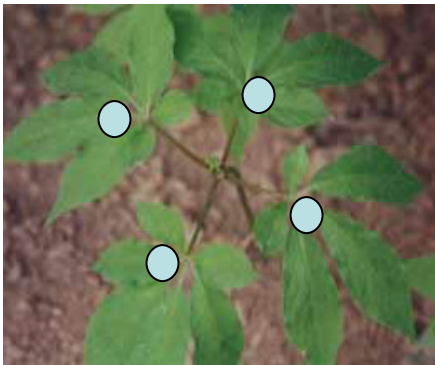


3
semi-erect

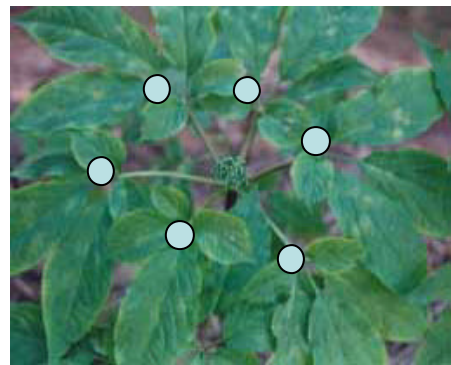


5
spreading

Ad. 7: Leaf: number of leaves/stems



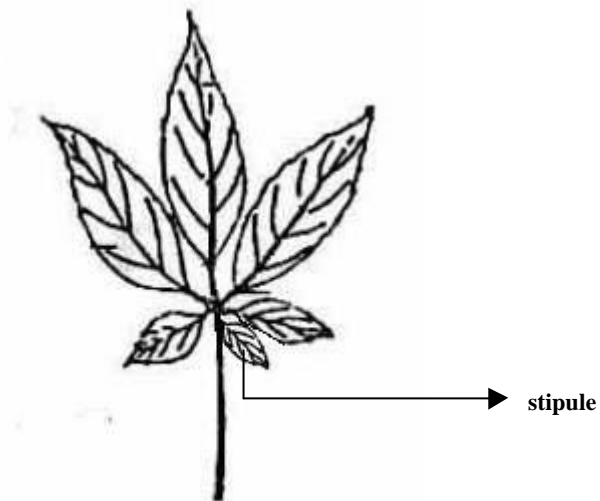
3
few (3 or 4)



5
medium (5)

7
many (6 or 7)

Ad. 8: Leaf: occurrence of stipule

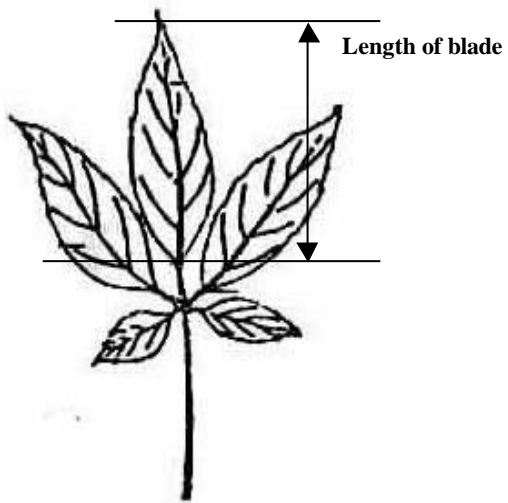


1
absent or very few > 20%

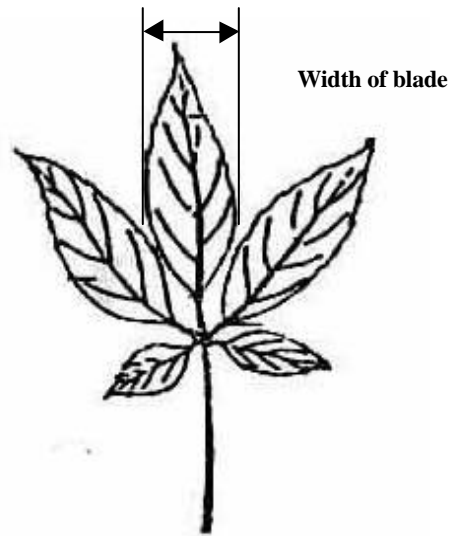
2
moderately 30-40%

3
strongly <60%

Ad. 11: Leaflet: length of blade



Ad. 12: leaflet : Width of blade at widest part



Ad. 13: Leaflet: shape

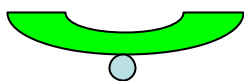


1
broad-elliptic

2
elliptic

3
spatulate

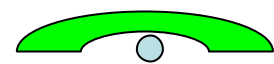
Ad. 14: Leaflet: shape in cross section



3
concave



5
plane

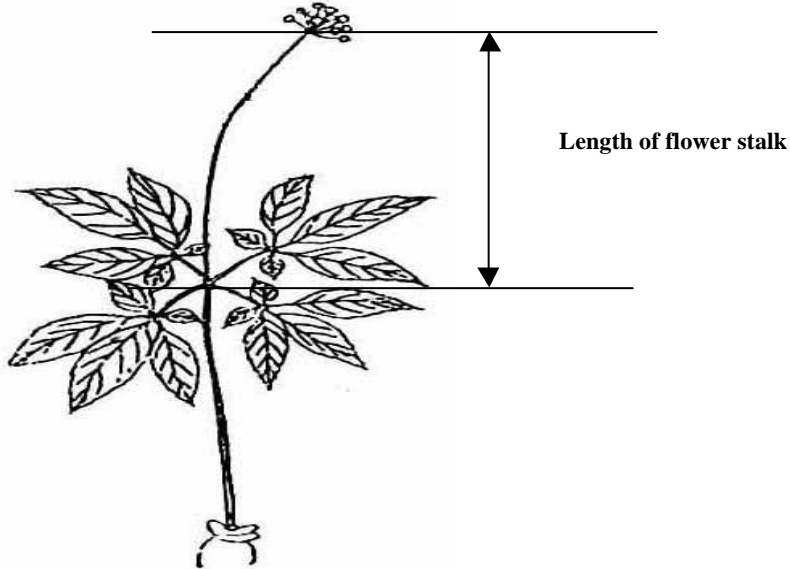


7
convex

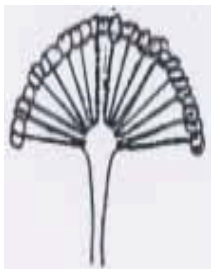
Ad. 17: Time of flowering

The time at which 50% of the plants flower

Ad. 18: Flower stalk: length



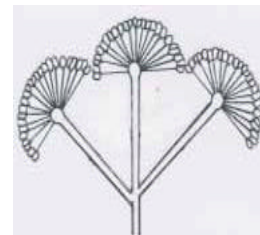
Ad. 19: Inflorescence: type



1
Type 1



2
Type 2



3
Type 3

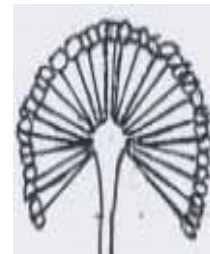
Ad. 20: Flower spike: attitude



3
semi-erect



5
horizontal



7
semi-recurved

Ad. 21: Berry: maturity

Time at which 50% of plants have berries with mature color

Ad. 22: Berry: color (at full maturity)



1. yellow

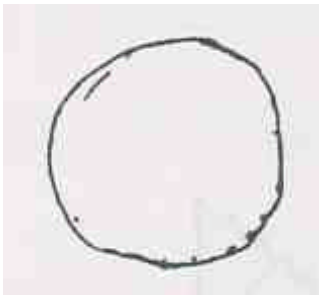


2. orange



3. red

Ad. 23: Berry shape (at full maturity)



1. compressed

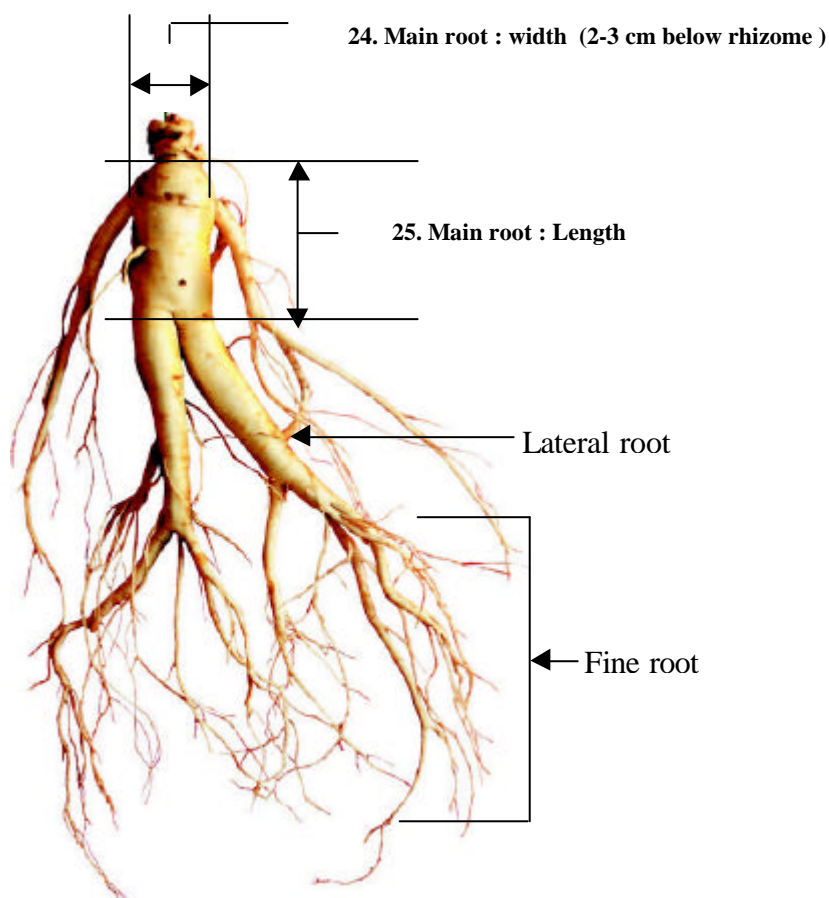


2. globose



3. twin globose

Ads. 24, 25: Main root width (24) and length (25)



Ad. 27: Rhizome: presence of stolon



1	9
absent	present

Ad. 28: Root: ethanol extract

50% ethanol-soluble extract: Weigh accurately about 2.3g of the sample for analysis, extract with 70 ml of diluted ethanol in a suitable flask with intermittent shaking for 5 hours, and allow to stand for 16 to 20 hours. Filter, and wash the flask and residue with small portions of diluted ethanol until the filtrate measures 100 ml. Evaporate a 50 ml aliquot of the filtrate to

dryness, dry at 105° for 4 hours, and cool in a desiccator (silica gel). Weigh accurately the amount, multiply it by 2, to determine the amount of dilute ethanol-soluble extract. Calculate the extract content (%) with respect to the sample on the dried basis.

Ad. 29: Root: presence of ginsenoside Rg1.

The extraction solvent is 70% ethanol and temperature is 100°C with 1.5hr (1hr and 0.5hr twice extractions) and the loading amounts are 0.4gr equivalent. For the elimination of pigments, 30% methanol was chosen for washing solvent and 100% methanol was adopted as elution solvents. The order of each ginsenoside elution was same such as ginsenoside-Rh-1, Rh-2, Rg-1, -Rg-3, -Rf, -Re, -Rd, -Re, -Rb2, and -Rb-1.

The calibration graphs of each ginsenosides are quadratic. The detection limits of ginsenosides-Rg-1, Re and Rb-1 were 9ng, 28ng, 108ng, respectively. The full procedure including from extraction to analysis was also valid through test of reproducibility which C.V. was below 3%. The recovery of the authentic ginsenoside compounds were between 89.4~95.7%.

Life cycle of Ginseng

Growing Year	General Description
1	One leaf with three leaflets
2	Two leaves, each leaf has 5 leaflets
3	Three leaves, each leaf has 5 leaflets Flower rhizome differentiation (around 10 poor florets formed in each
4	Four leaves, each leaf has 5 leaflets Flower rhizome differentiation (around 40 florets formed in each spike)
5	Five leaves, each leaf has 5 leaflets Flower rhizome differentiation (around 40 florets formed in each spike)
6	Six leaves, each leaf has 5 leaflets Flower rhizome differentiation (around 40 florets formed in each spike)

9. Literature

Chun, S. K., Mook, S. K., Lee, S. S., Shin, D. Y., 1991: "The effect of light quantity and quality on the ginseng growth and quality" 5(1) p21

Han C.Y. 1977: "Study on the Ginseng Breeding for High Quality Variety," Report on the Contract Study of Ginseng, KT & G. 1-36

Korea Ginseng Corp.: "A Humanoid for a Human Being," p 25, Korea Ginseng Corp.

Kyunggi Provincial RDA, 2002: "Cultural Techniques for High Quality Ginseng," Kyunggi Provincial RDA

Lee, J. H., Lee, J. C., Chun, S. K., Kim, Y. T., Ahn, S. B., 1982: "The effect of light intensity on the growth of ginseng" Korean Journal of Ginseng Science. 6(1) p18.

National Seed Management Office: "Test guideline of Ginseng for DUS Test," National Seed Management Office, Ministry of Agriculture and Forestry (MAF), Republic of Korea

Seeds and Seedlings Division: "Standard Description of Characteristics for the Identification of New Varieties of Ginseng and its Related Species," Ministry of Agriculture, Forestry and Fisheries (MAFF), Japan

W. Scott Persons: "American Ginseng Green Gold," Bright Mountain Books, Inc.

10. Technical Questionnaire

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
		Application date: (not to be filled in by the applicant)
<p>TECHNICAL QUESTIONNAIRE to be completed in connection with an application for plant breeders' rights</p>		
<p>ASW 14</p> <p>(ii)</p> <p>1. Subject of the Technical Questionnaire (please complete):</p> <p style="padding-left: 40px;">1.1 Botanical name [please specify species]</p> <p style="padding-left: 40px;">1.2 Common Name</p>		
<p>2. Applicant</p> <p>Name <input style="width: 400px; height: 20px;" type="text"/></p> <p>Address <input style="width: 400px; height: 80px;" type="text"/></p> <p>Telephone No. <input style="width: 400px; height: 20px;" type="text"/></p> <p>Fax No. <input style="width: 400px; height: 20px;" type="text"/></p> <p>E-mail address <input style="width: 400px; height: 20px;" type="text"/></p> <p>Breeder (if different from applicant) <input style="width: 400px; height: 20px;" type="text"/></p>		
<p>3. Proposed denomination and breeder's reference</p> <p>Proposed denomination <input style="width: 400px; height: 20px;" type="text"/> (if available)</p>		

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:
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Breeder's reference		
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#4. Information on the breeding scheme and propagation of the variety

4.1 Breeding scheme

(i) Variety resulting from:

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

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 Stem: anthocyanin coloration (3)			
absent	Gumpoong	1 []	
present	Gopoong	9 []	
5.2 Leaflet: shape (13)			
broad elliptic		1 []	
elliptic	Chunpoong	2 []	
spatulate		3 []	
5.3 Leaflet: serration of margin (15)			
weak		3 []	
medium		5 []	
strong		7 []	
5.4 Time of flowering (17)			
early		3 []	
medium	Mimaki	5 []	
late		7 []	
5.5 Flower stalk: length (18)			
short	Yunpoong	3 []	
medium	Gumpoong, Kaishusan Mimaki	5 []	
long	Sunpoong	7 []	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:	
Characteristics			
Example Varieties			
Note			
5.6 Inflorescence type (19)			
Type 1	Chunpoong	1 []	
Type 2		2 []	
Type 3		3 []	
5.7 Berry: maturity (21)			
early		3 []	
medium	Yunpoong	5 []	
late	Chunpoong	7 []	
5.8 Berry: color (at full maturity) (22)			
yellow	Gumpoong	1 []	
orange	Chunpoong	2 []	
red	Kaishusan, Mimaki, Yunpoong	3 []	
5.10 Main root : width (24)			
thin		3 []	
medium	Chunpoong, Mimaki,	5 []	
thick	Kaishusan, Yunpoong	7 []	
5.11 Main root: length (25)			
short		3 []	
medium	Gopoong, Kaishusan, Mimaki	5 []	
long	Chunpoong	7 []	

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

Comments:

TECHNICAL QUESTIONNAIRE

Page {x} of {y}

Reference Number:

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 of where you have indicated "yes".

.....

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9.3 Has the plant material to be examined been tested for the presence of virus or other pathogens?

Yes []

(please provide details as specified by the Authority)

No []

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]