|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  | | --- | --- | --- | |  |  | **E** | |  |  |  | |  | wordml://75.png | |  | | --- | | **TG/NELUM(proj.1) Rev.** | | **ORIGINAL:** English | | **DATE:** 2023-05-16 | | | **INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS** | | | |  | Geneva |  | |  | |  |  |  | | --- | --- | --- | |  |  |  | |  | DRAFT |  | |  |  |  | |  | |  |  |  | |  | |  | | --- | |  | | **LOTUS** | |  | | |  | | --- | |  | | |  | | --- | | UPOV Code(s): NELUM | | |  | | |  | | |  |  | | --- | --- | | |  | | --- | | *Nelumbo* Adans.   including *Nelumbo nucifera* Gaertn., *Nelumbo lutea* Willd. and the hybrids of them | | |  | | |  | | |  | | --- | | \* | | |  |  |  | | |  | | --- | | **GUIDELINES** | |  | | **FOR THE CONDUCT OF TESTS** | |  | | **FOR DISTINCTNESS, UNIFORMITY AND STABILITY** | | | | |  |  |  | | |  | | --- | | *prepared by experts from China* | | *to be considered by the* | | |  | | --- | | *Technical Working Party for Ornamental Plants and Forest Trees* | | | *at its fifty-fifth session, to be held in virtually* | | |  | | --- | | *from 2023-06-12 to 2023-06-16* | | | | | | *Disclaimer: this document does not represent UPOV policies or guidance* | | | | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  | | --- | | Alternative names:\* | | | | | | | |  | | --- | |  | | | | | | | *Botanical name* | *English* | *French* | *German* | *Spanish* | | |  | | --- | | *Nelumbo* Adans. | | |  | | --- | | Lotus | | |  | | --- | |  | | |  | | --- | | Lotus | | |  | | --- | |  | | | | | |  |  |  | | 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. |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | TABLE OF CONTENTS | PAGE | |  |  | | |  |  |  | | --- | --- | --- | | 1. | SUBJECT OF THESE TEST GUIDELINES.......................................................................................................... | [4](#Section1) | |  |  |  | | 2. | MATERIAL REQUIRED..................................................................................................................... | [4](#Section2) | |  |  |  | | 3. | METHOD OF EXAMINATION............................................................................................................... | [4](#Section3) | |  |  |  | |  | |  |  |  | | --- | --- | --- | | 3.1 | Number of Growing Cycles................................................................................................................. | [4](#Section3-1) | | 3.2 | Testing Place................................................................................................................... | [4](#Section3-2) | | 3.3 | Conditions for Conducting the Examination............................................................................................... | [4](#Section3-3) | | 3.4 | Test Design................................................................................................................. | [6](#Section3-4) | | 3.5 | Additional Tests................................................................................................................... | [6](#Section3-5) | | | |  |  |  | | 4. | ASSESSMENT OF DISTINCTNESS, UNIFORMITY AND STABILITY................................................................. | [6](#Section4) | |  |  |  | |  | |  |  |  | | --- | --- | --- | | 4.1 | Distinctness.......................................................................................................... | [6](#Section4-1) | | 4.2 | Uniformity............................................................................................................ | [7](#Section4-2) | | 4.3 | Stability............................................................................................................... | [8](#Section4-3) | | | |  |  |  | | 5. | GROUPING OF VARIETIES AND ORGANIZATION OF THE GROWING TRIAL................................................ | [9](#Section5) | |  |  |  | | 6. | INTRODUCTION TO THE TABLE OF CHARACTERISTICS................................................................................ | [14](#Section6) | |  |  |  | |  | |  |  |  | | --- | --- | --- | | 6.1 | Categories of Characteristics...................................................................................................... | [14](#Section6-1) | | 6.2 | States of Expression and Corresponding Notes........................................................................................ | [14](#Section6-2) | | 6.3 | Types of Expression............................................................................................................ | [14](#Section6-3) | | 6.4 | Example Varieties.............................................................................................................. | [14](#Section6-4) | | 6.5 | Legend................................................................................................................. | [15](#Section6-5) | | | |  |  |  | | 7. | TABLE OF CHARACTERISTICS/TABLEAU DES CARACTÈRES/MERKMALSTABELLE/TABLA DE CARACTERES.................................................................................................................. | [16](#Section7) | |  |  |  | | 8. | EXPLANATIONS ON THE TABLE OF CHARACTERISTICS............................................................................... | [39](#Section8) | |  | |  |  |  | | --- | --- | --- | | 8.1 | Explanations covering several characteristics........................................................................................... | [39](#Section8-1) | | |  | | --- | | 8.2 | | Explanations for individual characteristics................................................................................................. | [40](#Section8-2) | | | |  |  |  | | 9. | LITERATURE................................................................................................................... | [74](#Section9) | |  |  |  | | 10 | TECHNICAL QUESTIONNAIRE............................................................................................................ | [75](#Section10) | |  |  |  | |  | |  | | --- | |  | |  | | | |

|  |  |
| --- | --- |
| 1. | Subject of these Test Guidelines |
|  |  |
|  | |  | | --- | | These Test Guidelines apply to all varieties of *Nelumbo* Adans. including *Nelumbo nucifera* Gaertn., *Nelumbo lutea* Willd. and the hybrids of them. | |

|  |  |
| --- | --- |
|  |  |
|  |  |
| 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 rhizome propagules or seed. | |
|  |  |
| 2.3 | |  | | --- | | The minimum quantity of plant material, to be supplied by the applicant, should be: | |
|  |  |
|  | |  | | --- | | 12 rhizome propagules to meet at least 10 survivals after planting.  15 seeds to meet at least 10 survivals after germination and planting. | |
|  |  |
|  | In the case of seed, 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. |
|  |  |
|  | |  | | --- | | In the case of rhizome propagule, a standard propagule (meeting market requirement) should be fresh and healthy, and each must have two internodes with healthy shoots.  http://www.wipo.int/birt/images/3627/62+.png   Propagule with two expanded internodes    Propagule with only one expanded internode  In the case of seed, the seeds should be only collected from varieties of wild type lotus or pure line, which must be planted alone by separating from other lotus varieties to avoid crossing by insects. The applicant should guarantee the seeds to meet the requirement for purity, maturity and high germination capacity. | |
|  |  |
| 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* |
|  |  |
| |  | | --- | | 3.1.1 | | The minimum duration of tests should normally be a single growing cycle. |
|  |  |
| |  | | --- | | 3.1.2 | | The testing of a variety may be concluded when the competent authority can determine with certainty the outcome of the test. |
|  |  |
| *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 Table of Characteristics. The stages of development denoted by each number are described in Chapter 8. |
|  |  |
| |  | | --- | | 3.3.3 | | Because daylight varies, color determinations made against a color chart should be made either in a suitable cabinet providing artificial daylight or in the middle of the day in a room without direct sunlight. The spectral distribution of the illuminant for artificial daylight should conform with the CIE Standard of Preferred Daylight D 6500 and should fall within the tolerances set out in the British Standard 950, Part I. These determinations should be made with the plant part placed against a white background. The color chart and version used should be specified in the variety description. |
|  |  |
| |  | | --- | | 3.3.4 | | |  | | --- | | Based on its main use, the lotus is usually divided into three types, namely rhizome lotus (producing underground expanded rhizome for vegetable), seed lotus (producing seeds for food or medicine), and ornamental lotus (also called flower lotus for ornamental plant).  Except the characteristics shared by these three types of lotus, there are some specified characteristics for each type of them. The seed lotus can also be treated as ornamental plant because it produce numerous flowers which are usually used in wetland landscape. | |
|  |  |

|  |  |
| --- | --- |
| *3.4* | *Test Design* |
| |  |  | | --- | --- | |  |  | | |  | | --- | | 3.4.1 | | |  | | --- | | In the case of rhizome propagated varieties, each test should be designed to result in a total of at least 10 plants. | | |  |  | | |  | | --- | | 3.4.2 | | |  | | --- | | In the case of seed propagated varieties, each test should be designed to result in a total of at least 10 plants. | | | |
|  |  |
| |  | | --- | | 3.4.3 | | |  | | --- | | 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. | |
|  |  |
| |  | | --- | | 3.4.4 | | |  | | --- | | During growth season, some of the flowers and mature fruits will he collected for counting or measurement, but it has no influence on plant development and growth. At the end of growth cycle, the underground rhizomes will be harvested for observation of shoot shape, measurement of expanded rhizome diameter and counting of propagule number during dormancy or before planting. | |
|  |  |
| |  | | --- | |  |   *3.5* | *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. |
|  |  |
|  | |  | | --- | | To assess distinctness of hybrids, the parent lines and the formula may be used according to the following recommendations: | |  | | (i) description of parent lines according to the Test Guidelines; | |  | | (ii) check of the originality of the parent lines in comparison with the variety collection, based on the characteristics in Chapter 7, in order to identify similar parent lines; | |  | | (iii) check of the originality of the hybrid formula in relation to the hybrids in the variety collection, taking into account the most similar lines; and | |  | | (iv) assessment of the distinctness at the hybrid level for varieties with a similar formula. | |  | | Further guidance is provided in documents TGP/9 "Examining Distinctness" and TGP/8 "Trial Design and Techniques Used in the Examination of Distinctness, Uniformity and Stability". | | |  | | --- | | These Test Guidelines cover hybrid varieties of *N. nucifera* and *N. lutea* or hybrid between two different species or two varieties. | | |
|  |  |
| 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. |
|  |  |
| 4.1.4 | |  | | --- | | Number of Plants or Parts of Plants to be Examined | |
|  | |  | | --- | |  | | |  | | --- | | In the case of vegetatively propagated varieties, unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 10 plants or parts taken from each of 10 plants and any other observation made on all plants in the test, disregarding any off-type plants. | | |  | | |  | | --- | | In the case of observations of parts taken from single plants, the number of parts to be taken from each of the plants should be 1. | | |  | | |  | | --- | | In the case of seed-propagated varieties, unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 10 plants or parts taken from each of 10 plants and any other observation made on all plants in the test, disregarding any off-type plants. | | |  | | |  | | --- | | In the case of observations of parts taken from single plants, the number of parts to be taken from each of the plants should be 1. | | |
|  |  |

|  |  |
| --- | --- |
| 4.1.5 | Method of Observation |
|  |  |
|  | The recommended method of observing the characteristic for the purposes of distinctness is indicated by the following key in the Table of Characteristics (see document TGP/9 “Examining Distinctness”, Section 4 “Observation of characteristics”): |
|  |  |
|  | |  | | --- | | MG: single measurement of a group of plants or parts of plants  MS: measurement of a number of individual plants or parts of plants  VG: visual assessment by a single observation of a group of plants or parts of plants  VS: visual assessment by observation of individual plants or parts of plants | |
|  |  |
|  | Type of observation: visual (V) or measurement (M) |
|  |  |
|  | “Visual” observation (V) is an observation made on the basis of the expert’s judgment. For the purposes of this document, “visual” observation refers to the sensory observations of the experts and, therefore, also includes smell, taste and touch. Visual observation includes observations where the expert uses reference points (e.g. diagrams, example varieties, side-by-side comparison) or non-linear charts (e.g. color charts). Measurement (M) is an objective observation against a calibrated, linear scale e.g. using a ruler, weighing scales, colorimeter, dates, counts, etc. |
|  |  |
|  | |  | | --- | | Type of record: for a group of plants (G) or for single, individual plants (S) | |
|  |  |
|  | |  | | --- | | For the purposes of distinctness, observations may be recorded as a single record for a group of plants or parts of plants (G), or may be recorded as records for a number of single, individual plants or parts of plants (S). In most cases, “G” provides a single record per variety and it is not possible or necessary to apply statistical methods in a plant-by-plant analysis for the assessment of distinctness. | |
|  |  |
|  | In cases where more than one method of observing the characteristic is indicated in the Table of Characteristics (e.g. VG/MG), guidance on selecting an appropriate method is provided in document TGP/9, Section 4.2. |
|  |  |

|  |  |
| --- | --- |
| *4.2* | *Uniformity* |
|  |  |
| 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 | | |  | | --- | | These Test Guidelines have been developed for the examination of vegetatively propagated varieties. For varieties with other types of propagation, the recommendations in the General Introduction and document TGP/13 "Guidance for new types and species" Section 4.5 "Testing Uniformity" should be followed. | |
|  |  |
| |  | | --- | | 4.2.3 | | The assessment of uniformity for seed-propagated varieties should be according to the recommendations for cross-pollinated varieties in the General Introduction. |
|  |  |
| 4.2.4 | The assessment of uniformity for hybrid varieties depends on the type of hybrid and should be according to the recommendations for hybrid varieties in the General Introduction. |
|  |  |
| 4.2.5 | |  | | --- | | The Test Guidelines cover hybrid varieties of *N. nucifera* and *N. lutea,* and varieties of different genotypes from the same species. | |
|  |  |
| 4.2.6 | |  | | --- | | For the assessment of uniformity of seed-propagated varieties, a population standard of 5% and an acceptance probability of at least 5% should be applied. In the case of a sample size of 10 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 further examined by testing a new seed or plant stock to ensure that it exhibits the same characteristics as those shown by the initial material supplied. |

|  |  |
| --- | --- |
| 5. | Grouping of Varieties and Organization of the Growing Trial |
|  |  |
| 5.1 | The selection of varieties of common knowledge to be grown in the trial with the candidate varieties and the way in which these varieties are divided into groups to facilitate the assessment of distinctness are aided by the use of grouping characteristics. |
|  |  |
| 5.2 | Grouping characteristics are those in which the documented states of expression, even where produced at different locations, can be used, either individually or in combination with other such characteristics: (a) to select varieties of common knowledge that can be excluded from the growing trial used for examination of distinctness; and (b) to organize the growing trial so that similar varieties are grouped together. |
|  |  |
| 5.3 | The following have been agreed as useful grouping characteristics: |
|  | |  |  |  | | --- | --- | --- | |  |  |  | | |  | | --- | | (a) | |  | |  | | --- | | Emerging leaf: blade texture (characteristic 10) | | |
|  | |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  | | --- | | (b) | |  | |  | | --- | | Flower position comparing to leaf (characteristic 21) | | | |  | | --- | | (c) | |  | |  | | --- | | Flower type (characteristic 24) | | | |  | | --- | | (d) | |  | |  | | --- | | Flower shape (characteristic 25) | | |
|  | |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  | | --- | | (e) | |  | |  | | --- | | Anther color (characteristic 36) | | | |  | | --- | | (f) | |  | |  | | --- | | Color of stamen appendage (characteristic 37) | | | |  | | --- | | (g) | |  | |  | | --- | | Development status of carpel (characteristic 41) | | | |  | | --- | | (i) | |  | |  | | --- | | Color of receptacle top surface (characteristic 43) | | |
|  |  |
|  | |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  | | --- | | (j) | |  | |  | | --- | | Expansion degree of rhizome (characteristic 58) | | | |  | | --- | | (k) | |  | |  | | --- | | Internode shape of main expanded rhizome (characteristic 60) | | |
|  | |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  | | --- | | (l) | |  | |  | | --- | | Shape of expanded rhizome cross-section (for rhizome lotus only)  (characteristic 68) | | | |  | | --- | | (m) | |  | |  | | --- | | Texture of expanded rhizome (for rhizome lotus only) (characteristic 69) | | | |  |  | | --- | --- | | |  | | --- | |  | | | | | |
| 5.4 | Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the General Introduction and document TGP/9 “Examining Distinctness”. |

|  |  |
| --- | --- |
|  |  |
|  |  |
| 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* |
| 6.2.1 | 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. |
| 6.2.2 | All relevant states of expression are presented in the characteristic. |
|  |  |
| 6.2.3 | Further explanation of the presentation of states of expression and notes is provided in document TGP/7 “Development of Test Guidelines”. |

|  |  |
| --- | --- |
| *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* |
|  |  |
| |  |  | English | | français | | deutsch | español | Example Varieties Exemples Beispielssorten Variedades ejemplo | Note/ Nota | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  | | --- | | **1** | | |  | | --- | | **2** | | |  | | --- | | **3** | | |  | | --- | | **4** | | |  | | --- | | **5** | | |  | | --- | | **6** | | |  | | --- | | **7** | | | | | |  |  | |  | | --- | | **Name of characteristics in English** | | | |  | | --- | | **Nom du caractère en français** | | | |  | | --- | | **Name des Merkmals auf Deutsch** | | |  | | --- | | **Nombre del carácter en español** | |  |  | |  |  | |  | | --- | | states of expression | | | |  | | --- | | types d’expression | | | |  | | --- | | Ausprägungsstufen | | |  | | --- | | tipos de expresión | | |  | | --- | |  | |  | |  |  |  |  |  |  |  |  |  |  | | |
| |  |  |  |  | | --- | --- | --- | --- | | 1 | Characteristic number | | | |  |  |  |  | | 2 | (\*) | Asterisked characteristic | – see Chapter 6.1.2 | |  |  |  |  | | 3 | Type of expression | | | |  | QL | Qualitative characteristic | – see Chapter 6.3 | |  | QN | Quantitative characteristic | – see Chapter 6.3 | |  | PQ | Pseudo-qualitative characteristic | – see Chapter 6.3 | |  |  |  |  | | 4 | Method of observation (and type of plot, if applicable) | | | |  | MG, MS, VG, VS | | – see Chapter 4.1.5 | |  |  |  |  | | 5 | |  | | --- | | (+) | | |  |  | | --- | --- | | |  | | --- | | See Explanations on the Table of Characteristics in Chapter 8.2 | | | | |  |  |  |  | | 6 | |  | | --- | | (a)-(b) | | |  |  | | --- | --- | | |  | | --- | | See Explanations on the Table of Characteristics in Chapter 8.1 | | | | |  |  |  |  | | 7 | |  | | --- | | Growth stage key See Explanations on the Table of Characteristics in Chapter 8.3 | | | | | |

|  |  |
| --- | --- |
| 7. | Table of Characteristics/Tableau des caractères/Merkmalstabelle/Tabla de caracteres |
|  |  |

|  |  | English | | français | | deutsch | español | Example Varieties Exemples Beispielssorten Variedades ejemplo | Note/ Nota |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1.** |  | **QL** | **VG** | **(+)** |  | **10** | | | |
|  |  | |  | | --- | | **Color of young root** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | white | |  | |  |  | Nelumbo lutea | 1 |
|  |  | pink | |  | |  |  | Nelumbo nucifera 'Fen Bawang' | 2 |
|  |  | red | |  | |  |  | Nelumbo 'Cai Xia' | 3 |
| **2.** |  | **PQ** | **VG** | **(+)** |  | **10** | | | |
|  |  | |  | | --- | | **Color of young leaf** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | yellow | |  | |  |  | Nelumbo lutea | 1 |
|  |  | green | |  | |  |  | Nelumbo nucifera 'Baiyangdian Bai' | 2 |
|  |  | red center with green edge | |  | |  |  | Nelumbo nucifera 'Zhuo Yue' | 3 |
|  |  | green center with red edge | |  | |  |  | Nelumbo nucifera 'Qian Ban' | 4 |
|  |  | purple red | |  | |  |  | Nelumbo 'Gui Li' | 5 |
| **3.** | **(\*)** | **QN** | **MS|A** | **(+)** |  | **30** | | | |
|  |  | |  | | --- | | **Plant: height** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | very short | |  | |  |  | Nelumbo 'Chuzi Luo' | 1 |
|  |  | short | |  | |  |  | Nelumbo 'Xing Huo' | 2 |
|  |  | medium | |  | |  |  | Nelumbo 'Yijian Lian' | 3 |
|  |  | tall | |  | |  |  | Nelumbo lutea | 4 |
|  |  | very tall | |  | |  |  | Nelumbo nucifera 'Fen Bawang' | 5 |
| **4.** |  | **QN** | **MG** | **(+)** |  | **30** | | | |
|  |  | |  | | --- | | **Emerging leaf: number** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | absent | |  | |  |  | Nelumbo 'Ai Xiangsi Hong' | 1 |
|  |  | very few | |  | |  |  | Nelumbo 'Jin Fuwa' | 2 |
|  |  | few | |  | |  |  | Nelumbo nucifera 'Zhongshan Hongtai' | 3 |
|  |  | medium | |  | |  |  | Nelumbo nucifera 'Honghu Hong' | 4 |
|  |  | many | |  | |  |  |  | 5 |
|  |  | very many | |  | |  |  |  | 6 |
| **5.** | **(\*)** | **QN** | **MS** | **(+)** |  | **30** | | | |
|  |  | |  | | --- | | **Emerging leaf: blade size** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | very small | |  | |  |  | Nelumbo 'Chuzi Luo' | 1 |
|  |  | small | |  | |  |  | Nelumbo 'Yanzhi Wan' | 2 |
|  |  | medium | |  | |  |  | Nelumbo 'Jiuhua Haoyue' | 3 |
|  |  | large | |  | |  |  | Nelumbo lutea | 4 |
|  |  | very large | |  | |  |  | Nelumbo nucifera 'Fen Bawang' | 5 |
| **6.** | **(\*)** | **QL** | **VG** | **(+)** |  | **20-30** | | | |
|  |  | |  | | --- | | **Emerging leaf: variegation on blade** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | absent | |  | |  |  | Nelumbo 'Cai Xia' | 1 |
|  |  | present | |  | |  |  | Nelumbo 'Yin Sajin' | 2 |
| **7.** | **(\*)** | **PQ** | **VG|A** | **(+)** |  | **20-30** | | | |
|  |  | |  | | --- | | **Emerging leaf: blade color** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | yellow green | |  | |  |  | Nelumbo nucifera 'Baiyangdian Bai' | 1 |
|  |  | green | |  | |  |  | Nelumbo nucifera 'Honghu Hong' | 2 |
|  |  | dark green | |  | |  |  | Nelumbo lutea | 3 |
| **8.** | **(\*)** | **PQ** | **VG** | **(+)** |  | **20-30** | | | |
|  |  | |  | | --- | | **Emerging leaf: blade shape** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | rounded or nearly rounded | |  | |  |  |  | 1 |
|  |  | elliptic | |  | |  |  |  | 2 |
|  |  | long elliptic | |  | |  |  |  | 3 |
| **9.** | **(\*)** | **PQ** | **VG** | **(+)** |  | **20-30** | | | |
|  |  | |  | | --- | | **Emerging leaf: shape of longitudinal blade section** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | strongly concave | |  | |  |  |  | 1 |
|  |  | medium concave | |  | |  |  | Nelumbo nucifera 'Dan Sajin' | 2 |
|  |  | weakly concave | |  | |  |  | Nelumbo lutea | 3 |
|  |  | flat | |  | |  |  | Nelumbo 'Jia Jingying' | 4 |
|  |  | concave center with dropping edge | |  | |  |  | Nelumbo nucifera 'Elian 1' | 5 |
| **10.** | **(\*)** | **QN** | **VG** | **(+)** |  | **20-30** | | | |
|  |  | |  | | --- | | **Emerging leaf: blade texture** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | very rough | |  | |  |  | Nelumbo nucifera 'Daye Chi' | 1 |
|  |  | medium rough | |  | |  |  | Nelumbo nucifera 'Honghu Hong' | 2 |
|  |  | weakly rough | |  | |  |  |  | 3 |
|  |  | medium smooth | |  | |  |  | Nelumbo nucifera 'Fenhong Lingxiao' | 4 |
|  |  | very smooth | |  | |  |  | Nelumbo lutea | 5 |
| **11.** |  | **PQ** | **VG** | **(+)** |  | **20-30** | | | |
|  |  | |  | | --- | | **Emerging leaf: upper blade margin** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | rounded or nearly so | |  | |  |  | Nelumbo lutea | 1 |
|  |  | weakly concave | |  | |  |  | Nelumbo 'Honghe Zhanchi' | 2 |
|  |  | medium concave | |  | |  |  | Nelumbo 'Danban Jinxia' | 3 |
|  |  | strongly concave | |  | |  |  | Nelumbo nucifera 'Wuchang Wild' | 4 |
| **12.** | **(\*)** | **QL** | **VG** | **(+)** |  | **20-30** | | | |
|  |  | |  | | --- | | **Emerging leaf:  red line of leaf margin** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | absent | |  | |  |  |  | 1 |
|  |  | present | |  | |  |  |  | 9 |
| **13.** |  | **QN** | **MG/VG** | **(+)** |  | **20-40** | | | |
|  |  | |  | | --- | | **Leaf nose gap** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | absent or very narrow | |  | |  |  | Nelumbo 'Jia Jingying' | 1 |
|  |  | narrow | |  | |  |  | Nelumbo nucifera 'Honghu Hong' | 2 |
|  |  | medium | |  | |  |  | Nelumbo 'Yijian Lian' | 3 |
|  |  | broad | |  | |  |  | Nelumbo lutea | 4 |
| **14.** |  | **QN** | **MG** | **(+)** |  | **30** | | | |
|  |  | |  | | --- | | **Petiole: thickness** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | very thin | |  | |  |  | Nelumbo 'Chuzi Luo' | 1 |
|  |  | thin | |  | |  |  | Nelumbo 'Hong Sijuan' | 2 |
|  |  | medium | |  | |  |  | Nelumbo lutea | 3 |
|  |  | thick | |  | |  |  | Nelumbo nucifera 'Honghu Hong' | 4 |
|  |  | very thick | |  | |  |  | Nelumbo nucifera 'Fen Bawang' | 5 |
| **15.** |  | **QN** | **VG** | **(+)** |  | **20-40** | | | |
|  |  | |  | | --- | | **Petiole: spine density** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | absent or very sparse | |  | |  |  | Nelumbo lutea | 1 |
|  |  | sparse | |  | |  |  | Nelumbo 'Bian Lian' | 2 |
|  |  | medium | |  | |  |  | Nelumbo nucifera 'Honghu Hong' | 3 |
|  |  | dense | |  | |  |  | Nelumbo 'Jia Jingying' | 4 |
| **16.** | **(\*)** | **PQ** | **VG** | **(+)** |  | **20-30** | | | |
|  |  | |  | | --- | | **Shape of flower bud** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | globose | |  | |  |  | Nelumbo 'Xiao Hongqiu' | 1 |
|  |  | ellipsoid | |  | |  |  | Nelumbo 'Jin Fuwa' | 2 |
|  |  | ovoid | |  | |  |  |  | 3 |
|  |  | ovoid-conic | |  | |  |  | Nelumbo nucifera 'Dan Sajin' | 4 |
|  |  | conic | |  | |  |  | Nelumbo 'Xing Huo' | 5 |
| **17.** | **(\*)** | **PQ** | **VG** | **(+)** |  | **20-30** | | | |
|  |  | |  | | --- | | **Flower bud: color** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | green yellow | |  | |  |  | Nelumbo lutea | 1 |
|  |  | green | |  | |  |  | Nelumbo nucifera 'Baiyangdian Bai' | 2 |
|  |  | green with purple-red edge | |  | |  |  | Nelumbo 'Furong Qipa' | 3 |
|  |  | green red | |  | |  |  | Nelumbo 'Jiangnan Mingzhu' | 4 |
|  |  | purple red | |  | |  |  | Nelumbo nucifera 'Zhongshan Hongtai' | 5 |
|  |  | gray purple | |  | |  |  | Nelumbo 'Yinxiang Xihu' | 6 |
|  |  | variegated | |  | |  |  | Nelumbo nucifera 'Dan Sajin' | 7 |
| **18.** | **(\*)** | **QN** | **VG** | **(+)** | **(a)** | **30** | | | |
|  |  | |  | | --- | | **Starting blooming time** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | early | |  | |  |  | Nelumbo 'Jiuhua Haoyue' | 1 |
|  |  | medium | |  | |  |  | Nelumbo nucifera 'Honghu Hong' | 2 |
|  |  | late | |  | |  |  | Nelumbo nucifera 'Fenhong Lingxiao' | 3 |
| **19.** | **(\*)** | **QN** | **MG** | **(+)** |  | **30** | | | |
|  |  | |  | | --- | | **Flowering time of group plants** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | very short | |  | |  |  |  | 1 |
|  |  | short | |  | |  |  |  | 2 |
|  |  | medium | |  | |  |  | Nelumbo 'Yijian Lian' | 3 |
|  |  | long | |  | |  |  | Nelumbo 'Bian Lian' | 4 |
|  |  | very long | |  | |  |  | Nelumbo nucifera 'Fenhong Lingxiao' | 5 |
| **20.** | **(\*)** | **QN** | **MG** | **(+)** |  | **30** | | | |
|  |  | |  | | --- | | **Flower number** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | absent or very few | |  | |  |  | Nelumbo nucifera 'Elian 1' | 1 |
|  |  | few | |  | |  |  | Nelumbo 'Bo Ai' | 2 |
|  |  | medium | |  | |  |  | Nelumbo nucifera 'Zhongshan Hongtai' | 3 |
|  |  | many | |  | |  |  | Nelumbo 'Hong Sijuan' | 4 |
|  |  | very many | |  | |  |  | Nelumbo 'Xing Huo' | 5 |
| **21.** | **(\*)** | **QN** | **VG** | **(+)** |  | **30** | | | |
|  |  | |  | | --- | | **Flower position comparing to leaf** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | below | |  | |  |  |  | 1 |
|  |  | same | |  | |  |  |  | 2 |
|  |  | slightly above | |  | |  |  | Nelumbo 'Hong Sijuan' | 3 |
|  |  | medium | |  | |  |  | Nelumbo nucifera 'Honghu Hong' | 4 |
|  |  | far above | |  | |  |  | Nelumbo 'Chenshan Baihe' | 5 |
| **22.** | **(\*)** | **QN** | **MG** | **(+)** |  | **30** | | | |
|  |  | |  | | --- | | **Flower height** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | very short | |  | |  |  | Nelumbo 'Chuzi Luo' | 1 |
|  |  | short | |  | |  |  | Nelumbo 'Yanzhi Wan' | 2 |
|  |  | medium | |  | |  |  | Nelumbo 'Bo Ai' | 3 |
|  |  | tall | |  | |  |  | Nelumbo nucifera 'Zhizun Qianban' | 4 |
|  |  | very tall | |  | |  |  | Nelumbo nucifera 'Fen Bawang' | 5 |
| **23.** | **(\*)** | **QN** | **MS** | **(+)** |  | **30** | | | |
|  |  | |  | | --- | | **Flower size** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | very small | |  | |  |  | Nelumbo 'Chuzi Luo' | 1 |
|  |  | small | |  | |  |  | Nelumbo 'Hong Sijuan' | 2 |
|  |  | medium | |  | |  |  | Nelumbo 'Yijian Lian' | 3 |
|  |  | large | |  | |  |  | Nelumbo nucifera 'Honghu Hong' | 4 |
|  |  | very large | |  | |  |  | Nelumbo nucifera 'Fen Bawang' | 5 |
| **24.** | **(\*)** | **QN** | **MG/VG** | **(+)** |  | **30** | | | |
|  |  | |  | | --- | | **Flower type** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | single | |  | |  |  | Nelumbo nucifera 'Honghu Hong' | 1 |
|  |  | semi-double | |  | |  |  | Nelumbo 'Cai Xia' | 2 |
|  |  | double | |  | |  |  | Nelumbo nucifera 'Dan Sajin' | 3 |
|  |  | dual-layered | |  | |  |  | Nelumbo nucifera 'Hongtai Lian' | 4 |
|  |  | fully double | |  | |  |  | Nelumbo nucifera 'Zhizun Qianban' | 5 |
|  |  | thousand-petalled | |  | |  |  | Nelumbo nucifera 'Qian Ban' | 6 |
| **25.** | **(\*)** | **PQ** | **VG** | **(+)** |  | **30** | | | |
|  |  | |  | | --- | | **Flower shape** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | cup-shaped | |  | |  |  | Nelumbo 'Furong Qipa' | 1 |
|  |  | bowl-shaped | |  | |  |  | Nelumbo nucifera 'Honghu Hong' | 2 |
|  |  | plate-shaped | |  | |  |  | Nelumbo 'Jin Se', | 3 |
|  |  | dancing-shaped | |  | |  |  | Nelumbo nucifera 'Chenshan Feiyan' | 4 |
|  |  | head-shaped | |  | |  |  | Nelumbo nucifera 'Zhizun Qianban' | 5 |
|  |  | ball-shaped | |  | |  |  | Nelumbo 'Xiao Hongqiu' | 6 |
| **26.** | **(\*)** | **PQ** | **VG** | **(+)** |  | **30** | | | |
|  |  | |  | | --- | | **Color type of flower** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | white | |  | |  |  | Nelumbo nucifera 'Baiyangdian Bai' | 1 |
|  |  | pink | |  | |  |  | Nelumbo nucifera 'Hongtai Lian' | 2 |
|  |  | red | |  | |  |  | Nelumbo 'Zhongguohong Beijing' | 3 |
|  |  | yellow | |  | |  |  | Nelumbo lutea | 4 |
|  |  | orange | |  | |  |  | Nelumbo 'Xingse Chunshan' | 5 |
|  |  | green | |  | |  |  |  | 6 |
|  |  | variegated | |  | |  |  | Nelumbo nucifera 'Dan Sajin' | 7 |
|  |  | multicolored | |  | |  |  | Nelumbo 'Perry’s Giant Sunburst' | 8 |
| **27.** | **(\*)** | **QN** | **VG** | **(+)** |  | **30** | | | |
|  |  | |  | | --- | | **Changeability of flower color** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | none or very weak | |  | |  |  | Nelumbo 'Yijian Lian' | 1 |
|  |  | medium | |  | |  |  | Nelumbo 'Yi Xian' | 2 |
|  |  | strong | |  | |  |  | Nelumbo 'Bian Lian' | 3 |
| **28.** |  | **QN** | **MG/VG** | **(+)** |  | **30** | | | |
|  |  | |  | | --- | | **Tepal number** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | very few | |  | |  |  | Nelumbo 'Xianxian Yuzhi' | 1 |
|  |  | few | |  | |  |  | Nelumbo nucifera 'Honghu Hong' | 2 |
|  |  | medium | |  | |  |  | Nelumbo nucifera 'Zhongshan Hongtai' | 3 |
|  |  | many | |  | |  |  | Nelumbo 'Youyi Mudan' | 4 |
|  |  | very many | |  | |  |  | Nelumbo nucifera 'Qian Ban' | 5 |
| **29.** | **(\*)** | **QN** | **MS** | **(+)** |  | **30** | | | |
|  |  | |  | | --- | | **The size of the largest tepal** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | very small | |  | |  |  | Nelumbo 'Chuzi Luo' | 1 |
|  |  | small | |  | |  |  |  | 2 |
|  |  | medium | |  | |  |  | Nelumbo 'Yanzhi Wan' | 3 |
|  |  | large | |  | |  |  | Nelumbo 'Yijian Lian' | 4 |
|  |  | very large | |  | |  |  | Nelumbo nucifera 'Fen Bawang' | 5 |
| **30.** | **(\*)** | **PQ** | **VG** | **(+)** |  | **30** | | | |
|  |  | |  | | --- | | **Shape of the largest tepal** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | obovate | |  | |  |  | Nelumbo 'Toshihiros Friendship' | 1 |
|  |  | long-obovate | |  | |  |  |  | 2 |
|  |  | obovate-lanceolate | |  | |  |  | Nelumbo 'Yijian Lian' | 3 |
|  |  | oblanceolate | |  | |  |  |  | 4 |
|  |  | clawed | |  | |  |  | Nelumbo 'Jiangnan Mingzhu' | 5 |
|  |  | long-oblanceolate | |  | |  |  | Nelumbo 'Tan Kong' | 6 |
| **31.** | **(\*)** | **PQ** | **VG** | **(+)** |  | **30** | | | |
|  |  | |  | | --- | | **Apex of the largest tepal** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | acute | |  | |  |  |  | 1 |
|  |  | acuminate | |  | |  |  | Nelumbo 'Xianxian Yuzhi' | 2 |
|  |  | abtuse | |  | |  |  |  | 3 |
|  |  | rounded | |  | |  |  | Nelumbo 'Toshihiros Friendship' | 4 |
|  |  | retuse | |  | |  |  | Nelumbo 'Jingshui Guanyin' | 5 |
| **32.** | **(\*)** | **QN** | **MG** | **(+)** |  | **30** | | | |
|  |  | |  | | --- | | **Color of the largest tepal** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | upper position | |  | |  |  |  | 1 |
|  |  | middle position | |  | |  |  |  | 2 |
|  |  | base position | |  | |  |  |  | 3 |
| **33.** | **(\*)** | **PQ** | **VG** | **(+)** |  | **30** | | | |
|  |  | |  | | --- | | **Distribution of  tepal color** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | even | |  | |  |  | Nelumbo 'Yijian Lian' | 1 |
|  |  | gradually transitioned | |  | |  |  | Nelumbo 'Toshihiro’s Friendship' | 2 |
|  |  | alternatedly colored | |  | |  |  | Nelumbo 'Jiangnan Mingzhu' | 3 |
|  |  | apex colorationed | |  | |  |  |  | 4 |
|  |  | longitudinally white-stripped | |  | |  |  | Nelumbo 'Cangqian Hong' | 5 |
|  |  | variegated | |  | |  |  | Nelumbo nucifera 'Dan Sajin' | 6 |
| **34.** |  | **QN** | **VG** | **(+)** |  | **30** | | | |
|  |  | |  | | --- | | **Abaxial veins of tepal** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | absent or very weak | |  | |  |  | Nelumbo nucifera 'Zhongri Youyi' | 1 |
|  |  | medium | |  | |  |  | Nelumbo nucifera 'Honghu Hong' | 2 |
|  |  | strong | |  | |  |  | Nelumbo nucifera 'Taikong 36' | 3 |
| **35.** | **(\*)** | **QN** | **MG/VG** |  |  | **30** | | | |
|  |  | |  | | --- | | **Stamen number** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | absent | |  | |  |  | Nelumbo nucifera 'Zhizun Qianban' | 1 |
|  |  | very few | |  | |  |  | Nelumbo 'Piaocheng Fanying' | 2 |
|  |  | few | |  | |  |  | Nelumbo nucifera 'Zhongshan Hongtai' | 3 |
|  |  | medium | |  | |  |  | Nelumbo 'Hong Sijuan' | 4 |
|  |  | many | |  | |  |  | Nelumbo 'Yijian Lian' | 5 |
|  |  | very many | |  | |  |  | Nelumbo nucifera 'Jianxuan 17' | 6 |
| **36.** | **(\*)** | **PQ** | **VG** |  |  | **30** | | | |
|  |  | |  | | --- | | **Anther color** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | yellow | |  | |  |  | Nelumbo lutea | 1 |
|  |  | orange | |  | |  |  |  | 2 |
| **37.** | **(\*)** | **PQ** | **VG** | **(+)** |  | **30** | | | |
|  |  | |  | | --- | | **Color of stamen appendage** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | light-yellow | |  | |  |  | Nelumbo lutea | 1 |
|  |  | white | |  | |  |  | Nelumbo nucifera 'Baiyangdian Bai' | 2 |
|  |  | white with purple-pink spotted apex | |  | |  |  | Nelumbo 'Hong Mudan' | 3 |
|  |  | purple-pink | |  | |  |  | Nelumbo 'Yijian Lian' | 4 |
|  |  | purple-red | |  | |  |  | Nelumbo 'Gudu Jiangfang' | 5 |
|  |  | dark-brown | |  | |  |  | Nelumbo nucifera 'Yuhuo Niepan' | 6 |
| **38.** |  | **PQ** | **VG** |  |  | **30** | | | |
|  |  | |  | | --- | | **Shape of stamen appendage** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | nearly globose | |  | |  |  |  | 1 |
|  |  | elliptical | |  | |  |  |  | 2 |
|  |  | clavate | |  | |  |  | Nelumbo lutea | 3 |
|  |  | auriculiform | |  | |  |  | Nelumbo 'Jiangnan Mingzhu' | 4 |
| **39.** | **(\*)** | **QN** | **MG** | **(+)** |  | **20-40** | | | |
|  |  | |  | | --- | | **Carpel number** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | absent | |  | |  |  | Nelumbo nucifera 'Zhizun Qianban' | 1 |
|  |  | very few | |  | |  |  | Nelumbo nucifera 'Qian Ban' | 2 |
|  |  | few | |  | |  |  | Nelumbo 'Chuzi Luo' | 3 |
|  |  | medium | |  | |  |  | Nelumbo 'Hong Sijuan' | 4 |
|  |  | many | |  | |  |  | Nelumbo lutea | 5 |
|  |  | very many | |  | |  |  | Nelumbo nucifera 'Jianxuan 17' | 6 |
| **40.** | **(\*)** | **QN** | **MS** | **(+)** |  | **30** | | | |
|  |  | |  | | --- | | **Length of stamen appendaxage** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | very short | |  | |  |  |  | 1 |
|  |  | short | |  | |  |  | Nelumbo nucifera 'Fenhong Lingxiao' | 2 |
|  |  | medium | |  | |  |  | Nelumbo nucifera 'Honghu Hong' | 3 |
|  |  | long | |  | |  |  | Nelumbo 'Ms. Perry D. Slocum' | 4 |
|  |  | very long | |  | |  |  | Nelumbo lutea | 5 |
| **41.** | **(\*)** | **QN** | **VG** | **(+)** |  | **20-30** | | | |
|  |  | |  | | --- | | **Development status of carpel** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | normal | |  | |  |  | Nelumbo nucifera 'Honghu Hong' | 1 |
|  |  | partially bubbled | |  | |  |  | Nelumbo 'Lv Kongque' | 2 |
|  |  | completely bubbled | |  | |  |  | Nelumbo 'Qinhuai Yueye' | 3 |
|  |  | partially petaloid | |  | |  |  | Nelumbo 'Huang Lingyang' | 4 |
|  |  | completely petaloid | |  | |  |  | Nelumbo nucifera 'Zhizun Qianban' | 5 |
| **42.** | **(\*)** | **QN** | **VG** | **(+)** |  | **20-30** | | | |
|  |  | |  | | --- | | **Development status of receptacle** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | normal | |  | |  |  | Nelumbo lutea | 1 |
|  |  | partially degenerated | |  | |  |  | Nelumbo nucifera 'Hongtai Lian' | 2 |
|  |  | absent | |  | |  |  | Nelumbo nucifera 'Zhizun Qianban' | 3 |
| **43.** |  | **PQ** | **VG** | **(+)** |  | **30** | | | |
|  |  | |  | | --- | | **Color of receptacle top surface** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | yellow | |  | |  |  | Nelumbo lutea | 1 |
|  |  | yellow-green | |  | |  |  |  | 2 |
|  |  | green | |  | |  |  | Nelumbo 'Cuixin Xiangyang' | 3 |
| **44.** |  | **PQ** | **VG** | **(+)** |  | **30-40** | | | |
|  |  | |  | | --- | | **Shape of mature seedpod** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | trumpet-shaped | |  | |  |  | Nelumbo 'Hong Sijuan' | 1 |
|  |  | obconical | |  | |  |  | Nelumbo nucifera 'Jin Furong 2' | 2 |
|  |  | cup-shaped | |  | |  |  | Nelumbo 'Jin Fuwa' | 3 |
|  |  | bowl-shaped | |  | |  |  | Nelumbo 'Perry's Giant Sunburst' | 4 |
|  |  | oblate | |  | |  |  | Nelumbo lutea | 5 |
|  |  | umbrella-shaped | |  | |  |  | Nelumbo nucifera 'Thai Red' | 6 |
| **45.** | **(\*)** | **PQ** | **VG** | **(+)** |  | **30-40** | | | |
|  |  | |  | | --- | | **Shape of top surface of mature seedpod** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | concave | |  | |  |  | Nelumbo nucifera 'Jin Furong 2' | 1 |
|  |  | plate-like concave | |  | |  |  | Nelumbo 'Sino-American Friendship' | 2 |
|  |  | flat | |  | |  |  | Nelumbo lutea 'Missouri' | 3 |
|  |  | slightly convex | |  | |  |  | Nelumbo lutea 'Maryland' | 4 |
|  |  | convex | |  | |  |  |  | 5 |
| **46.** | **(\*)** | **PQ** | **VG** | **(+)** |  | **30-40** | | | |
|  |  | |  | | --- | | **Margin of mature seedpod** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | entire or nearly so | |  | |  |  | Nelumbo nucifera 'Jianxuan 17' | 1 |
|  |  | weakly concave | |  | |  |  | Nelumbo lutea | 2 |
|  |  | medium concave | |  | |  |  | Nelumbo 'Jiuhua Haoyue' | 3 |
|  |  | strongly concave | |  | |  |  |  | 4 |
| **47.** |  | **PQ** | **VG** | **(+)** |  | **30-40** | | | |
|  |  | |  | | --- | | **Color of mature seedpod top surface** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | greyed-green | |  | |  |  | Nelumbo 'Cuixin Xiangyang' | 1 |
|  |  | green | |  | |  |  | Nelumbo nucifera 'Honghu Hong' | 2 |
|  |  | green-yellow | |  | |  |  | Nelumbo lutea | 3 |
|  |  | purple-red | |  | |  |  | Nelumbo 'Cai Xia' | 4 |
| **48.** | **(\*)** | **QN** | **VG** | **(+)** |  | **30-40** | | | |
|  |  | |  | | --- | | **Fruit-setting rate** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | absent | |  | |  |  | Nelumbo nucifera 'Zhizun Qianban' | 1 |
|  |  | very low | |  | |  |  | Nelumbo 'Perry’s Giant Sunburst' | 2 |
|  |  | low | |  | |  |  | Nelumbo 'Moling Qiuse' | 3 |
|  |  | medium | |  | |  |  | Nelumbo 'Jiuhua Haoyue' | 4 |
|  |  | high | |  | |  |  | Nelumbo nucifera 'Jin Furong 2' | 5 |
|  |  | very high | |  | |  |  | Nelumbo nucifera 'Honghu Hong' | 6 |
| **49.** | **(\*)** | **QN** | **MG** | **(+)** |  | **30-40** | | | |
|  |  | |  | | --- | | **Position of fruit comparing to seedpod** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | low or nearly low | |  | |  |  | Nelumbo lutea | 1 |
|  |  | same | |  | |  |  | Nelumbo 'China-Japan Friendship' | 2 |
|  |  | weakly above | |  | |  |  | Nelumbo 'Hongyun Lai' | 3 |
|  |  | strong above | |  | |  |  | Nelumbo 'Zhongshan Honglan' | 4 |
| **50.** | **(\*)** | **PQ** | **VG** | **(+)** |  | **30-40** | | | |
|  |  | |  | | --- | | **Fruit shape** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | narrow obovate | |  | |  |  |  | 1 |
|  |  | narrow ovate | |  | |  |  |  | 2 |
|  |  | narrow elliptic | |  | |  |  |  | 3 |
|  |  | globose | |  | |  |  | Nelumbo 'Jiuhua Haoyue' | 4 |
|  |  | ovate | |  | |  |  |  | 5 |
|  |  | obovate | |  | |  |  |  | 6 |
|  |  | elliptic | |  | |  |  | Nelumbo nucifera 'Honghu Hong' | 7 |
| **51.** | **(\*)** | **PQ** | **VG** | **(+)** |  | **30-40** | | | |
|  |  | |  | | --- | | **Endocarp color** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | white | |  | |  |  | Nelumbo lutea | 1 |
|  |  | purple-pink | |  | |  |  | Nelumbo nucifera 'Dan Sajin' | 2 |
|  |  | light purple-red | |  | |  |  | Nelumbo nucifera 'Honghu Hong' | 3 |
|  |  | purple-red | |  | |  |  | Nelumbo 'Yijian Lian' | 4 |
| **52.** | **(\*)** | **QN** | **MG** | **(+)** |  | **30-40** | | | |
|  |  | |  | | --- | | **Size of dried mature fruit** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | very small | |  | |  |  | Nelumbo 'Chuzi Luo' | 1 |
|  |  | small | |  | |  |  | Nelumbo lutea | 2 |
|  |  | medium | |  | |  |  | Nelumbo nucifera 'Honghu Hong' | 3 |
|  |  | large | |  | |  |  | Nelumbo 'Jiuhua Haoyue' | 4 |
|  |  | very large | |  | |  |  | Nelumbo nucifera 'Jianxuan 17' | 5 |
| **53.** | **(\*)** | **QN** | **VG** | **(+)** |  | **40** | | | |
|  |  | |  | | --- | | **Mature time of expanded rhizome (for rhizome lotus only)** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | early | |  | |  |  | Nelumbo nucifera 'Elian 7' | 1 |
|  |  | medium | |  | |  |  | Nelumbo nucifera 'Elian 6' | 2 |
|  |  | late | |  | |  |  | Nelumbo nucifera 'Elian 8' | 3 |
| **54.** | **(\*)** | **PQ** | **VG** | **(+)** |  | **30-40** | | | |
|  |  | |  | | --- | | **Color of dried mature fruit** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | brown | |  | |  |  | Nelumbo lutea | 1 |
|  |  | greyed-brown | |  | |  |  | Nelumbo 'Ms. Perry D. Slocum' | 2 |
|  |  | gray | |  | |  |  | Nelumbo nucifera 'Honghu Hong' | 3 |
|  |  | black or dark brown | |  | |  |  | Nelumbo 'Jiuhua Haoyue' | 4 |
| **55.** | **(\*)** | **QN** | **VG** | **(+)** |  | **30-40** | | | |
|  |  | |  | | --- | | **White waxy powder on surface of dried mature fruit** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | absent | |  | |  |  | Nelumbo nucifera 'Honghu Hong' | 1 |
|  |  | little | |  | |  |  | Nelumbo 'Yanzhi Wan' | 2 |
|  |  | much | |  | |  |  | Nelumbo 'Perry's Giant Sunburst' | 3 |
| **56.** |  | **QN** | **VG** | **(+)** |  | **30-40** | | | |
|  |  | |  | | --- | | **Glossiness of dried fruit** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | absent | |  | |  |  | Nelumbo nucifera 'Yingquan Xike' | 1 |
|  |  | weak | |  | |  |  | Nelumbo 'Jiuhua Haoyue' | 2 |
|  |  | strong | |  | |  |  |  | 3 |
| **57.** | **(\*)** | **QN** | **VG** | **(+)** |  | **30-40** | | | |
|  |  | |  | | --- | | **Longitudinal stripes on fruit** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | absent | |  | |  |  | Nelumbo nucifera 'Honghu Hong' | 1 |
|  |  | weak | |  | |  |  | Nelumbo 'Jiuhua Haoyue' | 2 |
|  |  | strong | |  | |  |  | Nelumbo 'Perry’s Giant Sunburst' | 3 |
| **58.** | **(\*)** | **QN** | **MG** | **(+)** |  | **40-50** | | | |
|  |  | |  | | --- | | **Expansion degree of rhizome** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | absent or very weak | |  | |  |  | Nelumbo nucifera 'Fenhong Lingxiao' | 1 |
|  |  | weak | |  | |  |  | Nelumbo 'Bian Lian' | 2 |
|  |  | medium | |  | |  |  | Nelumbo 'Hong Sijuan' | 3 |
|  |  | strong | |  | |  |  | Nelumbo 'Wu Fei' | 4 |
|  |  | very strong | |  | |  |  | Nelumbo nucifera 'Elian 1' | 5 |
| **59.** | **(\*)** | **QN** | **MG/VG** | **(+)** | **(b)** | **40-50** | | | |
|  |  | |  | | --- | | **Internode number of main expanded rhizome** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | absent or nearly so | |  | |  |  | Nelumbo nucifera 'Fenhong Lingxiao' | 1 |
|  |  | few | |  | |  |  | Nelumbo lutea | 2 |
|  |  | medium | |  | |  |  |  | 3 |
|  |  | many | |  | |  |  | Nelumbo nucifera 'Elian 1' | 4 |
| **60.** | **(\*)** | **PQ** | **VG** | **(+)** |  | **40-50** | | | |
|  |  | |  | | --- | | **Internode shape of main expanded rhizome** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | nearly globose | |  | |  |  | Nelumbo nucifera 'Jin Taiyang' | 1 |
|  |  | short tubed | |  | |  |  | Nelumbo nucifera 'Elian 3' | 2 |
|  |  | tubed | |  | |  |  | Nelumbo nucifera 'Elian 1' | 3 |
|  |  | long tubed | |  | |  |  | Nelumbo nucifera 'Zhongshan Hongtai' | 4 |
| **61.** | **(\*)** | **PQ** | **VG** | **(+)** |  | **30-40** | | | |
|  |  | |  | | --- | | **Color of expanded rhizome** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | white | |  | |  |  | Nelumbo nucifera 'Elian 1' | 1 |
|  |  | yellow-brown | |  | |  |  | Nelumbo lutea | 2 |
|  |  | yellow-red | |  | |  |  |  | 3 |
| **62.** | **(\*)** | **QL** | **VG** | **(+)** |  | **40-50** | | | |
|  |  | |  | | --- | | **Spots on surface of expanded rhizhome** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | absent | |  | |  |  | Nelumbo nucifera 'Elian 5' | 1 |
|  |  | present | |  | |  |  | Nelumbo lutea | 2 |
| **63.** | **(\*)** | **PQ** | **VG** |  |  | **40-50** | | | |
|  |  | |  | | --- | | **Color of terminal rhizome shoot** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | white | |  | |  |  | Nelumbo nucifera 'Anhui Piaohua' | 1 |
|  |  | light-yellow | |  | |  |  | Nelumbo 'China-Japan Friendship' | 2 |
|  |  | purple-red | |  | |  |  | Nelumbo nucifera 'Da Zihong' | 3 |
|  |  | light-brown | |  | |  |  | Nelumbo nucifera 'Jinghua Dabai' | 4 |
| **64.** | **(\*)** | **QN** | **MG/VG** | **(+)** |  | **40-50** | | | |
|  |  | |  | | --- | | **Number of rhizome propagule** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | absent or very few | |  | |  |  | Nelumbo nucifera 'Fenhong Lingxiao' | 1 |
|  |  | few | |  | |  |  | Nelumbo nucifera 'Zhongshan Hongtai' | 2 |
|  |  | medium | |  | |  |  | Nelumbo lutea | 3 |
|  |  | many | |  | |  |  | Nelumbo nucifera ‘Qian Ban’ | 4 |
|  |  | very many | |  | |  |  |  | 5 |
| **65.** | **(\*)** | **QN** | **VG** | **(+)** |  | **40-50** | | | |
|  |  | |  | | --- | | **Branch number of expanded rhizome (for rhizome lotus only)** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | few | |  | |  |  |  | 1 |
|  |  | medium | |  | |  |  |  | 2 |
|  |  | many | |  | |  |  |  | 3 |
| **66.** | **(\*)** | **PQ** | **VG** | **(+)** |  | **40-50** | | | |
|  |  | |  | | --- | | **Apex shape of terminal internode (for rhizome lotus only)** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | acute | |  | |  |  |  | 1 |
|  |  | obtuse | |  | |  |  |  | 2 |
| **67.** |  | **QL** | **VG** |  |  | **40-50** | | | |
|  |  | |  | | --- | | **Surface texture of expanded rhizome (for rhizome lotus only)** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | smooth | |  | |  |  | Nelumbo nucifera 'Anhui Piaohua' | 1 |
|  |  | rough | |  | |  |  | Nelumbo nucifera 'Da Zihong' | 2 |
| **68.** | **(\*)** | **PQ** | **VG** | **(+)** |  | **40-50** | | | |
|  |  | |  | | --- | | **Shape of expanded rhizome cross-section (for rhizome lotus only)** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | circular | |  | |  |  | Nelumbo nucifera 'Elian 5' | 1 |
|  |  | elliptic | |  | |  |  | Nelumbo nucifera 'Elian 6' | 2 |
|  |  | rectangular | |  | |  |  |  | 3 |
| **69.** | **(\*)** | **QL** | **VG** | **(+)** |  | **40-50** | | | |
|  |  | |  | | --- | | **Texture of expanded rhizome (for rhizome lotus only)** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | crispy | |  | |  |  | Nelumbo nucifera 'Elian 1' | 1 |
|  |  | intermediate | |  | |  |  | Nelumbo nucifera 'Elian 4' | 2 |
|  |  | starchy | |  | |  |  | Nelumbo nucifera 'Elian 5' | 3 |
| **70.** |  | **PQ** | **VG** | **(+)** |  | **20-30** | | | |
|  |  | |  | | --- | | **Tolerance to disease: leaf rot** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | low | |  | |  |  |  | 1 |
|  |  | medium | |  | |  |  |  | 2 |
|  |  | high | |  | |  |  |  | 3 |
| **71.** |  | **PQ** | **VG** |  |  | **30-50** | | | |
|  |  | |  | | --- | | **Tolerance to disease: rhizome rot** | | | |  | | --- | |  | | | |  | | --- | |  | | |  | | --- | |  | |  |  |
|  |  | absent | |  | |  |  |  | 1 |
|  |  | medium | |  | |  |  |  | 2 |
|  |  | strong | |  | |  |  |  | 3 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  | | --- | --- | --- | --- | | 8. | Explanations on the Table of Characteristics | | | |  | | | | | *8.1* | *Explanations covering several characteristics* | | | |  | | | | |  | |  | | --- | |  | | | | |  |  |  |  | |  | Characteristics containing the following key in the Table of Characteristics should be examined as indicated below: | | | |  | | | | | |  | | --- | | (a) | | |  | | --- | | For flower, all characteristics are observed and measured on day 2 flower around 8:00–10:00 am (7:00–9:00 am in hot summer) except a few of special varieties, because a flower, particularly single and semi double flower types, starts to open in the early morning and completely closes afternoon from day 1 to day 3. One flower usually lasts for only four days and then its tepals fall off on the 5th day or afternoon of the 4th day. For most of varieties, the second day flower has the best appearance.  wordml://77.png | | | | |  |  |  |  | | |  | | --- | | (b) | | |  | | --- | | The underground expanded rhizome can be classified into three categories: Main (primary) expanded rhizome, primary branch of (secondary) expanded rhizome, secondary branch of (third) expanded rhizome.  wordml://78.png | | | | |  |  |  |  | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | |  | | | |  | | --- | | *8.2* | | *Explanations for individual characteristics* | |  | | | |  | | --- | | Ad. 1: Color of young root  The color of young roots could be checked on seedling or a rhizome propagule during planting season.    wordml://79.png                           1                                             2                                   3                       white                                        pink                               red | | | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Ad. 2: Color of young leaf  The color of young leaves should be observed in the early spring when temperature is still relatively low and one to several coin leaves grow out of water.  This characteristic will change or be unstable when temperature increases much in late spring or other seasons.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | wordml://80.png | | | | | | 1 | 2 | 3 | 4 | 5 | | yellow | green | red center with green edge | green center with red edge | purple red | | | | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Ad. 3: Plant: height  Lotus plant can not reach the tallest before flowering peak, therefore the plant height must be measured right after flowering peak. Plant height must be measured from the bottom of pot or artificial pond meeting DUS test requirement, because leaf grows nearly from inner bottom of container or artificial pond.  wordml://81.png     |  |  |  |  |  | | --- | --- | --- | --- | --- | | wordml://82.png | | | | | | 1 | 2 | 3 | 4 | 5 |   1. ​Very  short:  –20 cm       2. Short: 21–90 cm       3. Medium: 91–160 cm       4. Tall: 161–260 cm       5. Very tall: 261 cm – | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | |  | | --- | | Ad. 4: Emerging leaf: number  Lotus has both floating leaves and emerging leaves, and only the emerging leaves will be counted for leaf number per square meter of a container or pond.      1. Absent      2. Very few: 1–5      3. Few: 6–20      4. Medium: 21–40      5. Many: 41–60      6. Very many: 61–  The images of example cultivars will be uploaded later. | | | |  | | --- | | Ad. 5: Emerging leaf: blade size  The leaf blade size is calculated by (length + width)/2.  For the concave leaf, its size should be measured by the way of right photo showing to represent the true length and width of leaf.  wordml://83.png      1. Very small: –10 cm      2. Small: 11–20 cm      3. Medium: 21–40 cm      4. Large: 41–80 cm      5. Very large: 81 cm – | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | |  | | --- | | Ad. 6: Emerging leaf: variegation on blade  wordml://84.png | | | |  | | --- | | Ad. 7: Emerging leaf: blade color  Leaf color is based on observing adaxial surface of mature emerging leaves.  wordml://85.png | | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  | | --- | --- | --- | | |  |  | | --- | --- | | Ad. 8: Emerging leaf: blade shape     |  | | --- | | wordml://86.png   round or nearly rounded               elliptic                                 long elliptic | | | | |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Ad. 9: Emerging leaf: shape of longitudinal blade section  The leaf blade shape of longitudinal section should be based on observation of mature emerging leaves.     |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  |  |  |  |  | | --- | --- | --- | --- | --- | | wordml://87.png | | | | | | strongly concave | medium  concave | weakly concave | flat | concave center with dropping edge | | | | |

|  |  |  |
| --- | --- | --- |
| |  |  | | --- | --- | | |  | | --- | | Ad. 10: Emerging leaf: blade texture  The upper surface texture of mature leaf can be identified by finger touch based on rough area and degree of roughness. However, for a few of cultivars, both weakly rough and smooth leaves could be found.      1. Very rough: fully rough      2. Medium: half leaf area is rough      3. Weakly rough: ¼ leaf area to edge is rough      4. Medium smooth: not rough  5. Very smooth: much smoother than 4  wordml://88.png | | |

|  |  |  |
| --- | --- | --- |
| |  |  | | --- | --- | | |  | | --- | | Ad. 11: Emerging leaf: upper blade margin  Definition on direction of leaf blade: actually the lotus leaf is bilaterally symmetric considering shape of both blade and its nose (leaf center). It is convenient for describing leaf apex by defining direction of blade side like photo showing below. For leaf edge, usually the middle position of north side (upper side) is more concave than that of south side (lower side). Therefore, for shape of leaf apex, only northern side is observed for comparison.  wordml://89.png  wordml://90.png  rounded or nearly so    weakly concave       medium  concave         strongly concave | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | |  | | --- | | Ad. 12: Emerging leaf:  red line of leaf margin  The color of leaf margin should be better observed before leaf becoming mature and aged.  wordml://91.png | | | |  | | --- | | Ad. 13: Leaf nose gap  Definition: leaf nose is the nose-shaped structure located at the center of leaf. The distance between two halves of nose is defined as nose gap. The wild American lotus and some hybrid of American-Asian lotus have the widest gap and Asian lotus have the narrowest gap, and most of Asian-American hybrids have intermediate gap.  wordml://92.png  absent or very narrow                             medium                  broad | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | |  | | --- | | Ad. 14: Petiole: thickness  The diameter of petiole should be measured from the middle position of petiole for mature leaf.       1. Very thin: 0–3 mm       2. Thin: 3–5 mm       3. Medium: 5–10 mm       4. Thick: 10–20  mm       5. Very thick: 20 mm | | | |  | | --- | | Ad. 15: Petiole: spine density  Spine density is observed based on the middle position of petiole since it is not evenly distributed from bottom to top of petiole.  C:\Users\lenovo\Desktop\最新工作内容信息\18-2022年对外交流\6-13_17 UPOV meeting\莲属DUS测试指南\图片\00-性状图集\Photos for use\direct use\2-性状描述图\14.png  1 2 3 4  absent or very sparse    sparse                  medium                           dense | | | |  | | --- | | Ad. 16: Shape of flower bud  The shape of flower bud should be observed about two days before flower opening.  wordml://94.png            globose                      ellipsoid            ovoid                ovoid-conic    conic | | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Ad. 17: Flower bud: color  The color of flower bud should be observed about two days before flower opening.   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | wordml://95.png | | | | | | | | green yellow | green | green with purple-red edge | green  red | purple red | gray  purple | variegated | | | | |  | | --- | | Ad. 18: Starting blooming time        The time of starting blooming for lotus is not highly dependent on genotype and also  depending on regional climate particularly temperature. Tropical lotus blooms later than temperate lotus when they are planted in temperate region. Also the time of starting blooming is very different in different places of a country like China, and the lotus planted in the south  blooms much earlier than that planted in the north.        Therefore, the time of starting blooming must be recorded and compared at the same location. | | | |  | | --- | | Ad. 19: Flowering time of group plants        The flowering time of group plants is observed from the first flower to the end of flowering, and it is highly depending on the ecological type of lotus and where they are cultivated. For all types of lotus, the aboveground parts of plants will die usually in fall when temperatures drop enough and can not bloom in cold weather. For tropical and subtropical lotus, the flower time may last half year even nearly across an entire year when planted in tropical region.         1. Very short: 1 month (very few temperate lotus)         2. Short: 2 months (few temperate lotus)         3. Medium: 3 months (most temperate lotus)         4. Long: 4 months (subtropical lotus)         5. Very long: 5 months and above (subtropical and tropical lotus in tropical region | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | |  | | --- | | Ad. 20: Flower number         Flower number should be counted based on the number of flowers per square meter and it should include all flowers seen in a container or pond during the entire growth season,       1. Absent or very few: 0–3 flowers       2. Few: 4–10 flowers       3. Medium: 11–20 flowers       4. Many: 21–40 flowers       5. Very many: 41– flowers | | | |  |  | | --- | --- | | Ad. 21: Flower position comparing to leaf        The position of flower comparing to leaf is based on the relative height of a flower and its accompanying leaf only for comparability.     |  | | --- | | wordml://96.png          below                     same           slightly above   medium above    far above | | | |

|  |  |  |
| --- | --- | --- |
| |  |  | | --- | --- | | |  | | --- | | Ad. 22: Flower height        The flower height here include height of flower itself and its stalk length. Lotus flower usually can not reach the tallest before flowering peak, therefore the flower height must be measured at least at flowering peak. It must be measured from the bottom of container or artificially pond, because flower grows nearly from inner bottom of container or artificial pond.      1. Very  short:  –20 cm      2. Short: 21–90 cm      3. Medium: 91–160 cm      4. Tall: 161–260 cm  5. Very tall: 261 cm  –  wordml://97.png | | |

|  |  |  |
| --- | --- | --- |
| |  |  | | --- | --- | | |  | | --- | | Ad. 23: Flower size        The flower size is measured by the diameter of lotus flower and it should be measured between 8:00-10:00 am (7:00-9:00 am in peak summer), otherwise the flower will start to close near noon and most of day 2 flowers will completely closed after noon.        1. Very small: −5 cm        2. Small: 6−10 cm        3. Medium: 11−24 cm        4. Large: 25−38 cm        5. Very large: 39 cm  wordml://98.png | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | |  | | --- | | Ad. 24: Flower type        Since lotus has no stably basic number of flower tepals, and the tepal number of single flower has large variation and ranges from 20 to 34 observed in wild lotus population. Therefore, it is not reasonable to classify flower type based on a determined tepal number. The classification on flower type of lotus must consider both tepal number and development status of tepals.  Definition and classification on lotus flower type.      1. Single type: tepal number below 34 without petaloidity of stamens.      2. Semidouble type: tepal number around 21 to 60 with petaloidity of partial stamens.      3. Double type: tepal number usually over 40 with petaloidity of partial or all stamens.      4. Dual-layered type: a special type of double flower, its petaloid carpels form another layer of flower tepals which is separated from normal tepal layer by stamens.      5. Fully double type: a special type of double flower, in which both stamens and carpels are completely petaloid.      6. Thousand-petalled type: a very unique type of double flower, in which, both stamens and carpels are not only completely petaloid, but also the petaloid tissue continues developing into numerous petals during flower opening. The total number of tepals (petals) is at least more than one thousand.  wordml://99.png | | | |  | | --- | | Ad. 25: Flower shape  Definition and classification on flower shape      1. Cup-shaped: for the first day flower of most lotus cultivars, it can not fully open and looks like a cup. For a very few of cultivars, the second day flower also can not fully open.      2. Bowl-shaped: the second day flower can be usually fully open like a bowl.  3. Plate-shaped: the fully open flower looks like a plate, with nearly horizontally arranged petals.      4. Dancing-shaped: a special flower shape of usually single flower, its irregularly arranged petals look like a dance gesture.      5. Head-shaped: the head-shaped and fully double flower with numerous petals, most of which come from petaloid stamens and carpels.      6. Ball-shaped: for a very few cultivar, some or most of the flower buds can not open and remain a ball shape.  wordml://100.png | | |
| |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Ad. 26: Color type of flower  Definition and classification on color of lotus flower.  The color of lotus flower has large variation between different genotypes. The flower color is mainly based on main color of tepals (excluding small ones of outer layer).  The white flower type includes pure white and white tepal with pink tips.  Lotus have no pure pink and red flower, and actually pink and red flowers have purple element. The variegated type has clear boundary between main color and secondary color, while the multicolored flower has no clear boundary between different colors.   |  |  |  |  | | --- | --- | --- | --- | | wordml://101.png | | | | | 1 | 2 | 3 | 4 | | white | pink | red | yellow | |  |  |  |  | | wordml://101.png | | | | | 5 | 6 | 7 | 8 | | orange | green | variegated | multicolored | | | | |  | | --- | | Ad. 27: Changeability of flower color  For some varieties, the flower color may change (or discolorate) much from the first day to the end of flowering, particularly between day 1 and day 2, or/and between day 2 and day 3. The following figures show quick change of flower color of *Nelumbo* 'Bian Lian'.  wordml://102.png | | |
| |  |  | | --- | --- | | |  | | --- | | Ad. 28: Tepal number  The number of tepals includes the outermost four sepal-like tepals and all of petaloid structure for non‑single flower varieties.       1. Very few: −20       2. Few: 21−35       3. Medium: 36−100       4. Many: 101−500       5. Very many: 501− | | | |  | | --- | | Ad. 29: The size of the largest tepal        Since the shape and size change much from outer to inner layers of tepals, therefore, only the largest or nearly largest tepal is used for comparison in tepal shape and size.  The largest or nearly largest tepal is located at around the position where the half number of total tepals of a flower is counted for a single form flower.  For double form flower, it is treated as single form flower without considering petaloid petals for measuring.  The tepal size is calculated by (length + width)/2.  wordml://103.png | | |
| |  |  | | --- | --- | | |  | | --- | | Ad. 30: Shape of the largest tepal  The tepal shape of lotus changes so much from outer layers to inner ones, therefore this character should be compared only for the largest (or nearly so) tepal.  1. Obovate  2. Long-obovate  3. Obovate-lanceolate  4. Oblanceolate  5. Clawed  6. Long-oblanceolate  C:\Users\lenovo\Desktop\最新工作内容信息\18-2022年对外交流\6-13_17 UPOV meeting\莲属DUS测试指南\图片\00-性状图集\Photos for use\direct use\2-性状描述图\29++_副本.png  1 2 3 4 5 6 | | | |  | | --- | | Ad. 31: Apex of the largest tepal  Shape of tepal apex is based on the largest (or nearly so) tepal for comparability.  wordml://104.png        acute        acuminate          obtuse                      rounded                   retuse | | |

|  |  |  |
| --- | --- | --- |
| |  |  | | --- | --- | | |  | | --- | |  | | |
| |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Ad. 33: Distribution of tepal color  This characteristic is based on the largest (or nearly so) tepal for comparability.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | wordml://106.png | | | | | | | even | gradually transitioned | alternatedly colorationed | apex colorationed | longitudinally white-stripped | variegated |   ​ | | | |  | | --- | | Ad. 34: Abaxial veins of tepal  The longitudinal veins on tepal should be observed on abaxial surface of tepal (largest one or nearly so).  wordml://107.png | | |
| |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Ad. 37: Color of stamen appendage  The color of stamen appendage should be usually observed for the day 1 or day two flower. For dark-brown stamen appendage, only part and not all of stamens present this characteristic in the currently known varieties.   |  |  |  | | --- | --- | --- | | wordml://108.png | | | | light-yellow | white | white with purple-pink spotted apex |  |  |  |  | | --- | --- | --- | | wordml://108.png | | | | purple-pink | purple red | dark-brown | | | |  | | |  | | --- | | Ad. 39: Carpel number  wordml://109.png     0. Absent: 0     1. Very few: 1–6     2. Few: 7–15     3. Medium: 16–30     4. Many: 31–45     5. Very many: 46– | | |
| Ad. 40: Length of stamen appendage  The length of stamen appendage is measured based on day-2 flower.       Very short: –2 mm       Short: 2–3 mm       Medium 3–4 mm       Long: 4–5 mm       Very long: 5 mm –  wordml://110.png     |  | | --- | |  | |

|  |  |
| --- | --- |
| |  | | --- | |  | |
| |  |  | | --- | --- | | |  | | --- | | Ad. 41: Development status of carpel  1. normal: all carpels develop normally;  2. partially bubbled: part of carpels become bubbled (degenerated) and could not develop into the fruits;  3. completely bubbled: all carpels become bubbled and could not develop into the fruits;  4. partially petaloid: part of carpels become petaloid;  5. completely petaloid: all carpels become petaloid.  wordml://111.png | | | |  | | --- | | Ad. 42: Development status of receptacle  C:\Users\lenovo\Desktop\最新工作内容信息\18-2022年对外交流\6-13_17 UPOV meeting\莲属DUS测试指南\图片\00-性状图集\Photos for use\direct use\2-性状描述图\42_副本.png  1 2 3  Normal partially degenerated absent | | | |  | | --- | | Ad. 43: Color of receptacle top surface  Observation color of young receptacle top surface should be based on day 2 flower only.  wordml://112.png                   yellow                            yellow-green                          green | | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Ad. 44: Shape of mature seedpod  The shape of mature seedpod should be observed when seedpod approaching mature and before color change.   |  |  |  |  | | --- | --- | --- | --- | | wordml://113.png | | | | | trumpet-shaped | obconical | cup-shaped | bowl-shaped |  |  |  | | --- | --- | | wordml://113.png | | | oblate | umbrella-shaped | | | | |  | | --- | | Ad. 45: Shape of top surface of mature seedpod  wordml://114.png         concave  plate-like concave    flat                  slightly convex            convex  ​ | | | |  | | --- | | Ad. 46: Margin of mature seedpod  wordml://115.png  entire or nearly so      weakly concave              medium            strongly concave | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | |  | | --- | | Ad. 47: Color of mature seedpod top surface  wordml://116.png    greyed-green                    green                     green-yellow             purple-red | | | |  | | --- | | Ad. 48: Fruit-setting rate        The fruit-setting rate is basically calculated or visually estimated by the ratio of fruit number in total embryo number for each seedpod. The fruit-setting rate is largely different between selfing and crossing for a variety. Here it is only based on the case of open pollination.  wordml://117.png             1                2                     3                   4                  5                      6  1. Absent: totally sterile  2. Very low: 1% to 10% fruit-setting  3. Low: 10% to 40% fruit-setting  4. Medium: 40% to 60% fruit-setting  5. High: 60% to 80% fruit-setting  6. Very high: 80% to 100% fruit-setting | | | |  | | --- | | Ad. 49: Position of fruit comparing to seedpod  wordml://118.png  low or nearly so             same                      weakly above                strong above | | |
| |  |  | | --- | --- | | |  | | --- | | Ad. 50: Fruit shape | | | |  | | --- | | Ad. 51: Endocarp color  For some varieties, the color may be different in two halves of endocarp, and in such case, the characteristic should be based on the half endocarp with deeper color.  wordml://120.png  wordml://121.png          white                   purple-pink          light purple-red         purple-red | | |
| |  |  | | --- | --- | | |  | | --- | | Ad. 52: Size of dried mature fruit  The size of dried fruit is calculated by (length and width)/2, and its length should not include residual style and stigma which can be removed by rubbing fruit tip on a rough brick.  wordml://122.png  According to width (diameter) of fruits.      1. Very small: –5 mm      2. Small: 6–10 mm      3. Medium: 11–15 mm      4. Large: 16–20 mm      5. Very large: 21 mm – | | |
| |  |  | | --- | --- | | |  | | --- | | Ad. 53: Mature time of expanded rhizome (for rhizome lotus only)  Explanation will be added later. | | | |  | | --- | | Ad. 54: Color of dried mature fruit  For the same variety, the color of dried mature fruits may be different depending on collection time. Therefore, the fruits should be collected as soon as possible when they become dried in seedpod. Or, they can be collected when fruit color starts to change into brown and then be dried in room temperature or outside in sunny day.  wordml://123.png  The fruits of American lotus show different colors depending on collection time  wordml://124.png           brown                   greyed-brown             gray              black or dark-brown | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | |  | | --- | | Ad. 55: White waxy powder on surface of dried mature fruit  wordml://125.png                absent                                 little                                  much | | | |  | | --- | | Ad. 56: Glossiness of dried fruit  Glossiness of dried fruit should be observed on mature fruits, in which the waxy powder should be wiped off by hand for check.  wordml://126.png              absent                                   weak                                    strong | | |
| |  |  | | --- | --- | | |  | | --- | | Ad. 57: Longitudinal stripes on fruit  wordml://127.png             absent                    weak                         strong | | | |  | | --- | | Ad. 58: Expansion degree of rhizome  Expansion degree of rhizome is based on measurement of diameter of thickest rhizome for a variety. The tropical lotus has unexpanded rhizome or weakly expanded rhizome, while rhizome lotus (for vegetable production) has the thickest expanded rhizome.    1      1         1. Absent to very weak: –2 cm       2. Weak: 2–3 cm       3. Medium: 3–4 cm       4. Strong: 4–5 cm       5. Very strong: 5 cm – | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | |  | | --- | | Ad. 59: Internode number of main expanded rhizome  This characteristic is a very important trait for rhizome lotus. | | | |  | | --- | | Ad. 60: Internode shape of main expanded rhizome  C:\Users\lenovo\Desktop\最新工作内容信息\18-2022年对外交流\6-13_17 UPOV meeting\莲属DUS测试指南\图片\00-性状图集\Photos for use\direct use\2-性状描述图\59+.png  1 2 3 4      nearly globose        short tubed                  tubed long tubed | | |
| |  |  |  | | --- | --- | --- | | |  |  | | --- | --- | | Ad. 61: Color of expanded rhizome  Since the color of expanded rhizome may be different between early developing stage and late mature stage, it should be observed after lotus entered into dormancy in the fall.   |  | | --- | | wordml://130.png                       1                                          2                                               3                   white                             yellow-brown                             yellow-red | | | | |  | | --- | | Ad. 62: Spots on surface of expanded rhizome  wordml://131.png                          1                                             2                    absent                                   present | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | |  | | --- | | Ad. 64: Number of rhizome propagule  The number of rhizome propagules is based on count of the standard rhizome propagule each of which consists of two internodes with terminal shoot at least (figure A). Of course, the propagule with both terminal shoot and lateral shoot (figure B) has higher survival rate.    C:\Users\lenovo\Desktop\最新工作内容信息\18-2022年对外交流\6-13_17 UPOV meeting\莲属DUS测试指南\图片\00-性状图集\Photos for use\direct use\2-性状描述图\62-3.png  A B  1. Absent or very few: 0–5  2. Few: 6–10  3. Medium: 11–20  4. Many: 21–30  5. Very many: 31– | | | |  | | --- | | Ad. 65: Branch number of expanded rhizome (for rhizome lotus only)  C:\Users\lenovo\Desktop\最新工作内容信息\18-2022年对外交流\6-13_17 UPOV meeting\莲属DUS测试指南\图片\00-性状图集\Photos for use\direct use\2-性状描述图\65+.png | | |
| |  |  | | --- | --- | | |  | | --- | | Ad. 66: Apex shape of terminal internode (for rhizome lotus only)  wordml://133.png             1                                     2       acute                              obtuse | | | |  | | --- | | Ad. 68: Shape of expanded rhizome cross-section (for rhizome lotus only)  wordml://134.png                          1                                                      2                                                        3                    circular                                               elliptical                                         rectangular | | |
| |  |  | | --- | --- | | |  | | --- | | Ad. 69: Texture of expanded rhizome (for rhizome lotus only)  This characteristic is only applied for rhizome lotus. The texture of expanded rhizome can be tested by eating either fresh rhizomes or cooked ones. | | | |  | | --- | | Ad. 70: Tolerance to disease: leaf rot  The disease mainly attacks the emerging leaves and underground rhizomes. | | |
| |  |  | | --- | --- | |  | | | |  | | --- | | *8.3* | | |  | | --- | | *Growth stages*  10 Growth of shoots, coin leaves and floating leaves after planting in spring  20 Growth of emerging leaves and flower buds before flowering in early summer  30 Flowering, fruit setting, fruit maturation and rhizome expansion between summer and fall  40 Leaf aging, yellowing, and then died after end of flowering in fall.  50 Plant dormancy in winter  wordml://135.png | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  |  | | --- | --- | --- | | |  |  | | --- | --- | | 9. | Literature | | |  |  |  | | --- | | Agricultural Department of China. 2015. Guidelines for The Conduct of Tests for Distinctness, Uniformity and Stability——Lotus (*Nelumbo* Adans.), Standards of Agricultural Industry of China (NY/T 2756—2015.  China Agriculture Press, Beijing, China, 15pp.  Agricultural Department of China. 2016. Descriptor for Lotus Germplasm Resources. Standards of Agricultural Industry of China (NY/T 2937—2016). China Agriculture Press, Beijing, China, 17pp.  Ke WD, Li F, et al. 2005. Descriptors and Data Standard for Lotus (*Nelumbo nucifera* Gaertn.). China Agriculture Press, Beijing, China, 85pp.  Tian DK. 2020. Application to Register a Cultivar of *Nelumbo*. 8pp.  https://iwgs.org/nymphaea-and-nelumbo-registration/ (2023-2-26 accessed).  Wang QC, Zhang XY. 2005. Colored Illustration of Lotus Cultivars in China. China Forestry Press, Beijing, China, 306pp. | | |

|  |  |  |
| --- | --- | --- |
| |  |  | | --- | --- | | 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 | | | In the case of hybrid varieties which are the subject of an application for plant breeders' rights, and where the parent lines are to be submitted as a part of the examination of the hybrid variety, this Technical Questionnaire should be completed for each of the parent lines, in addition to being completed for the hybrid variety. | | |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | |  |  |  |  |  | | 1. | Subject of the Technical Questionnaire | | | | |  |  |  |  |  | |  | |  | | --- | | 1.1 | | Botanical name | |  | | --- | | *Nelumbo* Adans. | | |  | | --- | |  | | |  |  |  |  |  | |  | |  | | --- | | 1.2 | | Common name | |  | | --- | | Lotus | |  | |  |  |  | |  | | --- | |  | |  | |  |  |  |  |  | |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | |  |  |  |  |  | | 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 | | | |  | Variety resulting from: | | | | |  | |  |  |  |  |  | | --- | --- | --- | --- | --- | | |  | | --- | | 4.1.1 | | |  | | --- | | Crossing | |  | | |  | | --- | | (a) | | |  | | --- | | controlled cross | | [ ] | |  | |  | | --- | | (please state parent variety)  (…………………..……………..…)                          x        (……………..…………………..…)  female parent                                                                     male parent | | | | |  | | --- | | (b) | | |  | | --- | | partially known cross | | [ ] | |  | |  | | --- | | (please state known parent variety(ies))  (…………………..……………..…)                          x        (……………..…………………..…)  female parent                                                                     male parent | | | | |  | | --- | | (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) | [ ] | |  |  | | |  |  | | | | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| |  |  |  | | --- | --- | --- | | TECHNICAL QUESTIONNAIRE | Page {x} of {y} | Reference Number: | |
|  |
| |  |  |  | | --- | --- | --- | |  |  |  | |  | 4.2 | Method of propagating the variety | |  | |  |  |  | | --- | --- | --- | | |  | | --- | | 4.2.1 | | |  | | --- | | Seed-propagated varieties | |  | | |  | | --- | | (a) | | |  | | --- | | Cross-pollination | | [ ] | | |  | | --- | | (b) | | |  | | --- | | Hybrid | | [ ] | | |  | | --- | | (i) | | |  | | --- | | Single hybrid | | [ ] | | |  | | --- | | (c) | | |  | | --- | | Inbred line | | [ ] | | |  | | --- | | (i) | | |  | | --- | | Male sterile line | | [ ] | | |  | | --- | | (ii) | | |  | | --- | | Male fertile line | | [ ] | | |  | | --- | | (d) | | |  | | --- | | Apomictic Variety | | [ ] | | |  | | --- | | (e) | | |  | | --- | | Other (please provide details) | | [ ] | |  |  |  | |  |  |  | |  |  |  | | |  | | --- | | 4.2.2 | | |  | | --- | | Vegetative propagation | |  | | |  | | --- | | (a) | | |  | | --- | | *In vitro* propagation | | [ ] | | |  | | --- | | (b) | | |  | | --- | | Division | | [ ] | | |  | | --- | | (c) | | |  | | --- | | Rhizomes | | [ ] | | |  | | --- | | (d) | | |  | | --- | | Other (state method) | | [ ] | |  |  |  | |  |  |  | |  |  |  | | |  | | --- | | 4.2.3 | | Other (Please provide details) | [ ] | |  |  |  | |  |  |  | |  |  |  | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| |  |  |  |  | | --- | --- | --- | --- | |  | |  |  | | --- | --- | | |  | | --- | | In the case of hybrid varieties the production scheme for the hybrid should be provided on a separate sheet. This should provide details of all the parent lines required for propagating the hybrid e.g.  Single Hybrid        (…………………..……………..…)        x        (……………..…………………..…)        female parent                                                    male parent    Three-Way Hybrid        (…………………..……………..…)        x        (……………..…………………..…)        female line                                                     male line          (…………………..……………..…)        x        (……………..…………………..…)        single hybrid used as female parent                 male parent    and should identify in particular:  (a) any male sterile lines  (b) maintenance system of male sterile lines. | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| |  |  |  | | --- | --- | --- | | 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** |  |  | | --- | | **(1)** | | |  | | --- | | **Color of young root** | |  |  |
|  | |  | | --- | | white | | |  | | --- | | Nelumbo lutea | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | pink | | |  | | --- | | Nelumbo nucifera 'Fen Bawang' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | red | | |  | | --- | | Nelumbo 'Cai Xia' | | |  | | --- | | 3 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.2** |  |  | | --- | | **(2)** | | |  | | --- | | **Color of young leaf** | |  |  |
|  | |  | | --- | | yellow | | |  | | --- | | Nelumbo lutea | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | green | | |  | | --- | | Nelumbo nucifera 'Baiyangdian Bai' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | red center with green edge | | |  | | --- | | Nelumbo nucifera 'Zhuo Yue' | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | green center with red edge | | |  | | --- | | Nelumbo nucifera 'Qian Ban' | | |  | | --- | | 4 [   ] | |
|  | |  | | --- | | purple red | | |  | | --- | | Nelumbo 'Gui Li' | | |  | | --- | | 5 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.3** |  |  | | --- | | **(3)** | | |  | | --- | | **Plant: height** | |  |  |
|  | |  | | --- | | very short | | |  | | --- | | Nelumbo 'Chuzi Luo' | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | short | | |  | | --- | | Nelumbo 'Xing Huo' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | medium | | |  | | --- | | Nelumbo 'Yijian Lian' | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | tall | | |  | | --- | | Nelumbo lutea | | |  | | --- | | 4 [   ] | |
|  | |  | | --- | | very tall | | |  | | --- | | Nelumbo nucifera 'Fen Bawang' | | |  | | --- | | 5 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.4** |  |  | | --- | | **(4)** | | |  | | --- | | **Emerging leaf: number** | |  |  |
|  | |  | | --- | | absent | | |  | | --- | | Nelumbo 'Ai Xiangsi Hong' | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | very few | | |  | | --- | | Nelumbo 'Jin Fuwa' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | few | | |  | | --- | | Nelumbo nucifera 'Zhongshan Hongtai' | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | medium | | |  | | --- | | Nelumbo nucifera 'Honghu Hong' | | |  | | --- | | 4 [   ] | |
|  | |  | | --- | | many | | |  | | --- | |  | | |  | | --- | | 5 [   ] | |
|  | |  | | --- | | very many | | |  | | --- | |  | | |  | | --- | | 6 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.5** |  |  | | --- | | **(5)** | | |  | | --- | | **Emerging leaf: blade size** | |  |  |
|  | |  | | --- | | very small | | |  | | --- | | Nelumbo 'Chuzi Luo' | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | small | | |  | | --- | | Nelumbo 'Yanzhi Wan' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | medium | | |  | | --- | | Nelumbo 'Jiuhua Haoyue' | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | large | | |  | | --- | | Nelumbo lutea | | |  | | --- | | 4 [   ] | |
|  | |  | | --- | | very large | | |  | | --- | | Nelumbo nucifera 'Fen Bawang' | | |  | | --- | | 5 [   ] | |
|  |  |  |  |

|  | Characteristics | Example Varieties | Note |
| --- | --- | --- | --- |
|  |  |  |  |
| |  | | --- | | **5.6** |  |  | | --- | | **(9)** | | |  | | --- | | **Emerging leaf: shape of longitudinal blade section** | |  |  |
|  | |  | | --- | | strongly concave | | |  | | --- | |  | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | medium | | |  | | --- | | Nelumbo nucifera 'Dan Sajin' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | weakly concave | | |  | | --- | | Nelumbo lutea | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | flat | | |  | | --- | | Nelumbo 'Jia Jingying' | | |  | | --- | | 4 [   ] | |
|  | |  | | --- | | concave center with dropping edge | | |  | | --- | | Nelumbo nucifera 'Elian 1' | | |  | | --- | | 5 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.7** |  |  | | --- | | **(10)** | | |  | | --- | | **Emerging leaf: blade texture** | |  |  |
|  | |  | | --- | | very rough | | |  | | --- | | Nelumbo nucifera 'Daye Chi' | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | medium rough | | |  | | --- | | Nelumbo nucifera 'Honghu Hong' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | weakly rough | | |  | | --- | |  | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | medium smooth | | |  | | --- | | Nelumbo nucifera 'Fenhong Lingxiao' | | |  | | --- | | 4 [   ] | |
|  | |  | | --- | | very smooth | | |  | | --- | | Nelumbo lutea | | |  | | --- | | 5 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.8** |  |  | | --- | | **(11)** | | |  | | --- | | **Emerging leaf: upper blade margin** | |  |  |
|  | |  | | --- | | rounded or nearly so | | |  | | --- | | Nelumbo lutea | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | weakly concave | | |  | | --- | | Nelumbo 'Honghe Zhanchi' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | medium concave | | |  | | --- | | Nelumbo 'Danban Jinxia' | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | strongly concave | | |  | | --- | | Nelumbo nucifera 'Wuchang Wild' | | |  | | --- | | 4 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.9** |  |  | | --- | | **(12)** | | |  | | --- | | **Emerging leaf:  red line of blade edge** | |  |  |
|  | |  | | --- | | absent | | |  | | --- | |  | | 1 [   ] |
|  |  |  |  |
|  | |  | | --- | | present | | |  | | --- | |  | | |  | | --- | | 9 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.10** |  |  | | --- | | **(13)** | | |  | | --- | | **Leaf nose gap** | |  |  |
|  | |  | | --- | | absent or very narrow | | |  | | --- | | Nelumbo 'Jia Jingying' | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | narrow | | |  | | --- | | Nelumbo nucifera 'Honghu Hong' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | medium | | |  | | --- | | Nelumbo 'Yijian Lian' | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | broad | | |  | | --- | | Nelumbo lutea | | |  | | --- | | 4 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.11** |  |  | | --- | | **(14)** | | |  | | --- | | **Petiole: thickness** | |  |  |
|  | |  | | --- | | very thin | | |  | | --- | | Nelumbo 'Chuzi Luo' | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | thin | | |  | | --- | | Nelumbo 'Hong Sijuan' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | medium | | |  | | --- | | Nelumbo lutea | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | thick | | |  | | --- | | Nelumbo nucifera 'Honghu Hong' | | |  | | --- | | 4 [   ] | |
|  | |  | | --- | | very thick | | |  | | --- | | Nelumbo nucifera 'Fen Bawang' | | |  | | --- | | 5 [   ] | |
|  |  |  |  |

|  | Characteristics | Example Varieties | Note |
| --- | --- | --- | --- |
|  |  |  |  |
| |  | | --- | | **5.12** |  |  | | --- | | **(15)** | | |  | | --- | | **Petiole: spine density** | |  |  |
|  | |  | | --- | | absent or very sparse | | |  | | --- | | Nelumbo lutea | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | sparse | | |  | | --- | | Nelumbo 'Bian Lian' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | medium | | |  | | --- | | Nelumbo nucifera 'Honghu Hong' | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | dense | | |  | | --- | | Nelumbo 'Jia Jingying' | | |  | | --- | | 4 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.13** |  |  | | --- | | **(16)** | | |  | | --- | | **Shape of flower bud** | |  |  |
|  | |  | | --- | | globose | | |  | | --- | | Nelumbo 'Xiao Hongqiu' | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | ellipsoid | | |  | | --- | | Nelumbo 'Jin Fuwa' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | ovoid | | |  | | --- | | Nelumbo lutea 'Yellow Bird' | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | ovoid-conic | | |  | | --- | | Nelumbo nucifera 'Dan Sajin' | | |  | | --- | | 4 [   ] | |
|  | |  | | --- | | conic | | |  | | --- | | Nelumbo 'Tan Kong' | | |  | | --- | | 5 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.14** |  |  | | --- | | **(17)** | | |  | | --- | | **Flower bud: color** | |  |  |
|  | |  | | --- | | green yellow | | |  | | --- | | Nelumbo lutea | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | green | | |  | | --- | | Nelumbo nucifera 'Baiyangdian Bai' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | green with purple-red edge | | |  | | --- | | Nelumbo 'Furong Qipa' | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | green red | | |  | | --- | | Nelumbo 'Jiangnan Mingzhu' | | |  | | --- | | 4 [   ] | |
|  | |  | | --- | | purple red | | |  | | --- | | Nelumbo nucifera 'Zhongshan Hongtai' | | |  | | --- | | 5 [   ] | |
|  | |  | | --- | | gray purple | | |  | | --- | | Nelumbo 'Yinxiang Xihu' | | |  | | --- | | 6 [   ] | |
|  | |  | | --- | | variegated | | |  | | --- | | Nelumbo nucifera 'Dan Sajin' | | |  | | --- | | 7 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.15** |  |  | | --- | | **(18)** | | |  | | --- | | **Starting blooming time** | |  |  |
|  | |  | | --- | | early | | |  | | --- | | Nelumbo 'Jiuhua Haoyue' | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | medium | | |  | | --- | | Nelumbo nucifera 'Honghu Hong' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | very late | | |  | | --- | | Nelumbo nucifera 'Fenhong Lingxiao' | | |  | | --- | | 3 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.16** |  |  | | --- | | **(19)** | | |  | | --- | | **Flowering time of group plants** | |  |  |
|  | |  | | --- | | very short | | |  | | --- | |  | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | short | | |  | | --- | |  | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | medium | | |  | | --- | | Nelumbo 'Yijian Lian' | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | long | | |  | | --- | | Nelumbo 'Bian Lian' | | |  | | --- | | 4 [   ] | |
|  | |  | | --- | | very long | | |  | | --- | | Nelumbo nucifera 'Fenhong Lingxiao' | | |  | | --- | | 5 [   ] | |
|  |  |  |  |

|  | Characteristics | Example Varieties | Note |
| --- | --- | --- | --- |
|  |  |  |  |
| |  | | --- | | **5.17** |  |  | | --- | | **(20)** | | |  | | --- | | **Flower number** | |  |  |
|  | |  | | --- | | absent or very few | | |  | | --- | | Nelumbo nucifera 'Elian 1' | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | few | | |  | | --- | | Nelumbo 'Bo Ai' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | medium | | |  | | --- | | Nelumbo nucifera 'Zhongshan Hongtai' | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | many | | |  | | --- | | Nelumbo 'Hong Sijuan‘ | | |  | | --- | | 4 [   ] | |
|  | |  | | --- | | very many | | |  | | --- | | Nelumbo 'Xing Huo' | | |  | | --- | | 5 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.18** |  |  | | --- | | **(21)** | | |  | | --- | | **Flower position comparing to leaf** | |  |  |
|  | |  | | --- | | below | | |  | | --- | |  | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | same | | |  | | --- | |  | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | slightly above | | |  | | --- | | Nelumbo 'Hong Sijuan' | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | medium | | |  | | --- | | Nelumbo nucifera 'Honghu Hong' | | |  | | --- | | 4 [   ] | |
|  | |  | | --- | | far above | | |  | | --- | | Nelumbo 'Chenshan Baihe' | | |  | | --- | | 5 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.19** |  |  | | --- | | **(22)** | | |  | | --- | | **Flower height** | |  |  |
|  | |  | | --- | | very short | | |  | | --- | | Nelumbo 'Chuzi Luo' | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | short | | |  | | --- | | Nelumbo 'Yanzhi Wan' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | medium | | |  | | --- | | Nelumbo 'Bo Ai' | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | tall | | |  | | --- | | Nelumbo nucifera 'Zhizun Qianban' | | |  | | --- | | 4 [   ] | |
|  | |  | | --- | | very tall | | |  | | --- | | Nelumbo nucifera 'Fen Bawang' | | |  | | --- | | 5 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.20** |  |  | | --- | | **(23)** | | |  | | --- | | **Flower size** | |  |  |
|  | |  | | --- | | very small | | |  | | --- | | Nelumbo 'Chuzi Luo' | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | small | | |  | | --- | | Nelumbo 'Hong Sijuan' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | medium | | |  | | --- | | Nelumbo 'Yijian Lian' | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | large | | |  | | --- | | Nelumbo nucifera 'Honghu Hong' | | |  | | --- | | 4 [   ] | |
|  | |  | | --- | | very large | | |  | | --- | | Nelumbo nucifera 'Fen Bawang' | | |  | | --- | | 5 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.21** |  |  | | --- | | **(24)** | | |  | | --- | | **Flower type** | |  |  |
|  | |  | | --- | | single | | |  | | --- | | Nelumbo nucifera 'Honghu Hong' | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | semi-double | | |  | | --- | | Nelumbo 'Cai Xia' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | double | | |  | | --- | | Nelumbo nucifera 'Dan Sajin' | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | dual-layered | | |  | | --- | | Nelumbo nucifera 'Hongtai Lian' | | |  | | --- | | 4 [   ] | |
|  | |  | | --- | | fully double | | |  | | --- | | Nelumbo nucifera 'Zhizun Qianban' | | |  | | --- | | 5 [   ] | |
|  | |  | | --- | | thousand-petalled | | |  | | --- | | Nelumbo nucifera 'Qian Ban' | | |  | | --- | | 6 [   ] | |
|  |  |  |  |

|  | Characteristics | Example Varieties | Note |
| --- | --- | --- | --- |
|  |  |  |  |
| |  | | --- | | **5.22** |  |  | | --- | | **(25)** | | |  | | --- | | **Flower shape** | |  |  |
|  | |  | | --- | | cup-shaped | | |  | | --- | | Nelumbo 'Furong Qipa' | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | bowl-shaped | | |  | | --- | | Nelumbo nucifera 'Honghu Red' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | plate-shaped | | |  | | --- | | Nelumbo 'Jin Se' | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | dancing-shaped | | |  | | --- | |  | | |  | | --- | | 4 [   ] | |
|  | |  | | --- | | head-shaped | | |  | | --- | | Nelumbo nucifera 'Zhizun Qianban' | | |  | | --- | | 5 [   ] | |
|  | |  | | --- | | ball-shaped | | |  | | --- | | Nelumbo 'Xiao Hongqiu' | | |  | | --- | | 6 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.23** |  |  | | --- | | **(26)** | | |  | | --- | | **Color type of flower** | |  |  |
|  | |  | | --- | | white | | |  | | --- | | Nelumbo nucifera 'Baiyangdian Bai' | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | pink | | |  | | --- | | Nelumbo nucifera 'Hongtai Lian' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | red | | |  | | --- | | Nelumbo 'Zhongguohong Beijing' | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | yellow | | |  | | --- | | Nelumbo lutea | | |  | | --- | | 4 [   ] | |
|  | |  | | --- | | orange | | |  | | --- | | Nelumbo 'Xingse Chunshan' | | |  | | --- | | 5 [   ] | |
|  | |  | | --- | | green | | |  | | --- | |  | | |  | | --- | | 6 [   ] | |
|  | |  | | --- | | variegated | | |  | | --- | | Nelumbo nucifera 'Dan Sajin' | | |  | | --- | | 7 [   ] | |
|  | |  | | --- | | multicolored | | |  | | --- | | Nelumbo 'Perry’s Giant Sunburst' | | |  | | --- | | 8 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.24** |  |  | | --- | | **(27)** | | |  | | --- | | **Changeability of flower color** | |  |  |
|  | |  | | --- | | none or very weak | | |  | | --- | | Nelumbo 'Yijian Lian' | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | medium | | |  | | --- | | Nelumbo 'Yi Xian' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | strong | | |  | | --- | | Nelumbo 'Bian Lian' | | |  | | --- | | 3 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.25** |  |  | | --- | | **(28)** | | |  | | --- | | **Tepal number** | |  |  |
|  | |  | | --- | | very few | | |  | | --- | | Nelumbo 'Xianxian Yuzhi' | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | few | | |  | | --- | | Nelumbo nucifera 'Honghu Hong' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | medium | | |  | | --- | | Nelumbo nucifera 'Zhongshan Hongtai' | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | many | | |  | | --- | | Nelumbo 'Youyi Mudan' | | |  | | --- | | 4 [   ] | |
|  | |  | | --- | | very many | | |  | | --- | | Nelumbo nucifera 'Qian Ban' | | |  | | --- | | 5 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.26** |  |  | | --- | | **(29)** | | |  | | --- | | **The size of the largest tepal** | |  |  |
|  | |  | | --- | | very small | | |  | | --- | | Nelumbo 'Chuzi Luo' | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | small | | |  | | --- | |  | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | medium | | |  | | --- | | Nelumbo 'Yanzhi Wan' | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | large | | |  | | --- | | Nelumbo 'Yijian Lian' | | |  | | --- | | 4 [   ] | |
|  | |  | | --- | | very large | | |  | | --- | | Nelumbo nucifera 'Fen Bawang' | | |  | | --- | | 5 [   ] | |
|  |  |  |  |

|  | Characteristics | Example Varieties | Note |
| --- | --- | --- | --- |
|  |  |  |  |
| |  | | --- | | **5.27** |  |  | | --- | | **(30)** | | |  | | --- | | **Shape of the largest tepal** | |  |  |
|  | |  | | --- | | obovate | | |  | | --- | | Nelumbo 'Toshihiro’s Friendship' | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | long-obovate | | |  | | --- | |  | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | obovate-lanceolate | | |  | | --- | | Nelumbo 'Yijian Lian' | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | oblanceolate | | |  | | --- | |  | | |  | | --- | | 4 [   ] | |
|  | |  | | --- | | clawed | | |  | | --- | | Nelumbo 'Jiangnan Mingzhu' | | |  | | --- | | 5 [   ] | |
|  | |  | | --- | | long-oblanceolate | | |  | | --- | | Nelumbo 'Tan Kong' | | |  | | --- | | 6 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.28** |  |  | | --- | | **(31)** | | |  | | --- | | **Apex of the largest tepal** | |  |  |
|  | |  | | --- | | acute | | |  | | --- | |  | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | acuminate | | |  | | --- | | Nelumbo 'Xianxian Yuzhi' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | obtuse | | |  | | --- | |  | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | rounded | | |  | | --- | | Nelumbo 'Toshihiro’s Friendship' | | |  | | --- | | 4 [   ] | |
|  | |  | | --- | | retuse | | |  | | --- | | Nelumbo 'Jingshui Guanyin' | | |  | | --- | | 5 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.29** |  |  | | --- | | **(32)** | | |  | | --- | | **Color of the largest tepal** | |  |  |
|  | |  | | --- | | upper position | | |  | | --- | |  | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | middle position | | |  | | --- | |  | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | base position | | |  | | --- | |  | | |  | | --- | | 3 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.30** |  |  | | --- | | **(33)** | | |  | | --- | | **Distribution of  tepal color** | |  |  |
|  | |  | | --- | | even | | |  | | --- | | Nelumbo 'Yijian Lian' | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | gradually transitioned | | |  | | --- | | Nelumbo 'Toshihiro’s Friendship' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | alternatedly colored | | |  | | --- | | Nelumbo 'Jiangnan Mingzhu' | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | apex colorationed | | |  | | --- | |  | | |  | | --- | | 4 [   ] | |
|  | |  | | --- | | longitudinally white-stripped | | |  | | --- | | Nelumbo 'Cangqian Hong' | | |  | | --- | | 5 [   ] | |
|  | |  | | --- | | variegated | | |  | | --- | | Nelumbo nucifera 'Dan Sajin' | | |  | | --- | | 6 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.31** |  |  | | --- | | **(34)** | | |  | | --- | | **Abaxial veins of tepal** | |  |  |
|  | |  | | --- | | absent or very weak | | |  | | --- | | Nelumbo nucifera 'Zhongri Youyi' | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | medium | | |  | | --- | | Nelumbo nucifera 'Honghu Hong' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | strong | | |  | | --- | | Nelumbo nucifera 'Taikong 36' | | |  | | --- | | 3 [   ] | |
|  |  |  |  |

|  | Characteristics | Example Varieties | Note |
| --- | --- | --- | --- |
|  |  |  |  |
| |  | | --- | | **5.32** |  |  | | --- | | **(37)** | | |  | | --- | | **Color of stamen appendage** | |  |  |
|  | |  | | --- | | light-yellow | | |  | | --- | | Nelumbo lutea | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | white | | |  | | --- | | Nelumbo nucifera 'Baiyangdian Bai' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | white with purple-pink spotted apex | | |  | | --- | | Nelumbo 'Hong Mudan' | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | purple-pink | | |  | | --- | | Nelumbo 'Yijian Lian' | | |  | | --- | | 4 [   ] | |
|  | |  | | --- | | purple-red | | |  | | --- | | Nelumbo 'Gudu Jiangfang' | | |  | | --- | | 5 [   ] | |
|  | |  | | --- | | dark-brown | | |  | | --- | | Nelumbo nucifera 'Yuhuo Niepan' | | |  | | --- | | 6 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.33** |  |  | | --- | | **(38)** | | |  | | --- | | **Shape of stamen appendage** | |  |  |
|  | |  | | --- | | nearly globose | | |  | | --- | |  | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | elliptical | | |  | | --- | |  | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | clavate | | |  | | --- | | Nelumbo lutea | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | auriculiform | | |  | | --- | | Nelumbo 'Jiangnan Mingzhu' | | |  | | --- | | 4 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.34** |  |  | | --- | | **(40)** | | |  | | --- | | **Length of stamen appendaxage** | |  |  |
|  | |  | | --- | | very short | | |  | | --- | |  | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | short | | |  | | --- | | Nelumbo nucifera 'Fenhong Lingxiao' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | medium | | |  | | --- | | Nelumbo nucifera 'Honghu Hong' | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | long | | |  | | --- | | Nelumbo 'Ms. Perry D. Slocum' | | |  | | --- | | 4 [   ] | |
|  | |  | | --- | | very long | | |  | | --- | | Nelumbo lutea | | |  | | --- | | 5 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.35** |  |  | | --- | | **(41)** | | |  | | --- | | **Development status of carpel** | |  |  |
|  | |  | | --- | | normal | | |  | | --- | | Nelumbo nucifera 'Honghu Hong' | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | partially bubbled | | |  | | --- | | Nelumbo 'Lv Kongque' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | completely bubbled | | |  | | --- | | Nelumbo 'Qinhuai Yueye' | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | partially petaloid | | |  | | --- | | Nelumbo 'Huang Lingyang' | | |  | | --- | | 4 [   ] | |
|  | |  | | --- | | completely petaloid | | |  | | --- | | Nelumbo nucifera 'Zhizun Qianban' | | |  | | --- | | 5 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.36** |  |  | | --- | | **(42)** | | |  | | --- | | **Development status of receptacle** | |  |  |
|  | |  | | --- | | normal | | |  | | --- | | Nelumbo lutea | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | partially degenerated | | |  | | --- | | Nelumbo nucifera 'Hongtai Lian' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | absent | | |  | | --- | | Nelumbo nucifera 'Zhizun Qianban' | | |  | | --- | | 3 [   ] | |
|  |  |  |  |

|  | Characteristics | Example Varieties | Note |
| --- | --- | --- | --- |
|  |  |  |  |
| |  | | --- | | **5.37** |  |  | | --- | | **(44)** | | |  | | --- | | **Shape of mature seedpod** | |  |  |
|  | |  | | --- | | trumpet-shaped | | |  | | --- | | Nelumbo 'Hong Sijuan' | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | obconical | | |  | | --- | | Nelumbo nucifera 'Jin Furong 2' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | cup-shaped | | |  | | --- | | Nelumbo 'Jin Fuwa' | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | bowl-shaped | | |  | | --- | | Nelumbo 'Perry's Giant Sunburst' | | |  | | --- | | 4 [   ] | |
|  | |  | | --- | | oblate | | |  | | --- | | Nelumbo lutea | | |  | | --- | | 5 [   ] | |
|  | |  | | --- | | umbrella-shaped | | |  | | --- | | Nelumbo nucifera 'Thai Red' | | |  | | --- | | 6 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.38** |  |  | | --- | | **(45)** | | |  | | --- | | **Shape of top surface of mature seedpod** | |  |  |
|  | |  | | --- | | concave | | |  | | --- | | Nelumbo nucifera 'Jin Furong 2' | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | plate-like concave | | |  | | --- | | Nelumbo 'Sino-American Friendship' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | flat | | |  | | --- | | Nelumbo lutea 'Missouri' | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | slightly convex | | |  | | --- | | Nelumbo lutea 'Maryland' | | |  | | --- | | 4 [   ] | |
|  | |  | | --- | | convex | | |  | | --- | |  | | |  | | --- | | 5 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.39** |  |  | | --- | | **(48)** | | |  | | --- | | **Fruit-setting rate** | |  |  |
|  | |  | | --- | | absent | | |  | | --- | | Nelumbo nucifera 'Zhizun Qianban' | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | very low | | |  | | --- | | Nelumbo 'Perry’s Giant Sunburst' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | low | | |  | | --- | | Nelumbo 'Moling Qiuse' | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | medium | | |  | | --- | | Nelumbo 'Jiuhua Haoyue' | | |  | | --- | | 4 [   ] | |
|  | |  | | --- | | high | | |  | | --- | | Nelumbo nucifera 'Jin Furong 2' | | |  | | --- | | 5 [   ] | |
|  | |  | | --- | | very high | | |  | | --- | | Nelumbo nucifera 'Honghu Hong' | | |  | | --- | | 6 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.40** |  |  | | --- | | **(49)** | | |  | | --- | | **Position of fruit comparing to seedpod** | |  |  |
|  | |  | | --- | | low or nearly low | | |  | | --- | | Nelumbo lutea | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | same | | |  | | --- | | Nelumbo 'China-Japan Friendship' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | weakly above | | |  | | --- | | Nelumbo 'Hongyun Lai' | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | strong above | | |  | | --- | | Nelumbo 'Zhongshan Honglan' | | |  | | --- | | 4 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.41** |  |  | | --- | | **(50)** | | |  | | --- | | **Fruit shape** | |  |  |
|  | |  | | --- | | narrow obovate | | |  | | --- | |  | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | narrow ovate | | |  | | --- | |  | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | narrow elliptic | | |  | | --- | |  | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | globose | | |  | | --- | | Nelumbo 'Jiuhua Haoyue' | | |  | | --- | | 4 [   ] | |
|  | |  | | --- | | ovate | | |  | | --- | |  | | |  | | --- | | 5 [   ] | |
|  | |  | | --- | | obovate | | |  | | --- | |  | | |  | | --- | | 6 [   ] | |
|  | |  | | --- | | elliptic | | |  | | --- | | Nelumbo nucifera 'Honghu Hong' | | |  | | --- | | 7 [   ] | |
|  |  |  |  |

|  | Characteristics | Example Varieties | Note |
| --- | --- | --- | --- |
|  |  |  |  |
| |  | | --- | | **5.42** |  |  | | --- | | **(52)** | | |  | | --- | | **Size of dried mature fruit** | |  |  |
|  | |  | | --- | | very small | | |  | | --- | | Nelumbo 'Chuzi Luo' | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | small | | |  | | --- | | Nelumbo lutea | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | medium | | |  | | --- | | Nelumbo nucifera 'Honghu Hong' | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | large | | |  | | --- | | Nelumbo 'Jiuhua Haoyue' | | |  | | --- | | 4 [   ] | |
|  | |  | | --- | | very large | | |  | | --- | | Nelumbo nucifera 'Jianxuan 17' | | |  | | --- | | 5 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.43** |  |  | | --- | | **(54)** | | |  | | --- | | **Color of dried mature fruit** | |  |  |
|  | |  | | --- | | brown | | |  | | --- | | Nelumbo lutea | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | greyed-brown | | |  | | --- | | Nelumbo 'Ms. Perry D. Slocum' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | gray | | |  | | --- | | Nelumbo nucifera 'Honghu Hong' | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | black or dark brown | | |  | | --- | | Nelumbo 'Jiuhua Haoyue' | | |  | | --- | | 4 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.44** |  |  | | --- | | **(56)** | | |  | | --- | | **Glossiness of dried fruit** | |  |  |
|  | |  | | --- | | absent | | |  | | --- | | Nelumbo nucifera 'Yingquan Xike' | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | weak | | |  | | --- | | Nelumbo 'Jiuhua Haoyue' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | strong | | |  | | --- | |  | | |  | | --- | | 3 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.45** |  |  | | --- | | **(57)** | | |  | | --- | | **Longitudinal stripes on fruit** | |  |  |
|  | |  | | --- | | absent | | |  | | --- | | Nelumbo nucifera 'Honghu Hong' | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | weak | | |  | | --- | | Nelumbo 'Jiuhua Haoyue' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | strong | | |  | | --- | | Nelumbo 'Perry’s Giant Sunburst' | | |  | | --- | | 3 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.46** |  |  | | --- | | **(59)** | | |  | | --- | | **Internode number of main expanded rhizome** | |  |  |
|  | |  | | --- | | absent or nearly so | | |  | | --- | | Nelumbo nucifera 'Fenhong Lingxiao' | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | few | | |  | | --- | | Nelumbo lutea | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | medium | | |  | | --- | |  | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | many | | |  | | --- | | Nelumbo nucifera 'Elian 1' | | |  | | --- | | 4 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.47** |  |  | | --- | | **(61)** | | |  | | --- | | **Color of expanded rhizome** | |  |  |
|  | |  | | --- | | white | | |  | | --- | | Nelumbo nucifera 'Elian 1' | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | yellow-brown | | |  | | --- | | Nelumbo lutea | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | yellow-red | | |  | | --- | |  | | |  | | --- | | 3 [   ] | |
|  |  |  |  |

|  | Characteristics | Example Varieties | Note |
| --- | --- | --- | --- |
|  |  |  |  |
| |  | | --- | | **5.48** |  |  | | --- | | **(64)** | | |  | | --- | | **Number of rhizome propagule** | |  |  |
|  | |  | | --- | | absent to very few | | |  | | --- | | Nelumbo nucifera 'Fenhong Lingxiao' | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | few | | |  | | --- | | Nelumbo nucifera 'Zhongshan Hongtai' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | medium | | |  | | --- | | Nelumbo lutea | | |  | | --- | | 3 [   ] | |
|  | |  | | --- | | many | | |  | | --- | |  |   ffff | |  | | --- | | 4 [   ] | |
|  | |  | | --- | | very many | | |  | | --- | |  | | |  | | --- | | 5 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.49** |  |  | | --- | | **(65)** | | |  | | --- | | **Branch number of expanded rhizome (for rhizome lotus only)** | |  |  |
|  | |  | | --- | | few | | |  | | --- | |  | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | medium | | |  | | --- | |  | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | many | | |  | | --- | |  | | |  | | --- | | 3 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.50** |  |  | | --- | | **(69)** | | |  | | --- | | **Texture of expanded rhizome (for rhizome lotus only)** | |  |  |
|  | |  | | --- | | crispy | | |  | | --- | | Nelumbo nucifera 'Elian 1' | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | intermediate | | |  | | --- | | Nelumbo nucifera 'Elian 4' | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | starchy | | |  | | --- | | Nelumbo nucifera 'Elian 5' | | |  | | --- | | 3 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.51** |  |  | | --- | | **(70)** | | |  | | --- | | **Tolerance to disease: leaf rot** | |  |  |
|  | |  | | --- | | low | | |  | | --- | |  | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | medium | | |  | | --- | |  | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | high | | |  | | --- | |  | | |  | | --- | | 3 [   ] | |
|  |  |  |  |
|  |  |  |  |
| |  | | --- | | **5.52** |  |  | | --- | | **(71)** | | |  | | --- | | **Tolerance to disease: rhizome rot** | |  |  |
|  | |  | | --- | | absent | | |  | | --- | |  | | |  | | --- | | 1 [   ] | |
|  | |  | | --- | | medium | | |  | | --- | |  | | |  | | --- | | 2 [   ] | |
|  | |  | | --- | | strong | | |  | | --- | |  | | |  | | --- | | 3 [   ] | |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| |  |  |  | | --- | --- | --- | | 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* | |  | | --- | |  | | |  | | --- | |  | | |  | | --- | |  | | |  |  |  |  | |  |  |  |  | |  |  |  |  | | | |  | 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 | | | | |  |  |  |  |  | |

|  |  |  |  |
| --- | --- | --- | --- |
| |  |  |  | | --- | --- | --- | | 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”. | | | |  | |  |  | | | |  | | |  | |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | 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] |