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Associated Document
to the
General Introduction to the Examination
of Distinctness, Uniformity and Stability and the
Development of Harmonized Descriptions of New Varieties of Plants (document TG/1/3)

DOCUMENT TGP/14

**“GLOSSARY OF TECHNICAL, BOTANICAL AND STATISTICAL TERMS
USED IN UPOV DOCUMENTS”**

**Section TGP/14.2.1: Botanical Terms: Plant Shapes
(including TG/14.2.2: Botanical Terms: Hair Types)**

Document prepared by an expert from South Africa

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GENERAL COMMENTS FOR TERMS SUBGROUP

EB: In selecting terms to be included in the document, I found many terms which were somehow related to 'shape' and decided to rather include them than to leave them out. This will enable us to evaluate each of these terms and to delete any we don't require. I've included terms on texture (which also relates to hairiness), pattern (which relates to shape and color), arrangement and branching (which can also be considered as shapes), etc. In this process I worked through a number of glossaries and selected what I thought useful for UPOV purposes. I also attempted to formulate the definitions in such a way, as far as possible, that their meanings could be understood precisely for plant breeders' rights purposes, especially in comparison to similar terms, and I've included cross-references to similar terms where applicable. None of the definitions nor drawings have been taken directly from any single glossary (so we won't have copyright problems), although several glossaries were consulted and compared in the attempt to extract, as far as possible, the most discriminating features for each definition.

EB: Advice from the TWF was that the drawings should be done in a general way to cover all cases and not be specific e.g. for leaves. This was done as far as possible. The longitudinal axis and position of attachment were indicated, where applicable, for explanation purposes. (These are not necessarily the main vein and petiole of a leaf.) In some cases, however, it was easier to explain a definition by means of a specific example (one could add 'e.g.' to the drawing) and in cases where a shape was restricted to a certain plant part, that plant part was drawn. It is always important to interpret the drawing together with the definition.

INTRODUCTION TO TGP/14 SECTION 2: BOTANICAL TERMS

The purpose of this document is:

(a) to provide guidance on the development of characteristics related to plant shapes, plant structures and color;

(b) to provide standard illustrations of plant shapes, plant structures and color patterns which may be useful for inclusion in Test Guidelines, whilst noting that illustrations for specific characteristics can be found in the relevant Test Guidelines and noting that searches for relevant individual characteristics can be made through TGP/7 “Collection of Approved Characteristics”; and

(c) to provide definitions of botanical terms with an indication of whether those terms are generally used in Test Guidelines, or whether alternative terms might be more appropriate for use in Test Guidelines.

SECTION A: PLANE / TWO-DIMENSIONAL SHAPES

1. FULL PLANT PARTS

1.1 Components of Shape

1.1.1 Document TG/1/3 “General Introduction to the Examination of Distinctness, Uniformity and Stability and the Development of Harmonized Descriptions of New Varieties of Plants” (General Introduction) explains that shape can be considered in terms of a pseudo-qualitative characteristic:

“4.4.3 Pseudo-Qualitative Characteristics”

In the case of “pseudo-qualitative characteristics,” the range of expression is at least partly continuous, but varies in more than one dimension (e.g. shape: ovate (1), elliptic (2), circular (3), obovate (4)) and cannot be adequately described by just defining two ends of a linear range. In a similar way to qualitative (discontinuous) characteristics – hence the term “pseudo-qualitative” – each individual state of expression needs to be identified to adequately describe the range of the characteristic.”

However, document TGP/9 “Examining Distinctness” explains that the use of pseudo-qualitative characteristics for the assessment of distinctness on the basis of notes has particular limitations (see document TGP/9/1 Draft 6, Section 5.2.3):

“*Pseudo-qualitative (PQ) characteristics*”

[...]

“5.2.3.6 [...] However, an important additional factor with pseudo-qualitative characteristics is that, whilst a part of the range is continuous, there is not an even distribution across the scale and the range varies in more than one dimension (e.g. shape: ovate (1), elliptic (2), circular (3), obovate (4): there is a variation in the length/width ratio and in the position of the widest point). This means that it is difficult to define a general rule on the difference in Notes to establish distinctness within a characteristic.

1.1.2 Therefore, for the purposes of DUS examination, it can be useful to develop quantitative or qualitative characteristics related to shape, rather than considering shape as a single pseudo-qualitative characteristic. In that respect, it is possible to define a plane shape using the following components:

- (a) Ratio length/width
(used as a generic term in this document to cover also ratio: length/thickness; length/diameter; width/thickness, for profiles of 3 dimensional shapes);
- (b) Position of broadest part;
- (c) Shape of base (see Section 2 Base);
- (d) Shape of apex (see Section 3 Apex);
- (c) Lateral outline.

1.1.3 The shape of base and shape of apex are considered in Sections 2 and 3 respectively. The chart below (Chart for Simple Symmetric Plane Shapes) illustrates the other three components for simple symmetric plane shapes as follows:



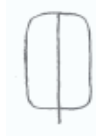


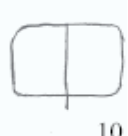


(a) Ratio length/width: the ratio length/width varies from left to right within a row [but is approximately the same within a column];





















(b) Position of broadest part: the position of the broadest part varies from row to row [but is approximately the same in each row];



































(c) Lateral outline: the shape of the lateral sides varies from set to set [but is approximately the same within a set].

Chart for Simple Symmetric Plane Shapes

>6:1 very narrow 6:1 to 3:1 narrow 2:1 to 1.5:1 medium 1.2:1 broad 1:1 very broad 1:1.2 shallow 1:1.5 to 1:2 very shallow 1:3 to 1:6

Parallel set		>6:1 very narrow	6:1 to 3:1 narrow	2:1 to 1.5:1 medium	1.2:1 broad	1:1 very broad	1:1.2 shallow	1:1.5 to 1:2 very shallow	1:3 to 1:6
oblong									
						9	10	11	12

Rounded set		>6:1 very narrow	6:1 to 3:1 narrow	2:1 to 1.5:1 medium	1.2:1 broad	1:1 very broad	1:1.2 shallow	1:1.5 to 1:2 very shallow	1:3 to 1:6
ovate									
elliptic									
						5	6	7	8
obovate									

Angular set		>6:1 very narrow	6:1 to 3:1 narrow	2:1 to 1.5:1 medium	1.2:1 broad	1:1 very broad	1:1.2 shallow	1:1.5 to 1:2 very shallow	1:3 to 1:6
triangular									
					1	2	3		
trullate									
rhombic									
obtrullate									
obtriangular									
					13	14	15		

- | | | | |
|---|--------------------|----|--------------------------|
| 1 | (narrow deltate) | 9 | square |
| 2 | (medium deltate) | 10 | transverse broad oblong |
| 3 | (broad deltate) | 11 | transverse medium oblong |
| 4 | (quadrate rhombic) | 12 | transverse narrow oblong |
| 5 | circular | 13 | (narrow obdeltate) |
| 6 | narrow oblate | 14 | (medium obdeltate) |
| 7 | medium oblate | 15 | (broad obdeltate) |
| 8 | broad oblate | | |

Notes

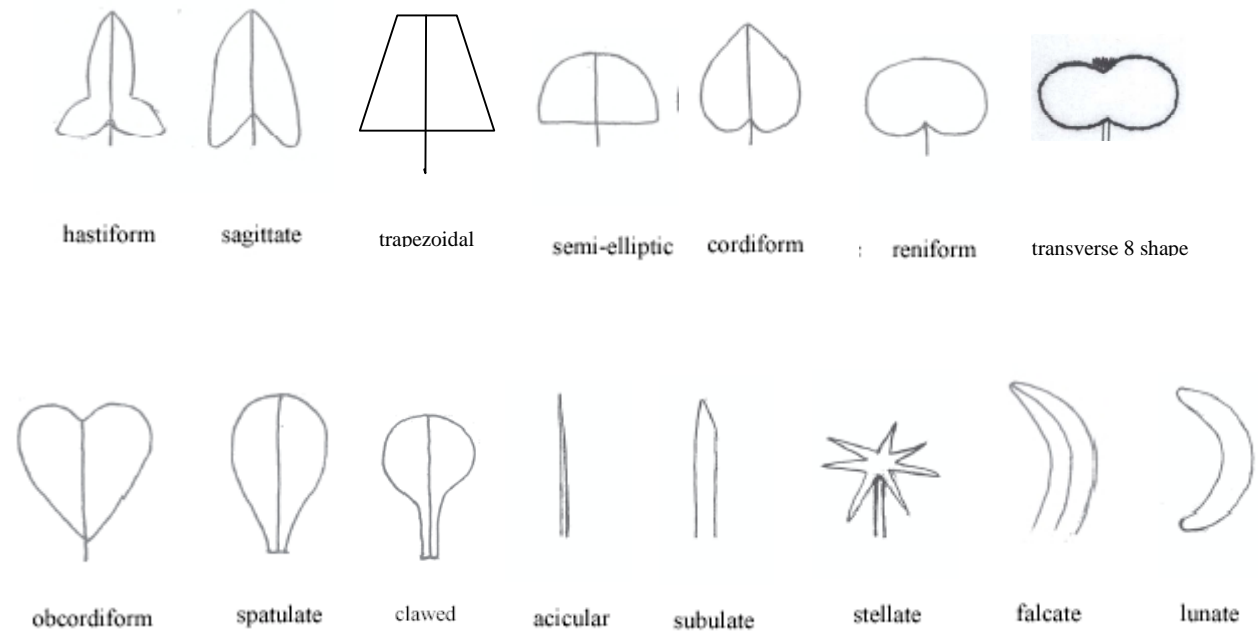
Parallel set: the lateral sides are more or less straight over most of their length and more or less parallel to the main axis (The leaves of most of the monocotyledons belong in this group.)

Rounded set: the lateral sides are rounded in a single, sweeping curve, without sudden changes of direction (The leaves of most of the dicotyledons belong in this group.)

Angular set: the lateral sides are somewhat bent at a certain point, resulting in a change of direction, combined with a somewhat straightening towards the base and apex from that point and more or less forming two triangles joined at the longitudinal axis.

1.1.4 The chart below (Chart for Non-Simple-Symmetric Plane Shapes) illustrates the most common non-simple-symmetric plane shapes:

Chart for Non-Simple-Symmetric Plane Shapes



1.2 Developing Plane-Shape-Related Characteristics

The following approach can be followed for the development of plane-shape-related characteristics:

1.2.1 *Deciding which components to describe*

1.2.1.1 In general, it can be most useful to consider the variation in shape between varieties in the variety collection using the following steps:

- Step 1: Ratio length/width;
- Step 2: Position of broadest part;
- Step 3: Shape of base (see Section 2 Base);
- Step 4: Shape of apex (see Section 3 Apex);
- Step 5: Lateral outline.

Thus, if all the variation in shape between varieties in the variety collection is accounted for by the ratio length/width (e.g. narrow elliptic, medium elliptic or broad elliptic), it is only necessary to have a characteristic “ratio length/width”. Similarly, if all the variation in shape between varieties in the variety collection is accounted for by ratio length/width and position of broadest part (e.g. all varieties fall within the rounded set in the Chart for Simple Symmetric Plane Shapes) it is only necessary to have the characteristics “ratio length/width” and “position of broadest part”. It is only necessary to go to subsequent steps when the variation in shape between varieties in the variety collection has not been accounted for by the preceding steps/components.

1.2.1.2 In general, it is appropriate to present the characteristics in the order of the steps 1 to 5. However, a particular exception to this approach should be made where a qualitative characteristic is identified. Qualitative characteristics should be presented as the first of the series of shape-related characteristics because of the value of such characteristics for assessing distinctness and because the examination of subsequent shape-related characteristics may not be relevant for varieties with certain states of expression for the qualitative characteristic. For example, “Only varieties with Leaf lateral outline: ovate: Leaf: ratio length/width” might be appropriate if the preceding characteristic for “Leaf: lateral outline” was qualitative, e.g. ovate (1); hastiform (2)) and there was no useful variation in ratio length/width for hastiform varieties.

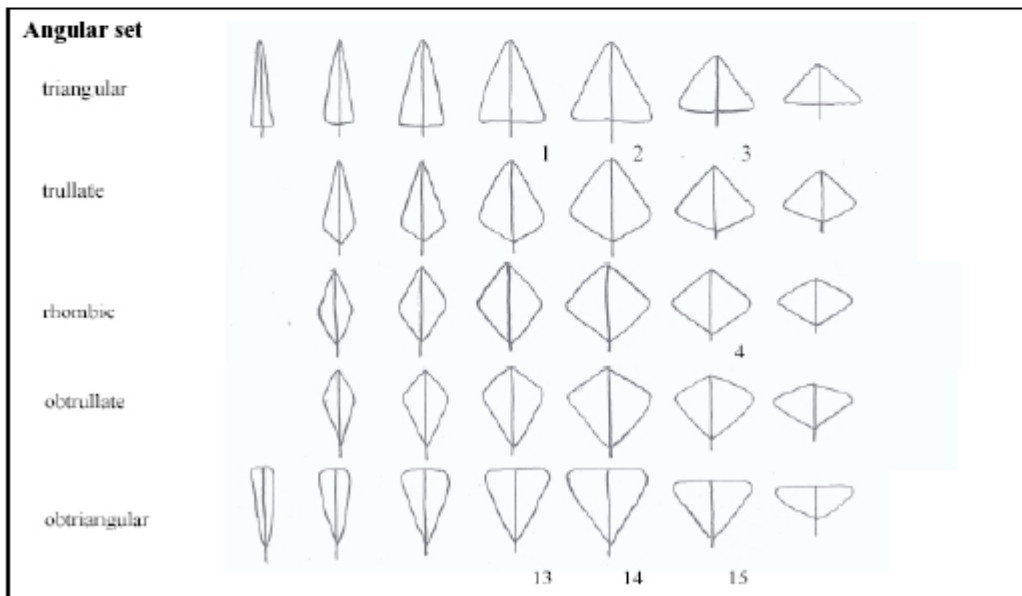
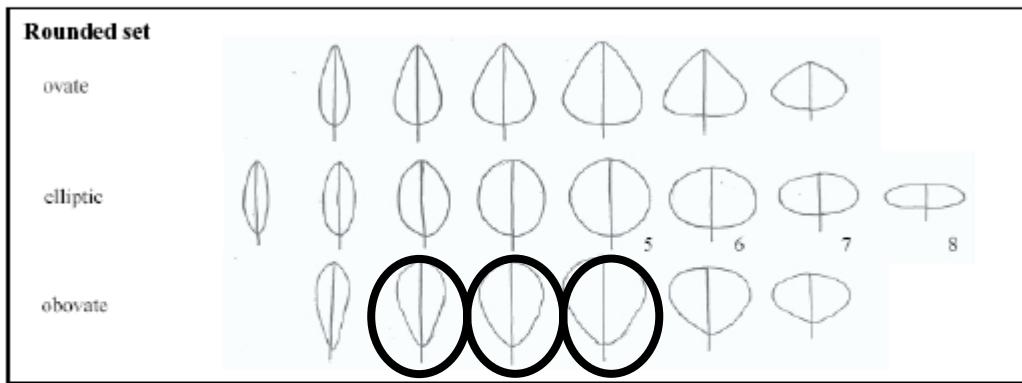
1.2.1.3 The following illustrations provide examples of this approach:

Example 1 (a circle indicates the shape of one or more varieties in the variety collection)

The only variation between varieties is found in the ratio length/width. Therefore, the only characteristic required for the Test Guidelines would be the following:

Plant [part]: ratio length/width (small to large) (QN)

>6:1	6:1 to 3:1	2:1 to 1.5:1	1.2:1	1:1	1:1.2	1:1.5 to 1:2	1:3 to 1:6
very narrow	narrow	medium	broad	very broad	shallow	very shallow	

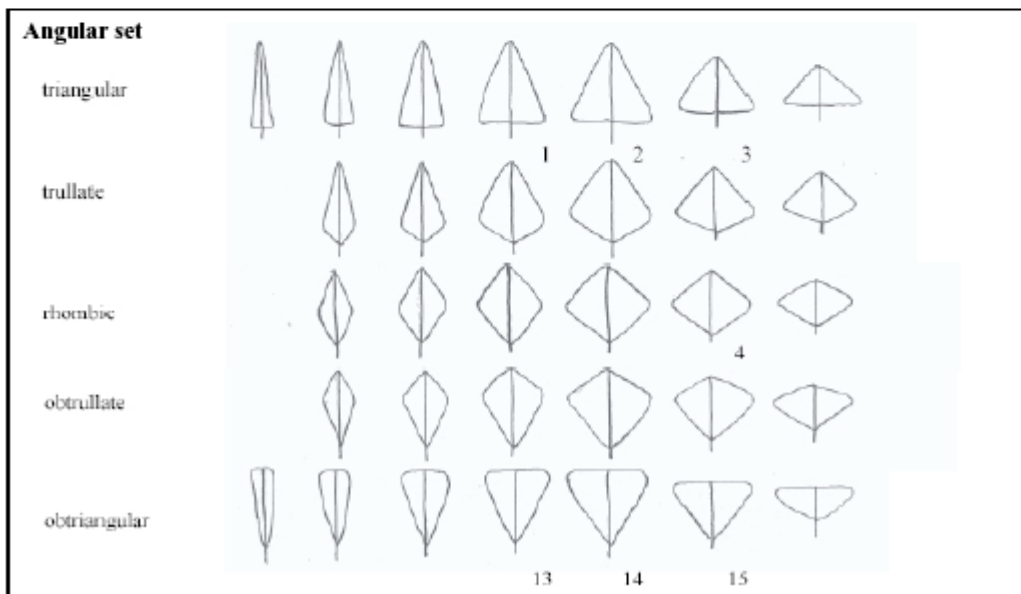
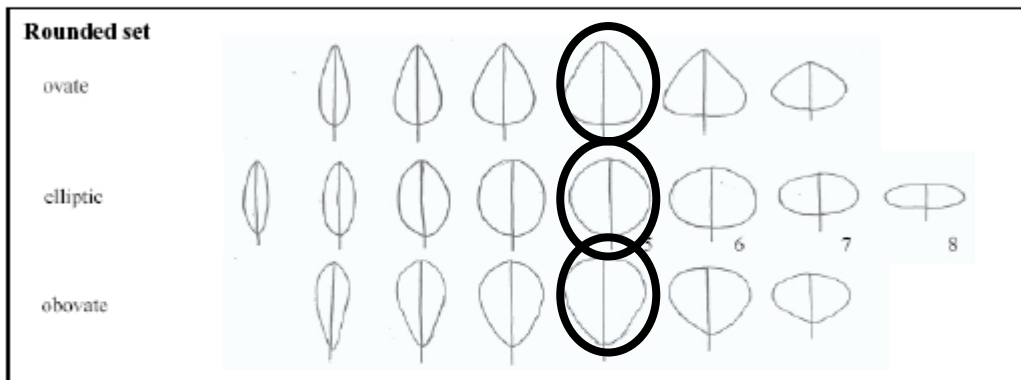


Example 2 (a circle indicates the shape of one or more varieties in the variety collection)

The only variation between varieties is found in the position of the broadest part. Therefore, the only characteristic required for the Test Guidelines would be the following:

Plant [part]: position of broadest part (towards base to towards apex) (QN)

>6:1	6:1 to 3:1	2:1 to 1.5:1	1.2:1	1:1	1:1.2	1:1.5 to 1:2	1:3 to 1:6
very narrow	narrow	medium	broad	very broad	shallow	very shallow	



Example 3 (a circle indicates the shape of one or more varieties in the variety collection)

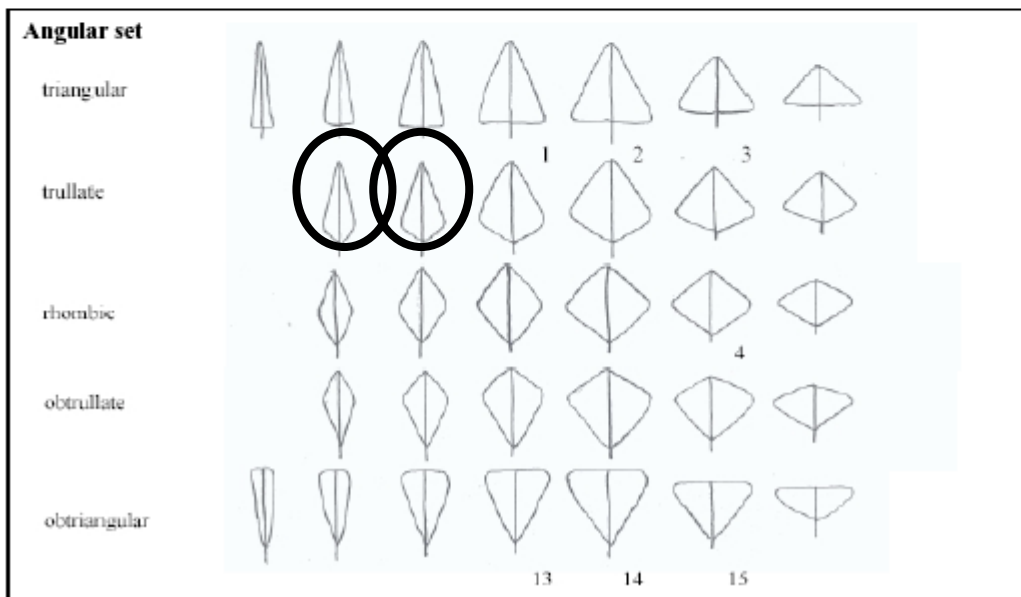
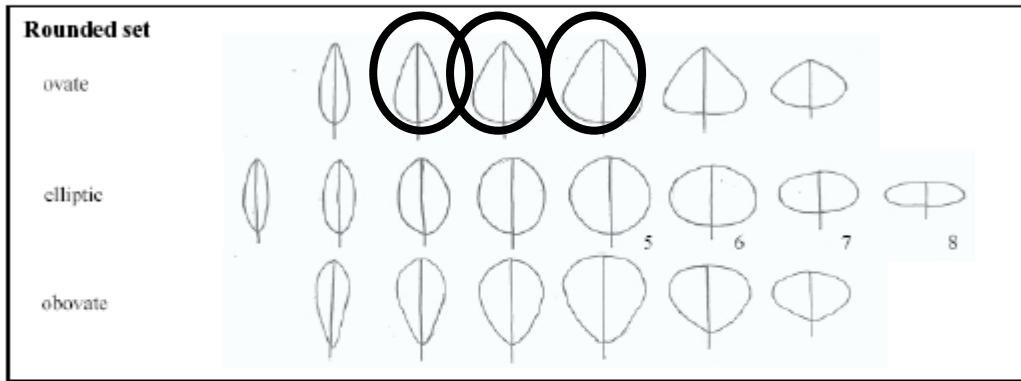
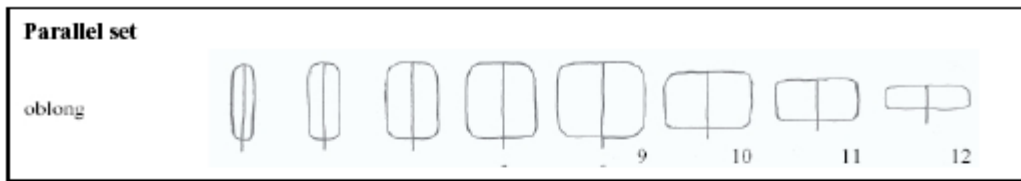
There is variation between varieties in the ratio length/width, the shape of the base and the lateral outline. Assuming that the lateral outline varies between ovate and trullate in a quantitative way, the characteristics required for the Test Guidelines might be the following:

Plant [part]: ratio length/width (small to large) (QN)

Plant [part]: shape of base (acute, obtuse, rounded) (PQ)

Plant [part]: lateral outline (clearly rounded to clearly triangular) (QN)

>6:1	6:1 to 3:1	2:1 to 1.5:1	1.2:1	1:1	1:1.2	1:1.5 to 1:2	1:3 to 1:6
very narrow	narrow	medium	broad	very broad	shallow	very shallow	



Example 4 (a circle indicates the shape of one or more varieties in the variety collection)

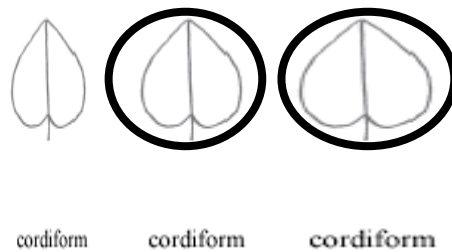
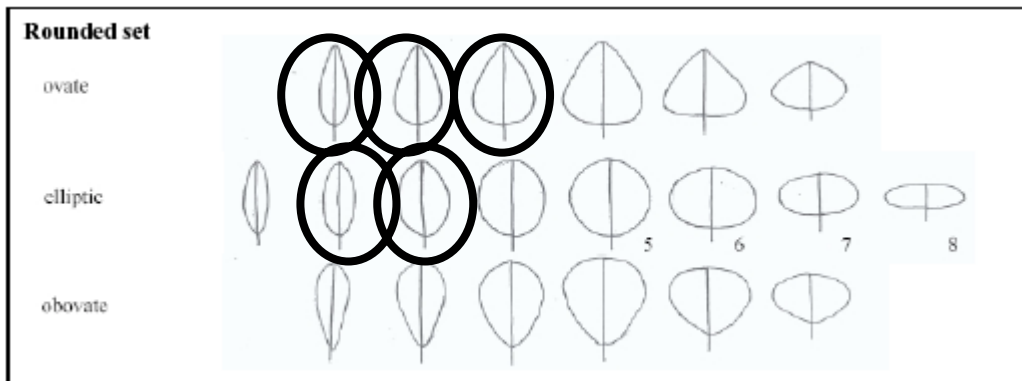
there is variation between varieties in the ratio length/width, the position of the broadest part (within ovate/elliptic), the shape of base and shape of apex. Assuming that there is a discontinuous step between the lateral outline shapes, i.e. it is a qualitative characteristic, the characteristics required for the Test Guidelines might be the following:

Plant [part]: lateral outline (cordiform (Note 1) / ovate or elliptic (Note 2)) (QL)

Plant [part]: ratio length/width (small to large) (QN)

Plant [part]: Only ovate or elliptic varieties: position of broadest part (clearly towards base to middle) (QN)

Plant [part]: shape of apex (acute, obtuse, rounded) (PQ)



1.2.2 *Symmetry*

Lateral symmetry around the main axis may be handled in different ways. For example:

(a) lateral symmetry of plant part shapes may be considered within a particular shape, e.g. falcate and lunate are laterally asymmetric (see Section 1.1.4); or

(b) it may be appropriate to introduce symmetry as a separate characteristic. In such cases, whether the characteristic for symmetry is a qualitative (symmetric / asymmetric), a quantitative (e.g. symmetric or weakly asymmetric (1), moderately asymmetric (2), strongly asymmetric (3)) or a pseudo-qualitative characteristic needs to be considered on a case-by-case basis.

1.2.3 *Types of expression and states / notes*

The type of expression (i.e. qualitative, quantitative or pseudo-qualitative) of the characteristics describing components of shape needs to be considered separately for each situation. In particular, as explained in document TGP/7 “Development of Test Guidelines”, Annex 4, paragraph 1 “it should be remembered that what may appear to be very similar characteristics in different types of plant, or different organs of the same plant, may in fact be under different types of genetic control.” Thus, for example, in one type of plant, or one organ, the characteristic “position of broadest part” might be a qualitative characteristic but in another type of plant, or organ, it might be a quantitative characteristic. Therefore, the following notes are only intended to indicate the most normal situations:

(a) Ratio length/width: normally a quantitative characteristic

(b) Position of broadest part: within the same lateral outline set (e.g. rounded), this is normally a quantitative characteristic. However, where varieties cover more than one lateral outline set (e.g. angular and hastiform), the position of the broadest part is less likely to be a quantitative characteristic and is more likely to be pseudo-qualitative or qualitative;

(c) Shape of base (see Section 2 Base);

(d) Shape of apex (see Section 3 Apex);

(e) Lateral outline: there is no “normal” situation for the lateral outline, which can be a qualitative, quantitative or pseudo-qualitative characteristic

1.2.4 *Defining the characteristic*

In the same way as for any characteristic, each characteristic should be precisely defined. With respect to shape-related characteristics it is particularly important to clarify which part of the plant is to be observed. Some illustrative examples are as follows:

Leaf: ratio length/width

- to specify if any tip (e.g. aristate tip) should be included or excluded from the observation of leaf length
- to specify if the reference point for the “base” should be the point of attachment or the lowest part of the plant part (e.g. for a cordiform leaf);
- to specify how to observe length/width in the case of laterally asymmetric shapes

Leaf: position of broadest part

- to specify if any tip (e.g. aristate tip) should be included or excluded from the observation of the position of the broadest part
- to specify if the reference point for the “base” should be the point of attachment or the lowest part of the plant part (e.g. for a cordiform leaf);
- to specify how to observe position of the broadest part in the case of laterally asymmetric shapes

1.2.5 Technical Questionnaire Characteristics

Where the normal requirements for a Technical Questionnaire characteristic are met (see document TGP/7 Annex 3 GN 13.3.2), characteristics developed according to the guidance set out in Sections 1.2.1 to 1.2.4 are suitable for inclusion in the Technical Questionnaire. However, document TGP/7: Annex 3 GN 13.3.3 clarifies that “[w]here necessary, characteristics in the Test Guidelines can be simplified (e.g. color groups can be created rather than requesting an RHS Colour Chart reference) for inclusion in the Technical Questionnaire (TQ), if this would be of assistance for the breeder completing the TQ. Furthermore, the characteristics contained in the Test Guidelines can be formulated in a different way, if breeders would then be able to describe them more precisely and the information would be useful for performing the test.”. Thus, in some cases, it may be appropriate to provide breeders with an opportunity to describe shape in a way which is more widely recognized. In such cases, the Technical Questionnaire may invite breeders to indicate shape on the following basis:

(a) Simple Symmetric Plane Shapes: to indicate the shape according to the Chart for Simple Symmetric Plane Shapes (see Section 1.1.3), e.g. narrow oblong

(b) Non-Simple-Symmetric Plane Shapes: to indicate the shape according to the non-simple-symmetric plane shapes identified in Section 1.1.4, with an indication of relative width where useful, e.g. narrow cordiform

1.3 Definitions

1.3.1 Simple Symmetric Plane Shapes

1.3.1.1 *Circular*

Round; length/width ratio as well as dimension in all directions 1:1.
The term 'circular' is preferable to 'round' and 'orbicular' for UPOV use.
Forms part of the 'elliptic' series.
Also applies to arrangement.

1.3.1.2 *Deltate*

More or less equilaterally triangular; narrowing towards the apex, that is away from the point of attachment. Length/width ratio of the basic shape: 1:1, same as 'very broad triangular'.
Forms part of the 'triangular' series.
Compare 'deltoid' which applies to three-dimensional shape, also compare 'obtriangular' and 'obdeltate' which narrow towards the base.

1.3.1.3 *Elliptic*

Ellipse-shaped; broadest at the middle, the margins tapering convexly and evenly to either end. Length/width ratio of the basic shape: 2:1 to 1,5:1.
The elliptic series also includes 'circular' and 'oblate', differing only in their length/width ratios.

1.3.1.4 *Lanceolate*

Lance-shaped; narrow ovate, broadest towards the base, that is towards the point of attachment. The apex may have a sharp or blunt tip. Length/width ratio 6:1 to 3:1, same as 'narrow ovate'.
Forms part of the 'ovate' series.

1.3.1.5 *Ligulate (Lorate)*

Strap-shaped; long and narrow, with the lateral margins parallel. Length/width ratio 6:1 to 3:1, same as 'narrow oblong'.
Forms part of the 'oblong' series.
Applies to two-dimensional shape.

1.3.1.6 *Linear*

Long and narrow, with the lateral margins parallel. Length/width ratio more than 6:1, same as 'very narrow oblong'.
Forms part of the 'oblong' series.
Applies to two- and three-dimensional shape and to arrangement.

1.3.1.7 *Lorate*

See 'ligulate'.

1.3.1.8 *Obdeltate*

Inversely deltate; more or less equilaterally obtriangular, narrowing towards the base, that is towards the point of attachment. Length/width ratio of the basic shape: 1:1, same as 'very broad obtriangular'.
Forms part of the 'triangular' series.

Compare 'obdeltoid' which applies to three-dimensional shape and 'deltate' which narrows towards the apex.

1.3.1.9 Oblanceolate

Inversely lanceolate; broadest towards the apex, that is furthest from the point of attachment. Length/width ratio 6:1 to 3:1, same as 'narrow obovate'.
Forms part of the 'obovate' series.

1.3.1.10 Oblate

Transverse elliptic; ellipse shaped but shorter than broad, broadest at the middle, with margins tapering convexly and evenly to the base and apex, the longest dimension orientated transversely. Length/width ratio of the basic shape: 1:1,5 to 1:2.
Forms part of the 'elliptic' series.

1.3.1.11 Oblong

Approximately rectangular, with more or less parallel sides terminating obtusely at both ends; four-sided with opposite sides parallel and all angles approximately 90 degrees. Length/width ratio of the basic shape: 2:1 to 1,5.
The 'oblong' series also includes 'square' and 'linear', differing only in their length/width ratios, 'square' having the same dimension in both its length and its width.

1.3.1.12 Obovate

Inversely ovate; broadest above the middle, that is towards the apex. Length/width ratio of the basic shape: 2:1 to 1,5:1.
Compare the 'ovate' series which is broadest towards the base and 'obovoid' which applies to three-dimensional shape.

1.3.1.13 Obtriangular

Inversely triangular; with three more or less straight sides, broadest at the apex and narrowing towards the point of attachment. Length/width ratio of the basic shape: 2:1 to 1,5:1
The 'obtriangular' series also includes 'obdeltate', with a more specific length/width ratio.
Compare 'triangular' which is broadest at the base and 'obconic' which applies to three-dimensional shape.

1.3.1.14 Obtrullate

Inversely trullate; broadest above the middle and tapering towards the basal and apical ends, the lateral margins more or less straight but angled at the position of greatest width.
Length/width ratio of the basic shape: 2:1 to 1,5:1.
Compare the 'obovate' series which is less angular, and the 'rhombic' series which is broadest at the middle.

1.3.1.15 Orbicular

The term 'circular', of which 'orbicular' is a synonym, is preferred for UPOV use.

1.3.1.16 Ovate

Chicken-egg-shaped; broadest below the middle, that is towards the point of attachment, the margin entirely convex, although the apex may be either rounded or pointed. Length/width ratio of the basic shape: 2:1 to 1,5:1.

Compare the 'obovate' series which is broadest towards the apex and 'ovoid' which applies to three-dimensional shape.

1.3.1.17 Quadrangular

Rectangular; four-sided with opposite sides parallel and all angles approximately 90 degrees. The term 'oblong' is preferred for UPOV use.

1.3.1.18 Rectangular

Quadrangular; four-sided with opposite sides parallel and all angles approximately 90 degrees. The term 'oblong' is preferred for UPOV use.

1.3.1.19 Rhombic

Diamond-shaped; broadening towards the middle and tapering with more or less straight margins to the basal and apical end. Length/width ratio of the basic shape: 2:1 to 1,5:1. Compare 'trullate' which is broadest below the middle and 'obtrullate' which is broadest above the middle.

1.3.1.20 Square

Equilaterally quadrangular or rectangular; with the length and the width having the same dimensions. Length/width ratio 1:1. Forms part of the 'oblong' series.

1.3.1.21 Triangular

With three more or less straight sides, broadening towards the base, that is towards the point of attachment. Length/width ratio of the basic shape: 2:1 to 1,5:1. The triangular series also includes 'deltate', with a more specific length/width ratio. Compare 'obtriangular' which is broadest towards the apex and 'conic' which applies to three-dimensional shape.

1.3.1.22 Trullate

Broadest below the middle and tapering towards the basal and apical end, the lateral margins more or less straight but angled at the position of greatest width. Length/width ratio of the basic shape: 2:1 to 1,5:1. Compare the 'ovate' series which is less angular, and the 'rhombic' series which is broadest at the middle.

1.3.2 Non-Simple-Symmetric Plane Shapes

1.3.2.1 Acicular

Needle-shaped; rigid, long and narrow and tapering to a fine point. Round or grooved in transverse section, e.g. conifers. Applies primarily to three-dimensional shape but may also be used for the outline.

1.3.2.2 Clawed (Unguiculate)

Abruptly contracted to a narrow, petiole-like basal portion. Applies to petals and sepals. Compare 'spatulate' which narrows more gradually towards the base.

1.3.2.3 *Cordiform*

Heart-shaped; with two equal, rounded, basal lobes divided by a deep sinus, and tapering fairly straightly to the apex.

Compare 'cordate' which applies to the base and 'obcordate' which is broadest towards the apex.

1.3.2.4 *Falcate*

Sickle-shaped; strongly curved sideways.

1.3.2.5 *Hastiform*

Arrowhead-shaped; gradually enlarged basally from an acute apex, but with two widely divergent basal lobes, directed outwards.

Compare 'hastate' which applies to the base and 'sagittate' of which the lobes are directed downwards.

1.3.2.6 *Lunate*

Crescent-shaped with more or less acute ends.

Compare 'reniform'.

1.3.2.7 *Obcordiform*

Inversely heart-shaped; with two equal, rounded, apical lobes divided by a deep sinus, and tapering fairly straightly to the base.

Compare 'obcordate' which applies to the apex and 'cordiform' which is broadest towards the base.

1.3.2.8 *Peltate*

Shield-shaped; applies to a stalked plant part, normally circular in shape, with the stalk attached to the lower surface instead of the margin.

1.3.2.9 *Reniform*

Kidney-shaped; thickly lunate with rounded ends.

Compare 'lunate'.

1.3.2.10 *Sagittate*

Arrowhead-shaped; gradually enlarged basally from an acute apex, with two more or less triangular basal lobes directed downward.

Applies to the base and overall outline.

Compare 'hastiform' of which the lobes are directed outwards and 'hastate' which applies to the base.

1.3.2.11 *Semi-elliptic*

An ellipse with the basal half cut off; rounded at the apex and flattened at the base.

ASL drawing is semi circular – I know this is in the elliptic series but perhaps the drawing should be more like half of fig 8 (broad oblate)

EB: OK.

1.3.2.12 *Spathulate*

See 'spatulate'.

1.3.2.13 Spatulate (Spathulate)

Spoon-shaped; attenuate at the base and rounded at the apex.
Compare 'clawed' ('unguiculate') which narrows more abruptly towards the base.

1.3.2.14 Subulate

Awl-shaped; tapering from a narrow base to a fine, sharp point.

1.3.2.15 Unguiculate

See 'clawed'.

2. BASE

2.1 Introduction / Developing Shape-of-Base-Related Characteristics

2.1.1 As explained in Section 1.2.1.1, it is only necessary to develop a characteristic for the shape of base when the variation in shape between varieties in the variety collection has not been accounted for by the ratio length/width or the position of the broadest part concerning the full plant part.

2.1.2 In the same way as for plane shapes, whilst a base shape can be considered in terms of a pseudo-qualitative characteristic, it can be useful to develop quantitative or qualitative characteristics related to base shape, rather than considering shape as a single pseudo-qualitative characteristic. A particular example of this is the consideration of the angle of the base (e.g. as a quantitative characteristic).

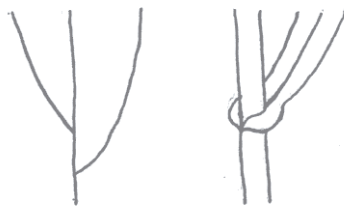
2.2 Illustrations



decurrent attenuate acute obtuse rounded truncate cordate



sagittate hastate auriculate



oblique sheathing

[Editorial note: illustration for truncate should not have parallel sides]

2.3 Definitions

2.3.1 *Acute*

With straight to slightly convex margins terminating in a sharp or blunt tip at an angle of less than 90 °.

Applies to the apex, base, etc.

Compare 'obtuse' where the angle is >90 °.

Comment: In cases where it is useful to distinguish between 'narrow acute' and 'broad acute', one should remember that they should still both be <90 °.

2.3.2 *Attenuate*

Tapering gradually, with lateral margins concave. Generally more tapered than 'acute'.

Applies to the base.

Compare 'acuminate' which applies to the apex.

2.3.3 *Auriculate*

Eared; with two rounded lobes directed outwards to either side and projecting beyond the general outline of the plant part.

Applies to the base.

Compare 'hastate' with triangular lobes directed outwards, and 'sagittate' with triangular lobes directed downwards.

2.3.4 *Cordate*

Heart-shaped; with two equal, rounded, basal lobes divided by a deep sinus.

Compare 'obcordate' which has the sinus at the apex and 'cordiform' which applies to general plane outline.

2.3.5 *Cuneate*

Wedge-shaped; broadest towards the apex, the lateral margins more or less straight and converging towards the base at an acute or obtuse angle.

Applies to the base.

2.3.6 *Decurrent*

Running downwards; with the base of the leaf blade prolonged downwards onto the stem as a wing.

Applies to the base of a leaf blade.

ASL also used for vegetative bud supports in plum – this must be part of the stem I think.

2.3.7 *Hastate*

Arrow-shaped; with two equal, more or less triangular lobes directed outwards to either side. Applies to the base of a leaf blade.

Compare 'auriculate' with rounded lobes directed outwards, 'sagittate' with triangular lobes directed downwards and 'hastiform' which applies to general plane outline.

2.3.8 *Obtuse*

With straight to convex margins terminating in a blunt tip at an angle of 90° or more.

Applies to the base, apex, etc.

Compare 'acute' where the angle is <90 °.

Comment: In cases where it is useful to distinguish between 'narrow obtuse' and 'broad obtuse', one should remember that they should still both be >90 °.

2.3.9 *Pointed*

A general term for a base or apex with concave or straight to slightly convex margins terminating in a sharp or blunt tip.

Compare 'acute' (<90°) and 'obtuse'(>90°).

2.3.10 *Rounded*

Curved like the outline of a circle.

Applies to the base, apex, etc. but not to be used for describing the general outline of a plane figure.

Also to lateral sides (Plane shape)?

2.3.11 *Sagittate*

Arrowhead-shaped; with two equal, more or less triangular lobes directed downwards.

Applies to the base and overall outline.

Compare 'hastate' with triangular lobes directed outwards and 'auriculate' with rounded lobes directed outwards.

2.3.12 *Sheathing*

Surrounding a plant part and resembling a tube; e.g. the leaf base of a grass surrounding the stem.

2.3.13 *Truncate*

With the base (apex) abruptly rounded to a straight, transverse, basal (distal) margin, as if cut off.

Applies to the base and apex.

3. APEX

3.1 Introduction / Developing Shape-of-Apex-Related Characteristics

3.1.1 As explained in Section 1.2.1.1, it is only necessary to develop a characteristic for the shape of apex when the variation in shape between varieties in the variety collection has not been accounted for by the ratio length/width or the position of the broadest part concerning the full plant part.

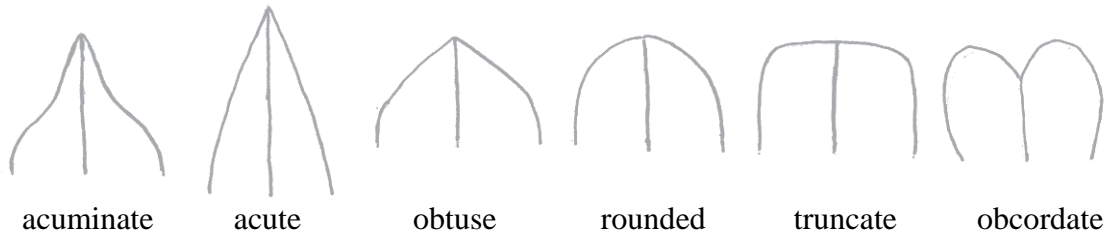
3.1.2 In the same way as for plane shapes, whilst an apex shape can be considered in terms of a pseudo-qualitative characteristic, it can be useful to develop quantitative or qualitative characteristics related to apex shape, rather than considering shape as a single pseudo-qualitative characteristic. A particular example of this is the consideration of the angle of the apex (e.g. as a quantitative characteristic).

3.1.3 Characteristics concerning the shape of the tip may be handled separately from those concerning the general shape of the apex, since different combinations between these two categories are possible, for example: a first characteristic for the general shape of the apex (e.g. acuminate, acute, obtuse, rounded), together with a second characteristic for emargination at apex (absent, present), or apiculate tip (absent, present). “Acuminate” should not be used as a shape of the apex if it concerns only the most distal part, or “tip”. An acuminate “tip” may be present on an acute, obtuse, rounded or truncate apex.

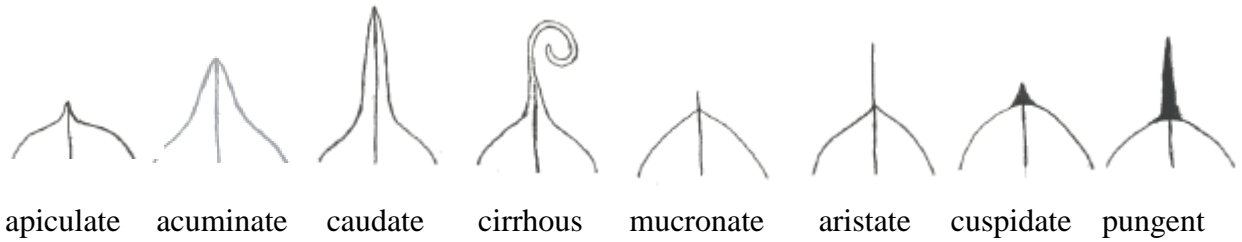
3.1.4 In the case of tip shapes, it may be more appropriate to have a simple characteristic such as length of tip, rather than using botanical terms. [Emarginate and retuse need only be used if there is variation within the collection.] The only difference between mucronate and aristate is the length of the ‘tip’, the only difference between cuspidate and pungent is the length of the ‘tip’, and the only difference between emarginate and retuse is the angle of the notch. These pairs can therefore also be quantified where applicable, by stating ‘length of tip’, for example, instead of using the specific botanical terms.

3.2 Illustrations

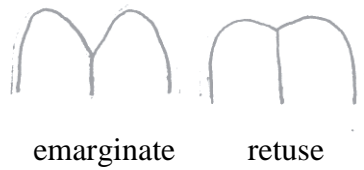
3.2.1 Apex



3.2.2 Tip



3.2.3 Notch



[Editorial Note: illustration for emarginate and retuse to be modified to clarify the difference between notch shapes and apex / tip shapes]

[Editorial Note: illustration for truncate should not have parallel sides]

[Editorial Note: to consider including illustration for barbed]

3.3 Definitions

3.3.1 Apex

3.3.1.1 *Acuminate*

Tapering gradually, with concave margins, to a sharp or blunt tip.

Applies to the apex.

Compare 'apiculate', tapering more abruptly and 'caudate', tapering more gradually, both applying to the tip only.

3.3.1.2 *Acute*

With straight to slightly convex margins terminating in a sharp or blunt tip at an angle of less than 90 °.

Applies to the base, apex, etc.

Compare 'obtuse' where the angle is >90 °.

In cases where it is useful to distinguish between 'narrow acute' and 'broad acute', one should remember that they should both still be <90 °.

3.3.1.3 *Obcordate*

Inversely heart-shaped; with two equal, rounded, apical lobes divided by a deep sinus, and tapering fairly straightly to the base.

Applies to general plane outline and the general shape of the apex.

Compare 'cordate' which has the sinus at the base and 'obcordiform' which applies to general plane outline.

Also compare 'emarginate' and 'retuse' where the incisions are too small to affect the general shape.

CB 2005: obcordate is also known as cleft. Cleft and emarginate are often confused.

3.3.1.4 *Obtuse*

With straight to convex margins terminating in a blunt tip at an angle of 90 ° or more.

Applies to the apex, base, etc.

Compare 'acute' where the angle is <90 °.

In cases where it is useful to distinguish between 'narrow obtuse' and 'broad obtuse', one should remember that they should both still be >90 °.

3.3.1.5 *Pointed*

A general term for a base or apex, etc. with straight to slightly convex margins terminating in a sharp or blunt tip.

Compare 'acute' (<90°), obtuse (>90°).

3.3.1.6 *Rounded*

Curved like the outline of a circle.

Applies to the base, apex, etc. but not to be used for describing the general outline of a plane figure.

3.3.1.7 *Truncate*

With the apex (base) abruptly rounded to a straight, transverse, distal (proximal) margin, as if cut off.

Applies to the base and apex.

3.3.2 Tip

3.3.2.1 *Apiculate*

Terminating abruptly in a small sharp but not rigid point which is both vascular and laminar in nature.

Applies to the most distal part of the apex (tip).

Compare 'acuminate' where the tapering is less abrupt and 'cuspidate' which is rigid.

3.3.2.2 *Aristate*

Awned; bearing a stiff, straight, bristle-like continuation of the primary vein.

Applies to the most distal part of the apex (tip) or used for other parts where bristles may occur.

Compare 'mucronate' where the point is shorter.

3.3.2.3 *Barbed, Barbate*

Terminating in a reflexed hook.

3.3.2.4 *Caudate*

Tailed; tapering to a long, narrow, pointed appendage which is both vascular and laminar in nature.

Applies to the most distal part of the apex (tip).

Compare 'acuminate' where the point is shorter.

3.3.2.5 *Cirrhous*

With a tendril; terminating in a narrow spiralled tip which is a continuation of the primary vein.

Applies to the most distal part of the apex (tip) or to other parts with tendrils.

3.3.2.6 *Cuspidate*

Terminating in a short rigid point, or cusp, which is both vascular and laminar in nature.

Applies to the most distal part of the apex (tip).

Compare 'mucronate' which is only vascular, 'apiculate' where the point is not rigid and 'pungent' where the point is long and rigid.

3.3.2.7 *Mucronate*

Terminating abruptly in a short, hard point which is a continuation of the primary vein and is only vascular in nature.

Applies to the most distal part of the apex (tip).

Compare 'aristate' where the point is longer and 'cuspidate' which is both vascular and laminar.

3.3.2.8 *Pungent*

Terminating in a long, rigid, sharp point which is both vascular and laminar in nature.

Applies to the most distal part of the apex (tip).

Compare 'cuspidate' where the point is shorter.

3.3.3 Notch

3.3.3.1 *Emarginate*

Notched; with an acute, deep, central sinus.

Applies to the apex.

Compare 'retuse' and 'obcordate'.

3.3.3.2 *Retuse*

Notched; with an obtuse, shallow, central sinus.

Applies to the apex.

Compare 'emarginate' and 'obcordate'.

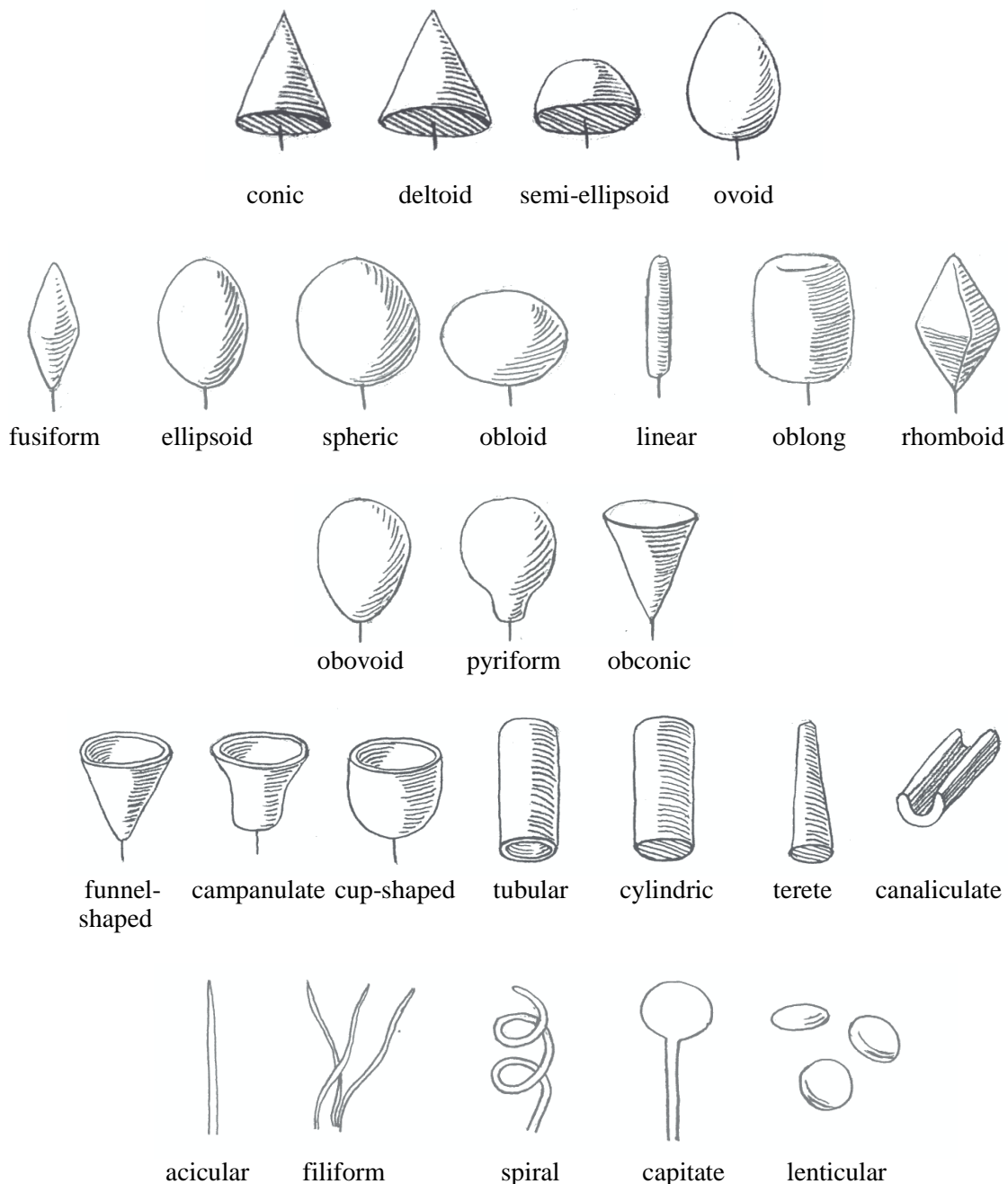
SECTION B: THREE-DIMENSIONAL SHAPES

1. FULL PLANT PARTS

1.1 Introduction

Wherever possible, three-dimensional plant parts should be described in profile as plane or two-dimensional shapes (see Section A: ratio length/width, position of broadest part, base, shape and lateral outline), e.g. using characteristics in cross-section, lateral view, longitudinal section etc.. To describe the three-dimensional shape fully it may also be necessary to use, for example, a characteristic for hollow or solid interior in addition to the characteristics describing the plane shape. The use of characteristics for three-dimensional shapes should only be used where it is not practical to describe the characteristic in a two-dimensional way.

1.2 Illustrations of Basic Shapes



1.3 Definitions

1.3.1 Simple basic three-dimensional shapes (those forming part of the length/diameter ratio series)

1.3.1.1 *Conic*

Cone-shaped; tapering evenly from a circular base to an acute apex. Length/diameter ratio of the basic shape: 2:1 to 1,5:1.

The conic series also includes 'deltoid', with a more specific length/diameter ratio.

Compare 'triangular' which applies to two-dimensional shape and 'obconic' which narrows towards the base.

1.3.1.2 *Cuneiform*

See 'obconic'.

1.3.1.3 *Deltoid*

More or less equilaterally cone-shaped; tapering evenly from a circular base to an acute apex. Length/diameter ratio of the basic shape: 1:1, same as 'very broad conic'.

Forms part of the 'conic' series.

Compare 'deltate' which applies to two-dimensional shape and 'obdeltoid' which narrows towards the base.

1.3.1.4 *Ellipsoid*

A three-dimensional ellipse; broadest at the middle, with margins tapering convexly and evenly to either end. Length/diameter ratio of the basic shape: 2:1 to 1,5:1.

The 'ellipsoid' series also includes 'spheric' and 'obloid', differing only in their length/diameter ratios.

Compare 'elliptic', 'circular' and 'oblate' which apply to two-dimensional shapes.

1.3.1.5 *Globose*

See 'spheric'.

ASL In common use as a UPOV term. Should definition be here as well as for spheric or should one or other term be encouraged? I like globose – it is not as mathematical sounding as spheric – more suited to less precise shapes found in fruit.

EB: I agree.

1.3.1.6 *Linear*

Long and narrow, with the lateral margins parallel. Length/diameter ratio more than 6:1, same as 'very narrow oblong'.

Forms part of the 'oblong' series.

Applies to two- and three-dimensional shape.

1.3.1.7 *Obconic*

Inversely conic; tapering evenly from a circular apex to an acute base. Length/diameter ratio of the basic shape: 2:1 to 1,5:1.

The obconic series also includes 'obdeltoid', with a more specific length/diameter ratio.

Compare 'obtriangular' which applies to two-dimensional shape and 'conic' which narrows towards the apex.

1.3.1.8 Obloid

Transverse ellipsoid; shorter than broad, broadest at the middle with margins tapering convexly and evenly to the base and apex, the longest dimension orientated transversely. Length/width ratio of the basic shape: 1:1,5 to 1:2 .
Forms part of the 'ellipsoid' series.

1.3.1.9 Oblong

With more or less parallel sides terminating obtusely at the base and apex, circular in transverse section. Length/diameter ratio of the basic shape: 2:1 to 1,5:1.
Applies to two- and three-dimensional shape.
The 'oblong' series also includes

1.3.1.10 Obovoid

Inversely ovoid; broadest above the middle, that is towards the apex. Length/width ratio of the basic shape: 2:1 to 1,5:1.
Compare the 'ovoid' series which is broadest towards the base and 'obovate' which applies to two-dimensional shape.

1.3.1.11 Ovoid

Chicken-egg-shaped; broadest below the middle, that is towards the base, entirely convex, although the apex may be either rounded or pointed. Length/width ratio of the basic shape: 2:1 to 1,5:1.
Compare the 'obovoid' series which is broadest towards the apex and 'ovate' which applies to two-dimensional shape.

1.3.1.12 Rhomboid

Diamond-shaped; square in transverse section, broadest and angled at the middle, tapering with more or less straight margins to each end. Length/width ratio of the basic shape: 2:1 to 1,5:1.

1.3.1.13 Spheric (Globose)

Ball-shaped; round in outline when viewed from any angle.

1.3.2 Other simple basic three-dimensional shapes (those not forming part of the length/diameter ratio series)

1.3.2.1 Acicular

Needle-shaped; rigid, long and narrow and tapering to a fine point. Round or grooved in transverse section, e.g. conifers.
Applies primarily to three-dimensional shape but may also be used for the outline.

1.3.2.2 Campanulate

Bell-shaped; with an inflated tube, gradually widening distally into a limb or lobes. Normally applies to the corolla.
Compare 'funnel-shaped' which is not inflated basally and 'cup-shaped' which does not diverge distally.

1.3.2.3 Canaliculate

Channeled, gutter-shaped; long and narrow, with a longitudinal groove.

1.3.2.4 Capitata

Headed; refers to a plant part which is stalked and terminates in a knob.
Also applies to an inflorescence type with crowded flowers (florets) borne in a head-like cluster, e.g. Asteraceae.

1.3.2.5 Cup-Shaped

With a tube which is rounded basally and which does not diverge distally.
Compare 'campanulate' which diverges distally and 'funnel-shaped' which is not rounded basally.

1.3.2.6 Cylindric

Solid, long and narrow with an even diameter, circular in transverse section.
Compare 'tubular' which is hollow.

1.3.2.7 Filiform

'Thread-like'.

1.3.2.8 Funnel-Shaped (Infundibular)

With an obconic tube gradually diverging distally.
Compare 'campanulate' and 'cup-shaped' which are rounded basally.

1.3.2.9 Fusiform

Spindle-shaped; long and narrow, circular in transverse section, thick in the middle and tapering to both ends.

1.3.2.10 Infundibular

See 'funnel-shaped'.

1.3.2.11 Inflated

Blown up; hollow and swollen in appearance.

1.3.2.12 Lenticular

Lens-shaped; doubly convex.

1.3.2.13 Pear-shaped

See 'pyriform'.

1.3.2.14 Pyriform

Pear-shaped; obovoid with a contraction towards the base.

1.3.2.15 Semi-ellipsoid

Ellipsoid with the basal half cut off; rounded at the apex and flattened at the base.

1.3.2.16 Spiral

Corkscrew-shaped; the circumference even or diminishing.

1.3.2.17 Stellate

Star-shaped.

1.3.2.18 Terete

Long and slender, tapering towards the apex, circular in transverse section.

1.3.2.19 Tubular

Hollow, long and narrow with an even diameter, circular in transverse section.
Compare 'cylindric', which is solid.

2. NON-FULL-PLANT PARTS???

SECTION C: SURFACE (EXTERNAL TEXTURE), COLOR PATTERN, GLOSSINESS AND VISIBILITY, TEXTURE (INTERNAL TEXTURE) AND RESILIENCE

1. INTRODUCTION / DEVELOPING CHARACTERISTICS

It may be appropriate to have a simple characteristic, such as length of hairs, rather than using botanical terms.

2. ILLUSTRATIONS

2.1 Hairiness and Spininess



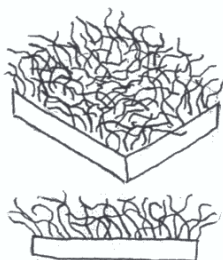
aculeate



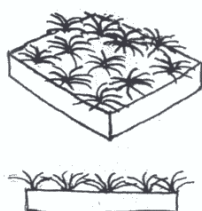
spinose



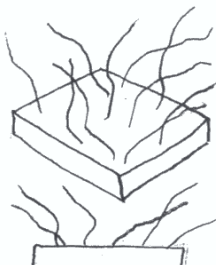
barbed; barbate



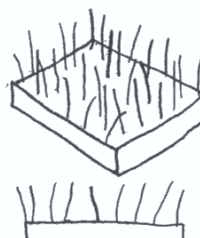
lanate



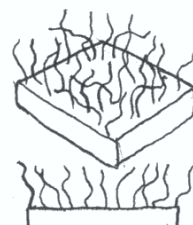
floccose



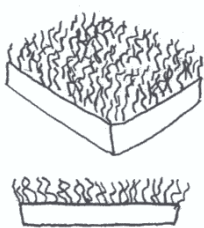
arachnoid



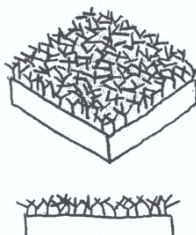
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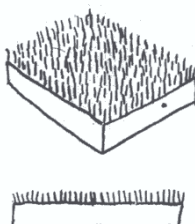
villous



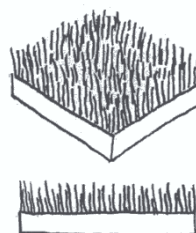
tomentose



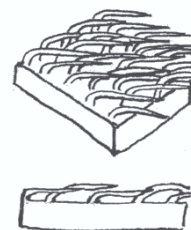
pannose



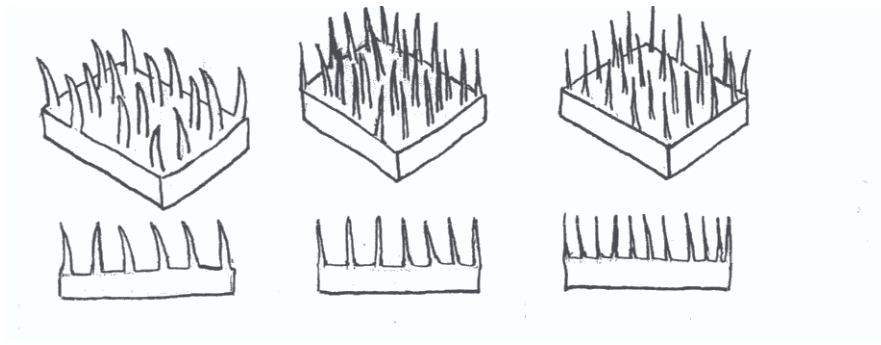
pubescent



velutinous



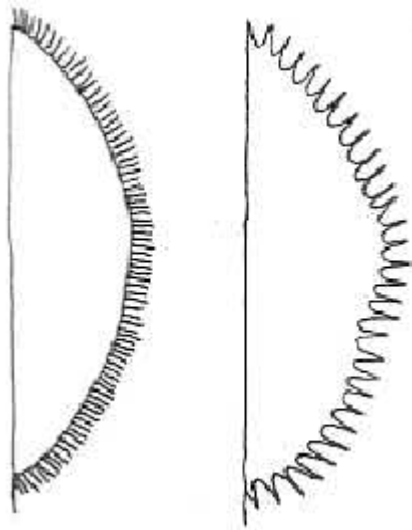
strigose



setose

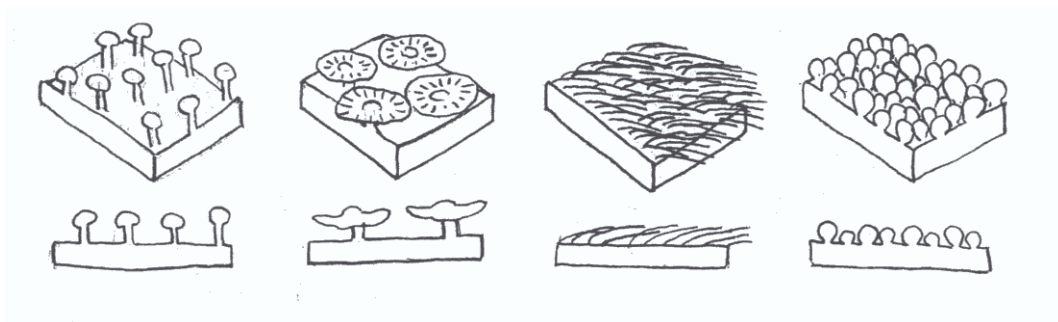
hispid

hirsute



ciliate

fimbriate



glandular

lepidote

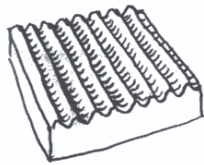
sericous

papillose

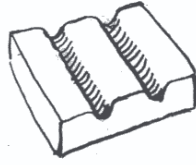
2.2 Texture



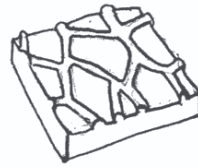
aciculate



striate



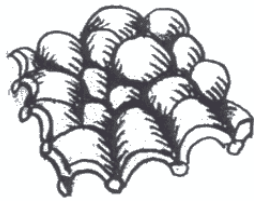
grooved



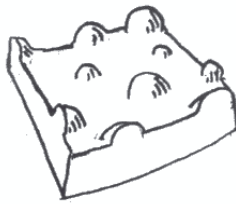
reticulate



corrugated



rugose

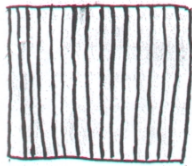


bullate

2.3 Color pattern



aciculate



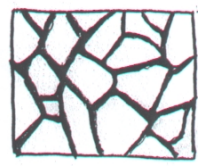
striate



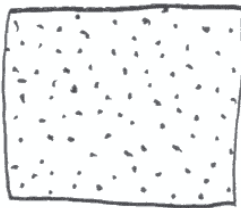
striped



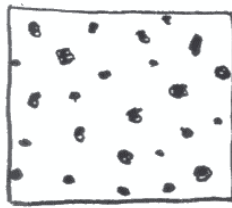
banded



reticulate



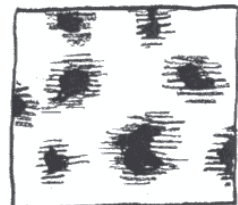
dotted



spotted



maculate



mottled

3. DEFINITIONS

3.1 **Surface (External Texture)**

3.1.1 *Aciculate*

With fine, straight stripes, like needle scratches, lying in different directions, and of a different color or texture.

Compare 'striate' (parallel lines).

3.1.2 *Blistered*

See 'bullate'.

3.1.3 *Bullate*

Blistered; the surface covered with irregular blister-like convexities.

EB: What is the difference between this and 'papillose'?

ASL bullate has flatter broader convexities – papillose has 'small, nipple like projections'

3.1.4 *Bumpy*

A general term for a surface with rounded lumps or swellings.

3.1.5 *Coarse*

See 'rough'.

3.1.6 *Corrugated*

Wrinkled, crumpled or folded into alternating furrows and ridges, e.g. *Papaver* petals in the bud.

Compare 'rugose'.

3.1.7 *Even*

Smooth; opposite of rough.

For internal texture characteristics the term 'fine' is used.

3.1.8 *Farinaceous (Farinose)*

Mealy; with a whitish, powdery covering.

Compare 'granular'.

3.1.9 *Glabrous*

Hairless.

3.1.10 *Glandular*

Bearing glands; with stalked or sessile glands.

3.1.11 *Granular (Grainy)*

Covered with small granules or grains.
Compare 'farinaceous'.

3.1.12 *Grooved*

With one or more narrow channels'

3.1.13 *Papillose*

Pimpled, with small, rounded, soft to firm, unequal bumps.

EB: What is the difference between this and 'bullate'?

CB 2005: Page 40 2.1.3 Papillose is a surface with small soft protuberances, sometimes hair. Blisters are not protuberances. Bullate are blister like and larger, often more rigid.

ASL small nipple like projections rather than flat blister like

3.1.14 *Prominent*

Standing out clearly from the surrounding surface, e.g. veins raised on the abaxial side of a leaf.

Compare 'conspicuous', which is 'clearly visible'.

3.1.15 *Pubescent*

Either a general term for 'hairy' or a specific type of hairiness.

EB: This is according to most references. To decide.

CB 2005: Page 41 2.1.15 Pubescence is a specific type of hair, however is generally used to describe the presence of short, fine hair. If we decide to define as a hair type only, then this could cause confusion as in many guidelines could give the wrong information. Suggest we define it as a hair type, but put a note that it may be used as a general term for fine, short hair.

ASL Agree – in very common use as a general term for 'hairy'. Can be used as a specific term for soft hairs.

Often used in publications e.g. Leaf pubescent (hairy) or leaf glabrous (no hairs) Do we have a term for soft hairs other than pubescent? I would prefer it kept as a general term for hairy.

3.1.16 *Resinous*

Covered with or exuding resin, which may be sticky.
Compare 'viscid'.

3.1.17 *Reticulate*

Netted; with a fine network contrasting in color or texture, e.g. veins on the abaxial side of a leaf.

Compare 'rugose' which has convex areas in between the netted venation.

3.1.18 *Rough*

Coarse; opposite of 'even' and 'smooth'.

3.1.19 *Rugose*

Impressed wrinkled; as in a leaf with convex areas in between the netted venation.
Compare 'corrugated' and 'reticulate'.

3.1.20 *Smooth*

Even; opposite of rough.
For internal texture characteristics the term 'fine' is used.

3.1.21 *Striate*

Finely striped; with more or less parallel lines of a different color, or grooves or ridges.
Compare 'aciculate' (needle scratches in different directions).

3.1.22 *Viscid*

Sticky or gummy.
Compare 'resinous', in which case the stickiness is due to resin.

3.1.23 *Wrinkled*

With folds or creases; a general term.
Compare 'corrugated' and 'rugose' where the wrinkling has a more specific nature.

3.2 Color Pattern

3.2.1 *Aciculate*

With fine, straight stripes, like needle scratches, lying in different directions, and of a different color or texture.
Compare 'striate' where the stripes are more or less parallel.

3.2.2 *Banded*

Broadly striped; with broad, more or less parallel stripes of a different color.
Compare 'striped' (narrower) and 'striate' (much finer).

3.2.3 *Blotched*

See 'maculate'.

3.2.4 *Dotted*

Finely spotted and of a different color, as if made by a pen.
Compare 'spotted' where the spots are larger.

3.2.5 *Maculate (Blotched)*

With sharply outlined blotches of irregular size and shape and of a different color.
Compare 'mottled' which is not sharply outlined and 'spotted' which is not necessarily irregular and 'dotted' where the spots are very fine.

ASL Maculate seems to be in common use as a general term for spotted. Perhaps we should just use blotched.

3.2.6 *Marbled*

Resembling marble in color pattern.

EB: Example for drawing? Do we need this?

ASL Drawing would probably be difficult. Could add 'irregularly mottled and veined' to the definition

3.2.7 *Mottled*

With differently colored blotches that are not sharply outlined.

Compare 'maculate' (sharply outlined).

3.2.8 *Reticulate*

Netted; with a fine network contrasting in color or texture, e.g. veins on the abaxial side of a leaf.

3.2.9 *Speckled*

See 'spotted'.

3.2.10 *Spotted (Speckled)*

A general term for sharply outlined circular or differently shaped markings of a different color.

Compare 'dotted' where the spots are very fine, 'maculate' where the spots are specifically irregular in size and shape and 'mottled' which is not sharply outlined.

3.2.11 *Striate*

Finely striped; with more or less parallel lines of a different color, or grooves or ridges.

Compare 'striped' (broader), 'banded' (much broader) and 'aciculate' (needle scratches in different directions).

3.2.12 *Striped*

With more or less parallel lines or narrow bands of contrasting shade or color.

Compare 'striate' (narrower) and 'banded' (broader).

3.3 **Glossiness and Visibility**

3.3.1 *Conspicuous*

Clearly visible; evident.

Compare 'prominent' which has to do with the surface and compare 'conspicuous'.

3.3.2 *Dull*

Not shiny; opposite of 'glossy'.

CB 2005: Page 44 2.3.2 Suggest matt as a synonym for dull

EB 2005: I agree.

3.3.3 *Glaucous*

Coated with a whitish or greyish waxy bloom which rubs off easily.

CB 2005: Page 44 2.3.3 Suggest that bloom be added as a synonym for glaucous. Bloom is a somewhat more general term for glaucous.

EB 2005: OK but how do we list it? Bloom is a noun and not a pronoun as the other terms.

Office: see definition of glaucous in TGP/14.2.3.1 Draft 2 Prov. "Color characteristics"

3.3.4 *Glossy*

Shiny; opposite of 'dull'.

3.3.5 *Inconspicuous*

Not clearly visible; obscure.

Compare 'conspicuous'.

3.3.6 *Indistinct*

Not to be used for 'inconspicuous' for UPOV purposes. This term is reserved for 'distinctness' in the DUS Test.

3.3.7 *Opaque*

Not transmitting light, as opposed to 'translucent' and 'transparent'.

3.3.8 *Translucent*

Semi-transparent; transmitting light diffusely.

Compare 'opaque' and 'transparent'.

3.3.9 *Transparent*

Transmitting light clearly; enabling one to see through clearly.

Compare 'opaque' and 'translucent'.

3.3.10 *Uniform*

Not to be used for 'evenness of color' for UPOV purposes. This term is reserved for 'uniformity' in the DUS Test.

3.4. **Types of Hair and Hair-Like or Prickly Appendages**

3.4.1 *Aculeate (Prickly)*

Bearing prickles; with stiff, sharp projections from the superficial layers of the plant part. Compare 'spinose' (from the superficial and deeper layers).

3.4.2 *Arachnoid*

Cobwebby; with loosely tangled, long, fine, white hair.

3.4.3 *Barbate*

Bearded; with tufts of long hairs.

3.4.4 *Barbed*

With short, rigid, hooked to reflexed bristles or points, like the barb of a fish-hook.

3.4.5 *Bearded*

See 'barbate'.

3.4.6 *Bristly*

With stiff, strong trichomes.

A general term including both 'hispid' (harsh to the touch) and 'setose' (spiny to the touch).

3.4.7 *Ciliate*

Bearing a marginal fringe of fine trichomes (outgrowths from the epidermis).

Compare 'fimbriate' which arises not only from the epidermis but from the deeper layers as well.

3.4.8 *Felted*

See 'pannose'.

3.4.9 *Fimbriate*

Bearing a marginal fringe of hair-like appendages extending not only from the epidermis but from the deeper layers as well.

Compare 'ciliate' which arises from the epidermis only.

3.4.10 *Floccose*

With tufts of long, soft hairs, usually rubbing off easily.'

3.4.11 *Glabrate*

Almost hairless.

3.4.12 *Glabrescent*

Becoming hairless with age.

3.4.13 *Glabrous*

Bald; without trichomes, smooth, hairless.

3.4.14 *Glandular*

With short-stalked or sessile glands or with hairs bearing glands at their tips.

3.4.15 *Hirsute*

With long, more or less erect, coarse, stiff trichomes.

Compare 'setose' which is spiny to the touch and 'hispid' which is coarser.

EB: I could not find clear differences between 'hirsute' and 'hispid', except that 'hirsute' seems to be somewhat finer.

ASL I think hairs are rough and coarse but do not have to be stiff.

3.4.16 *Hispid*

With stiff, bristly trichomes; harsh to the touch.

Compare 'setose' which is spiny to the touch, 'hirsute' which is somewhat finer and 'scabrous' which is also harsh to the touch.

3.4.17 *Lanate*

Woolly; with long, somewhat matted, tangled trichomes.

Compare 'tomentose' with shorter, denser hairs and 'pannose' which is even denser (felted).

3.4.18 *Lepidote (Leprous)*

Peltate-scaly; with small stalked scales.

3.4.19 *Pannose*

Felted; densely covered with short, matted, intertwined hairs.'

Compare 'tomentose' which is less matted.

EB: Some references have drawings with branched hairs – so they're not trichomes (trichomes are unbranched if I'm correct).

ASL My definitions say trichomes are 'any hair like growths, glandular or eglandular from the epidermis' they do not mention branching so one assumes that a branched hair from the epidermis could be called a trichome.

3.4.20 *Pilose*

With long, soft, sparse, slender trichomes.

Compare 'villous' which is more shaggy.

3.4.21 *Prickly*

With sharp-pointed outgrowths from the superficial layers, e.g. the bark or epidermis, containing no conducting tissue.

Applies to surface and margins, although a prickly margin is normally referred to as 'aculeate'.

Compare 'spinose' and 'thorny'.

EB: This does not agree totally with TWF/35/11 par. 43. I checked various publications and the main difference seems to be that prickles are from the epidermal layers only whereas spines and thorns are from the deeper layers as well.

CB 2005: Page 45 2.5 The use of prickles, spine and thorn are often confused and misunderstood. For the Blackberry guideline revision I have concluded the following. Spine: tough, usually woody structure, exogenous, contains vascular tissue and has a sharp point found on the leaf, stem and root. Prickle: a type of small spine found usually on a leaf. A prickle is not in a leaf axil, subtending a bud, lacks vascular tissue and is exogenous. Thorn: a type of spine, usually of larger size, sharp pointed, hard outgrowth from stem wood. Could be added to 2.5 as 2.5.4-6

ASL There does not appear to be any consistency in the literature. I have looked at two recent publications – both have spines related to leaves but prickles are woody and develop from both the epidermal and sub epidermal layers. (The opposite from the above)

The best thing would be to agree on a UPOV definition and say this is what we are going to use.

EB: I agree – to decide what we want to use.

3.4.22 *Pubescent*

Downy; with short, fine, soft, erect, slender trichomes.

3.4.23 *Scabrous*

Rough to the touch; with stiff, coarse, ascending trichomes.

EB: It appears that it is not a specific trichome type but rather refers to the roughness. See RHS.
ASL agree = roughness

3.4.24 *Sericeous*

Silky; with fine, long, adpressed trichomes.

3.4.25 *Setose, Setaceous*

Bristly; with long, erect, sharply pointed, rigid trichomes. Spiny to the touch.
Compare 'hispid' which is harsh to the touch and 'strigose' with adpressed trichomes..

3.4.26 *Spine*

A rigid, sharply pointed modified organ or part of an organ e.g. a modified stem or reduced branch, leaf, stipule, etc. Contains superficial as well as deeper layers.

Compare 'prickle' which arises from the superficial layers only and 'thorn' which can be used synonymously to 'spine' but normally applies to modified stems only.

CB 2005: Page 45 2.5 The use of prickle, spine and thorn are often confused and misunderstood. For the Blackberry guideline revision I have concluded the following. Spine: tough, usually woody structure, exogenous, contains vascular tissue and has a sharp point found on the leaf, stem and root. Prickle: a type of small spine found usually on a leaf. A prickle is not in a leaf axil, subtending a bud, lacks vascular tissue and is exogenous. Thorn: a type of spine, usually of larger size, sharp pointed, hard outgrowth from stem wood. Could be added to 2.5 as 2.5.4-.6

3.4.27 *Spinose (Spiny, Thorny)*

Bearing spines; with stiff, sharp projections from the superficial and deeper layers of the plant part.

Compare 'aculeate' (only from the superficial layers).

3.4.28 *Squamose (Scurfy)*

Scaly; with minute adpressed scales.

3.4.29 *Strigose*

With stiff, sharp, coarse, adpressed, bristly trichomes, often swollen at the base.

Compare 'setose' with erect trichomes.

3.4.30 *Thorn*

A rigid, sharply pointed modified organ or part of an organ, normally a modified stem. Contains superficial as well as deeper layers.

Compare 'prickle' which arises from the superficial layers only and 'spine' which can be used synonymously to 'thorn' but may apply to other modified organs as well, e.g. a leaf or stipule, etc.

CB 2005: Page 45 2.5 The use of prickle, spine and thorn are often confused and misunderstood. For the Blackberry guideline revision I have concluded the following. Spine: tough, usually woody structure, exogenous, contains vascular tissue and has a sharp point found on the leaf, stem and root. Prickle: a type of small spine found usually on a leaf. A prickle is not in a leaf axil, subtending a bud, lacks vascular tissue and is exogenous. Thorn: a type of spine, usually of larger size, sharp pointed, hard outgrowth from stem wood. Could be added to 2.5 as 2.5.4-6

3.4.31 *Thorny*

See 'spinose'.

3.4.32 *Tomentose*

Densely woolly; with short, matted, interwoven trichomes.

'Densely and softly matted-lanate.'

Compare 'pannose' which is even denser and more matted (felted) and compare 'lanate' with longer, less matted hairs.

3.4.33 *Trichome*

Unbranched hair-like outgrowth from the epidermis.

ASL add with or without glands?

EB: We could add that.

ASL My definitions say trichomes are 'any hair like growths, glandular or eglandular from the epidermis' they do not mention branching so one assumes that a branched hair from the epidermis could be called a trichome.

3.4.34 *Velutinous*

Velvety; with long, dense, straight trichomes.

Compare 'tomentose' with interwoven trichomes.

3.4.35 *Villous*

Shaggy; with long, slender, soft trichomes.

Compare 'pilose' which is less shaggy.

3.5 Scales

3.5.1 *Scaly*

Bearing scales.

3.6 Spininess

3.6.1 *Aculeate (Prickly)*

Bearing prickles; with stiff, sharp projections from the superficial layers of the plant part.

Compare 'spinose'.

3.6.2 *Prickly*

See 'aculeate'.

3.6.3 *Spinose (Spiny, Thorny)*

Bearing spines; with stiff, sharp projections from the superficial and deeper layers of the plant part.

Compare 'aculeate'.

3.7 **Texture (Internal Texture) and Resilience**

EB: To be taken out of this section?

3.7.1 *Cartilaginous*

Firm and tough, like cartilage.

Compare 'coriaceous' which is more flexible.

3.7.2 *Coriaceous*

Leathery; thick, tough and flexible.

Compare 'cartilaginous' which is more firm.

3.7.3 *Crustaceous*

Thin, hard and brittle.

3.7.4 *Fibrous*

With tough strands.

3.7.5 *Fine*

Not textured; smooth, opposite of 'rough'.

For surface characteristics the term 'smooth' or 'even' is used.

3.7.6 *Fleshy*

Pulpy; succulent but firm, easy to cut.

3.7.7 *Flexuous*

Resiliently bendable, like a whip.

EB: Is this correct?

CB 2005: Page 46 2.6.7 Flexuous may be better defined as bending or curving in alternating and opposite directions. I think this is in the wrong place as stems can be flexuous.

EB 2005: Stems can also be rigid, so perhaps we should divide this section in two: one for internal texture and one for resilience.

ASL can it also be wavy?

3.7.8 *Ligneous*

Woody.

3.7.9 *Membranous*

Like a membrane; thin and somewhat transparent.
Compare 'papyraceous' which is more opaque.

3.7.10 *Papyraceous, Papery*

With the consistency of paper; thin and somewhat opaque.
Compare 'membranous' which is more transparent.

3.7.11 *Rigid*

Stiff; not easily bendable.

3.7.12 *Rough*

Textured; coarse, opposite of 'fine'.

3.7.13 *Smooth*

EB: Do we use this for internal texture?
ASL possibly but more likely to use 'fine'

SECTION D: MARGINS

1. INTRODUCTION / DEVELOPING CHARACTERISTICS

It may be appropriate to have a simple characteristic, such as depth of incisions, rather than using botanical terms.

2. ILLUSTRATIONS



entire



denticulate



dentate



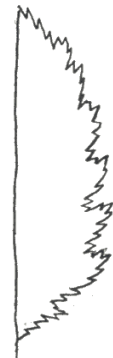
bidentate



serrulate



serrate



biserrate



crenulate



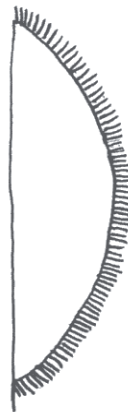
crenate



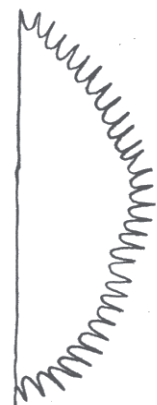
bicrenate



erose



ciliate



fimbriate



repand



sinuate



crispate



undulate

Section D margins 1 Drawings

ASL I don't like the drawing for bidentate – it should be one big tooth one small tooth
Rather than big teeth with smaller teeth on sides

3. DEFINITIONS

3.1 *Bidentate*

Doubly dentate; with the dentations themselves dentate.

ASL Doubly dentate with the margin composed of alternate larger and smaller teeth

3.2 *Bicrenate*

Doubly crenate; with the crenations themselves crenate.

ASL with alternate large and small crenations

3.3 *Biserrate*

Doubly serrate; with the serrations themselves serrate.

ASL with alternate large and small serrations.

3.4 *Ciliate*

Bearing a marginal fringe of fine trichomes (outgrowths from the epidermis).
Compare 'fimbriate'.

EB: To compare wording in TGP/14.2.2.

CB 2005: Page 49 2.4 Either definition would be OK.

3.5 *Crenate*

Scalloped, with rounded teeth.

3.6 *Crispate*

With the margin curled or crumpled and irregularly twisted.

3.7 *Dentate*

With sharp teeth pointed outwards. The two sides of a tooth are the same length.

Compare 'denticulate' which is finer, 'crenate' where the teeth are rounded and 'serrate' where the teeth point towards the apex.

3.8 *Entire*

With an undivided margin; not toothed or lobed.

3.9 *Erose*

Gnawed; with an irregularly toothed margin, as if chewed.

3.10 *Fimbriate*

Bearing a marginal fringe of hair-like appendages extending not only from the epidermis but from the deeper layers as well.

Compare 'ciliate'.

EB: To compare wording in TGP/14.2.2.

3.11 *Involute*

With margins rolled towards the adaxial surface.

Compare 'revolute' with margins rolled downwards.

3.12 *Repand*

Shallowly sinuate.

Compare 'undulate' which is wavy perpendicular to the plane of the plant part.

3.13 *Revolute*

With margins rolled towards the abaxial surface.

Compare 'involute' with margins rolled upwards.

3.14 *Serrate*

With sharp teeth pointed forwards, towards the apex. The front side of a tooth is shorter than the back.

Compare 'crenate' where the teeth are rounded and 'dentate' where the teeth point outwards.

3.15 *Sinuate*

Alternatively concave and convex in the plane of the organ; wavy.

Compare 'repand' which is shallowly 'sinuate' and 'undulate' which is wavy perpendicular to the plane of the plant part.

Comment: When e.g. a leaf is more deeply incised so as not to only affect the margin, it is lobed. This is handled under the section 'Division'.

EB: To check the above comment.

CB 2005: Page 51 2.18 Yes, comment is useful. We must not confuse margin terms with leaf divisions. It is possible to have a crenate margin on the lobe of a divided leaf. As stated the size of the marginal incision is significant and beyond a certain point it is no longer the margin that is divided but the whole leaf. A guide could be if the incision is more than half the distance between the margin and the midrib, then the leaf is divided, not just the margin. We need to discuss this.

ASL As I understand – the blade of the leaf is flat but the margin winds strongly inward and outwards

EB: I agree. Is the definition OK? ASL As sinuate but the margin winds up and down

3.16 *Undulate*

Wavy perpendicular to the plane of the plant part.

Compare 'repand' and 'sinuate' which are wavy in the plane of the plant part.

ASL As sinuate but the margin winds up and down

EB: I agree. Is the definition OK?

SECTION E: GROWTH HABIT; RELATIVE POSITION, GROUPING, FUSION; ATTITUDE, ORIENTATION, COURSE; SYMMETRY

EB: To say 'plant habit', 'growth habit' or 'habit'?

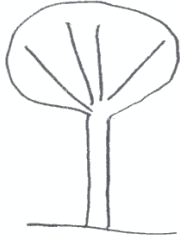



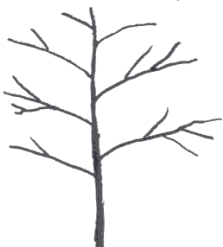



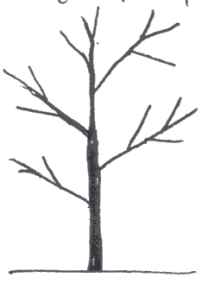
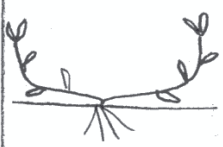




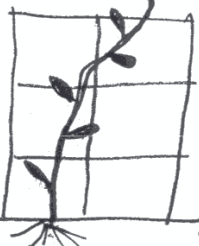
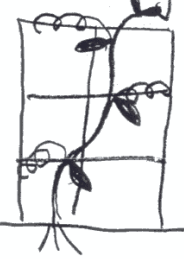
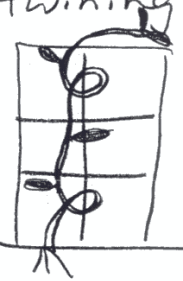
EB: The different subsections are not totally separated – some terms appear to belong in more than one section. However, I thought it could be useful to group the terms into smaller sections. Some terms have been repeated in different sections. We have to decide where they belong.

CB 2005: Page 51 section e Should we include here plant form and type? These are used where growth habit does not fit or for separation. e.g deciduous, evergreen, rosette, bushy, climber etc I prefer habit as we can have plant habit, branching habit.

ASL Either plant habit or growth habit. When we just use habit it is qualified e.g. tree: habit. Bush fruits are plant: growth habit.

1. ILLUSTRATIONS



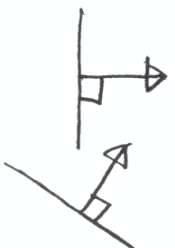

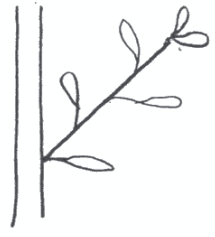





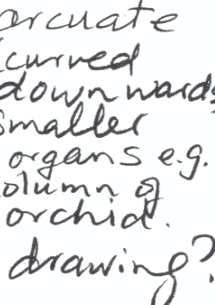


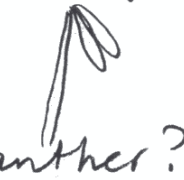







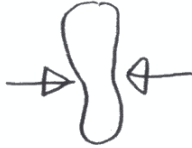
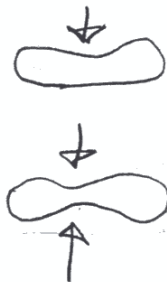




1.1 Habit (preliminary sketches):

<p>arborescent (tree-like)</p> 	<p>columnar</p> 	<p>fastigiata</p> 	<p>upright</p> 	<p>spreading</p> 
<p>drooping</p> 	<p>weeping</p> 	<p>divaricate</p> 	<p>ramified</p> 	
<p>decumbent</p> 	<p>procumbent (not rooting)</p> 	<p>stoloniferous (rooting)</p> 	<p>prostrate</p> 	<p>redining</p> 
<p>clambering</p> 	<p>climbing</p> 	<p>twining</p> 		

1.2 Relative position (preliminary sketches):

<p>apical distal terminal</p> <p>axillary</p> <p>basal proximal</p>	<p>upper inner adaxial ventral</p> <p>lower outer abaxial dorsal</p>	<p>exserted (e.g. stamens)</p>	<p>included (e.g. stamens)</p>	<p>oblique (e.g. stalk attachment)</p>
<p>Free (e.g. stamens)</p>	<p>contiguous (e.g. stamens) touching (not joined)</p>	<p>coherent (like parts superficially joined) (e.g. stamens)</p>	<p>connate (like parts histologically joined) (e.g. staminal tube)</p>	
<p>adherent (unlike parts superficially joined) (e.g. anthers + style)</p>	<p>adnate (unlike parts histologically joined) (e.g. anther to corolla tube)</p>	<p>adpressed</p>		
<p>sessile</p>	<p>stipitate (stalked)</p>			
			<p>attitude, direction Zig-zag</p> <p>(e.g. branches)</p>	

1.3 Attitude, direction (preliminary sketches)

<p>vertical</p> 	<p>horizontal</p> 	<p>perpendicular</p> 	<p>erect (e.g. branches)</p> 	<p>semi-erect (e.g. branches)</p> 
<p>diffuse, divergent, spreading (e.g. branches)</p> 	<p>ascending (upwards)</p> 	<p>descending (downwards)</p> 	<p>recurved (curving apically)</p> <p>drawing?</p>  <p>compare reflexed.</p>	<p>arched (branches)</p>  <p>← difference?</p>
<p>arcuate (curved downwards) smaller organs e.g. column of orchid. drawing?</p> 	<p>reflexed</p>  <p>drawing?</p>	<p>pendulous (e.g. heavy fruit)</p> 	<p>pendent (weak support) drawing?</p>  <p>anther?</p>	<p>incurved e.g. anthers?</p>  <p>drawing?</p>
<p>inflexed (bent in or up abruptly) drawing?</p> 	<p>inwards (e.g. corolla)</p> 	<p>outwards (e.g. corolla)</p> 	<p>involute</p> 	<p>revolute</p> 
<p>convolute</p>  <p>drawing?</p>	<p>compressed</p> 	<p>depressed</p> 	<p>transverse</p>  <p>lateral (view)</p> 	<p>longitudinal</p>  <p>marginal</p> 

2. DEFINITIONS

2.1 Growth Habit

2.1.1 Forms Relating to the Direction and Length of the Branches

2.1.1.1 *Columnar*

Upright, with a dominant main stem and suppressed branch development.
Compare 'fastigate' where the branch development is not suppressed.

2.1.1.2 *Decumbent*

Growing horizontally on the ground but with the apical parts ascending.
Compare 'prostrate' where the apical parts do not ascend.

2.1.1.3 *Divaricate*

With branches spreading widely, at almost right angles to the main axis.
Comment: 'divaricate' applies more specifically to the growth habit while 'divergent' applies to the direction of the branches. 'A divaricate plant would have divergent branches.

EB: Is this correct?

CB 2005: Page 55 2.1.1.3 Divaricate, having branches at wide, variable angles and intertangled. Divaricate is about habit where divergent is about angles, branching, also 2.2.26

ASL Divaricate seems to be 'widely spreading, greatly divergent' Divergent is spreading away from each other. Presumably branches could be widely spreading but not away from each other.

EB: I agree that divaricate is about the habit and divergent is about the direction of the branches.

2.1.1.4 *Drooping*

With branches bending downwards.
Compare 'weeping' where the downward bending is more pronounced.
Also used for attitude of plant parts.

2.1.1.5 *Fastigate*

Strongly upright, with a narrow crown, the branches virtually erect and parallel.
Compare 'columnar' of which the branch development is suppressed.

2.1.1.6 *Prostrate*

Growing flat on the ground.
Compare 'procumbent' which is more specific and 'decumbent' of which the apical parts ascend.

2.1.1.7 *Reclining*

With branches gradually curving downwards from an erect position, the distal parts lying on the ground.

2.1.1.8 *Semi-upright*

Half-upright; between 'upright' and 'spreading', not as tall and narrow as 'upright' and not as wide as 'spreading'.

For UPOV purposes 'semi-upright' is used for the whole plant only (habit) and not for plant parts (attitude). The term to be used for plant parts is 'semi-erect'.

2.1.1.9 *Spreading*

With branches directed outwards; wider than in 'upright'.
Also applies to plant parts.

2.1.1.10 *Upright*

General term used for tall and narrow plants. More specifically, 'fastigate' may be used if the branches are virtually erect and parallel to the main stem, and 'columnar' if the branch development is suppressed.
For UPOV purposes 'upright' is used for the whole plant only (habit) and not for plant parts (attitude). The term to be used for plant parts is 'erect'.

2.1.1.11 *Weeping*

Bending downwards, the terminal parts hanging.
Compare 'drooping' where downward bending is less pronounced.

2.1.2 *Other Growth Habit Forms*

2.1.2.1 *Arborescent (Tree-like, Tree)*

Tree-like; large woody plant, usually with a single main stem (trunk).

2.1.2.2 *Clambering*

Climbing without the aid of special structures e.g. tendrils.
Compare 'climbing'.

2.1.2.3 *Climbing (Climber)*

Climbing by means of special structures e.g. tendrils.
Compare 'clambering'.

2.1.2.4 *Dwarfed (Dwarf)*

A plant or part of a plant of which the growth is suppressed, leading to a much reduced size compared to the average of its kind.

2.1.2.5 *Epiphytic (Epiphyte)*

A plant growing on another plant, supported by the host, but not depending on it for food or water.
Compare 'parasite'.

2.1.2.6 *Herbaceous (Herb)*

Plant with soft, non-woody stems, of which the above-ground parts die back after the growing season, or, more generally, any non-woody plant.

2.1.2.7 *Parasitic (Parasite)*

An organism at least partly dependent on another organism (the host) for its food and water.
Compare 'epiphyte'.

2.1.2.8 *Procumbent*

Growing flat on the ground but not rooting at the nodes.
Compare ‘stoloniferous’ rooting at the nodes.

2.1.2.9 *Ramified*

Branched.

ASL Applies to all branched forms not just as shown in the drawing.
EB: I agree. How to improve the drawing?

2.1.2.10 *Shrubby (Shrub)*

Woody perennial with multiple stems arising from ground level.

2.1.2.11 *Spur Type*

Plant habit in which the shoot internodes are very short. Found in some fruit varieties.

2.1.2.12 *Stoloniferous*

Bearing prostrate stems rooting at the nodes or at the tips, producing new plants.
Compare ‘procumbent’ not rooting at the nodes.

2.1.2.13 *Tree-like (Tree)*

See ‘arborescent’.

2.1.2.14 *Twining*

Climbing by coiling around a support.

2.1.2.15 *Vine*

Climbing or trailing plant with long, slender stems, not self-supporting.

2.2 Relative Position, Grouping, Fusion

Office: need to provide guidance on arrangement of petals, e.g.

19. (+)	Flower: arrangement of petals	Fleur: disposition des pétales	Blüte: Anordnung der Blütenblätter	Flor: disposición de los pétalos		
QN	(c) free	disjoints	freistehend	abierta	Burlat, Sunburst	1
	intermediate	intermédiaires	mittel	intermedia	Germersdorfi 45, Van	2
	overlapping	chevauchants	überlappend	solapada	Hudson	3

2.2.1 *Abaxial*

The lower, outer or dorsal side; the side facing away from the axis.
Compare ‘adaxial’.

2.2.2 *Adaxial*

The upper, inner or ventral side; the side facing the axis.
Compare 'abaxial'.

2.2.3 *Adherent*

Dissimilar plant parts in close contact, e.g. anthers adherent to style.
Compare 'adnate', 'coalesced', 'coherent', 'connate', 'contiguous'.

2.2.4 *Adnate*

Dissimilar plant parts fused histologically, e.g. stamens implanted onto the corolla.
Compare 'adherent', 'coalesced', 'coherent', 'connate', 'contiguous'.

2.2.5 *Adpressed*

Lying close to or flat against the surface or another organ.

2.2.6 *Apex*

The apex (apical or distal part) of an organ or plant part is the end furthest from the point of attachment. The shape of the apex is taken as the general shape, excluding the most apical prolongation (the tip) or minor apical incision, if present.

2.2.7 *Apical, Distal, Terminal*

Located at the apex, furthest from the position of attachment.
Compare 'proximal', 'basal' which is closest to the position of attachment.

EB: Which term is preferred?

ASL I prefer apical but perhaps need terminal as well

2.2.8 *Apopetalous*

With separate petals; petals not fused into a corolla tube.
Compare 'sympetalous'.

2.2.9 *Axillary*

Situated within or arising from the axil, which is the upper angle between the axis and any lateral off-shoot, e.g. an axillary bud arising from the axil of a leaf.

2.2.10 *Basal, Proximal*

Located at the base, closest to the position of attachment.
Compare 'apical', 'distal', 'terminal'.

EB: Which term is preferred?

ASL prefer basal

2.2.11 *Base*

The base (proximal part) of a plant part is the end nearest to the point of attachment.

2.2.12 *Clustered*

Clumped; closely grouped, arising from a common point.

2.2.13 *Coalesced*

Unlike plant parts partially and irregularly fused.

Compare 'adherent', 'adnate', 'coherent', 'connate', 'contiguous'.

EB: Example?

2.2.14 *Coherent*

Similar plant parts in close contact, not fused, e.g. anthers clinging together.

Compare 'adherent', 'adnate', 'coalesced', 'connate', 'contiguous'.

2.2.15 *Congested*

Densely crowded; with almost no intervening spaces.

Compare 'crowded' which is less dense.

2.2.16 *Connate*

Like parts fused histologically, e.g. staminal filaments fused into a tube.

Compare 'adherent', 'adnate', 'coalesced', 'coherent', 'contiguous'.

2.2.17 *Connivent*

Converging but not fused. E.g. stamens with anthers touching.

2.2.18 *Contiguous*

Touching but not fused.

Not 'adnate', 'connate', 'adherent' or 'coherent'.

2.2.19 *Continuous*

In an uninterrupted arrangement.

Compare 'interrupted'.

2.2.20 *Convolute*

Rolled up longitudinally with the plant parts overlapping, as petals in a bud.

2.2.21 *Crowded*

Grouped together but with some intervening spaces.

Compare 'congested' which is more densely crowded.

2.2.22 *Dense (Density)*

Numerous per unit area, as opposed to sparse.

2.2.23 *Diffuse*

With plant parts e.g. petals spreading widely, or with branches spreading widely and frequently branching.

Compare 'divergent', spreading at almost right angles to the main axis.

2.2.24 *Distal, Apical, Terminal*

Located at the apex, furthest from the position of attachment.

Compare 'proximal', 'basal' which is closest to the position of attachment.

EB: Which term is preferred?

ASL, Apical

2.2.25 *Distinct*

Used for plant parts which are separate from one another but not to be used in this regard for UPOV purposes. This term is reserved for 'distinctness' in the DUS Test.

2.2.26 *Divergent*

With plant parts, specifically branches, spreading at almost right angles to the main axis.

Compare 'diffuse' and 'divaricate'

Comment: 'divaricate' applies more specifically to the growth habit while 'divergent' applies to the direction of the branches. 'A divaricate plant would have divergent branches.

EB: Is this correct?

CB 2005: Page 55 2.1.1.3 Divaricate, having branches at wide, variable angles and interangled. Divaricate is about habit where divergent is about angles, branching, also 2.2.26

2.2.27 *Dorsal*

The lower, outer or abaxial side in relation to the axis.

Compare 'ventral'.

2.2.28 *Exserted*

Extending beyond the surrounding parts, e.g. stamens sticking out beyond the corolla.

Compare 'included'.

2.2.29 *Fascicled, Fasciculate*

In tight clusters, appearing to arise from a common point, e.g. pine leaves.

2.2.30 *Free*

Separate from one another; not joined.

2.2.31 *Included*

Enclosed within; not extending beyond the surrounding parts, e.g. stamens not sticking out beyond the corolla.

Compare 'exserted'.

2.2.32 *Indistinct*

Used for plant parts which are not separate from one another but not to be used in this regard for UPOV purposes. This term is reserved for 'distinctness' in the DUS Test.

2.2.33 *Interrupted*

Not continuous; an arrangement which is disturbed at some point/points. Compare 'continuous'.

2.2.34 *Intricate*

Entangled; irregularly intertwined.

2.2.35 *Lax*

Loose; not compact, in an open arrangement.

2.2.36 *Lateral*

Towards or at the side of an axis or plant part.

2.2.37 *Longitudinal*

Parallel to the axis extending through the base and the apex, whether or not this is the longest axis.

2.2.38 *Marginal*

Associated with the margin or edge of an organ.

2.2.39 *Oblique*

Orientated at an angle other than 90 degrees to or parallel to the longitudinal axis. Applies to the base, apex, two-dimensional outline, position and attitude in relation to plant parts. In some cases the term refers to the shape or symmetry of a plant part, while in others it refers to the position.

2.2.40 *Pedicelled (Pedicellate)*

An individual flower or fruit borne on a stalk.

2.2.41 *Perpendicular*

At right angle to another plant part.

2.2.42 *Proximal, Basal*

Located at the base, closest to the position of attachment. Compare 'apical', 'distal', 'terminal'.

EB: Which term is preferred?

CB 2005: Page 63 2.2.42 Would prefer basal

2.2.43 *Sessile*

Stalkless; attached directly to the supporting plant part.
Compare 'stalked' and 'pedicelled'.

2.2.44 *Sheathing*

Enclosing; e.g. a leaf base enclosing the stem.

2.2.45 *Sparse (Density)*

Few per unit area, as opposed to 'dense'.

CB 2005: Page 64 2.2.45 Should we mention here the use of open instead of sparse for plant density?
EB 2005: I agree. The plant is open and the branches are sparse. OK?

2.2.46 *Spreading*

Directed outwards; e.g. branches diverging.
Also applies to growth habit.

2.2.47 *Stalked (Stipitate)*

Attached to the supporting plant by a stalk.
Compare 'sessile' and 'pedicelled'.

2.2.48 *Stipitate*

See 'stalked'.

2.2.49 *Sympetalous*

With petals fused, at least partly, into a corolla tube.
Compare 'apopetalous'.

2.2.50 *Terminal, Apical, Distal*

Located at the apex, furthest from the position of attachment.
Compare 'basal', 'proximal', closest to the position of attachment.

EB: Which term is preferred?

CB 2005: Page 64 2.2.50 Would prefer distal

2.2.51 *Tip*

An apical prolongation extending from the general outline of the plant part, e.g. a caudate tip on an ovate leaf.

For UPOV purposes the tip of a plant part is considered to be the most extreme distal or apical point, if existent. When considering the shape of the apex, the tip often requires additional description, to record its nature (e.g. whether hard or soft) or its dimensions (e.g. length).

Using this definition it is possible e.g. for a leaf tip to be absent, i.e. when the most apical part of the blade is rounded. See 'apex'.

2.2.52 *Top*

To be used in relation to soil level. Compare 'tip' and 'apex'.

2.2.53 *Transverse*

Perpendicular to the longitudinal axis, i.e. at right angle to the axis extending through the base and the apex, whether or not this is the longest axis.
Compare 'longitudinal'.

2.2.54 *Ventral*

The upper, inner or adaxial side in relation to the axis.
Compare 'dorsal'.

2.3 Attitude, Orientation, Course

2.3.1 *Arched, Arching*

Strongly curved more or less symmetrically, as an arch.

2.3.2 *Ascending, Upwards*

Growing or orientated gradually upwards in relation to soil level or to other plant parts.

2.3.3 *Attitude*

For UPOV purposes, 'attitude' is used for plant parts, while 'growth habit' is used for the whole plant. 'Attitude' is used in relation to soil level and to other plant parts.
Rather to use 'attitude' instead of 'stance'.

2.3.4 *Compressed*

Flattened laterally or lengthwise.
Compare 'depressed'.

2.3.5 *Concave*

Hollowed; curved inwards.

2.3.6 *Convex*

Rounded and curved outwards.

2.3.7 *Deflexed*

See 'reflexed'.

2.3.8 *Depressed*

Sunken, as if pressed into the middle from above or from above and below, causing a concavity. Compare 'compressed'.

EB: The published definitions seem to use 'compressed' and 'depressed' in a wider sense than we do. We don't use 'depressed' for 'flattened', as in an obloid fruit.
ASL Could say it was for plant parts e.g. base of a fruit and not for whole parts e.g. whole fruit

2.3.9 *Descending, Downwards*

Growing or orientated gradually downwards in relation to soil level or to other plant parts.

2.3.10 *Downwards*

See 'descending'.

2.3.11 *Drooping*

Bending downwards.

Compare 'pendulous' which is hanging, rather than bending downwards.
Also used for growth habit.

2.3.12 *Erect*

Vertical in relation to the ground or perpendicular to the surface where the plant part is attached.

For UPOV purposes 'erect' is used for plant parts only (attitude) and not for the whole plant (habit). The term to be used for plant habit is 'upright'.

2.3.13 *Diffuse*

With plant parts e.g. petals spreading widely, or with branches spreading widely and frequently branching.

Compare 'divergent', spreading at almost right angles to the main axis.

2.3.14 *Horizontal*

Level; parallel to the ground. To be used in relation to soil level, i.e. perpendicular to 'vertical'.

To be used for plant parts and not for growth habit. 'Prostrate' is to be used for habit. 'Adpressed' is preferable for plant parts lying flat on a surface, therefore not necessarily parallel to the ground.

2.3.15 *Incurved*

Curving inwards or upwards (adaxially).

Compare 'inflexed', which is bent inwards or upwards more abruptly.

2.3.16 *Inflated*

Blown up; hollow and swollen in appearance.

2.3.17 *Inflexed*

Bent inwards or upwards (adaxially) abruptly.

Compare 'incurved'.

2.3.18 *Involute*

Inrolled; with margins rolled inwards (adaxially).
Compare 'revolute'.

2.3.19 *Inwards*

Term used by UPOV for a plant part/plant parts facing inwards in relation to the whole plant or in relation to other relevant plant parts, e.g. stamens facing inwards in relation to the corolla.
Compare 'outwards'.

2.3.20 *Longitudinal*

Parallel to the axis extending through the base and the apex, whether or not this is the longest axis.

2.3.21 *Oblique*

Orientated at an angle other than 90 degrees to or parallel to the longitudinal axis.
Applies to the base, apex, two-dimensional outline, position and attitude in relation to plant parts. In some cases the term refers to the shape or symmetry of a plant part, while in others it refers to the position.

2.3.22 *Outwards*

Term used by UPOV for a plant part/ plant parts facing outwards in relation to the whole plant or in relation to other relevant plant parts, e.g. the corolla facing outwards in relation to the longitudinal axis of the flower.
Compare 'inwards'.

2.3.23 *Pendent*

Hanging downwards due to its own weight.
Compare 'pendulous'.
Compare 'drooping' and 'weeping', which are 'bending downwards', 'weeping' being more pronounced than 'drooping'.

2.3.24 *Pendulous*

Hanging downwards, due to the weakness of its support.
Compare 'pendent'.

2.3.25 *Perpendicular*

At right angle to another plant part.

2.3.26 *Recurved*

Curving downwards (abaxially).
Compare 'reflexed', which is bent downwards more abruptly.

2.3.27 *Reflexed (Deflexed)*

Bent downwards (abaxially) abruptly.
Compare 'recurved' of which the downward curving is less abrupt.

2.3.28 *Revolvute*

Rolled backwards; with margins rolled abaxially.
Compare 'involute'.

2.3.29 *Semi-Erect*

Standing up at more or less 45 degrees in relation to the ground or to the surface where the plant part is attached.
For UPOV purposes 'semi-erect' is used for plant parts only (attitude) and not for the whole plant (habit). The term to be used for plant habit is 'semi-upright'.

2.3.30 *Stance*

To use 'attitude', not 'stance'.

2.3.31 *Upwards*

See 'ascending'.

2.3.32 *Vertical*

Upright in relation to the ground. To be used in relation to soil level, i.e. perpendicular to 'horizontal'.

ASL Add Wavy?
EB: agree.

2.3.33 *Zig-zag*

With regular, angular, alternating changes of direction.

2.4 **Symmetry**

2.4.1 *Actinomorphic*

Radially symmetric, so that median division in any direction will produce two equal halves, e.g. inflorescence of Asteraceae.
Compare 'zygomorphic'.

2.4.2 *Asymmetric*

Not being capable of median division into two equal halves in any direction.

2.4.3 *Equilateral*

With sides or halves of equal shape and/or size.
Compare 'inequilateral'.

2.4.4 *Inequilateral*

With sides or halves of unequal shape and/or size; oblique.
Compare 'equilateral'.

2.4.5 *Oblique*

Orientation of plant part: Orientated at an angle other than 90 degrees to or parallel to the longitudinal axis.

Shape of plant part: Inequilateral; bilaterally asymmetric.

Applies to the base, apex, two-dimensional outline, position and attitude in relation to plant parts.

2.4.6 *Symmetric*

Being capable of median division into two equal halves, at least along the longitudinal axis.
Compare 'asymmetric', 'actinomorphic'.

2.4.7 *Trapezoidal*

EB comment: There was a proposal to add 'trapezoidal' but we called it 'oblique rhombic' instead. Do we need 'trapezoidal'? RHS calls it 'trapeziform': 'asymmetrical and four-sided, as a trapezium'.
CB 2005: Page 70 2.4.70 Does not really fit here. Is a shape, not really symmetry. Would question if needed at all?

EB 2005: I would be happy to delete it!

ASL delete

2.4.8 *Zygomorphic*

Bilaterally symmetric, only along the longitudinal axis, e.g. flower of Fabaceae.
Compare 'actinomorphic'.

SECTION F: ARRANGEMENT, DIVISION, BRANCHING AND INFLORESCENCE TYPES

1. ILLUSTRATIONS

2. DEFINITIONS

2.1 Arrangement

2.1.1 Alternate

Staggered; borne singly, as opposed to 'opposite' or 'whorled'.

2.1.2 Circular

Arrangement in a circular shape.
Also applies to two-dimensional shape.

2.1.3 Decussate

In opposite pairs, with successive pairs at right angles to one another.

2.1.4 Imbricate

Overlapping like tiles on a roof.

2.1.5 Linear

Arranged in a line/lines.
Also applies to two-dimensional and three-dimensional shape.

2.1.6 Opposite

Borne in pairs.
Compare 'alternate' and 'whorled'.

2.1.7 *Radiating*

Diverging symmetrically from a central point.

2.1.8 *Random*

‘With no apparent pattern of arrangement’.

2.1.9 *Tristichous*

In three ranks along the axis, the individual parts either alternate or opposite.

2.1.10 *Verticillate*

See ‘whorled’.

2.1.11 *Whorled (Verticillate)*

Borne in groups of three or more, arising from the same level; as opposed to ‘alternate’ or ‘opposite’.

2.2 Division and Branching

EB: I have not yet completed these definitions.

2.2.1 *Bilobate*

Having two lobes; with two subdivisions which are not completely separated and are normally rounded.

Comment: Segments are subdivisions which are completely separated while lobes are only partially divided.

2.2.2 *Bipinnate*

ASL Double pinnate; the primary leaflets again pinnate.

EB: Thanks. OK.

2.2.3 *Compound*

Divided into two or more similar parts, e.g. a leaf with two or more clearly separate leaflets. Compare ‘simple’.

2.2.4 *Determinate*

With the terminal (central) part developing first, thereby limiting the growth of the main axis. Applies to inflorescences, e.g. a cyme.

Compare ‘indeterminate’.

2.2.5 *Dichotomous*

Forked; the axis divided into two equal branches.

2.2.6 *Digitate*

See 'palmate'.

2.2.7 *Distichous*

In two opposite ranks along the axis, the individual parts either alternate or opposite.

2.2.8 *Furcate*

Forked; the terminal lobes prong-like.

2.2.9 *Imparipinnate*

Pinnately compound, with a single terminal leaflet.
Compare 'paripinnate'.

2.2.10 *Indeterminate*

With the terminal (central) part developing last, thus not limiting the growth of the main axis.
Applies to inflorescences, e.g. a raceme, panicle or corymb.
Compare 'determinate'.

2.2.11 *Lobate*

See 'lobed'.

2.2.12 *Lobed (Lobate)*

Having one or more lobes; with subdivisions which are not completely separated and are normally rounded.
Comment: Segments are subdivisions which are completely separated while lobes are only partially divided.

2.2.13 *Palmate (Digitate)*

Lobed, veined or divided from a common point, like the fingers of a hand.

2.2.14 *Palmately Compound*

...

2.2.15 *Palmately Lobed*

A leaf with three or more lobes originating from a common basal point.
Compare 'pinnately lobed'.

2.2.16 *Paripinnate*

Pinnately compound, with an even number of leaflets and none terminal.
Compare 'imparipinnate'.

2.2.17 *Pinnate*

Leaf: Feather-like; a compound leaf with leaflets (pinnae) arranged on opposite sides along an elongated rachis.

Venation: With a single primary vein from which the secondary veins originate.

2.2.18 *Pinnately Compound*

...

2.2.19 *Pinnately Lobed*

A leaf with three or more lobes arranged on opposite sides along an elongated rachis. Compare 'palmately lobed'.

2.2.20 *Segmented (Segment)*

...

2.2.21 *Simple*

Not divided into two or more similar parts, e.g. an undivided leaf or a lobed leaf but not one with two or more clearly separate leaflets.

Compare 'compound'.

2.2.22 *Trifoliolate*

ASL My definition says 'three leaved. Trifoliolate is with three leaflets

2.3 **Inflorescence Types**

2.3.1 *Capitate*

With crowded flowers (florets) borne in a head-like cluster, e.g. Asteraceae. Also applies to a plant part which is stalked and terminates in a knob.

2.3.2 *Corymbose (Corymb)*

Indeterminate inflorescence, flat-topped to convex, the flowers pedicelled, pedicels progressively shorter upward, not arising from a common point, the outer flowers opening first.

Compare 'cyme', in which the terminal flower opens first, and 'umbel' in which the pedicels arise from a common point.

2.3.3 *Cymose (Cyme)*

Determinate inflorescence, flat-topped to convex, the terminal flower opening first.

Compare 'corymb' (pedicels not arising from a common point) and 'umbel' (pedicels arising from a common point), both with the terminal flower opening last.

2.3.4 *Paniculate (Panicle)*

An indeterminate, branched inflorescence, the flowers pedicelled, the lower flowers opening first.

Compare 'raceme', in which the axis is unbranched.

2.3.5 *Racemose (Raceme)*

A long and narrow indeterminate inflorescence with unbranched axis, the flowers pedicelled, the lower flowers opening first.

Compare 'panicle', in which the axis is branched, 'corymb' and 'umbel', which are flat-topped to convex, and 'spike' of which the flowers are sessile.

2.3.6 *Scapose (Scape)*

An erect, leafless peduncle arising from near the ground, typically from a basal rosette in liliaceous plants.

2.3.7 *Spicate (Spike)*

An elongate, indeterminate inflorescence bearing sessile flowers on an unbranched axis. Compare 'raceme' with pedicelled flowers.

2.3.8 *Umbel, Umbellate*

Determinate or indeterminate inflorescence, branched or unbranched, flat-topped to convex, the flowers pedicelled, pedicels arising from a common point.

Compare 'corymb' (terminal flower opening last) and 'cyme' (terminal flower opening first), with pedicels not arising from a common point.

SECTION G: PLANT PARTS AND FRUIT TYPES

1. PLANT PARTS

EB: I have not yet completed these definitions.

1.1 Illustrations

1.2 Definitions

1.2.1 *Bract*

1.2.2 *Calyx*

1.2.3 *Carpel*

1.2.4 *Column*

1.2.5 *Endocarp*

The inner layer of the wall of the fruit (pericarp), e.g. the stony part of a peach. (The middle layer is the mesocarp (flesh) and the outer layer is the exocarp (skin)).

1.2.6 *Exocarp*

The outer layer of the wall of the fruit (pericarp), e.g. the skin of a peach. (The middle layer is the mesocarp (flesh) and the inner layer is the endocarp (stony part)).

1.2.7 *Filament*

1.2.8 *Foliage*

Includes the leaves and branches, not the leaves only. Gives a global impression.

1.2.9 *Inflorescence*

1.2.10 *Lamina*

1.2.11 *Main Vein*

To be used for Monocotyledons.
Compare 'midrib'.

1.2.12 *Mesocarp*

The middle layer of the wall of the fruit (pericarp), e.g. the flesh of a peach. (The inner layer is the endocarp (stony part) and the outer layer is the exocarp (skin)).

1.2.13 *Midrib*

To be used for Dicotyledons.
Compare 'main vein'.

1.2.14 *Peduncle*

1.2.15 *Perianth*

1.2.16 *Pericarp*

The wall of a fruit, sometimes differentiated into exocarp, mesocarp and endocarp.

1.2.17 *Petal*

An individual segment of the corolla, usually the larger, most colorful part of a flower. Compare 'tepal' and 'sepal'.

1.2.18 *Petiole*

1.2.19 *Petiolule*

1.2.20 *Pistil*

1.2.21 *Propagule*

Any plant material which is capable of growing into a plant (tissue culture plantlet, seed, etc.)

1.2.22 *Rhizome*

1.2.23 *Sepal*

An individual segment of the calyx, or outer whorl of a flower, usually green and smaller than the corolla.

Compare 'petal' and 'tepal'.

1.2.24 *Sheath*

1.2.25 *Sinus*

1.2.26 *Spadix*

1.2.27 *Spathe*

1.2.28 *Stalk*

Term used for the stem of a fruit.

1.2.29 *Stamen*

1.2.30 *Stigma*

1.2.31 *Stipule*

Originating from the leaf, not the stem, and therefore to be handled under the leaf characteristics in the Test Guidelines.

1.2.32 *Stolon*

1.2.33 *Style*

1.2.34 *Tepal*

A segment of a perianth which is not differentiated into a calyx and corolla. Often occurs in the Monocotyledons.

Compare 'petal' and 'sepal'.

1.2.35 *Vegetative parts*

Referring to the non-sexual parts of a plant. Vegetative propagation is by means of vegetative material.

2. FRUIT TYPES

2.1 Illustrations

2.2 Definitions

2.2.1 *Berry*

A fleshy, indehiscent fruit, derived from a superior ovary, normally several- to many-seeded, (e.g. tomato).

Compare 'drupe', 'pome'.

2.2.2 *Capsule*

A dry, dehiscent fruit derived from more than one carpel.

Compare 'follicle'.

2.2.3 *Drupe*

A fleshy, indehiscent fruit, derived from a superior ovary, normally one-seeded, with a stony endocarp (e.g. peach, cherry).

Compare 'berry', 'pome'.

2.2.4 *Follicle*

A dry, dehiscent fruit derived from a single carpel, splitting longitudinally along one side.

Compare 'capsule', 'legume'.

2.2.5 *Legume*

A dry, dehiscent, fruit of the Leguminosae (CHECK), derived from a single carpel, splitting longitudinally along two sides (e.g. pea pod).
Compare 'follicle, 'capsule'.

2.2.6 *Nut*

A hard, dry, indehiscent fruit, normally one-seeded.

EB: What about almond, macadamia and pistacio? They are dehiscent.

ASL I think that Almond, macadamia and pistachio are all botanically the same as drupes. The nut is the large seed in a woody pericarp and we do not eat the outside. In plum for example we eat the fleshy outside but discard the nut. I do not know whether they are all single seeded.

EB: Should we delete the word indehiscent? I'm still confused.

2.2.7 *Pod*

A general term for a legume or a follicle or other dry, dehiscent fruit types.

2.2.8 *Pome*

A fleshy, indehiscent fruit, derived from an inferior ovary with several locules, e.g. apple, pear.

2.2.9 *Samara*

A dry, indehiscent, winged fruit.

SECTION H: GENERAL

EB: I have not yet completed these definitions. Where do these terms belong? They don't relate to shape – should we broaden the heading of the document to accommodate these terms?

1. REPRODUCTION TYPES

1.1 *Allogamous*

See 'cross-fertilized'.

1.2 *Apomyctic*

Producing viable seed without fertilization.
Compare 'self-compatible'.

1.3 *Autogamous*

See 'self-fertilized'.

1.4 *Cross-Fertilized (Allogamous)*

Outcrossing, one plant fertilizing another.
Compare self-fertilized.

1.5 *Dioecious*

With unisexual (imperfect) flowers, the male and female borne on different plants.
Compare 'monoecious'.

1.6 *Hermaphrodite*

1.7 *Heterogamous*

1.8 *Heterozygotic*

1.9 *Homozygotic*

1.10 *Monoecious*

With unisexual (imperfect) flowers, the male and female borne on the same plant.
Compare 'dioecious'.

1.11 *Propagation*

Is ~~vegetative~~ multiplication. (To check.)

Compare 'reproduction'.

ASL propagation is a general term and also covers propagation by seed.

Office: propagation covers also seed propagation. Care needed with this term, because it is used in the UPOV Convention ("features of propagation" concerning uniformity)

1.12 *Reproduction*

Is generative multiplication. (To check.)
Compare 'propagation'.

1.13 *Self-Compatible*

Self-fertile; when the plant produces fruit from its own pollen.
Compare 'self-incompatible' and 'apomyctic'.

1.14 *Self-Fertilized (Autogamous)*

Individual flowers fertilizing themselves.
Compare cross-fertilized.

1.15 *Self-Incompatible*

Self-infertile; when the plant cannot produce fruit from its own pollen.
Compare 'self-compatible' and 'apomyctic'.

1.16 *Vegetatively propagated*

Referring to the non-sexual parts of a plant. Vegetative propagation is by means of vegetative material.

2. GROWTH CYCLE TYPES

2.1 *Annual*

A plant of which the full life span is completed in one year, from germination through flowering and seed production to dying down.

2.2 *Biennial*

A plant of which the full life span is completed in two years, from germination and vegetative growth in the first year through flowering and seed production to dying down in the second year.

2.3 *Caducous*

Early deciduous; plant parts falling off very early.

2.4 *Deciduous*

Non-evergreen plants or shedding of all leaves or petals over a specific period.

2.5 *Ephemeral*

An annual with a short growing season.

2.6 *Evergreen*

Having foliage throughout the year.
Compare 'deciduous'.

2.7 *Intermittent (Flowering)*

[...]

2.8 *Perennial*

A plant that lives for more than two years.

2.9 *Persistent*

Plant parts remaining attached and unwithered although similar parts may fall off at an earlier stage (e.g. calyx on a fruit).

2.10 *Remontant*

Flowering twice or more during one season.

3. OTHER

3.1 *Apetalous*

Without petals.

3.2 *Asepalous*

Without sepals

3.3 *Dehiscent*

Splitting open or apart at maturity or when ripe. Applies to a fruit or an anther.

3.4 *Dimorphic*

[...]

3.5 *Indehiscent*

Not splitting open or apart at maturity or when ripe. Applies to a fruit or an anther.

3.6 *Petaloid*

Petal-like in appearance.

3.7 *Resistant*

Compare 'tolerant'.

3.8 *Sepaloid*

Sepal-like in appearance.

3.9 *Tolerant*

Compare 'resistant'.

SECTION I: COLORS

EB: Not for this document?

CB 2005: Colour question: Crimson, lime, cream etc is mentioned. How far do we want to go with other 'colours'; scarlet, mauve, bronze?

EB 2005: Maybe just list them all together in a paragraph.

1. CREAM

A term acceptable for UPOV purposes, for 'yellowish white' or 'near-white' (?) (same situation as 'orange').

2. CRIMSON

For UPOV purposes rather to use 'dark red' or 'purple red'.

3. GRAY

For UPOV purposes use the spelling: 'grey'.

4. GREY

For UPOV purposes use the spelling: 'grey', not 'gray'.

5. LIME

For UPOV purposes rather use 'yellow green' or 'green yellow'.

6. PIGMENTS

EB: Where does this belong?

7. ANTHOCYANIN

Harris 'Water-soluble pigments (blue, purple or red)'

ASL present in plant cells – responsible for blue/purple/ red coloration.

EB: OK.

SECTION J: MASS AND WEIGHT

EB: Where does this belong?

1. MASS

See 'weight'.

2. WEIGHT

To be used instead of 'mass', to avoid confusion with 'volume'.

[End of document]