



TGP/14.2.1 Draft 2 (Rev.)

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**INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS**  
GENEVA

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  
To delete ‘Plant Shapes’. This document deals with  
other terms as well.**

*Document prepared by an expert from South Africa*

*to be considered by the*

*Technical Working Party for Fruit Crops (TWF), at its thirty-fourth session,  
to be held in Niagara Falls, Canada, from September 29 to October 3, 2003*

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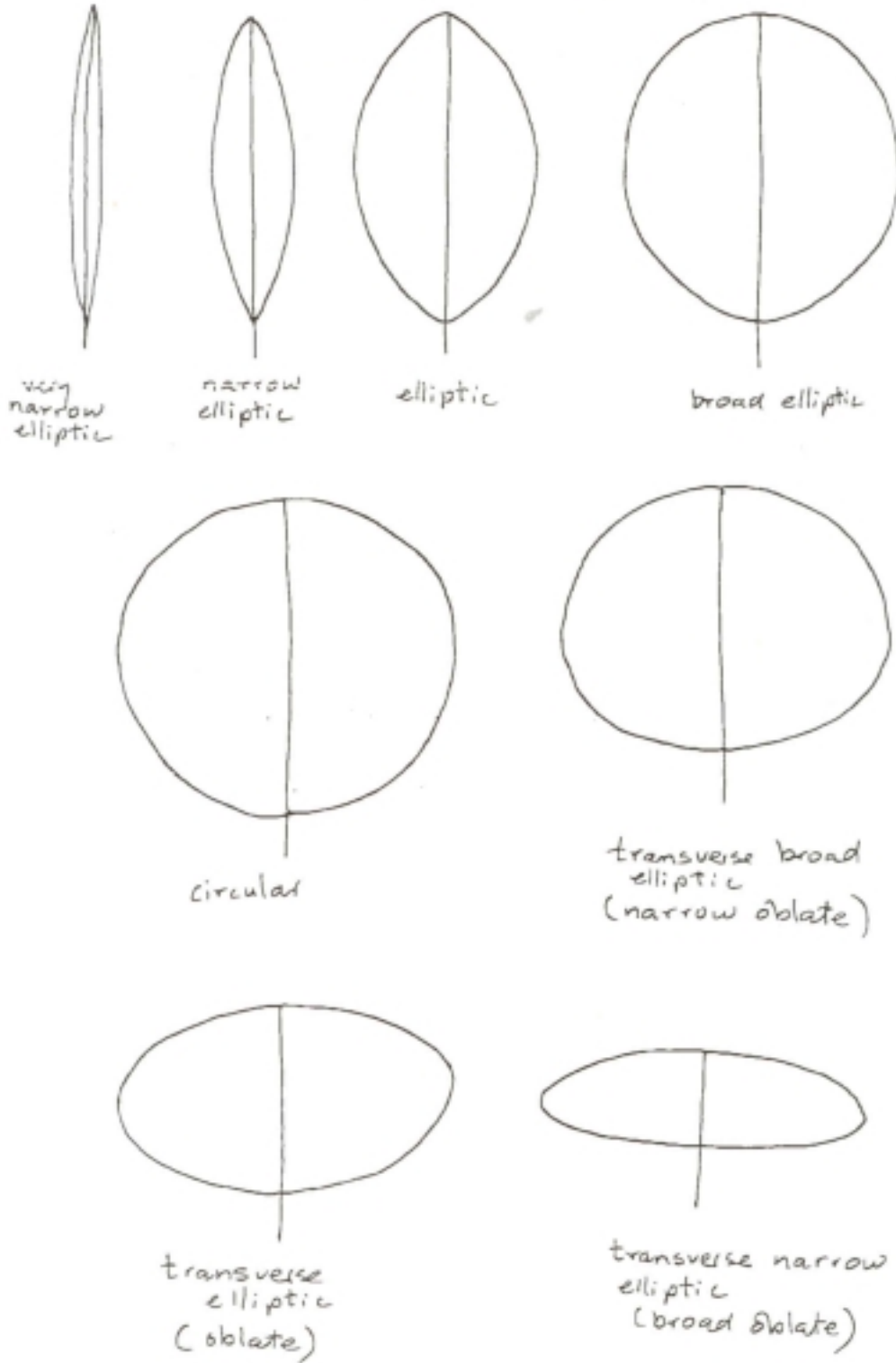
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1. PLANE / TWO-DIMENSIONAL SHAPES

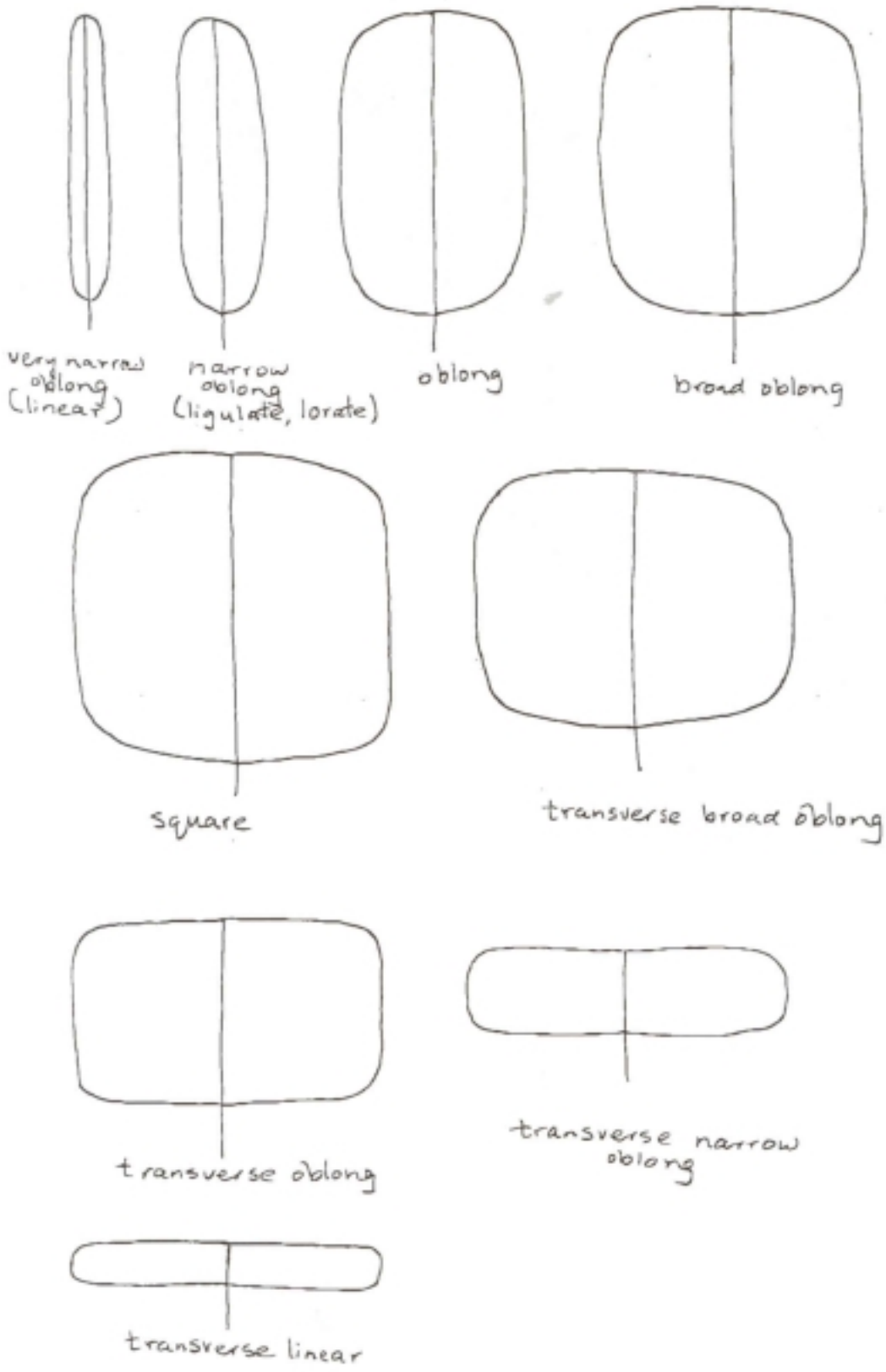
1.1 FULL PLANE SHAPES: ILLUSTRATIONS

Elliptic (1.1.8) / Circular (1.1.3) / Oblate (1.1.21)

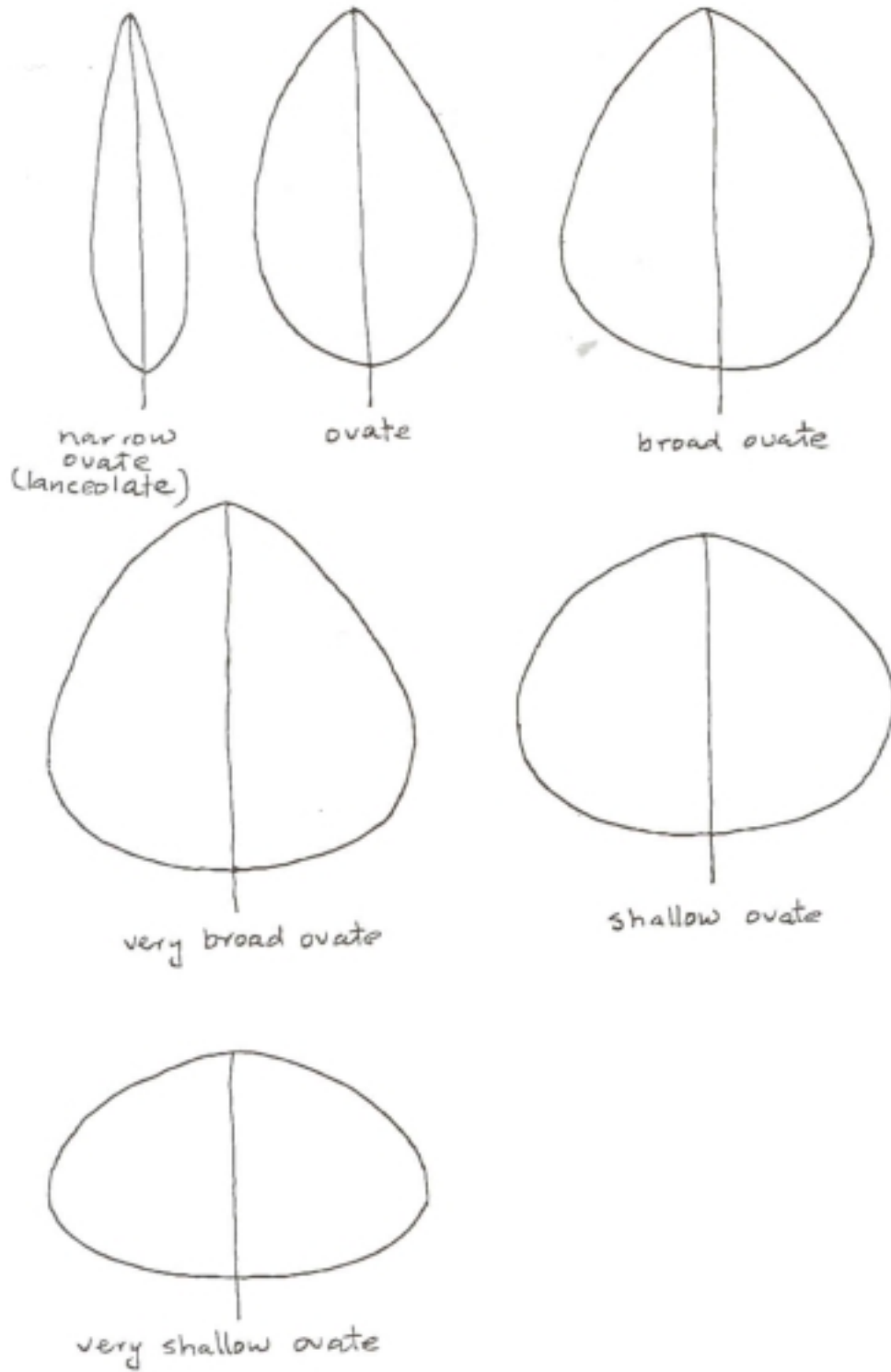




Oblong (1.1.23) / Square (1.1.36) / Linear (1.1.14)



Ovate (1.1.27) / Lanceolate (1.1.12)



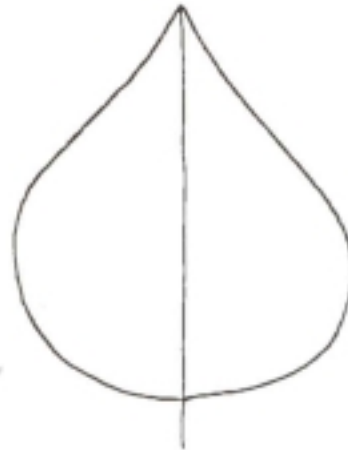
Ovate (1.1.27) / Lanceolate – with Acute Apex (1.1.12)



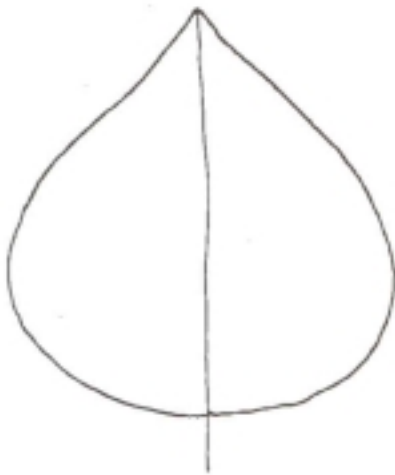
narrow ovate  
(lanceolate)



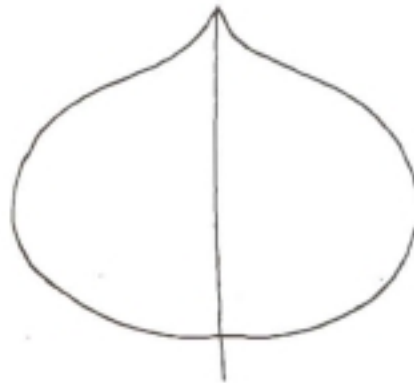
ovate



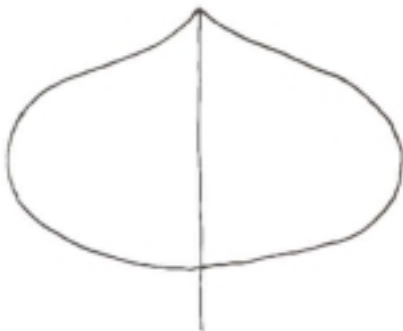
broad ovate



very broad ovate

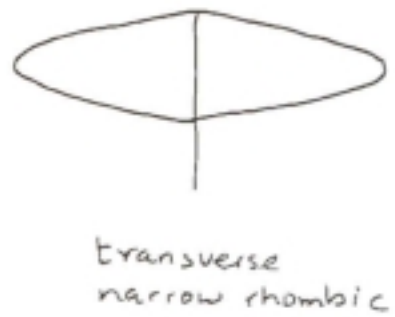
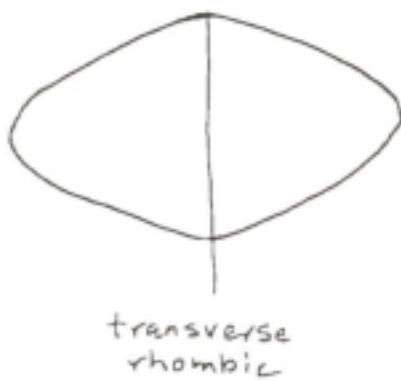
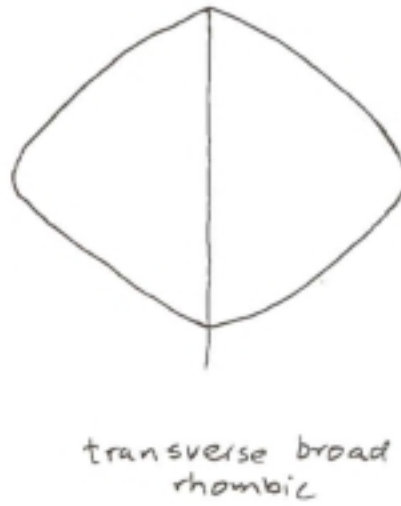
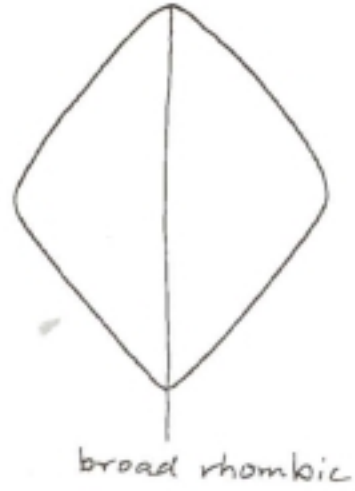


shallow ovate

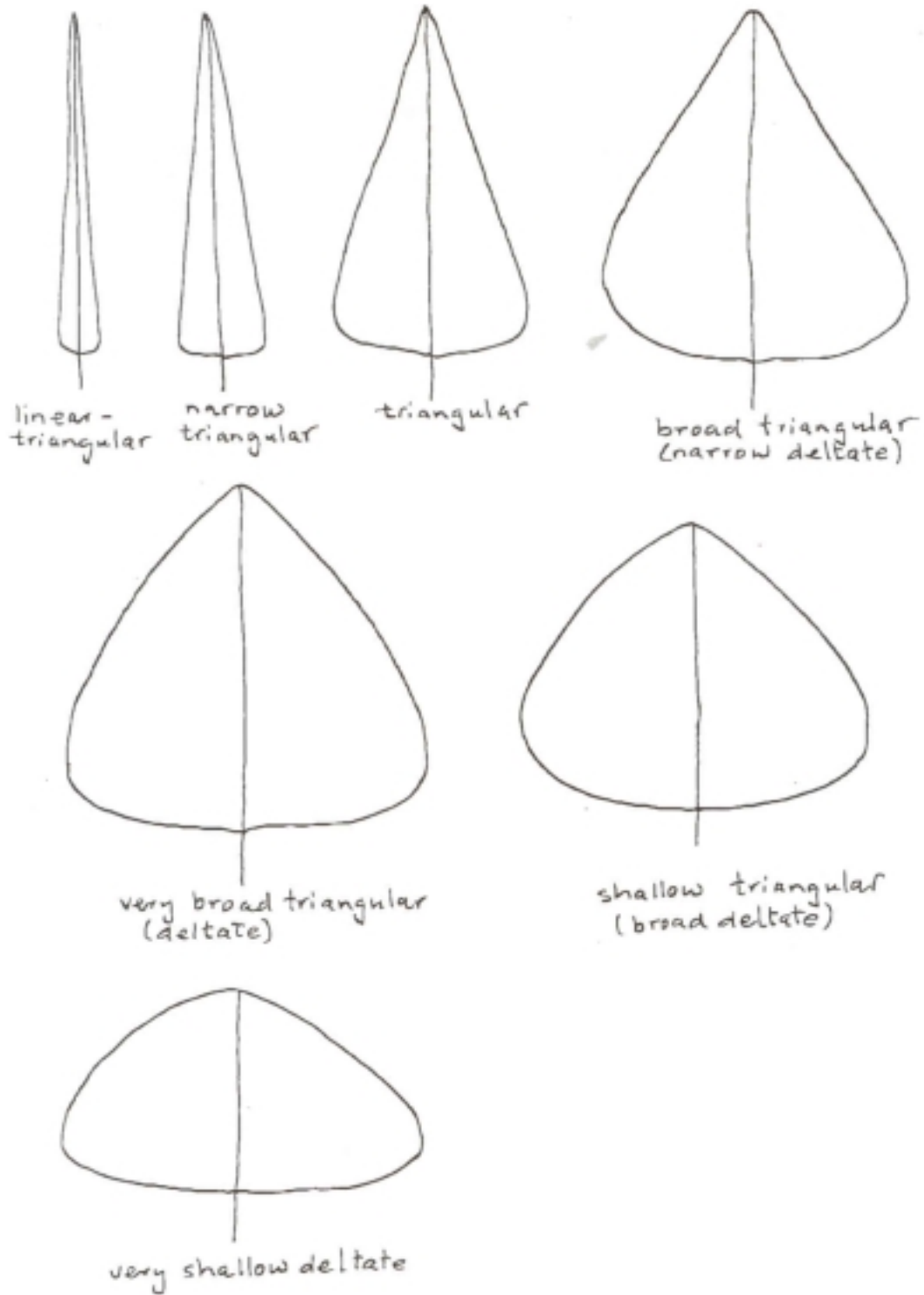


very shallow ovate

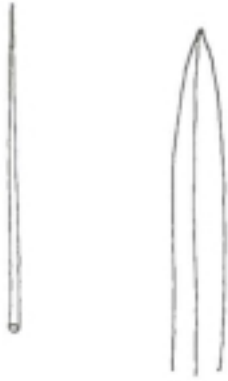
Rhombic (1.1.32)



Triangular (1.1.38) / Deltate (1.1.6)



Acicular (1.1.1) / Subulate (1.1.37) / Clawed (Unguiculate) (1.1.4) / Spatulate (1.1.35) /  
Cordiform (1.1.5) / Hastiform (1.1.11) / Sagittate (1.1.33) / Furcate (1.1.10) /  
Falcate (1.1.9) / Reniform (1.1.31)



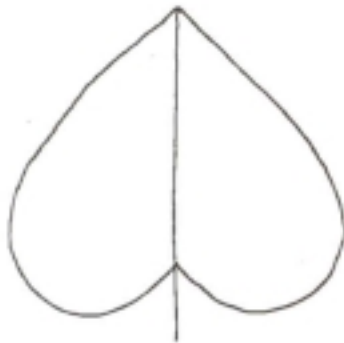
acicular subulate



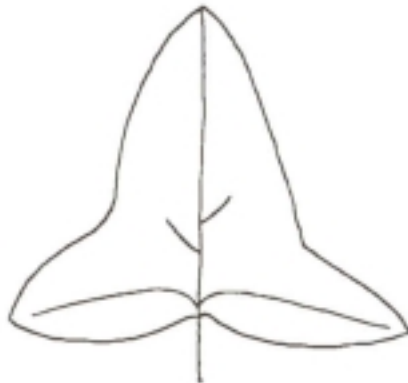
clawed (unguiculate)



spatulate



cordiform



hastiform



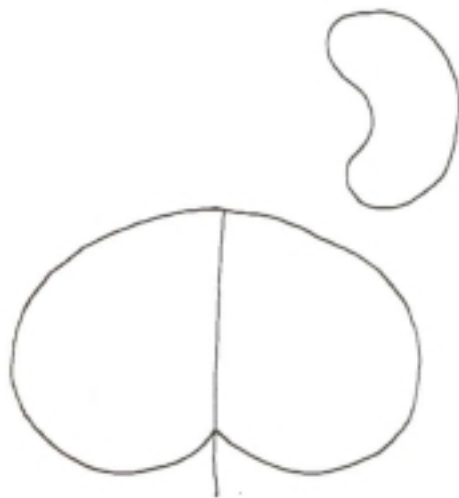
sagittate



furcate



falcate



reniform

Lunate (1.1.18)



lunate

## 1.1 FULL PLANE SHAPES: DEFINITIONS

### 1.1.1 Acicular

Needle-shaped; long and narrow and tapering to a fine point.

Applies primarily to three-dimensional shape (a needle which is circular in cross-section) but may also be used for the outline.

*Comments for Subgroup:*

*EB: We could use it as a two-dimensional shape for something much narrower than linear (linear has a ratio of more than 6:1, more or less 12:1). Should this be added to the three-dimensional shapes?*

### 1.1.2 Bilobate

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

*Comment: Segments are subdivisions which are completely separated.*

### 1.1.3 Circular

Round; the term ‘circular’ is preferable to ‘round’ for UPOV use.

### 1.1.4 Clawed (Unguiculate)

Abruptly contracted to a narrow and often elongate basal portion.

Used for petals and sepals.

Compare ‘spatulate which narrows towards the base more gradually.’

### 1.1.5 Cordiform

Heart-shaped in overall outline; with two rounded basal lobes, the broadest part near the base and tapering fairly straightly to the apex.

Compare ‘cordate’ which applies to the base.

### 1.1.6 Deltate

More or less equilaterally triangular; narrowing towards the apex, away from the point of attachment. Length/width ratios:

Narrow deltate	1,2:1	(broad triangular)
Deltate	1:1	(very broad triangular)
Broad deltate	1:1,2	(shallow triangular)

Compare ‘deltoid’ which applies to three-dimensional shape, also compare the ‘triangular’ series and ‘obdeltate’ which narrows towards the base.



*Comments for Subgroup:*

*EB 2003: Is it OK for UPOV purposes to have 'deltate' for two-dimensional shape and 'deltoid' for three-dimensional shape? Some publications have 'deltoid' as two-dimensional. Is it widely accepted as such?*

#### 1.1.7 Digitate

See 'palmate'.

#### 1.1.8 Elliptic

Ellipse shaped; broadest at the middle, with margins tapering convexly and uniformly to either end. Length/width ratios for the elliptic series:

Very narrow elliptic	more than 6:1
Narrow elliptic	6:1 to 3:1
Elliptic	2:1 to 1,5:1
Broad elliptic	1,2:1
Circular	1:1
Transverse broad elliptic	1:1,2 (narrow oblate)
Transverse elliptic	1:1,5 to 1:2 (oblate)
Transverse narrow elliptic	1:3 to 1:6 (broad oblate)

*Comments for Subgroup:*

*EB: See discussion under 'oblate'.*

*EB: To change 'uniformly' to evenly?*

#### 1.1.9 Falcate

Sickle-shaped; strongly curved sideways.

#### 1.1.10 Furcate

Forked; the terminal lobes prong-like.

#### 1.1.11 Hastiform

Generally triangular; gradually enlarged basally from an acute apex, then abruptly expanded into two acute, widely divergent basal lobes.

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

#### 1.1.12 Lanceolate

Lance-shaped; narrow ovate, broadest towards the base (towards the point of attachment). The apex may have a sharp or blunt tip. Length/width ratio 6:1 to 3:1.

Compare the 'ovate' series.

#### 1.1.13 Ligulate (Lorate)

Strap-shaped in overall outline; long and narrow, with the lateral margins parallel. Length/width ratio 6:1 to 3:1, same as narrow oblong.

Compare the 'oblong' series.

#### 1.1.14 Linear

Long and narrow, with the lateral margins parallel. Length/width ratio more than 6:1.

Compare the 'oblong' series.

*Comments for Subgroup:*

*EB: I said 'more than 6:1' to be in agreement with the whole series. If we only say 12:1 or 10:1 then there is a gap between this and 6:1, which is the next narrowest in the series.*

#### 1.1.15 Lobate

See 'lobed'.

#### 1.1.16 Lobed (Lobate)

Having one or more lobes; with subdivisions which are not completely separated and are normally rounded.

*Comments: segments are subdivisions which are completely separated.*

#### 1.1.17 Lorate

See 'ligulate'.

#### 1.1.18 Lunate

Crescent-shaped with the ends more or less acute.

Compare 'reniform'.

#### 1.1.19 Obdeltate

Inversely deltate; more or less equilaterally triangular, narrowing towards the base, that is towards the point of attachment. Length/width ratios:

Narrow obdeltate	1,2:1	(broad obtriangular)
Obdeltate	1:1	(very broad obtriangular)
Broad obdeltate	1:1,2	(shallow obtriangular)

Compare 'obdeltoid' which applies to three-dimensional shape, also compare the 'obtriangular' series and 'deltate' which narrows towards the apex.

### 1.1.20 Oblanceolate

Inversely lanceolate; narrow obovate, broadest towards the apex (furthest from the point of attachment). Length/width ratio 6:1 to 3:1.

Compare the 'obovate' series.

### 1.1.21 Oblate

Transverse elliptic; ellipse shaped but shorter than broad; broadest at the middle, with margins tapering convexly and evenly to both ends, the longest dimension orientated transversely. Length/width ratios:

Narrow oblate	1;1,2	(transverse broad elliptic)
Oblate	1:1,5 to 1:2	(transverse elliptic)
Broad oblate	1:3 to 1:6	(transverse narrow elliptic)

Compare the 'elliptic' series

*Comments for Subgroup:*

*EB: Is this the right way round – that 'narrow oblate' is closer to circular than 'broad oblate'? See also the 'elliptic' series.*

*AL: This is the right way round but could cause some confusion.*

### 1.1.22 Oblique

Inequilateral; bilaterally asymmetric.

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

### 1.1.23 Oblong

With more or less parallel sides terminating obtusely at both ends. Length/width ratios for the oblong series:

Very narrow oblong	more than 6:1, normally referred to as 'linear'
Narrow oblong	6:1 to 3:1, also referred to as 'ligulate' ('lorate')
Oblong	2:1 to 1,5:1
Broad oblong	1,2:1
Square	1:1
Transverse broad oblong	1:1,2
Transverse oblong	1:1,5 to 1:2
Transverse narrow oblong	1:3 to 1:6
Transverse linear	less than 1:6

#### 1.1.24 Obovate

Inversely ovate; broadest above the middle (towards the apex) and narrowest towards the point of attachment. Length/width ratios for the obovate series:

Narrow obovate	6:1 to 3:1, normally referred to as 'oblanceolate'
Obovate	2:1 to 1,5:1
Broad obovate	1,2:1
Very broad obovate	1:1
Shallow obovate	1:1,2
Very shallow obovate	1:1,5 to 1:2

Compare 'ovate' which is broadest towards the base.

*Comments for Subgroup:*

*EB: You will see that I am trying to standardise between the L/W ratios of the different series. I'm also considering e.g. 'depressed obovate' to be narrower than 'broad depressed obovate'. To me this seems to agree better with our UPOV concept than the examples mentioned in some of our selected publications, which are the other way round. See also 'oblate'.*

*EB: Considering my new comments (July 2003) concerning 'compressed' and 'depressed', I have replaced 'depressed' above with 'shallow'. OK? As far as I know, we consider 'depressed' to have some concavity, so I don't think we should use it if we simply mean 'compressed'. The term 'shallow' is used for some of our other shape series, so I suppose it's OK here.*

#### 1.1.25 Obtriangular

With three more or less straight sides, broadest at the apex and narrowing towards the point of attachment. Length/width ratios for the obtriangular series:

Very narrow obtriangular	more than 6:1
Narrow obtriangular	6:1 to 3:1
Obtriangular	2:1 to 1,5:1
Broad obtriangular	1,2:1 (narrow obdeltate)
Very broad obtriangular	1:1 (obdeltate)
Shallow obtriangular	1:1,2 (broad obdeltate)
Very shallow obtriangular	1:1,5 to 1:2

*Comments for Subgroup:*

*EB: I have tried to keep to our standardised ratios but some deviate a bit from the publications, which differ from one another anyway. Also compare 'deltate' which I changed to 'more or less equilateral' to provide for 'narrow deltate' to 'broad deltate'.*

*EB: Have replaced 'linear-obtriangular' with 'very narrow obtriangular' to correspond to the 'obconic' series.*

#### 1.1.26 Orbicular

*Comment for Subgroup:*

*EB 2003: Is it a synonym of 'circular'?*

### 1.1.27 Ovate

Chicken-egg-shaped; broadest below the middle (towards the base, which is towards the point of attachment), the margin entirely convex, although the apex may be either rounded or pointed. Length/width ratios for the ovate series:

Narrow ovate	6:1 to 3:1, normally referred to as 'lanceolate'
Ovate	2:1 to 1,5:1
Broad ovate	1,2:1
Very broad ovate	1:1
Shallow ovate	1:1,2
Very shallow ovate	1:1,5 to 1:2

Compare 'obovate' which is broadest towards the apex.

*Comments for Subgroup:*

*EB: You will see that I am trying to standardise between the L/W ratios of the different series. I'm also considering e.g. 'depressed ovate' to be narrower than 'broad depressed ovate'. To me this seems to agree better with our UPOV concept than the examples mentioned in some of our selected publications see Radford), which are the other way round. See also 'oblate'.*

### 1.1.28 Palmate (Digitate)

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

### 1.1.29 Palmatifid

Palmately cleft rather than lobed.

*Comments for Subgroup:*

*EB 2003: Do we need the terms 'palmatifid' (deeper incisions than 'lobed') and 'palmatisect' (deeper than 'palmatifid' but not totally divided. For our purposes we could perhaps just say 'lobed' and then 'depth of lobes' with states 'shallow' to 'deep'.*

### 1.1.30 Rectangular

Quadrangular; four-sided with opposite sides parallel and all angles approximately 90 degrees. Opposite sides are of equal length but adjacent sides are of different lengths.

*Comments for Subgroup:*

*EB: The diagram in RADFORD for the oblong figures fit our meaning of rectangular. The definition is from a general dictionary rather than a Botanical dictionary. Should the use of 'rectangular' be dropped from UPOV Guidelines?*

*AL: Agree to delete but I think the 'oblong' definition could be altered slightly. I like the 'sides' and 'angles' in the definition of 'rectangular'.*

### 1.1.31 Reniform

Kidney-shaped in general outline; thickly lunate with rounded ends.

### 1.1.32 Rhombic

Diamond-shaped; broadest at the middle and tapering with more or less straight margins to the basal and apical end. Length/width ratios for the rhombic series:

Narrow rhombic	6:1 to 3:1
Rhombic	2:1 to 1,5:1
Broad rhombic	1,2:1
Quadrate rhombic	1:1
Transverse broad rhombic	1:1,2
Transverse rhombic	1:1,5 to 1:2
Transverse narrow rhombic	1:3 to 1:6

### 1.1.33 Saggitate

Arrowhead-shaped in overall outline; generally triangular, gradually enlarged basally, with two more or less triangular basal lobes directed downward.

Applies to the leaf base and overall leaf outline.

Compare 'hastiform' of which the lobes are directed outwards.

### 1.1.34 Spathulate

See 'spatulate'.

### 1.1.35 Spatulate (Spathulate)

Spoon-shaped in overall outline; attenuate and narrowly extended basally, broadly expanded distally, the distal portion with a convex margin.

Compare 'clawed' ('unguiculate') which narrows more abruptly towards the base.

*Comments for Subgroup:*

*EB: Please check whether you agree. How does it differ from 'clawed'?*

### 1.1.36 Square

Equilaterally quadrangular, with all sides the same length. Length/width ratio 1:1.

See the 'oblong' series.

### 1.1.37 Subulate

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

### 1.1.38 Triangular

With three more or less straight sides, broadest at the base, that is at the point of attachment, and narrowing towards the apex. Length/width ratios for the triangular series:

Linear-triangular	more than 6:1
Narrow triangular	6:1 to 3:1
Triangular	2:1 to 1,5:1
Broad triangular	1,2:1 (narrow deltate)
Very broad triangular	1:1 (deltate)
Shallow triangular	1:1,2 (broad deltate)
Very shallow triangular	1:1,5 to 1:2

Compare 'conic' which applies to three-dimensional shape.

*Comments for Subgroup:*

*EB: I have tried to keep to our standardised ratios but some deviate a bit from the publications, which differ from one another anyway. Also compare 'deltate' which I changed to 'more or less equilateral' to provide for 'narrow deltate' to 'broad deltate'.*

### 1.1.39 Trullate

*Comment for Subgroup:*

*EB: I propose to delete because we use 'lanceolate'.*

### 1.1.40 Unguiculate

See 'clawed'.

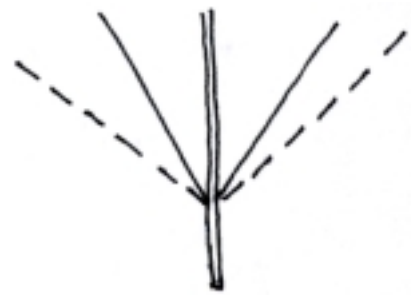
1.2 BASE: ILLUSTRATIONS



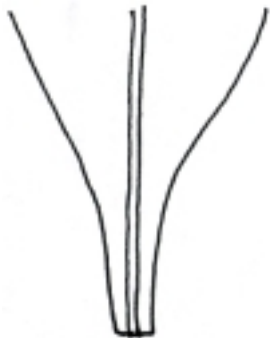
Attenuate (1.2.2)



Acute (1.2.1)



Cuneate (1.2.5)



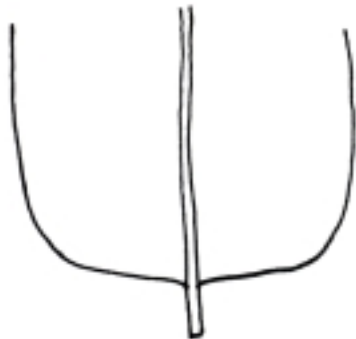
Decurrent (1.2.6)



Obtuse (1.2.9)



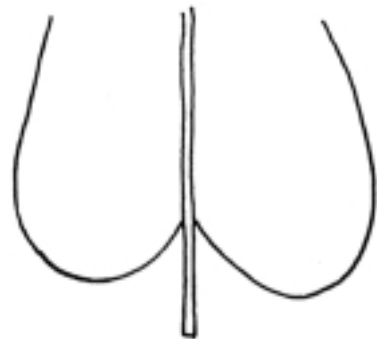
Rounded (1.2.11)



Truncate (1.2.13)



Oblique (1.2.8)



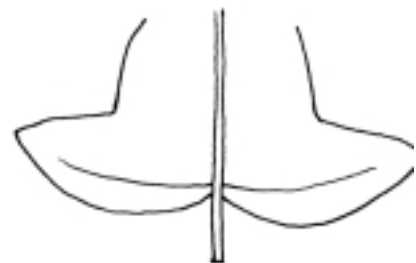
Cordate (1.2.4)



Auriculate (1.2.3)



Sagittate (1.2.12)



Hastate (1.2.7)



## 1.2 BASE: DEFINITIONS

### 1.2.1 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', of which the angle is >90 °.

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

### 1.2.2 Attenuate

Tapering gradually with the lateral margins concave.

Applies to the base.

Compare 'acuminate' which applies to the apex.

*Comments for Subgroup:*

*EB: See Alison's draft. I propose we keep it for base only, otherwise we'll have even more confusion trying to distinguish it from 'acuminate'.*

### 1.2.3 Auriculate

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

Applies to the base.

Compare 'hastate', with triangular lobes.

### 1.2.4 Cordate

Heart-shaped; with two equal, more or less rounded lobes and a deep basal sinus between, the lobes either overlapping one another or not.

Applies to the base.

Compare 'cordiform' which applies to an overall plane outline.

*Comments for Subgroup:*

*EB: I propose that we keep 'cordate' as a base shape and 'cordiform' as a full plane shape (what to say instead of 'full shape', Chris? I tried 'overall outline' – will that work?). We could include 'obcordate' as an apex shape if you think we should – see Alison's draft.*

### 1.2.5 Cuneate

Wedge-shaped; inversely triangular, the lateral margins straight or nearly so and converging at the base at either an acute or an obtuse angle.

Applies to the base.

*Comments for Subgroup:*

*EB: Radford seems to be very wrong.*

### 1.2.6 Decurrent

Running downward; with the base of the leaf blade prolonged downward to the stem as a wing.

Applies to the base of a leaf blade.

### 1.2.7 Hastate

Arrow-shaped; with two equal, more or less triangular lobes directed outward.

Applies to the base of a leaf blade.

Compare 'auriculate', with rounded lobes, 'hastiform' which applies to an overall plane outline and 'saggitate' with lobes directed downward.

### 1.2.8 Oblique

Inequilateral; bilaterally asymmetric.

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

### 1.2.9 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', of which the angle is <90°.

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

### 1.2.10 Pointed

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

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

### 1.2.11 Rounded

Curved like the arc of a circle.

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

### 1.2.12 Saggitate

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

Applies to the leaf base and overall leaf outline.

Compare 'hastate' (applies to base) and 'hastiform' (applies to overall plane outline), with triangular lobes directed outward.

1.2.13 Truncate

With the lateral margins abruptly rounded to a straight, transverse, proximal margin (or distal in the case of the apex), which is squared as if cut off.

Applies to the apex and base.

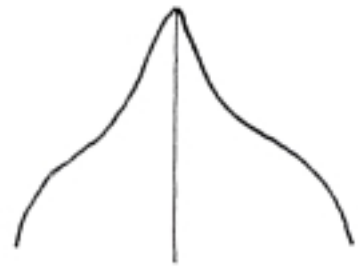
1.3 APEX: ILLUSTRATIONS



Apiculate (1.3.3)



Cuspidate (1.3.7)



Acuminate (1.3.1)



Acute (1.3.2)



Obtuse (1.3.13)



Rounded (1.3.17)



Caudate (1.3.5)



Mucronate (1.3.10)



Aristate (1.3.4)



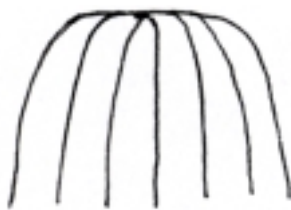
Pungent (1.3.15)



Cirrhous (1.3.6)



Oblique (1.3.12)



Truncate (1.3.18)



Retuse (1.3.16)



Emarginate (1.3.8)

### 1.3 APEX: DEFINITIONS

#### 1.3.1 Acuminate

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

Applies to the apex.

Compare 'apiculate', which tapers more abruptly, and 'caudate', which tapers more gradually.

*Comments: In some cases it could be helpful to distinguish between 'short acuminate', 'medium acuminate' and 'long acuminate'.*

#### 1.3.2 Acute

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

Applies to the apex, base, etc.

Compare 'obtuse', of which the angle is >90 °.

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

#### 1.3.3 Apiculate

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

Applies to the apex.

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

#### 1.3.4 Aristate

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

Applies to the apex or used for other parts where bristles may occur.

Compare 'mucronate', of which the point is shorter.

#### 1.3.5 Caudate

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

Applies to the apex.

Compare 'acuminate' of which the point is shorter.

#### 1.3.6 Cirrhous

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

Applies to the apex or to other parts with tendrils.

### 1.3.7 Cuspidate

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

Applies to the apex.

Compare ‘mucronate’, which is only vascular, ‘apiculate’, which is not rigid and ‘pungent’, which is a long point.

### 1.3.8 Emarginate

Notched; with an acute, deep, central sinus.

Applies to the apex.

Compare ‘retuse’ which refers to an obtuse, shallower sinus.

*Comments: A characteristic describing the emarginate apex may be separated from one dealing with the general shape of the apex, since it is possible to have different combinations of both, e.g. ‘general shape of apex: acuminate, acute, obtuse, rounded’ and a second characteristic ‘emarginate apex: absent, present’.*

*Could also be referred to as ‘obcordate’ if the overall outline conforms.*

### 1.3.9 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 apex.

Compare ‘aristate’ which has a longer point and ‘cuspidate’ which is both vascular and laminar.

### 1.3.10 Mucronulate

Minutely mucronate, diminutive of mucronate.

Applies to the apex.

### 1.3.11 Obcordate

Inversely heart-shaped; with two equal, more or less rounded lobes and an apical sinus between them.

*Comments: Could also be referred to as ‘emarginate’.*

### 1.3.12 Oblique

Inequilateral; bilaterally asymmetric.

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

### 1.3.13 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', of which the angle is <90 °.

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

### 1.3.14 Pointed

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

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

### 1.3.15 Pungent

Terminating in a rigid, long, sharp point which is both vascular and laminar in nature (as in Yucca leaf).

Applies to the apex.

Compare 'cuspidate', which has a shorter point.

### 1.3.16 Retuse

Notched; with an obtuse, shallow, central sinus.

Applies to the apex.

Compare 'emarginate' which refers to an acute, deeper sinus.

*Comments: A characteristic describing the retuse apex may be separated from one dealing with the general shape of the apex, since it is possible to have different combinations of both, e.g. 'general shape of apex: acuminate, acute, obtuse, rounded' and a second characteristic 'retuse apex: absent, present'.*

### 1.3.17 Rounded

Curved like the arc of a circle.

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

### 1.3.18 Truncate

With the lateral margins abruptly rounded to a straight, transverse, distal margin (or proximal in the case of the base), which is squared as if cut off.

Applies to the apex and base.

## 2. THREE-DIMENSIONAL SHAPES

### 2.1 ACICULAR

Needle-shaped; rigid, elongate and tapering to a fine point from a narrow base. Round or grooved in transverse section.

*Comments for Subgroup:*

*EB: See comments under 'canaliculate'.*

### 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' and 'cup-shaped'.

### 2.3 CANALICULATE

Channeled; gutter-shaped; elongate, with a longitudinal groove.

*Comments for Subgroup:*

*AL: Not to have 'elongate' in the definition if we say that we should not use it as a shape. Propose 'much longer than broad'.*

*EB: 'Elongate' is a very useful term for a general shape that is more or less straight and much longer than 'broad'. It's the same as 'round'. It gives an idea of a shape although it is not the shape itself. Also see 'cylindric', 'acicular', etc. How about 'long and thin'? We could use 'thin' instead of 'narrow' because it is three-dimensional. But Radford (see e.g. 'conic') speaks about 'broadly ...' and 'narrowly ...' in the case of solid shapes, so I suppose we could say 'narrow' for 'thin'. After working through many of these terms I can't find anything to really replace 'elongate'.*

### 2.4 CONIC

Cone-shaped; tapering evenly from a circular base to an acute apex. Length/diameter ratios for the conic series:

Very narrow conic	more than 6:1
Narrow conic	6:1 to 3:1
Conic	2:1 to 1,5:1
Broad conic	1,2:1 (narrow deltoid)
Very broad conic	1:1 (deltoid)
Shallow conic	1:1,2 (broad deltoid)
Very shallow conic	1:1,5 to 1:2

Compare 'triangular' which applies to two-dimensional shape and 'obconic' which has the broadest part at the apex.

*Comments for Subgroup:*

*You will see in Radford that they use all sorts of different terms for the different L/W dimensions such as 'subulate', 'narrowly pyramidal', etc. which I think is very confusing. Is it OK if we restrict ourselves to only 'triangular' for the two-dimensional shape and 'conic' for the three-dimensional shape and deltate/deltoid for more or less equilateral triangles/cones?*



## 2.5 CUNEIFORM

*Comments for Subgroup:*

*EB: Propose to delete. For the two-dimensional shape we have 'cuneate' and for the three-dimensional shape we have 'obconic'. We could either delete it totally or refer to it as a synonym of 'obconic'.*

## 2.6 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.

*Comments for Subgroup:*

*EB 2003: Please help with this definition. I think it is correct but – how to put it in the right words?*

## 2.7 CYLINDRIC

Elongate with a uniform diameter, circular in transverse section.

*Comments for Subgroup:*

*EB: Please help with wording to replace 'uniform'. See also 'elliptic' and 'ellipsoid'. What about 'even'/'evenly'? How does 'cylindric' differ from 'tubular'? Can 'cylindric' be solid, while 'tubular' is always hollow?*

## 2.8 DELTOID

More or less equilaterally cone-shaped; tapering evenly from a circular base to an acute apex.

Length/diameter ratios:

Narrow deltoid	1,2:1	(broad conic)
Deltoid	1:1	(very broad conic)
Broad deltoid	1:1,2	(shallow conic)

Compare 'deltate' which applies to two-dimensional shape, also compare the 'conic' series and 'obdeltoid' which narrows towards the base.

*Comments for Subgroup:*

*EB: See comments under 'conic'.*

## 2.9 ELLIPSOID

A three-dimensional ellipse; broadest at the middle, with margins tapering convexly and uniformly to either end. Length/diameter ratios for the ellipsoid series:

Very narrow ellipsoid	more than 6:1
Narrow ellipsoid	6:1 to 3:1
Ellipsoid	2:1 to 1,5:1
Broad ellipsoid	1,2:1
Globose, spheric	1:1
Transverse broad ellipsoid	1:1,2 (narrow obloid)
Transverse ellipsoid	1:1,5 to 1:2 (obloid)
Transverse narrow ellipsoid	1:3 to 1:6 (broad obloid)

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

*Comments for Subgroup:*

*Here we have 'uniformly' again.*

## 2.10 FUNNEL-SHAPED (INFUNDIBULAR)

With an obconic tube gradually diverging distally.

Compare 'campanulate' and 'cup-shaped' which are rounded basally.

## 2.11 FUSIFORM

Spindle-shaped; elongate, thick in the middle and tapering to both ends.

*Comments for Subgroup:*

*EB: Here we have 'elongate' again.*

## 2.12 GLOBOSE (SPHERIC)

Spheric; round in outline when viewed from any angle.

## 2.13 INFUNDIBULAR

See 'funnel-shaped'.

## 2.14 LENTICULAR

Lens-shaped; doubly convex.

*Comments for Subgroup:*

*EB: We could also add 'narrow' to this definition as in RHS but it appears that it should be narrow in lateral view and circular perpendicular to that. We can't just say narrow because that would give the impression that the shape is elliptic in all lateral views. Do you agree that the above definition is sufficient?*

## 2.15 OBCONIC

Very narrow obconic	more than 6:1	
Narrow obconic	6:1 to 3:1	
Obconic	2:1 to 1,5:1	
Broad obconic	1,2:1	(narrow obdeltoid)
Very broad obconic	1:1	(obdeltoid)
Shallow obconic	1:1,2	(broad obdeltoid)
Very shallow obconic	1:1,5 to 1:2	

## 2.16 OBLOID

Transverse ellipsoid; shorter than broad, thus broadest at the middle with margins tapering convexly and evenly to both ends, the longest dimension orientated transversely. Length/width ratios:

Narrow obloid	1:1,2	(transverse broad ellipsoid)
Obloid	1:1,5 to 1:2	(transverse ellipsoid)
Broad obloid	1:3 to 1:6	(transverse narrow ellipsoid)

## 2.17 OBOVOID

Inversely ovoid; broadest above the middle (towards the apex) and narrowest towards the point of attachment. Length/width ratios for the obovoid series:

Narrow obovoid	6:1 to 3:1
Obovoid	2:1 to 1,5:1
Broad obovoid	1,2:1
Very broad obovoid	1:1
Depressed obovoid	1:1,2
Broad depressed obovoid	1:1,5 to 1:2

Compare 'ovoid' which is broadest towards the base and 'ovate' which applies to two-dimensional shape.

## 2.18 OVOID

Chicken-egg-shaped; broadest below the middle (towards the base, which is towards the point of attachment), the margin entirely convex, although the apex may be either rounded or pointed. Length/width ratios for the ovoid series:

Narrow ovoid	6:1 to 3:1
Ovoid	2:1 to 1,5:1
Broad ovoid	1,2:1
Very broad ovoid	1:1
Depressed ovoid	1:1,2
Broad depressed ovoid	1:1,5 to 1:2

## 2.19 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 ratios for the rhomboid series:

Narrow rhomboid	6:1 to 3:1
Rhomboid	2:1 to 1,5:1
Broad rhomboid	1,2:1
Quadrangle rhomboid	1:1
Transverse broad rhomboid	1:1,2
Transverse rhomboid	1:1,5 to 1:2
Transverse narrow rhomboid	1:3 to 1:6

## 2.20 SPHERIC (GLOBOSE)

Globose; round in outline when viewed from any angle.

## 2.21 SPHEROID

*Comments for Subgroup:*

*EB: The Oxford Dictionary and some botanical glossaries define 'spheroid' as 'broad ellipsoid'. Radford defines it as with a ratio of 1:1. What should we do?*

## 2.22 TEREETE

Elongate, slender, tapering towards the apex, circular in transverse section.

*Comments for Subgroup:*

*EB: Use of the word 'uniform'.*

## 2.23 TUBULAR

Cylindric and hollow.

*Comments for Subgroup:*

*EB: How does 'cylindric' differ from 'tubular'? Can 'cylindric' be solid or hollow, while 'tubular' is always hollow? I think 'tubular' is useful for the corolla shapes.*

**3. SURFACE AND TEXTURE**

3.1 BLISTERED

3.2 BLOTCHES

3.3 BUMPY

3.4 DOTTED

3.5 FLUSHED

3.6 GLOSSY

3.7 GROOVED

3.8 MARBLED

3.9 MOTTLED

3.10 PATCHES

3.11 SPECKLED

3.12 SPOTTED

3.13 STRIATED

3.14 STRIPED

3.15 WRINKLED

4. MARGINS: ILLUSTRATIONS



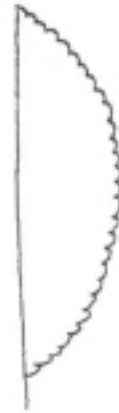
entire



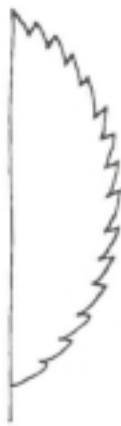
crenate



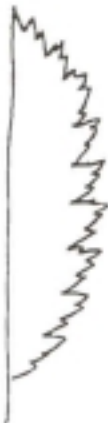
bicrenate



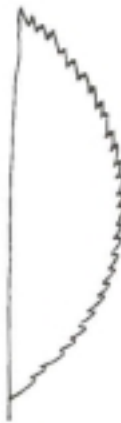
crenulate



serrate



biserrate



serrulate



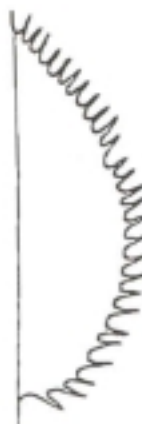
dentate



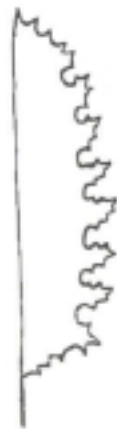
denticulate



ciliate



fimbriate

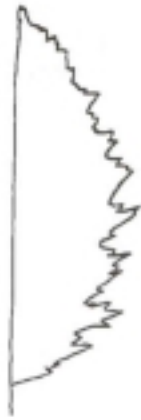


bidentate

4. MARGINS: ILLUSTRATIONS (*continued*)



crispate



crenate



sinuate



repand



undulate



#### 4. MARGINS: DEFINITIONS

##### 4.1 ACULEATE

Prickly; with stiff, sharp, spine-like projections.

*Comment for Subgroup:*

*AL: Cannot find this term for leaf margins, only on stems etc. Leaf margins are spinose. Suggest to delete.*

*EB: Found a definition 'minutely prickly' for aculeate (drawing of stem). Could come under 'hairiness'.*

##### 4.2 BIDENTATE

Doubly dentate; with the dentations themselves dentate.

##### 4.3 BICRENATE

Doubly crenate; with the crenations themselves crenate.

##### 4.4 BISERRATE

Doubly serrate; with the serrations themselves serrate.

##### 4.5 CILIATE

Bearing a marginal fringe of fine hairs.

Compare 'fimbriate'.

*Comments for Subgroup:*

*EB: From the different publications it appears that cilia are trichomes, meaning that they grow out from the epidermis, while fimbria are hair-like outgrowths extending from the whole of the organ. Cilia seem to be hairs stuck on while fimbria could possibly be formed from deeper layers as well. We have to check this further.*

##### 4.6 CRENATE

Scalloped, with rounded teeth.

Compare 'crenulate' in which case the teeth are smaller and 'dentate' as well as 'serrate' in which case the teeth are sharp.

##### 4.7 CRENULATE

Finely crenate; with minute rounded teeth.

Compare 'crenate' in which case the teeth are coarser.

#### 4.8 CRISPATE

With the margin curled or crumpled and irregularly twisted.

#### 4.9 DENTATE

With sharp teeth pointed outwards. The two sides of a tooth are the same length. Compare 'crenate' in which case the teeth are rounded and 'serrate' in which case the teeth point forwards, towards the apex.

#### 4.10 DENTICULATE

Finely dentate; with minute sharp teeth pointed outwards.

#### 4.11 ENTIRE

With an undivided margin; not toothed or lobed.

#### 4.12 EROSE

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

#### 4.13 FIMBRIATE

Bearing a marginal fringe of fine hairs.

Compare 'ciliate'.

*Comments for Subgroup:*

*EB: From the different publications it appears that cilia are trichomes, meaning that they grow out from the epidermis, while fimbria are hair-like outgrowths extending from the whole of the organ. Cilia seem to be hairs stuck on while fimbria could possibly be formed from deeper layers as well. We have to check this further.*

#### 4.14 INVOLUTE

Margin rolled upwards towards the adaxial surface.

#### 4.15 LOBED

*Comment for Subgroup:*

*To put it here as well as under full plane shapes?*

#### 4.16 REPAND

Shallowly sinuate.

4.17 REVOLUTE

Margin rolled downwards towards the abaxial surface.

4.18 SERRATE

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

Compare 'crenate' in which case the teeth are rounded and 'dentate' in which case the teeth point outwards.

4.19 SERRULATE

Finely serrate.

4.20 SINUATE

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

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

4.21 UNDULATE

Wavy, perpendicular to the plane of the organ.

## 5. PLANT HABIT, ATTITUDE OF PLANT PARTS

### 5.1 COLUMNAR

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

### 5.2 DECUMBENT

Lying horizontally on the ground but with the apical parts ascending.  
Compare 'prostrate' of which the apical parts do not ascend.

### 5.3 DEFLEXED

Compare 'recurved', 'reflexed'.

### 5.4 DROOPING

Bending downwards.  
Compare 'weeping' of which the downward bending is more pronounced, with the terminal parts hanging, and 'pendulous' which is hanging, rather than bending downwards.

### 5.5 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.

### 5.6 ERECT

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

*Comments for Subgroup:*

*AL: We use 'erect' exclusively for plant parts and 'upright' for habit.*

*EB: I agree. We must get the approval of all TWP's and give an explanation in this glossary.*

### 5.7 FASTIGIATE

Strongly upright, with a narrow crown, the branches virtually erect and parallel with the main stem.

Compare 'columnar' of which the branch development is suppressed.

## 5.8 HORIZONTAL

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

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

## 5.9 OBLIQUE

## 5.10 PENDENT

See 'pendulous'.

## 5.11 PENDULOUS (PENDENT)

Hanging downwards.

Compare 'drooping' and 'weeping' which are bending downwards, 'weeping' being more pronounced than 'drooping'.

## 5.12 PERPENDICULAR

## 5.13 PROSTRATE

Lying flat on the ground.

Compare 'decumbent' of which the apical parts ascend.

## 5.14 RAMIFIED

Branched.

## 5.15 RECURVED

Curved towards the abaxial side.

Compare 'reflexed', 'deflexed'.

## 5.16 REFLEXED

Compare 'recurved', 'deflexed'.

#### 5.17 SPREADING

Extending outwards horizontally.

#### 5.18 SPUR TYPE

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

#### 5.19 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.

#### 5.20 WEEPING

Bending downwards, the terminal parts hanging.

Compare 'drooping' of which the downward bending is less pronounced and 'pendulous' which is hanging, rather than bending downwards.

*Comments for Subgroup:*

*EB: I tried to write definitions which fit our UPOV understanding of drooping, pendulous and weeping. OK?*

## 6. PLANT PARTS

### 6.1 APEX

The apex (apical or distal part) of an organ or plant part is the end furthest from the point of attachment. For UPOV purposes it should, in general, be considered to be the part apical from the position where the plant part becomes about 20% narrower than its broadest dimension. The shape of the apex is the general shape of this whole (larger) apical part. See 'tip'.

### 6.2 BASE

The base (proximal part) of a plant part is the end nearest to the point of attachment. For UPOV purposes it should, in general, be considered to be the part proximal from the position where the plant part becomes about 20% narrower than its broadest dimension.

*Comments for Subgroup:*

*AL: Hickey defines a leaf base as that portion of the leaf bounded by approximately the lower 25% of the margin.*

*EB: I think it is safer to relate the base and apex to the width and not to the length. In a very broad, short leaf, the lower 25% of the margin may not even include the whole base as we consider it, while in a long, narrow leaf, 25% up its margin might be far beyond the part where it starts to narrow.*

### 6.3 BRACT

### 6.4 CALYX

### 6.5 CARPEL

### 6.6 COLUMN

### 6.7 FILAMENT

### 6.8 FOLIAGE

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

6.9 INFLORESCENCE

6.10 MAIN VEIN

To be used for Monocotyledons.  
Compare 'midrib'.

6.11 MIDRIB

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

6.12 PEDUNCLE

6.13 PERIANTH

6.14 PETAL

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

6.15 PETIOLE

6.16 PETIOLULE

6.17 PISTIL

6.18 PRICKLE

Compare 'spine'.

6.19 RHIZOME



6.20 SCALE

6.21 SEPAL

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

Compare 'petal' and 'tepal'.

6.22 SHEATH

6.23 SINUS

6.24 SPADIX

6.25 SPATHE

6.26 SPINE

Compare 'prickle'.

6.27 STALK

Term used for the stem of a fruit.

6.28 STAMEN

6.29 STIGMA

6.30 STIPULE

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

6.31 STOLON

6.32 STYLE

6.33 TEPAL

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

6.34 TIP

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) and 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'.

6.35 TOP

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

## 7. GENERAL

### 7.1 ABAXIAL

The lower, outer or ventral side. Compare 'adaxial'.

### 7.2 ACTINOMORPHIC

Radially symmetric (flower).  
Compare 'zygomorphic'.

### 7.3 ADAXIAL

The upper, inner or dorsal side. Compare 'abaxial'.

### 7.4 ALLOGAMOUS

Cross-fertilized.

### 7.5 ANTHOCYANIN

### 7.6 APOMYCTIC

Compare 'self-compatible'.

### 7.7 ATTITUDE

Rather to use 'attitude' instead of 'stance'.

### 7.8 AUTOGAMOUS

Self-fertilized.

### 7.9 COMPRESSED

Flattened laterally, or dorsally and ventrally.  
Compare 'depressed'.

### 7.10 CROSS-FERTILIZED

Compare self-fertilized.

7.11 DECIDUOUS

7.12 DEPRESSED

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

*Comments for Subgroup:*

*EB: I made this deduction from what I could find in the definitions of 'compressed' and 'depressed' and from the way we normally use these terms. OK? The published definitions seem to use 'depressed' in a wider sense than we do and that could be confused with 'compressed'.*

7.13 DETERMINATE GROWTH TYPE

Compare 'indeterminate growth type'.

7.14 DIOECIOUS

7.15 DORSAL

The upper, inner or adaxial side. Compare 'ventral'.

7.16 ELONGATE

This is not a defined shape. It is just a general term for a long and narrow shape, as if lengthened or extended.

7.17 HERMAPHRODITE

7.18 HETEROGAMOUS

7.19 HETEROZYGOTIC

7.20 HOMOZYGOTIC

7.21 INDETERMINATE GROWTH TYPE

Compare 'determinate growth type'.

7.22 INTERMITTENT (FLOWERING)

7.23 MASS

See 'weight'.

7.24 MONOECIOUS

7.25 PERSISTENT

7.26 PINNATE VENATION

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

7.27 PROPAGATION

Is vegetative multiplication. (To check.)  
Compare 'reproduction'.

7.28 PROPAGULE

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

7.29 PUBESCENCE

7.30 REMONTANT

7.31 REPRODUCTION

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

7.32 RESISTANT

Compare 'tolerant'.

7.33 RIGID (RIGIDITY)

Should be used instead of 'stiff' ('Stiffness').

7.34 SELF-COMPATIBLE

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

7.35 SELF-FERTILIZED

Compare cross-fertilized.

7.36 SELF-INCOMPATIBLE

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

7.37 STIFF (STIFFNESS)

See 'rigid' ('rigidity').

7.38 TOLERANT

Compare 'resistant'.

7.39 VENTRAL

The lower, outer or abaxial side. Compare 'dorsal'.

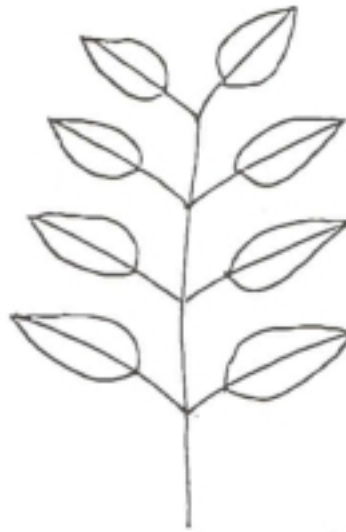
7.40 WEIGHT

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

8. DIVISION AND BRANCHING: ILLUSTRATIONS



paripinnate



imparipinnate



palmately lobed



palmately compound



pinnately lobed



pinnately compound

**8. DIVISION AND BRANCHING: DEFINITIONS**

8.1 BIPINNATE

8.2 CORYMBOSE

8.3 DIGITATE

See 'palmate'.

8.4 EVEN-PINNATE

8.5 ODD-PINNATE

8.6 PALMATE (DIGITATE)

8.7 PALMATELY COMPOUND

8.8 PALMATELY LOBED

8.9 PANICULATE

8.10 PINNATE

8.11 PINNATELY COMPOUND

8.12 PINNATELY LOBED



8.13 RACEMOSE

8.14 TRIFOLIATE

8.15 UMBELLATE

8.16 ZYGOMORPHIC

Bilaterally symmetric.  
Compare 'actinomorphic'.

**9. COLOR**

9.1 CREAM

Is acceptable for 'yellowish white'.

9.2 CRIMSON

Rather to use 'red'.

9.3 GRAY

Use spelling: 'grey'.

9.4 GREY

Correct spelling; not 'gray'.

9.5 LIME

Rather to use 'yellow green' or 'green yellow'.

[End of document]