

ORCHID COUNCIL OF NEW ZEALAND

COMMITTEE ON AWARDS

**TRAINING MANUAL AND GUIDELINES
FOR
ASSOCIATE JUDGES AND REGISTERED OBSERVERS**

FOREWORD

This training manual is presented in the hope it will assist you with your training to become a qualified judge.

Learning about the world of Orchids never ends as new species are still being discovered and orchid hybridizing adds new interest all the time.

The manual is for you to use as a tool, a source of information, and a guide to the knowledge a competent judge should acquire over a period of years.

These exercises are not compulsory, however, if you choose to complete them you should discuss your answers with members of your local Supplemental Panel.

You are encouraged to embrace this manual in the spirit it was intended; to assist you in your studies.

REFERENCES

A number of References have been included throughout this document, but these are not the only resources available. One additional resource you should consider is the American Orchid Society (AOS). You do need to join the AOS to access the wide range of information they have available, but it is well worth it.

Some of the reference books may be harder to obtain, but if you ask around you will most likely find someone with copies of these books that you can borrow.

Another resource mentioned is the OCNZ - Orchids (The yearbook) which has been published every year since 1997. An index of all the articles contained within Orchids can be found on the OCNZ website (<https://www.orchidcouncil.org.nz/past-journals/>).

While the internet is another reference source it needs to be used with caution. Not all the information is reliable so it needs to be checked against a known source such as RHS, OrchidWiz etc.

ABBREVIATIONS

The following is a list of abbreviations used within this document.

AOC	Australian Orchid Council
AOS	American Orchid Society
COA	Committee on Awards
OCNZ	Orchid Council of New Zealand
RHS	Royal Horticultural Society

ORCHID COUNCIL OF NEW ZEALAND

TRAINING MANUAL

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INTRODUCTION

Orchids are considered the most highly evolved flowering plants on earth. They are unusual in form, uncommonly beautiful in colour, often powerfully fragrant, intricate in structure, and different from any other family of plants.

The Orchidaceae is a large, ancient family of perennial plants. Botanically orchids are zygomorphic with one fertile stamen (rarely two) fused to form a column and an inferior ovary. The flower has three sepals and three petals; one petal is unlike the other two and is known as the labellum. In most orchid species this petal is enlarged into a pouch or lip and is the most conspicuous part of the flower.

According to current estimates there are some 730 genera and 30,000 species. There may be thousands more that have not yet been discovered and may be thousands that once lived on earth and are now extinct. Humans have created another hundred thousand hybrids by cross-fertilising one species with another or by crossing different hybrids to one another. Much of this has been done commercially in plant-breeding labs but many special and interesting hybrids of quality have been the result of hybridising by enthusiastic amateurs.

JUDGING OBJECTIVES

The aim of orchid judging is to recognise and acknowledge plants that exhibit characteristics of superior quality. While judging aims to seek theoretical perfection, there is an important relationship to commercial developments. Judging should take note of commercial trends and help such trends to develop with hybrids of maximum quality. With the trend towards smaller plants, and the massive Japanese and European move to pot plant styles our judging should encourage the development of appropriate hybrids.

Many people are put off judging by the apparent difficulty, the long training and the mystique engendered by those who have successfully negotiated the necessary hurdles in the way of becoming an accredited judge. It is hoped to remove some of the mystique, and perhaps encourage more successful growers to at least try their hand at judging for a season.

Obviously, many growers do exhibit with a competitive spirit and their efforts require ranking. Although in past years several Societies have been against competitive shows, there is now increasing enthusiasm for comparative judging to promote better culture and preservation of the Orchidaceae family.

Trainee Judges comprising both Registered Observers and Associate Judges have a period of training and apprenticeship. At the conclusion of training, candidates for Accreditation should have a well-grounded knowledge in what a perfect orchid should look like giving due consideration to its parents, and what sort of culture is needed to produce that perfect flower.

At the end of the training program the trainee judge should have:

- A portfolio of the work undertaken
- A record of the development of a flower/inflorescence/plant over a period of time.
- Observational drawings of flowers and plants.
- A thorough knowledge of the Judging Systems in NZ and an awareness of others.
- A thorough knowledge of hybridisers' achievements.
- The ability to identify important issues and trends.

And to have confidence to:

- Present a short talk on specific plants, genera, etc
- Have the ability to debate a topic.
- Design a successful display according to basic design principles.

PART ONE – GENERAL KNOWLEDGE

Flower Characteristics - introduction

Objective:

To demonstrate a knowledge of the awardable characteristics of an Orchid flower.

The flower and plant are judged against what is thought to be theoretical perfection for that cultivar. The plant should be outstanding for its type in as many characteristics as possible. Bi-generic and multi-generic crosses should show commendable improvement rather than the expected average from the combination of their parents. Characteristics of species in recent parentage should be taken into account. Any one fault should not be penalised more than once. Obviously different standards will apply to different genera.

Form (shape of a flower)

A flower to be judged must be mature or set. The flower form should be balanced and symmetrical, both are essential for quantity form. Twisting, reflexing and other distortions, if not natural to the genus, should be penalised. A vertical line drawn through the flower should bisect the flower into two symmetrical halves (mirror image). Slight asymmetry may not preclude an award but should always result in a lower score. The sepals should form a star pattern. The petals should form an inverted star pattern except where a synsepal occurs.

Complex hybrid shape should approach a filled in round or oval circle. If the edges of the petals and sepals are wavy this should be even. Generally reflexing of petals and sepals is a fault. Likewise, the flower should be without excessive cupping. When flat flowers are viewed side on, the petals should be held close to the plane of the dorsal sepal.

Colour

Each flower should be appraised on the basis of how good or bad it is for its class against the judge's concept of perfection for that genus. Care must be taken to avoid any colour preferences or prejudices influencing colour appraisal and each flower must be judged for what it is.

The flower colour should be definite, clear, bright and strong, and evenly dispersed throughout the petals and sepals without *washing out* at the mid veins. Bright, fresh, glistening colours are highly desirable and should be given recognition. Lip colour should be considered separately in evaluation of the general colour and appearance of the flower to see whether it contrasts, complements or is consistent with the general colour.

Markings, stripes and shadings should be well defined and distinct and distributed to enhance the colour appearance of the flower by forming symmetrical patterns or show regular lines or patterns, which enhance the zygomorphic style of the flower. Suffusion of one colour over another should be regular and harmonious. Improperly distributed colour should be avoided but polychromes and mottled colours must not be automatically discarded. Irregular spotting which is characteristic of many genera in the Oncidinae alliance should not be penalised.

Sepal staining, bronze pigmentation on the back of the sepals due to excessive light during the bud stage, should be considered on the basis of whether it gives an undesirable appearance.

Judging should be carried out in daylight, avoiding light within 2 hours of sunrise or sunset, as this enhances the red hue. Different types of artificial light will give different colours. Fluorescent lights give a green tinge while incandescent lights give an orange tinge. When judging a flower ensure that the light is coming over your shoulder, leaving back and side lighting to the 'effects' people.

Size.

Should be of good size for the species or within the range of what could be reasonably expected from the hybrid's parents. In the major genera grown in New Zealand the judging scales are divided into several groups which recognise the background hybridising. The Cattleyas are split into two, with the novelties recognising the influence of the less filled in varieties in the breeding. In Cymbidiums three divisions are recognised:

1. Standard where the flower itself is paramount and the bigger the flower the better

2. Intermediate where smaller flowers and foliage are required and the plant should not be merely a poorly grown standard. The charm and attractiveness of the plant replace size as a criterion.
3. Miniature Cymbidium where both flowers and plant must be small, with charm and attractiveness increasingly important along with floriferousness and colour.

Natural spread or overall width is the measurement of a flower across the petals without flattening and is normally recorded horizontally. Special measuring systems have been developed for the Pleurothalid Alliance (Masdevallia, Dracula Pleurothalid).

Substance

Thickness and turgidity of the flower tissue, should be sufficient to hold the petals and sepals firm and in place. You should be aware that light shining from behind the flower could tend to give the appearance of reduced substance.

Texture

Surface appearance of the flower tissue is that desirable feature of a flower's surface that enhances its appearance. The flower may look like dusted sugar crystals or patent leather depending on its parentage.

Generally, the flower should be of refined quality, firm, fresh, lustrous and without blemish.

Floriferousness

It is desirable that 75% of the flowers on the inflorescence to be judged should be open. This is particularly important in genera that are prone to fading. It does not apply to sequential flowering genera like the multi-floral Paphiopedilum species and hybrids. Sequential flowering genera should be judged when the inflorescence is fresh. The flower count should be comparable with what could be expected from the parentage. Where a species or hybrid is normally expected to produce only one flower on its inflorescence, then the points for floriferousness are inappropriate. These plants should not be unfairly penalised and should be judged under the Single Flowered Scale. As a guide a standard Cymbidium should have eight flowers, where as a miniature may have more than a hundred on many inflorescences. As with many other factors the flower count should be compatible with what could be expected from the parentage.

Flower Habit and Arrangement

The stem should be straight, strong and long enough to lift the flower(s) out of the foliage and display the flowers in a pleasing manner. It should be able to support and hold the flower upright, not skewed, at an angle, twisted or distorted. In general flowers should be well spaced on the inflorescence and not bunched. They should either all face approximately in the same direction or be well spaced around the inflorescence giving an overall cylindrical shape such as is seen in pendulous miniature Cymbidiums.

Suggested References:

OCNZ Judges handbook

Exercises:

- 1.1 Compare flowers where colour is better than form.
- 1.2 Compare flowers where form is better than colour.

- 2.1 Assess a plant that has excellent form.
- 2.2 Assess a plant that has excellent colour.

Ethics of Judging.

Objective:

To be familiar with the process of award and show judging.

Ethical standards are a set of moral ideals for intent and behaviour. Normally they are unwritten and they delineate what is right and wrong, what is and what is not acceptable behaviour. Each judge occupies a position of trust in that all competitors know that their plant will be treated fairly and equitable according to the judging rules. Due to human nature, all judges have a different perception of when a standard will be breached. To this extent it is better to err on the side of caution and not score the plant than to be the subject of an ethical violation, real or apparent, which could generate bitterness and acrimony on either the accused or the accuser.

There are a number of obvious, and some not so obvious, ethical issues that have to be considered in orchid judging. Some are listed below.

Conflicts of interest

Obviously, nobody should not take part in judging their own flowers or plants, but the matter is broader than that. The owner of a plant to be considered must leave the judging area so that they cannot see who are their supporters or who are their detractors. The same applies to plants being entered by a judge's close friend or conversely their enemy or where at any time it could be claimed that the judgement could have been less than impartial.

Bias

Strong personalities can lead the group to their opinion. It is fundamental that the chairperson of the panel should act promptly to eliminate such bias. Conversely it is tempting for less experienced (and sometimes experienced) judges to watch the hands of others before showing their vote. This is a trend that individual judges must avoid. They should make up their mind and vote without waiting to see how the vote appears to be going. This is where voting on paper (award judging) is superior to open hand voting (class judging at shows).

Prejudice

May be termed more severe than bias due to it implying that one has an favourable or unfavourable opinion of a colour, flower characteristic, the plant or the plant owner.

Undue influence and or intimidation

Both these imply that there is an outside influence on the awarding of a plant. This may not be so obvious at the time of judging but may be conveyed by a casual comment or tone and inflection of the voice at the time of judging. Beware of taking heed of comments that are said either enthusiastically or sarcastically like "Look at that flower!" "Is that award quality!"

Bribery

Bribery is the opposite extreme of intimidation, and usually is with compensation of goods or services to ensure that a flower/ plant is awarded. The 'prize' may take the form of plants, all expenses paid invitations, or more blatantly cash in hand.

Appearance of impropriety

Accurate and quick assessment of a flower is the mark of a competent judge. Care must be taken not to give the impression that any flower or plant has (not) been excluded from consideration. At all times when judging under the auspices of the OCNZ all actions of the judges both individual and collectively reflect on the image of the OCNZ whether the judges realize it or not.

Exercises:

- 1.1 Lead a group of judges with an outcome that is unbiased in Award Judging.
- 1.2 Lead a group of judges with an outcome that is unbiased in Show Judging.
- 1.3 Lead a group of judges with an outcome that is unbiased in Display Judging.

Presentation of plant for an Award

Objective:

To present a plant for Award judging.

There are some floral characteristics, which are so undesirable and unacceptable that they will prevent the plant being eligible for award consideration. These characteristics include colour breaks, failure of the flower to open fully, excessive cupping, extreme plane variation, column and staminode twisting, severe twisting or notching of petals or sepals, unbalanced dorsal, markings of low-level contrast, indistinct colour. However, at all times due consideration must be given to the characteristics of the genus being judged.

When presenting a plant for award the background of the plant must be researched. The awarding of a plant must be compatible with other Judging Systems to maintain creditability of the OCNZ judging system.

It is therefore necessary to research the specific plants, genera, lines of breeding, and awards given by other judging systems. Study the plants origin by using Plants of the World Online, RHS or Sanders. Consider if the plant is an improvement on the parents. Use OCNZ Awards Register Database, OrchidWiz, American Orchid Society Awards or Australian Orchid Council Awards to make comparisons with previously awarded plants.

At all times when a plant is being considered neutral language must be used which will not influence or bias the judging.

In short "Why should a flower be considered judgeable."

Suggested References:

- *OCNZ - Judges Handbook*
- *OCNZ - Award Register*
- Plants of the World Online (<https://powo.science.kew.org/>)

Exercises:

- 1.1 Detail the conditions that must be met, for a plant or flower to receive a CCC/OCNZ award.
 - 1.2 Detail the supporting information that is required with a Plant that is to be judged.
 - 1.3 Detail the conditions and restrictions for making Awards of Distinction.
 - 1.4 List why a flower may not be considered for judging
-
- 2.1 Present a Plant for judging using neutral language.
 - 2.2 Nominate a plant for Judging in the correct Award category and give reasons for the category selected.
 - 2.3 Discuss the Cultural Award describing when, why and how the award is made.
 - 2.4 Discuss a Quality Award. Describe the requirements for nomination of a plant for a Quality award.
 - 2.5 Discuss the requirements for a PBA/OCNZ.

Documentation of Award

Objective:

To complete an **AWARD APPLICATION (Form 4)** accurately.

The documentation of the awards is an important function of the judging process. This is necessary for the dissemination of the award to the other judging regions. When the pointing of the flower has been completed the award application form has to be written up. It is first necessary to obtain the correct details of the owner and the plant. The owner and photographer must be informed that the OCNZ reserve the right to use of the plant name and the photo of the awarded plant in any of its publications with out remuneration to either.

The flower is measured with a set of callipers as defined in the form giving the dimensions in millimetres (AOS is in centimetres). The Natural Spread, both vertical and horizontal, should be recorded as well as the width and length of the individual flower parts.

The flower / plant is then described.

In most judging systems the Award is subject to final ratification by the appropriate committee which within the OCNZ is the Committee on Awards (COA).

Suggested References:

- *OCNZ - Judges Handbook.*

Exercises:

- 1.1 Complete an AWARD APPLICATION (Form 4)- Owner and plant details, measurements & full description.
- 1.2 Detail the process that an award follows from the completion of the application form until the ratification of the award by the COA.

- 2.1 Demonstrate your ability to measure a flower with a set of callipers

Description Of Awarded Plants

Objective:

To demonstrate the ability to describe an awarded flower or plant

The importance of correctly describing the flower cannot be over emphasized, as this is the official record of an award. It should be possible to create a mental picture of the awarded bloom from the description provided. Uniform standards in describing awarded plants and flowers are critical to maintaining accurate records for the purpose of comparison. With the advent of digital photography an accurate description of the awarded plant becomes more paramount. Prints and slides provide useful information and are an adjunct to judging but in themselves do not allow adequate appraisal for a full evaluation. The description should be brief and accurate explaining clearly why the particular cultivar was recommended for an award.

An award description is made up of various parts, or sections, which together constitute the description. The different sections are separated by semicolons and the description ends with a period.

The three principal sections are:

1. Vegetative parts and culture
2. Inflorescence(s) and flower(s)
3. Comments

The sequence as listed above is essentially a summary of the sequence used in botanical descriptions.

1. Vegetative parts and culture

This section is a description of the vegetative portions of the plant (including cultural condition).

It does not necessarily apply to all awards, but should be included for all Cultural Awards (CCC & CCE) as well as for a Certificate of Botanical Merit (CBM) and Plant Breeders Award (PBA).

For Cultural awards the description must include the measurement of the overall spread of the plant, the size of the pot (if applicable) and number of inflorescences and flowers. Flower measurements must include at least the horizontal and vertical spread of a representative flower.

2. Inflorescence(s) and flower(s)

This section of a description concerns itself with the inflorescences and flowers and is itself broken down into subsections. These subsections are also separated by semicolons and follow sequence.

In describing the inflorescences and flowers, the sequence proceeds from the general to the specific and from the outer parts of a flower to the inner. This sequence is summarized below:

Number of Flowers

Number of Buds

Number of Inflorescences

Form-Arrangement-Presentation

General Flower Colour

Dorsal Sepal

Lateral Sepals or Synsepal

Petals

Lip*or Pouch Spur (if applicable, belongs with the flower part to which it is attached)

Column** or Staminode

Ovary

Substance

Texture

*Includes callus, disk, midlobe, side lobes and throat where applicable.

**Includes anther cap.

At times it is not possible to follow the above sequence, especially when various parts are described together, such as in the following example:

... flower with cream base colour; dorsal sepal and petals spotted mahogany; lateral sepals somewhat recurved, blushed mahogany at base...

In this example the petals are described out of sequence (before the lateral sepals) because they are described in combination with the dorsal sepal.

Form: Include a short descriptive sentence about the shape of each part of the flower, noting in particular features such as is it oval, spatula, concave, convex, reflexing. What are its characteristics; is it frilly edged, tails crossed, does it have an elongated pouch, warts, hairs, side lobes or keels.

The following is a list of preferred terms which should be used.

USE	INSTEAD OF
anther cap	pollen cap
cane (in Dendrobiums)	inflorescence
inflorescence	spike
lateral sepals	ventral sepals
parentage	cross
parts	segments
pouch (in Paphiopedilum)	labellum
synsepal	ventral sepal

An unusual case occurs among certain dendrobiums which produce clusters of flowers along the length of an elongated pseudobulb (cane). In such cases, it is sometimes difficult to determine the number of inflorescences and the entire cane is treated as if it were in fact just one inflorescence. In the descriptions of such dendrobiums, the use of the word "cane" (e.g., Fifteen flowers and 10 buds on two canes ...)

Colour: Particular attention should be paid to describing colours as accurately as possible. If they are available the RHS standards or Gibbon's stamp colour guides should be quoted.

Appreciate the depth of colour in the flower. Identify the main colour, the background colour or the overlay colour.

Note the clarity, intensity and hue on each of the sepals, petals, lip, lobes and keels.

Note any patterns, marking, spots, stripes, and edging, blushing or rendering of colour at the axial parts of the tepals.

If a colour is modified by another colour, then the two colours should be separated by a hyphen: yellow-green, purple-blue, red-brown.

If the colour is modified by a noun, omit the hyphen: grass green, sky blue, brick red.

Substance: The substance of the flower is the quality of density, thickness or firmness in the segments. This should be noted where it is of better quality than would normally be expected for the plant.

Texture: This is the surface quality of a flower and should be noted if it enhances the appearance. Your comments should state if it is waxy, velvet, wrinkled, smooth, iridescent, glowing, sparkling, crystalline?

3. Comments

Note the attractiveness; is it striking or exceptional. Inflorescence presentation; does it stand clear, above foliage, upright. Is there good spacing, symmetrical, arching, straight, strong, self-supporting, directional tendency whether pendulous or erect: under, over or clear of foliage.

Avoid the following:

Avoid describing the bad points of the plant or flower, remember that you are awarding it!

Stating the obvious, flowers should not be described as 'larger than average' or a plant as 'large and well grown' when this is the basis for the award!

Introduce yourself to a new world, buy a 10X magnifying glass and see what you have been missing!

General Notes

A period marks the end of a description. Thus, no periods should be used within the body of a description. The various parts of a description should be separated by semicolons. If it is necessary to subdivide within a section or subsections, commas are used

Numbers from one through ten are always spelled out in the body of the description. Any number, no matter how large, is always spelled out if it begins a sentence. Numbers larger than ten are written as numbers. Numbers between 21 and 99 are hyphenated when spelled out. Large numbers are not hyphenated when spelled out; however, if a large number contains within it a number between 21 and 99, that part of the number is hyphenated (see below for example). The word 'and' is not used when writing large numbers, e.g. Thirty-five, One hundred thirty-three, One thousand two hundred twenty-two.

Examples

Description 1: (Cymbidium - Quality Award)

Fourteen flowers on one erect inflorescence with flowers hanging down from the highest point; dorsal sepals are broad to oblong, pale pink to white with a subtle pink flush, and a lightly convex surface; lateral sepals and petals are similar in colour and shape; the lip is large and spoon-shaped with a deep crimson outer edge; the column is light pink, darkening near the anther cap, which is white with small crimson-maroon spots; substance is firm with a matte texture; a very eye-catching flower that displays itself naturally.

Description 2: (Paphiopedilum - Quality Award)

One flower of excellent shape well-held on one 45 cm inflorescence; dorsal sepal tan, dark brown-striped; synsepal similar, with fainter stripes; petals wide, cream, brown-blushed at the tips; pouch red-brown, somewhat small; staminode light brown, extremely hirsute; substance good; texture an excellent sheen; size of pouch precluded higher score.

Description 3: (Vanda – Cultural Award)

One hundred twenty-three flowers well displayed on ten inflorescences; plant 125 cm tall by 40 cm wide in a 16 cm plastic pot; sepals and petals have some slight reflexing and undulate margins and are white, overlaid with deep rose-pink spots, some spots joining together forming blotches; labellum side lobes purple, white at the centre; substance firm, texture smooth.

Description 4: (Dendrobium – Cultural Award)

One hundred ninety-four flowers and six buds on fifty inflorescences; plant 78 cm high by 58 cm wide, consisting of ten canes, grown in sandy soil with redwood chips in 35.6 cm clay pot; flowers butter yellow.

Exercises:

Write a short sentence (5 - 7 words) for a selection (5 - 7) of the following exercises.

- 1.1 Describe the form of the dorsal sepal.
- 1.2 Describe the form of the lateral sepals.
- 1.3 Describe the form of the petals.
- 1.4 Describe the form of the lip.
- 1.5 Describe the colour of the dorsal sepal.
- 1.6 Describe the colour of the lateral sepals.
- 1.7 Describe the colour of the petals.
- 1.8 Describe the colour of the lip.
- 1.9 Describe the overall substance.
- 1.10 Describe the overall texture.
- 1.11 Describe the overall habit and arrangement.

Display Judging

Objective:

To be familiar with the particular provisions relating to class judging in a show environment.

When orchid group requests that a show is to be judged it normally includes the judging of displays. The display judging is normally undertaken after the class judging but before the judging of quality awards. At all times judges are to make themselves familiar with the Show schedule as to the specific rules that apply at each show.

Judging of cut flowers or potted plants that are arranged for effect in displays is probably one of the most individual aspects of orchid judging. The design or general arrangement of a display should have flowers or plants that create a visual impact that is aesthetically pleasing and holds the interest of the viewer. This is achieved by the judicious placing of quality orchid flowers or flowering plants and foliage plants along with display props in the formation of the display to create balance and proportion. Supporting orchid flowers and foliage can be used to create a variation in texture, colour and overall harmony

Every display should have at least one focal point and larger displays may have more focal points. Premium flower or flowers that are fresh and of award quality as opposed to display props should create these focal points. Lines of contrast that take the viewer's eye to these focal points enhance displays. These lines of contrast may be generated by lines of colour (e.g. flowers or shadow) or by different plant foliage textures.

Displays that have a sensible use of scale of flowers to plants and flowers to props and that are well balanced without the display appearing to be lopsided while generating a flowing and harmonising rhythm are to be commended.

When an Orchid show schedule does not specifically exclude the use of flowers that do not belong to the Orchidaceae family in displays, these displays should be penalized if the proportion of orchids to other flowers is out of balance. Where as the effective use of foliage of plants from other families can be used to add a variety of textures and background that will enhance the display.

Orchid plants should have clearly written labels that are taxonomically correct and unobtrusive but enable the viewer to identify the plant without moving on to the display. However labeling should not be a distraction or a major eyesore on the display. Observation is to be made of general tidiness and finish on the display in the way of finished paint work, the disguising of pots, flower supports, hidden stands, and if bunting is used that the draping lines are realistic and that strong creases in the bunting are disguised.

Suggested References:

- *OCNZ - Judges Handbook*

Exercises:

- 1.1 Discuss the effect a show schedule may have on OCNZ judging criteria.
 - 1.2 Discuss the differences that may apply if there is no show schedule or rules.
 - 1.3 Discuss the effect dominance, color and harmony of a display.
 - 1.4 Discuss the effect of balance and proportion of a display.
 - 1.5 Discuss the how visual impact of a display can be enhanced.
-
- 2.1 Discuss the required action, if any to be taken at an entered show when plants are entered in the wrong class.
 - 2.2 Relate the answer you would give to somebody who queries the show results – e.g. "I can't understand why that plant got first place when this one has more (or bigger) flowers".

Review of Awards

Objective:

To be conversant with orchids awarded through OCNZ and other award judging authorities.

All judges should be aware of recent outstanding cultivars awarded by the various international judging systems to provide an appreciation for the modern breeding and commercial trends in orchid hybridising and to be aware of continuing improvements in flower quality.

Suggested References:

- *OCNZ - Judges Handbook*
- *OCNZ - Award Register*
- *Australian Orchid Council - Awards*

Exercises

- 1.1 Review several recent New Zealand flowers that have been awarded. Explain their strengths and weaknesses.
- 1.2 Compare a flower awarded in New Zealand with an overseas award of the same cross.

- 2.1 Discuss and describe from memory any particularly meritorious cultivars which you have seen exhibited, especially those awarded by your own Judging Panel which you have participated in.

Knowledge of By-Laws

Objective:

To have a thorough knowledge of the Orchid Council Judging By-laws and the Principles of Award Judging contained in the Judges Handbook.

To be able to use the guidelines in the Judging Handbook and show the need for and effects of having a formal judging system.

Award Judging, often takes place at shows because this is where superior plants are usually to be seen; however, it may occur at any time where a quorum of judges is able to meet and consider a plant.

The plant being considered is judged against perceived perfection for that particular species or hybrid. To make matters more difficult theoretical perfection is a shifting scale as the quality continues to improve so that it can never quite be reached. What may have been regarded as 85% of perfection in 1978 may be well below award consideration ten years later.

The Quality Awards recognised internationally are

FCC - First Class Certificate. (GM - Gold Medal.)

AM - Award of Merit. (SM - Silver Medal.)

HCC - Highly Commended Certificate. (BM - Bronze Medal.)

While most judging bodies use the FCC, AM, HCC terms some bodies including World Orchid Conferences use the medal designations. The RHS does not award an HCC. AOC only require 85 points for an FCC.

A special Award is the Award of Distinction (AD) given to a plant showing a feature never before seen such as the unique red lip seen on Cym. Jack Hudlow 'Joan' which, although a well awarded orchid, had never before been seen with such a striking red lip.

All of these Awards are given to the plant and a unique name must be given to that cultivar for recognition in posterity. This is the **Cultivar** name and it is written in single inverted commas as 'Joan' above. In the case of species, the unique name is called the **Varietal** name.

A CCC (Certificate of Cultural Commendation) is given to the owner of a plant to recognise a particularly well grown specimen of that species or hybrid. This does not require a Cultivar or Varietal name, and if a cross, does not need to be registered.

Other Awards include the Certificate of Botanical Merit and the Plant Breeders Award.

Suggested References:

Royal Horticultural Society Hand Book on Orchid Nomenclature and Registration, 4th Edition 1993

OCNZ Judges Handbook

Exercises:

- 1.1 Describe the Awards categories available from OCNZ and the points required for each.
 - 1.2 How do OCNZ Awards compare with awards from other organisations such as the RHS and the AOS.
 - 1.3 Explain the meaning of the following initials. CBM /AOS, GM(H)/DOG, CCM(SM)/SOG
 - 1.4 Why is it desirable to have a formal system for judging orchids? Explain the benefits that are obtained from this.
-
- 2.1 Demonstrate the ability to interpret the OCNZ Judging By laws.

Quality of Judging

Objective:

To be familiar with the judging score sheet and to maintain a consistent standard in pointing plants relative to the average for a panel.

Observe whether the scores of the participating judges are outside a range of five points inclusive of the highest and lowest scores.

All judges have the opportunity to reconsider their pointing. Under **no circumstances** must a judge feel that they are being pressurised to change their score up or down. If the scores are still outside the five points inclusive band, calculate the median and then discard the scores furthest away from the median until all scores fall within the range.

The mean is then calculated. Ideally the judging panel scores should be well clustered around the mid-point of the mean range. Mean scores of 75 and over suffice for an HCC, 80 and over an AM and 90 and over an FCC.

Be aware of differences that occur in other judging systems. In the AOC system 85 points suffices for an FCC. The RHS system has no HCC equivalent.

When an award is recommended the plant and flowers are carefully described and measured so that records of the plant on the day can be preserved for posterity. In all cases colour photographs are used to complement descriptions.

Suggested References:

- *OCNZ - Judges Handbook*

Exercises:

- 1.1 Point Plants ensuring that the correct scale is used, i.e. Single Flowered / Multi Flowered.
- 1.2 Maintain consistent standards of pointing plants relative to the average of a panel.
- 1.3 Complete judging in a minimum of five different genera.
- 1.4 Determine the average from a selection of numbers to fall within the criteria as defined in the Judges Handbook.

Flower Characteristics - advanced

For a general guide unacceptable features in flowers may include the following: -

- Severe asymmetry within placement of any segment of the flower
- Severely twisted column or staminode
- Undue reflexing of petals or sepals (not characteristic of its parents),
- Excessive cupping of petals or sepals (not characteristic of its parents),
- Twisting of petals or sepals (not characteristic of its parents),
- Severe colour breaks or blotches
- Very poor colour distribution.
- Lack of colour balance.

Form

A flower to be judged must be mature or set. The flower form should be balanced and symmetrical, both are essential for quality form. A vertical line drawn through the flower should bisect the flower into two symmetrical halves (mirror image). Slight asymmetry may not preclude an award but should always result in a lower score. Twisting, reflexing and other distortions, if not natural to the genus, should be penalised. Where a species is close in the breeding consideration must be given to the species effect on the outcome of the progeny.

The shape of Complex hybrids should approach a full round or oval circle completely filled in. There should be no light showing between the flower parts particularly near the base of the column. Likewise, the flower should be flat, without excessive cupping or excessive reflexing. When flat flowers are viewed side on, the petals should be held close to the plane of the dorsal sepal. At all times consideration must be given to the dominant gene characteristics in the background breeding of the flower.

The following comments refer more particularly to complex hybrids:

Sepals. These should be broad and fill in the gap between the petals and the lip. They should form a star pattern 120 degrees apart except where there is a synsepal. If the edges of the sepals are wavy this should be even.

Dorsal Sepals should be large, full and round, and flat to slightly concave. Except where it is a characteristic of the genus there should not be reflexing.

Ventral Sepals should form a background for the lip or pouch and extend low enough to give a balanced appearance. In *Paphiopedilums* the top of the ventral sepal should overlap the bottom of the dorsal sepal when viewed from the back.

Petals should form an inverted star pattern at an angle of 90 - 120 degrees to the lip when viewed from the front. Generally reflexing of petals is a fault. Undulating of the margins on the petal edges should be even. Notches in the petal edges are undesirable.

Labellum (Lip or Pouch) should be proportionate to the size of the rest of the flower, closed towards the base and more or less rolled around the column. It should be held in such a way that it gives balance and beauty to the form of the flower. All shapes are acceptable but when viewed from the side, the lip should curve down and not jut out at right angles to the plane of the tepals. If the edge of the lip is wavy this should be even. Where the lip has side lobes these should enhance the appearance of the lip in proportion to the whole flower.

Peloric forms

A peloric or abnormal petal mutation form has been found amongst Cattleyas as a colour pattern variation (due to a lack of a keel or callus structure in the Cattleya lip) for a long time. In Cymbidiums and Phalaenopsis lip structure is normally maintained to some degree when a peloric mutation occurs and appears on the petals as keels or callus. The petals can be expected to be wider, to have waving or goffering on the edges and not be so flat (reflecting the lip structure). The presence of keels on the mid lines can be expected where this is common in the lip of a genus, though the absence could make the flower more pleasing.

Atavistic forms

The atavistic form is a presumed reversion of the plant to the common ancestral form in that the lip has reverted to a petal. The lip (which will look like a petal) should be symmetrical from side to side so the whole flower maintains the bilateral symmetry around the column. With the lip as a petal, the petals should exhibit radial symmetry. Sometime the reversion will affect the column structure. This is undesirable. Atavistic breeding has occurred in Dendrobiums.

Labelloid forms

This consists of modified lateral sepals in which the lower half of each sepal is replaced by the structure and colour as seen in the labellum. Where the genus has a keel or callus on the lip this can be expected to be seen in the sepal also. The column and the rest of the flower should be normal for the genus.

In all the above variants forms, consistency is important. The flower form must be symmetrical for the labellum, petals and sepals. The whole flower, (the form and colour) must be consistent from flower to flower, inflorescence to inflorescence, and year to year.

Colour

A colour is any one or mixture of three primary colours. The primary colours are yellow, red and blue, or more correctly yellow, magenta and cyan. By mixing any two primary colours together we can create a secondary colour such as orange, green or purple. By mixing all three colours in differing proportions a tertiary colour (citrine, russet or olive). Black and white are considered to be neutral colours and brown, maroon and grey are semi neutral colours.

White light consists of all the colours in the rainbow - red, orange yellow, green, blue, indigo and violet light. The colour seen by the eye is the resultant light that is reflected from the article. Simply put a piece of paper is red because it reflects the red light. That is it absorbs (subtracts) the yellow and blue light. Likewise, the absorption of red light only will give a green colour (blue and yellow together) and the absorption of blue light gives an orange (red and yellow) hue.

In flowers, pigments generate the colour. Pigments are seen as coloured compounds, which have the ability to absorb certain wavelengths of light. Plant pigments may be divided for convenience into water (sap) soluble pigments found in the vacuoles of the protoplast, and lipid (fat) soluble pigments that occur in the plastids.

Chlorophyll's give green hues and are found in internal cells, not usually in the mature surface cells of the sepal or petal. In the early bud stages of flower development, the green pigments (chlorophyll *a*, *b*, *c* or *d*) tend to dominate.

Carotenoids give the orange and yellows hues and can be divided into carotenes (orange), with a hydrocarbon base or xanthophylls (yellow) which are derived from an oxygenated base.

As the flower 'ripens' there is a destruction of chlorophyll in the chloroplasts accompanied by an accumulation of yellow and or red pigments.

The sap soluble pigment cells occur in the cell vacuoles. The major colour influencing pigments are the anthoxanthins, anthocyanins and betacyanin.

Anthoxanthins in most circumstances are pale or colourless (cream and light yellow), while anthocyanins are the most common, most variable and numerous and usually occur together in various

combinations (red, purple and blue). The betacyanin causes the red colour in roots and leaves of garden beets and generally do not occur in flowers.

Superimposed on the effects of the pigment genes are intensity genes, which control the amount of pigment that forms.

The labellum, with its natural role in attracting pollinators, not only has a greater number of pigments than the other segments of the flower but also often has a greater intensity of the pigment. The various surface and internal layers of cells in the lip may have different pigments present from those found in the rest of the flower.

Size

In hybridising flowers, particularly with primary hybrids, the size, floriferousness and substance vary by the geometrical mean of the two parents not as an average. (R Northern and M Campbell). Most hybridisers have noted that if a small flower is crossed with a large flower the progeny always seems to be disappointingly nearer to the features of the smaller parent.

As an example, when *Cym. suave* (20 mm) is crossed with a large flowered Cymbidium hybrid (100mm) the resultant flower size would be closer to 44 mm than 60mm.

It should be noted however that the presence of polyploidy would distort these ratios.

Arithmetical mean $(20 + 100) / 2 = 60 \text{ mm}$

Whereas Geometrical mean $\sqrt{20 \times 100} = 44 \text{ mm}$

Suggested References:

- *OCNZ - Judges Handbook*

Photography of flowers / plants

Objective:

To be familiar with the requirements for photographing a plant / flower to a standard acceptable in the awards system.

A quality photograph is paramount in maintaining a permanent and accurate visual record of the plant/flower in the Awards System. To this extent the COA requires a photograph of the flower or plant to be submitted with the Award Application form. Photographs must be of a high standard to accurately represent the plant. Out of focus and sub-standard photographs may mean the award will not be ratified.

Photograph between 10am and 4pm when light conditions are more suitable. Avoid bright sunlight that will cause harsh shadows and bright spots. A light cloudy day is preferable to bright full sunny day. If the photograph is being taken outside choose a breeze free position preferably adjacent to a white or light coloured wall to give some reflected light on the side of the plant. A large piece of white cardboard is a suitable alternative. Remember to have the sun behind the camera in relation to the plant being photographed. If using flood lights be aware that the colour may not be the same as in natural light.

For the background use a background board covered with matt black cloth on one side and sky gray-blue on the other side. Use whichever side gives a good contrast against the flower. A very light colour will distract from the flower. The plant should be positioned approx. 30 cm in front of the backboard to ensure the background is out of focus. The background should be taut with no creases and no shadows crossing it or bright spots on it.

The plant/pot should be clean, unsightly foliage, labels and stakes removed if they are in the photograph. The flower (or plant) to be photographed is placed to be the main focus point, forward looking, attractively positioned. Have the camera at right angles to the plane of the flower so petal and sepal sizes are not distorted relative to each other.

The camera (SLR preferred) should be on a tripod or fixed stand. Zoom and close up lens can be helpful but generally reduce the depth of field available. Aperture opening governs the depth of field (the in-focus portion); the smaller the aperture the greater the depth of field (f16 will give a greater depth of field than f4.5). Shutter speed should be around 1/60th. Slower speeds can be used if there is no element of doubt that the camera or plant will not move! Use a soft flash when light is poor. But it should not cause shadows or bright spots on the flower / plant.

It is safe practice to take three photographs varying the exposure for each one.

Photographic faults to be avoided

Background in focus	Flower not presented or arranged at its best
Shadow on background	Flower not "front on"
Background mix of colour / distractions	Shadow on plant
Two-coloured background	Leaves not clean
Stake or container rods showing	Plant labelling showing
Loss of colour because of photograph taken in bright light	

Suggested References:

- *Fitch, Charles M.; Orchid Photography; American Orchid Society*
- *OCNZ - Judges Handbook*

Exercises:

- 1.1 Detail the requirements for photographs within the OCNZ system.
- 1.2 Describe the steps that must be followed in preparing a plant for an Award photograph.
- 2.1 Stage a plant for photographing.

Conservation

Objective:

To know the legal ramifications of importation of plants.

When importing plants into New Zealand there are two major pieces of legislation that must be considered.

CITES

The first demands for control on the international wildlife trade was made as early as 1911 when Paul Sarain, a Swiss conservationist called for restrictions on the import and export of bird feathers. In 1963, the General Assembly of the International Union for the Conservation of Nature (IUCN) called for an 'International convention on regulations of export, transit and import of rare or threatened wildlife species or their skins and trophies'. The IUCN initiative was successful and in 1973, CITES was finally concluded. It currently has approximately 145 parties and is probably the most successful of all international treaties concerned with conserving wildlife. The treaty has three appendices. Appendix I is for species threatened with extinction and prohibits international trade in all their parts. Appendix II allows for controlled trade in species whose survival is not yet threatened but may become so if trade continues without careful control. Appendix III is for species that may be subject to trade regulations by anyone party to the convention while not listed by all parties on Appendix I or II. There are also provisions for the listing of 'look-a-like' species. Special conditions apply to hybrids and cultural methods of certain plants on Appendices I and II.

Every 2 to 3 years there is a convention where representation is made to the up or down grading of species on the Appendices.

HSNO Act 1996

The Hazardous Substances and New Organisms Act 1996 (HSNO Act) controls the importation and development of new organisms into New Zealand. A 'new organism is a new species coming into New Zealand for the first time. If it was not in N.Z. before the HSNO Act came into effect on 29th July 1998 importation has to be approved by the Environmental Risk Management Authority (ERMA). A new organism could be a breed of fish a zoo animal, a packet of seeds, a flower plant, or a new micro-organism generated by genetic engineering (GMO). The Act also lists some animals and plants that are completely banned including any snake, venomous reptile, beavers, gerbils, prairie dog, mole, cane toad, Morton Bay Chestnut, Black Bean, *Cynanchum* and *Loranthaceae*.

A new organism also includes any plant, animal or microorganism developed through intergeneric breeding or genetic engineering. Genetically modified organisms (GMO's) are any organism in which the genes have been modified by using *in vitro* (recombinant DNA) techniques.

Suggested References:

- <https://cites.org/eng>
- <http://www.epa.govt.nz>
- Hybrids and the HSNO Act Pamphlet No3

Exercises:

- 1.1 Discuss the effect of CITES in relation to the importation of plants.
- 1.2 What is the effect on a plant that is listed in CITES Appendix I, II, and III.
- 1.3 List some of the plants on CITES Appendix I
- 1.4 Discuss the effect of the HSNO Act 1996 in New Zealand on the importation of plants.

Propagation - Seed culture.

Objective:

To demonstrate knowledge in the fertilisation of orchid flowers.

Orchids grown from seed seem to take forever to flower. The natural way of raising orchids from seed is dependent on a lot of conditions having to be met and is practically a method of chance. Charles Darwin computed that if an orchid attained 100% fertility and conditions were 100% ideal for germination, then in the first generation one plant would ensure a full acre of progeny; in the second-generation New Zealand would be covered and in the third generation, the whole world. Providing all conditions are right after pollination occurs the parent plant may form a seedpod. This seed pod may take six to eight months to mature. After germination of the seed the seedlings may then take up to seven years to flower.

Since the cultivation of Orchids has begun outside their natural environment there has been efforts to raise orchid plants from seed. The first cross to flower was *Cal Dominyi* (*Cal furcata* x *Cal masuca*) in 1856.

At the turn of the century the general 'recommendation' for raising orchids by seed was to prepare a surrogate parent (should be of the same allied genera) by re-surfacing the potting medium with a mixture of finely sieved sphagnum moss and fine black silky osmunda fiber. As the days lengthened, the mature seed was then sprinkled around the base of the orchid plant. Here were the right conditions for the germination of the seed and for the young plants to grow. Consequently, a lot of seed was sown and very few mature plants were raised.

In order to obtain seed from an orchid flower, the parent flowers must be mature. That is the flower that the pollen will come from must be ripe and the pod flower that will receive the pollen must also be ripe. When pollination occurs, the flower will collapse as it has completed its duty as a pollinator attraction. The pod will start to enlarge and mature ready for seed dispersal. When the distributed seed is in the right environment the germination occurs. Orchid seeds are monocotyledons and have no endosperm. When they germinate in the natural environment, they rely on a mycorrhizal fungus to supply the initial food source after germination until the young plant starts manufacturing its own carbohydrates by photosynthesis.

Monocotyledons is a flowering plant with an embryo that bears a single cotyledon (seed leaf).

Endosperm is the part of a seed which acts as a food store for the developing plant embryo.

Suggested References:

- *Weier T. E & et al 1982 Botany - An Introduction to Plant Biology 6th Edition, Wiley International Orchid Species Society of Victoria Reproductive Biology of Species Orchids Principles and Practice, 1988*

Exercises:

- 1.1 How are orchids pollinated?
- 1.2 What is the function of the stigmatic surface on the column?
- 1.3 Describe the process of setting seed from transfer of pollen to mature pod burst
- 1.4 Explain the terms "Green Pod" and "Mature Pod"
- 1.5 What is meant by 'Double germination'?

Propagation - Artificial

Objective:

To demonstrate knowledge in the artificial propagation of orchids.

Orchids can be propagated by dividing that is, one plant can be divided into two or rarely three (depending on the size of the plant) - but the rate of increase is unimpressive.

The lack of reliability in obtaining plants from seed resulted in investigations been carried out as to a method of raising orchid seed in a sterile medium. The growing of Orchid seed in laboratory conditions started with Dr Lewis Knudson first introducing a method of growing Orchids in sterile conditions. He used an agar solution with certain essential salts that were necessary for the growth of seedlings. Knudson came up with a variety of solutions of which the most well known one was the "Knudson B" solution. Many other solutions now exist that often contain secret portents of enzymes or aromatic hydrocarbons.

The science of cloning has remade the nature of orchid collecting. It has become possible to reproduce most species quickly and in large quantities and with genetic uniformity, and that in turn has made it possible to sell the plants at a reasonable price. However not all orchid genera can be cloned this way.

Artificially made genetic copies of orchid plants has only existed only since the late 1950s, when a French botanist named George Morel developed a process while trying to figure out a way of how to grow virus-free potatoes. Morel discovered that if he placed a few cells from the most actively growing part of a potato plant, that is the very tip of the growing shoot, into a growing medium and provided hormonal and chemical stimulation, the cells would multiply. Plant cells are undifferentiated until they orient themselves to the earth and the sun by detecting the force of gravity and warmth. As soon as they get oriented, some of the cells evolve into roots and others into leaves and stems. Morel realized that if he kept agitating and twirling the culture dishes, the cells would divide but remain undifferentiated. The cells kept splitting into more basic cells rather than developing into plants. He let the cells divide into thousands of basic cells and then he stopped shaking the dishes, separated the cells into smaller clumps, and placed the small clumps in another growing medium in motionless culture dishes. In a while the clumps matured into thousands of plants, and each one was an exact genetic copy - a clone of the original plant. Morel had a number of graduate students assisting him with the potato-cloning experiments. One of them was man named Walter Bertsch, who happened to be an orchid fancier and also happened to be dating a girl who worked at a famous French orchid company. Bertsch tried applying Morel's cloning technique to orchids and discovered that many species responded well. Dr Don Wimber is reputed to have been the first person to produce a Cymbidium by meristem process successfully. This is how orchids came to be the first ornamental plant to be cloned on a large scale.

Suggested References:

- *Kyte, Lydiane, John Kleyn, 1996 Plants From Test Tubes, : An Introduction to Micropropagation*

Exercises:

- 1.1 Describe the process that takes place in the modern laboratory for the seed culture of orchids.
- 1.2 Describe the process that takes place in the modern laboratory for the tissue culture of orchids.
- 1.3 Name some of the nutrients in an agar solution.

Hybridization

Objective:

To show the effects a particular plant can have on the progeny and why hybridizes follow particular trends.

Each hybridizer has their own personal vision and goal to create a perfect flower or pot plant. The only way of achieving this is from the current plant stock available.

In the mid 1800s, a monk named Gregor Mendel, working in Brno in the Czech Republic, carried out an amazing piece of scientific work. He observed that the offspring of certain plants had physical characteristics similar to the physical characteristics of the plant's parents or ancestors.

Mendel wondered why related organisms, both plant and animal, tended to resemble one another and how familiar resemblance might be explained. He reasoned that the close observation of inheritance might provide him with the answer for which he searched. He therefore set out to examine and quantify the physical traits in pea plants (because of their speedy reproductive cycles) in an attempt to predict the traits that would occur in future generations. During years of painstaking work, he counted many thousands of instances of seven characteristic traits, including plant height, flower colour and position, seed colour and shape, and pod colour and shape. Mendel concluded that certain particles or 'factors' were being transmitted from parent to offspring and so on, thus providing a connection from one generation to the next. He also observed that different characteristics were passed down in different sequences and came to the conclusion that characteristics were of two types, dominant or recessive. While each parent has a set of the theoretical characteristics only some of the characteristics were passed on, rather than blended into their offspring to produce the final physical characteristics of the individual plant. A characteristic may still be prominent even with very little of the particular parent left after several crossings of its progeny. Sometime the plant will have two dominant characteristics one desirable and one undesirable. For example, *Vanda coerulea* has a characteristic blue veining (tessellated pattern), which tends to show up in all its progeny however it also throws the characteristic of narrowing of the petals and sepals in the basal region of the flower.

A hybridizer's goal may be to create a red Cymbidium, magenta Cattleya, an iridescent Masdevallia, an out of season flower, or a flower with fragrance. In any plant breeding programme considerable time is spent in researching and tracing the predominant genes that have been handed down prior to the cross being made. Some crosses that have been bred, do not produced any flowers of any value but become valuable breeding stock parents due to the elimination of an unwanted dominant characteristic. Hence a breeding program may unlock a colour or characteristic that has previously been suppressed.

For some hybridizer's the commercial market has a great influence in their end product. They may be trying to extend the flowering season of a genus, or create a smaller size pot plant or to have a pot plant with a fragrant flower.

To obtain a particular trait, a breeding program may include a cross that may cross genus boundaries. Hybridizing different genera creates new genera.

Every flask of seedlings will bring surprises (and disappointments). Some discoveries are still made, some will be made by chance. Time and patience are essential. Looking to the future, even without gene splicing, the blue Cymbidium, or the ever-elusive black orchid may not be far away!

Suggested References:

- *Plant breeding lines can be followed in Sanders books, RHS or OrchidWiz.*

Exercises:

- 1.1 Detail a particular orchid species characteristic and show its domination in its hybrids. Discuss what the characteristic effects could be on future generations.
- 1.2 Detail a particular orchid hybrid characteristic and show its origins and desirability.
- 1.3 Explain the terms dominant and recessive genes.
- 1.4 Define a sibling cross.
- 1.5 Define the term intergeneric.

Genetics

Objective:

To have an understanding of genetics and genetic mutation that may occur within the Orchid family.

Genetics

Genetics is a recently discovered field of science. It was Alfred Hershey and Martha Chase who in 1952 published results of an experiment that convinced scientist that DNA (deoxyribonucleic acid) was the chemical that carries the genetic code or hereditary information for living tissue. The understanding of the mechanism that causes characteristic traits, chromosomes, had been identified. This started the mapping of genes and chromosome counting of living tissue.

A giant leap forward occurred in 1922 when a very superior cultivar *Cymbidium Alexanderi* 'Westonbirt' was awarded an FCC by the RHS. It had flowers of superior form and as a parent was responsible for lifting the hybridization of Cymbidiums out of the 'botanical' category. When it was crossed with almost anything the resultant hybrids were of a superior quality. This plant was a natural tetraploid. Natural tetraploids can occur either, by chance from seed, through crossing of existing tetraploids or during tissue culture.

Each germ cell (pollen or pod) contains a complete set of chromosomes, a haploid set (n). When these combine in a zygote or in a body cell, they are diploid ($2n$), because they contain two equal sets of chromosomes, one from the pollen parent and one from the pod parent. In plants the chromosomes can be in multiples (polyploid) as triploid ($3n$), tetraploid ($4n$) and hexaploid ($6n$) cells. Polyploid plants not only have larger cells but the plants themselves are often larger. This has led to deliberate creation of polyploid varieties of plants as watermelon, marigolds, and snapdragons. Some varieties of wheat are $6n$.

Genetic Mutations

A mutation is a change in the genetic material. It is where part of the cell's DNA is altered some way. Since the processes of duplicating genetic information and passing it on to either the next generation of cells or the next generation of individuals is complex, it is hardly surprising that mistakes occur sometime. These mistakes lead to the changes that are called mutations. Mutations in plants can be quite radically different from the parent or normal flower. With orchids flowers been of such a unique structure there is considerable variation of mutations that can occur. There are three basic mutations peloric, atavistic and labelloid. A peloric mutation in the Cattleya is commonly known as splash petal flowers. An atavistic mutation will give a regular appearance to the flower, but it will look more like a lily than an orchid. Labelloid forms while being regular are unusual to look at.

Exercises:

- 1.1 What is meant by the term's haploid, diploid, triploid, tetraploid chromosome count.
- 1.2 Discuss the effects these have in hybridizing.
- 1.3 Discuss the effects of chemically induced polyploidy.
- 1.4 Describe peloric mutations.
- 1.5 Describe atavistic mutations.
- 1.6 Describe labelloid mutations.

Viruses

Objective:

To have an understanding of the viruses that may occur within the Orchid Family.

In 1898, Friedrich Loeffler and Paul Frosch found evidence that the cause of foot-and-mouth disease in livestock was an infectious particle smaller than any bacteria. About the same time D. J. Iwanowski, a Russian plant scientist, carefully pressed some sap from a stunted and diseased tobacco plant. With a small amount of this sap, he inoculated a healthy tobacco plant. The healthy plant soon developed signs of a disease similar to that of the plant from which the sap had been taken. The experiment was repeated, but this time the sap from the diseased plant was forced through a filter with pores so small that bacteria could not pass through them. The healthy plants inoculated with this filtered sap soon contracted the disease of the healthy plant.

This was the first clue to the nature of viruses, genetic entities that lie somewhere in the grey area between living and non-living states. A virus is a small infectious agent, smaller than $0.2\mu\text{m}$, which is only able to replicate by modifying the genetic machinery of living host cells. Plant viruses can occur as spheres, bacilliform particles, or elongated rods. In each case there is some sort of RNA or DNA core surrounded by a protein sheath. Many angiosperms are susceptible to virus infection. Tobacco itself may suffer from 15 different viruses and potatoes from 18. If a virus particle is allowed to enter a plant it will multiply rapidly until the whole plant is infected. The plant remains so infected for the rest of its life. Several mechanisms allow the introduction of viruses into plants, insect infestation and field workers been the most common, bacteria, fungi and soil animals being less common. Some viruses are so infectious that they may be carried from one plant to the other by almost any sort of contact. There are over 400 different plant viruses known. Some viruses have a wide range of hosts (tobacco mosaic virus, cucumber virus) while others are limited to a few genera or even species. Higher than normal temperatures are often required to destroy a virus.

One of the most common symptoms of viral infection is the various mosaic mottling of leaves (occurrence of light–green or yellow areas), or chlorosis or necrosis blotches and streaks on leaves. Flowers may show colour breaks, brown markings or turn yellow or they may be distorted, irregular in shape or prematurely drop off.

Some orchids show severe black ticking in the leaves (*Cym. Colonial Boy*) which may be mistaken for a viral or bacterial infection.

Cymbidium Alexanderi 'Westonbirt' has had a virus for a long time.

The practice of meristeming an orchid will not eliminate a virus.

Exercises:

- 1.1 List three viruses that may be found in Orchid plants.
- 1.2 Discuss the visual signs of a virus in a plant.
- 1.3 Discuss methods of limiting virus spread.
- 1.4 Discuss methods of elimination of virus contaminated plants.

Nomenclature Rules and Regulations

Objective:

To demonstrate a general knowledge of plant nomenclature, especially relating to cultivated orchids, to understand the international orchid registration procedures maintained by the Royal Horticultural Society and to be able to advise a grower on how to complete an award application.

Every orchid has only one name that is separated into several terms. There are four basic terms to a name:

- **Generic name**
- **Collective or grex** (specific) **epithet** (hybrid or species as granted by the Royal Horticultural Society)
- **Cultivar name**
- **Parentage** (unless a collected species).

Generic Name

The first term is the generic name as each orchid falls into a single genus as: *Cattleya*, *Cymbidium*, *Laelia*, *Paphiopedilum*, *Phalaenopsis*, etc. Some hybrids may be the result of combining two compatible genera together to form multigeneric hybrids: *Brassocattleya*, *Laeliocattleya*, etc.

Standard abbreviations as defined by the RHS are usually used when indicating the genus of any plant, ie. B., C., Cym., Lc., Blc., Paph., Phal.

Collective or grex (specific) Epithet

When the parentage of an orchid is known, or if a species has been identified by recognised authorities, the plant may be granted a name after the hybrid is registered by the RHS.

Species names always start with a small letter and are written in italics (or a single straight underline). Most common species have been identified and described in publications, and individual plants can usually be given the proper name locally by knowledgeable growers. When in doubt, or if there is a chance that the plant may be a new species, correct identification can usually be obtained by sending a flower to a recognised plant identification facility.

Some species have varietal forms. This indicates that although the plants in question fall into the parameters of the description for the particular species, there may be significant variations sufficient to allow for a varietal section. Botanists are famous for their lumping, or splitting, of classifications on a regular basis. This has often been required as knowledge of a particular genera has increased. Many species known and awarded previously as separate species have been lumped into larger classes or separated into smaller ones. *Dendrobium cunninghamii* is now listed as *Winika cunninghamii*

Hybrids have certain rules governing the naming of cultivars. Hybrid names always begin with a capital letter and are written in roman type. The form must be a unique name and is governed by certain nomenclature rules. Be aware that the use of registered trademarks is not permitted.

Judges need to be continually monitoring name changes e.g. especially *Cattleya* and *Oncidium* alliance

Cultivar (Clonal) Name

This is an individual name given to a specific plant within a hybrid cross, or a specific name given to an individual plant of a species. It is always designated with a 'single' quote, never a "double" quote. Caution must be exercised that the assigned cultivar name has not previously been used for another plant of that grex.

Parentage

Every plant, including the species, has parents. The species parents will always be from within the same species. This will be either with pollen from the same flower onto itself, or a different flower from the same plant (called a selfing); or pollen from a different plant of the same species onto the flower of the first plant (called a sibling cross).

An unregistered hybrid will have two parents listed, but in an extreme case, four or more may be shown. This will arise when one or more of the parents used has not been registered. In order to register the cross, the earlier parental crosses must first be registered. A plant that has not been registered is still a recognised plant and may be entered as such in any form of judging. If, however, it is awarded an OCNZ award, it must be formally registered with the RHS before the award can be validated, with the exception that culture awards do not require registration, as the award is made to the grower rather than the plant.

An example of a multiple parent listing would be:

Cym. [(Profita x Sensation) x (*devonianum* x *insigne*)] = *Cym.* (Allara x VogelSang) = *Cym.* Maree Porter

Brackets () are used to represent the entire cross. Parentheses [] are used to designate unregistered crosses.

If one bloomed this plant as a seedling, and gave it a Cultivar name, the label on the plant could read: *Cym.* Maree Porter 'Waikanae' This cultivar name is unique to this seedling and it is the only grex from the cross on which it can be used.

If this cultivar was then mericloned it would always carry the name *Cym.* Maree Porter 'Waikanae'

Owners of plants should keep on the lookout for registration of the parents in one of the publications recording newly recorded hybrids such as *The Orchid Review* (RHS publication) or *Orchids* (the AOS publication). A record of the registration of all hybrids can be found in *Sander's List of Orchid Hybrids* or on computer databases such as the RHS.

Suggested References:

- Dressler R L *The Orchids: Natural History and Classification*
- Royal Horticultural Society *Hand Book on Orchid Nomenclature and Registration*, 4th Edition 1993
- Australian Orchid Society - Orchids Australia
- OrchidWiz

Exercises:

- 1.1 List the requirements of the owner for registering an orchid.
- 1.2 Complete an application form for the Registration of a Hybrid with the RHS
- 1.3 Explain the terms Intergeneric and Intrageneric

Glossary of Terms

Objective:

To be conversant with botanical terms used in the writing up of awarded plant descriptions.

GLOSSARY - SHAPE

Surface textures

bullate	blistered or puckered
farinose	mealy
glabrous	hairless
hispid	bristly
hirsute	hairy
papillose	small bumps or protuberance
pilose	densely haired
pubescent	covered with fine hairs
rugose	a rough or wrinkled surface
verrucose	with a warty or bumpy surface
woolly	provided with long, soft, and more or less matted hairs; like wool; lanate

General

auricles	ear-like lobes, often paired, as on the labellum or column
caudate	having a 'tail' or narrowed, apical extension, as some sepals and petals
ciliate	fringed with cilia or tiny hairs
crispate	curled
cristate	crested
dentate	referring to a toothed margin, the teeth pointing perpendicularly
denticulate	minutely toothed
fimbriate	finely fringed, as the margin of the labellum
hypochile	the basal portion of the labellum in some genera, e.g. Stanhopea
keel	a fleshy ridge, as on a labellum
labellum	lip, the median modified petal of an orchid flower
lamelia	raised membranous outgrowths on the labellum
lacerate	appearing torn, as the margin of a sepal or petal
lateral lobes	the two lobes on either side of the midlobe of a three lobed labellum
mentum	a 'chin' on some orchid flowers formed by the fusion of the lateral and the column-foot.
mesochile	the middle portion of the labellum in some genera
midlobe	the middle lobe of a three-lobed labellum, usually brightly coloured and furnished with calli, keels, and or lamellae
reclinate	turned or bent downward
recurved	curved backward or downward

reflexed	abruptly bent or turned downward or backward
rostellum	part of the median stigma lobe of orchid flowers
triquetrous	three-angled; three-winged
staminode	a sterile stamen
stellate	star-shaped
tubercle	a small, wart like protrusion, as on the callus on an <i>Oncidium</i> flower
undulate	wavy, as the margin of a sepal or petal
valvate	margins of sepals or petals not overlapping

GLOSSARY – COLOUR PATTERN DESCRIPTIONS

Banded	Distinctive horizontal stripes of one colour over another
Blotched	Colour disposed in broad, large irregular blotches
Bordered	As edged but surrounding colour broader
Candy striped	Normally red striped on a white background
Discoidal	Where a large spot of one colour is in the centre of a different colour
Dots	Colour disposed in very small round spots
Edged	A very narrow band on the edge of the petal/sepal
Enamel	Very shiny appearance
Marbled	As veined but edges further blurred
Maudiae type	Green on a white background
Ocellated	Where a large spot of one colour has another spot of a different colour
Painted	Colours are dispersed in streaks of unequal intensity
Peloric	Lateral petals mutated to resemble the lip
Picotee	Ornamental edging around the rims of the petals
Polychrome	Having as many as six or seven different colours
Pure colour	No red pigments in the flower
Spotted	Colour disposed in small spots
Splashed	Two toned petals, sepals normally single toned
Striped	Distinctive transverse stripes of one colour over another
Tessellated	Distinctive colour arranged in small squares
Variegated	Colour disposed in various irregular sinuous spaces
Veined	Distinctive irregular veins on the surface
Vini colour	Deep purple almost black
Waterfall	Colour pattern imitating a waterfall on the labellum
Zoned	Same as Discoidal but with concentric bands more numerous

GLOSSARY - GENERAL

acranthos	applied to a sympodium with a main axis of annual portions of successive axes, each beginning with leaf scales, and ending with an inflorescence
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aculeate	prickle-shaped
acumen	a tapered point
acuminate	referring to an apex (leaf, sepal, etc.) which tapers to a fine point
acute	referring to an apex that is broadly tapered
adnation	fusion of unlike parts, e.g. labellum with column; contrasted with connation
angulate	more or less angular
anther	the pollen-bearing portion of the stamen
applanate	flattened out or horizontally expanded
appressed	lying flat for the whole length of the organ
arcuate	curved like a bow
aristate	awned
apiculi	a short, sharp point
axil	the angle formed by a petiole and stem or, on an inflorescence, pedicel and rachis
basal	flower at the base of an organ or part such as the stem or pseudobulb
bifid	two-lobed
bifoliate	two-leafed
bifurcate	forked
bract	a leaflike organ
bursicle	the pouch like expansion of the stigma into which the caudicle of the pollinarium is inserted.
caducous	falling off early
caespitose	tufted; growing in small clumps
callus	a waxy or fleshy protuberance, as on a labellum
campanulate	bell-shaped
campanuliform	bell-shaped
canaliculate	channeled with a longitudinal groove
capitate	appearing in heads, as some inflorescences
capitulum	a dense head of flowers
capsule	a dry fruit splitting along one or more sutures; the fruit type in the orchid family
cataphyll	scale-like leaf, as on a rhizome or base of a stem
caudicle	extensions of tissue derived from the anther and connected to pollinia in many orchids.
cauline	borne on the stem
ceraceous	waxy
cereous	waxy
clavate	club-shaped, thickened towards the apex, sometimes said of some pseudobulbs and pollinia
claw	a long and narrowed basal portion of a sepal or petal (including labellum)
clinandrium	the portion of the column that supports the anther

column	the organ of the orchid flower representing the fusion of stamens, styles, and stigmas
column-foot	a basal extension of the column to which the labellum is attached, often flexibly
column wings	paired protuberances or winglike flanges on the column
conduplicate	folded once longitudinally down the middle
connation	fusion of like parts, e.g. sepal with sepal; contrasted with adnation
conspecific	belonging to the same species
cordate	heart-shaped
coriaceous	having a leathery texture
corm	a condensed stem, usually underground
corolla	the inner whorl of the flower
corymbose	a broad flat-topped inflorescence in which the outermost flowers open first
crenate	scalloped, toothed with crenatures
crenulate	shallowly scalloped; minutely crenate
cucullate	hooded or hood-shaped
cuneate	wedge-shaped
cuneiform	wedge-shaped
cuspidate	tipped with a sharp, rigid point
cymbiform	boat-shaped
cymose	a broad divaricately branched inflorescence, of determinate or centrifugal type
deflexed	bent backward or downwards
diaphanous	permitting the light to shine through
disc	an elevated region of the labellum, usually the midlobe, distinguished by colour and / or accessory features such as calii, keels, or lamellae
distichous	in two ranks or rows on opposite sides of an axis
divaricate	extremely divergent
echinate	having prickles, as some orchid ovaries and capsules
elliptic	ellipse-shaped, oblong with regularly rounded ends
emarginate	notched, usually at the apex
ensiform	sword-shaped
entire	smooth and continuous; said of the margin of a leaf or leaflike organ
epichile	the apical portion of the labellum in some orchid genera, e.g. Stanhopea
epiphyte	a plant growing on another
equitant	with leaves overlapping and arranged in two ranks or rows
erose	referring to the irregular margin of a leaf or leaflike organ which appears to have been chewed
facultative	not restricted to a particular way of life
falcate	sickle-shaped
fascicle	a small bunch or bundle

fasciculate	clustered or bundled
flabellate	fan-shaped
flexuose	bent alternately in opposite directions
foliaceous	leaflike
fugacious	withering away early; ephemeral
fusiform	spindle-shaped, as some pseudobulbs
furfuraceous	scurfy, having soft scales
galea in some orchids	a hood or "helmet" formed by the dorsal sepal or fusion of dorsal sepal and petals
glaucous	covered with a bluish-grey or sea green bloom
glomerate	densely clustered
gyrose	curved backward and forward in turn
hamate	hooked at the tip
hastate	spear or halbert-shaped, with the basal lobes turned outward
heteranthous	an apical inflorescence produced on a separate shoot which does not develop to produce a pseudobulb and leaves
hippocrepiform	horseshoe-shaped
hyaline	colourless or translucent
hysteranthous	used of an apical inflorescence produced after the pseudobulbs and leaves have developed
imbricate	overlapping, as the scales on a snake
imperfect	in flowers, having only male or female parts; unisexual
intergeneric	the result of crossing plants from two or more distinct genera
internode	the region of an axis between two successive nodes
intrageneric	the result of crossing two plants within the same genus
keikei	a vegetative offshoot formed at a node, as on an inflorescence
lamina	the blade (of a leaf, sepal, petal etc.)
lanceolate	lance shaped
ligulate	strap shaped
linear	at least 12 times longer than broad, with the sides and parallel
lip	the median modified petal of an orchid flower
lithophyte	a plant which grows on rocks
lorate	thong- or strap-shaped
lunate	half-moon-shaped
maculation	spotting or marking
meristem	in plants, undifferentiated tissue which retains the ability to provide new cells
monopodial	referring to a growth habit which new leaves develop from the same meristem or growing point
mucro	a sharp terminal point
mucronate	possessing a mucro

multicostata	many-ribbed
muricate	rough, with short and hard tubercular excrescence
mycorrhiza	a nutritional relationship between certain fungi and the roots of seedlings of orchids (as well as other plants)
navicular	boat-shaped
nervose	prominently nerved
node	the region on an axis (stem, rhizome etc.) to which other plant parts eg. leaves are attached
non-resupinate	referring to orchid flowers which do not twist 180 degrees during development or which twist a full 360 degrees, with the result that the labellum is uppermost
obcuneate	inversely wedge-shaped
oblanceolate	tapering towards the base more than towards the apex
obligate	restricted to a particular way of life
obovate	egg shaped, the broader end in the middle
obtuse	blunt or rounded at the apex
orbicular	circular, spherical
osmophore	a gland, usually floral, which produces fragrances that attract pollinators
ovary	the part of the pistil which contains ovules
ovate	egg-shaped, the broader end below the middle
ovule	the unit of the ovary which contains the egg cell and becomes the seed
paleaceous	chaffy
pandurate	fiddle-shaped
panicle	a branched raceme
papillae	a rounded projection from a portion of an epidermal cell, a small bump or protuberance
pedicel	the stalk of an individual flower in an inflorescence
peduncle	the stalk of a solitary flower or an entire inflorescence
pellucid	wholly or partially transparent
peltate	disc-shaped, the stalk arising from the undersurface
pendent	hanging
perfect	in flowers, having both male and female parts; bisexual
perianth	the sepals and petals of a flower
petal	the whorl of flower parts just inside the sepals, usually colourful, the median petal of orchids, the labellum, is often differentiated in form and or function
petiole	the stalk of a leaf
pistil	the female portion of the flower consisting of the stigma, style, and ovary with ovules
plicate	folded or pleated
plueicostate	many ribbed
plurisulcate	many grooved or furrowed

pod	a dry fruit splitting along one or more sutures; the fruit type in the orchid family
pollinarium	a functional unit in orchid pollination, consisting of two or more pollinia, stalk or stipe, and viscidium
pollinium	a mass of pollen grains
porate	set with pores
porrect	directed outward and forward
praemorse	bitten off at the apex
proteranthous	of an apical inflorescence produced before the pseudobulbs and leaves on the same shoot
protocorm	the embryo before primary differentiation is complete
pseudobulb	the variously thickened portion of an orchid stem
pyriform	pear-shaped
quadrate	square or rectangular
raceme	an unbranched inflorescence of stalked flowers
rachis	that portion of an inflorescence, above the peduncle, bearing flowers
ramicaul	the leafy stem of some sympodial orchids such as those in subtribe Pleurothallidinae; distinguished from the rhizome
reniform	kidney shaped
resupinate	referring to orchid flowers which twist through 180 degrees during development with the result that the labellum is upper most
reticulate	netted
retorse	directed backward or downward
retuse	shallowly notched at a rounded apex
revolute	rolled back from the margin
retuse	notched at the apex of a leaf or flower part
rhizome	the indeterminate axis of many plants (such as sympodial orchids) which successively gives rise to new shoots and flowers; often horizontal and may be underground but not necessarily
rostrate	beaked
rosulate	in rosettes
rotund	rounded in outline
saccate	with a conspicuous hollow swelling
sagittate	arrow-head-shaped
saprophyte	a plant which derives nourishment, in whole or in part, from dead organic material
scape	a leafless peduncle: commonly, the leafless stalk of an entire inflorescence
scarious	dry and papery, often said of bracts
sectile	referring to pollinia in loosely coherent packets
secund	to one side, as flowers on an inflorescence
septate	divided by partitions
septum	a partition

sepal	the outermost whorl of flower parts
serrate	referring to a toothed margin, the teeth pointing forward
sessile	lacking a stalk
setaceous	thread- or bristle-like
setose	bristly
spathe	a bract surrounding or subtending an inflorescence
speculum	the shiny, coloured region of the labellum region as in some <i>ophrys</i> species
spicule	a small, sharp point
spike	an unbranched inflorescence with sessile flowers, commonly used in lieu of inflorescence as 'a flower spike
spur	saccate or tubular extension of the labellum (or other floral parts) in many orchid species often bearing nectar
stamen	the male portion of the flower, consisting of the pollen-bearing anther and filament
stelidia	column teeth
stigma	that portion of the pistil that receives the pollen
stipe	the stalk connecting the pollinia and viscidium in a pollinarium
style	the elongate portion of the pistil between stigma and ovary
subcylindric	half cylindrical
subequitant	(leaves) half folded sharply in. the midrib
subspreading	half or somewhat having a outward direction
subquadrate	half square, somewhat square
subsimilar	somewhat similar
subulate	awl-shaped
subtend	to insert below, as a bract below a flower
sulcate	furrowed lengthwise, such as pseudobulbs
sympodial	referring to a growth habit in which new shoots arise successively from auxilliary buds of a rhizome
synsepal	a floral part formed by the partial or complete fusion of two or more sepals terete pencil-like; round in cross-section
terete	circular in transverse section, cylindrical and usually tapering
tessellation	a chequered pattern
trichome	a plant hair
tridactylate	literally, three fingered, with three narrow lobes
trifid	three cleft
trullate	trowel-shaped
truncate	with one end squared off
tuber	a thickened, usually underground storage organ consisting of stem tissues; commonly ascribed (incorrectly) to orchids
tuberoid	a thickened, underground storage organ with stem and root tissues
umbel	a more or less flat-topped inflorescence in which the pedicels arise from the same

	point, much like an umbrella
unciform	hook-shaped
uncinate	hooked
unguiculate	having a claw; commonly said of a perianth segment
unifoliate	one leafed
velamen	the outermost tissue of roots of many orchids, dead at maturity and capable of absorption and short-term storage of water and nutrients
viscidium	the sticky portion of the rostellum which is connected to the pollinia

DEFINITIONS OF WORDS AND PHRASES USED IN JUDGING EXHIBITIONS

accessories	articles other than the plants or flowers exhibited; accessories must be subordinate but a part of the whole; cut foliage and foliage plants, stands and containers, backgrounds, etc., are classed as accessories.
according to variety	the judging of flowers or plants which takes into consideration the potential and limitations of the species and clones from which they stem and the effects of hybridization.
alba (or album)	a term applied to an individual of a species or hybrid the flowers of which are normally coloured but which in this instance lack all coloration except white or, occasionally, yellow or green in combination with white.
amateur	one who grows his own plants primarily for his pleasure and who does not derive his livelihood or a substantial income therefrom.
arranged for effect	in schedules is a manner of composing plants or cut flowers primarily to exhibit the horticultural material to best advantage, as well as to contribute to the general beauty of the show.
arrangement	in schedules is an exhibit in which flowers with or without accessories are grouped to convey an idea. (contrary to other groups or classes, the living material is of secondary importance to the idea which it expresses). Arrangement of inflorescence. The manner in which flowers are displayed upon the stem.
artistic	pleasing to the eye; conceived with taste and executed with skill.
art shades	where a mixture or suffusion of strong colours combine to produce a pleasing effect (termed polychrome in Cymbidiums).
award judging	the non-competitive judging of plants and / or flowers for inherent quality according to established procedures.
balance	a design principle in that illusion of symmetrical or asymmetrical creates visual stability.
blemish	a bruise, spray discolouration, an injury by insects or disease, or any malformation detracting from the appearance of an exhibit.
bloom	an individual flower.
botanical	in point scales is a term designating any species or natural hybrid seldom seen in cultivation, the display of which contributes to the dissemination of knowledge of orchids: in schedules, any species or genus of orchids not commonly grown commercially for its flowers.
botanical variety	a plant in nature having minor characteristics or variations which distinguish it from the typical variety of the species.

breeder	see hybridizer.
breeding	the planned production of horticultural forms through selection, crossing, and / or hybridizing.
charm	an intangible quality which gives an exhibit an especially fascinating appeal.
class	the extent of a group of entries in a show established by the show schedule.
clonal variety	a named individual which is always vegetative propagated from a clone: a cultivar.
clone	a plant grown from a single seed and all subsequent vegetative divisions of it.
cluster	a group of several flowers growing close together on one stem.
colour	in point scales, the hue, clarity, intensity, etc., of colouring in relation to the usual forms; an orderly arrangement of colour areas; also, novelty of colouring, if handsome and desirable.
commercial grower	one who grows plants and / or flowers for sale with or without employed help, and derives his livelihood or a substantial income therefrom.
condition	the physical state of the flower or plant at the time of judging.
contrast	a design principle where different characteristics of design elements –coarse / smooth, light / dark, short / long.
cross	the mating of two different orchid clones, whether varieties, species, hybrids, or genera; the progeny from such a mating.
cultivar	an individual plant in cultivation, including its vegetative propagations and meristem propagation. (abbreviated as cv.)
cultivar name	a fancy (that is, non-Latin) name given to an orchid clone and set in single quotes when written or printed.
cultural perfection	the development of plants in flower to the presumed peak of their potential.
display	an exhibit of plants and flowers for effect with emphasis on the attractiveness of the grouping.
disqualify	to remove an entry from consideration for exhibiting or judging because of some defect which is the exhibitor's fault, eg., not conforming to schedule, use of forbidden accessories, violation of some rule in the schedule, or detrimental to the general quality of the show.
distinction	in point scales, a quality of excellence which places the exhibit above the usual or commonplace.
dominance	the phenomenon whereby, in an individual containing two allelic forms of a gene, one is expressed to the exclusion of the other.
eliminate	to remove from consideration of the judges an entry which for some reason (such as poor condition or lack of beauty) is detrimental to the general quality of the show or is not worthy of consideration.
exhibit	an entry placed in a show.
floriferousness	the degree of flower-bearing in relation to the typical.
foliage	in schedules, only natural foliage, ferns and other foliage plants.
form	the conformation, carriage and proportion of petals, sepals, and lip, according to variety.
genus (pl. genera)	a subdivision of a family, consisting of one or more species which show similar significant characteristics and appear to have a common ancestry.

grex	a flock or group, applied collectively to the progeny of a given cross.
grex name	the fancy (that is, non-Latin) name given to a cross and to all progeny of that cross.
habit of inflorescence	in point scales is the manner in which the inflorescence is displayed.
horticultural variety	any of a cultivated population with a species or interspecific hybrid group having characters by which it merits distinction from others of the same kind (same as cultivar).
hybrid	the offspring of a cross between two different species, a species and a hybrid, or two hybrids
hybrid genus	a category of plants derived from the combination of two or more genera.
hybridization	the act or process of creating hybrids, hybridizer. the firm or individual who originates a cross and produces progeny for distribution, irrespective of ownership of parent plants or agent technically concerned in pollination, germination, etc.: the breeder.
individual	a single plant, inflorescence or clone.
inflorescence	mode of flower-bearing. (for types of inflorescences, see panicle, raceme, scape, spike or umbel.)
labelling	in point scales is the identification of the individual plants in a group exhibit by means of suitable cards or tags.
made-up plant	a number of identical plants growing or placed together in one pot, not to be judged as a specimen plant.
mericlone	an individual plant produced through meristem tissue culture propagation and treated as a vegetative division of the clone from which it was produced.
meristem	undifferentiated, actively growing cells found in certain parts of a plant to produce individual mericlones by the technique of propagation: a mericlone.
meritorious	a term applied to an exhibit which possesses distinct individuality and exceptional horticultural, educational, or artistic value.
naturalistic	in schedules is a type of exhibit in which the material is displayed in a manner which suggests as nearly as possible its natural growth or habitat.
novelty	a recent introduction, a seedling or a sport, possessing unexpected but desirable qualities.
novice class	in schedules is a class in a show open to all new exhibitors.
originality	the quality of being independently conceived or novel but not bizarre or freakish.
outstanding exhibit	an exhibit that is prominent and striking for its design, quality, and cultural perfection.
overcrowded	a common fault resulting from the use of too much material, making it impossible to display each plant to its best advantage.
pendulous	plants where at least 50% of the flowers are carried below the rim of the container.
polychrome	where a flower has more than three colours or shades of colour excluding the labellum.
private grower	one who employs others to grow or assist in growing his plants, but does not derive his livelihood or a substantial income therefrom.
professional grower	a person who, because of his training and experience, qualifies for horticultural employment and derives his livelihood therefrom.

provisional award	a conditional award which cannot be certified for publication pending registration of a hybrid, or taxonomic verification of a species. species considered for awards other than CBM, and not identified to the satisfaction of the judging team, may also be given provisional awards.
pure colour	are flowers in the white-green-yellow range of colour lacking in or completely lacking in anthocyanin pigments (blue-red).
quality	high standard of excellence.
rarity	in point scales is the scarcity of such plants in general cultivation.
rhythm	a design principle where there is measure of component size to individual design parts.
scape	a leafless flower stalk arising from below, often with a single flower, as in Lycaste.
seedling	unless otherwise specified in the schedule, a plant grown from seed and flowering for the first time.
semi-alba	a term applied to a white flower that has a coloured lip.
show judging:	the judging of plants and/or flowers in competition, either individually or in groups, in accordance with the rules of the show.
size	the dimension of a flower in relation to the normal for its kind.
species	a group of plants (or animals) showing intergradation among its individual members and having in common one or more significant characteristics which definitely separate it from any other group.
specimen	(in schedules) a single plant of unusual size and number of flowers for the variety, exhibiting fine culture
spray	this is not a botanical term (sprays are either racemes or panicles), but may be used in a horticultural sense to imply an arching effect.
substance	the thickness and firmness of tissue in flowers.
texture	the surface qualities of a flower which enhance appearance.
variety	a given kind; a plant which varies from the type in one or more important characters. (also see botanical variety, clonal variety, horticultural variety, and cultivar).
variety	in a display both as numbers of different genera and variety within one or a few genera. (for use in scoring groups of plants. collection or cut flower exhibits)

PART TWO - PRACTICAL EXERCISES IN KNOWLEDGE OF GENERA

General

Objective

To have a working knowledge of both species and hybrids in the lesser-grown genera. This should include a knowledge of the sources of information to allow for rapid revision of details of such genera.

Discuss the judging of a genus or alliance not directly covered by the Judging Standards in the OCNZ Judges Handbook and how to research information on such genera or alliances.

Suggested References:

- *Shuttleworth F S, HS Zim & G W Dillon Golden Guide to Orchids.1989*
- *Bechtel, H., P. Cribb, & E. Launert.1992 Manual of Cultivated Orchid Species. MIT Press Cambridge Mass.*
- *Royal Horticultural Society - Sanders List of Orchid Hybrids*
- *OCNZ - Judges Handbook*

Cattleya Alliance - Standard

Objective:

To demonstrate competence in the application of modern hybridising trends and the judging of Standard Exhibition Type Cattleya.

A cattleya bloom is classified as standard by its shape and, although usually large flowered, not by its size. Small flowered cattleyas conforming to this shape also come within this category

Standard Exhibition type cattleyas, with the classic full rounded form and large frilly labellum, have been hybridised from Central and South American species. There has been considerable intergeneric crossing in the cattleya alliance to increase the range of colours and, more recently, to reduce the size of the plants.

For many years they were the predominant cut flower orchid in USA and due to this popularity, many hybrids were produced resulting in the majority of awards having been made under the American system.

Plants in the cattleya alliance have predominant pseudobulbs and may be divided into two groups; the unifoliate (one leaf per pseudobulb) and the bifoliate (two leaves per pseudo-bulb). With a few exceptions the flowers rise from the top of the pseudobulb and there may be up to thirty flowers per stem.

Suggested References:

- *Withner, Carl I. 1988 The Cattleyas and their Relatives – Vol I The Cattleyas, Vol 11 Laelia*
- *MacQueen J & B Orchids of Brazil*
- *Rentoul J N The Cattleyas and other Epiphytes*
- *Bechtel, H., P. Cribb, & E. Launert. 1992 Manual of Cultivated Orchid Species.*
- *Royal Horticultural Society - Sanders List of Orchid Hybrids*
- *OCNZ - Orchids (Yearbook)*

Exercises:

- 1.1 Research and name the species within the Cattleya Alliance (i.e. *Cattleya*, *Laelia*, *Brassavola* etc.) whose progeny are classified as Standard Cattleya Alliance hybrids.
 - 1.2 Describe (include sketches or photos) how to identify any five species within this group. Include its origin, environment, the characteristics of foliage or flower that makes it easily identifiable, and the potential of the species to be used in hybridising.
 - 1.3 Research the relevant plants used in breeding the first Cattleya Alliance cross or a classic hybrid e.g. C. Bob Betts or C. Bow Bells (draw a family tree).
 - 1.4 Name five or more Standard Cattleya Alliance hybrids awarded in New Zealand, USA or Australia in the last 10 years.
 - 1.5 Research the breeding of five different Standard Cattleya Alliance hybrids of recent breeding, at least one of which must have been awarded in the last two years. Derive the percentage of species in the parentage along with dominant characteristics carried forward from the species or their parents and passed on to the progeny.
-
- 2.1 Measure a Standard Cattleya Alliance flower preferably one that has been pointed.
 - 2.2 Describe a flower from this group. Use the Principles of Awards as a guide to explain the shape, colour, texture, substance, arrangement and overall appeal.

Cattleya Alliance –Modern/Other

Objective:

To demonstrate competence in the application of modern hybridising trends and the judging of these Cattleyas.

This includes all those plants which do not fit the criteria outlined for Standard Cattleyas. They are less formal and more diverse in shape, they have a greater range and variety of colour and markings, and they frequently have multi-floral heads.

Hybridisers have used species which introduce multi floral heads of flowers in bright colours and these are often of more open form, sometimes starry in shape or with smaller labella. Note that miniature or compact sized plants are not considered here if the flower shape is of the classic rounded form. In some countries these plants would be called Novelty.

Suggested References:

- *Withner, Carl I. 1988 The Cattleyas and their Relatives – Vol I The Cattleyas, Vol 11 Laelia*
- *MacQueen J & B Orchids of Brazil*
- *Rentoul J N The Cattleyas and other Epiphytes*
- *Bechtel, H., P. Cribb, & E. Launert. 1992 Manual of Cultivated Orchid Species.*
- *Royal Horticultural Society - Sanders List of Orchid Hybrids*
- *OCNZ - Orchids (Yearbook)*

Exercises:

- 1.1 Research and name the species within the Cattleya Alliance (ie *Cattleya*, *Laelia*, *Broughtonia*) whose progeny do not fit the criteria for Standard Cattleya Alliance hybrids.
 - 1.2 Write a precis (include sketches or photos) on how to identify any five species within this group. Include its origin, environment, the characteristics of foliage or flower that makes it easily identifiable, and the potential of the species to be used in hybridising.
 - 1.3 Research the relevant plants used in the first recorded inter-generic cross or a classic hybrid. e.g. *C. Chocolate Drop* (include a family tree).
 - 1.4 Name ten or more of these Cattleya Alliance hybrids awarded in New Zealand, USA or Australia in the last 10 years.
 - 1.5 Research the breeding of five different novelty Cattleya Alliance hybrids of recent breeding, at least one of which must have been awarded in the last two years. Derive the percentage of species in the parentage along with dominant characteristics carried forward from the species or their parents and passed on to the progeny.
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- 2.1 Measure a modern/other Cattleya Alliance flower.
 - 2.2 Describe a flower from this group. Use the Principles of Awards as a guide to explain the shape, colour, texture, substance, arrangement and overall appeal.

Cymbidium - Standard

Objective:

To demonstrate competence in the application of modern hybridising trends and the judging of Standard Cymbidiums.

Cymbidium species are terrestrial plants originating from South East Asia, the Indonesian Islands and northern Australia. They are mostly found growing at high altitude but the Indonesian and Australian species require warmer conditions. The genus was described in 1799 by Swartz who derived the name from the Greek word for boat referring to the shape of the lip.

There are approximately seventy species from which thousands of hybrids have been created. In Australia and New Zealand, they are a major part of the horticultural industry. Their attributes of long-lasting flowers, vigorous growth, comparative ease of cultivation, and great variety of forms, colours and sizes have all contributed to this phenomenon.

Because they have been so popular in this country there has been an unwarranted tendency in some quarters to treat them as merely show fillers.

Suggested References:

- *DuPuy, D and P Cribb 1988. The Genus Cymbidium, Timberland Press Portland, Oregon*
- *Smith Noe 1991 Cymbidium Species: A Quick Reference and Their Synonyms*
- *Bechtel, H., P. Cribb, & E. Launert. 1992 Manual of Cultivated Orchid Species. MIT Press Cambridge Mass.*
- *OCNZ - Orchids (Yearbook)*
- *Royal Horticultural Society - Sanders List of Orchid Hybrids*

Exercises:

- 1.1 Research and name ten Standard Cymbidium species.
 - 1.2 Describe (include sketches or photos) how to identify any five species within this group. Include, its origin, environment, the characteristics of foliage or flower that makes it easily identifiable, and the potential of the species to be used in hybridising.
 - 1.3 Research the relevant plants used in breeding the first cross or a classic Cymbidium hybrid e.g. *Cym Alexanderi* 'Westonbirt'. (include a family tree).
 - 1.4 Name ten or more Standard Cymbidium hybrids awarded in New Zealand, USA or Australia in the last 10 years.
 - 1.5 Research and describe the breeding of five different Standard Cymbidiums of recent breeding at least one of which must have been awarded in the last two years. Derive the percentage of species in the parentage along with dominant characteristics carried forward from the species or their parents and passed on to the progeny.
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- 2.1 Measure a Standard Cymbidium flower.
 - 2.2 Describe a flower from this group. Use the Principles of Awards as a guide to explain the shape, colour, texture, substance, arrangement and overall appeal.

Cymbidium - Intermediate

Objective:

To demonstrate competence in the application of modern hybridising trends and the judging of Intermediate Cymbidiums.

To be classified as an Intermediate Cymbidium the plant must be a species or have an intermediate flowered or foliated species/hybrid in its recent parentage and the flowers should be between 60 and 100mm in diameter.

Suggested References:

- *DuPuy, D and P Cribb 1988. The Genus Cymbidium, Timberland Press Portland, Oregon*
- *Smith Noe 1991 Cymbidium Species: A Quick Reference and Their Synonyms*
- *Bechtel, H., P. Cribb, & E. Launert. 1992 Manual of Cultivated Orchid Species. MIT Press Cambridge Mass.*
- *OCNZ - Orchids (Yearbook)*
- *Royal Horticultural Society - Sanders List of Orchid Hybrids*

Exercises:

- 1.1 Research and name ten Intermediate Cymbidium species.
 - 1.2 Describe (include sketches or photos) how to identify any three species within this group. Include its origin, environment, the characteristics of foliage or flower that makes it easily identifiable, and the potential of the species to be used in hybridising.
 - 1.3 Research a classic Intermediate Cymbidium hybrid e.g. *Cym Peter Pan* (include a family tree).
 - 1.4 Name five or more intermediate Cymbidium hybrids awarded in New Zealand, USA or Australia in the last 10 years.
 - 1.5 Detail the breeding of five different intermediate Cymbidiums of recent breeding at least one of which must have been awarded in the last two years. Derive the percentage of species in the parentage along with dominant characteristics carried forward from the species or their parents and passed on to the progeny.
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- 2.1 Measure an intermediate Cymbidium flower.
 - 2.2 Describe a flower from this group. Use the Principles of Awards as a guide to explain the shape, colour, texture, substance, arrangement and overall appeal.

Cymbidium - Miniature

Objective:

To demonstrate competence in the application of modern hybridising trends and the judging of Miniature Cymbidiums.

A plant is deemed to be a Miniature Cymbidium when the flowers do not exceed 60 mm. in diameter.

These must be a species or have a miniature flowered or foliated species/hybrid in their recent parentage.

Suggested References:

- *DuPuy, D and P Cribb 1988. The Genus Cymbidium, Timberland Press Portland, Oregon*
- *Smith Noe 1991 Cymbidium Species: A Quick Reference and Their Synonyms*
- *Bechtel, H., P. Cribb, & E. Launert. 1992 Manual of Cultivated Orchid Species. MIT Press Cambridge Mass.*
- *OCNZ - Orchids (Yearbook)*
- *Royal Horticultural Society - Sanders List of Orchid Hybrids*

Exercises:

- 1.1 Research and name ten Miniature Cymbidium species.
 - 1.2 Describe (include sketches or photos) how to identify any three species within this group. Include, its origin, environment, the characteristics of foliage or flower that makes it easily identifiable, and the potential of the species to be used in hybridising.
 - 1.3 Research a classic miniature Cymbidium hybrid e.g. *Cym. Sarah Jean*. (include a family tree).
 - 1.4 Name five or more miniature Cymbidium hybrids awarded in New Zealand, USA or Australia in the last 10 years.
 - 1.5 Describe the breeding of five different miniature Cymbidiums of recent breeding at least one of which must have been awarded in the last two years. Derive the percentage of species in the parentage along with dominant characteristics carried forward from the species or their parents and passed on to the progeny.
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- 2.1 Measure a miniature Cymbidium flower.
 - 2.2 Describe a flower from this group. Use the Principles of Awards as a guide to explain the shape, colour, texture, substance, arrangement and overall appeal.

Dendrobium - (nobile & phalaenopsis)

Objective:

To demonstrate competence in the application of modern hybridising trends and the judging of Dendrobium.

The genus Dendrobium with more than 1400 species is one of the most diverse genus of orchids. They have a wide distribution from Australia and the Pacific Islands to the Himalayas and as far north as Southern China and Japan.

Adapted to a vast number of different habitats the pseudobulbs range in size from 50 mm to 5 meters. In some the leaves are evergreen while others are deciduous, leaves often falling from the plant just before flowering. Flowers are produced singly, in clusters or arching sprays, all have the lateral sepals united at the base to form a short sac or spur. Many species produce keikis.

Dendrobiums can be divided into many different sections (e.g. Callista, Dendrocoryne, Formosae, Latouria, Phalaenanthe, Spatulata)

Suggested References:

- Schelpe, Sybella, & Joyce Stewart 1990 *Dendrobiums: An Introduction to the Species in Cultivation*.
- Rentoul, J.N. *Growing Orchids Book Three*
- Bechtel, H., P. Cribb, & E. Launert. 1992 *Manual of Cultivated Orchid Species*. MIT Press Cambridge Mass.
- Royal Horticultural Society - Sanders *List of Orchid Hybrids*

Exercises:

- 1.1 Name five Dendrobium species falling within the Phalaenanthe type.
 - 1.2 Describe (include sketches or photos) how to identify any five of these species. Include origin, environment, the characteristics of foliage or flower that makes them easily identifiable, and the potential of the species to be used in hybridising.
 - 1.3 Research the relevant plants used in breeding the first cross or a classic hybrid e.g. *Den. Jaquelyn Thomas* (include a family tree).
 - 1.4 Name ten or more Dendrobium hybrids from this group awarded in New Zealand, USA or Australia in the last 10 years.
 - 1.5 Research the breeding of five different Dendrobium from this group of recent breeding at least one of which must have been awarded in the last two years. Derive the percentage of species in the parentage along with dominant characteristics carried forward from the species or their parents and passed on to the progeny.
 - 1.6 Identify the difference between the hard cane and soft cane Dendrobiums.
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- 2.1 Measure a nobile or phalaenopsis type Dendrobium flower.
 - 2.2 Describe a flower from this group. Use the Principles of Awards as a guide to explain the shape, colour, texture, substance, arrangement and overall appeal.

Dendrobium - (other types)

Objective:

To demonstrate competence in the application of modern hybridising trends and the judging of Dendrobium.

With a large number of species and wide-ranging area of distribution big differences in size and characteristics of plants and flowers are to be expected. This section covers all dendrobiums other than the full shaped flowers of *Den. nobile* and *Den. phalaenopsis* types covered in the previous section.

Suggested References:

- Upton, Walter T. Dendrobium Orchids of Australia
- Bechtel, H., P. Cribb & E. Launert.1980 *Manual of Cultivated Orchid Species*. MIT Press Cambridge Mass.
- OCNZ Orchids 2000
- Royal Horticultural Society Sanders List of Orchid Hybrids

Exercises:

- 1.1 Name ten Dendrobium species which are not included in the nobile or phalaenopsis groups.
 - 1.2 Describe (include sketches or photos) (on) how to identify any five species within this group. Include its origin, environment, the characteristics of foliage or flower that makes it easily identifiable, and the potential of the species used use in hybridising.
 - 1.3 Research the relevant plants used in breeding a classic hybrid e.g. *Den. Bardo Rose* (include a family tree).
 - 1.4 Name ten or more Dendrobiums hybrids from this group awarded in New Zealand, USA or Australia in the last 10 years.
 - 1.5 Research the breeding of five different Dendrobium from this group of recent breeding at least one of which must have been awarded in the last two years. Derive the percentage of species in the parentage along with dominant characteristics carried forward from the species or their parents and passed on to the progeny.
 - 1.6 What is the common characteristic of all Dendrobium flowers?
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- 2.1 Measure a Dendrobium flower from this group.
 - 2.2 Describe a flower from this group. Use the Principles of Awards as a guide to explain the shape, colour, texture, substance, arrangement and overall appeal.

Masdevallia

Objective:

To demonstrate competence in the application of modern hybridising trends and the judging of Masdevallia and Dracula.

Masdevallias comprise of approximately 370 species growing from southern Mexico to southern Brazil, the largest concentration being Columbia, Peru & Ecuador. The species are mostly from areas on mountainous rain forest, in high elevations bathed in cloud and mist, many in remote areas.

Species of this genus may be recognised by paddle-shaped single leaves with rhizomes at the base which vary in length from 400mm to 25mm. Cultivated in the right conditions they form into clumps very quickly.

The flower stem is formed at the base of the leaves or on the leaf stem.

The flowers display great diversity in size, shape, texture and colour with the sepals and caudae being the most obvious part of the flower. The lip, petals and column are usually very small and are hidden within the flower. These parts are not measured for an award.

Suggested References:

- *Rhodehamel William, A Masdevallia Cultural Guide*
- *Pleurothallid Index of Masdevallia & Dracula*
- *Macdonald, Ross. 1994 Cool Flowering Orchids Throughout the Year*
- *Bechtel, H., P. Cribb, & E. Launert. 1992 Manual of Cultivated Orchid Species. MIT Press Cambridge Mass.*
- *Hawkes Encyclopedia of Cultivated Orchids*
- *OCNZ - Orchids (Yearbook)*
- *Royal Horticultural Society - Sanders List of Orchid Hybrids*

Exercises:

- 1.1 Name ten Masdevallia and Dracula species.
- 1.2 Describe (include sketches or photos) how to identify any five species within this group. Include, its origin, environment, the characteristics of foliage or flower that makes it easily identifiable, and the potential of the species to be used in hybridising.
- 1.3 Research the relevant plants used in breeding the first cross or a classic hybrid e.g. *Masdevallia Heathii* (include a family tree).
- 1.4 Name ten or more Masdevallia or Dracula hybrids awarded in New Zealand, USA or Australia in the last 10 years.
- 1.5 Research the breeding of five different Masdevallia or Dracula hybrids of recent breeding at least one of which must have been awarded in the last two years. Derive the percentage of species in the parentage along with dominant characteristics carried forward from the species or their parents and passed on to the progeny.
- 2.1 Measure a Masdevallia or Dracula flower.
- 2.2 Describe a flower from this group. Use the Principles of Awards as a guide to explain the shape, colour, texture, substance, arrangement and overall appeal.

Miltonia

Objective:

To demonstrate competence in the application of modern hybridising trends and the judging of Miltonia.

Found naturally in the highlands of the Andes and in South East Brazil. The species are characterized by a climbing rhizome and pseudo bulbs having apical two leaves. The flower has a bowed column and normally has a colourful lip.

The growth and cultural requirements are very similar to that for some oncidium and some taxonomists consider they should be part of that genus.

Suggested References

- Bechtel, H., P. Cribb, & E. Launert.1992 *Manual of Cultivated Orchid Species*. MIT Press Cambridge Mass.
- Hawkes A D Encyclopedia of Cultivated Orchids
- OCNZ - Orchids (Yearbook)
- Royal Horticultural Society - Sanders List of Orchid Hybrids

Exercises:

- 1.1 Name ten species.
 - 1.2 Describe (include sketches or photos) how to identify any three species of Miltonia. Include, its origin, environment, characteristics of its foliage or flower that makes it easily identifiable and the potential of the species to be used in hybridising.
 - 1.3 Research the relevant Miltonia used in breeding the first cross or a classic hybrid e.g. *Miltonia Goodale Moir* (include a family tree).
 - 1.4 Name ten or more Miltonia hybrids awarded in New Zealand, USA or Australia in the last 10 years.
 - 1.5 Research the breeding of five different Miltonia hybrids of recent breeding. Derive the percentage of species in the parentage along with dominant characteristics carried forward from the species or their parents and passed on to their progeny.
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- 2.1 Measure a Miltonia flower.
 - 2.2 Describe a flower from this group. Use the Principles of Awards as a guide to explain the shape, colour, texture, substance, arrangement and overall appeal.

Miltoniopsis

Objective:

To demonstrate competence in the application of modern hybridising trends and the judging of Miltoniopsis.

Miltoniopsis means 'resembling a *Miltonia*' applying to the 'pansy orchids' which were separated from *Miltonia* in 1976. They originate from the high Andean plateau of South America (Costa Rica, Venezuela, Ecuador and Colombia). Distinguished by clustered one leafed pseudobulbs and the flower column united with the lip. The large lip is a predominant feature of the flowers and some plants exhibit a waterfall patterned mask. The lip is an important consideration in judging these flowers.

There are about 25 species in the genus and hundreds of hybrids have been registered. They do not breed as readily with other members of the *Oncidiinae* as do the *Miltonia*.

Suggested References

- *Bechtel, H., P. Cribb, & E. Launert. 1980 Manual of Cultivated Orchid Species. MIT Press Cambridge Mass.*
- *Royal Horticultural Society - Sanders List of Orchid Hybrids*

Exercises

- 1.1 Name ten *Miltoniopsis* species.
 - 1.2 Describe (or explain) (include sketches or photos) how to identify any species *Miltoniopsis*. Include, its origin, environment, characteristics of its foliage or flower that makes it easily identifiable and the potential of the species to be used in hybridising.
 - 1.3 Research the relevant *Miltoniopsis* used in breeding the first cross or a classic hybrid e.g. *Miltoniopsis* Gascogne (include a family tree).
 - 1.4 Name ten or more *Miltoniopsis* hybrids awarded in New Zealand, USA or Australia in the last 10 years.
 - 1.5 Research the breeding of five different *Miltoniopsis* of recent breeding. Derive the percentage of species in the parentage along with dominant characteristics carried forward from the species or their parents and passed on to their progeny.
-
- 2.1 Measure a *Miltoniopsis* flower.
 - 2.2 Describe a flower from this group. Use the Principles of Awards as a guide to explain the shape, colour, texture, substance, arrangement and overall appeal.

New Zealand Native

Objective:

To understand the importance of our native flora to our country. To demonstrate how difficult it has been to achieve hybridizing of the New Zealand native genera.

Of the 25 genera recorded as growing in New Zealand most species are ground orchids of which five are non green parasites or saprophytes. All the genera, except five (*Aporostylis*, *Danhatchia*, *Earina*, *Waireia* and *Winika*) are also recorded in Australia, and at least one third of the species are common to the two countries. Known under various common names such as greenhoods, sun or onion orchids they grow in a variety of conditions across the length of New Zealand.

Some species are endemic to certain areas while others natural range is limited to above or below certain latitudes. The pasturing of New Zealand has removed considerable natural habitat and there are now a number of threatened New Zealand orchid species. The flowers are invariably small and normally a 10xs magnifying glass is needed to identify and appreciate them. Some flowers have peculiar floral mechanisms that are indicative to that genus.

The last 'official' full taxonomic treatment of the New Zealand native orchids was in 1970 when they were extensively described by L. B. Moore and E. Edgar in 'Flora of New Zealand Vol. II', published by the Government Printer for DSIR and lists 21 different genera. Prior to this, various manuscripts (e.g. Hooker 'Handbook of the New Zealand Flora' in 1864) were the accepted authority.

Since then, Ian St George in 'The Nature Guide to New Zealand Native Orchids' published in 1999 has updated and expanded on this using information gained by New Zealand Native Orchid enthusiasts and botanical experts. Considerable work is still being undertaken to establish their correct identity and classification.

Suggested References

- *St George I. Bruce Irwin and D Hatch 1996 Field Guide to the New Zealand Orchids N Z Native Orchid Group*
- *St George I. 1999 The Nature Guide to New Zealand Native Orchids*
- *Cooper D. 1981 New Zealand Native Orchids A field guide. Price Milburn*
- *Hawkes Encyclopedia of Cultivated Orchids Faber & Faber*
- *OCNZ - Orchids (Yearbook)*

Exercises

- 1.1 Name ten of the common New Zealand species.
 - 1.2 Describe (include sketches or photos) how to identify any five New Zealand native orchid species. Include its origin, environment, characteristics of its foliage or flower that makes it easily identifiable, and the potential of the species to be used in hybridising.
 - 1.3 Research the relevant New Zealand native species used in making the first hybrid. Include hybrids where one parent may not be of New Zealand origin.
 - 1.4 Research *Winika cunninghamii* syn *Den. cunninghamii*
 - 1.5 Name New Zealand Native orchids awarded in the last 10 years.
-
- 2.1 Describe a flower from this group. Use the Judges Handbook as a guide to explain the shape, colour, texture, substance, arrangement and overall appeal.

Odontoglossum

Note: Following DNA research by Kew Science, *Odontoglossum* is now considered as a synonym of *Oncidium*. However, RHS are still registering some hybrids under the genus *Odontoglossum*. Therefore, this section of the manual has been retained for information purposes.

Objective:

To demonstrate competence in the application of modern hybridising trends and the judging of the classic *crispum* type *Odontoglossum*.

The 60 odd species of *Odontoglossum* form part of the *Oncidiinae* and they hybridise freely with other related genera. The species were discovered in an area extending from Mexico to Brazil and Bolivia with the majority occurring in the Andean regions of Northern South America.

Some species grow in warm lowlands but the majority grow at high elevations hence generally they are cool growing. An inflorescence may bear from one to many showy and often large flowers.

Odontoglossum crispum has played a major part in the development of classic exhibition type *Odontoglossum* and *Odontioda* hybrids. This section of the manual deals with the species and hybrids which fall into this category.

Suggested References

- *Bechtel, H., P. Cribb, & E. Launert. 1980 Manual of Cultivated Orchid Species. MIT Press Cambridge Mass.*
- *OCNZ – Orchids (Yearbook)*
- *Royal Horticultural Society - Sanders List of Orchid Hybrids*

Exercises

- 1.1 Name ten *Odontoglossum* species.
 - 1.2 Describe (include sketches or photos) how to identify any five *Odontoglossum* species. Include its origin, environment, characteristics of its foliage or flower that makes it easily identifiable and the potential of the species to be used in hybridising.
 - 1.3 Research the relevant *Odontoglossum* used in breeding the first cross or a classic hybrid e.g. *Odontoglossum Moselle* (include a family tree).
 - 1.4 Name ten or more *Odontoglossum* hybrids awarded in New Zealand, USA or Australia in the last 10 years.
 - 1.5 Research the breeding of five different *Odontoglossum* of recent breeding. Derive the percentage of species in the parentage along with dominant characteristics carried forward from the species or their parents and passed on to their progeny.
-
- 2.1 Write out the procedure for measuring an *Odontoglossum* plant that is being pointed.
 - 2.2 Describe a flower from this section. Use the Principles of Awards as a guide to explain the shape, colour, texture, substance, arrangement and overall appeal.

Odontoglossum Alliance

Objective:

To demonstrate competence in the application of modern hybridising trends and the judging of Odontoglossum Alliance

The Odontoglossum Alliance refers to the whole of the *Oncidiinae* though separate sections have been established to consider the full shaped crispum type *Odontoglossum* and the *Oncidium*.

When all the genera are included, this is the largest group of South American orchids in number of plants, geographic range and cultural diversity.

As most species within this alliance hybridise freely a significant number of intergeneric genera have been established. Plants from these groups will form the majority of those being considered for judging under this section.

Each of the genera have their own particular characteristics which are carried forward to varying degrees in their progeny giving considerable differences in flower size, shape and quantity. It is important that judges are able to understand and recognise these characteristics.

Suggested References

- *Bechtel, H., P. Cribb, & E. Launert. 1980 Manual of Cultivated Orchid Species. MIT Press Cambridge Mass.*
- *OCNZ - Orchids (Yearbook)*
- *Royal Horticultural Society - Sanders List of Orchid Hybrids*

Exercises

- 1.1 Name the species included in the Odontoglossum alliance, e.g. *Cochlioda*, *Brassia*, *Miltonia*.
 - 1.2 Describe (include sketches or photos) how to identify any five species from this group of the Odontoglossum alliance. Include its origin, environment, characteristics of its foliage or flower that makes it easily identifiable and the potential of the species to be used in hybridising.
 - 1.3 Research the relevant plants used in breeding the first cross or a classic hybrid e.g. *Odontocidium* Tiger Butter (include a family tree).
 - 1.4 Name ten or more hybrids in the Odontoglossum alliance awarded in New Zealand, USA or Australis in the last 10 years.
 - 1.5 Research the breeding of five different Odontoglossum Alliance hybrids of recent breeding. Derive the percentage of species in the parentage along with dominant characteristics carried forward from the species or their parents and passed on to their progeny.
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- 2.1 Measure an Odontoglossum alliance flower.
 - 2.2 Describe a flower from this group. Use the Principles of Awards as a guide to explain the shape, colour, texture, substance, arrangement and overall appeal.

Oncidium

Objective:

To demonstrate competence in the application of modern hybridising trends and the judging of Oncidium.

The genus name refers to the small tubercles situated at the base of the lip which resemble tumors (Greek *onkos*). Having over 750 species this is one of the biggest genera with a range extending from Florida to southern Argentina.

Revision of the genus has seen the reclassification of a number of species (i.e. the *Tolumnea* group) over recent years though these may not be recognised by the RHS for registration purposes and great care is therefore required in the researching of plants from within this group.

The number of flowers is highly variable – *O. abortivum* bears a few while others such as *O. harrisonianum* produce hundreds.

They are generally tolerant plants adapting well to cultivation with the majority growing well under intermediate conditions.

Suggested References

- *Bechtel, H., P. Cribb, & E. Launert. 1980 Manual of Cultivated Orchid Species. MIT Press Cambridge Mass.*
- *OCNZ - Orchids (Yearbook)*
- *Royal Horticultural Society - Sanders List of Orchid Hybrids*

Exercises

- 1.1 Name ten *Oncidium* species.
 - 1.2 Describe (include sketches or photos) how to identify any five species *Oncidium*. Include its origin, environment, characteristics of its foliage or flower that makes it easily identifiable and the potential of the species to be used in hybridising.
 - 1.3 Research the relevant *Oncidium* used in breeding the first cross or a classic hybrid e.g. *Oncidium Java* (include a family tree).
 - 1.4 Name ten or more *Oncidium* hybrids awarded in New Zealand and USA in the last 10 years.
 - 1.5 Research the breeding of five different *Oncidium* of recent breeding. Derive the percentage of species in the parentage along with dominant characteristics carried forward from the species or their parents and passed on to their progeny.
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- 2.1 Measure an *Oncidium* flower.
 - 2.3 Describe a flower from this group. Use the Principles of Awards as a guide to explain the shape, colour, texture, substance, arrangement and overall appeal.
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- 1.1 Name a species that was once classified as an *Oncidium* that has been reclassified. What is its new classification?
 - 1.2 What would be the genus of the plant in 3.1 be if crossed with an *Oncidium*?

Paphiopedilum - Complex Hybrids

Objective:

To demonstrate competence in the application of modern hybridising trends and the judging of Paphiopedilum Complex Hybrids.

The genus is widespread over a huge region extending from Southern China and the Himalayas to New Guinea. Well over 50 species are recognised and a significant number of these have been discovered in very recent years.

This has always been a very popular genus and thousands of hybrids have been made. In the 19th century collectors paid vast sums of money to acquire plants, particularly *P. fairrieatum*, though they are now much more modestly priced with the possible exception of *P. rothschildianum*.

There is considerable variation in plant and flower habit within the genus. In this section of the manual, we are considering only complex hybrids exhibiting a full round shape.

Suggested References

- *Bechtel, H., P. Cribb, & E. Launert. 1980 Manual of Cultivated Orchid Species. MIT Press Cambridge Mass.*
- *Royal Horticultural Society - Sanders List of Orchid Hybrids*
- *Koopowitz, H 1995 An Annotated Check List of the Genus Paphiopedilum*

Exercises

- 1.1 Name the Paphiopedilum species that have had an influence in the development of complex hybrids.
 - 1.2 Describe (include sketches or photos) how to identify any five species Paphiopedilum. Include its origin, environment, characteristics of its foliage or flower that makes it easily identifiable and the potential of the species to be used in hybridising.
 - 1.3 Research a classic hybrid e.g. *Paphiopedilum* Winston Churchill (include a family tree).
 - 1.4 Name ten or more hybrids in the Paphiopedilum alliance awarded in New Zealand, USA or Australia in the last 10 years.
 - 1.5 Research the breeding of five different Paphiopedilum of recent breeding. Derive the percentage of species in the parentage along with dominant characteristics carried forward from the species or their parents and passed on to their progeny.
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- 2.1 Measure a Complex Paphiopedilum plant.
 - 2.2 Describe a flower from this group. Use the Principles of Awards as a guide to explain the shape, colour, texture, substance, arrangement and overall appeal.

Paphiopedilum - (novelty & multifloral)

Objective:

To demonstrate competence in the application of modern hybridising trends and the judging of Paphiopedilum (novelty & multifloral).

This genus is widespread over a huge region extending from Southern China and the Himalayas to New Guinea. Well over 50 species are recognised and a significant number of these have been discovered in very recent years.

Complex hybrids are covered in a previous section but there remains a great diversity of plants within the genus to consider. Some have plain leaves while others have mottled or marbled foliage. Many hybrids carry a single flower on the inflorescence while others are sequential or multi-flowered.

As many of the hybrids are primary or secondary crosses the influence of the species is still very strong. A thorough grasp of the species characteristics is therefore important when considering plants within this section.

Suggested References

- *Braem, Guido J., Charles O Baker & Margaret Baker 1998 The Genus Paphiopedilum: Natural History and Classification Vol 1*
- *DuPuy, D and P Cribb 1988. The Genus Paphiopedilum Timberland Press Portland, Oregon*
- *Bechtel, H., P. Cribb, & E. Launert.1992 Manual of Cultivated Orchid Species. MIT Press Cambridge Mass.*
- *Koopowitz, H 1995 An Annotated Check List of the Genus Paphiopedilum*
- *OCNZ - Orchids (yearbook)*
- *Royal Horticultural Society - Sanders List of Orchid Hybrids*

Exercises

- 1.1 Name ten Paphiopedilum species in this group.
 - 1.2 Describe (include sketches or photos) how to identify any five Paphiopedilum species in this group. Include its origin, environment, characteristics of its foliage or flower that makes it easily identifiable and the potential of the species to be used in hybridising.
 - 1.3 Research the relevant Paphiopedilum used in breeding the first cross or a classic hybrid e.g. *Paphiopedilum Saint Swithin* (include a family tree).
 - 1.4 Name ten or more hybrids in the Paphiopedilum awarded in New Zealand, USA or Australia in the last 10 years.
 - 1.5 Describe the breeding of five recent Paphiopedilum hybrids. Derive the percentage of species in the parentage along with dominant characteristics carried forward from the species or their parents and passed on to their progeny.
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- 2.1 Measure a Paphiopedilum flower.
 - 2.3 Describe a flower from this group. Use the Principles of Awards as a guide to explain the shape, colour, texture, substance, arrangement and overall appeal.

Phalaenopsis – Other than Novelty

Objective:

To demonstrate competence in the application of modern hybridising trends and the judging of Phalaenopsis.

Often referred to as the Moth orchid, plants of this genus are among the most popular of cultivated orchids overseas. As a consequence, vast numbers of hybrids are now being produced and over 5000 have been registered. There are approximately 50 recognised species with a distribution range from India through South East Asia and the Philippines to northern Australia.

They have hybridised freely with the small flowered *Doritis* though many of today's *Doritaenopsis* are impossible to differentiate from a true *Phalaenopsis*.

The whole group can be divided into 5 different sections, (Phalaenopsis, Polychilos, Sturoglottis, Amboinensis, Zebrinae.) A number of inter-generic hybrids have been made with other genera within the *Sarcanthinae*.

Suggested References

- *Bechtel, H., P. Cribb, & E. Launert. 1980 Manual of Cultivated Orchid Species. MIT Press Cambridge Mass.*
- *OCNZ - Orchids (Yearbook)*
- *Royal Horticultural Society - Sanders List of Orchid Hybrids*

Exercises

- 1.1 Name five Phalaenopsis species.
 - 1.2 Describe (include sketches or photos) how to identify any five species Phalaenopsis. Include its origin, environment, characteristics of its foliage or flower that makes it easily identifiable and the potential of the species to be used use in hybridising.
 - 1.3 Research the relevant Phalaenopsis used in breeding the first cross or a classic Phalaenopsis hybrid e.g. *Phalaenopsis*. Doris (include a family tree).
 - 1.4 Name ten or more Phalaenopsis hybrids awarded in New Zealand, USA or Australia in the last 10 years.
 - 1.5 Research the breeding of five different Phalaenopsis of recent breeding. Derive the percentage of species in the parentage along with dominant characteristics carried forward from the species or their parents and passed on to their progeny.
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- 2.1 Measure a Phalaenopsis flower.
 - 2.2 Describe a flower from this group. Use the Principles of Awards as a guide to explain the shape, colour, texture, substance, arrangement and overall appeal.

Phalaenopsis – Novelty

Objective:

To demonstrate competence in the application of modern hybridising trends and the judging of Novelty Phalaenopsis.

The Phalaenopsis included in this group do not have the full rounded shape of the previous section and come in a variety of colours. Due to the influence of species in the parentage, used to increase the colour range, the flowers often lack regularity of arrangement on the inflorescence. Multi floral plants often have a reduced flower size.

It was not until of *Phalaenopsis Deventeriana* was remade in 1974 that the potential of buttercup-yellow Phalaenopsis with heavy substance was realised. This cross has become one of the famous breeding stocks in the orchid world.

Suggested References

- *Bechtel, H., P. Cribb, & E. Launert. 1980 Manual of Cultivated Orchid Species. MIT Press Cambridge Mass.*
- *OCNZ – Orchids (Yearbook)*
- *Royal Horticultural Society - Sanders List of Orchid Hybrids*

Exercises

- 1.1 Name five Phalaenopsis and Doritis species
 - 1.2 Describe (include sketches or photos) how to identify any five species of Phalaenopsis or Doritis. Include its origin, environment, characteristics of its foliage or flower that makes it easily identifiable and the potential of the species to be used in hybridising.
 - 1.3 Research the relevant Phalaenopsis and / or Doritis used in breeding the first cross or a classic Hybrid e.g. *Phalaenopsis Deventeriana* (include a family tree).
 - 1.4 Name ten or more Phalaenopsis / Doritaenopsis hybrids awarded in New Zealand, USA or Australia in the last 10 years.
 - 1.5 Research the breeding of five different Phalaenopsis and / or Doritaenopsis hybrids of recent breeding. Derive the percentage of species in the parentage along with dominant characteristics carried forward from the species or their parents and passed on to their progeny.
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- 2.1 Measure a Phalaenopsis and / or Doritaenopsis flower.
 - 2.2 Describe a flower from this group. Use the Principles of Awards as a guide to explain the shape, colour, texture, substance, arrangement and overall appeal.

Phragmipedium

Objective:

To demonstrate competence in the application of modern hybridising trends and the judging of Phragmipedium

This genus makes up the South American division of the *Cypripedioideae*. Less than 20 species are known but they have become very popular in recent years particularly since the discovery of the brightly coloured Phrag. besseae.

Some excellent hybrids have been produced, particularly through the Eric Young Foundation, and a significant number of awards have been made to plants of this genus.

Suggested References

- Braem, Guido J., Charles O Baker & Margaret Baker 1998 *The Genus Paphiopedilum: Natural History and Classification Vol 1*
- DuPuy, D and P Cribb 1988. *The Genus Paphiopedilum* Timberland Press Portland, Oregon
- Bechtel, H., P. Cribb, & E. Launert. 1992 *Manual of Cultivated Orchid Species*. MIT Press Cambridge Mass.
- OCNZ - Orchids (Yearbook)
- Royal Horticultural Society - Sanders List of Orchid Hybrids

Exercises

- 1.1 Name ten Phragmipedium species.
 - 1.2 Describe (include sketches or photos) how to identify any five species of Phragmipedium. Include its origin, environment, characteristics of its foliage or flower that makes it easily identifiable and the potential of the species to be used in hybridising.
 - 1.3 Research the relevant Phragmipedium used in breeding the first cross or a classic hybrid e.g. *Phragmipedium Grande* (include a family tree).
 - 1.4 Name ten or more Phragmipedium hybrids awarded in New Zealand and USA in the last 10 years.
 - 1.5 Research the breeding of five different Phragmipedium of recent breeding. Derive the percentage of species in the parentage along with dominant characteristics carried forward from the species or their parents and passed on to their progeny.
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- 2.1 Measure a Phragmipedium flower.
 - 2.2 Describe a flower from this group. Use the Principles of Awards as a guide to explain the shape, colour, texture, substance, arrangement and overall appeal.

Pleione

Objective:

To demonstrate competence in the application of modern hybridising trends and the judging of Pleione.

The name Pleione is derived from Greek mythology after the mother of Pleiades. Comprising around 15 species the genus is widely distributed in the Himalayas through to Southern China and Formosa.

Closely allied to Coelogyne, their cluster-forming deciduous pseudobulbs make them somewhat unique in habit. Growing at altitudes from 1000 to 3300 m these orchids can withstand very low winter temperatures, and probably largely as a consequence of this, are popular in this country.

They have been grown on the continent for many years and a number of hybrids have been created, particularly by Ian Butterfield in the UK. An increasing number of these are being seen in this country.

Suggested References

- *Bechtel, H., P. Cribb, & E. Launert. 1992 Manual of Cultivated Orchid Species. MIT Press Cambridge Mass.*
- *Cribb P and Butterfield Ian 1988 The Genus Pleione Timberland Press Portland Oregon*
- *Hawkes A D Encyclopedia of Cultivated Orchids*
- *Royal Horticultural Society - Sanders List of Orchid Hybrids*

Exercises

- 1.1 Name ten Pleione species.
 - 1.2 Describe (include sketches or photos) how to identify any five species of Pleione. Include, its origin, environment, characteristics of its foliage or flower that makes it easily identifiable and the potential of the species to be used in hybridising.
 - 1.3 Research the relevant Pleione used in breeding the first cross or a classic hybrid e.g. *Pleione Versailles* (include a family tree).
 - 1.4 Name ten or more Pleione hybrids awarded in New Zealand, USA or Australis in the last 10 years.
 - 1.5 Research the breeding of five different Pleione of recent breeding. Derive the percentage of species in the parentage along with dominant characteristics carried forward from the species or their parents and passed on to their progeny.
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- 2.1 Measure a Pleione flower.
 - 2.2 Describe a flower from this group. Use the Principles of Awards as a guide to explain the shape, colour, texture, substance, arrangement and overall appeal.

Sarcochilus

Objective:

To demonstrate competence in the application of modern hybridising trends and the judging of *Sarcochilus*.

The genus *Sarcochilus* (about fourteen species) are distributed in tropical and sub tropical regions. All but one are endemic to Eastern Australia and the mountain ranges from Queensland to Victoria. Most species are small epiphytes: however, three robust species grow on cliff faces in humid gullies, gorges, rainforest, on rocks, crevices, in trees or may grow in extensive lumps where there is bright light, humidity and free movement of air. Growth habit is Vandaceous, the few channelled leaves are often not upright but hanging over water. The inflorescences all come from between bracts of leaves and there is a wide range of flower size and number of flowers per inflorescence.

They are sometimes sequential flowering with a great variety of flower shapes. The shapes vary from small bells to starry types, with anything in between. The flowers are long lasting and often fragrant. The genus is characterised by having four pollinia attached to the viscidium.

The classical shape displays radial symmetry (the petals and sepals are equally spaced like a five bladed propeller). The labellum is centrally positioned small and relatively inconspicuous. In the novelty species the flower shape is distorted from the perfect radial symmetry with the labellum becoming the dominant feature.

Sarcochilus is one of 28 genera forming the sub tribe Sarcanthinae and most of these will hybridise. The hybrids of *Sarcochilus* using *Pteroceras* have a limited number of flowers out at any one time, but the flowers last over a long time.

Suggested References

- Bechtel, H., P. Cribb, & E. Launert. 1992 *Manual of Cultivated Orchid Species*. MIT Press Cambridge Mass.
- A D Hawkes Encyclopedia of Cultivated Orchids
- Royal Horticultural Society - Sanders List of Orchid Hybrids
- Upton Walter T *Sarcochilus Orchids of Australia*

Exercises

- 1.1 Name ten *Sarcochilus* species.
 - 1.2 Describe (include sketches or photos) how to identify any five species of *Sarcochilus*. Include, its origin, environment, characteristics of its foliage or flower that makes it easily identifiable and the potential of the species to be used in hybridising.
 - 1.3 Research the relevant *Sarcochilus* used in breeding the first cross or a classic hybrid e.g. *Sarcochilus* *Heathii* (include a family tree).
 - 1.4 Name ten or more *Sarcochilus* hybrids awarded in New Zealand, USA or Australia in the last 10 years.
 - 1.5 Research the breeding of five recent *Sarcochilus* hybrids. Derive the percentage of species in the parentage along with dominant characteristics carried forward from the species or their parents and passed on to their progeny.
- 2.1 Measure a *Sarcochilus* flower.
 - 2.2 Describe a flower from this group. Use the Principles of Awards as a guide to explain the shape, colour, texture, substance, arrangement and overall appeal.

Vandaceous

Objective:

To demonstrate competence in the application of modern hybridising trends and the judging of Vandaceous.

The genus *Vanda* has more than 50 species covering an area from India through the Philippines and South East Asia to New Guinea and northern Australia. They are found mostly in tropical regions at low altitude. The few higher altitude species require a cooler, dry period when growth is complete. Closely allied to *Vanda* are the dwarf growing *Ascocentrum* which produce many small brightly coloured flowers on stiff erect stems.

Stems are usually stout, often long with short spaces between the leaves. Flowers are usually flat with a short spur on the lip and normally long lasting. The genus may be split into three groups:

- i) strap shaped leaves
- ii) terete (cylindrical) leaves
- iii) the cool growing.

Suggested References

- *Bechtel, H., P. Cribb, & E. Launert. 1992 Manual of Cultivated Orchid Species. MIT Press Cambridge Mass.*
- *Royal Horticultural Society - Sanders List of Orchid Hybrids*

Exercises

- 1.1 Name ten *Vanda* / *Ascocentrum* species.
 - 1.2 Describe (include sketches or photos) how to identify any five Vandaceous species. Include its origin, environment, characteristics of its foliage or flower that makes it easily identifiable and the potential of the species to be used in hybridising.
 - 1.3 Research the relevant *Vanda* used in breeding the first cross or a classic Hybrid e.g. *Vanda rothschildiana* (include a family tree).
 - 1.4 Name ten or more *Vanda* / *Ascocentrum* hybrids awarded in New Zealand, USA or Australia in the last 10 years.
 - 1.5 Research the breeding of five different *Vanda* / *Ascocentrum* of recent breeding. Derive the percentage of species in the parentage along with dominant characteristics carried forward from the species or their parents and passed on to their progeny.
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- 2.1 Measure a *Vanda* / *Ascocentrum* flower.
 - 2.2 Describe a flower from this group. Use the Principles of Awards as a guide to explain the shape, colour, texture, substance, arrangement and overall appeal.

Zygopetalum

Objective:

To demonstrate competence in the application of modern hybridising trends and the judging of Zygopetalum.

Sometime around 1826 Mr Mackay, of Trinity College Botanical Gardens, exhibited the first Zygopetalum which is now known as *Z. mackayi*. It had come from Brazil and was sent to Sir William Hooker who was the first official director of the Royal Botanical Gardens at Kew. He found it so unlike any described species in its floral structure that he had no hesitation in naming it the genus Zygopetalum, from the Greek *zygo* (yoke) and *petalon* (petal or sepal).

Zygopetalums are natives mostly to southeastern Brazil, Bolivia, Peru, and northern Argentina. They occur mostly in mountainous regions where the climate is considerably cooler than on the coast. They are very hardy have a sympodial growth habit and form pseudo-bulbs. The inflorescence and new growth emerge from the base and are about 250 to 600 mm. long, with four to seven flowers. The flowers are usually 50 to 75 mm. Wide. One of their greatest attractions is the contrast of light green with brown bars or spots on the petals and sepals. The three lobed lip which normally has a transverse callus at the base, is usually white with a purple overlay and has veining or spotting of red, blue, or purple. The four pollinia are united to form one pair attached to the viscidium. A mature plant with several inflorescences may produce an overwhelming fragrance on a warm autumn afternoon.

Intergeneric breeding with approximately 20 other genus has produced a large number of genera. These lines of breeding are still in their infancy. More complex hybrids are more often than not bred back to the Zygopetalum parent. This leads to a greater degree of Zygopetalum influence being carried forward as the distinguishing characteristic in the progeny.

Suggested References

- Bechtel, H., P. Cribb, & E. Launert. 1980 Manual of Cultivated Orchid Species. MIT Press Cambridge Mass.
- OCNZ - Orchids (Yearbook)
- Royal Horticultural Society - Sanders List of Orchid Hybrids

Exercises

- 1.1 Name five Zygopetalum species.
 - 1.2 Describe (include sketches or photos) how to identify any two species Zygopetalum. Include its origin, environment, characteristics of its foliage or flower that makes it easily identifiable and the potential of the species to be used in hybridising.
 - 1.3 Research the relevant Zygopetalum used in breeding the first cross or a classic hybrid e.g. *Zygopetalum* B. G. White (include a family tree).
 - 1.4 Name ten or more Zygopetalum hybrids awarded in New Zealand, USA or Australia in the last 10 years.
 - 1.5 Research the breeding of three different Zygopetalum of recent breeding. Derive the percentage of species in the parentage along with dominant characteristics carried forward from the species or their parents and passed on to their progeny.
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- 2.1 Measure a Zygopetalum flower.
 - 2.2 Describe a flower from this section. Use the Principles of Awards as a guide to explain the shape, colour, texture, substance, arrangement and overall appeal.