The Genus Dendrobium

Overview with Notes on Cultural Requirements

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Disclaimer!

- This presentation is a work in progress….
- It was created primarily for today and still has some significant additions to be made
- Even as it is, it is unlikely that time or my voice will hold out to get through it, so which ever gives out first!
- We can try to fill in the gaps with questions
- Most of the flower pictures are AOS award slides which can be ‘lifted’ from AQ Plus and can be used only for educational purposes – I will be glad to show you how if anyone is interested
- This is a great addition to educational activities

Dendrobiums

- General principles
  - Watch your plants carefully, as with most orchids they will tell you what they need if you don't ignore them too long!
  - Look up and see country and conditions of natural habitat and try to mimic that
  - Remember there are some monsoon plants and some dry location plants – one size does not fit all!

History of the Genus

- The genus Dendrobium (dendros = tree and bios = life) was established by the Swedish botanist Olaf Swartz in 1799 and contains the largest number of species (?>1600 - Hawkes or ~900 - Bechtel) 2nd only to Bulbophyllum.
- Type species - *Dendrobium moniliforme*.
- The geographic distribution is from India through China, Japan, Malaysia, Philippines, and the islands of the South Pacific, with the largest diversity in New Guinea.
- In much of the orchid literature, the phrase 'center of distribution' is used frequently, indicating the possibility that the group originated there.
- However, New Guinea arose on 16 million years ago, similarly Borneo, which is also rather recent geologically, well after Dendrobium precursors arose….

History - 2

- It appears that there has been a burst of Dendrobium species origination since this time, rapidly expanding into new niches. One example is the highland species with highly colored tubular flowers that are mostly bird pollinated.
- There are frequently different color forms of one species from one mountain peak to another.
- The three most popular theories remaining suggest origins either in India, Australia, or dual origin.
- The most widespread species are *Dendrobium anosmum, erosum, crumenatum, lobbi, stuartii, secundum, and macrophyllum*, which variously occur all the way from India down to Australia. Most of these are lowland species.

Geology

- The continental masses that grouped together between 60-110 million years ago, drifted apart with India flying across what is now the Indian Ocean, to collide with Asia and create the Himalayas ~40 million years ago.
- 50 million years ago, Australia began to drift away and collided with the Laurasian plate, which pushed up the islands of New Guinea and Indonesia, a process still occurring, with mountains rising at 300 meters/10,000 years.
- The southern areas of South America, Antarctica, and Australia all shared a tropical rainforest like environment, as evidenced by fossil plant records.
- Many of these environments shared common orchid ancestors, which subsequently developed into the separate sub tribes that evolved in Asia, South America, and Africa.
- This diversion occurred 30-50 million years ago, as there are no shared species of Cattleyas or Dendrobiums between the Eastern and Western Hemispheres.

History, continued

- Being such a large and diverse genus, plant and flower habit, habitat, temperature range, etc, are extremely varied.
- These plants generally grow from new growths with little or no rhizome and are generally very long lived.
- Numerous attempts have been made to better characterize relationships but these are not uniformly accepted.
- A major revision of the genus is sorely needed.
- There is also significant controversy with regard to the grouping of these plants in sections; however, it may be relevant in terms of intersectional hybridization.

Floral Characteristics

- Sepals are more or less equal, laterals adnate to the foot of the column and form a mentum between it and the base of the lip.
- In some species, the mentum is extended into a spur
- Petals are usually the same length as the sepals
- The lip is more or less contracted at the base into a claw, next to or actually joined to the foot of the column.
- The anther cap is moveable and conceals 4 pollinia, which are parallel to one another, waxy, oval, and oblong.
- Capsule, rounded or ovoid, occ. winged, rarely elongated.

The Major Sections of the Genus

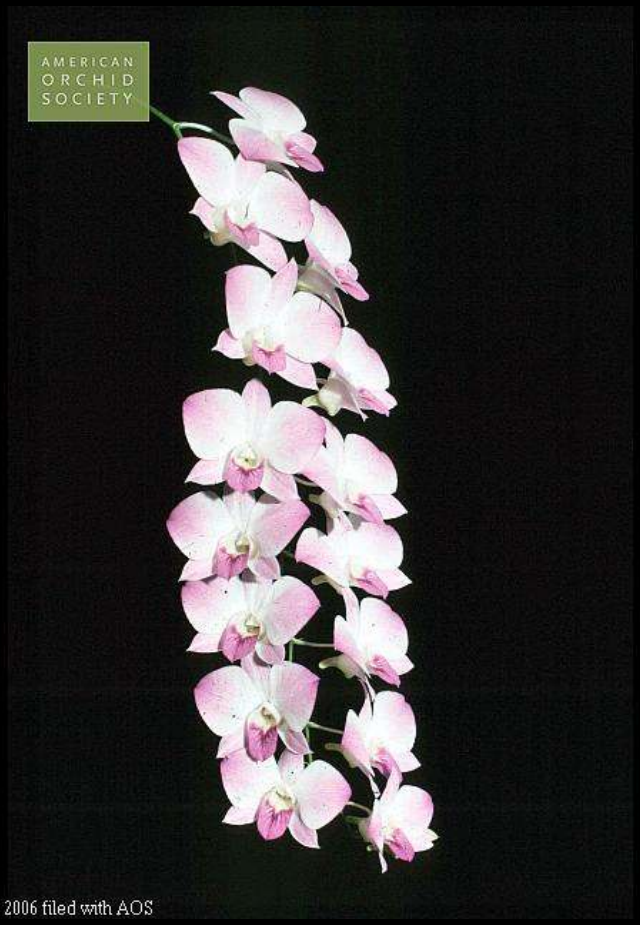
- Phalaenopsis
- Spatulata
- Latouria
- Formosae
- Dendrobium

Section Phalaenopsis
Species

- *Den bigibbum*
- *Den phalaenopsis*
  - *Den lithicolum*: *Den phalaenopsis v compactum*
- *Den affine*

Den bigibbum

Den phalaenopsis



Den phalaenopsis v. album

Den lithicolum (phalaenopsis v compactum)

Den affine

Section Phalaenopsis
Culture

- Generally grow in very warm climates, higher light
- Like lots of water, especially when developing new pseudobulbs
- Like to be in small pots, some species, such as *Den affine* do best mounted
- Flowers last ~2 months

Section Phalaenopsis Hybrids and Culture

- Probably have the largest number of hybrids, especially the intersectional hybrids with the Spatulata section
- Flowers generally resemble phalaenopsis, hence the name, unless comprised of a large amount of Spatulata influence

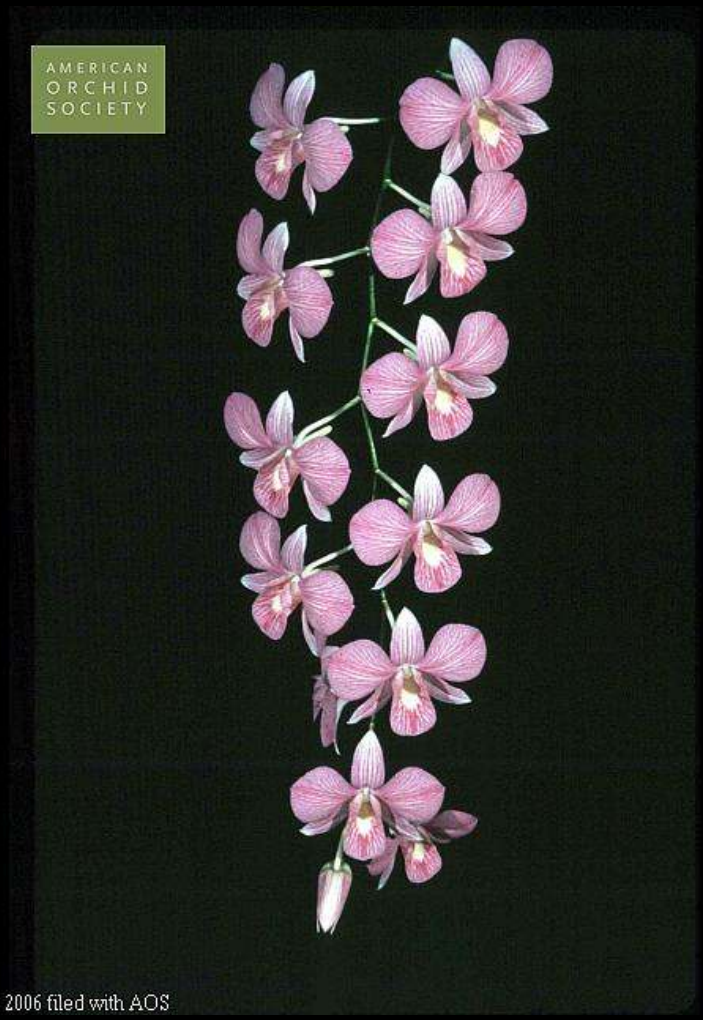
Den Ahulani Hinjosa

Den Anching Lubag

Den Burmese Ruby

Den Caesar

Den Candy Stripe



Den Carol Kamemoto

Den Doreen

Den Ekapol

Den Fuchs Blue Angel

Den Fuchs Blue Twist

Den Hawaiin Starburst

Den Joanna Mesina

Den Kaneohe Beauty

Den Kelli Nicole

Den Madame Uraiwan

Den Palolo Sunshine

Den Pinky Sem

AMERICAN ORCHID SOCIETY

Den Singapore White

Den Sonia

Den Starting Point

Den Tsuruyo Kamemoto

Den Walter Oumae

Section Spatulata
Species

- Den antennatum
- Den stratiotes
- Den strebloceras
- Den canaliculatum
- Den carronii
- Den johannis
- Den taurinum

Section Spatulata
Species

- Den gouldii
- Den lineale
- Den cochliodes
- Den discolor
- Den helix
- Den lasianthera
- Den tangerinum
- Den williamsianum
- Den sutiknoi

Den antennatum

Den stratiotes

Den strebloceras

Den canaliculatum

Den johannis

Den taurinum

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Den lineale

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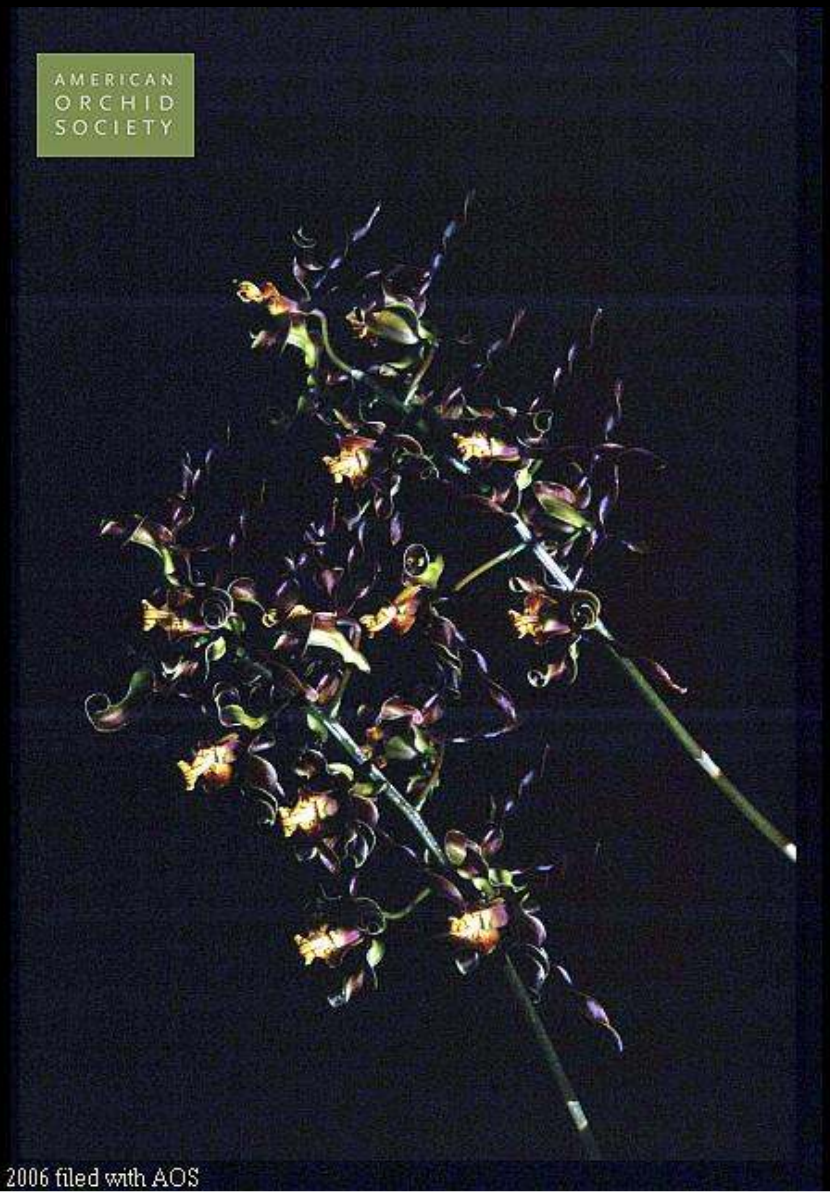


Den discolor (undulatum and v Broomfieldii)

Den helix

Den lasianthera (ostinoglossum)

Den tangerinum

Den williamsianum

(It's in this section b/c of DNA evidence)

Den sutiknoi

Newly described in 2005

from New Guinea and Indonesia

Section Spatulata
Culture and Hybrids

- Generally warm growers, high sunlight, exposed locations, some near seashore
- *Den lasianthera*, probably most beautiful, but difficult to grow – high humidity, wet, high light – great hybrids
- Den johannis – great dark color to hybrids, does best mounted

Dendrobium Spatulata Hybrids

Den Christabella (lasianthera x sutiknoi)

Dendrobium Spatulata Hybrids
Den Lorrie Mortimer
(Caesar x Samarai)

Dendrobium Spatulata Hybrids

Linc's Jewel
(taurinum x canaliculatum

Retrorocket
(Bobby Aisaka x lasianthera)

Touch of Gold

(gouldii x johannis)

Section Latouria
Species

- *Den eximium*
- *Den macrophyllum*
- *Den polysema*
- *Den alexanderae*
- *Den convolutum*
- *Den spectabile*
- *Den atroviolaceum*
- *Den johnsoniae*
- *Den rhodostictum*

Den eximium, Den polysemum
“the fuzzy ones”

Den spectabile and *Den alexanderae*
"Nightmares unto themselves"

The White Ones

rhodostictum

macrophyllum

johnsoniae

atroviolaceum

Den convolutum:
The Green One

Section Latouria

- There are approximately 57 species in this section
- Country of origin – New Guinea
- Hence rainfall is heavy all year, especially in summer
- Plants should not dry and should be watered heavily and fertilized especially in active growth
- Flower long lasting (months) in winter and spring
- All species white-cream with some having more color in lip
- Flowers are nodding much like Hellebores

Section Latouria

- Hybrids within this section have been popularized by H&R Nurseries following the increased availability of the species in the 1990's
- Plants are easy to grow and are excellent choices for beginners
- Note: they can fill up your display in a spring show and move well from show to show without significant flower damage!
- I use them shamelessly…

Section Latouria
Important Hybrids

- Den Roy Tokunaga
  - atroviolaceum x johnsonae
- Den Stephen Batchelor
  - alexanderae x johnsonae
- Den Andree Millar
  - atroviolaceum x convolutum
- Den Bill Takamatsu
  - Roy Tokunaga x johnsonae
- Den Wonder Nishii
  - atroviolaceum x alexanderae
- Den Green Elf, Little Green Apples
  - alexanderae x convolutum; Green Elf x convolutum
- Den New Guinea
  - macrophyllum x atroviolaceum

Den alexanderae Hybrids

Stephen Batchelor

Wonder Nishii

“White Hybrids”

Roy Tokunaga

‘Shady Acre’ HCC 76

‘Matt’ CCE 90

Bill Takamatsu

Green Hybrids with *Den convolutum*

Andree Millar
'Susan Samson'
HCC 78

Green Elf
'Hihimanu' AM 80

Little Green Apples
'Cap Gunn' HCC 76

Note the influence of *Den convolutum* both in green color as well as color in lip

Section Formosae

- Den dearei
- Den draconis
- Den formosum
- Den infundibulum
- Den sanderae
- Den schuetzei
- Den scabrilingue
- Den tobaense
- Den cruentum
- Den bellatulum
- Den senile (or Dendrobium section?)
- Den sinense
- Den trigonopus

Den bellatulum

Den cruentum

Den dearei

Den draconis

Den formosum

Den hancockii

Den infundibulum

Den sanderae

Den scabrilingue

Den senile

Den tabaense

Den trigonopus

Typical Formosae Hybrid

Section Densiflora syn. Callista

- *Den chrysotoxum*
- *Den densiflorum*
- *Den farmeri*
- *Den thyrsiflorum*
- *Den lindleyi (syn. aggregatum)*
- *Den sulcatum*

Section Densiflora
Culture

- These species originate from SE Asia, i.e., India, Thailand, Burma, Vietnam, Laos
- The major significant downside to the culture of these plants is their eventual large size and the transient nature of their flowers; however, when in bloom, they are spectacular
- Their culture should mimic the natural environment, i.e., monsoons in spring and summer with subtantial drying and cooling in winter
- Fertilize heavily in growing season (spring/summer) as soon as new growths appear

Section Densiflora

Den densiflorum ‘Golden Temple’
CCM 85

Den densiflorum ‘Clackamas’
AM 85

Den farmeri ‘Yolanda Carmen’
CCM 84

Den chrysotoxum ‘Sunny Eugene’
CCM 82

Den thyrsiflorum ‘Saint Chrysostom’
CCE 95

Section Densiflora

Den sulcatum ‘Westfield’ AM/80

Den aggregatum ‘Anteak’
CCM 85

Den lindleyi ‘Key West Sunshine’
CCM 84

Section Dendrobium

(Den nobile group, moniliforme = type species)

- Den nobile
- Den moniliforme Den anosmum
- Den crepidatum
- Den devonianum
- Den falconeri
- Den fimbriatum
- Den findlayanum
- Den loddigesii
- Den moschatum
- Den parishii
- Den primulinum
- Den senile
- Den signatum
- Den stuartii
- Den unicum

Den nobile

Den moniliforme

Nobile Hybrids

Den nobile Group Culture

- Plants of this group come mostly from SE Asia with largest concentrations in India, Himalayan regions and on into China and Japan
- Himalayan origin plants should have winter drying and tolerate cooler temperatures
- Regular watering and feeding resume with blooming and new growth initiation, which are usually simultaneous in late winter/spring
- In Hawaii, plants are taken from sea level nursery (Yamamoto) in trucks up the mountain to cool to initiate blooming

Other Sections of Importance to Hobbyist

- Calcarifera
- Calyptrochilus
- Callista
- Dendrocoryne
- Dockrillia
- Pedilonum - oxyglossum
- Cadetia
- Rhizobium

Section Dendrocoryne

- Den kingianum
- Den speciosum

Dendrocoryne - Culture

- In Native Australia these plants tolerate full sun, rocky growing conditions and significant cooling in the winter
- Where possible, these conditions should be reproduced in culture

Section Pedilonum:
Den cuthbertsonii

- Typical cloud forest plant – should be ideal for mountain culture
- Doesn't like temps above 80 degrees F
- Should not become dehydrated
- In nature clouds roll in in afternoons
- Bird pollinated

Section Pedilonum

Den cuthbertsonii







Section Calcarifera

Comber lists 85 species - the most common in cultivation are

- *Den amethystoglossum* - Philippines
- *Den bicallosum* - Sumatra
- *Den diffusum* - Philippines
- *Den epidendropsis* - Philippines
- *Den gonzalesii* - Philippines
- *Den guerreroi* - Philippines
- *Den nudum* - Java, Sumatra
- *Den serratilabium* - Philippines
- *Den victoriae-reginae* - Philippines

Section Calcarifera

- The Section was created in 1908 by JJ Smith, but not recognized by Schlechter in his revision of the Genus Dendrobium in 1914.
- Comber believes this to be due to the fact that Schlechter spent little time outside of New Guinea, where only one member of the section is endemic.
- Calacarifera has been split from Pedilonum
- The center of distribution for the section appears to be Sumatra, with 29 species plus 4 which have yet to be named
- There are 21 species in Borneo, Malaysia 15, Java 10, and Thailand 9 - which is the western limit of the section

Section Calcarifera

- Larger wider lip, which is undulating and keeled
- Lip claw has a tooth which protrudes into the spur in most species
- Flowers are generally larger than those in Pedilonum in lip structure, undulations at apex of lip, and the spur that points away from the pedicel instead of being parallel to it, and the tooth, if present.

Den amethystoglossum

- 5 awards
  - 3 CCM's - 80-84 points (1969-1996)
    - Range - 13, 40 and 50 inflorescences with 500-1500 flowers.
  - AM - 81 points
    - Natural spread 5.0; 6 infl with 184 flowers (1998)
  - CBM 82 points (RA 6)
  - Judging points: one should now expect a fairly large plant with multiple pendulous inflorescences. The lip color should be vivid. The foliage is difficult to grow clean.

Den amethystoglossum ‘Beatrice’ CCM 89 points

Den epidendropsis

- Slightly cupped, bunched flowers on 4 pendulous inflorescences
- Inflorescence and pedicle light lavender
- Flowers waxy, green fading to yellow on older flowers, lip isthmus yellow, spur green with lavender spots.

Den gonzalesii - flowers on leaved and leafless canes.

- 5 awards
  - CBR - 14 flowers on 3. NS 3.8 cm. Flowers white with deep lavender veins.
  - CHM 81 points. NS 4.2, 28 pale lavender blue flowers (1999)
  - HCC 76 points. NS 4.3, 70 flowers and 30 buds, 1999.
  - AM - 83 points - NS 5.2 13 fls + 3 buds on 3. Flowers described as cerulean blue, noted to be more striking than CBR plant above. AQ 29
  - CCM 82 points. NS 4.3, 130 flowers and 6 buds, multiple branched canes, same as HCC plants, 2001.

Dendrobium guerroroi

- CHM 82 points. 25 chartreuse flowers and 36 buds, with brown overlay on sepals. NS 3.0, 1997, AQ 29.

Dendrobium nudum

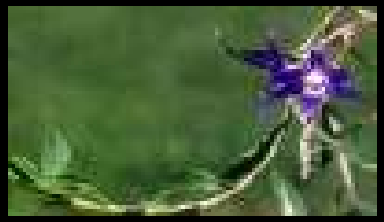
- Flowers 2-4 per inflorescence
- 2.5-3.6 cm
- Cream or pale yellow brown, sometimes suffused with violet spots
- Broad tongue shaped lip has a greenish yellow blotch in the center with a wide waxy margin of rose pink or violet speckles

Dendrobium serratilabium

- 3 awards
  - CBR 1984, AQ 16. 13 flowers and 3 buds on 2 infl., suffused pale mahogany on exterior of sepals and petals. NS 2.4.
  - 2 HCC's 78 points. 39 flowers on 10 and 8 on 1. NS 3.4 and 4.0 respectively.

Dendrobium victoriae-reginae

- 14 awards (Wildcatt misses some because of two spellings of victoria(e) reginae)
  - This emphasizes the value of the printed page or someone is going to have to go in and manually correct spelling errors in the Awards Database and Fisher Bishop.
  - The AOS should standardize this an either change all to be uniform or move things together so that they are somehow cross linked



References

- Schelpe, S, and Stewart, J. Dendrobiums: an introduction to the species in cultivation. Orchid Sundries, Ltd, Dorset, 1990
- Cribb, PJ. A revision of Dendrobium sect. Latouria (0rchidaceae). Kew Bulletin 38 (2) 1983 and 41 (3) 1986.
- Reeve, TM and Woods, PJB. A revision of Dendrobium section oxyglossum (Orchidaceae). Notes from the Royal Botanic Garden Edinburgh, 46 (2) p. 161-305, 1989.
- Comber, J. Dendrobium section Calcarifera. The Orchid Review 110 (1244), March-April 2002, p. 88-93.
- Lavarack, B, Harris, W, Stocker, G. Dendrobium and its relatives. Timber Press, Portland, 2000.
- Wood, HP. The Dendrobiums. Gantner Verlag, 2006
- Baker, ML, Baker, CO. Orchid Species Culture: Dendrobium. Timber Press, 1996.