

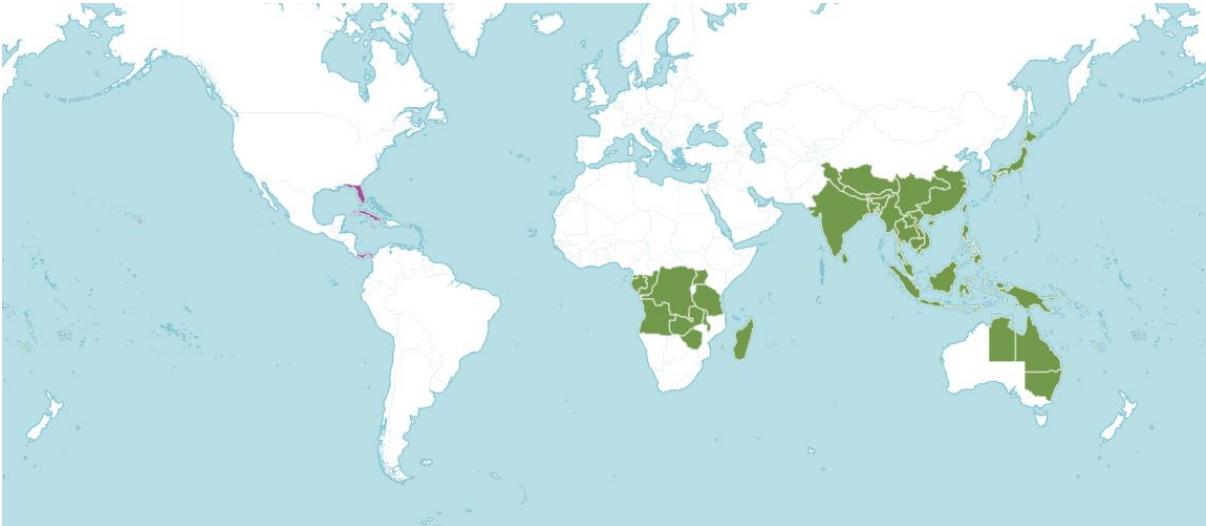
The genus Phaius

Written and edited by Ken Jones
First published November 2020



The genus *Phaius*

Orchids in the Genus *Phaius* Lour. 1790 SUBFAMILY Epidendroideae, TRIBE Collabieae, SUBTRIBE Collabiinae can be found in Africa, Madagascar, mainland and island southeast Asia, Papua New Guinea and Australia as shown in the following map. *Phaius* species from Madagascar are more often listed in the genus *Gastorchis*. *Phaius* is an introduced and invasive genus in the purple areas shown in Florida, Cuba and Central America. The genus was identified by Juan Loureiro, who named it using the Greek word phaios (swarthy), probably because of the yellow–brown flower colouration that dominates the genus. *Phaius tankervilleae* was introduced into England in 1778 by John Fothergill, who brought the plant from China.



Source: <http://plantsoftheworldonline.org/taxon/urn:lsid:ipni.org:names:325891-2>

The type species is *Phaius grandifolius* Lour. 1790 which is considered to be synonymous with *Phaius tankervilleae* [Banks] Blume 1852. Genus synonyms are *Cephalantheropsis* Guillaumin 1960; *Gastorchis* A. Thouars 1822; *Hecabe* Raf. 1838; *Limatodis* Lindley 1825; *Pachyne* Salisb. 1812; *Pesomeria* Lindl. 1838; *Tankervillia* Link 1829

Depending on which author you follow, this genus comprises some forty species that are widespread from Africa through Madagascar to the Philippines, the Pacific Islands and Australia. They are predominantly robust, sympodial, terrestrial herbs with relatively attractive foliage even when not in flower. As shade loving terrestrials (although a few species can be found as epiphytes or lithophytes), year round watering is required and the plants will benefit from fertiliser during active growth phases.

Pseudobulbs are generally small, and new growths arise from the base of mature pseudobulbs or from the rhizome connecting pseudobulbs. The large plicate (folded lengthwise) leaves can be ruffled. Flowering occurs on upright inflorescences arising from the base of the old pseudobulb or from the rhizome with racemose (unbranched raceme) with several flowers held at the top of the raceme.

The relatively large, and often richly coloured flowers have fleshy, similar shaped tepals, and an erect three lobed, saccate (shaped like a pouch or a sack) to spurred lip is connate (joined or united with a structure of the same kind such as sepals or petals) at or near the base of the column. The disc is variously ridged, and the column is long and stout without a foot. The anther is incompletely four-lobed and the eight, waxy pollinia are in two groups of four and attached to a large granular viscus.

Species in the genus *Phaius* generally have large, pleasantly fragrant flowers. Plantlets can be produced from the nodes on flower racemes by layering. After removal from the flowering plant, the cut flower raceme should be placed in a container and partially covered in seed raising mix. When kept in a shady moist area, plantlets can be

produced from the nodes in one-two months. A detailed explanation of the layering process for *Phaius* can be



found under "node culture" at the web site <https://www.orchideenvermehrung.at/english/nodes/index.htm>.

Photo source: Orchidophile November 2014

The common name refers to the flowers turning back with age

With some exceptions, species in the genus are generally amenable to shadehouse culture although do require heavier shade than the majority of bright light orchids that we grow such as *Cymbidium* and *Dendrobium* species to avoid leaf damage/burning. Winter

protection is also required to prevent plants being cold and wet as the majority come from the warm to hot tropics where the winter is generally drier and cooler, and the summer hot and wet.

Seedlings and flowering size plants of *Phaius australis*, *Phaius tankervilleae* and *Phaius wallichii* are generally commercially available, with several other species available from specialist suppliers. The Madagascan *Phaius* species have been also been used in hybridising, often with species in the genus *Calanthe* with which *Phaius* will hybridise to produce the hybrid *Phaiocalanthe*. The six species in the Asian genus *Thunia* were also considered by early taxonomists to be *Phaius* species. For convenience, I will include them as a separate group at the end of this article as they require similar cultural conditions.

In the November 2014 newsletter, I reprinted an article by Jim Brydie about *Phaius tankervilleae* that can be found on the Species Society website at <http://members.iinet.net.au/~emntee/Phaius%20tankervilleae.htm>. This article provides helpful background on the Australian members of this genus, the taxonomic debates and more importantly, valuable cultural advice for those wishing to grow the genus.

For the purpose of this article, I will focus on the more readily available species plus highlight some that will be more of a challenge and therefore more suitable for experienced growers. The most commonly grown *Phaius* species are *Phaius australis* and *Phaius tankervilleae*. However, I will discuss them within an alphabetic listing

Phaius australis F. Muell. 1888 while recognised by the Australian Government as it is considered an endangered species is not recognised as species by the Royal Horticultural Society (RHS). Following the publication of Lady Tankerville's Legacy - A Historical and Monographic Review of *Phaius* and *Gasrtorchis* by J.V.Stone & P.J.Cribb in 2017, *Phaius australis* was reduced to a variety of *Phaius tankervilleae* var. *australis* (F.Muell.). This species is found in coastal swampy forest between Cooktown in Queensland and Lake Cathie in New South Wales, where it often forms large colonies in *Melaleuca quinquenervia* swamps and in wet forests. *Phaius tankervilleae* var. *australis* is probably the most widely cultivated of the Australian *Phaius* species, and is a large robust plant with elongated, oval shaped leaves up to a metre in length with flower racemes that can be up to 2m in height. Flowering in spring, the large flowers are borne on upright racemes in clusters of between four and twelve flowers. Individual flowers are about 100mm diameter and are reddish brown and white in colour. Flowering occurs in spring. The other varieties of *Phaius tankervilleae* will be included in the review of this species later in the article.



Photo source:

https://www.gardensonline.com.au/GardenShed/PlantFinder/Show_4483.aspx

Phaius amboinensis Blume 1856 can be found in Java, the Moluccas, Sulawesi, the Philippines, the Bismark Archipelago, New Guinea, the Solomon Islands, Northern Territory Australia, New Caledonia, Fiji, Samoa, Tonga, Vanuatu, Wallis & Futuna, the Cook Islands and the Carolines. It grows in dense shade in swampy forests at 100-300m and is a medium to large sized, hot growing terrestrial. Three-four cylindrical to angular stems each carry 3 to 8, dark green plicate leaves, Flowering in winter and spring occurs on erect, 30-90 cm 5 to 20 flowered racemes. Its common name is the Ambon Phaius referring to the location where it was originally discovered, while in Australia it is known as the Arnhem Land Swamp Orchid. Synonyms in use are *Bletia amboinensis* Zipp. ex Blume 1856; *Phaius amboinensis* var. *papuanus* (Schltr.) Schltr. 1912; *Phaius graeffei* Rchb.f. 1868; *Phaius neocaledonicus* Rendle 1921; *Phaius papuanus* Schltr. 1905; and *Phaius zollingeri* Rchb.f. 1857.



Photo source:

<http://www.orchidspecies.com/phaiusamboinensis.htm>

Phaius antoninae P. Balzer 2011 is found in the Philippines at sea-level to 600m as a large to very large hot to warm growing terrestrial. The tapering pseudobulbs carry elliptic, acuminate, plicate, petiolate base leaves. Flowering in spring occurs on erect, up to 1.3m racemes carrying up to 20 flowers, each with a large floral bract behind nodding flowers that do not fully open. The difference between this species and the more common *Phaius tankervilleae* is that the sepals and petals of *Phaius antoninae* are always longer than the lip and the flower appearance is always nodding and does not fully open. Its common name is Antonina's Phaius after the wife of its describer.

However, as noted in the discussion about *Phaius australis*, the published and accepted work of J.V.Stone & P.J.Cribb, Lady Tankerville's Legacy: 103 (2017) has reduced *Phaius antoninae* to *Phaius tankervilleae* var. *antoninae* (P.Balzer).



Photo source:
<https://upload.wikimedia.org/wikipedia/commons/thumb/8/86/Phaius.antoninae.inflorescence.JPG/1200px-Phaius.antoninae.inflorescence.JPG>

In a publication *Phaius orchids* by Eike and Carlise Jauch, a blog about *Phaius*, *Calanthe*, *Gastrochis*, *Cephalantheropsis* and their hybrids that can be found at <https://prachtorchideen.wordpress.com/2020/04/15/phaius-antoninae-growing-in-new-caledonia/>, it is suggested that *Phaius antoninae* appears to be an

apomictic species. Apomixis, or the setting of seeds without the benefit of fertilisation resulting in seedlings identical to the parent plants is frequently observed in many terrestrial orchids, particularly in the mycoheterotrophs (parasitic on fungi). Such plants have bypassed the pollination syndrome and have found a way to perpetuate themselves without the help of pollinators.

Phaius baolocensis Duy, Tao Chen & D.X.Zhang 2012 has also been reduced to a varietal form of *Phaius tankervilleae* in the published and since accepted work of J.V.Stone & P.J.Cribb, Lady Tankerville's Legacy: 103 (2017). In publishing their findings, Duy and Zhang wrote that in January 2011 during an expedition to Dang Rac Village, Di Linh Distr., Lam Dong Province, in the southern highlands of Vietnam, they collected specimens in a private orchid garden of an unusual flowering *Phaius* orchid. The owner informed them that he had collected the plants from the Bao Loc forest some years earlier, however subsequent attempts to locate the population failed.



In their description, they say that this 'endemic' species is only known from the Bao Loc District, Lam Dong Province, Vietnam where it grows in wet mossy ground over shale, sandstone and granite in closed evergreen broad-leaved primitive forest. This habitat at 800-1,200m has constant high humidity amongst shaded and damp areas in forests, forest margins, along valleys and streams. The conical pseudobulbs are 7-8 cm long, 3-4 cm in diameter and carry 2-5 prominently veined leaves 60-80 cm tall. Flowering in late winter to early spring, upright sparsely flowered inflorescences are 60-100cm tall.

Photo source:
<https://www.bluenanta.com/detail/526344/species/?gen=150964&newgen=&type=species&tab=tax&role=pub>

Phaius baconii J.J.Wood & Shim 1994 can be found in Sabah Borneo in lower montane forests generally growing in amongst bamboo thickets at 1,200 -1,500m as a medium sized cool growing terrestrial. It has a fleshy, branching, dark green

flushed purple stem that carries 2 apical leaves and rarely a 3 smaller, lower leaf. Flowering in winter and spring 3-6 white flowers with purple stripes on the lip and a yellow disc sometimes speckled with red are borne on erect inflorescences. Its common name is Bacon's Phaius named for a Sabah veterinary officer who discovered the species. A synonym is *Dimorphorchis rossii* var. *tenomensis* A.L.Lamb 1994

Phaius borneensis J.J.Sm. 1903 can be found in Borneo and the Philippines in lower montane forests at 500 to 1,500m as a large sized, warm to cool growing terrestrial in deep shade, often near streams in humid valleys. The pseudobulbs are circular at the base but become more quadrangular towards the apex and carry up to six, elliptic to lanceolate, plicate, petiolate base leaves. Flowers are borne on erect 75cm racemes carrying up to 15 flowers. Its common name is the Borneo Phaius.



Photo source:
<http://www.orchidspecies.com/phaiusborneensis.htm>

In situ photo source:
http://www.fpcn.net/a/lankezhiwu/20131025/Phaius_borneensis.html



Phaius callosus [Bl.] Lindl. 1831 can be found in peninsular Malaysia, Borneo, Java, Sumatra & Sulawesi as a medium sized, cool growing terrestrial in montane forests on mossy boulders and leaf litter at 1,000 -1,800m. The pseudobulbs are enveloped by imbricate leaf-bearing sheaths that carry plicate, acute, gradually narrowing leaves. Flowering in spring, the basal inflorescence up to 1.2m tall carries 10-20 fragrant, long-lasting flowers. The oblong, obtuse, concave floral bracts drop off as soon as the flowers open. An albinistic form, *Phaius callosus* also exists. Its common name is the Callous Carrying Phaius. Synonyms in use are *Geodorum plicatum* Voigt 1845; **Limodorum callosum* Bl 1825; *Phaius callosus* var. *sumatranus* J.J.Sm. 1920; *Phaius kuhlii* Rchb.f. 1865.



Photo source:
<https://www.pinterest.com.au/pin/314689092706465043/>



Photo source: <http://orchidofjava.blogspot.com/2013/01/phaius-callosus-blume-lindl-1831-forma.html>

In situ photo source: <https://www.bluenanta.com/detail/photos/150982/>



Phaius columnaris C.Z.Tang & S.J.Cheng 1985 can be found in Guangdong, China as a large to giant sized, hot to cool growing terrestrial in rocky places in forests or on limestone slopes at 200 -1,700m. Dark green, cylindric, several to 10-noded pseudobulbs enveloped by 6-7 leaf sheaths towards the apex carry elliptic, chartaceous (papery), plicate, erect leaves. Flowering in late spring, the many-flowered 20cm raceme carries white flowers that do not fully open with orange tinges to the lip. Its common name is the Column-Shaped Phaius, while in China, it is known as Xian Bi He Ding Lan.



Photo source:
<http://www.orchidspecies.com/phaiuscolumnaris.htm>

Phaius corymbioides Schltr. 1911 comes from Java and Sumatra where it grows as a large sized, warm to cool growing terrestrial at 760 – 2,100m. It has close set, basally thickened, more or less terete but somewhat angular stems carrying 5-10, elliptic to oblong-elliptic, acute, long acuminate, prominently nerved and channelled leaves.



Flowering on erect racemes that arise from nodes of the stem, the short inflorescence has up to 9 flowers.

Photo source:
<http://www.orchidspecies.com/phaiuscorymbioides.htm>

Similar to and sometimes confused with *Phaius pauciflora*, it differs in the different

coloured flowers, the glabrous lip with virtually no side lobes, the basally broadened spur and the two-crested lip. Its common name is the Corymb-Like Phaius.



In situ photo source:

<https://www.bluenanta.com/detail/150991/species/?tab=sum>

Phaius daenikeri Kraenzl. 1929. This species can be found in central and southeast New Caledonia, Vanuatu and Samoa on rotting logs. There are two distinctly different forms, the first as a hot to warm growing terrestrial at 100 -600m with yellow speckled leaves and 6-15 pale yellow flowers with a dull orange midlobe. The second is a warm to cool growing terrestrial or epiphyte found at 800 -1,200 m with pale green leaves that do not show any speckling and has 3 -11 golden yellow flowers with an orange red midlobe of the lip. Both forms flower in spring, early summer and autumn. Its common name is Daeniker's Phaius after the collector of the type specimen in the 1900's

Phaius flavus (Blume) Lindl. 1856 is found in Assam, eastern Himalayas, Nepal, Myanmar, Thailand, Malaysia, China, Laos, Vietnam, Java, Moluccas, the Philippines, Sulawesi, Sumatra, New Guinea, New Caledonia, Samoa, Vanuatu, Taiwan, Ryukyu Islands and Japan where it grows as a medium sized, hot to cold growing terrestrial on the humid shady floors of broad-leaved, evergreen primary forests. The forest floor soils are constantly dampened by mists and this species can be found amongst moss covered logs in scrub and in the splash zone along steep watercourses at 200 -3,400m. Conical to ovoid-cylindric pseudobulbs carry 3-8 elliptic-lanceolate, acuminate, plicate, yellow -white spotted leaves. This species flowers in winter and spring on up to 90cm erect, basal, several to many flowered inflorescences with persistent bracts carrying several to many, yellow, long lived, fragrant flowers. This is a highly variable species in flower size and colour with an albinistic form known.

Its common name is the Yellow Flowered Phaius. In Japan, it is known as Ganzeki-ran, while in China as Huang Hua He Ding Lan. Synonyms in use are *Bletia flava* Wallace ex Lindl. 1831; *Bletia woodfordii* Hook. 1827; *Hecabe lutea* Raf. 1836; *Limodorum crispum* Reinw. ex Blume 1856; *Limodorum flavum* Blume 1825; *Phaius bracteosus* Rchb. f. 1857; *Phaius celebicus* Schltr. 1911; *Phaius crispus* Blume 1856; *Phaius flavus* fma. *punctatus* (Ohwi) K. Naeckj. 1981; *Phaius flexuosus* Blume 1856; *Phaius indigoferus* Blume 1842; *Phaius linearifolius* Ames 1912; *Phaius maculatus* Lindley 1828; *Phaius minor* Blume 1856; *Phaius minor* fma. *punctatus*

Ohwi in ?; *Phaius platytilus* Rchb. f. 1857; *Phaius somai* Hayata 1916; *Phaius undulatomarginata* Hayata 1914; *Phaius undulatomarginatus* Hayata 1914; *Phaius woodfordii* (Hook.) Merr. 1948



Photo source:

<https://travaldo.blogspot.com/2018/01/phaius-flavus-care-and-culture.html>

Note the spotted leaves shown in the following in-situ photo. This is a common characteristic in *Phaius* species. In situ photo source:

<http://www.orchidspecies.com/orphotdir/phaiuflavu.jpg>



Phaius fragilis L.O. Williams 1938

Found in the Philippines in mossy forests as a large sized, warm to cool growing terrestrial at 900- 1,500m. Small, cylindrical pseudobulbs carry lanceolate to broadly elliptic leaves, and this species flowers on erect 25 cm racemes that are shorter than the leaves. Each inflorescence carries 2-3 flowers. Its common name is the Fragile Phaius



Photo source: <https://orchidiana.weebly.com/blog>

Phaius indochinensis Seidenf. & Ormerod 1995 can be found in Vietnam and Thailand. It is reported in a paper published by Researchgate titled 'New records of Orchidaceae from Cambodia IV' at https://www.researchgate.net/publication/329060481_New_records_of_Orchidaceae_from_Cambodia_IV

Andre Schuiteman from Kew says “this is undoubtedly the showiest orchid reported in the present paper. With flowers 6–8 cm across. It proved to be common in humid evergreen montane forest in Pursat Province, about 24 km SW of Pramoy at 870 m. growing in leaf litter in dense shade. Only two or three specimens out of hundreds were seen in flower on 23 November 2016. It often grew together with *Plocoglottis bokorensis* Seidenf., which is superficially similar in appearance when not in flower. However, the latter has distinct, ovoid pseudobulbs at the base of the slender stems, whereas the stems of *Phaius indochinensis* are uniformly terete. *Phaius indochinensis* is also known from Laos (Schuiteman et al., 2008), Thailand and Vietnam, and has been misidentified as *Phaius indigofer* Hassk. (Seidenfaden, 1992, as “indigoferus”), a species that probably does not exist.



Its common name means the Indochinese Phaius

Photos source:

<https://www.orchidroots.com/detail/151030/species/?newgen=466451&tab=sum>



Phaius longicornu Guillaumin 1957 comes from Đà Lạt, Lâm Đồng Province (Central Highlands region of Vietnam in southern Vietnam) where it can be found as a cool growing terrestrial at 600 – 1,400m (see <https://prachtorchideen.wordpress.com/author/prachtorchideen/page/2/>). Principally growing as a lithophyte or occasional terrestrial in wet open rocky places along rivers and streams and on moist cervices of waterfall cliffs on silicate rock, it flowers in spring. This species is often cited as a synonym of *Phaius wallichii* but they are obviously different. It is recognised as a species by Kew. Its common name is the Long Horned Phaius.



Photo source:

<https://prachtorchideen.wordpress.com/author/prachtorchideen/page/2/>

Phaius mishmensis Rchb. f. 1857 can be found in China, Assam India, eastern Himalayas, Myanmar, Thailand, Laos, Vietnam, Philippines, Taiwan and the Ryukyu Islands as a large warm to cool growing terrestrial in shady, humid habitats with rocky substrates at 500 – 2,000m. Its obscure pseudobulbous, fleshy, narrowly fusiform-cylindric pseudobulbs are enveloped by basal sheaths and carry 6-8, apical, plicate, alternate, elliptic-lanceolate to oblong-ovate, acuminate or acute leaves. Flowering in autumn occurs on an axillary 30-60 cm racemose, laxly flowered inflorescence that is shorter or equal to the leaf length with lanceolate, cauducous (shed after the flower opens) bracts. The flowers of this species often do not fully open. Its common name in northeastern India is the Mishmi Hills Phaius, while in Japan it is Hime-kaku-ran, in China Zi Hua He Ding Lan and in Thailand Kluai Mai Dong. Synonyms in use are *Calanthe crinita* Gagnep. 1931; *Calanthe ramosa* Gagnep. 1951; **Limatodis mishmensis* Lindl. & Paxton 1852-3; *Phaius augustinianus* Klotzsch 1856; *Phaius crinita* (Gagnep.) Seidenf. 1973; *Phaius cupreus* Rchb.f. 1855; *Phaius gracilis* Hayata 1911; *Phaius mishmensis* var. *tonkinensis* Aver.

1997; *Phaius roseus* Rolfe 1893 *Phaius luridus* Thwaites



Photo source:

<https://www.flowersofindia.net/catalog/slides/Mishmi%20Hills%20Phaius.html>

In situ photo source: <http://koma33.web.fc2.com/himekaku.html>



Phaius montanus Schltr. 1912 is a large, warm to cool growing terrestrial species endemic to Papua New Guinea, Irian Jaya the Moluccas and Solomon Islands. In Papua New Guinea, it can be found on sharp ridges in the mist forest zone of the Torricelli range in humus between rock in semi-open, bushy areas at 800 -1,300m. Oval pseudobulbs carry 4-6, petiolate, elliptic, acuminate, plicate leave. This species flowers in spring and summer on 80 cm, terete, glabrous, laxly 6-15 flowered inflorescences. The long lasting flowers are carried on the apical third of the inflorescence. Its common name is the Mountain Living Phaius, and the synonym is *Phaius montanus* var. *seranicus* J.J.Sm. 1928



Photos source: <http://www.orchidsnewguinea.com/orchid-information/species/speciescode/679>



Phaius occidentalis Schltr. 1903 is an African species found in Gabon, the Democratic Republic of the Congo, the Congo, Uganda, Tanzania, Malawi, Angola, Zambia and Zimbabwe as a medium to large sized, cool growing terrestrial in seasonally wet, swampy grasslands or dambos at 1,150 -1,500m. Fleshy pseudobulb-like structures carry 5-6 leaves set out in a basal rosette. The leaves are elliptic-lanceolate to obovate (a leaf with the narrower end at the base) and plicate. This species flowers in autumn on lateral, 50-70 cm densely 5-6 flowered inflorescences that carry erect, fleshy, white flowers with brownish pink spots at the base of the lip. Its common name is the Western Phaius



http://www.centralafricanplants.senckenberg.de/root/index.php?page_id=34&id=10601



https://www.zambiaflora.com/speciesdata/image-display.php?species_id=118030&image_id=1

Phaius pauciflorus (Blume) Blume 1856 is found in peninsular Malaysia, Java and Sumatra as a large warm - cool growing terrestrial in deep hill and lower montane Cameron Highlands forests often near rivers at 500 – 1,900m. Close set, basally thickened, terete stems carrying 5-6, plicate, oblong, acuminate leaves. Flowering on basal 25cm, 8-15 successively flowered inflorescences with persistent bracts, there are several recognised colour variants of this highly variable species. This might indicate that further research will find that some variants are in fact separate species. Its common name is the Few Flowered Phaius, and synonyms are *Limatodis pallida* (Ridl.) Ridl. 1924; **Limatodis pauciflora* Blume 1825; *Limatodis punctata* Lindl. 1885; *Phaius pallidus* Ridl. 1896; *Phaius pauciflorus* subsp. *sabahensis* J.J. Wood & A.L. Lamb 1993; *Phaius pauciflorus* var. *pallidus* (Ridl.) Holttum 1947; *Phaius pauciflorus* var. *punctatus* (Lindl.) J.J.Sm. 1920; *Phaius pauciflorus* var. *sumatranus* J.J.Sm. 1920 *Phaius pauciflorus* (Blume) Blume



Photo source:

https://orchid.unibas.ch/index.php/en/?option=com_content&view=article&id=3&SearchResultID=2043546/Phaius/pauciflorus/Blume_Carl_Ludwig_von/Blume_Carl_Ludwig_von&setLang=en-GB

Phaius philippinensis N.E.Br. 1889 comes from the Philippines where it is a small sized, warm to cool growing bog terrestrial in shady locations up to 1,300m. Cylindrical pseudobulbs carry 2-4, lanceolate, deeply channelled leaves. Flowering takes place on erect, several flowered inflorescences that carry the reddish-brown, heavy substance flowers at the apex. Its common name is naturally the Philippine Phaius



Photo source:

<https://orchidroots.com/detail/information/?pid=151076&role=pub>

Phaius reflexipetalus J.J.Wood & Shim 1994 can be found in northern Borneo and the Philippines as a medium sized, warm to cool growing terrestrial in deep humus amongst limestone boulders in deep shade often near rivers in hill forests at 500 -1,100m. Erect, fleshy, dark green stems are enveloped by 4-5, tubular, acute to acuminate, scarious sheaths, and carry 3-4, elliptic, acuminate, plicate leaves. Flowering in spring and autumn, flowers are borne on erect 21- 27 cm inflorescences that arise from the axils of the lower stem sheaths.

Inflorescences have tubular, acute bracts and deciduous floral bracts. Its common name is the Reflexed Petal

Phaius for the sharply reflexed petals.

Synonyms in use include *Calanthe reflexipetala*.

Photo source:

http://phytoimages.siu.edu/imgs/pelserpb/r/Orchidaceae_Phaius_reflexipetalus_1312



49.html

Photo source: <http://www.phytoimages.siu.edu/img-bin/image?Orchidaceae/Phaius/reflexipetalus/131193&squeeze>



Phaius robertsii F. Muell. 1883 comes from Papua new Guinea, New Caledonia, Fiji, Tonga, Vanuatu and north-eastern Queensland as a medium sized, hot to warm growing terrestrial in medium to deep shade in forests at 550m. Stout erect stems carry 4-6, plicate leaves that are sub-erect and scattered along the stem. Each leaf is lanceolate-elliptic, acuminate and gradually narrows at lower end into the shortly petiolate base. This species flowers in winter on erect, lateral 30cm few flowered inflorescences. Its common name is Roberts' Phaius, and synonyms in use are *Phaius monticola* Guillaumin 1941 and

Phaius robertsii F. Muell.

Photo source: <https://a4.pbase.com/g4/48/839548/2/143600019.v1kaE1VV.jpg>

Phaius subtrilobus Ames & C. Schweinf. 1920 is endemic to Sarawak and Sabah (Borneo) where it grows as a large sized, cool growing terrestrial in lower montane mossy and swamp forests at 1,300-1,600m. This attractive species flowers in summer with 4-10 flowers on the upright inflorescence. The white lip is in striking contrast to the brownish-red colour of the sepals and petals. Its common name/meaning is the Almost-Three Lobed Phaius



Photo source:

<http://www.orchidspecies.com/phaiussubtrilobus.htm>

In-situ photo source:

<https://www.pinterest.com.au/pin/44895327511887056/>



Phaius takeoi (Hayata) H.J.Su 1989 comes from south Yunnan, Vietnam and Taiwan as a warm to cool growing terrestrial in moist broad leaved forests and dense forests along valleys at 500-1,400m. The stem-like, cylindric pseudobulb carries 5-8 leaves on the upper part of the pseudobulbs with elliptic to elliptic-lanceolate, plicate, glabrous, long acuminate leaves. Flowering in Autumn on erect racemes that arise from basal and lower nodes of the pseudobulb, the 30-55cm inflorescence is shorter than the leaves and carries 4-10 yellowish-green widely opening flowers with persistent, ovate-lanceolate floral bracts. In 2010, this species was first reported from Thailand and Myanmar. Its common name is Takeo's Phaius after its discoverer, and in China, as Chang Jing He Ding Lan. Synonyms in use are *Calanthe takeoi* Hayata 1920; and *Phaius longicuris* Z.H.Tsi 1981



Photo source:

<http://www.orchidspecies.com/phaiustakeoi.htm>



In-situ photo source:

<https://www.earth.com/earthpedia/plant/hi/phaius-takeoi/>

Phaius tankervilleae (Banks) Blume 1856 is the most widely found and best known *Phaius* species. It is found in China, Hong Kong, Taiwan, the Pacific Islands, Malaysia, Singapore, Sumatra, Java, Borneo, Sulawesi, Lesser Sunda Islands, Moluccas, Papua New Guinea, Philippines, Himalayas, Sri Lanka, Thailand, Laos, Vietnam, Japan, and Australia as a large sized, hot to cool growing terrestrial in lower montane woods and in grasslands in moist depressions with black soil up to 1,300m. Ovoid or conical, green pseudobulbs are basally enveloped by leaf bearing sheaths with elliptic-lanceolate, acuminate, plicate, thin-textured leaves. Mostly flowering in spring (although some populations flower year round) on up to 1.2m upright flower racemes, 4-14 showy large, pleasantly fragrant brown flowers have distinctive reddish labellums. There are many colour and albinistic forms following the publication of Lady Tankerville's Legacy - A Historical and Monographic Review of *Phaius* and *Gasstrochis* by J.V.Stone & P.J.Cribb in 2017 which reduced many species, including *Phaius australis*, to synonymy.



Photo source: <http://www.orchidsnewguinea.com/orchid-information/species/speciescode/680>

Phaius tankervilleae was introduced into England in 1778 by John Fothergill, who brought the plant from China. The genus was identified by Juan Loureiro, who also named it using the Greek word *phaios* (swarthy), probably because of the yellow-brown flower colour that dominates the genus. *Phaius tankervilleae* is commonly called the nun's orchid, possibly due to the lateral view of the column which resembles a Madonna.

Phaius tankervilleae has become an invasive species in some countries such as Jamaica and Hawaii, while in Papua New Guinea, the smoked flowers are eaten as a contraceptive.

Its common names are the Nun's Orchid, the Kunai [tall grass] Orchid, Emma Tankerville's Phaius [named for the English Orchid Enthusiast after whom the species is named] in Thailand Ueang Phrao, In Japan- Kaku-ran - Chiru-ran - Sarunkwa-bana and in China He Ding Lan.

The recognised varietal forms of *Phaius tankervilleae* are:

- *Phaius tankervilleae* (Banks) Blume, Mus. Bot. 2: 177 (1856).
- *Phaius tankervilleae* var. *antoninae* (P.Balzer) J.V.Stone & P.J.Cribb, Lady Tankerville's Legacy: 103 (2017).
- *Phaius tankervilleae* var. *australis* (F. Muell.) J.V.Stone & P.J.Cribb, Lady Tankerville's Legacy: 105 (2017).
- *Phaius tankervilleae* var. *baolocensis* (Duy, Tao Chen & D.X.Zhang) J.V.Stone & P.J.Cribb, Lady Tankerville's Legacy: 108 (2017).
- *Phaius tankervilleae* var. *bernaysii* (Rowland ex Rchb.f.) J.V.Stone & P.J.Cribb, Lady Tankerville's Legacy: 111 (2017).
- *Phaius tankervilleae* var. *devogelii* P.J.Cribb & J.V.Stone, Lady Tankerville's Legacy: 115 (2017).
- *Phaius tankervilleae* var. *tankervilleae*.



Phaius tankervilleae var. *australis*

Photo source:

<https://www.orchidroots.com/detail/526345/hybrid/?tab=sum>

Synonyms are *Bletia incarvillei* R. Br; *Bletia tankervilleae* R. Br. 1813; *Calanthe bachmaensis* Gagnep. 1950; *Calanthe speciosa* Viell. 1861; *Dendrobium veratrifolium* Roxb. 1832; *Limodorum incarvilliae* Pers. 1807; *Limodorum*

incarvillei Blume 1825; *Limodorum spectabile* Salisb. 1796; *Limodorum tancarvilleae* L'Hér. 1789; *Limodorum tankervilleae* Banks 1788; *Pachyne spectabilis* Salisb. 1812; *Phaius bicolor* Lindley 1831; *Phaius blumei* Lindley 1831; *Phaius blumei* Lindley var *assamicus* Rchb.f 1882; *Phaius blumei* Lindley var *pulcher* King & Pantl. 1898; *Phaius carroni* F. Muell. 1860; *Phaius giganteus* Hemsl. 1882; *Phaius grandifolius* Rchb.f 1828; *Phaius grandifolius* Lour 1790; *Phaius grandifolius* Lindl. 1831; *Phaius grandifolius* var. *superbus* Van Houtte 1852; *Phaius incarvillei* O.Ktze. 1891; *Phaius incarvillei* O. Ktze. var *speciosa*; *Phaius leucophaeus* F. Muell. 1863; *Phaius mannii* Rchb.f 1878; *Phaius oweniae* Sander 1894; *Phaius roeblingii* O'Brien 1895; *Phaius sinensis* Rolfe 1913; *Phaius tahitensis* Schltr. 1926; *Phaius tankervilleae* fma. *alboflorens* S.S. Ying, Coloured Ill. Fl. Taiwan 4: 798 (1992); *Phaius tahitensis* fma. *obtusa* F.Br. 1930; *Phaius tankervilleae* fma. *veronicae* S.Y.Hu & Barretto 1976; *Phaius tankervilleae* var. *mariesii* Rchb.f. 1882; *Phaius tankervilleae* var. *pulchra* (King & Pantl.) Karth. 1989; *Phaius tankervilleae* var. *superbus* (Van Houtte) S.Y.Hu 1974; *Phaius tenuis* Rchb. f. 1857; *Phaius veratrifolius* (Roxb.) Lindl. 1840; *Tankervillia cantoniensis* Link 1829

Phaius tenuis Rchb.f. 1857 can be found in Java and Sumatra as a medium to large sized, warm to cool growing terrestrial at about 1,000m. With 4-5, oblong, acute, basally clasping petiolate base leaves, flowering takes place on an axillary raceme arising from the axil of one of the lower sheaths. The inflorescence is 30 -100 cm long and carries 8 yellow flowers with a white labellum with broadly lanceolate, acute floral bracts that drop off early. The common name is the Delicate Phaius.



Photo source:

<http://www.orchidspecies.com/phaiustenuis.htm>.

Phaius wallichii Lindl. 1831 comes from India, Bhutan, Sri Lanka the eastern Himalayas, Assam, Bangladesh, Myanmar, Thailand, Vietnam, Yunnan China, Hong Kong and possibly Sumatra where it can often be found in dense forests along ravines as a large sized, warm to cool growing terrestrial at 900-1,300m. The fusiform to cylindric-ovoid pseudobulbs carry up to 4 green, oblong-elliptic, plicate, glabrous, acuminate leaves. Flowering takes place in late spring on an erect up to 180 cm raceme with 10 or more flowers. The inflorescence arises from the lower pseudobulb nodes and has caudaceous, ovate-lanceolate, glabrous floral bracts with widely opening flowers.



This species is very different to *Phaius tankervilleae* with which it is often confused. The pseudobulbs are much larger; the inflorescence can be up to 180 cm tall, carrying 16 or more large flowers. The flowers face forward whereas *Phaius tankervilleae* flowers are often pointed downwards, the base colour of the flowers is an ochre yellow-with a yellow brown overlay while *Phaius tankervilleae* is white and the labellum is quite different. Synonyms in use are *Phaius bicolor* Lindl. 1831; *Phaius longicornu* Guillaumin 1957; *Phaius magniflorus* Z.H.Tsi & S.C.Chen 1994 and *Phaius sanderi* Sander 1892. Its common name is Name Wallich's Phaius named for an 1800's Danish botanist and orchid collector. In China, it is known as Da Hua He Ding Lan

Photo source:

<https://www.orchidroots.com/detail/information/?pid=151120&role=pub>

In situ photo source: <http://www.orchidspecies.com/orphotdir/phaiuwallic.jpg>



Phaius wenshanensis F.Y.Liu can be found in south-eastern Yunnan and northern Vietnam in forests as a medium to large sized, cool growing terrestrial at 1,300 meters. Stem-like, cylindric pseudobulbs carry 6-7, plicate, elliptic, glabrous, acute leaves. Flowering occurs on erect racemes that arise from the lower or basal nodes of the pseudobulb. The 45 cm inflorescence carries 5-6 flowers with cauducous floral bracts, and widely opening flowers.



Its common name is the Wenshan Phaius named for an autonomous Prefecture and city of southern China. In China it is known as Wen shan he ding lan

Photo source:

https://orchidroots.com/detail/151122/species_detail/?newgen=150964&newpid=151122&tab=sum&role=pub&att=

The Madagascan Phaius

Several *Phaius* species found in Madagascar have been reclassified as *Gastrorchis* Tribe: *Arethuseae*, Subtribe: *Bletinae* Thouars 1809 following their earlier identification. *Gastrorchis* (also spelled *Gastorchis*) is currently a genus of 8 species endemic to Madagascar. While superficially like *Phaius*, and previously classified as *Phaius*, the plants differ from *Phaius* by their overall smaller and less robust stature and very different floral structure. The name *Gastrorchis* was first used by Thouars in 1809 and is derived from the two Greek words gaster (stomach or belly) and orchis (orchid) in reference to the sack-like lip base. The 8 species are terrestrial and have small clustered pseudobulbs typically 1-2cm in diameter and up to about 3cm tall. The inflorescences, produced from developing new growth, are erect and carry 4-12 comparatively large 5-6cm richly coloured successive, strikingly beautiful flowers over 3-5 weeks.

Gastrorchis francoisii Schltr. 1925 is a striking medium to large sized, cool growing terrestrial orchid from Madagascar where it occurs in humid forests at 1,200 – 1,600m. The striking flowers and dark-green leaves with undulated edges frame an erect 60-70cm inflorescence in late spring and summer. The beautiful flowers have sepals and petals that are white inside and purple outside and a tri-lobed labellum that is violet- rose to reddish-brown on a golden background. Its common name is Francois' Phaius named after a French 20th century collector.



Photo source:
<https://www.orchidsforum.com/threads/gastrorchis-francoisii.14087/>

© Marni Turkel

Gastrorchis humblotii [Rchb.f.] Schlechter 1925 comes from Madagascar and the Comoros Islands as a medium to large sized, cool growing terrestrial in wet semi-deciduous forests and mossy forests at 1,000 – 2000m. Spheric pseudobulbs carry elliptic-lanceolate, plicate, acute leaves. Flowering in spring through summer to autumn, the erect, robust 90cm apical, racemose inflorescence carries 7-10 successively opening long-lasting flowers. Several colour variants are recognised including *Gastrorchis humblotii* var. *rubra* and *Gastrorchis humblotii* var. *schlechteri*.



© Marni Turkel

Its common name is Humblot's Phaius named for a French orchid collector working in Madagascar in the 1900's. Synonyms in use are *Phaius humblotii* [Rchb.f 1880; *Gastrorchis humblotii* var. *rubra* (Bosser) Bosser & P.J.Cribb in D.J.Du Puy & al. 1999; *Gastrorchis humblotii* var. *schlechteri* (H.Perrier) Senghas ex Bosser & P.J.Cribb 1999; *Gastrorchis schlechteri* H. Perrier 1930; *Gastrorchis schlechterii* H. Perrier ex François 1929; *Phaius humblotii* var. *ruber* Bosser 1971; *Phaius humblotii* var. *schlechteri* (H.Perrier) Bosser 1971; *Phaius schlechteri* (H. Perrier) Summerh. 1964.

Gastrotrchis humblotii Photo source:
<http://marniturkel.com/mostlyspecies/f.x.gastror.hybrid.2630.html>



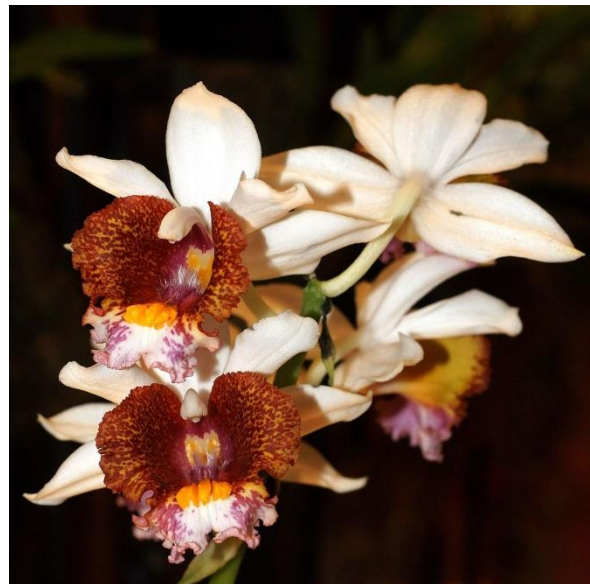
Gastrotrichis humblotii var *schlechteri* Photo source: <https://plantarium.info>

Gastrotrichis lutea (Ursch & Toill.-Gen. ex Bosser) Senghas in F.R.R.Schlechter, Orchideen Beschreib. Kult. Zücht., ed. 3, 1(15): 887. This species comes from humid evergreen Madagascan forests where it can be found as a medium to large sized, warm to cool growing terrestrial at 500 – 1,100m. Large ovate, slightly compressed pseudobulbs that are completely enveloped by foliaceous leaf sheaths carry 3-4, plicate, narrowly elliptic-lanceolate leaves. Flowering in spring, the basal 60cm several to many flowered inflorescence has pleasantly fragrant flowers. Several colour forms are recognised *Gastrotrichis lutea* var. *geffrayi* (Bosser) J.V. Stone & P.J.Cribb, Lady Tankerville's Legacy: 232 (2017) and *Gastrotrichis lutea* var. *lutea*.

Its common name is the Egg-Yellow Phaius, and synonyms in use are *Phaius luteus* Ursch & Toill.-Gen. ex Bosser 1971; *Phaius geffrayi* Bosser 1971; *Phaius villosus* var. *longibracteatus* S. Moore 1877



Photo source: <https://www.aos.org/orchids/orchids-a-to-z/letter-p/phaius.aspx>



Gastrotrichis lutea var. *lutea*. Photo source: https://species.wikimedia.org/wiki/Gastrotrichis_lutea_var._lutea

Gastrorchis peyrotii (Bossert) Senghas in F.R.R. Schlechter, Orchideen Beschreib. Kult. Zücht., ed. 3, 1(15): 887 (1984) comes from north eastern Madagascar where it grows as a small to medium sized, warm to cool growing terrestrial orchid in humid evergreen forests at 900 – 1,000m. It has discoid (flat circular or disc shaped), small pseudobulbs that carry few small, greyish green, linear-oblong, undulate and crispate margined, acute leaves. Flowering in late spring and early summer, the erect inflorescence carries 5 - 12 flowers.



Its common name is Peyrot's Phaius named for a French botanist who specialized in Madagascan orchids in the 1900's. The synonym in use is *Phaius peyrotii* Bossert 1971

Photo source:

<https://prachtorchideen.wordpress.com/2018/06/29/gastrorchis-peyrotii-eine-echte-raritaet/>

Gastrorchis pulchra Humbert & H. Perrier, Mém. Inst. Sci. Madagascar, Sér. B, Biol. Vég. 6: 259 (1955) comes from Madagascar where it is found as a cool to warm growing terrestrial in n shady, humid forests at 800 - 1,700m. Flowering on 60-120 cm basal inflorescences arising from mature pseudobulbs throughout the year, the inflorescence has up to 12 longlasting flowers at the apex. An albinistic colour form also exists, often known as *Gastrorchis pulchra* var. *perrieri*, although this name is not accepted by Kew in its World Checklist of Selected Plant Families. Its common name is the Beautiful Phaius. The synonym is *Phaius pulcher* (Humbert & H. Perrier) Summerh. 1964



Photo source: <https://www.aos.org/orchids/orchids-a-to-z/letter-g/gastrorchis.aspx>



Photo source:

<http://www.orchidspecies.com/orphotdir/phaiuspulchervar.jpg>

Phaius pulcher (Humbert & H. Perrier) Summerh. 1964 is found in Madagascar in where it grows as a cool to warm growing terrestrial in shady, humid forests at 800 – 1,700m. Flowering throughout the year occurs on 60-120 cm long, basal inflorescences arising from mature pseudobulbs carrying up to 12 longlasting flowers at the apex. An albinistic form also exists. Its common name is the Beautiful Phaius, and the synonym is *Gastrorchis pulchra* Humbert & H. Perrier 1955. This species remains in the genus *Phaius*. Although some authors consider that it should be transferred to the genus *Gastrorchis*, it has not been accepted at this time.



Photos source:

<http://www.orchidspecies.com/phaiupulcher.htm>



Phaius pulchellus Kraenzl., Abh. Naturwiss. Vereine Bremen 7: 254 (1882) can be found in Madagascar, Mauritius and Reunion Island. A warm to cool growing medium to large sized terrestrial or epiphyte, it grows in damp, evergreen forests at 700 – 1,700. Cauliform pseudobulbs, the oldest green and discoid and the newest enveloped by sheaths carry 3-4, narrowly lanceolate, acute, plicate, undulate margined, longly acuminate petiolate base leaves. Flowering in late spring and early summer occurs on erect 40-80 cm long racemes. Each peduncle (stalk supporting the flowers) 10 to 20 cm long is enveloped by 3 to 4 basal sheaths and several sterile bracts that are caducous (drop off early), with the 12-15 flowered caducous inflorescence with large variable coloured flowers.



Photo source: <https://www.orchidsforum.com/threads/phaius-pulchellus-var-pulchellus.3142/>

Similar to *Phaius pulcher*, this species too remains in the genus *Phaius*. Its common name is the Charming Phaius, and synonyms are *Phaius pulchellus* var. *ambrensis*; *Phaius pulchellus* var. *andrambovatensis* Bosser 1971; and *Phaius pulchellus* var. *sandrangatensis* Bosser 1971



Phaius pulchellus var. *sandrangatensis* Bosser 1971

Photo source: <http://www.orchidspecies.com/orphotdir/phaispuchellusvarsan.jpg>

Gastrorchis simulans Rolfe) Schltr. 1925 Repert. Spec. Nov. Regni Veg. Beih. 33: 168 (1924). comes from northeastern Madagascar where it grows as an epiphyte, a major variation from the majority of genus that are terrestrial. It also has a slender, elongate rhizome, smaller flowers and like others, this species flowers in spring and summer. Several colour variants are known.



Its common name is the Seems Like Phaius referring to its similarity to *Phaius tuberculatus*, and the synonyms are *Phaius fragrans* Grignan 1901; *Phaius simulans* Rolfe 1901

Photos source:

<http://www.orchidspecies.com/orphotdir/phaiusimulans.jpg>



Gastorchis tuberculosa [Thou.]Schlechter 1925 Repert. Spec. Nov. Regni Veg. Beih. 33: 169 (1924) is a hot to warm growing medium to large sized terrestrial from Madagascar where it can be found at 200 – 900m. Short, small pseudobulbs are completely enveloped by leaf-bearing sheaths and each carries 5 -6, suberect to spreading, longly petiolate, narrowly lanceolate, acute, plicate leaves. Flowering in spring and summer takes place on erect, stout, 60cm long few-several flowered inflorescences with successively opening, long-lasting flowers carried for an extended period of time. The raceme has a distinctive white bract at each joint.



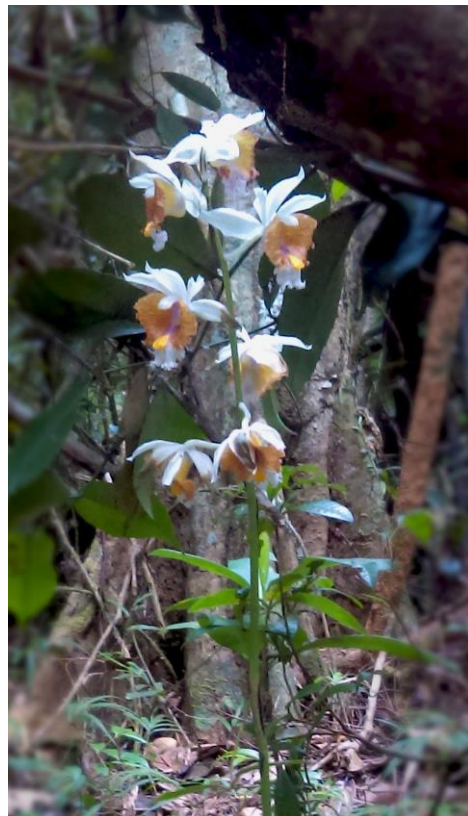
Photo source:

www.clarkriley.com/classtest/Pages/25.html

Its common name is the Tubercule Bearing Phaius. Synonyms are *Bletia tuberosum* [Thouars]Sprengel 1822; *Gastorchis simulans* (Rolfe) Schltr. 1925; *Limodorum tuberosum* Thouars 1822; *Phaius fragrans* Grignan 1901; *Phaius simulans* Rolfe 1901; *Phaius tuberculatus* Blume 1858; *Phaius tuberosus* [Thou.] Blume 1856; *Phaius warpuri* Weathers 1901

In situ photo source:

<https://www.facebook.com/MadagascarFaunaGroup/photos/gastorchis-tuberculosa-orchid-growing-in-betampona-strict-nature-reserve/1641858902555244/>



Gastrorchis villosa (Thouars) J.V. Stone & P.J. Cribb, Lady Tankerville's Legacy: 258 (2017) can be found in Mauritius and Reunion as an epiphyte on shaded mossy trees or a lithophyte on rocks at 1,700 – 2,400m. It is a small to medium sized species with numerous narrow tubers with stems carrying 2-3 lanceolate, acute sheaths that gradually reduce in size to oblong-lanceolate, attenuate-acute apical leaves. Flowering takes place in late summer and autumn on erect, 15cm densely flowered inflorescences. The flowers become smaller in length towards the base. Its common name is the Hirsute Phaius. Synonyms are *Bletia villosa* (Thouars) Spreng., Syst. Veg. 3: 743 (1826); *Limodorum villosum* Thouars, Hist. Orchid.: t. 32 (1822); *Gastrorchis lutea* subsp. *longibracteata* (S. Moore) P.Bernet, Richardiana 12: 12 (2011); *Phaius longibracteatus* (S.Moore) Frapp. ex Cordem., Fl. Réunion: 226 (1895); *Phaius stuppeus* Blume, Coll. Orchid. 14 (1858); *Phaius villosus* (Thouars) Blume, Mus. Bot. 2: 182 (1856); *Phaius villosus* var. *longibracteatus* S.Moore in J.G.Baker, Fl. Mauritius: 349 (1877)



Photo source:

<http://www.africanorchids.dk/images/africanorchids/Fred/phaius%20longibracteatus%20%2002.jpg>

In situ photo source:

<http://www.africanorchids.dk/images/africanorchids/Fred/phaius%20longibracteatus%20%2002.jpg>



To conclude this article about Phaius, there are six species that were initially classified as Phaius but are now accepted as the genus Thunia. All these species are found in Asia, and unlike Phaius and Gastrorchis, have tall canes rather than pseudobulbs that are seasonally dormant and deciduous. However, the dormant canes remain viable and will support new plantlets if they lie on the ground surface. All the members of the genus are terrestrial or occasionally semi-epiphytic or lithophytic. Rapid new growth occurs in spring-early summer and terminal flowering takes place on the new growths when they mature. The species in this genus should be kept dry once dormancy occurs during the rest period to prevent plant loss.

Thunia alba (Lindl.) Rchb. f. 1852 is the type species for the genus. It is a large sized, cool to warm growing, deciduous-leaved terrestrial or lithophyte found on the ground on rocks and in tree forks in the western Himalayas, China, Assam India, eastern Himalayas, Nepal, Bhutan, Sikkim, Andaman Islands, Myanmar, Thailand, Malaysia and Vietnam at 1,000 – 2,300m. Elongate, tufted, erect stems carry two-ranked, elliptic-lanceolate, sessile, thin fleshy, glaucous leaves. Flowering in mid-summer occurs on terminal up to 30cm 5-10 flowered inflorescences with ovate-oblong floral bracts and very fragrant orange scented flowers that may not fully open.

Thunia alba is highly variable in colouration, a trait which has led to it being described as many different species over time. This confusion has been resolved and it is now a single species with several colour forms. *Thunia alba* var. *alba* and *Thunia alba* var. *bracteata* (Roxb.) N.Pearce & P.J.Cribb, Edinburgh J. Bot. 58: 116 (2001) are accepted forms. Its common name is the White Thunia. In China it is known as Sun Lan; and in Thailand as Chang Nga Diao – Phothuki.



Thunia alba

Photo source:

<http://www.nationaalherbarium.nl/pubs/orchidweb/genera/thunia/thunia.htm>



Thunia alba var. *bracteata*

Photo source: <http://www.india-flora.com/veinedthunia.aspx>

This species has many synonyms *Limodorum bracteatum* Roxb. 1832; **Phaius albus* Lindl. 1828; *Phaius bensoniae* Benth. 1881; *Phaius marshalliae* auct 1871; *Phaius marshallianus* N.E. Br. 1889; *Phaius marshallianus* var. *purpurata* (Rchb.f.) N.E.Br. 1889; *Phaius marshallianus* var. *triloba* (Rchb.f.) N.E.Br. 1889; *Phaius niveus* Hemsl. 1882; *Phaius veitchianus* Mottet 1896-1897; *Phaius marshallianus* (Rchb.f.) N.E. Br. 1889; *Thunia alba* subvar. *triloba* Rchb.f. ex B. Grant 1895; *Thunia alba* var. *marshalliana* (Rchb.f.) B. Grant 1895; *Thunia bracteata* (Roxb.) Schltr. 1919; *Thunia majorensis* Colman 1932; *Thunia marshalliae* B.S. Williams 1874; *Thunia marshalliana* Rchb.f. 1876; *Thunia marshalliana* fma. *ionophlebia* (Rchb.f.) M. Wolff & O. Gruss 2007; *Thunia marshalliana* var. *ionophlebia* Rchb.f. 1885; *Thunia marshalliana* var. *purpurata* Rchb.f. 1888; *Thunia marshalliana* var. *triloba* Rchb.f. 1888; *Thunia nivalis* (Hemsl.) Rchb.f. 1888; *Thunia venosa* Rolfe 1905.



Thunia alba var. *bracteata*

In situ photo source: https://www.researchgate.net/figure/Thunia-alba-var-bracteata-Roxb-N-Pearce-PJ-Cribb-Habitat-and-Habit_fig1_258120960

In situ photo source:

https://08511630493324166816.googlegroups.com/attach/3faafd4fa8787/20160529_163914-1.jpg?part=0.1&view=1&vt=ANaJVrFieaje0IXxjJO-XPWKNmY-Fk8j9soQkre3BgoRotdouAmp3iFIC7ox4_OWHsd3RDGNwzGcxMHozOfo3TR6RHrIM_lp91e0RNpoa0THpLpV-wwJVI



Thunia bensoniae Hook.f. 1868 comes from India, Myanmar and Thailand where it can be found as a warm to cool growing terrestrial with a jointed stem carrying, velvety, light green, plicate leaves. This species flowers in late spring and early summer on a terminal, 2 to 6 flowered raceme. A significant day to night temperature variance is necessary to trigger flowering. *Thunia bensoniae* is deciduous and will shed all its leaves in the late autumn and requires a long winter rest without water to avoid rotting. Its common name is Mrs. Benson's Thunia named after the wife of an English General in Myanmar in the 1800's. The synonym is *Thunia winniana* L. Linden 1894



Photo source:

<http://www.orchidspecies.com/thunbensoniae.htm>

Thunia bensoniae in situ

Photos source: <http://botanyboy.org/a-rare-cane-orchid-from-myanmar-and-western-thailand-thunia-bensoniae/>



Thunia brymeriana Rolfe 1892 can be found in Myanmar where it is listed as endemic. I found no habitat or descriptive information. Its common name is Brymer's Thunia named after an 1800's English orchid enthusiast.



Photo source:

<https://www.jardimexotico.com.br/orquidea-thunia-brymeriana>

Thunia marshalliana Rchb. f. 1877 grows as a very large, erect, cool to cold growing terrestrial in Myanmar, Thailand and southern China on the ground, on rocks and in tree forks at 1,000 – 2,300m. Robust, jointed, stems, enveloped by leaf sheaths below and leafy above carry oblong, lanceolate, distichous, glaucous below, acuminate, pale green, leaves with a pale mid nerve. Flowering in mid-summer, the terminal, drooping racemose

inflorescence has large, spatheaceous, persistent bracts all arising on young leaf shoots and 3 - 12, large, showy, fragrant, short-lived flowers each sheathed by a white, cucullate, floral bract.



Photo source: <http://vietnamorchids-nguyentienquang.blogspot.com/2014/02/thunia.html>

Its common name is Marshall's Thunia named for an 1800's English orchid collector. Synonyms are *Phaius marshallianus* N.E. Br. 1889; *Phajus marshallianus* (Rchb. f.) N.E. Br. 1889; *Phaius marshallianus* var. *purpurata* (Rchb.f.) N.E.Br. 1889; *Phaius marshallianus* var. *triloba* (Rchb.f.) N.E.Br. 1889; *Thunia marshalliana* var. *ionophlebia* Rchb.f. 1885; *Thunia marshalliana* var. *purpurata* Rchb.f. 1888; *Thunia marshalliana* var. *triloba* Rchb.f. 1888



In situ photo source:
https://bluenanta.com/static/utis/images/species/spc_000204311_000028436.jpg
g

Thunia pulchra Rchb.f. 1872 can be found in Myanmar, Thailand and Vietnam as a large sized, hot to warm growing epiphyte with 6-8 flowers on a racemose inflorescence. Its common name is the Beautiful Thunia. Synonyms are *Phaius dodgsonii* Dean 1878; *Thunia dodgsonii* (Dean) B.S.Williams 1894; *Thunia mastersiana* Kraenzl 1894; *Thunia xanthophlebia* Rchb.f. ex Parish 1883



Photo source:
<https://prachtorchideen.wordpress.com/2019/07/14/thunia-pulchra-a-rare-thunia-species-from-thailand/>

Thunia pulchra
by Eike Jauch