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The uses and misuses of orchids in medicine

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Introduction

We are now aware that medicines need to be tested before being consumed by human beings. Today, this takes the form of experimentation to assess toxicity, and subsequent randomized control trials to assess both efficacy and adverse effects. However, orchid products, the tubers, leaves or flowers, were introduced into medicine with no such testing, and ultimately their use has declined, not through being proven ineffective, but more through lack of evidence and changes in fashion.

This article examines the medicinal uses of orchid plants in the Orient, Europe, the Americas, Australia and Africa, and concludes by examining their usage today.

China and Japan

There is no doubt that the Chinese were the first to cultivate and describe orchids, and they were almost certainly the first to describe orchids for medicinal use. Reinikka reports[1] a Chinese legend that Shên-nung described *Bletilla striata* and a *Dendrobium* species in his *Materia Medica* of the 28th century BC. The earliest Middle East report of plant remedies is in a 4000-year-old Sumerian clay tablet,[2] but I do not know if this included any orchids. Shên-nung's herbal 'cures' were probably published many times, but were certainly published in 1600 in the *Pun-tsae*, a pharmacopoeia.[2–4] Confucius (551–479 BC) called the orchid (*lan* in Chinese) the 'King of Fragrant Plants', and Chinese writings indicated that they stood for many things: 'retirement, friendship, perfection, numerous progeny, all things feminine, noble and elegant'[1]—and some of these themes were echoed in Europe.

The Chinese were also the first to write books devoted to orchids. In 1233, Chao Shih-Kệng wrote *Chin Chan Lan P'u*, and described 20 species and how to grow them.[3] In 1247, Wang Kuei-hsueh wrote his *Treatise on Chinese orchids*, and described 37 species. The first Western volumes dedicated to orchids did not appear until Georg Eberhard Rumphius' (1628–1702) *Herbarium Amboinense* was eventually published in 1741–1755, two of 12 volumes being devoted to orchids.

In Japan, legend has it that a sterile Emperor's wife inhaled the inebriating perfume of *Cymbidium ensifolium* and went on to have 13 children.[3] The Japanese call the orchid *ran*, and in 1728, Jo-an Matsuoka described species of *Cymbidium, Neofinetia, Aerides, Dendrobium* and *Bletilla*.[5] The Samurai grew *Neofinetia falcata*, the merchants grew *Cymbidium*, and possibly the peasants grew *Bletilla*. The enthusiasm for orchids grew to such an extent that fortunes exchanged hands for different orchids. This was even worse than the Dutch tulip 'bubble', and the disruption of the economy forced the Emperor to forbid the growing of orchids on pain of death (Mark Griffiths, personal communication).

The medicinal use of orchids continues in Chinese herbal medicine to this day, and therefore will be described under the heading of 'The uses of orchids today'.

Europe

The Greeks referred to testicles as *orchis*, and Theophrastus (372–286 BC) named the orchids

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Figure 1. The tubers of the Early Purple Orchid. From: Williams JG, Williams AE, Arlett N. *A field guide to the Orchids*. London, Collins, 1978. ISBN 0002 19314 0.

from that word, as the underground tubers of many European terrestial orchids resemble a pair of testicles[6] (Figure 1). In his *Enquiry into Plants*, he reported that the orchids had medicinal properties.[1] In the first century AD, Dioscorides, who was a Greek working as a Roman military physician, wrote his *De Materia Medica*, including two terrestrial orchids.[3,7] He adopted and promoted the 'Doctrine of Signatures' whereby plants were used for medicinal purposes according to their resemblance to parts of the human anatomy, for example by shape or colour. Naturally this led to orchid tubers being used to heal diseases of the testicles, and to stimulate lust. Moreover if given to men as whole fat new tubers this was supposed to produce male progeny, and if the shrivelled old tubers were given to women, this should produce female children.

Ancient writers found it difficult to determine how orchids were fertilized, produced seed and propagated themselves. The sexual organs of orchids were not recognized, nor were the dust-like seeds recognized as such. In the sixteenth century, Hieronymus Tragus (Jerome Bock) (1498–1554) decided that they must arise (owing to their testicular shapes) from the semen of birds and beasts when this fell to the ground. In 1665, Anthanasuis Kircher, in his *Mundus Subterraneus*, concluded that as bees arose from the carcasses of bulls, bee orchids must arise from the semen of bulls (Figure 2).

Table 1 describes the use of orchid products throughout European history. William Turner in the first *English Herbal* (1568) gave four main uses, including the treatment of alcoholic gastritis![8] Eleven years later, Williams Langham reported anti-pyretic, anti-consumption and anti-diarrhoeal effects.[9] John Parkinson in 1640 still thought the tubers increased fertility in men,[10] and the Ottomans extracted 'Sahlep' from the dried tubers. The Arabic word became corrupted in English to Salep. In the East, Salep was (and is) mainly made from *Orchis morio*, but it could be made in the UK from *Orchis mascula*, the early purple orchid (Figure 3), or from *Orchis maculata* or *Orchis latifolia*. Orchids, presumably as Salep, were dispensed in London in Oliver Cromwell's time, and before the introduction of coffee, hot drinks of Salep were sold at stalls in the streets of London. The tubers were mainly imported from the East but also came from Oxfordshire.[11] In Hamlet, Ophelia's fantastic garlands included 'long purples' that were either generally known by a rude name or by the name 'dead man's fingers'—if the former, a reference to testicles, then the orchids must have been of the genera *Orchis* or *Ophrys*, if the latter from the genus *Dactylorhiza* where the tubers are palmate and resemble fingers.[3]

Today, Salep is largely collected in Asia Minor but also in Germany, Greece, Afghanistan and India. Turkey uses the greatest bulk in making ice-cream and beverages. Although not allowed to export the tubers any more, Turkey still uses vast quantities. It takes 2600 tubers to obtain one kilogram of dried tubers, and the BBC reported in 2003 that one ice cream factory used up to three

Figure 2. Bee Orchid, Photograph by author.

Table 1 Uses of terrestrial European orchids

Author	Year	Proposed use of orchid	
		Preparation	Indication
Turner W[8]	1568	Tender tuber and goats milk	Aphrodisiac
		Dry	Anti-aphrodisiac
		Topical	Antiseptic
		Tuber	Gastro-intestinal problems arising from too much wine
Langham W[9]	1579	Tuber	Anti-pyretic
		Tuber	Anti-consumption
		Tuber	Anti-diarrhoea
Parkinson J[10]	1640	Tuber	Increase fertility in men
'Ottoman empire'		Tuber ('Salep')	Aphrodisiac
			Make ice-cream (Turkey)
			Coffee substitute (Albania)
			Perfume (Iran)

Figure 3. Early Purple Orchid, Photograph by author.

tonnes of Salep or twelve million plants in a year.[12] Unsurprisingly, several orchid species in Turkey face extinction.

The Americas

Table 2 discusses vanilla, an aromatic oil that exudes from the seed pods of V*anilla* (Figure 4), and is the most famous orchid product. Apparently the word 'vanilla' is derived from the Spanish word, 'vainilla' which in turn came from the Latin 'vagina' or pod or sheath. The most important vanilla species is *Vanilla planifolia*, introduced into Europe by the Spanish in 1510, and brought to popularity in the UK when the Marquess of Blandford introduced it here in 1800.[3] Unlike Salep, vanilla can be farmed but the flavour and aroma molecule, vanillin (4-hydroxy-3-methoxybenzaldehyde) is now produced synthetically. The Aztecs had several uses for vanilla, but today its medicinal uses are confined to relieving nausea and improving food intake in patients receiving chemotherapy,[13] and as a diagnostic aroma for Alzheimer's disease, loss of the sense of smell being an early manifestation

Table 2 Medical uses of vanilla

Author	Year	Proposed use of vanilla derivatives
Aztec herbal[1]	1552	Flavouring and perfume prevent fatigue in those holding public office. Bestow the bodily strength of a gladiator Drive weariness far away Drive out fear and fortify the human heart
Menashian *et al.*[13]	1992	Improve food intake and reduce nausea and vomiting in patients given chemotherapy
Fladby *et al.*[14]	2004	Diagnostic of Alzheimer's disease (patients cannot smell vanilla)
Fitzgerald *et al.*[15]	2004	Antimicrobial against *Eschericha coli, Lactobacillus planatarum* and *Listeria innocua*

Figure 4. *Vanilla planifolia*. Flowers with several pods developing below and one large leaf. From: Skelsey A. *Orchids*. Time-Life International (Nederland) BV, 1979. ISBN 7054 0569 9.

of this condition.[14] Although described as an anti-microbial agent,[15] I am not aware if it is used in medicine for this purpose, although it may prolong the life of food products. *Vanilla pompona* was also used to flavour tobacco in Cuba.

Table 3 Use of orchids by Australian aborigines and early settlers (adapted from Lawler and Slaytor[16])

Orchid	Use
Cymbidium canaliculatum	Cure for dysentery Food
Cymbidium madidum	Oral contraceptive Cure for dysentery
Dendrobium teretifolium (bruised leaves)	Rub to relieve pain
Dendrobium discolor	
Young canes	Poultice
Mature canes (bruise and extract with spirit)	Cures ringworm

Australia

Table 3 describes the use of orchids by Australian aborigines and early settlers.[16] In addition, many orchid bulbs were employed as emergency bush food, e.g. *Gastrodia sesamoides* (roasted), *Dendrobium speciosum* and *Caladenia* species. *Diuris maculata* has sweet-tasting tubers but Lawler and Slaytor warn that some Australian orchid bulbs have toxic alkaloids: for example, *Liparis reflexa*.[16]

Africa

Brian Morris has described twelve orchids currently used as medicine in Malawi.[17] Nine of these are used for stomach complaints and two for fertility problems. Interestingly, two species, *Cyrtorchis arcuata* and *Eulophia cucullata,* are employed to promote friendship, the former being dried and pounded into a powder and the latter prepared as an infusion of the roots. *Cyrtorchis arcuata* is also employed to treat diabetes or skin infections

and *Eulophia cucullata* to prevent epilepsy. An infusion of the leaves and pseudobulbs of *Bulbophyllum maximum* is used to protect against sorcery, and *Tridactyle tricuspis* to treat madness.

In Zambia, Davenport and Bytebier[18] have described an 'orchid rush', whereby the boiled root tubers of terrestial orchids are used to make a food dish, *Chikanda* or *Kinaka*. The orchids involved are from three genera: *Disa, Habenaria* and *Satyrium.* The orchids have become scarce in Zambia, and are now illegally imported from Tanzania. The pressure on Tanzanian orchids has fortunately led the Government to designate 135 square kilometres of the Kitulo Plateau as a new National Park. Presumably this designation will protect some orchids. Four million Tanzanian orchids are currently sent from Tanzania to Zambia each year.[18]

Also in Africa, an amulet of leaves of *Ansiella africana* impregnated with a paste made from the pseudobulbs was said to work as a contraceptive, but, most conveniently, only in the short term for unmarried women.[3]

Other regions

Orchids that feature in the Indian Pharmacopoeia are thought to include *Vanda coerulea* and possibly *Coelogyne ovalis*. In the Molucca islands the seeds of *Grammatophyllum scriptum* have been added to a woman's food to ensnare her for life! Berliocchi also pointed out that Bourbon tea, popular in the nineteenth century, was made from an infusion of orchids from Mauritius and Reunion that included *Angraecum fragrans*. The tea was thought to be a sedative. A tincture was also made to apply to the fingertips and improve the sense of touch.[3]

The uses of orchids today

Table 4 lists some Chinese orchid preparations that are used in traditional Chinese herbal medicine. An orchid product called 'Shihu' is currently for sale and made from several *Dendrobium* species. It is recommended for indigestion, rehydration, as an anti-pyretic, to increase white cells in the blood and reduce 'fidgets'. Interestingly, the Chinese use it for stomach and lung cancer, and moscatilin, derived from *Dendrobium loddigesii*, has anti-cancer activity for stomach and lung cancer cell lines.[19] It is also an anti-platelet agent.[20] Also for sale is 'Shihu Yeguang Wan', which also contains *Dendrobium* products and is recommended for eye problems. *Gastrodia elata* is grown commercially (*Rhizoma Gastrodia Elatae* or *Tian Ma).* It is used to treat allergies and relieve headache and fatigue. Many herbal formulas for treating hypertension, convulsions, migraine, wind and cramps include this preparation.[21] Interestingly, the plant contains gastrodin, which has anticonvulsant effects, at least in gerbils.[22]

Conclusions

It is surprising that despite the large number of alkaloids in orchid tissue,[23,24] no medicinal use

Table 4 Orchids in Chinese medicine

Medicine	Orchid	Use
Shihu (herba Dendrobii)	Several *Dendrobium* species*	Nourish stomach (promotes peristalis and gastric secretions) Replenish body fluid (treats dry tongue, thirst, red tongue) Reduce fever Increase white cells 'Reduce fidgets' In China: treatment of stomach, oesophageal and lung cancer
Shihu Yeguang Wan	*Dendrobium* a minor part	Pseudomyopic Tired eyes Amblyopia 'Central retinitis'
Moscatilin	*Dendrobium loddigesii*	Antiplatelet agent (in animals)[20] Anti-cancer (stomach and lung cell lines)[19]
Tian Ma	*Gastrodi elata*.	Treat allergies Headache Fatigue[21]

*Diequiao Shihu—*Dendrobium denneanum*; Jichai Shihu—*Dendrobium nobile.* May also include *Flickingeria* and *Pholidota.*

for them has been proven. By proven, I mean 'shown to be efficacious' as determined in a double-blind randomized trial. Until such experiments determine the benefits and risks of consuming orchid products as medicine, we must conclude that these beautiful plants have no place in medicine. For flavouring, however, both vanilla and Salep are widely used, the former as a delicious flavouring and wonderful perfume. Both are used in making ice-cream and beverages, although many are not enthusiastic about the aroma of Salep. There are thousands of alkaloids in plants and Martindale[25] mentions over 130 plants used in medicine. Nevertheless he only mentions one orchid, *Vanilla,* for flavouring, despite the fact that the Orchid family is claimed to be the largest plant family with about 30 000 species.

I shall continue to grow orchids despite their lack of therapeutic efficacy, and hope that one day a medicinal use will finally be established for these beautiful plants.

The author is currently Chairman of the Orchid Society of Great Britain, and declares this possible 'conflict of interest'!

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