

Lavender — A New Industry for an Ancient Plant

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HISTORY

In this time of “New Release,” “PBR,” and “improved form” plants it is interesting to see the popularity of this, one of the world’s oldest cultivated plants. It seems that much of what we have come to appreciate as being of value in plants originated in the areas surrounding the Mediterranean. Lavender is one of these niceties. The early records of the Ancient Greeks, Romans, and Arabs show regular usage of lavender. It was used as a medicine, a bathing additive, a body perfume, and for a few other weird purposes.

The Romans are credited with giving the name lavender. It is generally believed that the word is a derivation of the Latin verb *lavare*, which means to bathe. The species first described is *Lavandula stoechas* from the Stoechades Islands (now called Iles de Hyeres). The Greeks and Romans also referred to lavender as Nard, from the Latin *Nardus italica*, after the Syrian town Naarda.

Lavender made its way into the modern history via the French monks around the start of the 9th century. Lavender was seen in many of the garden designs of the European gentry and religious orders. It became the herb of the royals in England when Queen Elizabeth I decreed that she should always have a jar of lavender conserve on the royal table. It first appeared in English literature during the late fifteenth century. There are dozens of anecdotes of various members of royal households throughout Europe having particular desires for lavenders.

The folklore on the properties of lavender and lavender oils are extensive enough to generate a book in their own right. The Egyptians used lavender at least a thousand years before Christ. They dried the flowers in buried terracotta crocks. The products were then used as an expectorant and antispasmodic. The women also used them to produce oils, water, and vinegar which were in turn used as skin ointments and makeup. The priests used the plants as one of the unguents in their mummification rituals, and its scent was still fresh after 3000 years in Tutankhamen’s perfume urns, opened in 1922.

From 60 A.D., by Discorides [translated by J. Goodyer, 1655]:

“Stoechas grows in the Islands of Galatia over against Messalia, called Stoechades, from whence also it had its name, is an herb with slender twigs, having ye haire like tyme, but yet longer leaved, and sharp in ye taste, and somewhat bitterish, but ye decoction of it as the Hyssop is good for ye griefs in ye thorax. It is mingled also profitably with Antidots.”

It was the Romans who really found uses for this versatile plant:

- An aromatic in their bathing rituals.
- Burned as a room purifier to ward off the plague.
- Rubbed into the hair to deter lice.
- Filled special brackets carved in their bedposts to keep bedbugs at bay.

- The armies used lavender in their first aid kits and were probably responsible for importing lavender into Britain (as was used by many soldiers in WWI).
- As an insect repellent.
- Burnt in honor of their gods.

During the centuries since it has also been used for many abstract purposes:

- “Our Lady’s Candlestick”; to supposedly repel the devil and bound into the shape of a cross and suspended above doorways as a talisman to ward off witches.
- As a test for chastity, it was supposed to wither in the hands of the impure.
- Placed in a man’s right shoe to ensure fidelity.
- Baked with caraway into small cakes by seamen’s wives to ensure their fidelity.
- Mixed it with ground charcoal to form toothpaste.
- Made into a vinegar and used by robbers to protect themselves from the plague whilst robbing their helpless victims. This gave rise to the name ‘Vinegar of the four thieves.’
- In 1826 a French scientist managed to fix an image chemically by employing bitumen of Judea (a type of asphalt) which changes its solubility in lavender oil depending on its exposure to light. An early Kodak was built.

INDUSTRY

What is the lavender industry? Lavender is an aromatic, perennial herb with flowers that can be used fresh, dried, stripped, or turned into oil. It is the last two that make up the greatest diversity of lavender products. In using stripped lavender and essential oils the product range is almost endless. The more traditional ones include bathroom products, perfumery, potpourri, and aromatherapy, with the increase in low camphor forms we are seeing an increase in culinary uses in such things as tea, salad, cookies, honey, wine, and so on. The less well known uses include disinfectants, antibacterial agents, pesticides, and medical ointments.

There is a wealth of new research on lavender. It is showing great promise as a “chemical” treatment for cancer without the side effects. It is also showing promise as an insect dip for stock, as a bactericide for hospitals, and as a sedative for both humans and animals. The research goes on and, I believe, is only limited by our imagination.

CULTIVATION

Lavenders are greatly influenced by light levels. They evolved in southern France, at an altitude of sea level to 1000 m for *L. latifolia* and above 1000 m for *L. angustifolia*. Here the summer days are long and warm with strong sunlight. They grow on the forest edge or in the heathland where there is little shade and plenty of light. Their normal soil is very high in limestone and is basically white. These limestone soils are highly reflective and increase the light levels received by the lavender plants. Thus wild lavenders have a high-light level which explains their requirement for direct sun.

As Australian plants have adapted physiologically to low phosphorus, lavender has adapted to high calcium. Originally it was thought that they require high pH

but in reality it is not the pH but the calcium levels that are critical. As we need it for strong bones lavender needs it for strong cell walls. Deficiencies will result in very low immunity to fungal attack.

Lavender has evolved in fairly harsh and particular conditions. As a consequence of this the genus, particularly the cultivars in the *Lavandula* Section have developed some specific physiological requirements:

- Long day length.
- High light levels.
- Fast-draining soils.
- Ample calcium levels.
- Low humidity.
- Winter moisture.

BOTANY

There are about 40 species and 400 cultivars of lavender in three sub-genera each with several sections. There are also a number of interspecific and intersectional hybrids. The whole genus was fully reviewed by Susyn Andrews and Tim Upson in 2004 (Andrews and Upson, 2004). Their research brought about a far greater understanding of the relationship between the species and the sections. The majority of the cultivated forms are in subgenus *Lavandula*, sections *Lavandula*, *Dentatae*, and *Stoechas* along with section *Pterostoechas* in subgenus *Fabricia*. The commercially farmed taxa are in section *Lavandula* and involve two species and one naturally occurring interspecific hybrid.

Lavandula angustifolia is a small rounded shrub that originates in the mountains of southern France at altitudes above 1000 m. Unfortunately it has the common name of English lavender (comes from France, French lavender comes from Spain, and Italian lavender comes from Greece). *Lavandula latifolia* comes from the same region but at altitudes below 1000 m. It has the common name of spike lavender. The third species is *L. ×intermedia* which is the naturally occurring hybrid between these two species. It has an odd chromosome number and is thus a sterile hybrid. All three taxa produce good but very different oils.

The oil make up is complex enough to generate a whole series of workshops in its own right. Briefly though, the oils are as different as red and white wine. “Lavender Oil” or “Lavender Fine” is the product from *L. angustifolia* and “Lavandin Oil” or “Clonal Oil” is the oil from *L. ×intermedia*. “Spike Oil” comes from *L. latifolia*. The difference is in the “nose” which is the result of the percentages of the constituent component oils. There are in excess of 60 of these but only five of major influence: cineole, linalool, camphor, borneol, and linalyl acetate. The main target one is camphor, in lavender oil it has to be below 5% and preferably below 1%, in lavandin oil it should be between 5% and 15% and in spike oil it can be as much as 25%. Camphor, along with borneol and cineol give the oil that strong menthol-like fragrance which is not desirable in perfumes and cooking.

Lavender farming in Australia began in the 1950s by the Denny family in northern Tasmania. Their farm, called Bridestowe, quickly became the benchmark in world-wide oil production. They are now one of the world’s bigger producers and have set the standard for true lavender oil.

Nothing much happened for the next 40 years, and then in the early 1990s a book on alternative farming was published. This included a review of a successful small

lavender farm and instilled a sudden desire to farm this elusive herb. Many farmers were achieving returns of less than \$500 per acre and had major water supply issues. With its supposed yields this plant seemed a Godsend. They were told it could return upwards of \$13,000 per acre with no watering.

At the same time Australia relaxed its important treatments for lavender. All plants coming into Australia have to be gassed with methyl bromide for 2 h. This treatment kills lavender by the time it is removed from the chamber. Some work was done in the early 1990s to prove this and so the rules were eased. Now lavender is treated with other chemicals. This was when we started importing plants.

Most of our early importing came from New Zealand. This was fortunate as it is where the two largest lavender collections (worldwide) existed. One was just south of Auckland at a small specialist nursery called the Ploughman's Garden Centre. It was operated by a real character, the late Peter Carter. Peter had been collecting lavender and rosemary from all over the world. The other collection was just out of Christchurch and belonged to Virginia McNaughton, a passionate plants woman. Virginia had an academic approach to the naming and collecting of lavender and spent much time researching the nomenclature. She was fastidious in her approach.

Between the two of them there was a wealth of knowledge about the various taxa and what made them different. Over a short period we imported about 50 different cultivars — both ornamental and commercial. Being a botanist with a strong belief in the importance of nomenclature and varietal purity, I made sure we got the naming correct. At the same time there were many growers in Australia who wanted to know more and to ensure that they had the correct plants.

CULTIVAR SELECTION

In the early days of our industry there was a lot of confusion over the cultivars. Initially it was getting the mind around the differences between *L. angustifolia*, *L. latifolia*, and *L. ×intermedia* that caused the most problems. As most of the pre-1990 lavender was of seed origin, and most seed companies persisted in selling seed from the various cultivars it was nigh on impossible to identify what was being grown. This was aggravated by the fact that most nurseries would put an “English Lavender” label on any of the above three species.

At the same time there were a lot of people with large redundancy payouts looking for simple and romantic investment opportunities. These people, along with the struggling farmers had little knowledge of the plant and its botany. Hence if they went into a nursery and saw a plant called English lavender they assumed it was *L. angustifolia*. Others had even less understanding and there were quite a few plantings of *L. ×allardii* (*L. dentata* × *L. latifolia*) — which produced a very camphoraceous oil.

Between 1995 and 2004, a large number of cultivars of both lavender and lavandin were imported into Australia. Most growers now have accurately named cultivars and grow them separately. In 2000, at the annual TALGA (The Australian Lavender Growers' Association) conference, the first national oil competition was held. Oils from both types across several cultivars were judged for aroma and color. From this the differences between the taxa became more apparent. Now most lavender farms will sell cultivar-specific oils. The consumer can smell and decide which selection they prefer.

Five years ago we entered a partnership with Charles Sturt University to produce some polyploid lavender. Without going into the genetics, these are plants with double the number of chromosomes. This will normally result in bigger flowers with a greater number per bush. We are now about to release the first of these to the lavender industry. The other aim was to produce a double chromosome *L. ×intermedia*. The normal plant has an odd chromosome number and is therefore sterile. By doubling the number it becomes an even number and hopefully the plant will produce viable seed. This will then allow for some selective breeding.

From the research we have a polyploid *L. angustifolia* that has much larger flowers. So far the oil seems okay but we will have to wait until we have harvested from a number of plants to be sure. We have also produced a couple of *L. ×intermedia* forms. From the polyploidy work there were a couple of lavandins that produced viable seed. This was then germinated and planted out. The new plants are more vigorous and larger than the type. The suspicion is that they are *L. ×intermedia* that have backcrossed with *L. angustifolia*. This would produce a triploid plant which ties in with what we have observed. They are sterile but are strong growers.

CONCLUSION

The industry is now maturing and we are starting to see oil blending to produce specific fragrances. Commercial buyers are aware of the different cultivars. Unfortunately though, the big buyers require surety of supply and are looking for drums of oil and not the litres that our small farms are producing. It is hoped that many of the farmers who have been able to grow lavender and produce oil will expand their plantings. We envisage the new varieties will assist these farmers to produce more and better quality oil. This would then make them more competitive on the world market.

LITERATURE CITED

Upson, T., and S. Andrews. 2004. The genus *Lavandula*. Kewbooks, Cumbria.