The thyme is right

Maggie Tisserand talks about the development of a unique blend of thyme oils

Having lived with, and written about, essential oils for more than 30 years, I was intrigued and shocked by what I found on the internet back in 2003; that antibiotics were losing their ability to control mankind's most common bacteria, *Staphylococcus aureus*.

Soon it was being called a 'super-staph' as doctors were unable to prevent their post-operative patients from succumbing to its unstoppable march through the body.

Also known as methicillin-resistant *Staphylococcus aureus* (MRSA), these strains had mutated so many times that almost all antibiotics had become powerless against hospital-associated MRSA (HA-MRSA), the term for MRSA infections acquired by patients in a healthcare setting, and responsible for 95 per cent of MRSA cases in UK hospitals.

Sometimes called a 'superbug', in fact HA-MRSA comprises two main strains of *S aureus*, named Epidemic MRSA-15 and Epidemic MRSA-16. Most of the reports I read in 2003 related to these UK strains of MRSA, mainly contracted by hospital patients with weakened immune systems.

However, subsequent internet research showed that in the United States there were other strains of the bacterium, collectively known as Community-Associated MRSA.

This was causing great concern because it was said to be affecting young, healthy individuals with strong immune systems, who had no connection to healthcare facilities. Chief scientists around the world were predicting that unless something was discovered soon, then 'we will be entering a pre-antibiotic era' – in other words, back to when limbs and lives were lost because after bacteria had entered the body, there was no way to prevent sepsis and death.

The more I read about the problem the more I saw it as a challenge. Having successfully used essential oils to treat and rid myself of pretty nasty conditions during my years of travelling to developing countries, I wanted to find an essential oil, or combination of essential oils, that could kill MRSA. I knew several university researchers had tested tea tree oil in laboratory trials and that it worked well against MSSA (methicillin sensitive *Staphylococcus aureus*) as well as MRSA, but two of my three children have never been able to tolerate tea tree, so I sought an alternative.

Private trials get under way

At first I funded trials in private laboratories – a fairly costly business that I was able to undertake with a second mortgage over my property.

After six months, and having found what seemed to be an effective blend, I approached the MRSA Support Group to recruit volunteers for a small, patient-centred trial. Each of the five volunteers had been hospitalised with MRSA infections and, although well enough to be sent home, were all still suffering from discharge, repeatedly testing positive for MRSA, and never feeling well.

The blend I had put together was effective at decolonising the nasal passages and pertinent body sites, and delivered overall good results. However, I wanted to continue my research, and when I was introduced to the head of microbiology at the University of Brighton, within a short time a research programme was set up and running.

University trials

Initial trials at the University of Brighton pitted a small range of essential oils against a large number of micro-organisms, with the best results being achieved by one particular thyme sample. From that point, all further research focused on MRSA and a selection of thyme oils.

Thyme oil has a history of use in perfumes and is regarded as a powerful oil (to be used with caution) in the aromatherapy world, but it has rarely been used as an anti-microbial in a clinical setting. Over the years, much research has also established thyme oil as one of the most reliable and effective preservatives in the food industry.

It is only in recent years that MRSA isolates have been challenged with thyme oil, and from the few scientific papers investigating essential oils against MRSA, the results have always shown that white thyme was inferior to tea tree oil. Yet white thyme is simply a rectified form of red thyme, and there are close to 350 species of thyme plants in the world, with several having sub-species.

On top of that, thyme is polymorphous, which means that it changes its chemical balance according to where it is growing. Research has shown that when cloned thymes were planted out on neighbouring hills and valleys, the plants had a different mix of aroma-

Table 1.
Small patient-centred trial using Benchmark Thyme on three hospital patients with persistent MRSA colonisation.

Patient	Area	Dilution	Start date	1st clear result	2nd clear result	3rd clear result
A	Mouth	5%	05.05.09	02.07.09	20.07.09	20.08.09
B	Tracheotomy site/inner tube	5%	14.05.09	20.07.09	10.08.09	08.10.09
C	Nose	5%	14.05.09	0	0	0
C	Groin	10%	14.05.09	0	0	0

chemicals according to the depth of soil, the drainage, amount of sunshine, exposure to early morning frost, and so on.

To make things even more complex, thyme plants produce their aroma-chemicals at different points in the year. In the early stages of growth the plant has mainly terpenes but as it matures, the effects of oxidation, hydration and light – together with enzymes within the plant – convert the terpenes into terpene alcohols, alcohols, esters and sesquiterpenes. The timing of each harvest can therefore be very significant in terms of its chemical composition.

As the University of Brighton trials continued, one thyme sub-species in particular showed great promise, but obtaining large quantities was impossible, so I set about looking for a comparable thyme, or blend of thyme oils, that would produce a similar chemical profile. I would have been content to find something that was almost as good as the research sample, but ended up with something that was even more effective and which I would eventually name Benchmark Thyme.

Each of the thyme plants from which the blend is made are analysed regularly during the growing season, with the plants being distilled when the chemistry is right, rather than when the plants have the optimum levels of essential oil.

When I first saw an analysis of the aroma-chemistry I was pleasantly surprised as it had roughly equal proportions of phenols, terpenes and alcohols. Thymol, which is a powerful antibacterial, is a phenol and could irritate the skin, so having similar quantities of terpenes and alcohols in the blend would help to counterbalance this, and make it skin-friendly. In addition, the blend would be reliable year after year, as the chemical make-up and ratio would always be consistent, or 'industry standard'. To some therapists, this will be a negative, as the pursuit for organic oils has been of paramount importance over the past decade or so. However for me, the objective was simply to find an essential oil/oil blend powerful enough to kill MRSA and yet be safe for use on normal skin, regardless of whether or not it came with organic certification.

Happily though, while not organic, Benchmark Thyme does use a blend of thyme cultivars that are ethically grown, and chemical and pesticide free.

Comparing Benchmark Thyme with tea tree oil

With the UK thyme blend, or Benchmark Thyme, now in hand (called Oil B in the trials) a further round of research was undertaken at the university, which challenged MRSA-15 and MRSA-16 and two strains of MSSA with three different tea tree oils. A comparison of the results was then made between the tea tree oils and Oil B.

A scientific paper was written, though not published, which highlighted that Oil B produced slightly larger Zones of Inhibition on agar plates cultured with MRSA and MSSA, and in Kill Curve graphs it worked faster than tea tree at killing MRSA, and with a similar length of time to kill MSSA. (*See graphs 1, 2 and 3*).

The university researchers went on to write another paper, 'Enhancing the in vitro activity of *Thymus* essential oils against *Staphylococcus aureus* by blending oils from specific cultivars', which compared a single thyme linalool to Oil B. The paper concluded that 'the results for Oil B compare favourably to those for the linalool chemotype thyme oil, and the blend shows good in vitro potential for the treatment of MRSA colonisation'. The paper was published in the International Journal of Essential Oil Therapeutics in 2009 (Vol 3, Issue 1, p35-39), a journal directed at 'individuals and establishments that have an interest in the bioactivity of aromatic plants as well as the potential applications of such activities in human and animal treatment modalities'. (To read the abstract, visit www.benchmark-thyme.com)

A small patient-centred trial using Benchmark Thyme

Now armed with university research and Benchmark Thyme, I approached a private hospital to discuss the opportunity of using of Benchmark Thyme on patients persistently colonised with MRSA. This particular hospital was already using tea tree oil and manuka honey, alongside a conventional anti-microbial agent. Although this approach was proving successful with most of the patients, there were three in particular whose swabs always came back as MRSA-positive.

With permission from the director of the hospital, and under the supervision of a resident infection control nurse, these three in-patients agreed to have Benchmark Thyme dilutions applied to affected sites, the results of which are in *Table 1*.

Patients A and B were MRSA-negative at the end of the trial period. Patient C remained MRSA-positive. Further trials would need to take place to determine why Patient C's results were not successful.

Benchmark is no substitute for antibiotics

Benchmark Thyme is not a substitute for medical care or antibiotics, and will not be of use to someone with systemic MRSA. By systemic, I mean a sick person with a suppurating wound/deep seated infection – for example, after a hip replacement where MRSA has entered the surgical site and taken a hold – and for whom all available antibiotics have been given but the problem persists. When MRSA-infected matter is oozing from the body then a topical application of an anti-microbial – whether this is an essential oil or a conventional agent – is unlikely to be successful.

However, the continuing demise of antibiotics brings challenges to everyone involved in caring for others. For instance, there is a need for therapists to protect themselves and to ensure that their therapy room/clinic is not contaminated.

It is unlikely that an aromatherapist would choose to treat someone with a wound that was known to be colonised with MRSA

(unless working in a medical or healthcare context), but there are varying levels of colonisation – from MRSA being a harmless resident on the skin or in the nasal passages, through to heavy colonisation in the groin and armpit, or having a chronic wound that will not heal because it is heavily colonised.

In the UK it has been estimated that one third of adults are carriers of MRSA. However, it is not usually until the bacteria enters the body via a cut or compromised skin that infection may occur and potentially lead to health complications. Infection is most common in those in hospital, not least because a patient's immune system is already compromised. MRSA is much less likely to lead to infection in a healthy individual, namely someone who has not recently undergone surgery and has no medical conditions.

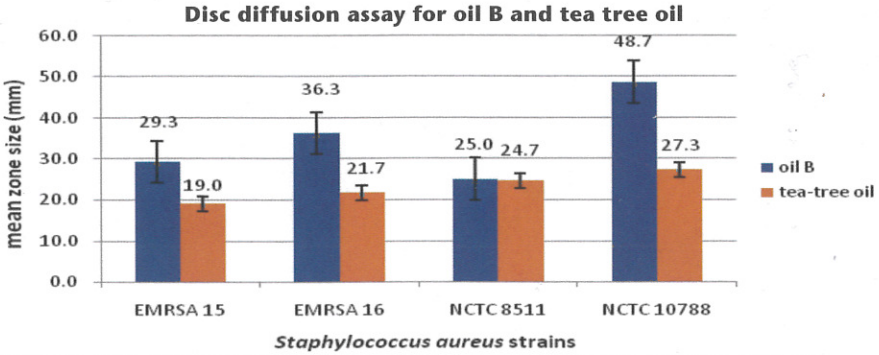
For more information about MRSA, visit www.nhs.uk/Conditions/MRSA/Pages/Introduction.aspx

Looking ahead

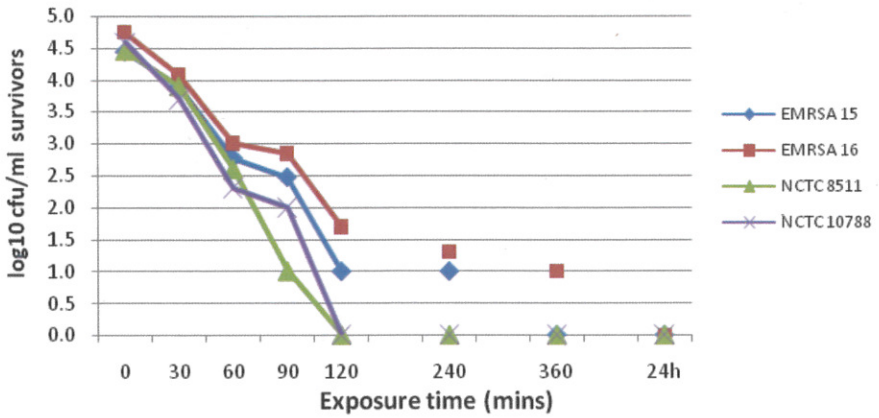
What about the future? In a perfect world, I would like to see wound clinics and diabetic clinics using anti-microbial essential oils on MRSA-colonised wounds to support the body's own healing process. Sadly, though, there are many regulations and committees to appease and, at present, a clinic cannot use any product for medical purposes without a CE mark, which indicates it has been approved by the Medicines and Healthcare products Regulatory Agency (MHRA).

I would love to see funding made available for research to assess how different essential oils could be used in the control of infectious diseases, but beyond funding, there needs to be relaxation of the red tape surrounding clinical trials. It is extremely difficult (and costly) to even obtain permission for a clinical trial as essential oils are classified as 'borderline medicinal products'.

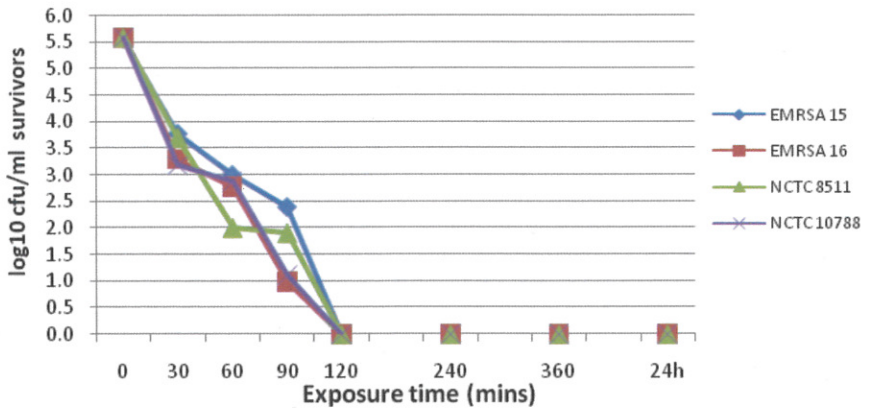
So, bearing all of the above in mind, I would encourage people to take responsibility for their own health and well-being and stop waiting for the 'perfect antibiotic' to be developed that will kill the superbug but not hurt the patient, because nobody knows if or when that will happen.



Comparison of the anti-staphylococcal activities of Oil B and tea tree oil



Time-kill curves of stphylococci after exposure to 5% (w/w) tea tree oil



Time-kill curves of stphylococci after exposure to 5% (w/w) Oil B

The aroma-chemistry of Benchmark Thyme

Benchmark Thyme is a specially formulated blend of thyme oils, with thymol and linalool being its major components, together with relatively high concentrations of alpha-terpinene and terpinen-4-ol, compounds found in tea tree oil but not usually in thyme oil. All four of these chemicals have particularly strong anti-bacterial effects and are found in a variety of essential oils, to varying degrees, but not in high concentration in one single oil – which is why four different thyme plants were put together to create Benchmark Thyme.

	Tea tree	Benchmark Thyme	Thyme linalool
1-terpinen-4-ol	●	●	
Thymol		●	●
Linalool		●	●
Alpha-terpinene	●	●	

Members' prize draw!

Three lucky members have the chance to win a copy of Maggie Tisserand's latest book, Aromatherapy vs MRSA. To take part in this free prize draw, please email your name and membership number to jreeves@fht.org.uk (writing 'Maggie Tisserand prize draw' in the subject box), or write your name and address on a postcard only and send to 'Maggie Tisserand prize draw' at the usual FHT address. Entries to be received no later than 10 May. Terms and conditions apply – please refer to competition terms and conditions on page 45).

Maggie Tisserand has been involved with essential oils since the mid-1970s and is the author/co-author of five books on aromatherapy. In 1989, she was the first speaker in Japan to talk on the subject of aromatherapy. Maggie's sixth book, Aromatherapy vs MRSA, is newly published by The Clarity Press, and available from www.theclaritypress.co.uk Further information about Benchmark Thyme can be found on www.benchmark-thyme.com together with a link to Aromantic, the UK distributor of Benchmark Thyme, and Atlantic Aromatics, the distributor for Ireland.

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