INTRODUCTION

On behalf of my fellow growers of Australian tea tree oil, I want to thank you for attending this presentation and IFEAT for the opportunity to launch our “improved identification methods” awareness campaign here today.

To understand why improved identification methods for pure tea tree oil are necessary, we need to go back to the history of tea tree oil as a key ingredient in personal care products.

Tea tree oil has substantial medical properties that have been established by equally substantial research. This research was conducted using pure tea tree oil. It is this established research on the “efficacy” and “safety” of tea tree oil that has seen a proliferation in its use in personal care products and more importantly, enabled manufacturers to make claims on the performance of their product and the consumer to have confidence in these claims.

In the past two years however, we have seen an increase in the amount of adulterated tea tree oil being sold in the market as low priced tea tree oil. Manufacturers and consumers have not been warned that this cheap oil is adulterated and that no tests have been done to prove its “efficacy” or “safety”.

To reduce the risk faced by manufacturers and consumers from this adulterated oil, our industry has embarked on a programme to introduce improved identification methods for pure tea tree oil.

Adulteration of essential oils is a common problem in the market place. However, our industry believes that the adulteration of tea tree oil is a matter of great concern because of the types of personal care products it is used in and the healing properties the consumer relies on when using these products. When untested, un-researched and un-controlled adulterated tea tree oil is being used in products which are then being applied topically or orally to cuts, burns or infections – there is a very real safety concern which is a matter of great interest.

Let me now introduce you briefly to the organisation that will be prosecuting this case.
ATTIA stands for the Australian Tea Tree Industry Association. It is the Australian Government approved industry body promoting tea tree oil.

In 2003, Richard Davis and his father from GR Davis presented at the IFEAT conference in Sydney where they spoke also about tea tree oil. At that time, if you talked to Richard or anyone else about tea tree oil, it was overwhelmingly understood that (a) it was 100% pure and (b) it was from Australia.

This is not the case today.

Purely by chance, I am able to make this point today with the help of an advertisement appearing in the 2012 IFEAT Singapore conference programme. This advertisement is promoting tea tree oil that originates from China – Chinese tea tree oil.

It so happens that I can speak from personal experience on this matter as I met the owner of this company in China when IFEAT had its conference in Shanghai. He openly told me that his oil did not resemble pure tea tree oil and offered me the opportunity to blend our oil with his and to then sell this adulterated oil off as pure tea tree oil.

I rejected the offer and it appears that this company has found other ways to overcome their problem. What is also worth noting in the advertisement is his reference to a new Chinese National Standard for tea tree oil. This may provide him with some flexibility to deal with the non-conformance of his oil. In any event we now have identified “Chinese tea tree oil” as a product.

ATTIA’s response is to promote the brand Pure Australian Tea Tree Oil as a simple identification method for manufacturers and consumers to now specify when they are purchasing tea tree oil.

It is also worth noting that ATTIA collaborates with the Australian Rural Industry Research Development Corporation. This is an Australian government corporation that has been involved in developing the science around the production and uses of Pure Australian Tea Tree Oil.

We have available today as a hand-out, a publication produced in conjunction with ATTIA entitled The Effectiveness and Safety of Australian tea tree oil. It is a very useful starting point for manufacturers and consumers and is available free of charge. You or your customer will gain more from spending 30 minutes reading this publication than you will from hours of web based research.

I have a few hard copies available here today or I can send you the electronic version if you prefer that.

I would now like to move on and talk about the importance of the history of tea tree oil.

Tea tree oil is produced from the native Australian plant – Melaleuca alternifolia.

What Is ATTIA
- ATTIA is the Australian Tea Tree Industry Association. It is the Australian Government approved industry body supporting the tea tree oil industry.
- Branding of “Pure Australian Tea Tree Oil” (PATTO)
- It collaborates with the Australian Rural Industry Research Development Corporation to improve and enhance the production and uses of PATTO
- Provides a forum and channel for regulators, growers, researchers, manufacturers and consumers to raise issues concerning PATTO

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History Of Natural Australian Tea Tree Oil
- Tea tree oil is an essential oil distilled from the Australian plant Melaleuca alternifolia
- It has been used medicinally for centuries and was identified as an antiseptic by the New South Wales chief chemist in the 1924
- Published research has shown that tea tree oil has also been found to have substantial anti-fungal, antibacterial, anti-viral and anti-inflammatory properties
- Tea tree oil has become an established ingredient in many personal care products
Australian aboriginals have used the oil for hundreds of years but it was only in 1924 that its antiseptic properties were established. Since then, research has also proved the oil’s:

- Anti-fungal
- Anti-bacterial
- Anti-viral and
- Anti-inflammatory properties.

Based on its history and established research – tea tree oil has grown to be a valuable and widely used ingredient in personal care products.

This research into the medical properties of tea tree is on-going and indeed moving into areas that could yield significant benefit to people suffering from diseases.

Examples Of Recent Medical Research

Prof Thomas Riley - 2010

“The demonstration that 4 applications of topical TTO can inhibit tumour growth and even induce tumour regression of subcutaneous models of mesothelioma and malignant melanoma with local toxicity in the form of skin irritation completely resolving, is extremely encouraging.” [referenced]

Dr Christine Carson - 2010

“Firstly, when applied during the wound cleansing step as a wound irrigant, 3.3% tea tree oil was unable to decolonise methicillin-resistant Staphylococcus aureus from wounds. Secondly, wounds to which this tea tree oil irrigant was applied began to heal; most wounds (8 of 11) were smaller after the tea tree oil product was used and this included chronic wounds” [referenced]

I refer here to two recent research papers. Both are referenced later in the presentation so you can read them in more detail.

Prof Thomas Riley’s research looked at how tea tree oil can inhibit tumour growth in models of mesothelioma and malignant melanoma. His conclusion – tea tree oil did inhibit tumour growth and also induced tumour regression.

Dr Christine Carson did research which established that tea tree oil used as a wound irrigant was successful in reducing the size of wounds caused by the super-bug “golden staph”. I quote “wounds to which tea tree oil irrigant was applied began to heal – most wounds (8 out of 11) were smaller after tea tree oil was used and this included chronic wounds”

I draw on these two examples of valuable research to reinforce our argument that tea tree oil is an essential oil with significant medical prospects and why it is vital that improved identification methods be made available and adopted to ensure that such work and the consumer confidence in the medical benefits of tea tree oil is not undermined by adulterated oil.

You have heard me refer to the terms “efficacy and safety” of tea tree oil. The Australian Government’s RIRDC publication title also refers to “effectiveness and safety”. These qualities in tea tree oil have been established from research conducted using pure Australian tea tree oil. It is this research that gave manufacturers the confidence to formulate personal care products using tea tree oil and the consumer the confidence to use those products.

What Is The Industry Concerned About

- Research published on “efficacy” and “safety” of tea tree oil was done using PATTO
- Market interest in natural products drove demand for PATTO to be used in personal care products because of its medical properties
- ATTIA concerned that adulterated oils are now being sold as pure tea tree oil
- ATTIA’s analysis of tea tree oil samples showed that many of these were not complying even with the ISO standard
- Manufacturers and consumers are being misled
The fact that many consumers use tea tree oil products for its healing properties, places a burden of responsibility on traders and manufacturers to ensure that they are selling and using the correct type of tea tree oil in personal care products.

This comes to the crux of what the industry is concerned about.

Some adulterated oil is being sold as tea tree oil and being used to manufacture personal care products. This adulterated oil has not been tested for its “efficacy” or “safety” and the consumer is not being warned when such adulterated oil is being used.

In recent analysis done by ATTIA on a range of oil samples, we were shocked to find that most of the oils identified to be adulterated oils, were not even complying with the ISO standard.

Despite this, manufacturers and consumers are buying these oil and products made from these oils because they are not being warned that these oils are adulterated and are not ISO compliant.

Our contention is that manufacturers and consumers are being misled and being placed at risk.

ISO Specification

- The oil of *Melaleuca alternifolia* has 113+ components
- The International Standard for Oil of Melaleuca (ISO 4730) list only 15 components
- The most observed of these is terpinen-4-ol, Cineole and p-cymene levels
- An increasing number of other national and international standards apply to tea tree oil. The BP, EP and the World Health Organisation have produced international monographs and Australia, France and Germany have published national standards.

<table>
<thead>
<tr>
<th>Component</th>
<th>ISO 4730 (range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>α-pinene</td>
<td>1 – 6</td>
</tr>
<tr>
<td>α-thymene</td>
<td>0.5 – 8</td>
</tr>
<tr>
<td>α-terpine</td>
<td>0.5 – 8</td>
</tr>
<tr>
<td>limonene</td>
<td>0.5 – 15</td>
</tr>
<tr>
<td>p-cymene</td>
<td>0.5 – 8</td>
</tr>
<tr>
<td>1,8-Cineole</td>
<td>0.5 – 15</td>
</tr>
<tr>
<td>γ-terpinene</td>
<td>10 – 20</td>
</tr>
<tr>
<td>terpinolene</td>
<td>1.5 – 5</td>
</tr>
<tr>
<td>terpin-4-ol</td>
<td>30 – 40</td>
</tr>
<tr>
<td>a-terpinol</td>
<td>15 – 8</td>
</tr>
<tr>
<td>α-thymene</td>
<td>0.5 – 8</td>
</tr>
<tr>
<td>globulol</td>
<td>true – 1</td>
</tr>
<tr>
<td>valeylol</td>
<td>true – 1</td>
</tr>
</tbody>
</table>

You might well ask – how can that happen?

Well let’s look a little closer at this.

Pure tea tree oil has over 113 components in it.

The ISO 4730 standard only measures 15.

Many traders focus on just 2 or 3 of the components as their measure of oil standard.

What appears to be occurring is that poor quality oils are being adulterated with cheap Terpinen-4-ol and at times with limonene - to look similar to the key compounds found in pure tea tree oil.

So if all you look for is the level of Terpinen-4-ol, cineole and p-cymene, you may well be ignoring the high limonene levels or the non-existence of the bottom 5 minor sesquiterpenes that would otherwise warn you of the adulteration.

It is worth noting that there are a number of national and international standards that are there to guide the consumer but even these are at times not being fully observed.

What really surprises us - is when you consider that the difference in cost per kg between pure and adulterated tea tree oil is under US$10 per kg and the quantity of tea tree used in products is mostly less than 1% - manufacturers may be saving less than 5 cents off the selling price of a product and for this small profit, risk product withdrawal or prosecution for misleading conduct.
Another interesting point is the number of products with tea tree oil in them that may not comply with the INCI nomenclature for tea tree oil, which is

*Melaleuca alternifolia* (Tea Tree) Leaf Oil

The oil described here is an ingredient that is a natural product and it comes from a single plant.

We have a small gift here for you from Integria Healthcare of Australia. It’s a tea tree foam face wash under their successful Thursday Plantation brand. If you get hold of one of these you will clearly see the correct description of the ingredient on the packaging.

This poses a real problem for manufacturers who use adulterated tea tree oil and sell their product in countries that have adopted the INCI standards. At the very least they will not be able to identify tea tree as an active ingredient to avoid being in breach of these standards.

It makes little commercial sense to us and we suspect that manufacturers must not be aware that they are being sold adulterated tea tree oil or the commercial risk they may be facing because of this.

So let me crystallize the issue as we see it:

**What Is The Issue**

<table>
<thead>
<tr>
<th>Pure Australian Tea Tree Oil</th>
<th>Adulterated Tea Tree Oil</th>
</tr>
</thead>
<tbody>
<tr>
<td>113+ Components Natural</td>
<td>Fewer than 15 components Blended or extended</td>
</tr>
<tr>
<td>The basis for research work &amp; INCI reference Personal care products relying on established research to make claims</td>
<td>No supporting research to base claims on No disclosure to manufacturer or consumer</td>
</tr>
</tbody>
</table>

**Pure Australian tea tree oil**

This is a 100% natural product made up of over 113 components. The INCI nomenclature specifies this as oil from a specified plant. This pure oil was the basis for the research done to establish “efficacy” and “safety”. This knowledge and confidence has promoted the use of tea tree oil in personal care products.

On the other hand you have:

**Adulterated tea tree oil**

There is no disclosure that it is adulterated or what the source material of the adulteration is. There is no research to support what the efficacy or safety is for adulterated oil. The public is not being warned of this risk.
Fellow attendees, the potential victims from this adulteration are the consumer and the integrity of so much of the valuable research being currently undertaken using pure tea tree oil. Our industry is very concerned about this and we intend to make our voice heard.

Our industry believe that the best way to deal with this very serious issue is to:

a) Make the adulterators aware that we are aware of the issue and that we intend to let the regulator and consumer know about it and

b) To continue to rollout a variety of improved identification methods for people purchasing tea tree oil to rely on when they are buying pure tea tree oil

Today's presentation here in Singapore and a similar one occurring at In-Cosmetics in Bangkok at this very moment is the start of an official public awareness campaign to make this issue public.

ATTIA launched its Facebook page in the middle of the year to be ready to support this initiative and we are delighted with the response we have received even before the public campaign begun.

Another major ATTIA initiative has been the development of the Industry Code of Practice to promote the quality and reliability of pure tea tree oil being produced in Australia.

What Is The Industry Doing?

- **Branding To Differentiate**
  ATTIA promoting use of “Pure Australian Tea Tree Oil” as a brand to enable users to identify the higher quality oil where “Efficacy” and “Safety” has been established

- **Applying for Chiral testing in the new ISO standard**

Last but most importantly is the application underway with Standards Australia to have chiral testing included as part of the Australian Standard and subsequently the ISO.

For those of you who are not familiar with chiral testing, I hope the diagram is of some use to you.

Nature makes some compounds in what is referred to as enantiometric forms – compounds having a mirror image relationship. Because of this, you can

What Is The Industry Doing?

- **Market Awareness Program**
  - Public Presentations - IFEAT and In-Cosmetics
  - ATTIA website, Facebook and other social media
  - Topic papers for circulation

- **Code Of Practice [CoP]**
  - Develop an industry code of practice to provide PATTO users with confidence of quality. ATTIA CoP has been endorsed by SCCP
  - Conduct strict field audits prior to certification
  - Produced CoP stainless steel drum seal to prevent adulterated tea tree oil from passing off as PATTO

An important part of this CoP was the introduction of stainless steel drum seals that are only available to accredited growers. This is another identification method you can now rely on to know that you are purchasing pure Australian tea tree oil.

New Specification – Chiral Testing

- Nature makes compounds in specific enantiomeric (chiral) forms (i.e. d-glucose not l-glucose)
- In TTO we have three compounds which are enantiomeric
  - Terpinen-4-ol
  - α-Terpineol
  - Limonene
perform a chiral test on these compounds to identify if they have chiral ratios that are similar or different. Tea tree happens to have some compounds that are anantiometric.

The best illustration of this given to me is the example of the shape and composition of our hands. When you look at your hands, you will note immediately that your left and right hands are mirror images of each. However, when you place one on top of the other, you can see that they cannot be superimposed on each other. Chiral testing can help spot such differences in certain compounds.

The next three slides look at the results of chiral test done by ATTIA on a sample of oils we obtained from the market.

First, the chiral ratios of terpinen-4-ol were analysed.

You can immediately see the difference between the group of samples on the left, which are pure tea tree oil, and the group on the right, which are adulterated.

The same disparity occurs again when we look at the chiral ratios of alpha terpineol.

We are now looking at the chiral ratios for limonene. Again, the differences are apparent.

Chiral testing when adopted in the standards will make it easier for you to identify pure tea tree oil from adulterated oil.
Until the standard is adopted, please make sure you get the full ISO 4730 analysis.

Showing the 15 key components

The key physical properties

And also request a Pesticide Residue Test report
If you are buying oil in 185 kgs stainless steel drums, then having drums with the ATTIA CoP seal cap is an easy identification method for you to rely on.

If your oil has been re-packed, ask your supplier to confirm if the oil they received came with the seal cap.

In summing up, I would like to confirm that ATTIA has begun the lodgement process to have Chiral testing included in the Australian Standards as a simple to use identification method.

This type of testing is being used for lavender oil and is in the pharmacopeia.

Will this benefit the manufacturer and consumer?

We believe that it certainly will and it is extremely necessary to ensure that the “efficacy” and “safety” record of pure tea tree oil is not compromised by adulterated oil. As this message is being rolled out, you can minimise your risk from any fall-out from dealing in adulterated tea tree oil by making your customers aware of the risk they face when not using pure tea tree oil. There is very little to gain and much to lose!

Your starting point should be to specify “pure Australian tea tree oil”. You can also demand your supplier provide you where appropriate with:

- A CoP certificate
- A certificate of origin and a certificate confirming the oil is 100% natural
- Try to only buy oil with an ATTIA seal cap and
- Please always ask for the full ISO 4730 analysis

“Where is the Specification Headed?”

- Chiral testing can differentiate the enantiomers
- ATTIA making a submission to ISO to include chiral testing as part of the ISO standard
- Is Chiral testing used for other oils?
  - Lavender Oil already has chiral testing in the pharmacopia
  - Does chiral testing benefit the manufacturer and consumer?
    - Guarantee of safety and efficacy of product performance

“How Can You Minimise Your Risk?”

- Make your customer aware of the risk of using un-researched adulterated tea tree oil when relying on safety and efficacy claims that arose out of research using PATTO.

Ask for Pure Australian Tea Tree Oil

- Demand that your supplier provide you with
  (a) CoP Certificate of Accreditation
  (b) Certificate of origin and 100% natural
  (c) Ensure all 205 ltr stainless steel drums come with CoP seals
  (d) Ensure you receive a complete analysis to ISO 4730, EP 2012

- If you are suspicious about any oil being sold as tea tree oil then contact ATTIA or provide ATTIA with a sample for chiral testing
Finally, if you are suspicious of any oil being sold to you, you can contact me or ATTIA and we will be happy to assist you with testing the oil.

That concludes my presentation. I am happy to take questions from the floor but first want to thank Phang and Johnny Lim from Bronson & Jacobs Singapore and Phillip Daley from Bronson Jacobs Sydney for their assistance here today and also to Andrew Alchin of Bronson & Jacobs, Sydney for helping facilitate this presentation with IFEAT.

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**References**


**Websites**

- ATTIA [www.attia.org.au](http://www.attia.org.au)
- Maria River Plantation [www.mariariverplantation.com](http://www.mariariverplantation.com)
- Thursday Plantation [www.thursdayplantation.com](http://www.thursdayplantation.com)

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Jerome Chopard is a Director of Newell Palmer Securities Pty Ltd, a boutique financial adviser in Sydney, Australia. Jerome advised on the establishment of 3 tea tree farms between 1994 and 2000 in Port Macquarie, some 400 kms north of Sydney. The total area planted was 487 ha. In 2000, Jerome advised on the purchase of these farms and with his partners, established the Maria River Plantation group. The operations have expanded and the group today manages over 550 ha of tea tree farms and is the largest producer in Australia with an annual production of approximately 100 tons. Jerome is responsible for the group sales at Maria River Plantation and sits on ATTIA committees responsible for the promotion of Australian Tea Tree Oil. He is a Fellow at Finsia Australia and Senior Associate FPA Australia.