SPRING 2024

# IFEAT WORLD

INTERNATIONAL FEDERATION OF
ESSENTIAL OILS
& AROMA TRADES

**ITALY STUDY TOUR**
REPORT

**ICATS REVIEW ON RECENT F&F EVENTS**

**MY FAVOURITE:**
CALENDULA

**IFEAT ADVOCACY**
REPORT

IFEAT 2024
BANGKOK
10 - 14 NOVEMBER 2024
MARRIOTT MARQUIS QUEEN'S PARK

**SHAPING THE FUTURE:**
FROM ASIA TO THE WORLD

# FROM THE IFEAT 2024 BANGKOK CONFERENCE CHAIRS

**Dr Geemon Korah**

**John Nechupadom**

Following the overwhelming response we received at our Berlin 2023 Conference, we are excited to welcome you to the IFEAT 2024 Bangkok Conference taking place from Sunday 10th to Thursday 14th November 2024 at The Marriott Marquis Queen's Park.

We return to Asia to celebrate 47 years of IFEAT. Our annual gathering of the IFEAT community from across the global essential oils, flavour and fragrance industry is one of the most anticipated events of the year.

The theme for this year's Conference is "Shaping the Future, from Asia to the World." Asia is the largest consumer in the world of essential oils and aroma products, so developments in this region are hugely important for our industry. We shall discuss changing consumer behaviour in Asia as well as developments in agriculture across the region and how these will change the way we view naturals in the future. We look forward to presentations on the evolution, and future, of the F&F industry in China as well as listening to speakers from Australia and New Zealand on their markets.

Important trade issues will be covered, including global regulatory challenges and the importance of harmonisation

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## BANGKOK CONFERENCE CO-CHAIRS' REPORT

where possible and why this often does not happen in an increasingly fractured world. With this in mind there will be an important summary of the Plant Protection Project of IFEAT with its focus on concentration and processing factors that re-defines how we see Maximum Residue Levels (MRLs). There will also be an update on the citrus market from all the major producing countries including Argentina, Brazil, Mexico, Italy, Spain and South Africa.

As climate change and sustainability remain priorities for everyone, we look forward to continuing the roundtable held in Berlin last year on sustainability and the Road to Net Zero. We shall also have an update on the important topic of the EU's Green Deal and how this affects our trade.

Other topics that will be discussed in Bangkok include aromatherapy and aroma chemicals, with updates on research and development (R&D), new regulations, how markets are evolving, current trends and their future.

As is traditional for IFEAT Conferences, we look forward to the Medal Lecture and keynote address, both of which are always delivered by renowned speakers who manage to inspire us all!

We shall enjoy the beauty and culture of Bangkok together with colleagues and friends, providing the opportunity to network and share our insights.

Bangkok's popularity stems from its diverse attractions and experiences. Renowned for its vibrant street life, rich cultural heritage and majestic temples like the Grand Palace and Wat Arun, it is also famous for its bustling markets, delectable cuisine and lively nightlife. The city is known for ornate shrines, the Chao Phraya River which feeds its network of canals, flowing past the Rattanakosin royal district, home to the opulent Grand Palace and its sacred Wat Phra Kaew Temple. Nearby is Wat Pho Temple with a reclining Buddha and, on the opposite shore, Wat Arun Temple with its steep steps and Khmer-style spire.

The Conference programme will consist of speaker presentations in the plenary on all four mornings from Monday to Thursday, a trade exhibition, workshops and roundtables. Additionally, the Conference will include private company meeting rooms, meeting tables and ample networking areas.

Registration is planned to open mid-April and due to the high interest, we request all participants to book accommodation in the venue hotel using our booking link which you will receive after registration to access the discounted rates as soon as possible.

**Dr Geemon Korah** and **John Nechupadom**
*Co-Chairs of the IFEAT 2024 Bangkok Conference Committee*

If you would like to contribute to IFEATWORLD or would like to write a "My Favourite", contact the editor. Email **ifeatworld@ifeat.org**

# Notes from the Chair

Dear IFEAT Community,

I write this column as I am flying back from Bangkok and our Executive Committee meetings, held there in the fabulous Marriott Marquis where many of us will gather in November of this year.

**Catherine Crowley**, Chair of the IFEAT Executive Committee

**Bangkok Conference:** I expect this year we will have a fantastic turnout for the Conference. Our two Conference Co-Chairs, together with IFEAT staff, have done a great job of choosing a venue that can provide everything we need in a great location.

The hotel is large and I believe meeting space will feel expansive for everyone. With four restaurants on site and many others within easy walking distance – both local and other international cuisine will be part of your experience. It's an exciting location and I am very pleased we were able to get a sense of it in preview!

**Work of the Executive Committee:** IFEAT continues to move into new areas to provide opportunities for networking, education and support for Member and non-Member companies.

**Italy Study Tour:** With 42 delegates from 18 countries making 11 site visits, the fast pace of our January Study Tour to the Calabria & Sicily regions of Italy provided great experiences for those participating. The days included opportunities to see different farming practices, a variety of production and processing facilities, new technologies and innovative practices, along with a chance to learn of adaptations for climate change and solutions being sought for supply chain issues. A big thank you is extended to the Local Organising Committee: Antonella Corleone (as Chair), Gianfranco Capua and Simona Caratozzolo; along with guiding of Alessandra and the work of the local tour agency (TMT); and of course to our 'always setting the bar higher' Study Tour Coordinator Peter Greenhalgh. It was a great team effort facilitating learning experiences and memorable moments for all those involved.



NOTES FROM THE CHAIR

Keep an eye out for the overview video to be posted soon on the IFEAT website!

**Upcoming Türkiye Study Tour:** IFEAT's 15th Study Tour will take place from 1st to 8th June 2024 in western Türkiye, with opportunities to see fields and processing of essential oils that include rose, oregano and laurel oils. Travelling through areas that include Istanbul, Izmir, Denizli, Isparta and Antalya, delegates will visit both traditional and modern distillation facilities, while taking in the beauty of Türkiye's landscape and rich cultural setting. There are a few places left – contact IFEAT soonest if you are interested in attending!

**Legislation Affecting Essential Oils and their Related Products:** IFEAT was pleased with the final language in the CLP Revisions earlier this year. This will be finalised in the upcoming months.

Together with EFEO, work was done to ensure language was included that could protect essential oils and their related products. Ongoing scientific studies are now being planned, that will provide further evidentiary support for the European Commission's scientific report on this issue, to be published within the next five years.

With that first step in place, attention is now turned to issues like the consideration by ECHA of reclassification of tea tree oil to a Category 1B for fertility. A joint submission by IFEAT and EFEO was made to CARACAL on this issue, emphasising the need for data that reflects human relevance before considering any changes to current classification. CARACAL is the expert group that advises the European Commission and ECHA on matters regarding safety.

Collaborative work is continuing on this issue, with special attention being given to any potential extension to other essential oils.

IFEAT continues its work with FGS, the global communications group that assists the Federation in its EU advocacy planning and outreach to key decision-makers. The debate surrounding risk versus hazard classification means attention must be given now to definitions of 'Essential Use'. This work will factor in the revisions to come in the Cosmetic Products Regulations (CPR) and REACH, either later this year or early next year.

We do believe one success can be a building block for future successes – as we work to ensure that Essential Oils and related products are protected from any unintended consequences of legislating safe use of chemicals.

IFEAT Protect Essentials

This will be a busy year for all of us! Stay tuned for new IFEAT activities, further updates on IFEAT's Protect Essentials Campaign (**www.protect-essentials.org**), and the opening of registration for the IFEAT 2024 Bangkok Conference!

There is lots to do – we look forward to you being a part of our work in any way you can!

*Catherine*

IFEAT 2024 BANGKOK
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Italy
IFEAT STUDY TOUR
21-27 JANUARY 2024
Calabria-Sicily

IFEAT Türkiye STUDY TOUR 1-8 JUNE 2024

# IFEAT is prepared for 2024

By Dr John Cavallo, Chair of IFEAT Scientific Committee

## To bring you up to speed...





As you are aware, our priority for 2023 was to secure a positive outcome for the essential oils industry in the EU's Classification Labelling and Packaging (CLP) Regulation. And we succeeded in doing just that!

Thanks to the constructive dialogue between our industry and EU legislators, the final text of the Regulation is a significant improvement to the initial proposal, and importantly, grants a derogation for essential oils and related products from the stringent rules to prove the safety of each constituent of a mixture. This outcome, achieved by IFEAT together with our partners at EFEO, provides the much-needed business certainty for our industry and guarantees the continued trade and safe use of essential oils, as has been the case for centuries. In the coming weeks, the legislative text will be presented to the European Parliament for final sign-off and will become law later this year. We will continue collecting scientific evidence demonstrating to the European Commission that the derogation is justified.

***With the revised CLP Regulation, we are confident about a sustainable future for the essential oils sector in Europe, and globally***

Catherine Crowley, Chair of the IFEAT Executive Committee and Manolo Donaire Alliët, President of the European Federation of Essential Oils

**However, our advocacy efforts do not end here.** As part of the EU's overhaul of chemicals legislation, under the EU's Chemical Strategy for Sustainability, the EU Commission will bring forward new proposals – for example revisions to the Cosmetic Products Regulation (CPR) and the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) regulation. With a shift in the fundamental principles of how chemicals are assessed, the EU is moving away from a risk management approach, and the concept of "safe use" to a more precautionary "hazard-based" approach. The upcoming revisions of REACH and CPR could therefore have a significant impact on essential oils producers around the world. Despite the long-awaited REACH revision being delayed until after the EU elections and the new Commission taking up office which will not occur before the end of this year, we expect that certain impactful elements of it could be published as stand-alone legislation already this year.

The risks to our industry are high but **we, as IFEAT, will continue our EU advocacy efforts to secure positive outcomes for our industry in the upcoming EU legislative initiatives**. As we approach the EU elections, set for 6-9 June 2024, the shifting political landscape will present both new challenges and opportunities. The appointment of a new European Commission and the election of new Members of the European Parliament (MEPs) will bring a renewed legislative agenda and potential shifts in policy direction. The expected turnover among MEPs is high, with up to 60 per cent of the chamber being new and several prominent members retiring. It is therefore crucial that IFEAT continues building new relationships, sharing our story, demonstrating the significance of our industry and ensuring that our voice is heard. Therefore, building awareness of our industry and the benefits it provides is a key area of focus for IFEAT. The upcoming EU elections will undeniably bring considerable uncertainty. But what is certain is that the future will bring changes to the EU's chemical strategy and our team is ready to continue our advocacy work.

**IFEAT is well prepared to take necessary actions in the context of the revisions of CPR and REACH.** We are evaluating early drafts and their potential impacts on the essential oils industry. We are preparing our advocacy strategy already, months before the legislative texts are tabled and discussions with EU policymakers can start in earnest.

With last year's launch of **IFEAT's public campaign 'Protect Essentials'*** we are determined to continue educating and influencing policymakers who will be involved in CPR and REACH proposals. Ultimately, our goal is to protect the production and use of essential oils, and protect an industry that is of historical, cultural and socio-economic significance for local communities globally. We have succeeded so far in our efforts, and with this campaign and our continued advocacy efforts we are working to secure a bright and healthy future for the essential oil industry.

***https://www.protect-essentials.org**

IFEAT Protect Essentials

# IFEAT and EFEO Joint Submission to EU's CARACAL – Tea Tree Oil

In March 2024, IFEAT co-signed with the European Federation of Essential Oils (EFEO) a submission to the EU Competent Authorities for REACH and CLP on the recent recommendation by the European Chemicals Agency (ECHA) to classify tea tree oil as Category 1B for reproductive effects. Category 1B covers "Presumed human reproduction toxicants – largely based on animal studies". The joint submission stresses the importance of human relevance being considered in detail before deciding on this classification.

Tea tree oil is an essential oil obtained by steam distillation of fresh leaves and twigs of *Melaleuca alternifolia*. It has been produced commercially since the beginning of the 20th century. In the EU it is principally used in cosmetics and traditional pharmaceuticals. More recently (since the mid-2000s), it has been used as a plant protection product. The concern is that, if tea tree oil is classified as Category 1B (fertility), trade in this product to the EU will collapse. About 150-200 tonnes/year of tea tree oil is currently imported to the EU. Furthermore, any regulations against tea tree oil could have a knock-on effect for other essential oils, other naturally complex substances, as well as some of the major components of tea tree oil such as para-cymene and terpinolene.

With over 100 years of safe use in the EU, and thousands of years of exposure to humans without any reported negative effect, IFEAT and EFEO stress: **"Until there is more mechanistic data available on tea tree oil itself, we have to rely on exposure data for human consumption. Since there is a broad human exposure to all constituents contained in tea tree oil from natural sources without any known negative effect, it is warranted that tea tree oil is labelled as Category 2 as there is clearly 'doubt on human relevance' – the key criterion to discriminate Category 1B from Category 2."**

The studies used to determine Category 1B classification have to be supplemented with additional information related to human relevance, in part due to the fact that para-cymene, a component of tea tree oil, has a different mode of action in humans, contrasted to that in rats.

The Committee for Risk Assessment (RAC), responsible for preparing opinions related to the risks of substances to human health and the environment, emphasises that the mode of action of para-cymene certainly raises doubt on human relevance. Although being only a minor component of tea tree oil, the mode of action of para-cymene raises enough doubt for the entire oil. The CLP guidance document clearly does not require "proof" of mode of action but mentions that as soon as mechanistic information raises doubt on human relevance, a classification in Category 2 may be more appropriate.

We shall keep IFEAT Members updated on this important topic, and will continue to address these concerns, along with those related to CLP, REACH and the CPR (Cosmetics Products Regulation).





**Dr. Alison Green,** Director of Studies at the International Centre for Aroma Trades Studies, reports on F&F events attended by the ICATS and IFEAT teams

# Unlocking the Mind

## October 2023

## IFRA Fragrance Forum

This wonderful event took place in the historic Royal Institution, London, founded in 1799 and home to the famous annual Christmas lectures founded by Faraday in 1825. The ICATS stand was in the beautiful library, just next door to the historic lecture theatre and we had a full day of networking with past, current and potential students during the breaks between lectures and round table sessions.

The focus of the day was '***Unlocking the Mind***' and it addressed this fascinating topic from a number of avenues. Firstly, Givaudan explained their revolutionary work with care home residents suffering from dementia using their Smell and Tell game. This was closely followed by an introduction from Dr Stuart Firestein, who provided some updates on the topics presented last year with Barry Smith (How do I Smell?). He gave a good overview of the complexities of the sense of smell and also attempted some definition of what an odour actually is (far from simply a 'smell'). He explained recent research attempting to understand what happens when we smell neurologically and find a predictable system that can be mapped. Unfortunately, *in vivo* experimentation in mice (Sosulki *et al*. Nature 2011) showed that, although there is some organisation, there is no over-riding pattern – rather it is more like an ultra-complex mosaic with some odorants actually inhibiting perception, while some non-odorants affect fragrance notes. Clearly there is still some way to go towards a full understanding of this intricate system.

### Anosmia and parosmia

Dr Thomas Hummel, Technische Universitat Dresden, gave a presentation on the *Science and Creation of Olfaction and Memory* with a focus on what happens when the sense of smell fails (anosmia) or becomes faulty (parosmia). Initially Dr Hummel explained where humans sit on a scale of smelling ability amongst animals and surprisingly, we are somewhere in the middle. As social animals, this should be expected as smell is crucial for any community interactions as well as to detect danger and discriminate between edible and inedible substances. However, we tend to think of ourselves as having a poor sense of smell in comparison to many other animals. To some extent, this could be because we don't realise the subtle ways our olfactory system communicates with our subconscious; apparently the smell of the tears of women has a demonstrable effect on the male libido!

**Dr. Thomas Hummel**

Anosmia and parosmia not only have an effect on the quality of life but can also be symptomatic of other medical issues as there is a link between olfactory loss and mortality risk and neurodegenerative disease. There is also a correlation between age and olfactory loss, with 30% of those over 75 showing functional anosmia (although the number is less in Asia). Women in general are far better at smelling than men, so if their sense of smell fails, it appears to have a far greater impact on them.

Dr Hummel also looked at the link with the trigeminal nerve function and how this influences the senses, noting that this adds physical sensations such as tickling, stinging, fizzing to the gustatory experience, which can both help and hinder the sense of smell. Not only is this the case, but the eustachian tubes, which form part of the auditory network also impact olfaction thus tasting could be described as an 'integrative system *par excellence*'. To further complicate our understanding of olfaction, Dr Hummel left us with the astounding fact that even those humans who had no olfactory bulbs whatsoever could still smell, which he quite freely admitted was a total mystery of nature!

## Memories evoked by odours

Next to take the lectern was Professor Maria Larsson, Chair in Perception and Psychophysics, Stockholm University Dept of Psychology, who spoke on *Odour Memory – an Emotional Time Machine*. Professor Larsson approached the sense of smell from a psychological and cognitive science background, noting that olfaction was key in humans for food, mood, social situations, wellbeing and to evoke memory. It is not only the oldest sense from a genetic point of view, developing very early in the evolutionary timeline, but also the first sense recognisable in unborn babies in utero.

**Professor Maria Larsson**





An area that Prof. Larsson has focused on in her research is the time at which humans encode the most scent memories and how this relates to other kinds of memories given that scent is processed, interpreted and encoded by the limbic system, in contrast with other memories. In general, most really accurate or vivid memories date back to an individual's late teens or early twenties – a time of limited stress for most, when many 'firsts' are experienced, and the central nervous system is becoming more concrete. Childhood memories, particularly those from under the age of ten, are more like blurry snapshots and tend to be far more vague. This contrasts vastly, however, with odour memory which has a strong correlation to comforting smells from an individual's early years such as grandmother's cooking, flowers that grew in a favourite holiday or play location or mother's favourite perfume or laundry powder. This is also the case in the blind, who still hold very vivid childhood scent memories. Prof. Larsson finished up by asking why early scent memory was so developed in comparison to other types of memories such as recalling names and events from the same time in our lives. She concluded that from an evolutionary point of view, these sensory memories would have originally been intended to keep an individual safe within their environment so that they could recall where to seek refuge in times of danger and what odours signalled that refuge. This all rings very true with me as, having grown up in mid-Kent UK, the scent of hops was all around and I still find this an immensely comforting aroma.

After a presentation where Alzheimer's Research UK and The Perfume Shop explained their project Scent Memories, the afternoon consisted of a creative session. With Lizzie Ostrom as chair, young perfumers had been given a brief to create a fragrance from a personal memory. Each individual showcased a strong memory, which they had translated into a perfume that we all had a chance to smell. It was really great to see Kamila Lelakova (CPL), one of our alumni showcase a beautiful fragrance alongside Mabelle Abi Ramia (Olfactive Studio Mabell O'Rama), who had created a scented art piece, Kyle Fearn (Redolescent) who presented a highly personal and poignant creation related to his family and Celine Herbette (CPL) who looked back to happy times in her past.

**Creative panel of young perfumers with Lizzie Ostrom**

In all, it was a truly fantastic day which I would highly recommend to all who are interested in the sensory world. Keep an eye on IFRA UK's website (**www.ifrauk.org**) for this year's dates.

# Bringing the Senses Together

## February 2024

## British Society of Perfumers, British Society of Flavourists and the Society of Cosmetic Scientists

With this event, I had the privilege to visit yet another historic London building. The Royal Society of Chemistry has been situated in the historic Burlington House, Piccadilly since the mid-nineteenth century, and the event was held in the fabulous library. ICATS was also given a display table here to promote the course during break times.

The event was split into three sections with numerous speakers, so I will try to give a flavour (and fragrance!) of the day by selecting a few of the presentations that I hope will be of interest to the readers of IFEATWORLD.

### AI and aromas

In the first section, one of the most interesting presentations came from Prof. Jane Parker (Reading University) who was part of a multi-disciplinary international academic team (in conjunction with Google Brain and Monell) who explored whether flavour/fragrance profiles could be predicted from molecular structure using machine learning, thereby codifying aroma[1]. This is one of the most elusive issues in current olfactory science, with the challenges perfectly exemplified by Sell's triplets of molecules[2] demonstrating the key difficulty: similarly structured molecules smell differently or have no scent at all, whereas molecules with a completely different structure can and do smell similar. With this seemingly insurmountable problem, it would seem to be an impossible task however much data was added to the AI using machine learning.

In a massive data gathering exercise, that employed GC-O olfactometry, the machine learning was exposed to thousands of molecules and their fragrance profiles, which it was able to systematise to some extent and create an odour map (which can be seen in the full research paper – see below for weblink), with some smell groupings more difficult for it to see patterns and therefore recognise aromas such as musk, and some complex mixtures. Prof. Parker also noted that whereas a human smelling panel would understand the notion of context, much in the way that a dog could scent their way to the park through its familiarity, AI is incapable of doing this. Nevertheless, the AI proved effective at dealing with Sell's triplets and placing them in the correct part of the odour map along with a good proportion of substances it sampled. This is obviously embryonic at the moment, but there is clearly a strong foundation that can be built upon, with a large number of potential odorous compounds that could be identified through this technique.

## Sandalwood and its many qualities

After the break we were in for a real treat with Dr Danny Hettiarachchi of Quintis, Australia and a wonderful journey through history and across the world with Indian sandalwood. This historic wood has been prized across the world for its spiritual, medicinal and olfactive qualities. The tree is hemi-parasitic, so must be grown in a way that allows each tree to connect in a network. There is a specific receptor for sandalwood in the nose, and it has been a valued component of ayurvedic medicinal applications for many hundreds of years. We tend to think of it purely as a fragrance ingredient, as it forms a component of numerous famous fragrances, but in India a cordial including sandalwood has traditionally been utilised for its 'cooling' qualities and sandalwood is also used within traditional Chinese medicine. Danny was delighted to introduce two different sandalwood oils used as flavours in biscuits (cookies) and the taste was complex and very pleasant. Highlighting its versatility as a flavouring, Danny noted that according to John Wright and Scott Zimmerman[3] its applications could range from baked goods to confectionery and even meat and spice flavourings. He also explained how Quintis promoted sustainability and traceability, having learnt from the disastrous annihilation of sandalwood in India through overharvesting. Each tree has its own QR code and any waste is converted to 'bio-char', while the plantations are well-managed and have FSC certification. All this is good news for this beautiful and versatile oil, which is one of my personal favourites; hopefully we can look forward to some exciting new edible applications too.

## The art of chemistry in culinary excellence

Before dinner, we had been expecting someone from Heston Blumenthal's Fat Duck restaurant to discuss sensory science but were all very surprised to see the legendary chef and 'kitchen chemist' Heston himself arrive, being introduced by ICATS tutor John Forbes of the British Society of Flavourists. Heston gave a lively and typical no holds barred insight into his culinary inspiration and drives as represented in his coat of arms. It afforded us great insight into this creative and sometimes rebellious chef and entrepreneur and was a real treat with some fabulous audience questions such as '*why isn't your ice cream stocked in Waitrose anymore?*'!

After supper, IFF treated us to a complex overview of what they described as the 'ubiquitous molecule' cis-3-hexanol or leaf alcohol with Trevor Groome, Laura Gibbs and Matthew Williams giving insight on its numerous flavour and fragrance applications with lots to smell and taste encompassing a huge range of odour/flavour families.


**John Forbes of the BSF and ICATS tutor chairs the Q&A with Heston Blumenthal**

## Awards for new fragrances

Finally, to further add to the glamour of the event, Virginie Daniau of the British Society of Perfumers announced the award-winning fine fragrances as voted for by attendees of last winter's Fine Fragrance Trends evening. Awards were given in the following categories: -

All genders fragrance: *Lineage* from Amouage

Masculine fragrance: *C.H.Pasión* for Him from C. Herrera

Feminine fragrance: *Goddess* from Burberry

All in all, it was an inspiring day – a real treat for all the senses and to be greatly recommended in the spring of 2025 if you can make it!

1 The complete research paper can be found here: https://www.biorxiv.org/content/10.1101/2022.09.01.504602v1.full.pdf
2 Sell, C.S. (2006), On the Unpredictability of Odour, Angew. Chem.Int. Ed. 45 (38): 6256-6261
3 Wright, J. (2020) Flavor Bites, *Perfumer and Flavorist* Aug. 2020
Zimmerman, Scott (2021) Report for Quintis on Sandalwood as a Natural Flavor



# Italy

# IFEAT STUDY TOUR

*21-27 January 2024*

*By Dr Peter Greenhalgh*


*Sponsored by*

# Introduction

On Sunday 21st January 2024, over 50 IFEAT Members met at the Grand Hotel Excelsior in Reggio Calabria for the start of IFEAT's 14th Study Tour to Calabria and Sicily (IST 24). This was IFEAT's second Study Tour to southern Italy, the first was in 2009. The IST 24 was organised by a small Local Organising Committee of IFEAT Members: Antonella Corleone (Chair), Gianfranco Capua and Simona Caratozzolo, the IFEAT Secretariat and TMT, the local tour agent.

The delegates from 18 countries were a diverse and multi-generational group, with a wide range of expertise and knowledge. Delegates included some major citrus oil producers, processors and end users from Argentina, Brazil, Italy, Mexico, Spain and the USA. Sharing knowledge and experiences over a week provided a remarkably informative learning opportunity for everyone involved, particularly those for whom it was their first Study Tour and visit to Italy. Travelling together for a week, visiting 10 major Italian companies, and seeing the whole citrus supply chain from crop production, harvesting, processing, packaging, final products, storage, transport, laboratories, R&D and quality assessments, provided a remarkably informative and enjoyable experience for everyone involved.

On arrival, delegates were presented with their rucksacks, gifts and briefing document which included a detailed itinerary, maps and profiles of the delegates and companies to be visited. This was followed by a briefing session and then an excellent Welcome Dinner with music sponsored by Agrumaria Reggina. The IST 24 began as it was to continue - convivial and knowledgeable people and companies, excellent food and gifts, almost perfect weather and with many insights into Italy's essential oil sector, the economy, some magnificent scenery, and its complex history and politics. It proved to be a great success as confirmed by all the delegates and the many positive company and delegate postings on social media.

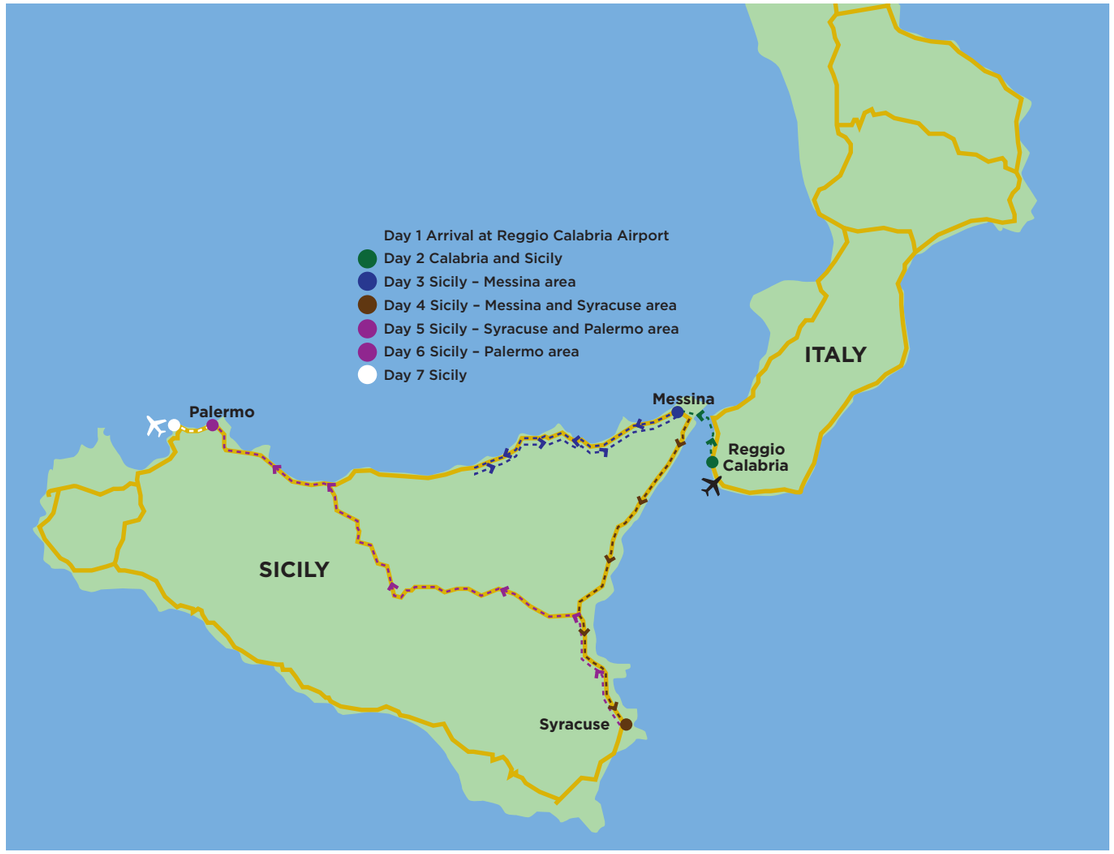




# Italy's Citrus Industry

Southern Italy's favourable climate, soils and agricultural traditions enable the production of some of the world's finest citrus oils. These oils are highly regarded in the flavour, fragrance and aromatherapy sectors for their exceptional quality, aromas and other properties leading to a wide range of end uses. Within a relatively small area of southern Italy sizeable quantities of conventional and organic oils including bergamot, clementine, lemon, mandarin and both blond and blood orange are produced to very high standards. Hence the choice of Calabria and Sicily for the IST24.

For many decades, Italy has been an important supplier of citrus essential oils, and a significant producer of lesser-known citrus oils, used in a wide and expanding range of applications. Annual Italian citrus production is approximately 3.1 million MT of which 80% is from Sicily. In a normal season average estimated annual fruit production is, blond orange: 1,265,000, blood orange: 615,000 MT, clementine: 680,000 MT lemon: 480,000 MT, mandarin: 150,000 MT and bergamot: 25,000 MT. Except for bergamot, a large proportion of production is used in the fresh market but a substantial proportion is processed into a dizzying range of products. The proportion processed varies between fruits as does the proportion of organic fruit production and processing.



For each type of citrus fruit several varieties are grown in Sicily and research efforts are continuing to improve the varieties to obtain high yields, greater drought resistance, minimise water utilisation and of course to improve organoleptic characteristics and qualities. The main varieties grown in Sicily and the estimated production share are:

Lemon - Femminello (70%), Monachello (25%), Other (5%)
Green, yellow, and red mandarins - Avana (65/70%), Ciaculli (30/35%)
Blond Orange - Navel and Washington Navel (20%), Early Valencia and Late Valencia (60%), Biondo Comune and Ovale (20%)
Blood Orange - Moro (10/15%), Tarocco (75/80%), Sanguinello (10%)
Clementine
Grapefruit

From these fruits the diverse range of citrus products produced include:

- Essential oils
- NFC (not from concentrate) juices
- Concentrates
- Specialities
- Pulp and cells
- Frozen peels

Each of these products in turn has different categories. For example, essential oil categories include cold pressed (CP), essences, folded, oil phase, FTNF (from the named fruit), WONF (with other natural flavours), terpenes and terpeneless.

**Estimated Italian Citrus Production, Cultivated Area and Processing 2022 – 2024**

| Citrus Fruit | Production 2022 (MT) | Production 2023 (MT) | Production 2024 (MT) | Area 2023 (ha) | Processed % | Processed 2023 (MT) |
|---|---|---|---|---|---|---|
| **Blond Oranges** | 1,298,700 | 1,317,442 | 922,209 | 55,315 | 40 | 526,977 |
| **Blood Oranges** | 517,836 | 709,876 | 496,913 | 28,652 | 40 | 283,950 |
| **Mandarins** | 156,893 | 154,787 | 123,830 | 8,866 | 25 | 38,697 |
| **Clementines** | 656,840 | 674,349 | 687,836 | 26,763 | 20 | 134,870 |
| **Lemons** | 482,293 | 511,976 | 522,216 | 26,567 | 35 | 179,192 |
| **Limes** | 600 | 600 | | 32 | 10 | 60 |
| **Grapefruits** | 5,470 | 5,634 | | 301 | 10 | 563 |
| **Bergamots** | 27,000 | 27,810 | 16,686 | 1,500 | 99 | 27,532 |
| **Citrons** | 1,150 | 1,150 | | 65 | 40 | 460 |
| **Chinotto** | 54 | 54 | | 6 | 99 | 53 |
| **Other Citrus** | 6,771 | 6,854 | | 305 | | |

*Source: ISTAT and Agrumaria Reggina Citrus Report 2024*





## Italy Citrus Fruit Processing Calendar

| | Lemon | Blond Orange | Blood Orange | Mandarin, Clementine and Tangerine |
|---|---|---|---|---|
| January | ● | ● | ● | |
| February | ● | | ● | |
| March | ● | | ● | ● |
| April | ● | ● | ● | ● |
| May | ● | ● | ● | |
| June | ● | ● | | |
| July | | ● | | |
| August | ● | | | |
| September | ● | | | ● |
| October | ● | ● | | ● |
| November | ● | ● | | ● |
| December | ● | ● | | ● |

CITROFOOD

The microclimates of this region are ideal for the cultivation of excellent citrus products and production of some crops is very regional specific. For example, bergamot production is heavily concentrated in Calabria, and efforts to grow elsewhere, even in nearby Sicily, have not been successful. Similarly, blood orange production is concentrated on the volcanic soils around Mount Etna, where the soil, climatic conditions and temperature changes between day and night produce a citrus fruit that is unique in colour and taste.

The varying harvesting periods for the different citrus fruits are shown in the diagram. Recent climatic variations, particularly very high temperatures and drought, are creating greater variation in both yields and harvesting periods.

Another feature of Italian citrus production is the large number of very small producers, often producing on 1-2 hectares of land, in sharp contrast to other major citrus producers. All the Italian companies visited have built up very close and often direct relationships with their suppliers over many decades. This facilitates greater transparency of production as well as the communication of necessary ethical, organic and pesticide standards.

# *Company Visits*

The six days were filled with visits to diverse companies and organisations - all IFEAT Members except for Chromaleont SRL at the University of Messina. All were very much involved in citrus oil production and processing or analysis. All were family-owned companies and inter-generational, often dating back to the 19th century, and some now having 5th generation family employees.

During the visits the companies explained in detail the type of fruits harvested, processed and packaged as well as the diverse range of citrus products produced. Delegates remarked on the openness of the companies and willingness to discuss in detail their operations and the challenges they faced. Other key features remarked upon by delegates included the innovative nature of the Italian citrus industry, which was seen as key to survival in an increasingly competitive and globalised world. The increasing role of women managers and owners was noticeable compared with two decades ago, as was the involvement of the younger generation in the industry – which all bodes well for a successful future. Throughout the visits companies stressed their efforts to facilitate more sustainable and ethical production, through recycling, minimising energy utilisation and waste.

## Agrumaria Reggina

The first day was spent in Calabria. Two sizable family-owned production and processing operations producing several essential oils and a bergamot farm were visited. Agrumaria Reggina (**www.agrumariareggina.it**) provided a detailed account of the whole supply chain providing an analysis of Italy's citrus crops, a guided tour of the processing operations and technologies used. This was followed by detailed insights into their R&D efforts and the new innovative and diverse citrus products being developed for use in the food, beverage and F&F industry. The company was founded in 1985 and the initial focus was on producing NFC (Not From Concentrate) juice. The company became more vertically integrated within the value chain with the blending of juices, flavours and other ingredients for the food, beverage, flavour, and fragrance sectors. There were several presentations during the visit in addition to a hot off the press publication given to each delegate on "*The Art and Science of Citrus Processing at Agrumaria Reggina*". This contains detailed descriptions of the supply chain from harvesting to final product and is an excellent guide to citrus processing and products. The diagrams below are taken from the guide and illustrate the various products produced and the Circular Economy System used by Agrumaria Reggina.

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**bionat's** epitomizes our commitment to offering meticulous **in-house production** of unrivaled reliability and **environmentally friendly** products.

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LEADERS IN ESSENCE

**Ingredients obtained from processing**

Agrumaria Reggina

The ingredients we obtain from our citrus processing:

| Juice NFC | Juice Concentrate | Essential Oil | Cloudy Extract | Pulp & Puree |
|---|---|---|---|---|

They are used to develop our range of ingredients and solutions:

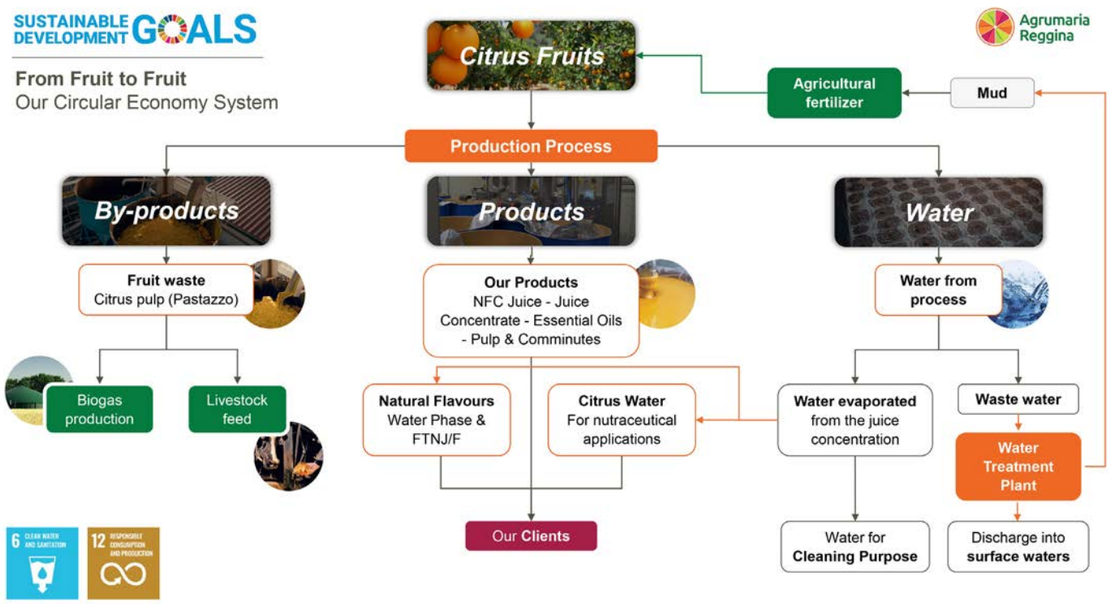
| Juice & Fruit | Essential Oil | Flavour & Extract | All-in-one Systems |
|---|---|---|---|
| Juice Concentrate<br>Juice NFC<br>Juice Blend<br>Juice Base<br>Pulp/Puree<br>Cloudy | EO Cold Pressed<br>EO Folded<br>EO Distilled<br>EO Rectified<br>Terpene | Flavour FTNF<br>Flavour 95-5<br>Flavour NI or NAT<br>Cloudifier<br>Infusion<br>Extract<br>Recovery Aromas | Juice-based Compound<br>Fruit Preparation<br>Tea-based Compound |

**Circular Economy System**

SUSTAINABLE DEVELOPMENT GOALS

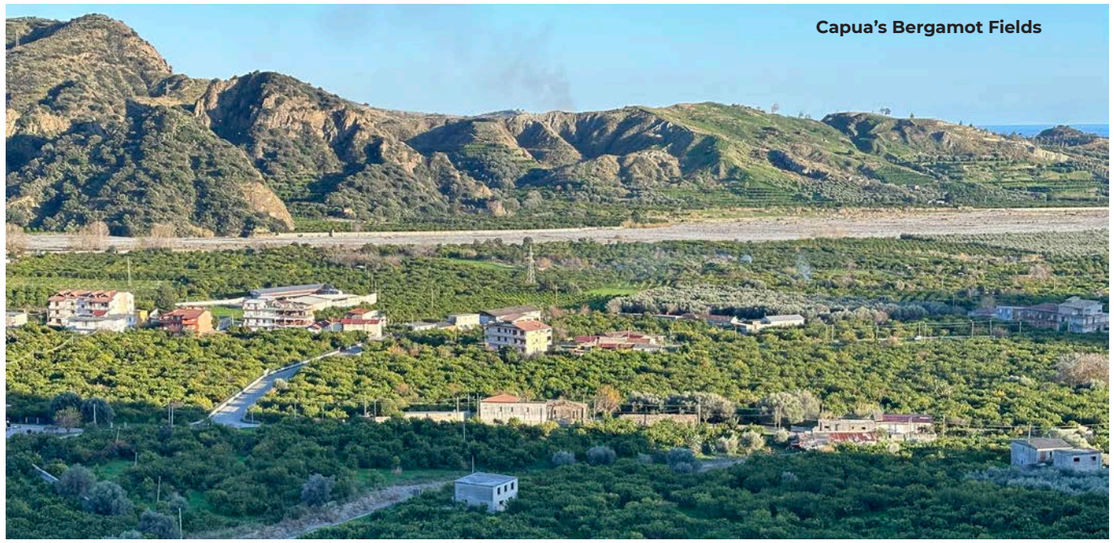
From Fruit to Fruit
Our Circular Economy System

Agrumaria Reggina







**Capua's Bergamot Fields**

## Capua

After an excellent lunch and short tour of their recently acquired plant, another Calabrian company, Capua 1880 (**www.capua1880.com**) provided a detailed tour of their processing operations, concentrating mainly on their ethically and sustainably sourced bergamot. This second plant of 24,000 sq. metres had been redeveloped and converted according to an ambitious architectural plan. This was followed by a drive south along the Calabrian coastline, with stunning views of Mount Etna across the Strait, to visit the Capua bergamot Condofuri orchards. While walking through the orchard and up the nearby hill, detailed discussions took place on many aspects of bergamot production, harvesting, processing and marketing. Global production of bergamot is dominated by Calabria, despite efforts to grow and process the product elsewhere. Then a journey back to Reggio Calabria for the short ferry journey over to Messina, Sicily with more stunning views of volcanic Mount Etna and the setting sun.

**Delegates Touring Capua's Processing Facilities**

## Branca

Two days were spent based in the Messina Region, visiting four companies in the region. The family-owned F.llla Branca (**www.brancaspa.com**) has been processing citrus fruits for 132 years, when the traditional "sponge" extraction techniques were first used. Managed by two sisters, it is a leading producer of lemon, orange and mandarin juice concentrates, essential oils, diced and dried peels and is strong in organic citrus products. The plant has a daily fruit processing capacity of 1,000 MT and an annual processing capacity of 20,000 MT of juices and concentrates over three independent lines. Its annual citrus oil production capacity is 300 MT and oils account for approximately a quarter of the value of production. Although still located in its historic premises, these have been expanded considerably, and delegates were shown innovative processing technologies, including cold pressed extraction methods using In-Line, Pelatrice and Sfumatrice extractors. The plant also has substantial controlled temperature and frozen storage capacities. Quite some time was spent in visiting the laboratory where creative work was being undertaken in collaboration with various partners to create new products as well as utilise by-products from processing. The company, like several other citrus processors, is taking sustainability and the circular economy very seriously. A diverse range of citrus-based products was discussed including pectin, animal feed, paper, natural fibres, table lamps and leather substitutes.

**Lemons, Blond Oranges and Blood Oranges at F. Illa Branca**

## Citrofood and Eurofood

In the afternoon visits were made to two closely related companies based on the same site at Cap d'Orlando, Citrofood (**https://www.citrofood.it/**) and Eurofood (**https://www.lemonplus.it/**). Prior to the visits several presentations were made at the nearby Marina Sestante Hotel followed by an excellent lunch sponsored by Citrofood. The first presentation was by the Hon. Luca Sammartino, Councillor for Sicilian Agriculture. This was followed by presentations on the history and operations of Eurofood and Citrofood. In addition, a presentation was made on blood oranges: the history, varieties, production calendar, volumes, area, essential oils and chemical composition.

The Citrofood group has a turnover of over €50 million and a capacity to squeeze 100,000 MT of fruit annually. Initially established to process lemons it has diversified into processing other citrus fruit including blond and blood oranges, mandarins, clementines, grapefruit and bitter oranges producing a wide variety of products for a wide number of end uses. Delegates toured the processing operations from the arrival and treatment of the fruit followed by the in-line FMC extraction process which allows the immediate segregation of juices from the essential oils and when required, from the peel and zest. There were 19 FMC extractors, as well as UF clarifying equipment, aseptic and standard filling equipment. For all products, there were chilled and frozen warehouses for storage. Juice filling is done in two different indoor separate rooms: one for aseptic and one for frozen. Eurofood, another family operation, processes and bottles fresh Sicilian citrus juice at the facility. This enables the preservation of all the organoleptic and nutritional characteristics of the juice throughout the production process. In addition, it bottles imported juices as well as produces a range of other citrus products including organic products. The companies stressed their continued efforts to produce and process products sustainably, e.g. safeguarding diversity and sustainable agricultural production techniques, as illustrated by the work with bees, the use of solar power, utilising residues in pet food or biomass for energy treatment companies, alongside a wide range of certifications and memberships.


**Citrofood and Eurofood**





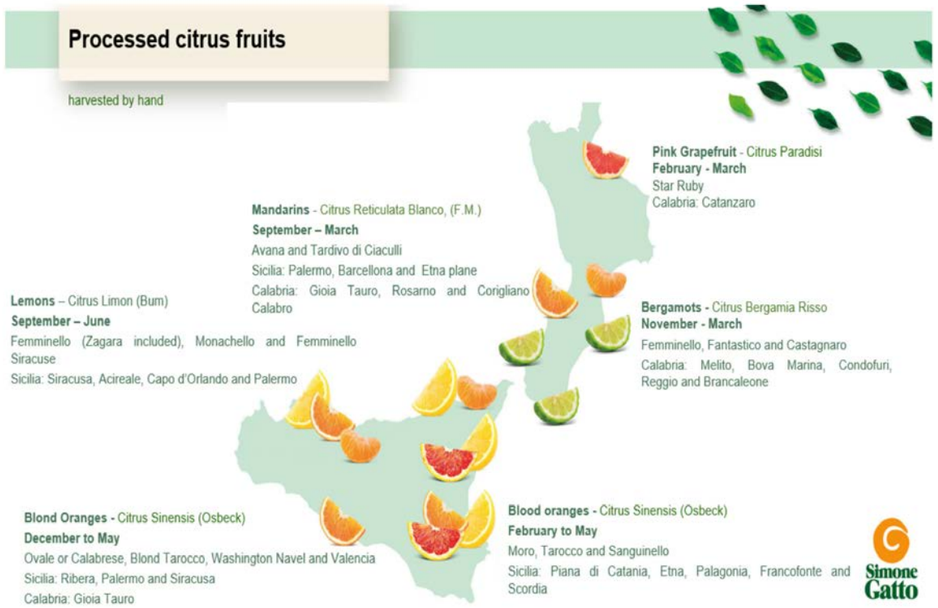
## Chromaleont

For some delegates the most impressive and possibly the most unexpected aspect of the IST24 was the visit to Chromaleont SRL facilities at the Messina Institute of Technology (MeIT) at the University of Messina (**https://www.chromaleont.it** and **https://sepsci.unime.it**). Delegates were welcomed by Professors Paola Dugo and Luigi Mondello. The latter, who had given the IFEAT Medal Lecture in Rome in 2014, provided a very detailed overview of the organisation and its facilities. Chromaleont, established in 2007, is an academic spin-off company that offers solutions for the development of analytical instruments and dedicated software for chemical analysis, as well as consultancy in the field of Separation Science. It has considerable expertise in solving analytical problems faced by industries in different fields and in developing innovative methods and instrumental prototypes. In addition, it is very much involved in the education of a new group of scientists working in these fields as well as participating in conferences and symposiums to disseminate the academic results. The presentation was followed by a tour of the extensive laboratories, where members of staff explained in detail the various analytical procedures used e.g. GC-MS, GC-FID and GC-FID Chiral analysis; HPLC-PDA, HPLC-MS, and HPLC-MS/MS analysis, MOSH and MOAH identification, GC-C-IRMS analysis, Multidimensional GC and LC analysis, and GC and LC FTIR analysis. It was particularly enlightening to hear of the technical advances being made in analysing essential oil constituents – and there is no doubt it is a world-leading institution in this respect.

**The Chromaleont Team at the Messina Institute of Technology**

## Simone Gatto

The final afternoon in the Messina Region was spent at Simone Gatto SRL (**www.simonegatto.com/**), a family business currently led by the fourth generation, but with the fifth generation actively involved. Following another excellent lunch and brief introduction to the company, delegates toured the company processing and packing operations. The diagram illustrates the extensive range of citrus fruits and varieties (oranges, lemons, mandarins, and bergamots) that the company processes into juices and oils from selected Sicilian and Calabrian citrus groves. Again, the company stressed the fundamental criteria by which it operates: a sustainable supply chain, fair price, low environmental impact, compliance to the varieties and pesticide control to supply more than 150 products worldwide.




## Campisi Citrus

The following day saw a visit to the Campisi fourth generation family operations near Siracusa (**www.campisicitrus.it**). Accompanied by several family members, the delegates viewed the company's supply chain with visits to the Campisi organic lemon (Siracusa Femminello) PGI orchards, the Campisi OPAC fresh packing unit and the Campisi Citrus processing plant. This included a visit to a recently reclaimed land area where new lemon orchards had been planted on very rocky soils that had to be removed. The Campisi group of companies prides itself on being the only Italian citrus company operating exclusively on a closed supply chain, owning every step of production from the seeds at the certified plant nursery, through growing, harvesting, and processing. This guarantees full traceability and the ability to ensure rigorous quality standards. Moreover, since 2002 the company has shifted entirely to organic production practices. The packing of the fresh fruit is undertaken next to the processing operation, thus reducing the post-production time prior to processing, and leading to both higher yields and quality for the essential oils and juices. Moreover, the Siracusa Femminello lemon variety has the highest concentration of citric acid leading to larger volumes of juice and essential oils, as well as a unique taste and smell.

The company produces a variety of citrus products including packaged products for fresh retail sale, frozen fruit juices, cold-pressed essential oils, and frozen fruit parts, such as slices, wedges, pulp cells and zests. At the time of the visit the company was celebrating its selection by a major European supermarket chain as the supplier of Sicilian organic lemons PGI (Protected Geographical Indication). The PGI certification label guarantees the origin of the lemon as well as its quality and taste.

**Campisi Lemon Orchard**



ITALY STUDY TOUR 2024 REPORT

## Agrumaria Corleone

The final day of the IST 24 saw visits to two companies in the Palermo area, one of Italy's leading citrus processing companies and the other a cooperative grower and packer. Agrumaria Corleone (**www.agrumariacorleone.com**) was established in 1890, when Salvatore Corleone introduced the sponge extraction technique to western Sicily, to produce lemon oil for use in the fragrance industry. A container of 2,000 litres of lemon oil was the dowry he gave to the groom on the marriage of his daughter! The company works closely with producers of citrus fruits – lemons, blond and blood oranges, mandarins – from Palermo, Trapani, Messina, Catania, and Syracuse. It then processes them into a range of juices and essential oils for the global juice, soft drink, flavour, and fragrance markets. The close collaboration with producers is seen as vital in ensuring quality, transparency, traceability, biodiversity, and sustainability in the supply chain. Similar systems are used in packaging control and logistics. Alongside conventional production, the company produces an increasing volume of organic products certified to a range of different organic standards. Another trend over recent decades has been the commitment and adoption of sustainability and ethically certified practices.

The delegates toured the processing operations including the careful washing and selection procedure followed by the large state-of-the-art squeezing and concentrating systems allowing the retention of the organoleptic characteristics of the citrus fruit. A short visit was made to the large computer controlled cold store facility used to preserve the juices and essential oils. The tour ended with a visit to the company's laboratories for detailed discussions of the quality control systems and the various oils and other ingredients that the company produces.

## Consorzio A.P.O. Sicilia

The final visit of the IST 24 was to the growing and packaging operations of the Consorzio A.P.O. Sicilia (Sicilian Association of Fruit and Vegetable Producers) (**http://www.aposicilia.com**). The consortium brings together approximately 300 members spread over 500 hectares. They mainly work with organic fruit, according to the seasons but particularly lemons, as well as some vegetables. They are certified by Global Gap, BRC-IFS, ISO: 22005: 2008, 9001:2008. The President of the Consortium took delegates around the packing operations.

**Agrumaria Corleone**

**Consorzio Packing House**

**Traditional Extraction Equipment**

**Consorzio *Citrus medica***

# Culture and Gastronomy

IFEAT Study Tours provide not only a great learning experience on essential oils and the F&F industry but also on the culture of the regions being visited. Southern Italy was no exception. Delegates were very impressed with the physical beauty of some of the natural landscape and the cities, the gastronomy, the importance of families and the culture.

Time constraints meant that cultural opportunities were strictly limited but some delegates took the opportunity to visit the Reggio Calabria Museum directly opposite the first hotel which houses the magnificent Riace Warriors. These are two full-sized Greek bronze statutes of naked bearded warriors, cast almost 2,500 years ago and found five decades ago in the sea off the Calabrian coast. Early morning and evening visits were made to nearby churches and cathedrals as well as the many piazzas. On the last evening prior to an excellent meal, music and tour of the huge neo-classical Teatro Massimo opera house delegates took a guided tour through the compact old part of town. It was a pleasure to see many of the renovated beautiful old buildings, including the 12th century Cathedral, and reflecting the influence of many different conquerors: Phoenicians, Arabs, Normans, and Spaniards.

For many the cultural highlight of IST 24 was the superb cuisine with meats, fish, vegetables and desserts full of flavour alongside excellent aperitifs and local wines. Throughout the visit the companies visited provided superb lunches as well as a wine tasting at the Yuzu Wine Club in Messina. Three excellent evening meals were sponsored: the Welcome Dinner by Agrumaria Reggina, a superb buffet meal and wines at the Gusto Gourmet Store in Siracusa by Campisi, and the Closing Dinner with live music at the magnificent Opera House in Palermo, sponsored by Agrumaria Corleone, and followed by a tour of the Opera House, the icing on the cake - or blood orange in the ice cream(!).

**Riace Bronze Warrior**


> ***A huge thank you to all the organisers, the IFEAT team, the local companies and also to the great fellow study-tourers! It was a perfect week, Sicily is wonderful, it has been a privilege to share these moments with all of you! Grazie mille!***





# Some Conclusions

Each IFEAT Study Tour is both memorable and different. By the end of the IST 24 on Saturday 28th January delegates had, over six days, travelled by coach almost 1,000 km in almost perfect weather through some beautiful scenery in Calabria and Sicily visiting some historic cities and ten diverse companies – predominantly IFEAT Members - involved in a range of citrus activities and oils. Delegates saw and discussed at length several essential oils and other citrus products - bergamot, clementine, lemon, mandarin, blond and blood oranges. Each company gave a warm welcome and explained in detail aspects of the growing, harvesting, distillation and further processing of various citrus fruits and F&F ingredients, as well as supplying beautiful fruit drinks, several gifts and lots of calories through lunches and dinners!

The companies were very open and enlightening about many issues including citrus production, processing innovations, the growing impact of climatic variations, the increasing importance of organic essential oils and their certification, sustainability efforts, organic production monitoring, packaging, traceability, and quality control. The visit to the Chromaleont laboratories at the University of Messina was particularly enlightening regarding the technical advances being made in analysing essential oils and their constituents. It was exciting to see the important strides and efforts that the Italian citrus industry is taking to increase the quality and scope of natural citrus ingredients and products.

Alongside knowledge acquired from the visits and discussions with companies directly involved in essential oils, another important benefit was the interaction and networking between the delegates – all IFEAT Members from 18 countries and representing many different nationalities and some of the major players in the citrus oil sector. Another important component of Study Tours is the 'bus lectures" that take place on the longer coach journeys. Delegates make short presentations relevant to their work and enlightened other delegates on a range of topics. Short lectures on the citrus oils sector in Argentina, Egypt, India, Mexico, and Spain; developments in biotechnology, IFEAT's expanding education and research programme, Ugandan essential oils, and Indian sandalwood. The food provided throughout the tour was excellent, the transport worked well as did the Whisper communication system. The gifts were much appreciated including the rucksack, scarf, perfumes, dispenser, and ceramics as well as the detailed documentation and books.

A successful Study Tour is dependent on a collaborative effort by several players. Antonella Corleone and the LOC must be congratulated on arranging such an excellent diversified programme of visits and TMT, particularly Alessandro Trapani, for implementing the planned programme so well. However, most important was the role of the ten Italian companies involved who opened their doors and showed how the complex Italian citrus sector works, as well as illustrating the strength and support of the IFEAT family.

A book is planned on the IST 24 later this year as well as a short video and photos from the tour, which will be available on the IFEAT website (**www.ifeat.org**). The website also contains details of future Study Tours, the next being to Turkey from 1st – 8th June 2024.

> ***What a fantastic time with lots of learning and good company, perfect organisation, the dedication of the hosting companies, lots of delicious calories and time passed by so quickly. It was my first Study Tour and I loved it from beginning to end.***

> ***I also want to express heartfelt gratitude to the IFEAT organisers and delegates, as well as the warmly welcoming factories that hosted us in this marvellous land, and special thanks to all my tour companions who made this tour more delightful. Spending this fantastic week together has been truly a great pleasure. THANK YOU.***

IFEAT Türkiye STUDY TOUR 1-8 JUNE 2024

IFEAT's 15th Study Tour and the first to Türkiye will take place from June 1st - 8th 2024 in western Türkiye. Following visits to major fragrance and flavour companies in Istanbul, delegates will travel to Izmir on the Aegean Sea, and then on to Denzili visiting oregano and laurel leaf production and processing operations. The final part of the TST 24 will be in Isparta, the centre of rose oil distillation, finishing in Antalya on the Mediterranean Sea. Türkiye produces a range of essential oils and is the world's largest producer of oregano and laurel leaf, and the second largest rose oil producer.

Delegates will gain an intimate knowledge of the production and processing of these products alongside viewing both very modern and traditional distillation units. During the six days an excellent programme of visits has been organised which will provide an opportunity for delegates to meet with Turkish producers, processors and exporters. In addition, delegates will spend the tour with other F&F industry professionals from a variety of countries and disciplines - an intense learning experience.

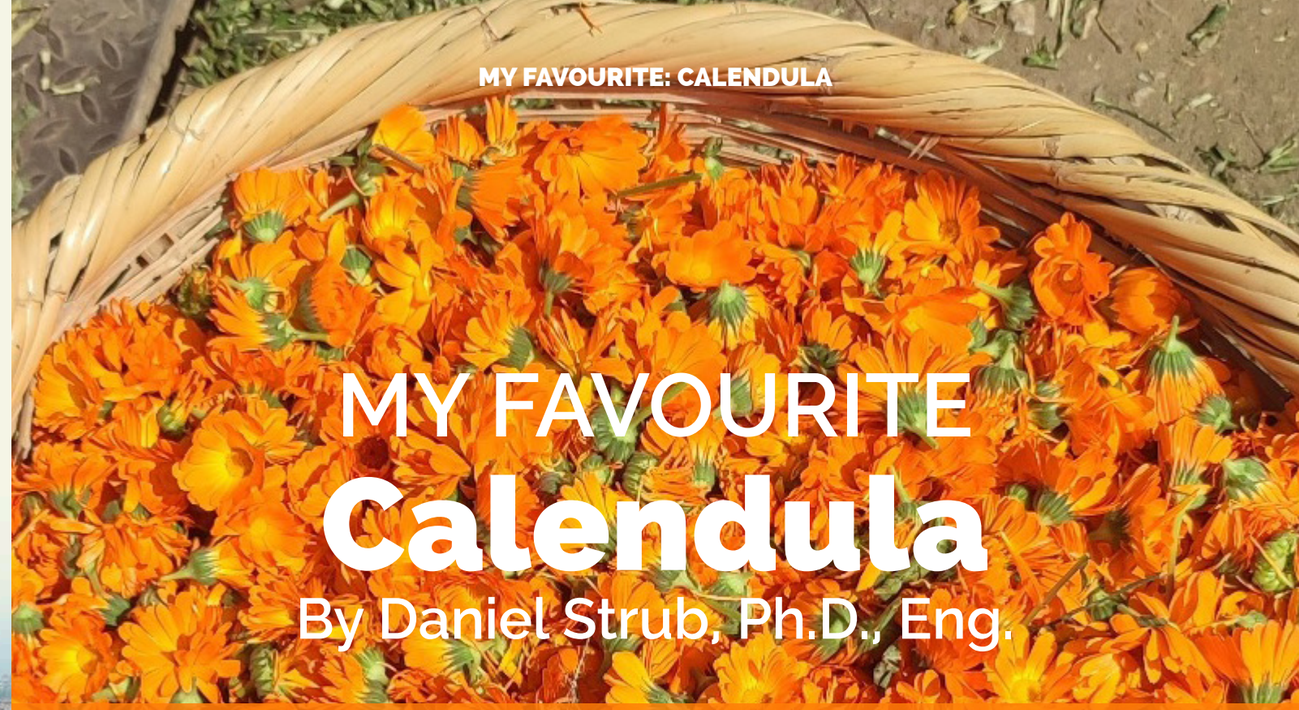
The tour will focus on technical and economic aspects of essential oils, but this will be combined with an introduction to Türkiye's rich history and heritage as well as the excellent local gastronomy. Like the previous 14 IFEAT Study Tours, it will be enjoyable, educational and unforgettable. Registration opened on March 14th and is limited to one delegate per IFEAT Member. Since Study Tours are very popular, delegates are advised to book early.

**For more information visit**

**www.ifeat.org**







# MY FAVOURITE Calendula

## By Daniel Strub, Ph.D., Eng.

In the vast flora of our planet, *Calendula officinalis*, with its vibrant golden blooms, holds a special place in my heart. Reminiscent of sunlight captured in petals, calendula is not just pleasant for the eyes, but a plant rich in history and healing properties. From ancient Egyptians to Greeks and Romans who used it for treatments, calendula has been a symbol of joy and health throughout the ages[1]. My personal connection to this plant is rooted in childhood memories, where it was more than just a visually appealing flower. The infusions prepared by my parents, used to heal wounds, were my first introduction to the ability of the natural world to heal and soothe. This connection deepened over time, as I learnt of its wide spectrum of uses, from its anti-inflammatory and antimicrobial properties to its role in traditional and modern herbal medicine. Calendula, with its myriad benefits, is a testament to the wonders of nature, making it an unequivocal favourite of mine.

Courtesy of A. Fakhry & Co.

The history of calendula is deeply connected to human civilisation, going back to ancient cultures where it was revered not only for its beauty but also for its healing and spiritual properties[2]. The Egyptians valued it for its rejuvenating qualities, while in Hindu culture it was used in religious ceremonies and offerings to the gods[3]. The Greeks and Romans incorporated calendula into their rituals, using its blossoms in garlands and to adorn statues of deities, symbolising love and respect. In medieval Europe, it was believed to protect against evil and pestilence. This cultural background showcases the significance of calendula beyond its medicinal uses, embodying the human connection to nature and the divine[4].

*Calendula officinalis*, also known as pot marigold, boasts vibrant orange-yellow petals that flourish from early spring through the first frost. As a robust annual, it thrives in fertile and well-drained soil and tolerates both full sun and partial shade, making it versatile in diverse climates. Its hardiness and straightforward cultivation have popularised it worldwide, from Europe's temperate gardens to North America's varied landscapes. The capacity of the calendula to self-sow and spread easily not only attracts it to gardeners, but also proves its role in decorative and medicinal plantings, prized for its aesthetic appeal and healing qualities[5].

*Calendula officinalis*, comprising a vast amount of biologically active phytochemicals, such as flavonoids, triterpenoids, and carotenoids, is celebrated for its healing activity. It is known for the facilitation of wound healing like cuts and burns, for its anti-inflammatory properties and soothing skin issues such as eczema. With antibacterial benefits, it is essential for fighting infections. Calendula-based creams, salves and oils are popular in aromatherapy and skincare, offering skin relief and promoting wellness. This herb, blending tradition with modern uses, holds a revered spot in holistic health for its broad therapeutic effects in both traditional and modern medicinal practices[6]. In particular, its application has been effective in preventing grade 2 or higher acute dermatitis during radiation therapy for breast cancer, as evidenced by a Phase III randomised trial, highlighting its superior efficacy over trolamine and highlighting its role in skin protection[7]. Furthermore, clinical evidence from a study on acute hand wounds validates the ability of calendula to accelerate the healing process of cutaneous wounds, reinforcing its traditional use for skin regeneration and care[8]. The scientific understanding of calendula is enhanced by a thorough systematic review that consolidates its status as a potent natural remedy. This review demonstrates its positive impacts on wound closure rates, microbial resistance and overall healing quality[9]. Together, these scientific studies underscore calendula's therapeutic versatility and efficacy in skin care and wound healing applications.

My journey with *Calendula officinalis*, which symbolises warmth and healing since my childhood, deepened through my scientific endeavours. Working closely with IFEAT Members, we have delved into the evaluation of activities of essential oils and aromatic extracts, notably on understanding their impact on SARS-CoV-2 proteases and identifying antiviral properties of the most active protease inhibitors. This work was published at the end of August 2022 and managed to rank seventh among the most downloaded articles in the "Chemistry" category in the *Scientific Reports* journal from the prestigious Springer Nature publisher in 2022 (Top 100 in Chemistry - 2022 collection). In this journal category, more than 1,600 articles were published in 2022, indicating significant interest in the findings of my cooperation with IFEAT and IFEAT Members. During this latest scientific endeavour, the process of preparing samples of calendula concrete, absolute and essential oil rekindled my connection to this remarkable plant. Essential oil, in particular, with its distinctive olfactory properties, evoked a profound sense of home and healing, encapsulating memories and scientific exploration.

***Calendula officinalis, also known as pot marigold, boasts vibrant orange-yellow petals that flourish from early spring through the first frost***

Courtesy of A. Fakhry & Co.



MY FAVOURITE: CALENDULA

***My affection for calendula transcends its scientific attributes, deeply intertwined with memories of home and a testament to nature's healing power***

Courtesy of A. Fakhry & Co.

There is some research on the essential oil of *Calendula officinalis* produced on a laboratory scale[10], including evaluation of its activities on various clinical fungal strains. The composition of calendula essential oil is complex and comprises α-cadinol as the most abundant component. Other significant components included τ-muurolol, γ-himachalene, and α-pinene, underscoring the complexity and potential therapeutic value of calendula essential oil. This diverse chemical profile contributes to the therapeutic properties of this essential oil, making it a subject of interest for further research and application in various fields.

My affection for calendula transcends its scientific attributes, deeply intertwined with memories of home and a testament to nature's healing power. Calendula remains my favourite not only for its multifaceted uses, but also as a symbol of the connection between nature and personal wellbeing.

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*Daniel is a professor at the Department of Chemical Biology and Bioimaging at the Wrocław University of Science and Technology, Poland. His current scientific interests focus on the exploration of the biocidal (viricidal, bactericidal, fungicidal and sporicidal) activity of essential oils and aromatic extracts.*

**daniel.strub@pwr.edu.pl**

# Welcome and fond farewell

IFEAT has recently welcomed two new members to its team - Rebecca (Becky) Denby as Finance Assistant and Divya Sara Mammen as Study Tour Administrator.

Becky will assist Ronit Meier, IFEAT's Finance Manager. Ronit covers all finance and accounting matters for IFEAT and ICATS and Becky will support her in these areas. Divya will work alongside Peter Greenhalgh, who has been in the role of IFEAT's Study Tour Coordinator for many years, and Shaehzad Chaudhry, IFEAT's Events Manager. Divya will play an important role in IFEAT's ongoing offerings of industry Study Tours and Focus Study Tours in new parts of the world. We extend a warm welcome to them both!

At the end of December 2023, Tina Hotchin left the role of Conference Programme, Web and Media Manager and Editor of IFEATWORLD to pursue other endeavours. The IFEAT Executive Committee thanks Tina for seven years of hard work and wishes her well in her future positions.

Sarah Nightingale has worked with IFEAT previously and has been able to step into the role of interim Editor of IFEATWORLD. Her experience and knowledge are greatly appreciated!

**Becky Denby**

**Divya Sara Mammen**





## CLASSIFICATION AND LABELLING OF CHEMICALS FOR GLOBAL TRADE

### Publication of the 2023 IOFI-IFRA GHS Labelling Manual - **ERRATUM** correcting the Carcinogenic classification of Estragole

The 2023 IOFI-IFRA Labelling Manual (LM) was published on 10th January 2024 (shared with the IFEAT Membership on 15th January2024) with a classification for estragole (CAS 140-67-0; JECFA 1789; FEMA 2411) as CMR 1B (carcinogen). However, the IFRA CMR&ED Working Group, responsible for the classification of CMR materials, had not yet completed the review of this material. Therefore, the classification of estragole remains the same as in LM 2022, i.e., Carcinogenic Cat.2 (H351) and the classification of the NCSs that contain estragole remain as follows:

| LM unique identifier | NCS NAME | Classification (estragole Car. 2) |
|---|---|---|
| LM1000 | Basil oil, chemotype estragole | CAR. 2 |
| LM1575 | Tarragon oil | CAR. 2 |
| LM5565 | Ravensara aromatica oil | CAR. 2 |
| LM3282 | Basil oleoresin, chemotype estragole | CAR. 2 |
| LM8305 | Star Anise oil | CAR. 2 |
| LM9525 | Anise seed oil | CAR. 2 |
| LM3817 | Fennel oil, sweet | CAR. 2 |
| LM9056 | Fennel oil, bitter | CAR. 2 |
| LM7617 | Fennel bitter oleoresin | CAR. 2 |
| LM1587 | Basil oil, chemotype linalool | No CAR. classification |
| LM9029 | Mentha citrate oil | No CAR. classification |
| LM7556 | Ylang ylang oil I | No CAR. classification |
| LM6237 | Hyssop oil | No CAR. classification |
| LM4260 | Laurel leaf oil | CAR. 2 |
| LM2495 | Ylang ylang oil II | No CAR. classification |
| LM6089 | Bay leaves, West Indian, oil | CAR. 2 |
| LM7603 | Myrtle oil | CAR. 2 |

Please take note of this erratum when implementing the classifications of the LM 2023.

The IFRA CMR&ED Working Group is currently reviewing the related data and aims to conclude by Q2 2024. The outcome of the review will be reflected in the next version of the LM, i.e., in LM 2024.

Please note that the LM applies the EU mixture cut-off of 1%. In the USA, the cut-off is 0.1% for carcinogens which would classify Basil linalool type, Mentha citrata, Ylang ylang I and Ylang ylang II as CAR. 2.

IFEAT Protect Essentials

## IFEAT AND EFEO WELCOME PROVISIONAL AGREEMENT ON REVISION OF CLP

In an open letter dated 6th December 2023, IFEAT and the European Federation of Essential Oils (EFEO) welcomed the derogation given to essential oils and related products from the EU's Classification, Labelling and Packaging of Chemical Substances and Mixtures revision (CLP Regulation), which is due to be formally adopted shortly. It brings much-needed business certainty to the sector, and ensures the continued safe use of essential oils and related products going forward. IFEAT and EFEO will continue to collect scientific evidence, complemented by further independent studies, to demonstrate that the derogation is justified.

The open letter can be found here: **https://www.protect-essentials.org/letter**

*Prepared by the IFRA-IOFI GHS Task Force, the GHS Labelling Manual classifies fragrance and flavour materials following the criteria laid out in the United Nations GHS guidance document, known as the **'Purple Book'**.*

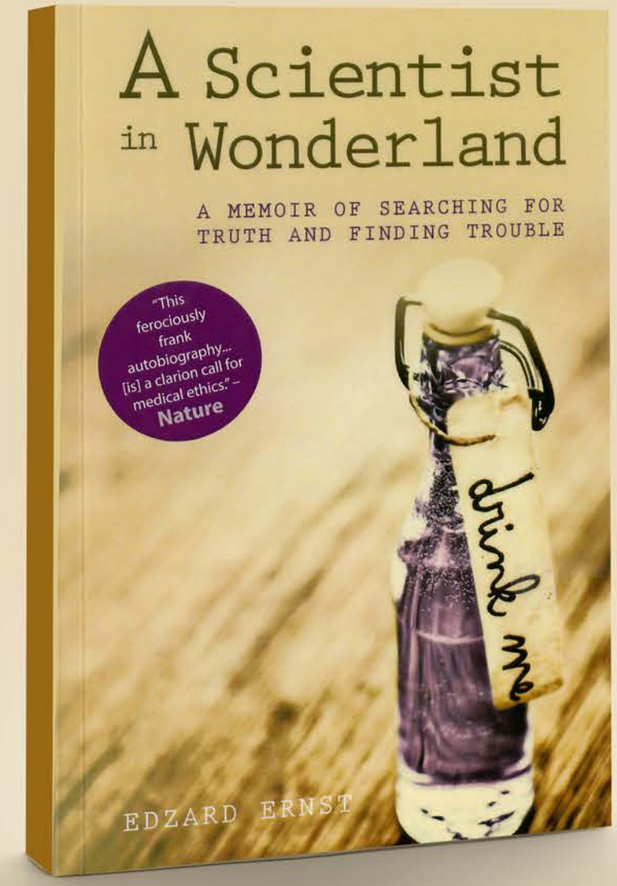
*A new edition of the GHS Labelling Manual is produced in January each year and is distributed to IFRA and IOFI members.*

# A Scientist in Wonderland:

# A Memoir of Searching for the Truth and Finding Trouble

By **Edzard Ernst**

Reviewed: **DR TONY CURTIS**



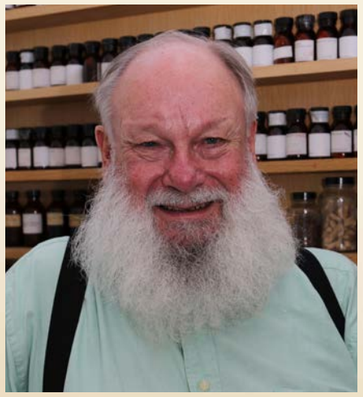

**Edzard Ernst, MD PhD**
**2015: Imprint Academic, Exeter, UK**
**£14.95 ISBN 9 781845 407773**

Well, as they say, now for something completely different. I have only recently become aware of this book. However, its importance cannot be over emphasised. Some time ago I reviewed a classic historic text. Rachel Carson's *Silent Spring*[1]. This is considered by some to be one of the top 10 most important scientific books of the 20th century. This book is a brilliantly argued and evidentially substantiated exposé of the POP (**P**ersistant **O**rganic **P**ollutant) nature and toxicity of DDT. She was subjected to considerable attack by vested interests at the time. Edzard's book is rather different. I cannot improve on the review summary from Nature "*This ferociously frank autobiography .... [is] a clarion call for medical ethics*". In the age of 'fake news' and deliberate falsehoods being promoted over the internet this book makes sober and disturbing reading. I will return later to the ethical issues, ruthless and painfully laid out in this book.

When exploring truth in science and medication-labelled alternative/complementary medicine, it is useful to set out a couple of guiding principles. The scientific method & philosophy is to define things (carefully, precisely, and unambiguously), to measure and to explore hypotheses using these definitions and measurements. Sometimes the result of an experiment is not certain. If we toss a fair coin there is a 50% probability it will be heads and a 50% probability of tails. Repeated trials and the mathematics of the binomial theory will give a satisfactory account of this experiment.

AI has mapped out the three dimensional structures of a vast range of protein structures. This is expected to enable drug discovery to be more directed rather than the molecular roulette (involving the screening of thousands of candidate structures) used in the past. I discussed this approach in Perfumery in my recent review of turpentine chemistry[2].

Consider a simple example of blood pressure. Elevated blood pressure is an indicator of increased likelihood of major health problems and medical intervention is required to reduce this risk. In my case I take a particular medication and measure my blood pressure at weekly intervals. The medication has been tested to show that it is indeed effective. This is not an easy experimental task as the problem is confounded by the placebo (and possibly the nocebo) effect[3]. The solution is the double-blind experimental design where neither the experimenter nor the subject knows if the dummy or test medication has been admitted. Only during the statistical analysis[4] of the results does the outcome become revealed.



As mentioned with the AI structure elucidation of protein structures, better understanding of the nature of the mechanism of action of a treatment can (often does) improve the treatment and the discovery of new approaches. Another problem Edzard encountered was consideration of adverse side effects. Here one encounters a major legal and ethical issue. In 'mainstream' medical practice practitioners are strictly regulated and explicit procedures are in place to report issues (sadly not always fully effective). However, this meticulous collection of data is not so well structured in the areas of alternative medicines which can be subjected to much less regulation. In this book a case is described as finding that a procedure was relatively safe and major complications were rare. However, in the age of fake news and chasing the attention-grabbing headline, this can be reported as 'X process can kill you!' The sensational account does not put the risk in perspective with something like 'you are more likely to be killed in a road traffic accident than with this procedure'.

Here we get to the heart of this provocative book. Using the scientific approach, one does not need to know why or how the medication is effective. To go back to our coin example, we do not need a theory of why the coin 'decides' to end up heads or tails in a specific single test. We can simply observe the results of a lot of trials and come up with an analysis. For many years medicine has been practised without the benefit of understanding the science (e.g. infectious diseases only became understandable with the invention of the microscope).

**Dr Tony Curtis**

With medications (either natural or synthetic) the placebo pill type of approach will often work. Edzard Ernst accepted an immense intellectual challenge. How could you explore the effectiveness (or lack of it) with traditional alternative therapies such as faith healing, aromatherapy, acupuncture etc., using what I have called the black box approach? You make no assumptions about if the treatment will be effective or about any potential explanations as to why and how the treatment works. To eliminate the placebo (and other potential confounding variables) can be challenging e.g. a patient knows someone is approaching them with a sharp needle in acupuncture. For the chemists and scientists who read this book, the experimental designs are brilliant, inventive, and work. There is rigorous critical thinking (another theme of this book) involved. No spoiler alerts! Please read the book yourself to follow the pathway to probing these apparently impossible problems with scientific experiment.

Here the fur begins to fly. The world is not full of people dispassionately seeking deeper knowledge. If you have spent a lifetime and built up a practice in homeopathy you may not take too kindly to ruthless scientific experimental work that shows that there appears to be no measurable effectiveness in the treatment. The academic and personal knives come out, just as they did for Rachel Carson. This is how vested interests behave! What is new is Edzard Ernst's furiously frank personal account of this behaviour in his case of investigating these important issues.



When I open my pack of blood pressure medication there is a leaflet that outlines the potential side effects and the likelihood of my experiencing them. These estimates are evidence based and included in the pack is the instruction to report any adverse effects I may experience to continue developing the evidence on which the advice is being given. This is an essential part of the evidence-based progress of medicine. Should such rigorous procedures be in place for alternative medicine approaches?

I started this unusual review with a quotation from one of the most renowned scientific journals *Nature* '...a clarion call for medical ethics'. The alarming and sobering problem is that honest scientific investigation can involve the people concerned in utterly unacceptable pressures such as internet harassment. The dismal result of this is that much needed clarity and insight into complex areas of health will not be undertaken. The Rachel Carsons of this world have paid a personal price for their ethical integrity. Such people should be protected and nurtured.

Do read this deeply disturbing book. It is ferociously frank and exposes a developing problem in the age of internet trolling. Will progress be hampered by ignorance because researchers will simply not be prepared to be subject to vilification and abuse. However, let me put this aside and remind active researchers who read IFEATWORLD, that the discussion of novel experimental designs and use of critical thinking to problem issues is exemplary.

This book should be widely read.

**References**

[1] Silent Spring, Rachel Carson, 1962
[2] IFEATWORLD Spring 2023
[3] Placebo effect: intervention with a passive treatment (e.g. sugar pill) elicits a positive improvement effect (improvement) on the condition. The nocebo effect is the reverse.
[4] Of necessity complications about managing issues such as appropriate random sampling and interaction effects are not discussed in this book review. Reference should be made to books on statistics for this.

# NEW IFEAT MEMBERS

Below is a list of new IFEAT Members who had joined by 15th February 2024

**Aromatic Ingredients Private Limited**
Kolenchery - 682311, Cochin, India

Contact: **Rohit Ravi**
Email: **rohit.ravi@aromaticingredients.in**
Web: **www.aromaticingredients.in**

Aromatic Ingredients, established in 2006, merges scientific know-how with creative finesse to produce top-notch fragrance ingredients. Aromatic Ingredients has a wide range of offerings to perfumers, with specialisation in creating a diverse range of fragrance components, including essential oils, resinoids and absolutes.

**Aromsa**
G.O.S.B. Ihsan Dede Caddesi 700. Sokak No:704,
41400 Gebze Kocaeli, Türkiye

Contact: **Melis Yasa Aytaman**
Email: **melis.yasa@aromsa.com.tr**
Web: **https://www.aromsa.com.tr/en**

Aromsa is a 41 year old local flavour manufacturing company run by first and second generation family members. It is the market leader in Türkiye, fully operating in sales, purchasing and production, with two factories situated in Germany.

**Bright Aromatics and Chemicals Company Limited**
91/3 Soi Ratchaphruek 9, Bangchueknung,
Talingchan, Bangkok 10170, Thailand

Contact: **Sekchai Sodsai/Dan**
Email: **cm01@brightaromaticsgroup.com**
Web: **http://www.brightaromatics.com/**

Professional food and beverage ingredients distributor for Thailand, which helps customers transform imagination to life.

**Guangzhou Fenhao Fragrance Co. Ltd**
6/F, Building 6, No.8, St4, Airport International
Center, Huadu District, Guangzhou, Guangdong
Province 510000, China

Contact: **Joanna Lin**
Email: **perfumetechnology002@gzfenhao.com**
Web: **https://www.fenhao.com.cn/**

Founded in 2000, Fenhao is a modern, fragrance enterprise in China which includes research and development, production and sale and is mainly engaged in fragrance and flavour.

**IL Health & Beauty Natural Oils Co., Inc.**
2644 Hegan Lane, Chico, CA 95928, USA

Contact: **Mr Josef Demangeat**
Email: **josef@hbno.com**
Web: **https://www.essentialnaturaloils.com/**

HBNO is a world class supplier of natural essential oils and aromatic chemicals located in Chico, California.

**L.R. Flavours & Fragrances Industries S.p.A.**
Via Pantano, 24 - Contrada Valcorrente, 95032
Belpasso (CT), Italy

Contact: **Luca Raimondo / Aurora Prestipino**
Email: **amministrazione@lrindustries.it**
Email: **aurora.prestipino@lrindustries.it**
Web: **https://www.lrindustries.it/en/**

Established in 1998, the company leads in the creation and production of fragrances and flavours, dealing also with the trading of natural essential oils.

**Lecheq Farm&Distillery LLC**
A. Tala district, Zagatala highway, Zagatala city,
Az 6200, Azerbaijan

Contact: **Nijat Mahmudlu**
Email: **nijat.mahmudlu@lecheq.az**
Web: **https://www.lecheq.az/**

Established in 2016, in the northern part of Azerbaijan, Lecheq Farm&Distillery has become one of the biggest essential oil processing companies in the region. We distill our roses and lavender from organic certified farms and present to the fragrance world as a new discovery.

**Power Base Enterprises Ltd**
Unit 1-3, 10th Floor, 118 Connaught Road West,
Hong Kong, SAR, China

Contact: **Frank Yu**
Email: **fyu@powerbasepek.com**
Email: **citroteam@powerbasepek.com**
Web: **http://powerbasepek.com/en/**

Power Base has been in the citrus business since 2014 and participates in sourcing citrus raw materials from all over the world to supply the Chinese market.

**Purdy & Figg Ltd**
9 Heron Business Park, Hemel Hempstead,
HP2 7FW, United Kingdom

Contact: **Charlie Rubin**
Email: **charlie@purdyandfigg.com**
Web: **https://purdyandfigg.com/**

Our vision is to transform cleaning into something that matters. We invent, manufacture and retail our own natural, essential oil based cleaning products for the home.

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