ISSUE 63 2024

IHEAT WORLD

INTERNATIONAL FEDERATION OF
ESSENTIAL OILS
& AROMA TRADES

TÜRKIYE STUDY TOUR: REPORT

MY FAVOURITE: ROMAN CHAMOMILE

WHY THE EU'S GREEN DEAL NEEDS TO SUPPORT AN AGE-OLD INDUSTRY

INTERNATIONAL STANDARDS FOR ESSENTIAL OILS

FLAVOURIST TRAINING COURSE REPORT

BOOK REVIEW: SCENT AND CHEMISTRY: THE MOLECULAR WORLD OF ODORS

IHEAT 2024
BANGKOK
10 - 14 NOVEMBER 2024
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FROM THE IFEAT 2024 BANGKOK CONFERENCE CO-CHAIRS

Dear Members and friends of IFEAT,

On behalf of the IFEAT family, we are thrilled to extend our warmest invitation to you for the IFEAT 2024 Bangkok Conference. Join us from Sunday, 10th November to Thursday, 14th November at the splendid Marriott Marquis Queen's Park. This year, our theme, **"Shaping the Future, from Asia to the World,"** promises to inspire and connect us all.

Preparations for our cherished annual gathering are well under way, and we have an extraordinary lineup of speakers ready to enlighten and engage you. Beyond the insightful sessions, we have arranged superb facilities for private meetings and individual networking events, ensuring you can foster meaningful connections.

Moreover, this beautiful and vibrant city will provide world-class entertainment and dining options making your experience truly unforgettable. For more details, please visit the dedicated conference website. Don't miss out on the Early Bird registration rate, available until 31st July 2024.

https://conference.ifeat.org/

We eagerly await your presence at what promises to be a remarkable event.

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

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Confirmed speakers for IFEAT 2024 Conference

The IFEAT Bangkok Conference is set to feature an impressive lineup for its Speaker Programme. **Kedar Vaze**, the Group Chief Executive Officer & Director at S H Kelkar and Company, will deliver the keynote address, sharing his extensive expertise in the aroma trades. Additionally, **Robby Gunawan**, CEO of Indesso, based in Jakarta, Indonesia, will present the prestigious IFEAT Medal Lecture.

There will be insightful regional reports on the Asian Market from **Kelvin Tay**, a presentation on *Sustainability by Design* by **Mitch Cooke**, and *Rewilding Asia* by **Deborah Vorhies**. Other speaker presentations will cover issues including regulatory challenges, unexplored essential oils and the important topics of sustainability and carbon footprint reduction. There will also be a report on the citrus markets from producing countries, including the latest data and trends.

Enlightening presentations will include an update on IFEAT's EFEO Scientific Platform, a report on IFEAT's advocacy activities by FGS Global, reports on the recent IFEAT Tours to Italy and Türkiye plus news from the IFEAT Flavourist Course at the University of Reading and the IFEAT/ICATS Aroma Trades Course. These presentations will highlight various initiatives and educational opportunities supported by IFEAT.

The conference programme will also feature the IFEAT Annual General Meeting on Tuesday, 12th November from 09.00. Members are encouraged to attend in order to vote on important Federation matters and non-Members are welcome to attend as observers.

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

We continue with lots of activities for IFEAT in 2024!

Catherine Crowley,
Chair of the IFEAT
Executive Committee

Study Tours

The first ever Türkiye Study Tour for IFEAT took place from 1st to 8th June, welcoming 33 IFEAT delegates from 17 countries to Istanbul to start the Tour. Feedback from the Tour has been fantastic! The next seven days took delegates to rose fields and rose processing areas, facilities handling oregano, sage, laurel and other Mediterranean herbs, state-of-the-art laboratories and production facilities, including final consumer goods production, presentations on all aspects of distillation and innovative sustainable farming practices, and even a visit to one company's museum, charting their journey through their years developing their business in the aroma trades.

A warm thank you goes out to Mr Kazim Gürel, Chair of the Local Organising Committee (LOC), as well as to Ms Şerife Ulu and Dr Süleyman Kinaci, for all their work as part of the LOC. Arkas Travel, the Tour Agency represented by Ms Belde Durmuş, provided great support at all stages of the itinerary.

The pictures from the Tour tell it all! So much so that I am sure I'm not the only person hoping that another Study Tour to Türkiye will be offered in the coming years – to give more of us a chance to share these experiences!

Türkiye Study Tour delegates at the Gülbirlik rose extraction plant

Peter Greenhalgh enjoying the rose petals at Sebat Rose Oil Ltd. Co.

Sir Peter

Finally, the TST marked the wrap up of an incredible, iconic career for Dr Peter Greenhalgh, in dedication and service to IFEAT through all these years. Both a colleague and friend to so many of us, Peter has steered many aspects of IFEAT. His comprehensive work on IFEAT's Study Tours has played a key role in making the Tours the amazing experiences they are for those attending, including his dedication to ensuring all of those experiences are captured in an actual book of each Tour, produced afterwards and provided to all delegates that attended. More behind the scenes, Peter has steered the production of the Socio-Economic Reports (SERs) published by IFEAT, since their inception ten years ago. His dedication to this work has helped ensure the continuation of these Reports. We do not say goodbye to Peter, as we have convinced him to stay involved in the SERs and other areas of our work. We have told him he can retire fully when he becomes a Centenarian, which is still many years away!

Words are not enough to thank you Peter.

Regulatory & Advocacy Work

IFEAT's work continues in this area: ongoing work includes further defining the Essential Use Concept and monitoring developments with the European Commission's response to the challenge on the reclassification of tea tree and CARACAL's input on this issue. In addition, the newer Scientific Platform created by EFEO and IFEAT is progressing with the work of collecting data and potentially steering further testing to address the issues raised by the recent MOCS (More than One Constituent Substance) ruling. As a reminder, that ruling includes language that indicates *'where a plant extract would contain a constituent classified under the CLP regulation, then the extract should fall under the classification of the constituent, even if data on the extract show absence or less severe hazard properties.*' The Scientific Platform is assisted by CEHTRA (Consultancy for Environmental & Human Toxicology and Risk Assessment) and IFEAT thanks those in the Core Team for the time they are spending on this important area.

Sustainability & Due Diligence in the Supply Chain

With more attention now focused on this area, IFEAT is looking for opportunities to proactively assist member companies in their efforts to ensure company practices conform to international standards. Guidelines in this area are included in the following: UN Guiding Principles on Business and Human Rights (2011), the corresponding UN Sustainable Development Goals (SDGs, 2015) and the International Labour Standards established by the International Labour Organisation (ILO) since 1919. IFEAT supports these guidelines and will continue working on ways to communicate these more practically to members and other interested parties. Further forums will be held where this issue can be discussed, and practical steps agreed on to strengthen supply chains in this way. One way to look at this issue further will be in the context of the requirements set out in the CSDDD and the CSRD. And yes – these are more acronyms for us to understand!

To explain: in May 2024, European Union (EU) co-legislators adopted a supply chain law for the EU known as the Corporate Sustainability Due Diligence Directive (CSDDD). EU Member States have two years until 2026 to implement the directive and adapt their national laws. The Corporate Sustainability Reporting Directive (CSRD), adopted in 2022, obliges large companies in Europe to identify their material impacts, risks and opportunities across the value chain and disclose them in their corporate reporting. SMEs fall into this scope as of 2026. Suppliers to large EU companies are thus already now becoming part of those companies' CSRD value chain engagement and disclosure process*.

These are fairly complex areas and we will be bringing more opportunities for understanding both this legislation as well as the guidelines further, and providing chances for shared conversations around our work together to strengthen the industry in this area.

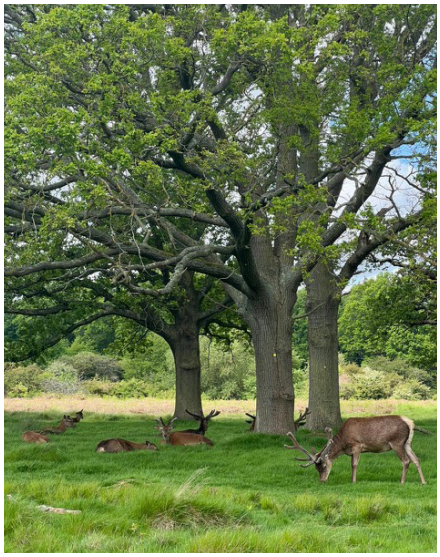
** Additional info provided by FGS, IFEAT's global communications firm that assists in this work.*

Industry Gatherings

IFEAT has had a chance to participate this year in May with a presence at SIMPPAR (see page 45), held in Grasse, along with the accompanying EFEO Conference, which presented further legislative and regulatory developments important to the industry, followed by participation in the World Perfumery Congress (WPC) in Geneva. These events provide opportunities for IFEAT to share information in person on expanded IFEAT activities, including the new curriculum being developed as part of the IFEAT-ICATS expanded learning platform.

For IFEAT's Executive Committee (EC), the May meeting this year was moved to Richmond, instead of Central London, in the UK. The EC meetings happen over a very intensive three-day period, with back-to-back Committee and Sub-Committee meetings. While the initial response to being outside the 'City' might have been hesitant, the sense was the beautiful surroundings created an even better work environment and certainly better scenery for those needing to get out for exercise after lengthy periods of meetings and discussions!

River Thames, Richmond, UK



Richmond Park, UK

Bangkok Conference

Preparations for the IFEAT 2024 Bangkok Conference, to be held from 10th to 14th November, are well underway and with over 800 registrations already in we expect the Conference to provide a great gathering for all of us! If you haven't registered, the Early Bird rate will expire soon; don't miss this chance to join us and experience the first ever IFEAT Conference in this specific part of the world!

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Stay close and stay connected to us... meet us on a Tour or at a Conference or on Socials in the meantime!

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The international standardisation of essential oils

By Lucía Jiménez, Chairperson of ISO/TC 54 and Esther Bermejo Nuñez, ISO/TC 54 Committee Manager

The International Technical Committee ISO/TC 54 “Essential oils” plays a crucial role in facilitating global trade within the essential oils industry. By establishing international standards for analysis methods and specifications, this committee streamlines commercial exchanges and ensures quality control across the sector.

Essential oils are products widely used either in food or in perfumery industries and, in a minor degree, in cosmetics and in some other fields related to health, such as pharmaceuticals, phytotherapy and aromatherapy. The food industry consumes about 60% of total essential oils production, while the rest is mainly consumed in perfumery with high value added. There are about 300 commonly used essential oils in making fragrances and flavours.

The last meeting of ISO/TC 54 took place in Gold Coast, Australia in November 2023

The essential oils industry faces several challenges, ranging from sourcing and production to market demand and regulatory issues. Here are some of the key challenges:

- **Regulatory Compliance:** The essential oils industry is subject to regulations governing product safety, labelling and marketing in various jurisdictions. Compliance with these regulations can be complex and costly, particularly for companies operating in multiple markets with differing requirements, especially in Europe.
- **Sustainability and sourcing:** Many essential oils are derived from plants that may be vulnerable to over-harvesting or habitat destruction. Sustainable sourcing practices, including ethical harvesting and cultivation methods, are crucial to ensure the long-term viability of essential oil production. The production of essential oils can have environmental impacts, including habitat loss, water consumption and pesticide use. Sustainable production practices are increasingly important to minimise the industry's ecological footprint.
- **Market Competition:** The essential oils market is highly competitive, with numerous suppliers and manufacturers vying for market share. Differentiation through product quality, innovation, branding and marketing strategies is essential to stand out in the crowded marketplace.
- **Volatility in Supply and Prices:** Essential oil production is susceptible to fluctuations in factors such as weather conditions, crop diseases and geopolitical events. These factors can impact supply levels and prices, posing challenges for both producers and buyers in terms of planning and budgeting.
- **Quality Control and Authenticity:** Maintaining consistent quality and ensuring the authenticity of essential oils can be challenging due to factors such as adulteration, contamination and variability in raw materials. Robust quality control measures and testing protocols are necessary to address these issues and maintain consumer trust.

In response to these challenges, in 1947 the ISO/TC 54 Essential Oils Committee was created to develop international standards with a focus on optimising available resources. The objectives of the technical committee include:

- Facilitating essential oils global trade.
- Fostering the quality of produced and marketed essential oils.
- Safeguarding the health of essential oil consumers.
- Promoting safety protocols across essential oil products and industrial processes.
- Facilitating the adoption of advanced industrial technologies within the sector.

ISO/TC 54 is led by Spain, being the Committee Manager from UNE, the Spanish Standardisation Body, member of ISO, and the Chairperson from the Spanish Cosmetics, Toiletry and Perfumery Association, STANPA. It currently includes 14 participating countries and 34 observer countries, alongside 5 liaison organisations, including IFEAT. This diverse membership base encompasses major producers, suppliers and consumers within the essential oils industry, guaranteeing that the developed standards reflect the collective expertise and global best practices.

ISO/TC 54's scope includes the development of specific monographs for each essential oil, standardisation of analytical methods to uphold quality standards, and requirements concerning transport, labelling and nomenclature and botanical names among others. Currently, the committee has published 136 International Standards, with 12 active projects underway to address emerging needs and advances in the field.

The importance of standardisation in the field of essential oils is remarkable. From a technical point of view, it serves as a key reference point in the exploration of new varieties and formulations. Commercially, standards serve as valuable repositories of information for industry stakeholders, providing information on the properties of natural components used in product compositions. Addressing these challenges requires collaboration among industry stakeholders, government agencies and consumers

to promote responsible sourcing, production and use of essential oils while ensuring environmental sustainability and product safety.

In essence, ISO/TC 54's efforts not only respond to the demands of a rapidly changing economic landscape, but also underline its commitment to promoting excellence, innovation and sustainability in the essential oils sector.

Every two years, ISO/TC 54 holds a plenary meeting where members convene to set priorities, establish schedules for standard development, review the work programme and address challenging issues. During the last plenary meeting it was decided to celebrate the next one in 2025 in online format, in order to align with the committee's commitment to fostering inclusivity and ensuring a more active involvement of its members. This new approach underscores the committee's adaptability and dedication to advancing global standardisation efforts within the essential oils industry.

Benefits of standardising within the industry

The standardisation of essential oils has significantly bolstered the global trade of key essential oils used in the food, perfumery and cosmetics industries, contributing not only to enhance the safety profiles of these essential oils but also establishing stringent quality benchmarks. With the advent of new technologies and the ever-expanding globalisation of markets, the importance of standardisation has surged, underscoring the role of standards in facilitating seamless international trade.

Furthermore, advances in analytical methodologies have been a direct outcome of this standardisation drive, leading to more precise and accurate results. This has been instrumental in addressing authenticity concerns and uncovering previously undetected adulterations in essential oils. As industries strive to harmonise analytical methods to streamline international

Tea tree oil vats at Main Camp Natural Extracts, visited by TC 54 during its plenary meeting in Australia

trade, the analytical methods developed by ISO/TC 54 have become immensely important on a global scale.

The importance of participating

ISO/TC 54 acts as a central hub for the consolidation of knowledge and information, providing a comprehensive repository of references for all its members. The active engagement of major multinationals and companies in the essential oils sector, together with their collaboration with the national standardisation bodies within ISO/TC 54, ensures that the standards and analytical methods developed are widely adopted as authoritative references.

With a firm commitment to providing exceptional service to its members and driving sectoral growth, the committee remains dedicated to maintaining the standardisation trajectory established thus far. This involves continually adding new areas of interest and relevance to its agenda, ensuring that it remains responsive to the changing needs of its members.

ISO/TC 54's effectiveness lies in its ability to foster a broad and inclusive membership base. To develop standards that respond to the diverse needs and contexts of the international essential oils market, it is essential to have a rich set of perspectives from different geographies, industry sectors and organisational scales.

A key aspect of ensuring effective representation in ISO/TC 54 is the active participation of its members. Beyond mere membership, active participation implies a strong commitment to the committee's activities, including attendance at meetings and input to the standardisation process. By actively participating, members not only determine the direction of standards development, but also benefit from the ideas and experience shared by their colleagues, thus promoting a dynamic exchange of knowledge and best practices.

As ISO/TC 54 continues to serve as a catalyst for innovation and collaboration within the essential oils sector, its proactive efforts are prepared to shape a future where the benefits of these natural resources are harnessed responsibly and inclusively for the betterment of society.

Complete information about the ISO/TC 54 can be found at ISO website:
https://www.iso.org/committee/48956.html

My favourite: Roman chamomile

By Ruben Francot, CEO, SACMAR S.R.L.

I'm head of SACMAR, a renowned company for the production and sales of essential oils and flavourings, as well as SELVANIA, a company specialising in the production of creams and semi-finished products for the confectionery industry. My passion for this sector goes beyond simple commercial interest; it is one which has led me to years of ongoing technological research and a close connection to the raw materials. One in particular, Roman chamomile, is a plant that holds a special place in my heart and business.

Roman chamomile, scientifically known as *Anthemis nobilis*, is a herbaceous perennial plant belonging to the *Asteraceae* family. Its essence is one of the Italian excellences on the European scene, thanks to the recognition, and its enhancement, of beneficial properties admired worldwide. The essential oil, famous for its fragrance and colour, is loved not only by perfumers and fragrance companies but also the aromatherapy world for its calming, anti-inflammatory, antibacterial and anti-fungal properties.

Both plant and oil have been known and used since the times of ancient Greece and Egypt; in the Mediterranean their properties have been celebrated for millennia. The name "chamomile" comes from ancient Greek, meaning "little apple," while the Latin name *Anthemis nobilis* means "little noble flower" - a tribute to the beauty and importance of this plant over the centuries.

The flowers are particularly beautiful, with a corolla full of delicate petals forming almost white and yellow pom-poms. The harvesting and subsequent distillation is a 24-hr cycle, with the families of growers taking turns in supporting each other to follow production. During the harvesting, especially in the evenings, a pleasant and irresistible scent of fresh fruit resembling slightly unripe apples perfumes the air.

During the dry period of July when temperatures reach 40°C during the day and a minimum of 20-25°C at night, some growers harvest the whole plant, cutting off the base of the stem and leaving them for more than half a day to evaporate some of the water. Others harvest the whole plant using a small thresher which is immediately put into a container and left to distill in steam. While the harvesting is fully automated, the caring of the fields involves manual intervention to remove weeds as the chamomile plant is fragile and tends to suffer from even the most specific herbicides. During peak demand, Piedmont, the growing area in northern Italy, has yielded up to 6 tonnes of oil: a yield per hectare of approximately 15 kg.

Besides its commercial value, Roman chamomile has a more poetical significance for me. During flowering, the fields become immense white carpets which create a landscape that seems to be covered by a light snowfall. It is an extraordinary sight that exudes an unmistakable aroma and offers a unique sensory experience. In the 18th century, English noblemen are said to have planted chamomile in their gardens to walk barefoot on 'natural, soft and fragrant carpets' while obtaining beneficial effects to the body and a fragrance underfoot at the same time.

I have fond childhood memories spent with my grandfather who was founder of the company in the Piedmont countryside. He used to take me to the negotiations with farmers, which always ended in a hearty lunch following traditional peasant customs. These moments not only helped shape my character, but also created great respect for the land and those who cultivate it.

Chamomile just before distillation

Thanks to this legacy I have established a close partnership with farming families in Piedmont, increasing the production of Roman chamomile while keeping the tradition of quality and authenticity alive which characterises our product.

Removing weeds and protecting chamomile from pests requires manual intervention and constant attention. It is work that goes beyond mere production; it is a commitment to nature and the community around us which often involves entire families on a daily basis from March to July.

Whenever I visit the Roman chamomile fields, the farmers always take me to visit the most beautiful fields they are most proud of and where they have made great effort to keep them clean. I remember with great fondness the farmer who showed me his field with pride telling me that it would be 18 years old that year; a demonstration that the care for his land overrides any demands from the market through the

"...the fields become immense white carpets"

Chamomile field in early July a few days before harvest

Chamomile leftovers after steam distillation

good and not-so-good years. Crops are produced with second cuttings from the original one and repopulating or planting new fields in October. The only way to keep this crop active and profitable over the years is to keep the fields alive and healthy.

The Piedmont plain, with its fertile lands and favourable climate, has always been the heart of Roman chamomile production. Thanks to collaboration from farming families in the region, we have been able to achieve high quality standards and meet the needs of an increasingly demanding market.

The production of essential oils has expanded alongside the ever-growing activities of other sectors such as aromatherapy and cosmetics. Its calming and anti-inflammatory properties make it a valuable ingredient for products intended for wellness and body care.

My relationship with Roman chamomile is not limited to commercial production; it has deep roots which extend to the natural world and the people who work the land. Every kilogram of essential oil we produce carries with it the history and passion of generations of growers and producers.

In conclusion, Roman chamomile is not only a plant with many virtues, but also a symbol of tradition, passion and commitment to sustainable and responsible agriculture.

Chamomile plants after harvest waiting to be distilled

With this spirit we will continue to cultivate and promote this wonderful plant, moving forward in our commitment to the quality and authenticity that sets us apart.

An ancient world has met the market demands of today, establishing a connection between the past and present.

Ruben Francot, who is based in Milan, northern Italy, recently joined the Executive Committee of IFEAT .

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IFEAT TÜRKIYE STUDY TOUR REPORT

1- 8 June 2024

By Divya Sara Mammen
IFEAT Study Tour Administrator

Introduction

On Saturday, June 1st, at 5:30 pm, the 33 delegates of the Türkiye Study Tour, along with the IFEAT team and the Local Organising Committee, gathered at a hotel in Istanbul overlooking the Bosporus Strait separating Europe from Asia, to kick off IFEAT's 15th Study Tour.

The Türkiye Study Tour 2024 (TST 2024) was made possible with the help of Local Organising Committee members Mr Kazim Gürel (Chair), Ms Şerife Ulu, and Dr Süleyman Kinaci, the IFEAT Secretariat, and Arkas Travel, represented by Ms Belde Durmuş.

The study tour took place in western Türkiye, starting in Istanbul and continuing to Izmir, Denizli, Isparta, and culminating in Antalya. Over the course of 7 days and 7 nights delegates travelled by road and air, covering approximately 1,400 kilometres, in almost perfect weather.

The TST 2024 comprised delegates from 17 different countries, including founders of new businesses, multi-generational family enterprise owners, and employees of corporate companies in various segments of the flavour, fragrance, food and aromatherapy sectors. The group was diverse not only in culture and language but also in age, ranging from their 20s to their 70s. While some had attended over 10 IFEAT study tours previously, for many this was their first and it was gratifying to see that a third of the delegates were young IFEAT Members.

"The IFEAT Türkiye Study Tour was a comprehensive learning experience and a window into the F&F industry in Türkiye. The delegates visited fields, factories, labs and packing facilities, all of which are experiences mostly limited to company insiders and local farmers, making this a unique educational opportunity for us. In addition, the variety (age, country, business type) of the delegates attending the trip made the exchange of knowledge and social interactions even more engaging and educational. 100% would go on another study tour with IFEAT."

Sahil Tekriwal

Among the participants were several members of IFEAT's Executive Committee and noteworthy stalwarts of the industry, including the world's three largest jasmine producers. Sharing knowledge and experience is a founding principle of IFEAT's Study Tours, and TST 2024 was no different. Travelling together in Türkiye and closely observing crop production, harvesting, processing, packaging, final products, storage, transport, laboratories, R&D, quality assessments and new product development provided an enjoyable and informative learning experience for everyone involved.

Upon arrival delegates received their lanyards, rucksacks, gifts, and briefing documents, which included a detailed itinerary, maps, and profiles of the delegates and companies to be visited. This was followed by a briefing session where Dr Peter Greenhalgh, the Study Tour Coordinator, introduced the Executive Committee members present, the Local Organising Committee, and the IFEAT Team as well as outlining various aspects of the TST 24 aims and objectives.

The Welcome Reception and Dinner included a boat tour of the majestic Bosporus. Dr Sedat Bornovali, an art historian, interpreter, and professional tour guide, highlighted the sights and scenes along the Bosporus while sharing stories of its strategic significance. Lined with historic palaces, fortresses, and charming waterfront homes, the Bosporus provided a picturesque backdrop as we officially began the tour.

THE ROSE INDUSTRY

Rose pickers

Türkiye's rose market is notable for its long history of rose cultivation, primarily in the Isparta region, which was developed by the Ottoman Empire in the 19th century while retreating from the region that became Bulgaria. Thanks to its ideal climate and soil, this area is renowned for producing high-quality *Rosa damascena*. The first commercial rose oil distillery was established in 1934/1935.[1]

Türkiye is now a significant player in the global rose oil and rose concrete markets. Rose oil is obtained almost exclusively from steam distillation of the single clone of *Rosa damascena*, as in Bulgaria. Turkish rose oil production is estimated between 1,500 and 2,000 kg/year on average, while rose concrete production exceeds 14,000 kg/year. Türkiye is the world's leader in the rose concrete market.

Rose oil, rose water, concretes and absolutes are highly valued in various industries, including fragrance, cosmetics, and traditional medicine. The production, harvesting, and processing of roses provide vital employment opportunities for local residents and a growing number of Syrian refugees, supporting rural livelihoods.

Isparta's rose fields cover some 5,000 hectares, mainly made up of small plots ranging from 0.3 to 1 hectare. These family-run farms, numbering over 10,000, also employ outside pickers. A very good picker can harvest around 100 kg of flowers in 6 hours. Half of the expected final price is paid on delivery during the season, then adjusted at the end of the season according to yield. The minimum price for 1 kg of flowers is 60 Turkish pounds (TL) per kg, of which 30 TL is paid to the picker.

There are conventional rose fields, which produce up to 10,000 kg of flowers per hectare, and organic rose fields, which produce on average up to 5,000 kg of flowers per hectare. Organic fields can be prone to insect invasions, and the farmer can see his productivity drop by 90% in a very bad year. He may then be forced to prune the shrub almost completely, which considerably reduces the following year's yield.

Rose harvesting begins at 5 am on hot days, or 9 am on cold days, and usually ends by midday, depending on the weather forecast, the aim being to deliver fresh flowers to the distiller as soon as possible. The ideal weather is cold mornings, followed by slightly warmer hours, but not too hot weather. Short showers every few days help a lot. The traditional weather patterns of May and June have become less frequent over the last ten years, with progressive distortions such as long periods of drought followed by very short periods of heavy rain, affecting the crops. Altitude also defines the season and quality, with most roses growing at higher altitudes starting in mid-May and preferably being used for rose oil production, while roses grown at a lower altitude will be picked from early May and likely be used for concrete.

In general, between 3,600 and 4,000 kg of flowers are needed per kg of rose oil. Copper distillation is still very much required; the first distillation produces the olfactory note and greenish colour demanded by most perfumers, especially in the Middle East. A second distillation yields a more yellowish essential oil, with most producers blending the two rose oils according to the olfactory profile requested by their customers.

Rose concretes are obtained by extracting rose petals using a hexane solvent under pressure, agitation and at low temperature to prevent the petals from burning. It takes between 360 and 400 kg of flowers to produce 1 kg of concrete. The yield from concrete to absolute averages 60%.

THE OREGANO INDUSTRY

Oregano flower

Oregano is a perennial plant that thrives throughout the Mediterranean region, typically at altitudes ranging from 300 to 1,600 metres. The primary essential oil constituents are carvacrol and/or thymol, along with p-cymene and gamma-terpinene. Used for centuries in both culinary and medicinal applications, its demand has surged in recent decades. Today, oregano is a staple in Mediterranean cuisine worldwide, especially in pizzas, and it is increasingly sought after in the aromatherapy and animal feed industries.

Türkiye dominates the global production and processing of oregano, accounting for approximately 85% of the world's output. Production is concentrated on smallholder farms in the Denizli mountains, with around 85,000 hectares under cultivation. In 2022, the production of dried oregano amounted to 23,000 tonnes.[2]

This is a fine example of how farmers have adapted to the declining demand for tobacco, switching from traditional tobacco cultivation to oregano. Over 6,000 farmers in the Denizli region produce oregano. Wild harvesting is very rare.

[1] IFEAT Socio- Economic Impact Study of the Naturals - Rose
[2] IFEAT Socio-Economic Report on Oregano from Türkiye

"A 'business trip' that is a perfect melding of personalities and cultures, coming together to experience life. Life-long friendships and memories have been created and I genuinely couldn't be more grateful - it turns out this is my second of what has become some of my favourite trips of my life."

Chris Jones

COMPANY VISITS

MG INTERNATIONAL FRAGRANCE COMPANY

Our first visit of the study tour was to MG International Fragrance Company (MG International or MG), where we were warmly received by Ms Duygu Beşbıçak and her team. Unfortunately, Mr Aslan Gülçiçek, the CEO of MG International, had a personal emergency and couldn't be present.

MG International was founded in 1961 by Mr Misel Gülçiçek and remained a family operation until 2020 when they entered an alliance with industry leader Firmenich. The dsm-firmenich merger was launched in 2023, bringing together two market leaders in fragrance, taste, texture, and nutrition. The motto "For the love of fragrance" has been MG's guiding principle since 1961.

Our visit commenced with a sumptuous lunch organised at MG's canteen facilities. The delegates were amazed not only by the state-of-the-art facilities but also by their impressive scale. Lunch was followed by a short presentation on the work being done at MG and an overview of their facilities. We then began our tour, which included visits to their creation & application laboratory, R&D laboratory, quality control laboratory, as well as their synthesis and naturals laboratory. We were also able to sample several of their signature scents, including Turkish rose, pink pepper, and Turkish coffee.

The delegates were then escorted to the Gebze facility and production area, where we closely observed the Concordia machines. The facility has an annual production capacity of 5,000 tonnes and includes a 28 km stainless steel supply line. We were also shown the Roxane machines, which have a production capacity of 70 batches per day. Other parts of the tour included the powder unit, dosing unit, mixing tanks, mixing area, and the robot feeding system.

MG's staff were open to all questions and all operations were available for viewing. A special mention here of the fabulous facilities that were available to the employees of MG. These included a large swimming pool, state of the art gym, recreation centres, a bar, a coffee shop and even a hotel. We also acknowledge their graciousness in opening their facilities and hosting us on a Sunday, which would otherwise have been a non-working day for the staff.

"Is it still necessary to talk about the legendary beauty of Türkiye? It's a fact that this country is magical in so many ways. We enjoyed beautiful landscapes, beautiful food, and wonderful encounters. Sharing and connections were created during this study tour. I think that before creating commercial relationships, there are first (and even above all) human relationships."

Khadija Farissi

AROMSA

We arrived at Aromsa, located in the Gebze Organised Industry Zone, on June 3rd at 8:30 am. We were warmly welcomed by Mr Murat Yasa, the founder and General Manager, his daughter Melis Yasa, the Deputy General Manager and second-generation representative, Ms Canan Kaya, the head of Marketing and Corporate Communications, and the rest of the team.

Aromsa was founded in 1982 by Murat Yasa. It is a 100% local flavour producer, a leader in the Turkish market, exporting to more than 80 countries worldwide. It currently has 9 factories, 7 in Türkiye and 2 in Emmerich, Germany, and an R&D and Innovation centre in Türkiye. Aromsa has had a long association with IFEAT, and Murat Yasa was closely involved in the IFEAT Conferences held in Antalya and Istanbul in 1990 and 1995 respectively.

The visit began with a briefing and a welcome for the delegates, setting the agenda for the day. This was followed by a detailed presentation about Aromsa, covering its history, values, and vision. We were then taken on a comprehensive guided tour of the facilities, with detailed explanations of the activities in the plants.

Following this, we toured Aromsa's R&D laboratories. Murat Yasa personally guided us through a sensorial atelier tour where we experienced different stages of life through scents, from birth to old age. We then had a special visit to their museum, showcasing Aromsa's journey from its inception to the present through objects, letters, photographs, and memorabilia.

The tour concluded with lunch, where we had further opportunities to interact with Aromsa's staff and enjoy a delectable Turkish meal.

KÜTAS FOOD GROUP

Mr Kazim Gürel, CEO of the Kütas Group, joined us on the coach to his facilities in Izmir, providing a briefing along the way. Upon arrival, we were given a presentation on Kütas Tarım and the broader activities of the Gürel Group. In addition, Mr Hugo Bovill a former IFEAT President joined us for the Kütas portion of the TST 24.

The Kütas Group, established four generations ago, was founded with a vision to leverage Türkiye's natural resources to build a legacy of quality, integrity, and sustainability. In just over 40 years, it has become the leading provider of oregano, sage, and laurel, and the largest processor of Mediterranean herbs. The Kütas Group serves as the food division of the Gürel Group, which has a well-established presence in various industries, including tobacco, real estate, automotive, finance, and other investments.

Laurel leaf sorting

The delegates were introduced to the laurel leaf (also known as bay leaf) facility with a short film detailing how wild laurel leaves are harvested and collected by locals before being brought to the factories. We observed the sterilisation, sorting, and grading processes, which use a combination of specially designed machinery and manual labour. Additionally, we witnessed their AI-enabled sorting process, an algorithm that matches 2,000 pictures/second. We were also shown the packaging facilities, where we observed the different packing processes tailored to clients' specific needs. Türkiye exports around 90% of the world's consumption of bay leaves, mainly as fresh or dried culinary herbs. Dried leaves are used as a flavouring and spice. Laurel is harvested in the wild, under government licence. Laurel is an evergreen tree which can reach hundreds of years old, but the best quality leaves are found on shoots at least 3 years old. Once the leaves are dried, any imperfections (insect attacks, stains, etc.) become more visible. Laurel leaf essential oil is distilled either from fresh leaves without drying or from the unusable portions after the physical selection and drying process. Laurel leaf essential oil has become more widely used in the flavouring, cosmetic and perfume industries.

At the oregano facility, we saw how oregano is harvested, dried, separated from large stems, and then packed into bags before being brought to Kütas facilities. A quality check is performed on each bag, which is then tagged and labelled, providing farm to fork traceability. At the facility, delegates observed the processing of oregano, which includes separating the bud into leaves, removing small stems, stones, and lighter material until the final product is ready for packaging. We also visited Kütas's lab facilities where testing is conducted.

Oregano fields

Kütas works closely with over 1,500 farmers who apply sustainable farming practices, through the Kütas Herb Club loyalty programme. Through annual contracts, the member-farmer commits to give supply preference to Kütas in exchange for a variety of services such as agronomic support (soil analysis, improved agronomic practices regarding weeding and planting, better use of fertilisers), traceability technology, financing and price discounts on biological materials and equipment. Kütas uses the FarmForce online platform for agricultural data collection, guaranteeing 100% product traceability, which we had the opportunity to see in action during our field visit. It's interesting to note that many agronomists are women, because it's their female counterparts among farmers who are making the biggest improvements in the fields. Indeed, better productivity translates into better value and, ultimately, better conditions for the whole family. An improved lifestyle is necessary to keep young generations working at their farm, often smaller than 1 hectare, although consolidation of farming is going on.

The next day, we visited oregano fields to observe the plants up close, with an expert available to answer all our questions about farming. We also toured sage fields and a lavandin garden. After enjoying a lovely farmhouse lunch cooked by local Turkish women, we visited the essential oils facilities of Kütas. This operation, which began in 2021, includes a distillation unit with a capacity of 30,000 litres per year, with plans for rapid expansion in the coming years.

"The trip to Türkiye has potentially broken prejudices, revealing the professionalism, competence, and further potential present in the country. It highlighted the high calibre of local industry players and their capabilities."

Zahra Osman Guelle

SEBAT ROSE OIL LTD. CO.

Sebat Rose Oil Ltd. Co. (Sebat) is a third-generation family-owned company founded in 1950 by Hasan Kinaci. The company initially focused on buying and selling roses and trading essential oils. The name "Sebat," meaning "to persevere," reflects the founder's advice to remain dedicated to the rose oil business. Sebat's first modern factory was established in Senir, Isparta in 1985. Since 2000, Sebat has been producing rose concrete, rose absolute, lavender oil, and orange flower absolute. Today, they have a production capacity of 1,200 kg/year of rose oil, 7,000 kg/year of rose concrete, and 4,500 kg/year of rose absolute, making them a leading producer of rose raw materials globally. Sebat is the largest processor of rose in Türkiye, and the largest producer of rose concrete worldwide. As with many processors, only a minor proportion of their needs come from their own plantations. A vast majority of their roses is supplied by not less than 2,000 external farmers in the Isparta region. Interestingly, Sebat has partnerships in Bulgaria, and extend their expertise up to Pakistan in the quest for methyl eugenol-free roses.

The company also designs new equipment, improves technologies and markets them through Cebat Technologies. Other rose processors in Türkiye benefit from the know-how acquired through the effective combination of engineering skills and decades of experience with these fragile plants.

Rose oil extraction at Sebat

The Sebat tour began with a visit to their own rose fields in Dinar. Dr Süleyman Kinaci, the Chairman of the Board and head of the R&D Department, accompanied us and provided an overview of the processes involved. He also answered numerous questions from the group. Next, we visited the company headquarters, where we enjoyed a live demonstration of a vintage distillation unit. This was followed by a presentation from Dr Süleyman Kinaci and a hearty Turkish lunch.

We then moved to the Sebat production facility, where CEO Hasan Ali Kinaci gave us a tour. This facility is the world's largest for rose and fragrant plants, with a capacity of 35 rose distillation vessels (20 x 1-ton vessels and 15 x 500-kg vessels), 15 concrete vessels (500 kg), and 2 continuous rose system and absolute units, covering approximately 6,200 square metres. We observed the distillation process, redistillation, extraction of rose concrete, and its conversion to rose absolute.

A special surprise awaited the delegates: a sizeable heap of rose petals, which resulted in a joyful experience reminiscent of toddlers playing in a ball pit, only with rose petals and adult delegates.

We were then shown their stock room, or "treasury," where large tins of rose oil and rose concrete were stacked, awaiting sales. Finally, we visited Sebat's product manufacturing facility, where they produce skincare, body care, aromatherapy, and home products under their own brands as well as for others. The delegates also toured the herb processing unit of Sebat.

The next morning, we visited the rose garden, where we saw expansive fields filled with beautiful pink roses. We were taught how to pick the roses, and all the delegates had a chance to try their hand at it. Despite our efforts, we only managed to fill a bag with 2.5 kilos of roses.

Afterwards, we were taken to the collection centre, where we observed how the roses are weighed and packed upon arrival. Due to the roses' sensitivity to heat, all the bags had to be loaded onto trucks and transported to the processing facilities as early as possible to optimise the quality and quantity of rose oil output.

AYDIN GÜLYAĞI

Aydin Rose Oil (Aydin) cultivated roses in its own gardens even before its official establishment in 1989. Since its inception, Aydin has been producing pure rose water, rose oil, and rose concrete. At Aydin, delegates had the opportunity to observe the distillation of rose petals to produce rose oil, as well as the extraction process using hexane as a solvent to produce rose concrete. We were also treated to some delicious rose flavoured ice-cream which was much appreciated by all the delegates. Aydin Gülyağı has been working with an NGO to improve the working conditions of seasonal migrant workers in the production of their organic rose oil as well as the welfare of their children and this was the subject of a presentation at the IFEAT Berlin Conference in October 2023.

Extraction plant at Aydin Gülyağı

GÜLBIRLIK

Rose extraction plant at Gülbirlik

Gülbirlik, a union of cooperatives established in 1954, has over 3,000 active producer partners processing rose flowers. The delegates were welcomed by Mr. Ibrahim Isidan, who showed us an old distillation unit that is no longer in use. This was followed by lunch and a tour of the current facility. Some delegates also had the opportunity to browse the store on the premises, which sells Gülbirlik's own home brand of cosmetics.

Each of the companies visited presented the delegates with a range of excellent gifts. In addition, those IFEAT Turkish Member companies whose operations we were unable to visit were invited to participate in some of the evening receptions or dinners. Botanika Tarim, Demirsoy Tarim, Göymen Aromatik and Orlife Global participated and presented the TST 24 delegates with some of their essential oils and other products.

CULTURE AND GASTRONOMY

The study tour commenced with a Bosporus cruise, accompanied by Mr. Sedat Bornovali, an art historian, interpreter, and professional tour guide. Sunset aboard the yacht provided stunning panoramic views of Istanbul's iconic landmarks, including historic mosques, palaces, bridges, and mansions.

The next morning, we had a guided tour of Sultanahmet Square, where we walked around the Hagia Sophia, the Blue Mosque, the Grand Bazaar, and other monuments of historical significance. The tour concluded with a quick shopping expedition at the Spice Bazaar, where fragrant teas, delightful sweets, and intricate jewellery, among other things, were sold.

Almost all our meals consisted of Turkish cuisine made with fresh local produce. We enjoyed meals by the water with fresh local catches as well as delicious meats. One dinner, sponsored by Kütas, featured a baked salted fish with "IFEAT" inscribed on top. Another dinner, sponsored by Sebat, included live performances by a belly dancer and a musician. A highlight meal was cooked at a farm by local Turkish women, who rolled dough into flatbreads baked before us. Some delegates had the chance to interact with these women and learn about their lives. Several baklavas and other delectable desserts were devoured throughout the trip. Many delegates have likely returned home a few kilos heavier!

Baked salted fish

Turkish farm lunch

Continued on page 28

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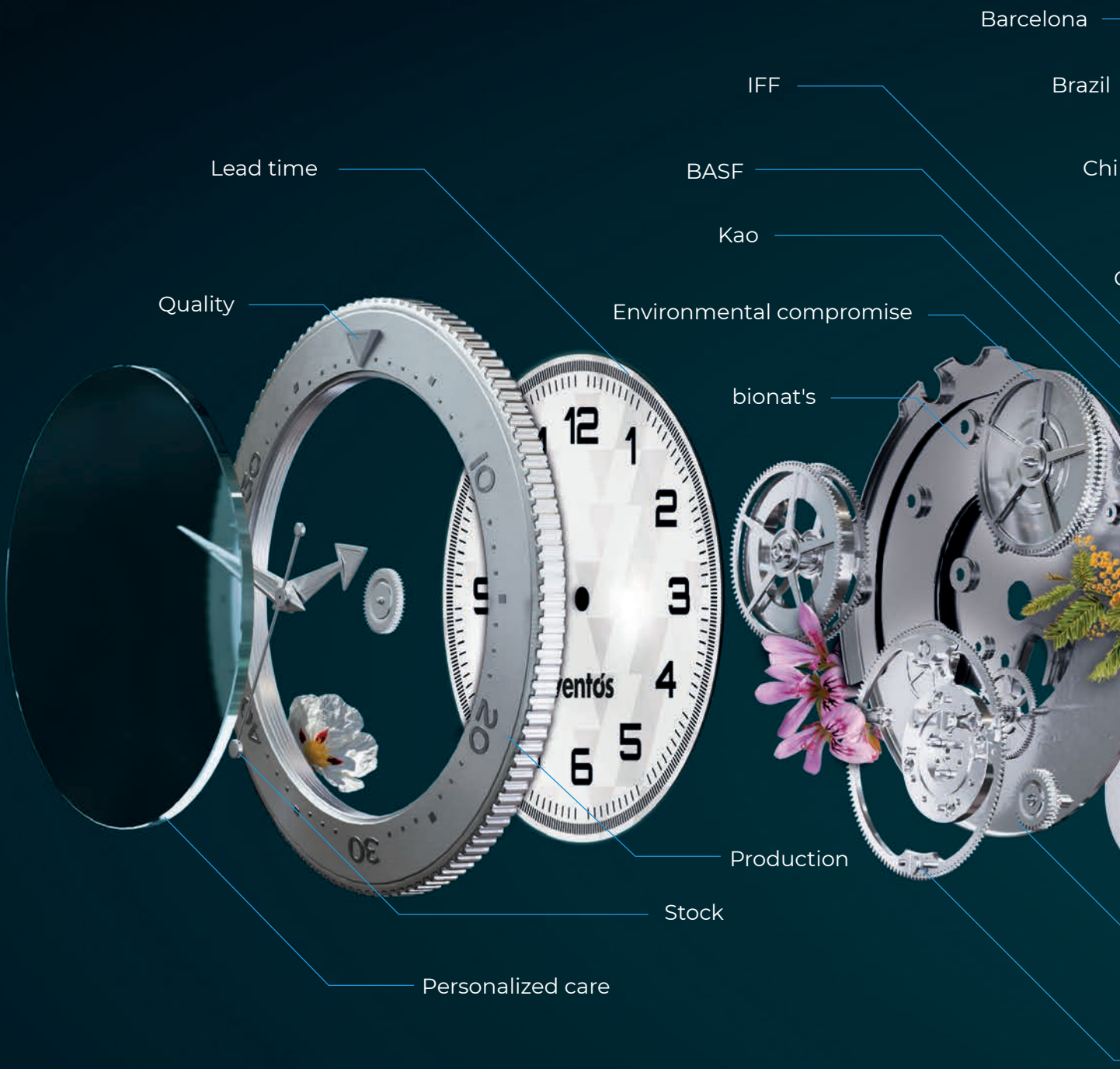

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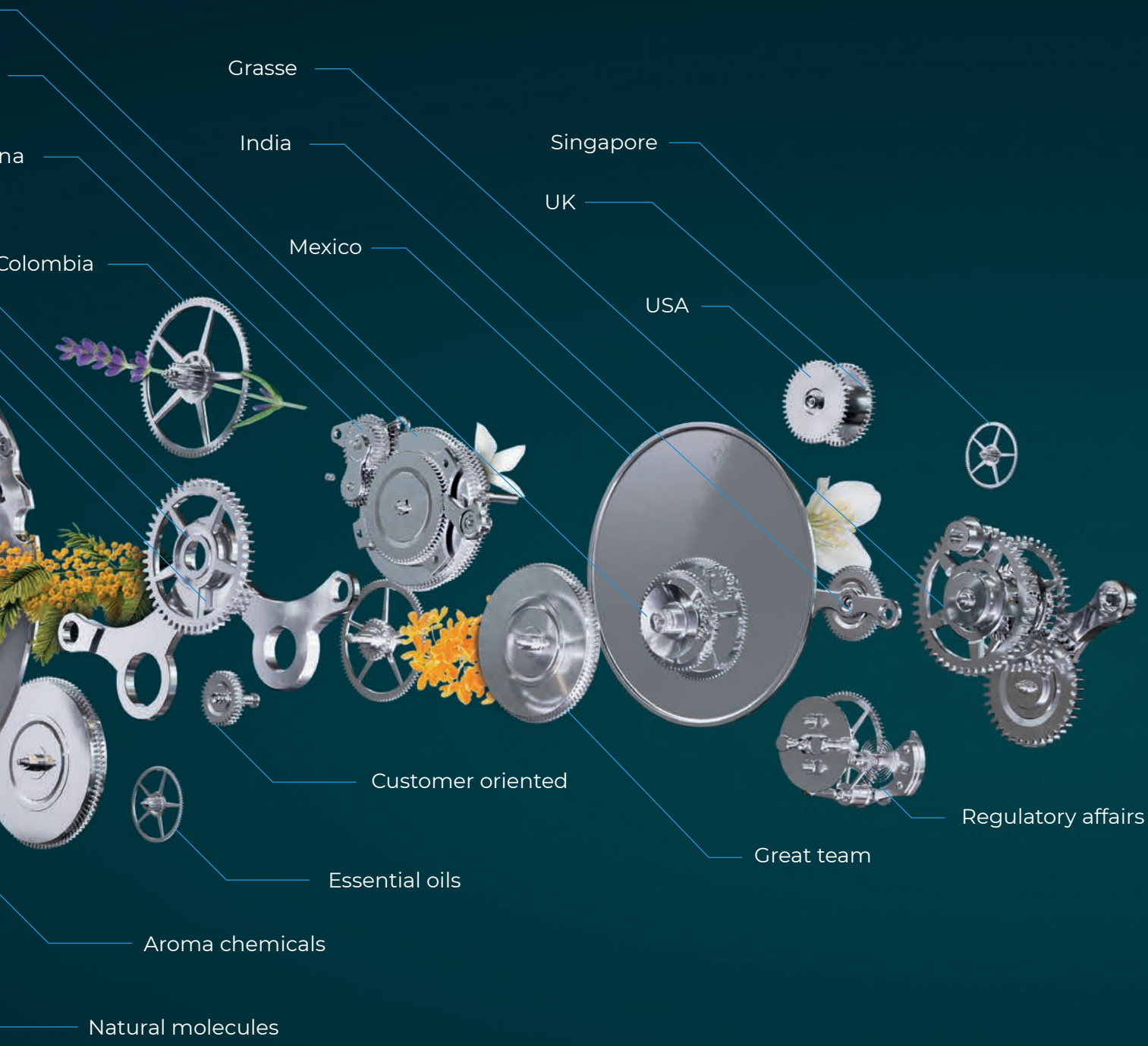

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LEADERS IN ESSENCE

"After the IFEAT Türkiye Study Tour 2024, we returned full of ideas and projects to implement. An enriching journey, not only professionally but personally in which we worked on the front line with colleagues from all over the world and with workers who have shown us centuries of history and tradition to obtain the best natural aromas. We came back full of experience and knowledge."

Manuel Pena-Alcaraz

SOME CONCLUSIONS

Some delegates had visited Türkiye several times, but for those visiting for the first time or after a long hiatus, the advanced infrastructure and modernity of the country were surprising. Almost all the facilities we viewed featured state-of-the-art machinery and used advanced technology in production and processing. Even small villages were easily accessible by well-maintained roads and excellent connectivity.

Each company we visited welcomed us warmly and was eager to show and explain every process. All questions were answered openly, and the delegates were given detailed insights into the growing, harvesting, distillation, and processing of all the crops we had the chance to see.

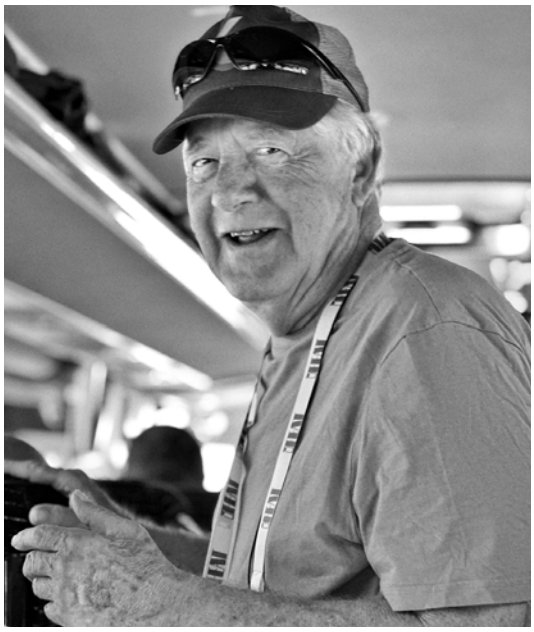
Our coach lectures, where some delegates take the time to give a brief talk on an area of expertise, have become a popular study tour feature. It's unique to see all players from the same industry come together to share knowledge and experience openly.

Peter Greenhalgh, IFEAT's Study Tour Coordinator, began his welcome brief by stating, "Though you meet as strangers, at the end of the study tour you will have made some lifelong friends." Those words couldn't have been truer. Travelling together for seven days created tight friendships and bonds among competitors, buyers, and suppliers.

This study tour was especially poignant as it was Peter Greenhalgh's last one. Our final dinner was dedicated to celebrating his wonderful work in shaping the study tour into what it is today. Several delegates spoke tributes to him, leaving most eyes at the table teary. His absence on future study tours will be deeply felt by everyone who has been on a tour with him, as he leaves behind shoes too big to fill.

I would like to thank Peter Greenhalgh and Alain Frix, who helped me put together this report, as well as Stephen Pisano and Şerife Ulu for all the photographs used.

A final dinner to thank Peter for his dedicated work on so many IFEAT Study Tours



Peter Greenhalgh

Flavourist Training Course, University of Reading

sponsored by

IFEAT takes great pride in its commitment to education within the aroma trades. One of its initiatives is sponsoring the hugely popular annual Flavourist Training Course at the University of Reading, UK. This unique three-week course is led by highly experienced industry flavourists alongside flavour scientists from the university. May 2024 marked IFEAT's first visit to this esteemed event, which is organised by Professor Don Mottram and Professor Jane Parker from the university's Flavour and Sensory Research Group, and Colin Scott, Richard Lewis and David Baines, in conjunction with the British Society of Flavourists.

Lindsay Smith, IFEAT's Education Officer, attended the oversubscribed professional development course on its final days of flavour creation and presentations. The campus laboratory visit provided an excellent opportunity to meet with tutors, organisers and students alike. Fourteen lucky students were invited to participate in the course this year. The students came from all corners of the world, and it was amazing to witness such enthusiasm for the aroma trades!

Towards the end of the course each student was tasked with creating two bespoke flavours to present. This involved the practical creation of flavourings and incorporating them into various food matrices. A wide spectrum of flavours was showcased, including key lime, pineberry, beef, pear and dulce de leche. Students also presented slides with the chemical compositions of their individual flavours. It was evident that despite the seriousness of the task at hand, the students and staff were thoroughly enjoying the exceedingly positive educational experience.

Each year at the annual IFEAT Conference an award is presented to the student deemed by the tutors to have made the most progress as a flavourist during the course. This year is no exception, and we look forward to presenting the award in Bangkok in November.

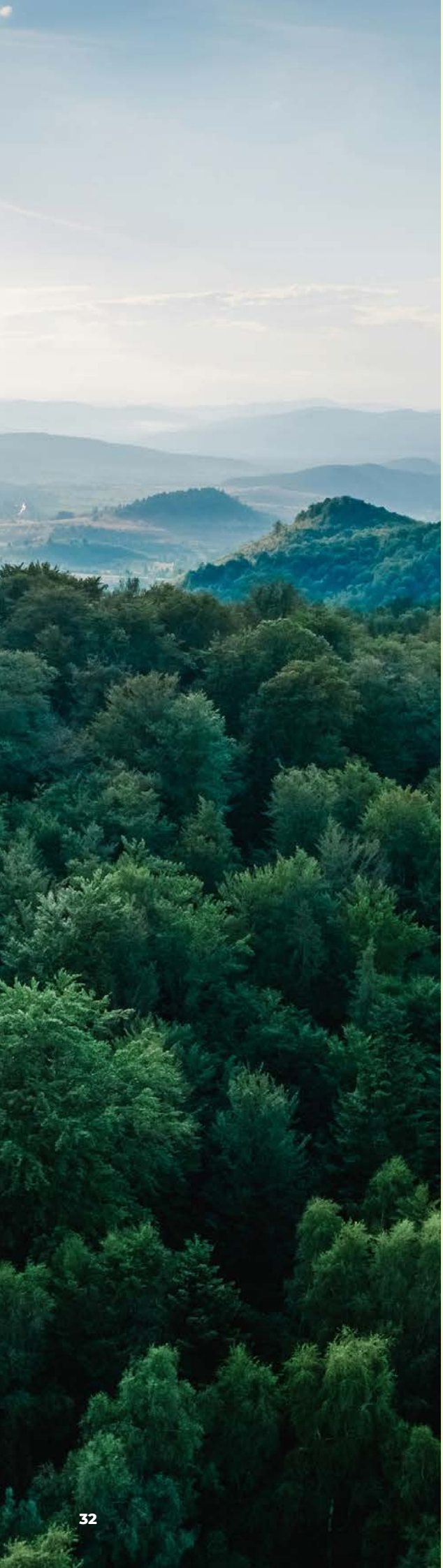
Next year's Flavourist Course will take place from the 9th to 27th June 2025.

Students and lecturers at the 2024 IFEAT Flavourist Training Course

ESSENTIAL OILS AND FOREST EXTRACTS

Why they are essential to our society, and why the European Union's "Green Deal" needs to support an age-old natural industry

By Alain Frix, Director, Allchemix-Biom Consultancy, Belgium



Every day, we wake up, live and fall asleep, often within a restricted perimeter. Yet these few square metres of our daily lives are overhung by an immense airspace in perpetual motion. This world of air is full of emanations from the millions of plants that surround us. We breathe in what the wind silently carries: the products of neighbouring forests, but also of vegetation far, far away. Every day, we breathe their essences.

In light of the EU Green Deal's laudable prospects for a cleaner and safer environment, this article presents a holistic approach to the world of natural scents and extracts, and essential oils in particular, from various angles such as their complexity, socio-economic importance and vulnerability, as well as various reflections on petrochemical alternatives to natural products.

Trees, the oldest perfumers...

Forests have always been appreciated for their beneficial effects on the human body. A walk through these large living organisms that produce sugars and cellulose is in fact a walk through a natural perfume factory. Trees are indeed perfume plants; they produce massive quantities of biogenic volatile organic compounds (VOCs). According to recent estimates, forests emit around 1 billion tonnes of VOCs every year[1,2], a thousand times more than all the perfumes created by man[3].

Biogenic VOCs are the volatile signs of life: a reflection of the metabolism of plants and animals, a continuous, uninterrupted system that only comes to an end when the organism dies. Human beings also emit hundreds of these VOCs, particularly through the skin and breathing, day and night. Our human odours are mainly shaped by the billions of bacteria and other micro-organisms that colonise our skin and populate numerous organs.

But it is above all the plant kingdom that constitutes the largest living biomass in the world, almost entirely masking animal odours: plant biomass is more than 200 times greater than that of the animal kingdom and more than 7,500 times greater than that of humankind. In other words, the odoriferous trace of all humans worldwide is insignificant. And that's without counting the bacteria buried in the soil, which breathe or exchange in one way or another: these bacteria have an impact 1,000 times greater than that of humans as a whole. Plants and bacteria are therefore, in a way, the masters of planetary odours, emitting billions of molecules into the atmosphere at every moment[4].

Plants and bacteria are ...the masters of planetary odours, emitting billions of molecules into the atmosphere at every moment

VOCs, the smell and taste of life and the afterlife

When a plant synthesises biochemical products from carbon dioxide, it generates substances that are released into the atmosphere, day and night, winter and summer. This is why forests smell like forests, tirelessly emitting their "VOCs", their olfactory signatures. The death of a plant or animal is a new lease of life for the bacteria and fungi that strip the dead biomass of its carbon and other substances. These micro-organisms thrive while enriching the soil and generating VOCs: the VOCs of bacteria and of microscopic fungi, such as yeast, partly define the taste of our cheeses, bread, beer and wine. Micro-organisms generate countless aromatic notes during fermentation by breaking down the biomass of milk, wheat, hops and grapes; they create ketones (giving notes of butter and caramel), esters (fruity, spicy, vegetal notes), alcohols (flower, rose), terpenes (ripe wheat, woody, spicy), and so on. Artisan producers of essental oils (EOs), just like talented cheese-makers, bakers, brewers and wine-growers, have developed the art of managing these VOCs for many centuries: culinary and perfumery traditions are deeply rooted in the cultures of many peoples, some going back over 7,000 years.

Smell and taste define a fundamental relationship between man and nature. If the bewitching aroma of the Alba truffle seems irresistible to you, it's not by chance: it's primarily a survival mechanism; the truffle - and the bacteria that inhabit it - generate numerous VOCs to attract the animal that will eat it, and which, after digesting it, will spread the thousands of spores contained in the famous mushroom[5].

Other VOCs have a protective function, such as those that regulate the temperature of trees. Certain messengers signal aggression to other plants, such as the smell of freshly cut grass which is nothing other than a VOC that warns of an attack: cis-3-hexenol. Only a few of these mechanisms are understood, and much remains to be discovered[6,7,8,9,10,11].

So how can it be so naively claimed that VOCs are pollutants? And, pollutants for whom? Some EU regulators see VOCs from forests as harmful, but can you really describe a system that has been self-regulating for millions of years as harmful? Biogenic VOCs are part of a natural game whose rules are beyond human understanding, at least for the time being. Before categorising these products as pollutants, it is essential to gain a better understanding of plant biomasses and their subtle but real interconnections with the rest of our world.

VOCs have complicated names

Plant VOCs are highly diverse, with over 1,000 different volatile chemicals released by plants and trees. These names may frighten some people, but this is 100% natural chemistry, the chemistry of the life cycle. Around 50% of all biogenic VOCs are isoprenes, major metabolic intermediates in plants, followed by methanol, acetaldehyde, alpha-pinene, beta-pinene, d-limonene, beta-ocimene, sabinene, myrcene, camphene, cineole, camphor, linalool, para-cymene, delta-3-carene, linalool oxide, borneol, bornyl acetate, terpinen-4-ol, copaene, humulene, alpha-phellandrene, beta-phellandrene, alpha-terpinene, alpha-terpineol, alpha-terpinolene, bergamotene, longifolene, methyl jasmonate, methyl salicylate, alpha thujene, beta farnesene, and hundreds of other molecules, many of which have probably yet to be detected[12].

These molecules, with their daunting names, are nature's signatures and have always been present in our environment and in our food, since the earliest of times. They are also basic ingredients for perfumers... the perfume industry uses some 150 different types of terpene, whereas nature contains more than 40,000.

The principle behind essential oils: simple and chemical-free

The principle behind essential oils is simple: to capture the VOC's, the scents of flowers, fruit, herbs, bark, wood and roots by distillation using water vapour. The aim is to extract the VOCs from the plants before they have a chance to leave the plant and enter the atmosphere. Distillation is a physical process in which water vapour passes through the plants: the passage of this hot fluid through the plant tissue causes the cells containing the volatile compounds to burst, taking them with it. Then, as it cools, the water vapour condenses and separates from the entrained VOCs. This separation is just as natural: by a simple density differential, a fragrant layer appears and tends to float above the water, or vice versa depending on the botanical; this layer is easy to recover, and we call it essential oil. The EOs therefore bear the natural and olfactory imprint of the plants.

Turpentine EO is a formidable resource for renewable alternatives to the world's growing demand across industries

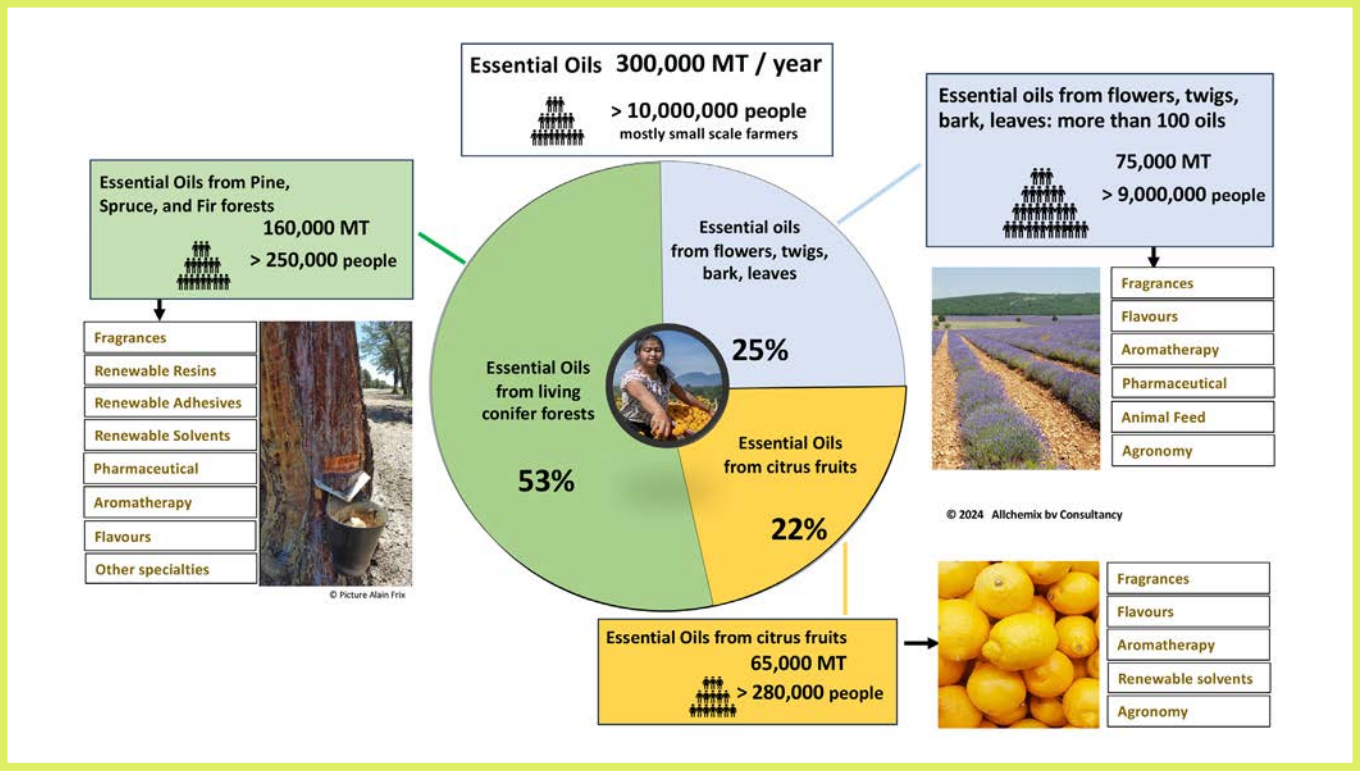


Figure 1: Essential oils: main segments and markets (in tonnes per year)
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Diversity and Essentiality: EO are key players in various industries, a genuine alternative to petrochemicals and an important basis for future food preservation and global health

There are over 200 different types of commercial essential oil used in perfumes, flavours and aromatherapy, but what many people don't know is that some essential oils have unique applications in other important sectors such as food preservation (rosemary EO, oregano EO, spearmint EO), or as specific solvents for the electronics industry (orange EO and its extracts such as limonene). One versatile EO covers many industries and represents a unique alternative to petrochemicals: turpentine EO, which has renewable applications in the automotive industry (polyterpene rubber resins in tyres), printing and adhesives. Many essential oils have human and animal health applications, such as oregano EO, which acts as a natural antibiotic. Recent research suggests that oregano EO and white thyme EO have the potential to modify ruminal fermentation and considerably reduce methane production in the rumen without adverse effects on feed digestibility in beef cattle[13]. This could make a major contribution to reducing greenhouse gas emissions from livestock. Other essential oils have antiviral, antifungal and antiparasitic properties, offering a natural and environmentally-friendly option for disinfection (lemon EO, tea tree EO, thyme EO, etc.)[14]. In agronomy, a variety of EOs are potential natural alternatives to synthetic pesticides and synthetic insect repellents (lemongrass EO, citronella EO, tea tree EO, rosemary EO, etc.), representing an important step towards new organic agronomic practices for the protection of food crops. EOs are also an essential aid in the fight against mosquitoes, the vectors of existing infectious diseases such as malaria, which kills a child every minute of every day[15]. Various EOs are also selective against ticks and ants, while having minimal impact on the environment, including the preservation of honey bees. Essential oils are definitely part of today's and tomorrow's solutions for a more environmentally-friendly world.

The author estimates annual world production of essential oils at 300,000 tonnes, broken down as follows (see Figure 1):

- 160,000 tonnes of turpentine EO (and other conifer extracts such as pine needle oils) obtained from living trees: tens of thousands of people around the world collect the resins from millions of conifers by hand. This age-old technique preserves trees and forests, providing work for many people living in rural areas, particularly in Asia and South America. It also encourages local populations to protect the surrounding forests. There are more than 250,000 tappers[16]. Derivatives of this turpentine EO are extremely important, and offer unique alternatives to replace petrochemical materials in wide applications such as adhesives, resins, rubbers.[3,17,18,19] Turpentine EO is a formidable resource for renewable alternatives to the world's growing demand across industries.

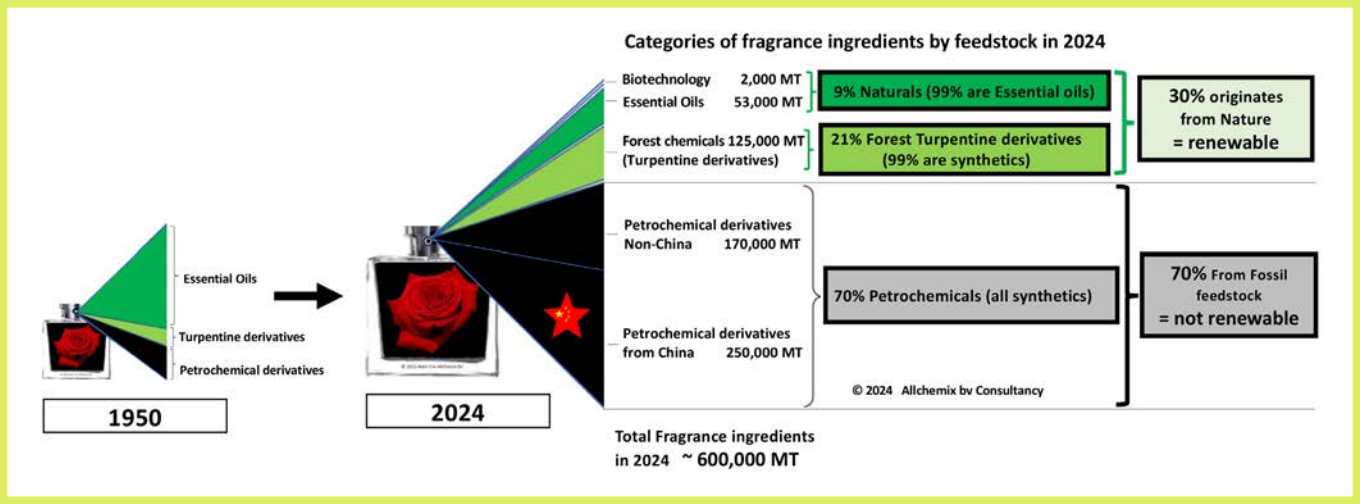

Figure 2: Industrial fragility of naturals: the example of perfumes.
The share of natural fragrance ingredients is declining, as the perfume industry becomes increasingly dependent on fossil raw materials, mainly petrochemicals manufactured in China.
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- 75,000 tonnes of EO from flowers, twigs, leaves, bark, wood and roots. These include more than one hundred most diverse EOs such as mint varieties, eucalyptus, clove, lavandin, lavender, lemongrass, patchouli, sage, citronella, vetiver, cinnamon, geranium, basil, verbena, chamomile, and around a hundred other EOs and other natural extracts, providing work for several million pickers and farmers, often smallholders.
- 65,000 tonnes of citrus EO. These are familiar EOs obtained mainly by cold pressing the peel of citrus fruits, such as orange, lemon, lime, mandarin, grapefruit, bergamot, yuzu, etc. They are also very important to many local communities around the world.

Industrial fragility of naturals: the example of perfumes

Perfumes are a good illustration of the problem encountered with natural products, in the face of an industry that is increasingly obsessed with cost, convenience and the standardisation of materials (ironically often by the same companies that claim to advocate biodiversity).

If all the world's man-made perfumes were placed in a large container, the author estimates that the fragrant mixture would weigh around 600,000 tonnes, of which only 9% are genuinely natural ingredients

There are 4 main categories of ingredients in fragrances (Figure 2.):

- **Petrochemical ingredients:** Aromatic chemicals derived from petroleum, gas and coal are widespread in fragrance ingredients; up to 70% or 420,000 tonnes per year are used in fragrances.

  Petrochemicals are the cheapest fragrance ingredients and the main driver of fragrance expansion worldwide. They guarantee wellbeing and hygiene for a huge proportion of the world's population. Many of them offer interesting and unique properties, such as very delicate notes, powerful effects and greater stability in detergents and cleaners, while meeting very strict toxicity standards.

  Petrochemical companies are launching initiatives to replace a (very small) proportion of their fossil raw materials with certified renewable raw materials, involving rigorous certification systems, and inspired by the concept of carbon credits. The question remains as to whether this practice meets the need to free ourselves from dependence on petrochemicals.

- **Turpentine derivatives:** These derivatives account for up to 125,000 tonnes per year in the perfume industry, or 21% of all perfume ingredients worldwide. They are obtained from two types of turpentine, both derived from coniferous trees: gum turpentine EO (GT), and crude sulphate turpentine (CST). GT is the world's largest essential oil and a by-product of the gum resin industry.

  CST is a by-product of the sawmill and paper industry. GT and CST will be fully fractionated into their individual constituents, in particular two precious molecules: alpha-pinene and beta-pinene. These pinenes will then be chemically transformed into major synthetic fragrance ingredients such as Dihydromyrcenol, Terpineol or Iso-E super, and others.

- **Essential oils and their natural extracts:** To the contrary of Gum Turpentine EO, most of the other EOs will not be chemically converted and they will appear in the final fragrance as real purveyors of naturality. These EOs carry

Tapping the pine tree... for gum resin and gum turpentine, a formidable forestry resource with multiple applications. Some 250,000 people around the world collect gum resin by hand from millions of conifers. This age-old technique preserves trees and forests and provides work for many people living in rural areas. Gum resins are versatile products and the source of 160,000 tonnes per year of turpentine EO, the world's largest EO and used by many industries as an important alternative to fossil-based materials.

familiar names, from lavender to patchouli and vetiver, they represent over two hundred EOs and are estimated to average 53,000 tonnes per year or some 9% of all fragrance ingredients worldwide. These EOs carry the most social footprint since EOs are the most important socio-economic contributors to the fragrance industry, providing work for millions of pickers and farmers around the world.

- **Biotechnology and natural chemicals:** These are aromatic molecules obtained for the most part from micro-organisms, mainly through fermentation by bacteria, or by fungi such as yeast. Some of these micro-organisms are genetically modified, but not all. Other natural chemicals can be produced without any micro-organisms, but by isolating certain natural molecules from biomass and applying mild chemistry in accordance with American or European protocols for natural chemicals. Their use in fragrances is currently extremely low due to their high price, generally in excess of 200 euros/kg of final material. At present, the total annual volume of biotechnological and other natural chemicals is expected to be around 2,000 tonnes, or 0.3% of fragrance ingredients, which is very limited. The majority of these natural chemicals are manufactured in China, most without clear evidence of compliance with US or European naturalness protocols.

  This often unfair competition with Western European or American producers is aided and abetted by the complicity of many multinationals, which continue to buy questionable products, often with full knowledge of the facts, at a knock-down price well below the production costs of a genuine natural product.

  The complacency of certain multinationals and the elaborate arsenal of dubious natural certificates have a very real impact: millions of consumers find themselves using, drinking or eating substances certified as EU or US natural when in fact they are not.

The appeal of petrochemicals at the expense of natural products

Today, many natural ingredients are on the verge of disappearing from the fragrance palette, as regulatory pressure on EOs continues to intensify at a frantic pace. Natural ingredients were already under threat, having lost a large part of their market share since the 1970s to petrochemical products: petrochemicals are much cheaper and much more abundant, with predictable prices and continuous, seasonless availability. These are the same principles that are driving multinationals to produce an increasing number of petrochemical ingredients themselves. And, over the last 20 years, many Western companies have relocated the sourcing of their synthetic ingredients, particularly to China which has become an impressive and sophisticated petrochemical hub. In addition to the distances and the geopolitical risk profile associated with this relocation, there is an environmental problem that is often forgotten: most of the energy used by Asian producers, particularly in China and to a lesser extent in India, comes from coal, while Western producers - of which there are fewer and fewer - mainly use gas and oil, with the latter emitting proportionately much less carbon dioxide than coal. The author estimates that more than 60% of current petrochemical ingredients in perfumery are derived from raw materials produced in China. For some specific petrochemical ingredients, the global market's dependence on China exceeds 90%. China has achieved undisputed supremacy in chemistry, a feat that deserves great respect but also the fear of imbalance.

Taking a step back: the proportional carbon requirements of various industries

The world extracts more than 5 billion tonnes of crude oil a year, or the equivalent of 16,000 gigantic tankers (VLCC type) with a capacity approaching 300,000 tonnes of crude oil per vessel.

The proportionality is quickly established by imagining that one single tanker as described above can transport all the EO produced in the world in one year (300,000 tonnes)... the EO market is therefore 16,000 times smaller than the crude oil market.

The author estimates that the fossil fuel market accounts for 14 billion tonnes of carbon per year, with energy being by far the largest consumer of coal, gas and oil, releasing an equivalent amount of carbon into the atmosphere. Fossil energy is therefore 45,000 times larger than the world's production of EOs.

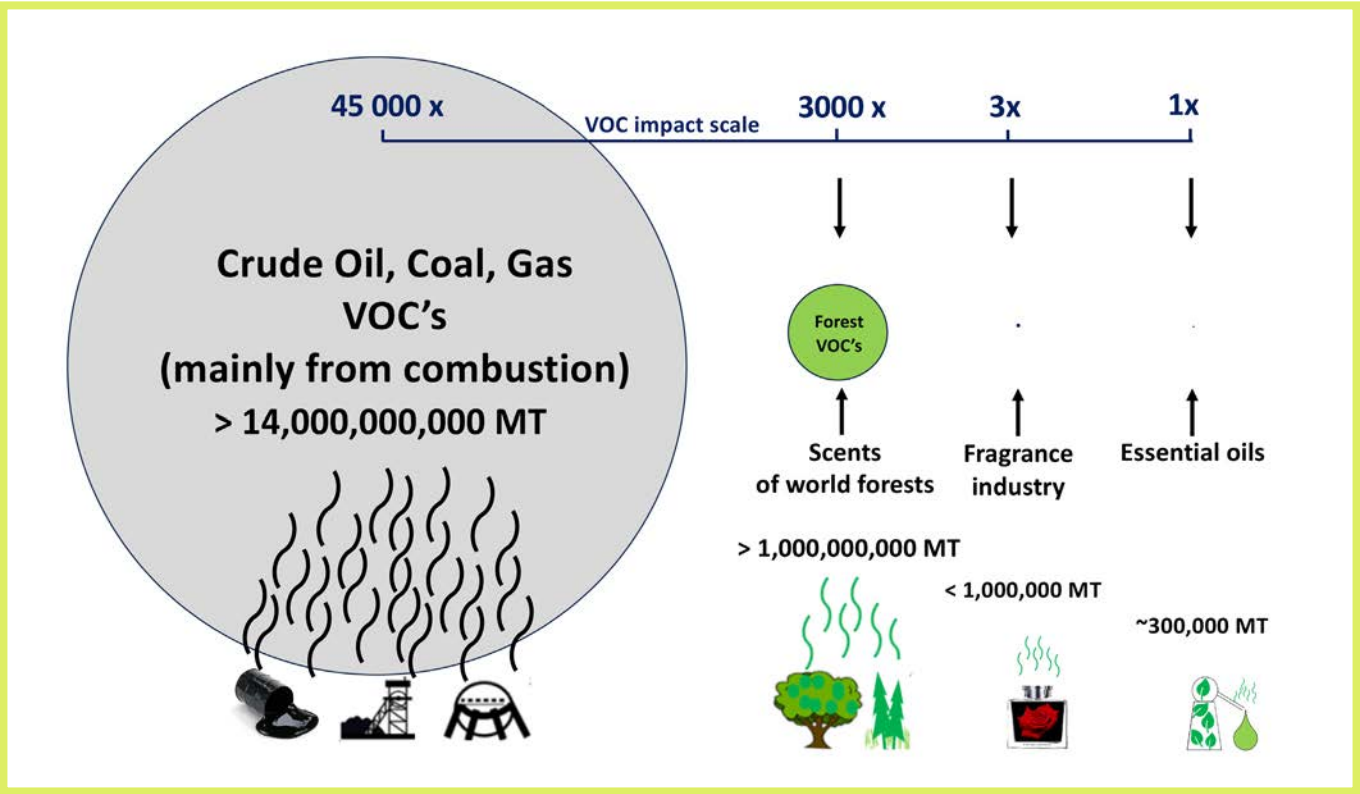

Figure 3 : The concept of proportionality: annual world production of VOC's (in tonnes/year)

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Apart from the huge gap in volume, the VOC profile is fundamentally different: the combustion of this fossil energy generates highly toxic molecules, which have nothing in common with the EO world, as the EOs retain the footprint of biogenic VOCs - since the latter are not burnt, just like the biogenic VOCs produced by forests, estimated at over 1 billion tonnes a year[1,2].

The concept of proportionality illustrates the true minuscule size of the EO industry.

Humans evolved without petrochemical VOCs

Crude oil, or its composition, is a mixture extracted from underground geological formations and formed from large quantities of dead organisms under the effect of intense heat and pressure. Most of these petrogenic substances were buried for millions of years beneath the earth's surface, so unlike biogenic VOCs, there were probably few interactions between most living organisms and fossil VOCs. It is therefore not surprising that crude oil and many of its VOCs have been particularly toxic to humans and other living organisms since they were extracted and put into circulation only recently in the 19th century. This very different evolutionary history is another fundamental distinction between biogenic VOCs and petrogenic VOCs.

The carbon footprint and collective myopia

Industries sometimes short-sightedly reduce the sustainability equation to a 'carbon footprint' equation. Of course, carbon dioxide reduction is an important factor. But sustainability also means reducing toxic waste, increasing biodegradability, protecting biodiversity, preserving natural resources such as water and soil, and so on. Last but not least, sustainability encompasses people and their socio-economic culture: traditions, fair trade, profit-sharing, the rural economy, women's autonomy. Farmers, particularly smallholders, are by far the weakest link in the value chain of farm products.

These fundamental elements are often obscured, if not crushed, by the "carbon footprint" principle which is a far too reductive concept that often favours petrochemical groups.

The Sherpas of unconsciousness

The cultivation, harvesting and processing of aromatic materials have a significant impact on the well-being of rural populations, who often live in very remote areas. Experts from IFEAT have estimated that over 10 million farmers, gatherers and harvesters are lifted out of poverty by the aromatic crops they grow, often on their own small plots of land and sometimes using very old techniques. In recent years, requirements from multinationals such as traceability, sustainable development programmes, organic or vegan products and compliance with the rules of a myriad of other certification bodies have added a heavy and complex burden to their suppliers. At the end of the chain, farmers and pickers are most affected by the domino effect: most of these people live in poor countries, with few resources, and are now forced by their customers to become the sherpas of sustainability. Have we forgotten how unsustainable Western countries have been over the last 200 years? We shouldn't expect the whole planet to align itself with our new Western core values and impose on developing countries a model that didn't even exist in the Western world 50 years ago. Although working conditions are improving in developing countries, change is gradual and slow, as it encompasses the weight of tradition and is also limited by the prices offered for these natural products. Often, world prices do not allow these farmers to invest properly in better practices and implement new technologies. The gradual and worrying disappearance of small-scale farmers is leading to socio-economic degradation

upstream, standardisation of ingredients downstream, and a drift towards petrochemical alternatives[10].

Disinformation or ignorance

Some people often hastily claim that the EO industry has a negative impact on biodiversity and that it competes with food in terms of land use.

Of the 300,000 tonnes of EO, 60,000 tonnes of citrus EO are produced from by-products of the food industry (fruit juices). This leaves 240,000 tonnes of EO that could potentially compete with food crops, although most of this EO comes from coniferous forests in remote mountain areas where food production is not widespread. What's more, some previous estimates suggest that the cultivated area of EO crops compared with food crops is around a factor of 1 in 10,000[20,21]. The disproportion is such that one might understand that there is no existential competition between EOs and the food industry. In fact, the opposite is true: EO can be a complementary crop, supporting the farmer between two food crops. A good example is the Indian mint, *Mentha arvensis*, one of the largest EOs in the world with a production of almost 35,000 tonnes, and a good source of income for several million Indian farmers. Mint crops complement food crops on the same field, in between food harvest seasons. These EOs increase and diversify farmers' incomes, which is extremely important with climate change factors making crops less predictable.

New sandalwood forests

Some producers of bio-synthetics claim that they offer an excellent alternative to 'endangered' species, citing *Santalum album*, the East Indian sandalwood. It is true that this tree was almost wiped out by serious over-exploitation in India three decades ago. At the end of the 1990s, the West Australian Forestry Department began growing East Indian sandalwood as part of a worldwide conservation programme. *Santalum album* showed promising potential. Today, more than 10,000 hectares of arid savannah in Kununurra (Australia) have been transformed into a huge sandalwood plantation, creating a new ecosystem and providing income for the local population. Today, millions of *Santalum album* trees stand magnificently in Australia, as well as new plantations in other parts of the world. Nevertheless, some continue to spread the idea that the *Santalum album* species is almost "on the brink of extinction". Nothing could be further from the truth. Once again, a forest that offers recurring economic value through sustainable management is the best guarantee against deforestation. Sandalwood has a bright future ahead of it, and we should applaud and support such large-scale reforestation initiatives[22].

Essential oils and safety assessments: toxicology and policy

Regulators in the EU and other regions seem to be struggling to understand the complexity of naturals. The current mindset of safety assessment protocols - to assess natural complexes on the basis of their individual components - is worrying. This approach implies that NCS (Natural Complex Substances), such as essential oils, react as if each individual component behaved in isolation. It has been shown time and again that this is not really the case. For example, several studies carried out by the RIFM (Research Institute for Fragrance Materials) in collaboration with IFEAT indicate that the genotoxicity profile of whole oils containing chemicals of concern is often much better than would be expected on the basis of individual component analysis. For example, rose oil, which contains methyl eugenol, gave favourable results, in contrast to the results of similar tests carried out on methyl eugenol alone, which is considered dangerous in its own right.

EO can be a complementary crop, supporting the farmer between two food crops

The principle of absolute precaution, adopted by certain EU technocrats, advocates zero risk management, which is unrealistic. Clearly, toxic ingredients (most of them petrochemical, but some of them natural) must be banned, and excellent work has been done jointly by the authorities and industry over the last fifteen years.[23,24]

There are, however, positive signs: thanks to the combined efforts of various associations, from French lavender, Spanish and Italian citrus oil producers to Bulgarian rose growers, the active collaboration of EFEO and IFEAT, visits by European leaders to the farmers and the help of many responsible politicians across Europe, a genuine dialogue has gradually been possible with the various European Union bodies in Brussels. During this multi-year dialogue, the European Parliament was made aware of the fragility and complexity of the essential oils industry. Many MEPs understood that essential oils have been used for thousands of years in numerous applications, with proven benefits for mankind, and positive socio-economic impact in rural areas. Some also questioned the bureaucratic logic of separating lavender oil into its 85 components and assessing the behaviour of many of these components individually, when it is lavender oil as a whole that reaches the consumer.

On 23 April 2024 the European Parliament validated the agreement with the EU Council on the Classification, Labelling and Packaging of Chemicals (CLP), Regulation (EC) No. 1272/2008, which serves as the basis for many legal provisions in EU legislation and determines whether a substance or mixture must be classified and labelled as hazardous. Most importantly, the new CLP document approved on 23 April contains a derogation for essential oils: these will not be assessed as a mixture of chemicals, a relief for our industry which has been pleading for an exemption for many years. However, the derogation is provisional and valid for only 5 years: the EU is giving our industry the time it needs to submit solid scientific data and mechanistic understanding, by independent academic experts, to highlight the differences in behaviour between complete essential oils and the sum of their corresponding components (in particular for various environmental and human toxicology parameters: biodegradation, genotoxicity, endocrine disruption and skin sensitisation).

At the end of these five years, the Commission will present a summary scientific report, and if it is conclusive, the EU authorities will make the derogation permanent.

The science of olfaction is set to become an essential component of medical therapies and early diagnosis of various diseases by 2030

We all know that our nose detects smells. Indeed, our 400 different types of human olfactory receptors are mainly expressed, by the millions, in the very narrow olfactory epithelium of the nose. However, many people are unaware that olfactory receptors are also expressed in vast tissues outside the nose and are involved in a variety of biological processes, including sperm chemotaxis, muscle regeneration, bronchoconstriction and bronchodilation, inflammation, appetite regulation and energy metabolism. The elucidation of the physiological role of these receptors reveals potential therapeutic and diagnostic applications in wounds, hair loss, asthma, obesity and cancer, among other ailments.

Recently, a Belgian company has discovered one olfactory receptor expressed in skin cells and has found the way to modulate this receptor in order to increase natural melanin production and so increase the pigmentation of the skin[25]. This improves UV skin protection even before the skin is exposed to any sun. The new technology enables consumers to be naturally and better prepared for UV exposure, thus considerably reducing the incidence of UV-induced skin cancers. It also can substitute traditional self-tanning dihydroxyacetone (DHA) which provides a false sense of sun protection. The same company has found the way to reverse the skin pigmentation in a controlled way.

Another company, related to the previous one, designs the first medical diagnostic tools based on knowledge of canine DNA: as an example, dogs are capable of detecting certain types of cancer, Parkinson's disease and tuberculosis, and are even accurate in detecting many pathologies at an early stage, sometimes years before they manifest themselves. Many human pathologies are associated with olfactory biomarkers, more easily detected by dogs thanks to their 800 different types of olfactory receptors. Current technologies enable us to screen the activity of each olfactory receptor - expressed in vitro - when exposed to pathological biomarkers. The olfactory receptor protein, indicative of a disease, can be reproduced endlessly and linked to microelectronic components to create diagnostic tests: when a patient blows into these tools, they indicate the presence of possible diseases, enabling us to spot them at an early stage, when treatment is easiest to implement.
These olfactory receptor-based detection systems have a wide range of potential applications, from medicine (cancers, epilepsy, Parkinson's, viruses, etc.) to security (detection of explosives and drugs), to industry (early detection of engine fatigue) and also to agronomy with the detection of warning VOCs in fields.

More than ever, understanding odours and their perception plays an essential role in our society.

Final thoughts

You might wonder why there are so many misconceptions about the world of EOs. Every natural product inherits its own danger when used inappropriately. Water is the best and simplest example, killing thousands of people every year. So far, there have been no reports of deaths from inhaling the many fragrances on a walk in the woods, nor of casualties from a normal use of essential oils.

Fortunately, people are still free to walk in a forest and free to smell the trees. Let's not forget that our history has been closely linked to forests for millions of years. Palaeoanthropologists indicate that the first humans were already evolving in forests and *a fortiori* exposed to the hyper-complex abundance of natural chemicals, inhaling VOCs, chewing leaves, branches and bark. Our ancestors evolved in a world rich in biogenic VOCs.

The excess of regulatory constraints in the small EO market seems to be reaching strange and alarming proportions. It is worrying to note that the European Union approach is increasingly intransigent and disconnected from reality, based on an omnipresent, almost religious ideal of purity, a vision of a completely 'detox' world. This excessive vision would lead absurdly to the labelling of all the trees in the world, followed by the systematic destruction of forests, since trees are the biggest producers of "undesirable" VOCs.

Politicians would do well to understand the distinction between biogenic VOCs and those produced by the combustion of crude oil. These are two fundamentally different worlds in terms of toxicity and impact on the environment.

Regulators must be aware that the production of natural extracts is already extremely fragile and exposed to numerous economic, climatic and social uncertainties. If EO regulations become too strict, many multinationals will abandon using them altogether because the regulatory costs and burdens associated with their use will become excessive. And this is not a theoretical risk: it is the continuation of a reality focused on costs and control: over the last thirty years, natural products have been increasingly replaced by petrochemicals - mainly developed in-house by the same multinationals that buy or used to buy EOs from farmers.

Globalisation and the acquisition of many family-run companies by multinational compounders have profoundly changed the dynamics of the market: family-run companies were used to the seasonal and sometimes unpredictable dynamics of natural products; they knew how to manage crises and disburse funds to ensure the continuity of naturals, from generation to generation. Today, multinationals have imposed a dynamic of absolute predictability and lowest cost: ingredients must be cheap and readily available, and the vagaries of nature are no longer tolerated. Too bad for those millions of farmers and pickers, left out in the cold by many who will continue to use their photos for marketing purposes.

Petrochemicals predominate, and their dominance grows every year. This also strengthens the positions of their producers. As a result, it is not the compounding house that will suffer most from over-regulation of natural products, but consumers and a large number of small and medium-sized family businesses that have been growing, producing, processing, extracting and refining quality natural products, sometimes for centuries. And behind them, the millions of invisible and unheard-of farmers, pickers and gum producers. Many of them will see their lavender, patchouli, vetiver, agarwood and ylang-ylang gradually replaced by petrochemical derivatives of oil, gas and coal.

This certainly cannot be the objective of the EU's Green Deal, and we must be aware of the harmful effects of any unilateral decision - based on an overly narrow approach defined by a few purists - on millions of producers and consumers.

About the author

Alain Frix has devoted 33 years of his life to renewable materials, from forest products such as turpentine and its derivatives for perfumery to aromatic plants and essential oils. After chairing IFEAT for several years, he currently sits on the IFEAT Scientific Committee and is involved in various projects relating to the fragrance and flavour markets, natural and synthetic ingredients, biodiversity and climate change. In 2020, Alain Frix founded an independent consultancy company, Allchemix BV, of which he is the sole owner. He also set up BioM Consultancy, which is the consultancy arm working on biomass. Alain holds a master's degree in biology and management.

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Flavour Talk 2024, BSP's One Day Symposium: New Materials for the Perfumer and SIMPPAR

By Dr Ali Green, Director of Studies, International Centre for Aroma Trades Studies (ICATS)

2024 has been a busy year of commitments for the ICATS/IFEAT team with an excellent event in the calendar at least once a month. March, April and May were no exception with three related but very different events, all spotlighting new and novel aroma materials, research and development within the aroma trades.

Flavour Talk 2024

Building on the success of last year's event, which was the first to take place in London, Flavour Talk (organised by Flavour Horizons and the British Society of Flavourists) returned to its two-day format for a sell out conference and trade show hosted by the Millennium Gloucester Hotel in London. Programme co-ordinator David Baines arranged one day of lectures entitled *The Future for Flavours* featuring ground-breaking research in areas related to the aroma trades, and particularly the world of flavours.

The morning was devoted to AI, with a keynote lecture by Prof. Jeremy G Frey of Southampton University on *Will an AI win the next Chemistry Nobel Prize*, followed by Dr Joel Maitland (Monell) discussing the revolutionary research on *Digitising Olfaction*, which I discussed at length in the March issue of IFEATWORLD. After lunch, the focus was on sustainability and biotechnology, both hot topics in the aroma trades world.

With consumers increasingly pursuing fewer processed and more 'natural' ingredients, there has been an increased demand for naturals but at what cost to sustainability and what is the knock-on effect for food supply. Jamie Rice, Director of Global Trends and Insight, Food Trending UK gave an excellent and thought-provoking lecture on this topic outlining the stakeholders within the flavouring industry and the impact of the demand for naturals.

Dr Luke Bell then took the stage to discuss his fascinating research on flavour compounds in brassicas at Reading University in a lecture entitled *Genome Editing and Molecular Techniques for Engineering Plant Flavour*. Advocating a systems approach, which would not only benefit the planet through making plants more robust, but also enhance their aroma profile, benefitting the industry, his ideas made fascinating viewing and I would recommend those interested to read his team's published research.

There were two further excellent talks on the topic of biotechnology from Axxence and DAB Bio, focusing on how these two companies could substantially improve the sustainability of flavour and fragrance production with better technology and more sustainable feedstocks thereby implementing green chemistry techniques.

The second day was the 14th Flavour Talk Exhibition where flavour producers from across the world showcased their new products in a kind of 'speed tasting' event. Lindsay Smith, IFEAT's Education Officer and I manned the ICATS stand along with Peter Whipps and John Forbes, our two tutors, and were able to talk with many attendees who were interested in our distance learning opportunities.

Peter Whipps, ICATS tutor, at Flavour Talk 2024

British Society of Perfumers One Day Symposium

The 40th BSP One Day Symposium: New Materials for the Perfumer fell at the end of April and was held at Whittlebury Hall near Towcester, UK. This friendly event is always well-attended, with well over 100 delegates this year, and ICATS were given a table in the main break-out area to publicise our courses and chat to the numerous delegates about their company's educational needs.

The day's events kicked off with the Keynote Lecture from award-winning perfumer and educator Nicola Pozzani, entitled *Fragrance: Bridging Art and Culture*. He explored the creative process of the perfumer and examined the question, 'can fragrance both reflect heritage and be inspiring for contemporary art?' This vibrant and surprising lecture showcased some of his creations, which we were able to smell, having followed the journey of their development, taking us from Venice to petrol as inspirations!

The British Society of Perfumers welcomed their incoming President, Denise McLaverty and thanked Julie Dunkley for all she has achieved during her year in office. The BSP in conjunction with Ultra International had run a patchouli perfume competition, for which they had received 124 submissions from across the world. These had been whittled down to twelve finalists, which were then further narrowed down to just three by an expert panel of ten judges. We were all asked to vote for our favourite from the three and the winner was announced later in the day.

Then a day of smelling began with everyone split into a colour-coded cohort within a carousel set up, visiting one of three rooms in turn, where a company had 45 minutes to give a deep dive into their new products. This was more of a considered sensory immersion in comparison with the speed-tasting Flavour Talk event, with the seven exhibitors having more time to explain their new ingredients and explore potential applications for these. The sessions enabled us to discuss the various new products on our tables with other delegates as well as giving us all a good opportunity to discuss current issues in the aroma trades and gain awareness of global trends.

The day was brought to a close with the announcement of the winner of the patchouli perfume competition, which was won by Michael Nordstrand from Mythologist in New Jersey, USA. As seems to have now become a BSP tradition, there was also a most excellent fragrant cake to commemorate the 40th anniversary of the One Day Symposium, suitably adorned with perfume bottles.

SIMPPAR

In May, Lindsay Smith and I were joined by Catherine Crowley, Chair of the IFEAT Executive Committee in Grasse for the XVIIth edition of SIMPPAR (Salon International des Matières Premières pour le Parfumerie) as special guests of the Société Française des Parfumeurs. We had a central display table in the raised kiosk area featuring giant hanging smelling strips denoting local ingredient specialities and were alongside the British Society of Perfumers, the Deutsche Gesellschaft der Parfümeure and the Société Française des Parfumeurs.

This open-air event in the beautiful traditional home of French perfumery, took place opposite Grasse Palais des Congrès and played host to 97 exhibitors from 20 different countries, each showcasing raw materials for the perfumer. It was a great opportunity and pleasure to network with those in the aroma trades from all over the world, listen to their educational needs and experience the wonderful ingredients that were showcased. We were able to market the ICATS courses as well as raise awareness of all that IFEAT does and to publicise both organisations to many who had not encountered us previously or who wanted more information about what we do.

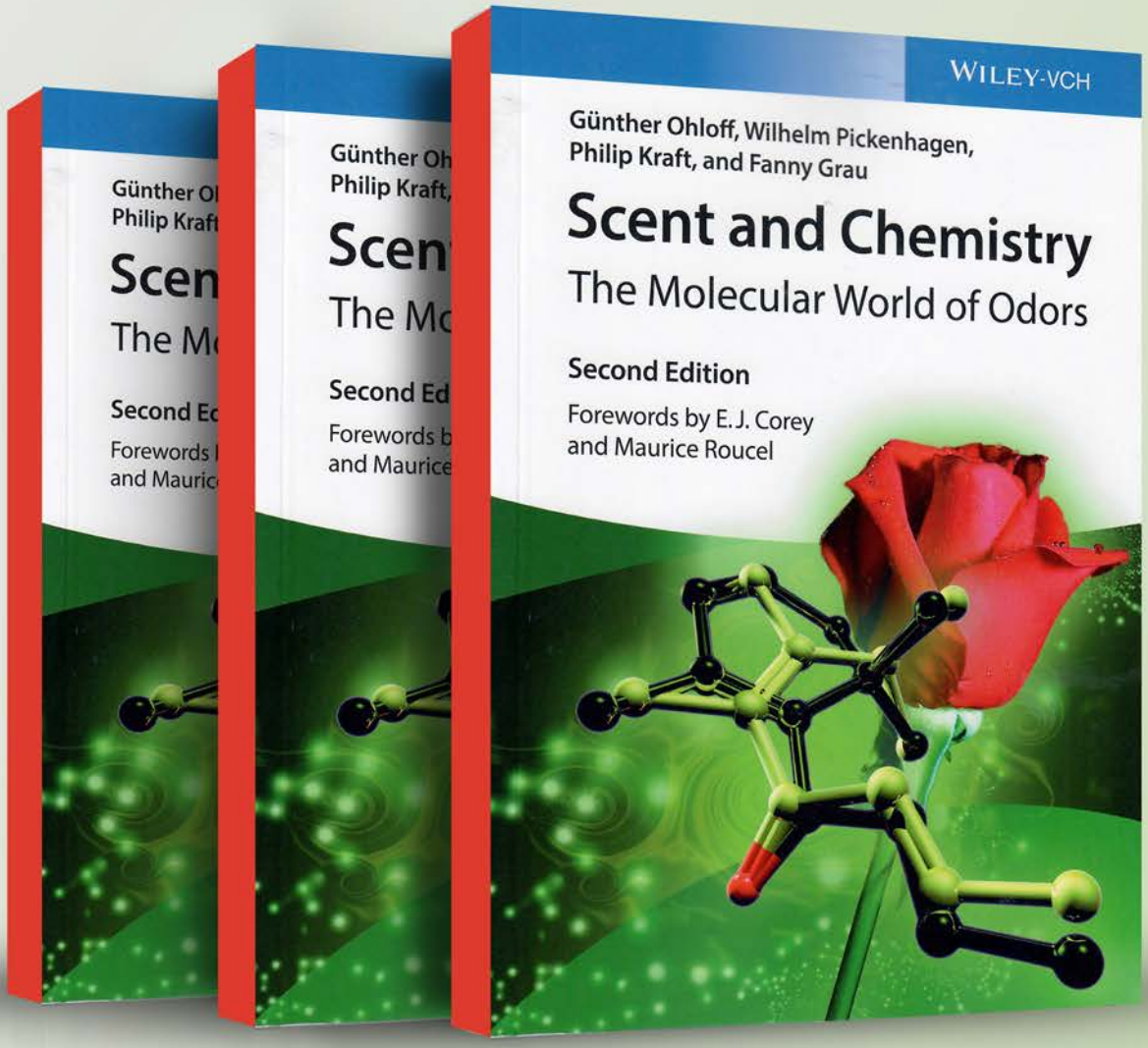
Lindsay Smith and I were lucky enough to spend the day after the Salon visiting the new Fragonard *Rosa centifolia* plantation and learn from Directeur Éric Fabre about their new venture in the fields surrounding their beautiful family home. The fragrance of the 'rose de mai' was truly spectacular - a scent you could really get lost in with so much rich warmth and comfort! We were made to feel very welcome and offered some beautiful rose flavoured drinks and nibbles; it was a wonderful conclusion to our visit to France.

ICATS and IFEAT have really benefitted from attending these events which are not only an opportunity to network, but also provide an excellent opportunity to learn about new research, trends and what is of current interest to those in industry. We are looking forward to attending again next year.

Scent and Chemistry: The Molecular World of Odors (Second Edition)

Reviewed by: **DR TONY CURTIS**

Günther Ohloff, Wilhelm Pickenhagen, Philip Kraft and Fanny Grau
2022: WILEY – VCH, Weinheim, Germany
£75.00 ISBN 978 3 527 34855 8 (also available as an e-book)

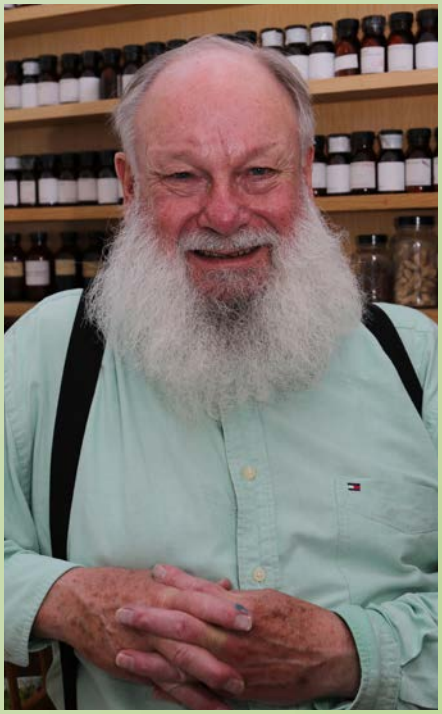


1 Historical Aspects
2 The Chemical Senses
3 Structure – Odor Relationships
4 Odorants from Natural Resources
5 Odorants from Petrochemical Sources
6 Ionones, Damascones, and Iso E Super
7 Essential Oils
8 Odorants of Animal Origin
9 Composition and Creativity & Simple Guide to Learning Perfumery

First let me address the obvious question: I have the first edition, should I buy the second edition? The answer is an emphatic 'Yes!' For newcomers into the industry the addition of the final chapter *Composition and Creativity & Simple Guide to Learning Perfumery* is most welcome. As owners of the first edition will testify this is not a light bedtime read. It is an epic work of reference covering most of the key issues. As such, two aspects are worthy of note: the range of references is comprehensive. The serious researcher will be able to quickly immerse themselves in the major primary sources for the chapter topics. The Figures bring some life to the book (e.g. Figure 8.2 picture of musk pod). As an academic chemist writing learning material in this area, the meticulous wide use of chemical structures (e.g. Figure 1.1 *Timeline of the initial phase of modern perfumery featuring the most important perfumes in 1870-1910 that were influenced by new odors* [molecules]) rather than just names are most helpful.

Chapter 2: *The Chemical Senses* and chapter 3: *Structure – Odor Relationships* bring these important areas of edition 1 up to date. This is an area where there is still lively debate and evolving contributions. This authoritative review will be appreciated by research chemists, perfumers and active researchers into this aspect of the human senses.

As a research chemist (now retired!) I purred with pleasure in working through the heart of the book: chapters 4 to 8. I do wish some of the 'green' authors would take time to discover and read this book. Too often people



Dr Tony Curtis

who should know better equate synthetic organic molecules as being derived from petrochemical sources. The extensive contribution of natural turpentine to the volume of odorant chemicals used in current perfumery is beautifully covered with well-illustrated chemical flow charts. As professionals in our industry know, the designation 'synthetic' is a bit technical. For good reasons and to avoid some confusion the term 'nature identical synthetic' [e.g. geraniol derived from natural renewable resources such as CST turpentine from paper manufacture] are not so widely used. Sadly, this can give rise to an assumption that all synthetics must come from petrochemical sources.

In an earlier article for IFEATWORLD on my personal experience of turpentine oil chemistry research in the 20th century, I noted that it was one thing to create a new molecule, but it was another to have the creative insight to envisage how a new molecule [odour] could fit into the lexicon of words to create new poetry of novel fragrances. The perfumery highlights spread throughout the book (e.g. [use of] *Black & Pink Pepper in Perfumery* in chapter 7) perfectly emphasise this issue. New discoveries need the creative invention of both chemists and perfumers.

Perfumers, do refer to this book. The explicit coverage of chemical synthesis does need an advanced understanding of organic chemistry. Just skip that and explore these overviews of the entwined history of chemical material discovery and new perfumery creative directions. For the hardened organic chemists, it is also a timely reminder that in the laboratory and plant we synthesise chemicals, in the marketplace we market poetry in odours. Nobody buys Chanel 5 and tells their friends what lovely aliphatic aldehydes! Chemists make the materials that creative perfumers convert into beloved fragrances which are about feelings and emotions. This book will help to remind us all that perfumery is both creative and collaborative.

This book is just at the top end of student affordability. It is a "must-have" addition to reserach and creative laboratories. I also hope that serious students of the aroma trades will use it (take it out on extended loan from the company library!).

Obituary

Monique Rémy, 1936-2024

We are sorry to report that Mme. Monique Rémy passed away in January 2024. She was an exceptional person with great qualities, including her professionalism, and for searching for what is natural and true. Her entrepreneurial character and concern for showing totally natural essences led her 40 years ago to create, together with her husband Mr. Christian Rémy, the company that bore her name, le Laboratoire Monique Rémy, also known as LMR. The goal of LMR was to supply high-quality, 100% pure natural extracts, with a strict ethos of complete transparency and a commitment to environmental management and sustainable development.

Christian Rémy, a great connoisseur of raw materials at their origin, contributed crucially to the development of new natural essences. In this way they anticipated the future and were pioneers twenty years earlier in the development of 100% pure natural products, in their different variations of essential oils, concretes and absolutes for the creation of high-end perfumes. The beginnings were difficult, at a time when perfumers mostly used synthetic essences. However, large companies believed in them and opted for the creation of the most natural perfume possible. Monique Rémy was able to show and teach perfumers what a natural scent was. LMR caused a change in trend and new expectations in the sector. In March 2000, it was acquired by the IFF perfume house, thus enriching its palette of high-end natural ingredients.

This passionate woman who dedicated her life to perfumery ingredients has done a lot for the perfumery sector and in recent years she participated in various associations. Her wisdom graced institutions like the Grasse Museum Gardens where she served as President, amongst other significant roles.

Monique Rémy, a native of Grasse, the world capital of perfume, has become an icon of the perfume industry.

54th INTERNATIONAL SYMPOSIUM ON ESSENTIAL OILS

8-11 September 2024, Hunguest BAL Resort, Balatonalmádi, Hungary

ISEO annual international conference is the best forum to share your findings on any aspects of essential oil research. We extend a warm invitation to all interested people to join and present results through oral lectures or poster sessions. The programme will commence with insightful plenary lectures delivered by distinguished speakers. The Young Researchers session offers an excellent stage for those at the beginning of their research career.

We look forward to welcoming you to ISEO 2024 for an enriching exchange of knowledge and camaraderie amidst the serene beauty of Balatonalmádi.

Conference official website:
https://iseo2024.hu

NEW IFEAT MEMBERS

Below is a list of new IFEAT Members who had joined by 14th June 2024

Afriplex Pty Ltd
10 De Vreugde Crescent, Dal Josaphat, Paarl, 7546
South Africa

Contact: **Anke Barnard**
Email: **AnkeB@afriplex.co.za**
Web: **https://afriplex.co.za/**

A GMP facility based in South Africa, specialising in the bulk manufacture of essential oils, botanical extracts and pharmaceutical final packed products.

Agrin Maroc
Q.I. Sidi Brahim - B.P. 1683 - 30003 Fez
Morocco

Contact: **Mouhssine CHAMI**
Email: **MouhssineC@agrinmaroc.ma**
Web: **https://agrinmaroc.ma/**

Fully integrated producer and processor of main herbs, botanicals, and flowers of Morocco, Agrin Maroc stands as a pioneer of quality, sustainability and innovation in the industry since 1992.

Anhui Chinaherb Flavors & Fragrances Co. Ltd
No. 7 Ruquan Avenue, Huaiyuan Economic Development Zone, Bengbu City, Anhui Province
China

Contact: **Amy Pan**
Email: **pmm@cnherb.com.cn**
Web: **https://www.cnherbflavor.com/**

Our company is focusing on the R&D, production and sales of flavours and fragrances, specialising in cooling agent WS-23 WS-3 WS-12 WS-10 WS-27 production.

Anhui Great Nation Essential Oils Co. Ltd
No.37 Xinyang Road Economy and Technology Development District, Fuyang City, Anhui Province
China

Contact: **Ann Zhang / Haiyan Zhang**
Email: **gn.ann@great-nation.net**
Email: **gn.info@great-nation.net**
Web: **https://www.china-menthol.com/Home/Indexen/index**

Founded nearly 30 years ago, Anhui Great Nation Essential Oils is located in Fuyang city, the largest plantation region for mentha in Anhui province. 80% of our products (menthol crystals, peppermint oil, eucalyptus oil and citronella oil) are exported to Europe, USA, Southeast Asia and Middle East.

Anhui Hyea Aromas Co. Ltd
No. 42 Shuzhou Avenue, Qianshan City,
Anhui Province
China

Contact: **Richard Pan**
Email: **richardpan@hyeaaromas.com**
Web: **http://www.anhuihuaye.com/index_en.html**

A top 10 aromatic chemicals company in China and a professional manufacturer of lactone aromatic chemicals.

Anhui Rodafone Perfume Co. Ltd
No. 215 Jinzhai Road,Hefei
China

Contact: **Miao ChunRui**
Email: **spices@cnanp.com**
Web: **http://www.ahperfume.xyz/**

The largest manufacturer of Chinese garlic oil, ginger oil and spearmint oil.

Australian Mustard Oil Pty Ltd (AMO)
PO Box 981, YOUNG, NSW 2594
Australia

Contact: **Andrew Puckeridge**
Email: **sales@australianmustardoil.com.au**
Web: **https://www.australianmustardoil.com/**

Australian Mustard Oil (AMO) is a wholly Australian owned company established in 2014 to meet the growing demand for a premium quality natural essential oil of mustard and triple filtered, cold pressed mustard oil. AMO is the only facility in Australia producing essential oil of mustard and is Australia's largest mustard seed buyer.

Australian Native Products
106 The Channon Road, The Channon, NSW 2480
Australia

Contact: **Hui Li-Bogdanovic / Tristian Kelly**
Email: **hui@australiannativeproducts.com.au**
Email: **tristian@australiannativeproducts.com.au**
Web: **https://www.australiannativeproducts.com.au/**
Australian Native Products, the world's largest commercial producer of lemon myrtle – a beautiful and versatile native Australian plant.

Devi Trading Company
100-102 Reclamation Road Colombo 11
Sri Lanka

Contact: **Devi Vengadasalam**
Email: **exports@devitrading.com**
Email: **dtcspice@gmail.com**
Web: **https://www.devitrading.com/**

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Gyeonggi-do, 18547
South Korea

Contact: **Eundeok Hwang (David) / JY Moon**
Email: **dotter300@gmail.com**
Email: **dotter1@daum.net**
Web: **http://dotter.co.kr/main/**

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NEW IFEAT MEMBERS

Evera by Citrosuco
Handelskai 94-96, 1200 Vienna
Austria

Contact: **John Lin / Hadrien Mathieu**
Email: **John.lin@everaingredients.com**
Email: **hadrien.mathieu@everaingredients.com**
Web: **https://everaingredients.com/**

A company specialised in the development of natural ingredients. Through technology and innovation, we make the most of raw materials and contribute to healthier and sustainable formulations in industries around the world.

Fragrand Aromas Ltd
222-1, 2nd Floor, Jinshan Building, No.8 Linshan Lane, Jingshang Rd, Chittagon Road, Zhuhai, 519015, Guangdong
China

Contact: **Alvin Xia**
Email: **info@fragrandaromas.com**
Web: **https://www.fragrandaromas.com/**

Dedicated to discovering and producing the extraordinary, China's special and new natural flavour and fragrance raw materials produced in environmentally-friendly and sustainable ways.

GRĒNE SAS
305 route de la GARE 84470, Chateauneuf de Gadagne
France

Contact: **Pierre-Julien LOYER**
Email: **loyer.pj@grene-provence.com**
Web: **http://www.grene-provence.com/**

GRĒNE is a new French company dedicated to sourcing natural extracts with a particular focus on efficiency, transparency and long-term relationships with producers.

MAAK Natural Extractors PVT Ltd
P44, Kinfra Mega Food Park, Kanjikode, Palakkad.
India

Contact: **Mohamed Fayaz**
Email: **fayazspicera@gmail.com**
Email: **antu@maak.in**
Web: **https://www.maaknaturals.com/**

MAAK Natural Extractors Private Limited is a spice oil and extract manufacturing company located at KINFRA Mega Food Park, Kanjikode, Palakkad, India. We specialise in the manufacture of curcumin, essential oils, oleoresins and extracts from different herbs and spices.

Madho Aromatics and Spices Private Limited
Tower 1, Flat 103, Orange County Indirapuram, Ghaziabad - 201014
India

Contact: **Mr Basu Agarwal**
Email: **basu.ag@gmail.com**
Web: **https://www.madhaviimpex.com/**

Madho Aromatics and Spices Pvt Ltd is a sister concern of Madhavi Impex primarily involved in trading, import and export of aromatic chemicals and essential oils.

Pavlovi Food Industries Ltd
Yantra Str, 5, General Toshevo 9500
Bulgaria

Contact: **Hristo Ilkov Pavlov / Svetoslav Dimitrov**
Email: **hristo_pavlov@pavlovigroup.eu**
Email: **s.dimitrov@pavlovigroup.eu**
Web: **https://pfi.bg/**

Our company was established in 2016 as a natural continuation of the many years of experience, accumulated by the group. Thus, we focused on cultivation, production and trade with essential oil crops

PT Mignon Sista International
Jl Raya Gbhn No.120, Desa Bojongnangka, Gunung Putri, Bogor 16963
Indonesia

Contact: **Liana Hardiyanto**
Email: **liana@mignon-international.com**
Web: **https://www.mignon-international.com/**

Our natural, raw materials reveal the richness of Indonesian soil. Mignon Sista offers a wide selection of Indonesian essential oils, spices and aromatic woods.

PT. Indoharvest Spice
JL. Joko Kendil, By Pass, Mojokerto 61363, East Java
Indonesia

Contact: **Stanley Winarto**
Email: **stanley@indoharvestspice.com**

As a third generation global leading spice manufacturer, PT. Indoharvest Spice is now offering sustainable Indonesian spice essential oils, extracts and oleoresin solutions.

Rachidi Aromes
359, Avenue Med V - 14000, Kenitra
Morocco

Contact: **Abdallah Rachidi**
Email: **arachidi6@gmail.com**
Web: **https://rachidiaromes.ma/**

Founded in 1996 in Kenitra, Morocco and a certified Ecocert FFL and Organic NOP, Rachidi Aromes is specialised in extraction of essential oils, concretes and floral waters from aromatics and medicinal plants and owns several plantations and industrial sites in Morocco.

Tianxin Flavors Co., Ltd
31 Kilometer, Jinhan Highway, Doli Dist, Tianjin
China

Contact: **Jenny / Mr He**
Email: **tianxinheyu@126.com**
Email: **yumiao_583493768@qq.com**
Web: **http://www.tianxinflavors.com/en/**

Tianxin Flavors: Rich fragrance, with your health.

THE INTERNATIONAL FEDERATION OF ESSENTIAL OILS AND AROMA TRADES LIMITED

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