

A new olfactive expression for wood

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The development of a new perfumery raw material - an ingredient offering novel olfactive properties - represents a major challenge. However, only a selective number of fragrance houses embark on this quest with the goal of designing and producing new exclusive ingredients, also known as captives.

Introducing a new captive to the perfumer's palette offers fresh creative possibilities to companies who design and market perfumes. It allows them to create original scents, with distinct properties that can go a long way in differentiating their customers' products from those of their competitors. Ultimately, it is consumers who will benefit from such innovations via the brands they cherish.

L'Âme du Bois™ (hereafter called the new woody note) is a new, patent-pending, naturally derived captive that has been developed by Eurofragrance. The name means the soul, or spirit, of wood in French. This new ingredient not only provides a new olfactive expression to woody notes, but it also offers interesting properties to fragrance compositions and to the other ingredients in the formula.

Breakthrough in woody notes

As building blocks in fragrance creation, woody notes have long played an important role in perfumery. Historically, in fine perfumery, wood-based ingredients were most often - although not exclusively - associated with masculine scents. More recently, however, there has been a clear trend for creating fragrances around woody notes that have a more universal, gender-neutral appeal.

According to Mintel, 17% of the fragrance launches in 2010 were considered gender-neutral. By 2018, this figure had reached 51% of launches and the trend appears to have continued in recent years. Vogue recently published an article entitled 'The rise and rise of gender-fluid fragrance'.¹ While the wording is slightly different, the idea of scents appealing to both genders is the same.

In reality, however, the choice of woody ingredients to meet these new consumer expectations is relatively limited. There was thus an opportunity to fill a gap in the perfumer's palette. In 2017, Eurofragrance tasked a multi-functional team to create a captive that would provide a new olfactive expression for wood, in line with evolving market trends. The creation, R&D, regulatory and purchasing departments made up the core of the team on this project.

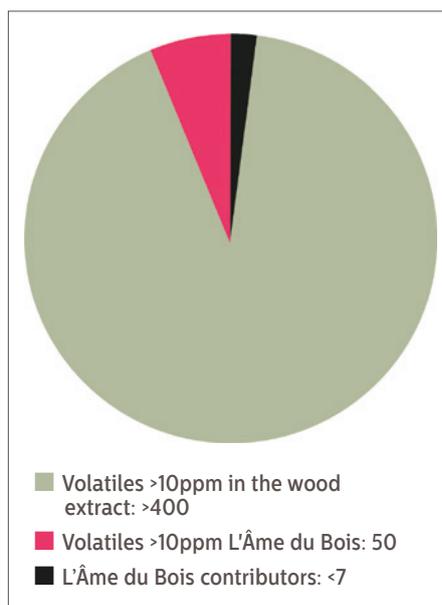


Figure 1: Ratio of contributing molecules in new woody note

Understanding the importance of sustainability in today's market for manufacturers and marketers of brands as well as for consumers who purchase them, the team opted to explore the possibility of creating an ingredient that was both of natural origin and sustainable. The result is a new proprietary raw material that fully respects the company's sustainability philosophy, while making a significant contribution to the perfumer's palette.

The new captive is currently being incorporated in perfume creations, which are marketed to customers producing and distributing fine fragrances, upmarket cosmetics and other premium body care brands. Among its olfactive properties, it:

- Is multifaceted and engagingly complex.
- Binds with other ingredients in the fragrance formula to highlight their characteristics.
- Delivers contrasting sensations of freshness and warmth.
- Offers perfume intensity and diffusiveness, along with increased long lastingness.

The creation of the new woody note represents a significant investment for a mid-size company with just under 400 employees. Early results and feedback from

clients and consumers are highly encouraging, and have prompted the team to explore the development of additional ingredients.

The importance of captives

The mission of the company's R&D department is to develop technical and scientific perfume innovations that will help brands deliver on their promise. In recent years, Eurofragrance has seen the introduction of a range of fragrance technologies that enhance consumers' product experiences, be it a personal care brand or a home care one.

As a consumer-centric company, the objective is to meet the needs and aspirations of consumers, including the demand for respectful and eco-friendly products. Four years ago, the company's R&D department undertook the additional challenge of developing its very first captive.

As captives are so important in the perfumery industry, it is worth reiterating what a captive is and how it can be leveraged in economic terms. A fragrance captive is a molecule or ingredient - natural or synthetic - that offers unique and desirable olfactive properties in the creation of a perfume. As the word suggests, a 'captive' is held, or belongs to the company that has developed it - hence the idea of a proprietary ingredient.

A company that creates a captive often has it patented and is responsible for its commercialisation, dissemination and where it will be used. Ideally, a captive will have organoleptic characteristics that cannot be found in any other ingredient. This means that competitors will not be able to create a similar scent.

After a period of five to ten years, it is not unusual for the holder of a given captive to sell it as a raw material to other fragrance houses that wish to use it in their creations, while retaining ownership of it. The perfumes formulated with the new captive are one-of-a-kind scents. For customers, this can be extremely interesting if their consumers can only find the smell they love in a precise brand.

Making the new note

Having set themselves strict ecological parameters, the question for the team became: 'How does one produce a natural wood-based fragrance ingredient without cutting down a tree?'. The answer came from studying the sawdust produced by wood mills processing a certain kind of wood.

The sawdust used comes from one specific tree species that is cultivated and harvested in a manner that meets Forest Stewardship Council (FSC) certification. Discarded sawdust can be recycled in certain industrial applications, but the objective, in this instance, was to upcycle a waste product into a perfumery ingredient.

To produce such an ingredient, the team relied on an elaborate purification methodology. This procedure allowed the researchers to obtain a material with the right chemical composition. This composition was both simple and complex, as some compounds appeared in significant amounts, but were of little interest in the final ingredient, while others present in small percentages offered significant perfume value.

From the sawdust, they extracted 0.1% of the volatile material, from which they removed certain molecules, leaving them with 10% of selected volatile odorant compounds in the finished ingredient. Roughly, in the original extract, over 400 volatiles at >10 ppm were identified. At its final stage, the new woody note counts 50 volatiles over 10 ppm, but fewer than seven of which are considered essential contributors to the captive's unique olfactive profile (Figure 1).

In order to arrive at this result, the team tried different purification techniques before settling on a single approach to separate positive contributors from the negative contributors based on the inherent properties of each family of molecules. The undesirable compounds that were removed, were, for example, most of the terpenes and terpenoids along with organic acids (Figure 2).

The physical operations used in this process did not alter the molecules in themselves and preserved the natural, odorant qualities of the wood, and from beginning to end, the processes deployed respected a sustainability philosophy.

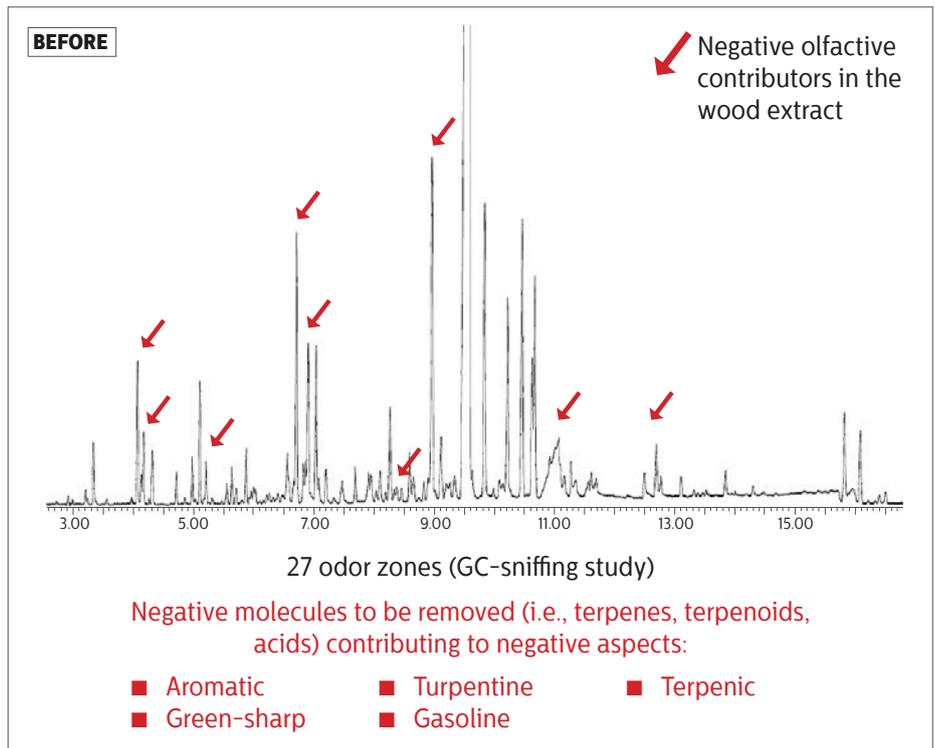
R&D scientists & perfumers

The critical and obvious question during this entire venture was always: 'How does this new ingredient smell in a fragrance formula?' The team had to first evaluate the ingredient they were developing in its 'purified' form, i.e. when not combined with other ingredients in a perfume formula.

Early on, and then at repeated intervals, analytical characterisation of odour impact was performed thanks to gas chromatography (GC)-mass spectrometry and GC-sniffing, to evaluate the contribution of individual molecules. The analytical results of successive extraction trials, in correlation with sensory evaluation data made it possible to understand the role of each molecule in the raw material (Figure 3). Sensory (qualitative) evaluation of the ingredient was carried out by several of the company's perfumers. Thanks to a balance of quantitative data and qualitative input, the R&D team would reach a point where the extract they were working on deserved to be - in their eyes - integrated into a perfume formula.

As might be expected, this occurred on several occasions, but the actual results in certain formulas proved disappointing.

GC-MS ANALYSIS OF THE WOOD EXTRACT



GC-MS ANALYSIS OF L'ÂME DU BOIS

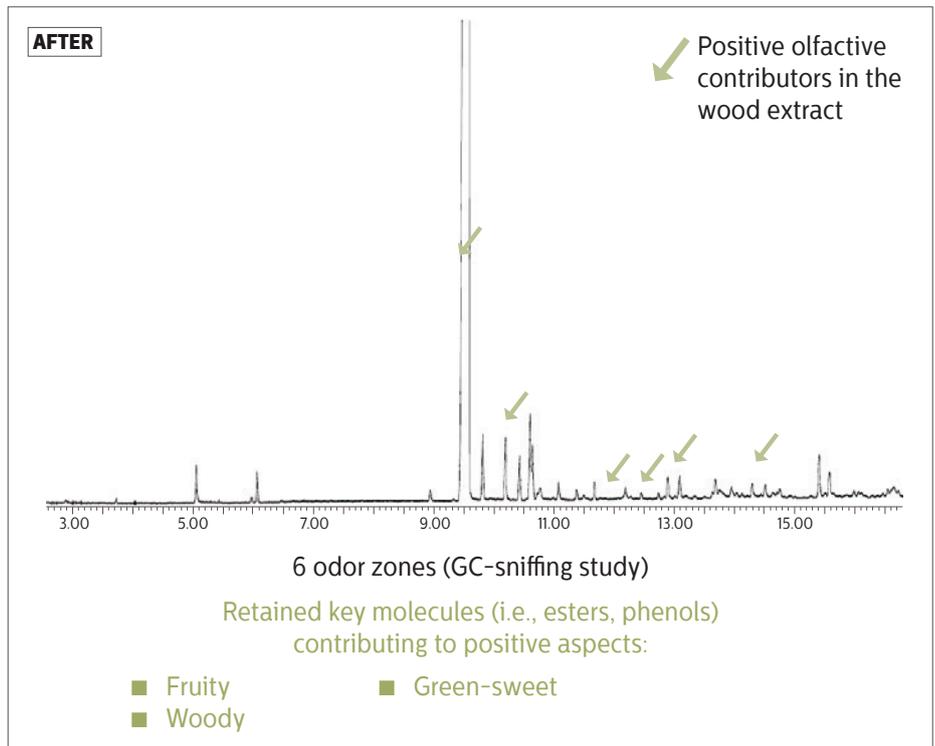


Figure 2: GC-MS analysis: Before & after

After numerous trials spanning a period of two years, R&D researchers and perfumers uncovered an extracted natural ingredient that offered genuinely unusual and meaningful benefits in actual fragrance compositions, most often fine fragrance creations.

The fragrance development managers and perfumers who evaluated fragrances containing the new woody note have found

that this new ingredient offers some extremely interesting and desirable perfumery properties. In summary, the most commonly stated attributes of the new captive are:

- Intensity.
- Long-lastingness.
- Multi-faceted composition.
- Binding properties.
- Genderless modernity.

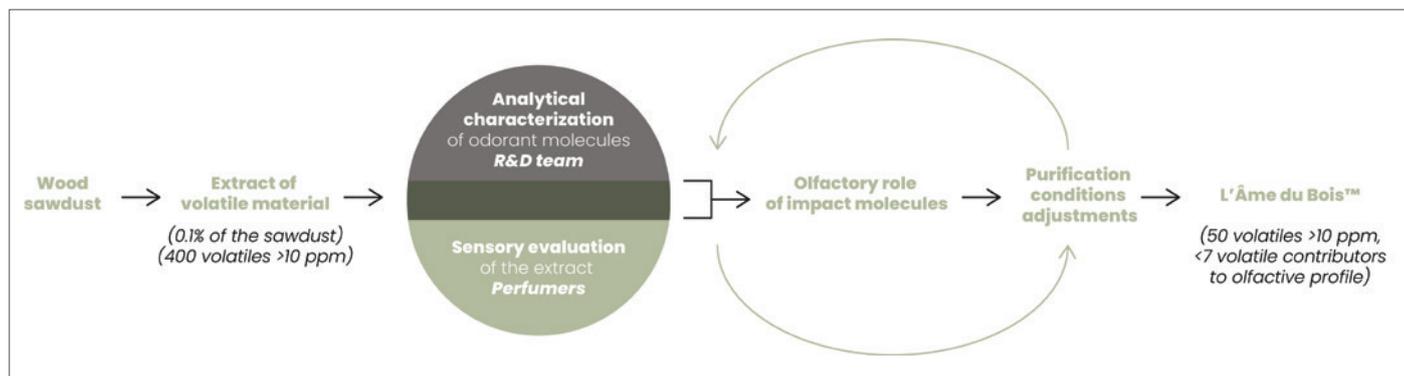


Figure 3: Development steps & synergy between R&D team & perfumers

In terms of describing the new ingredient, woody, resinous, fruity, green and earthy notes are prevalent (Figure 4). Furthermore, the use of a small amount of the new woody note has a powerful and positive impact on the entire fragrance. Altogether, perfume designers are confident that it will help differentiate their customers products—in a meaningful way—in this extremely competitive environment.

Sustainable & safe

Eurofragrance's regulatory affairs department was involved in the development of the new ingredient from the very beginning to ensure that the substances produced were safe. The company follows the recommendations of the International Fragrance Association (IFRA) Code of Practice, and is an active member of the Spanish Association of Manufacturers of Fragrances & Flavours (AEFAA).

With regards to quality assurance and the implementation of proper processes, the company follows ISO 9001 and ISO 14001

management guidelines. In particular, the regulatory team conducted due diligence with regards to the usage of the future raw material when incorporated into a range of products from cosmetics to laundry detergents.

To evaluate the potential toxicity of the new woody note, the team called on the expertise of Cehtra, a French environmental and human toxicology consultancy. Cehtra found that it is safe and non-allergenic when properly dosed. Additionally, the novel ingredient was created by using natural, sustainable processes.

While captives can be of natural or synthetic origin, it appears as though the number of natural or sustainable captives introduced on the market each year is on the rise. This trend is probably fuelled by the growing demand from end-users for sustainable products and green chemistry.

Not only is the new woody note created from upcycled waste product, its extraction process is also respectful of the environment. Furthermore, it is safe for use in cosmetics,

and, because its recommended dosage in a fragrance formula is so low (<1%), it has no impact on consumer health.

For manufacturers interested in offering a true sustainable product, it is now possible for them to create fragrances with the new captive that are 100% sustainable and natural, if they wish to do so.

New to the palette

No perfume house can afford to overlook its palette of raw materials. These raw materials are literally the foundation of fragrance design. Companies are constantly looking to improve and enlarge the number of ingredients, natural or synthetic, to offer to their creation departments.

In this instance, the new woody note joins the company's broad palette of roughly 1,200 ingredients, comprised roughly of 25% natural and 75% synthetic ingredients.

With regards to the former, half of the company's suppliers abide by strict sustainability protocols, and it is encouraging others to take this step and further increase this ratio. That said, synthetic perfumes also offer interesting sustainability and ecological benefits, such as the reduction of deforestation and the depletion of resources, e.g. arable land and water.

The new woody note clearly falls into the natural ingredient category and, in addition, ticks all the sustainability boxes. The story behind it, with its origins, its production process and its 'sustainable' label makes for an emotional story that resonates with today's customers and consumers—after all, perfumes are all about emotions.

Conclusion

What is expected from perfumers when they select a captive from their palette is for that ingredient to give the fragrance a distinct signature that cannot be attained any other way. L'Âme du Bois has such a signature.

In the industry, possessing a proprietary ingredient with its very own signature, allows one to approach and engage with customers. It is a door-opener that fosters win-win relationships. Other captive products are already on the way. **PC**

Reference

1. Valesdolo F. The rise and rise of gender-fluid fragrance. Vogue. 11 February 2022. <https://www.vogue.com/article/gender-fluid-fragrance>

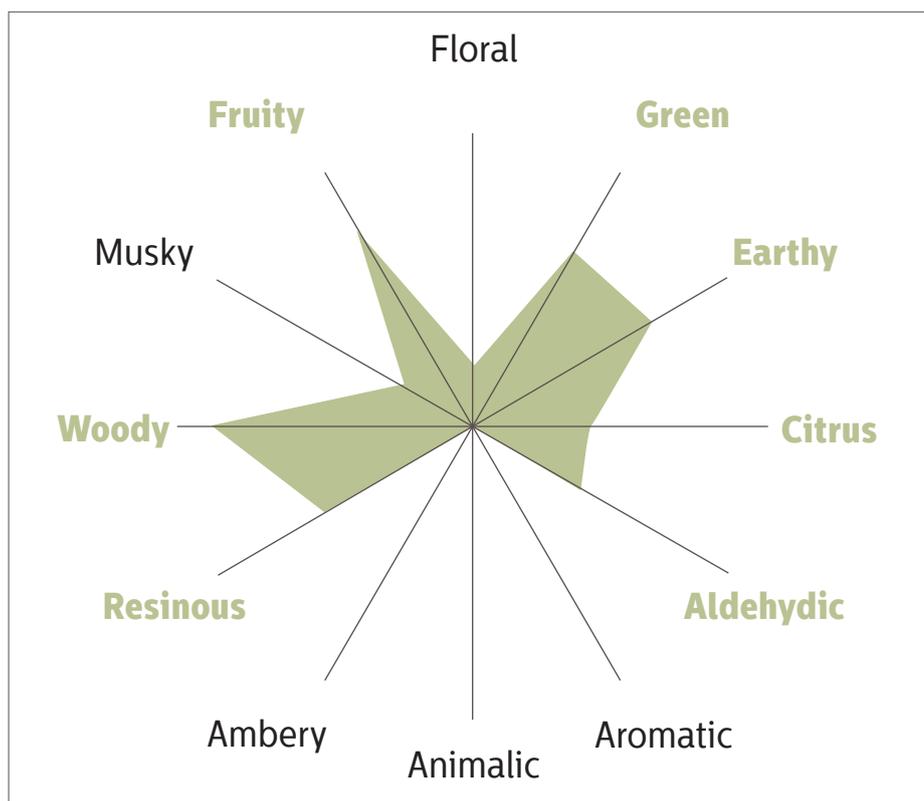


Figure 4: Olfactive spiderweb chart of new woody note