It is not all about the smell: How drop-in technologies are changing the perfumery market with scientifically proven claims

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Introduction:

The perfumery industry has sought to deliver technologies that add scientifically proven emotional and physical responses to their products [1]. Pheromones seem to be an opportunity to develop functional fragrances beyond the smell. Drop-in technologies are quite interesting, as they have a wider range of applications without necessarily being linked to the fragrance's hedonic. Grupo Boticário developed a fragrance with an unscented plant-based technology that combines Coleus Forskohlii Root Extract and Camellia Sinensis Leaf Extract. Forskolin has the purpose of increasing the synthesis of androstadienone from its precursor. Several previous studies have demonstrated the ability of forskolin to induce an increased expression of the 3β-HSD enzyme, which represents a kind of "turbo effect" in the production of androstadienone [2] [3].

On the other hand, theaflavins and other natural polyphenols have shown the capacity to reduce the enzymatic activity of 5α-reductase. According to the synthesis pathway of pheromones, this inhibitory action constitutes a reduction in the metabolism of androstadienone, allowing its accumulation [4], [5]. The result is an active enhancer of the natural production of androstadienone through a coordinated enzymatic modulation. **Androstadienone is a testosterone derivative compound, postulated as a male pheromone. Both are linked to sexual characteristics and impact human behavior and psychophysiological events (such as attraction)** [6].

Focusing on consumers' resocialization needs and the innovation opportunities in the fragrance category, this work aimed to prove how a developed **male fragrance with this technology can deliver not only a biological effect but also real emotional and physical tangible benefits to consumers,** using explicit evaluation by questionnaires and implicit technique from neuroscience.

Materials & Methods:

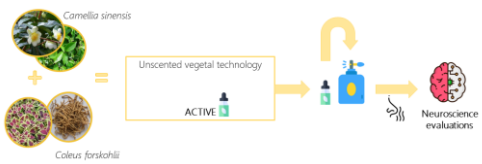
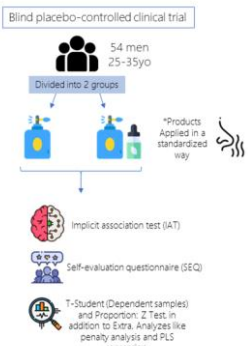


Figure 1: Makandi forskolin (Coleus Forskohlii) roots and a fraction rich in theaflavins obtained from fermented leaves of black tea (Camellia Sinensis) was used to develop an unscented vegetal technology.



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Results & Discussion:

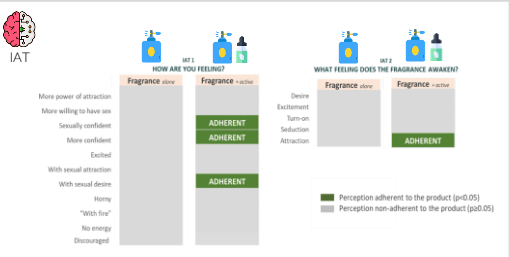

Figure 3: IAT results for both groups (fragrance alone: placebo; and fragrance + active). Participants were asked "We know that fragrances can arouse different sensations. Now that you've had contact with this fragrance, we want to understand a little bit how you're feeling after smelling it. You can smell it again now, and pay attention to how you're feeling". The results indicated in green as "adherent" are the ones that the perception was adherent to the product (p<0.05) and the results indicated in grey are the ones that the perception was not adherent to the product (p≥0.05).

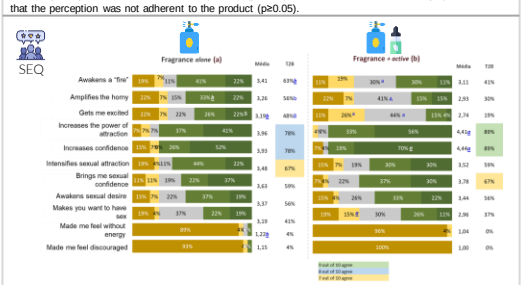

Figure 4: Self-assessment results for both groups (fragrance alone - placebo; and fragrance + active). Participants were asked, "Thinking about what this fragrance awakens in you, say if you agree or disagree with this statement.". The results indicated in green, blue and yellow were the ones that were statistically significant when compared to the other group (p<0.05).

The surprising in vivo neuroscience results have proved that when included in fragrances' formulations, this specifically **unscented plant-based drop in technology (active ingredient) can improve human opposite-sex interactions by unconsciously triggering emotional sensations.**

The results demonstrated that **the active ingredient was responsible for bringing the desired sensation and physical reaction into the users: feelings of attraction**. Since the active ingredient increases androstadienone production, it is suggested that this increase in pheromone could be the one responsible for triggering the emotional responses. It is known that androstadienone has a beneficial effect on sexual desire and arousal [7], affecting subjects' mood and cortisol levels and also activating some brain areas that are linked to social cognition [8], both in men and women [7,8]. Therefore, using this active ingredient was essential so the product could deliver the desired claims. This type of technology is still a novelty within the perfumery and cosmetics market since it is not inside the fragrance. **Drop-in technologies are versatile since they can be added to different formulas. These could be the beginning of a new path in the field of sensations and emotions within the cosmetic sector.**

Conclusions:

The drop-in technology added to the formula was essential for developing the product since it was the one that was proven to trigger the emotional sensations of attraction, confidence, and sexual desire in men by neuroscience. Nowadays, most of the technologies for emotional benefits are within the fragrance; therefore, adding a drop-in technology is a unique strategy for perfumery.

Acknowledgements:

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