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

Reus, Thamile Luciane[1*]; Lyra, Thiago de Marchi[1]; Pereira, Vanessa Jaqueline De Almeida Ribas[1]; Oliveira, Camila Flavia Schettino[1]; Marson, Luciana[1]; Firmino, Ana Raquel Inácio[1]; Müller, Rafael[1]; Bosch, Jordi[2]; Monteiro, Roberto Jorge[3]; Roda, Priscila[3]; Meneguel, Jessica[3].

1 Research and Development Department, Grupo Boticário, Paraná, Brasil

2 Technical Department, Provital S.A.U., Barcelona, Spain.

3 Marketing Department, Provital, São Paulo, Brazil.

**thamile.reus@grupoboticario.com.br*

Abstract

The current world scenario has encouraged consumers to seek cosmetic products that deliver emotional benefits. Since smell is the most related sense to emotions, perfumes have the power to unveil different kinds of feelings and sensations.

Nowadays, the industry of perfumery has sought to bring functional fragrances that go 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. The unscented drop-in technology, developed by Provital, was added to the formulation of male perfume, and neuroscience and consumer evaluations were carried out. The neuroscience results demonstrated that the product with the drop-in technology was highly associated with the concepts: "sexually confident," "more confident," "with sexual desire," and "attraction". The self-assessment questionnaire showed similar results for both groups, showing the limitation to access emotions by explicit analysis and the importance of neuroscience techniques in this context. The surprising in vivo neuroscience results have proved that when included in fragrances' formulations, this specifically unscented plant-based drop in technology can improve human opposite-sex interactions by triggering emotional sensations. These could be the beginning of a new path in the field of sensations and emotions within the cosmetic sector.

Keywords: Neuroscience; Emotions; Sensations; Drop-in; Functional fragrances.

Introduction:

The coronavirus pandemic has caused economic and health uncertainties. In addition, it has raised stress levels by depriving people of maintaining social interactions that are indispensable conditions for human association [1]. This scenario encouraged consumers to seek cosmetic products focused on holistic approaches that, besides improving their outward appearance, also deliver emotional benefits. Since smell is the most related sense to emotions, perfumes have the power to unveil different kinds of feelings and sensations [2]. It is established that smell and body odor are significant for self-esteem and social communication [3]. When it comes to socialization, the existence of communication through pheromones is present in almost all social animals. Pheromones are natural substances produced and released by animals (including humans), which act as chemical stimuli to elicit certain responses, either physiological or behavioral, in other individuals of the same species. In most mammals, these molecules are detected by a unique organ, the vomeronasal organ (VNO), that signals the hypothalamus to trigger this behavioral or physiological response. Several studies support pheromones' role in human communication, especially in sexual attraction [4].

The perfumery industry has sought to deliver technologies that add scientifically proven emotional and physical responses to their products [5]. 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 [6] [7].

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 [8], [9]. 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) [10].

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 and Methods:

Provital synergic combined 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 that stimulates and modulates the synthesis and production of androstadienone, a male pheromone related to sexual attraction. The unscented drop-in technology, developed by Provital, was added to the formulation of male perfume, and neuroscience and consumer evaluations were carried out. To prove the emotional effects of the technology, a blind placebo-controlled clinical trial using an implicit research method was conducted in Brazil with 54 men from 25-35 years old. Participants were divided into two groups (27 each): (i) product with the technology (fragrance + active); (ii) placebo (product without the technology: fragrance alone). Both groups applied the product in a standardized way, and the methodologies carried out were: The implicit association test (IAT) and a self-evaluation questionnaire. The IAT is a measure of implicit bias based on the principle that if a congruent association between two concepts (e.g., a product and a sentence) is readily accepted as true by the rater, then the reaction time for categorizing such associations will be very quick. The statistical analysis carried out for the comparison between groups was: T-Student (Dependent samples) and Proportion: Z Test, in addition to Extra, Analyzes like penalty analysis and PLS regression.

Results:

The IAT methodology demonstrated that the product with the drop-in technology (fragrance + active) was highly associated with the concepts: “sexually confident,” “more confident,” “with sexual desire,” and “attraction,” while the placebo (fragrance alone) did not have adherence to the concepts. These prove that the drop-in technology can affect not only biological mechanisms, but also unconscious responses as emotions (Figure 1).

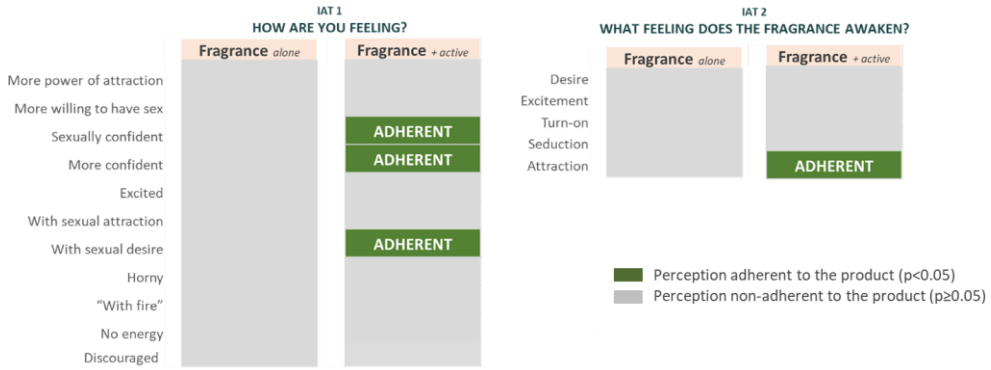

Figure 1: IAT results for both groups (fragrance alone: placebo; and fragrance + active). Participants were asked “We know that fragrances can arouse different sensations. Now that you've had contact with this fragrance, we want to understand a little bit how you're feeling after smelling it. You can 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 ($p\geq0.05$).

On the other hand, the self-assessment questionnaire showed similar results for both groups (Figure 2), demonstrating the limitation to access emotions by explicit analysis, and the importance of neuroscience techniques in this context.

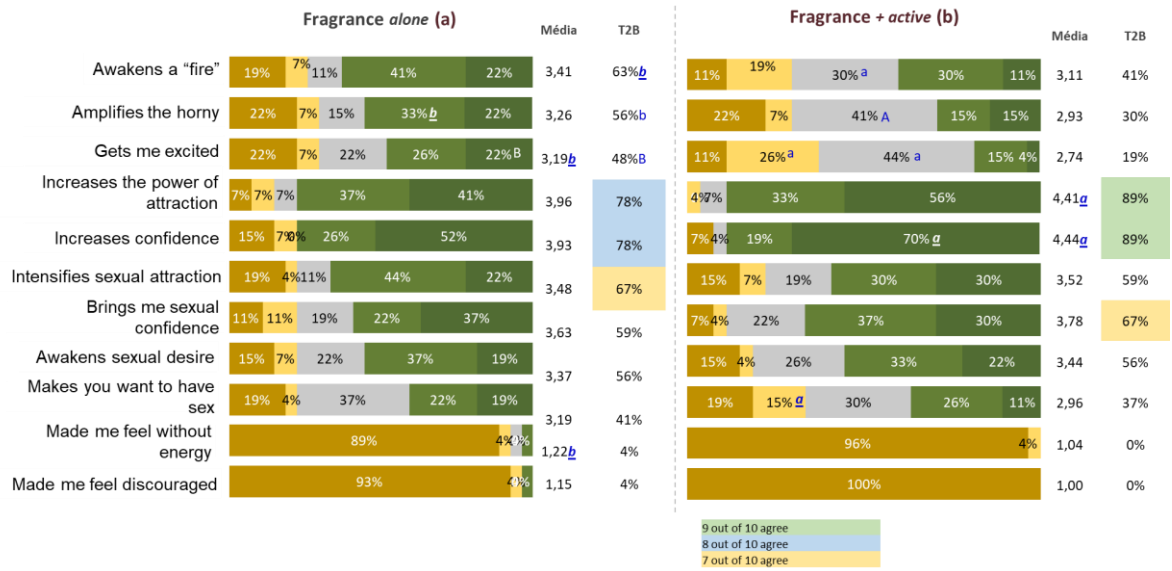

Figure 2: Self-assessment results for both groups (fragrance alone - placebo; and fragrance + active). Participants were asked, "Thinking about what this fragrance awakens in you, say if you agree or disagree with this statement.". The results indicated in green, blue and yellow were the ones that were 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.

Discussion:

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 [10], affecting subjects' mood and cortisol levels and also activating some brain areas that are linked to social cognition [11], both in men and women [10, 11]. 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.

Conclusion:

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.

Conflict of Interest Statement. None.

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