ABSTRACT
Cosmetic products must be kept free from micro-organisms to ensure the safety of the product and of their users. To maintain the microbiological quality required during its shelf life, one or several preservatives are usually added to the product. However, the safety of some preservatives for human health has been brought into question, such as parabens or isothiazolinones for example. Regulations of these conventional preservatives are perpetually under revision, and restrictions of their use are often adopted. In this context, alternative to conventional preservatives are searched for. Suppliers of raw materials try to propose new antimicrobial substances that can help the preservation of formulations, but it is currently a real challenge for formulators to find satisfactory solutions. Indeed, it is really problematic nowadays to find an efficient preservative system which is compatible with various galenics, which present a large antimicrobial spectrum and which is safe for users at the used concentrations.

In order to find some interesting preservative systems, we worked on a methodology to determine the efficacy of some antimicrobial substances while evaluating their impact in various formulations (Fig.1). During this 6-months study, we worked on 17 selected substances thanks to a screening that was realized among propositions of raw material suppliers. These substances were incorporated in various representative galenic forms of skin-care and make-up products. Physicochemical controls and stability studies were carried out on these formulas. Concurrently with this formulation step, microbiological tests were realized. A specific protocol, inspired from the challenge test protocol described in the ISO 11930 standard, was put in place in order to collect rapidly some reliable results by reducing the number of tests and decreasing the length of the study.

The strategy developed during this study was aimed at optimizing the time between the formulation step and the evaluation of the efficacy of the tested substances in the final product.

Three criteria were evaluated:
1. the impact on the stability of the product;
2. the antimicrobial efficiency;
3. the impact on the cost of the formulation.

On the basis of these three criteria, 6 substances were found to be interesting. Concerning the methodology, some discordance between our microbiological protocol and the normalized protocol of challenge testing were highlighted. This observation revealed that this lightened method allows an important reactivity for the realization of a screening of potential new substances, but in any case it can be a solution of replacement of the actual protocol.

To conclude, the methodology followed during this study was adapted to collect many results to study potential interesting preservatives systems. In the current context, this method can be applied for future studies in order to find solutions to boost the preservative system of cosmetic products.
**FIG1 LEGEND**
Figure 1: Methodology to search for alternatives to conventional preservatives

**KEYWORDS**
Preservative | Antimicrobial substances | Methodology | Challenge Test | Screening

**REFERENCES**

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