TITLE: IMPACT OF DIFFERENT METHODS OF INACTIVATION OF THE PROBIOTIC STRAINS IN *P. ACNES* AND *S. EPIDERMIDES* FOR COSMETIC APPLICATION.

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ABSTRACT:
Acne vulgaris is one of the most common skin diseases and is observed in approximately 80% of young adults. The microbiome may influence disease severity in the skin. The proliferation of *Propionibacterium acnes* is an example and is involved in the development of acne. There are some strategies to inhibit inflammation or kill *P. acnes* and the use of probiotics strains could be a natural control. Probiotics are live microorganisms that when administered in adequate amounts confer benefits to the health of the host. Lactic acid bacteria (LAB), such as Lactobacillus species, have protective effects against a variety of pathogenic infections. For cosmetic industry application the use of lysates and inactivated probiotic bacteria is a trend. As long as the beneficial effects are maintained, they present an advantage such as reducing the shelf life problem, translocation risk, and consumer infection. This study aimed to evaluate the inactivation of four LAB species by different medium and methods and evaluated their activity against *P. acnes* and *Staphylococcus epidermidis*. The inactivation study of the LAB species UFSJA, UFSJB, UFSJC and UFSJD cultured in whey or MRS was performed by autoclave**,** sonication, UV and pearl mill. The antimicrobial activity of the viable cell pellets and inactivated cells for LAB species were tested against *Propionibacterium acnes* ATCC 6919 and *Staphylococcus epidermidis* ATCC 12228 by spread plate. About 100 µL of the bacterial suspensions were added on petri dishes with MRS agar medium and incubated for 48h at 37°C and then the cells were counted. All the LAB species viable cell pellets were able to inhibit the growth of *P. acnes* in an intermediate form, with inhibition halos between 10 to 20 mm and they did not inhibit the growth of *S. epidermidis*. All the LAB species cultivated in MRS medium were completely inactivated by autoclave and UV, and in the case of sonication excepted for UFSJB. Using whey medium only the autoclave process was effective for inactivation. Using pearl mill the process was not effective. The inactivated isolates demonstrated not anti-acne activity. **Conclusion:** distinct species may be more sensitive to different methods of inactivation and in different cultures. MRS medium was more susceptible for inactivation process than whey medium. The antimicrobial effect against *P. acnes* is a thermos sensitive, and cell viability is required. The viable probiotic strains presented health application to combat acnes.
Keywords: lactic acid bacteria, probiotics, inactivation, antimicrobial, cosmetic

Agency: CAPES, CNPq, FAPEMIG and UFSJ.