Optimizing fungal unhairing in bovine skin with *Fusarium oxysporum*

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Abstract

The optimization of enzymatic unhairing in bovine skin was carried out by means of different dilutions and by means of the correlation between the observation and the score of the morphological changes.

Introduction

The global context of climate change and the events related to the origin of the COVID-19 pandemic call for a paradigm shift in industrial process technologies. Enzymatic unhairing is presented as a sustainable alternative: not only reduces the emissions of hydrogen sulfide, but its biotechnology obtaining is friendly to the environment. However, their characterization through their enzymatic activity and histological action is necessary.

Materials and Methods

•Enzimatic extracts (EE): batch liquid culture of *Fusarium oxysporum*
•Quantitative test: keratinolytic activity (2,7 U ker)
•Unhairing assay at laboratory scale: Submerged bovine skin+EE (1:1; 1:2; 1:4)+biocide 0,2%+anionic tensioactive 0,1%+ non-ionic tensioactive 0,5% . EE at different concentration (Table 1)
•Control skin whitout EE
•Incubation 24 h and 48 h at 37°C at 40 rpm in thermostatic bath (Table 1)
•SEM observation of morphological changes
•Score of the samples: parameters of morphological changes
•Score in the spider graph (Fig.1)

Table 1

Sample number	1	2	3	4	5	6	T1	T2
Dilution	1:1	1:1	1:2	1:2	1:4	1:4	--	--
Incubation time (h)	24	48	24	48	24	48	48	48

Parameters of morphological changes: score

➢hair, epidermis with normal patterns: (0 to +3)
➢detachment of hair follicle sheath (+3 to 0)
➢absence of epidermis (+3 to 0)
➢empty hair follicles (+3 to 0)
➢visible dermal papilla (+3 to 0)

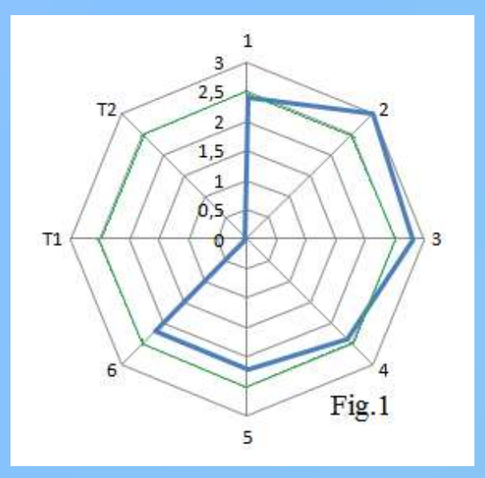


Fig.1: average values according to parameters (samples 1 to 6; controls T1 and T2)

Results and discussion

SEM observation

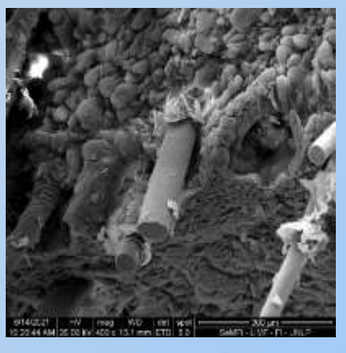


Fig.2: sample 1

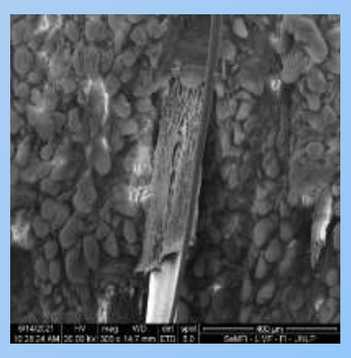


Fig.3: sample 2

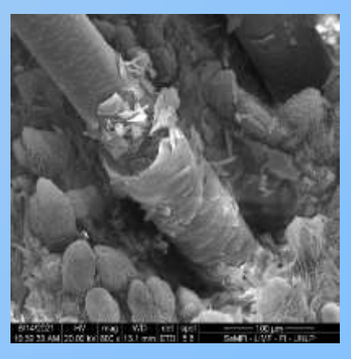


Fig.4: sample 3

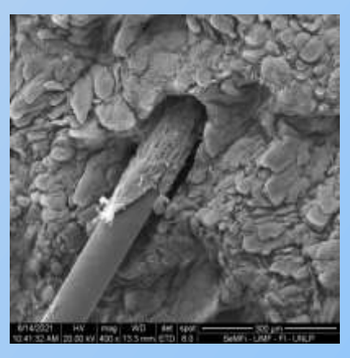


Fig.5: sample 4

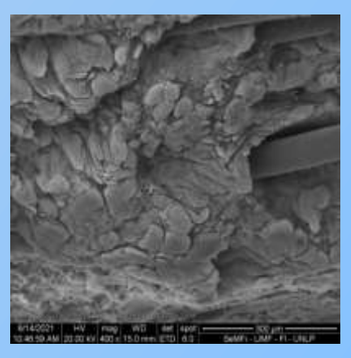


Fig.6: sample 5

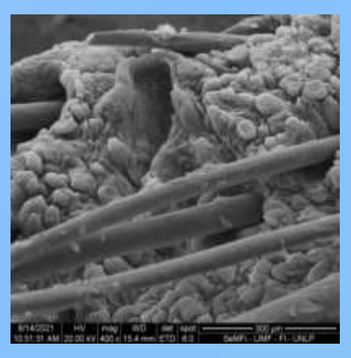
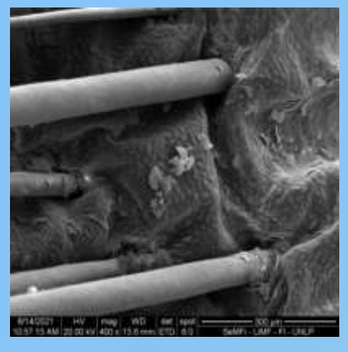


Fig.7: sample 6



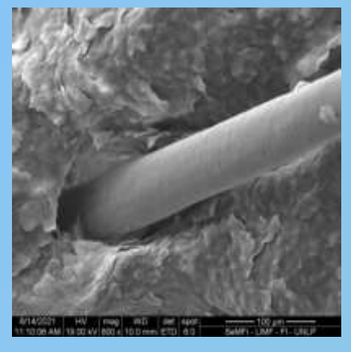


Fig.8 and 9 : Controls T1, T2

Conclusions

SEM observation and score showed the highest values in samples 1 and 2 with EE 1:1, 48 h and 24 h. In samples 5 and 6, 1: 4, 24 h and 48 h, the average values were lower; control samples were close to zero (Fig. 1). In conclusion, the observations have shown a linear correlation between the EE conditions and its action on the skin.

References

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