Study on Bio-conversion and Microbiome Diversity of Compound Traditional Chinese Herbal Medicines

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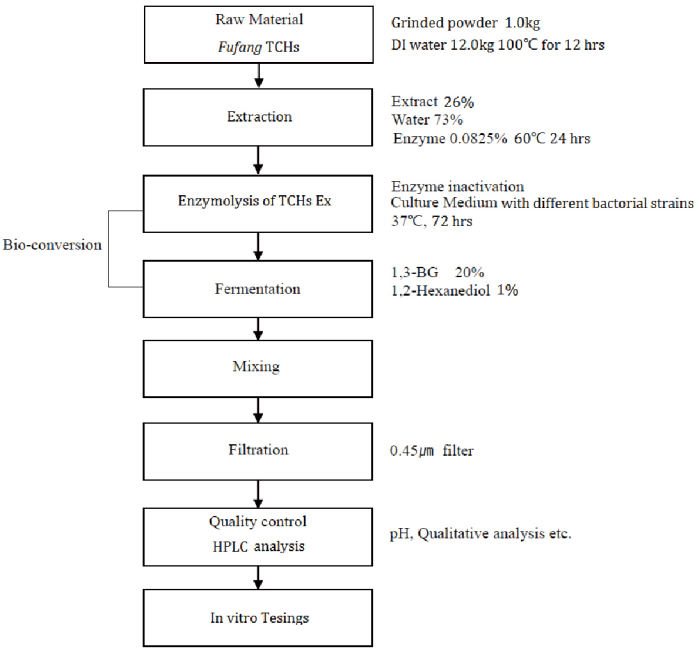
1.Introduction

Recent years, fermentation or enzymolysis bio-conversion of TCHs can enhance their effectiveness and reduce their toxicity, improve the bioavailability and so on, because both bio-conversion techniques can produce new components and break down or convert certain common substrate components into compatible components. Furthermore, they can typically increase physiological and biochemical activities of biological substrates by modifying their naturally occurring molecules.[2,3]

2. Experimental Methods

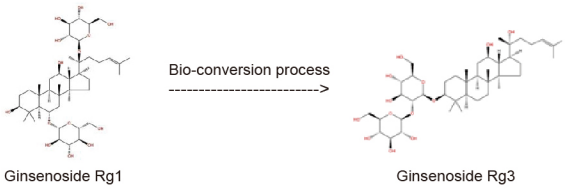


4. Conclusion

It can be concluded that by using the newly designed enzymolysis and fermentation biotransformation process under optimized conditions, which can transform the water extract to fermented extracts with higher actives level and better skin benefits. Analytical testing results showed that the actives content in fermented TCHs was dramatically increased to 2 ～ 4 times higher than unfermented TCHs. Biotransformation process can enhance the release of functional ingredients from the extracts. Moreover, in-vitro tests including DPPH radical scavenging activity, cells proliferation and Hyaluronan-CD44 receptor, have showed significant enhancement of efficacy, inhibition rate on DPPH antioxidation as example achieved over 60% improvement, which makes TCHs application more feasible. It is inferred that this study potentially enables the TCHs to deliver required bio-efficacy in cosmetic application.

3. Results and Discussion

3.1 Enzymatic hydrolysis to enhance the active levels



3.2 In-vitro experiments to evaluate the skin benefits

Table 5. In-vitro experiments results

Items	TCHs Ex	TCHs-F formula B
DPPH/%	44.0	70.5
Tyrosinase inhibition rate/%	74.1	86.7
TGF-β1content /pg/mL	189.0	487.0

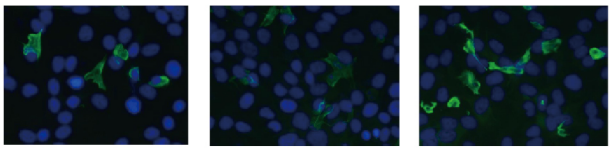


Figure 1. Hyaluronan-CD44 expression with different extracts

3.3 In-vivo clinical study

Table 1.Skin parameters after four weeks treatment(Mean±SD,n=100)

Item		TEWL		Sebum amount		Skin pH	
		Before	After	Before	After	Before	After
Formula with 90% fermented compound	Average	27.87353	23.57958	102.05	102.7325	5.899	5.968
	SD	7.549333	5.41173	57.2202	79.36056	0.410214	0.443125
	P		0.000992*		0.95416		0.502422
Formula with 90% water	Average	28.26075	24.53535	131.875	127.225	5.932	6.0205
	SD	9.848531	10.35359	66.41138	76.07166	0.493778	0.552806
	P		0.12408		0.76568		0.3922

Note：*significant difference

3.4 Analysis of species composition and differences

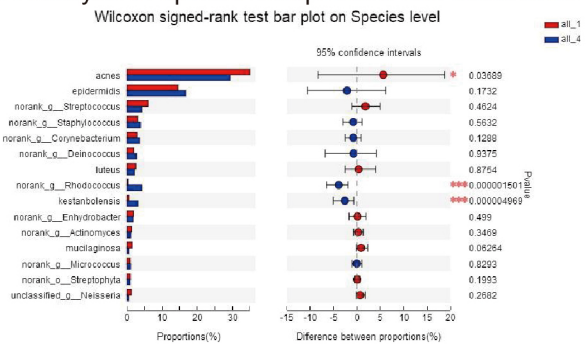


Figure 2. Wilcoxon signed-rank test bar plot on Species level

Reference

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