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Isolation of endophytes from *Gentiana veitchiorum* and its potential application in cosmetics

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Introduction:

Plants from *Gentiana* genus have been widely utilized as herbal medicines for a long history over the world. The effectiveness of different *G.* species in treatment of hepatic disorders and inflammatory diseases also have been proved over the time. This shows that the medicinal value of *G.* plants has been widely recognized all over the world with the effects of antibacterial, antioxidant, anti-tumor, etc. *G. veitchiorum* Hemsl. is an effective traditional herbal in Tibetan medicine, mainly distributing in alpine-cold region of China, such as Tibet, Sichuan and Yunnan Province. In traditional Chinese medicine, it was always used for treatment of high fever, dizziness, jaundice, sore throat, red eyes and hepatitis [4]. Endophytes, which include bacteria and fungi, live within the healthy tissues of living plants and are essential components of plant micro-bionetwork. In planta, endophytes play diverse roles: nutrient acquisition, including nitrogen fixation and phosphate solubilization, phytohormone and siderophore production, protection against abiotic stresses, such as salinity, drought or pollution, or phytopathogen control [5]. Endophytes are a large group of microorganisms, which is distributed in different parts of host plants, and does not present infection symptoms to the host. It is reported that plant endophytes showed a great species diversity [6]. Endophytes and the host plants keep a relatively stable symbiosis by producing some metabolites and those metabolites have the function of anti-tumor, antibacterial, antiviral, insecticidal, immunosuppressive, antioxidant and hypoglycemic activities according to the research [7, 8]. Therefore, potential biotechnological applications of endophytes from different plants is of great significance in the future. In this study, endophyte strains were isolated from the different parts of *G. veitchiorum* and the components, antioxidant activity, antimicrobial activity, elastase inhibition of their fermentation products were then investigated, in order to evaluate the application potential of those endophytic ferments in skin care.

Materials & Methods:

Gentiana veitchiorum

Flowers | Stems | Leaves | Roots

Isolation of endophytes

Identification by 16S/26S rDNA

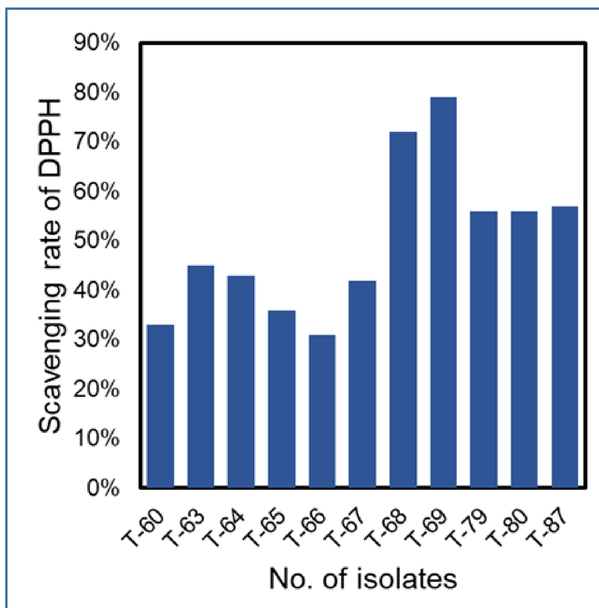
Preparation of endophytic ferments

Assessments of cosmetic application

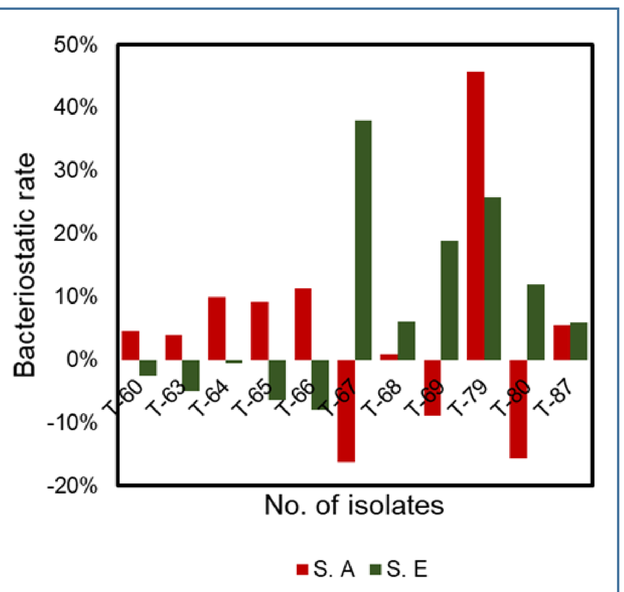
Functional components: Total polyphenols | Total polysaccharides

Skin care effects: DPPH radical scavenging | Anti-bacterial | Elastase inhibition

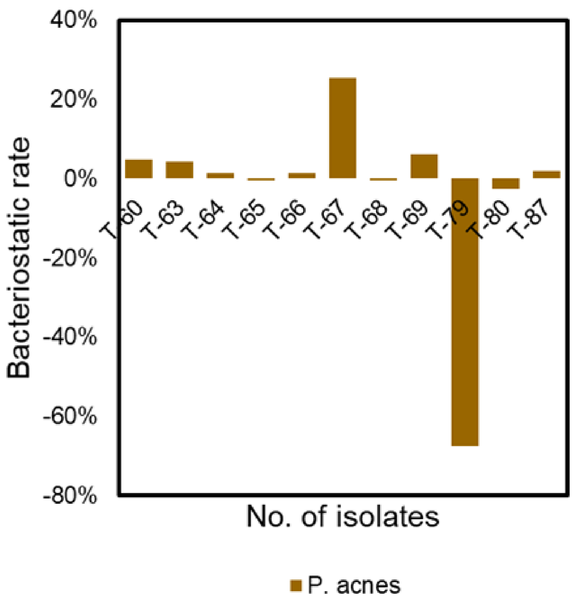
Results & Discussion:



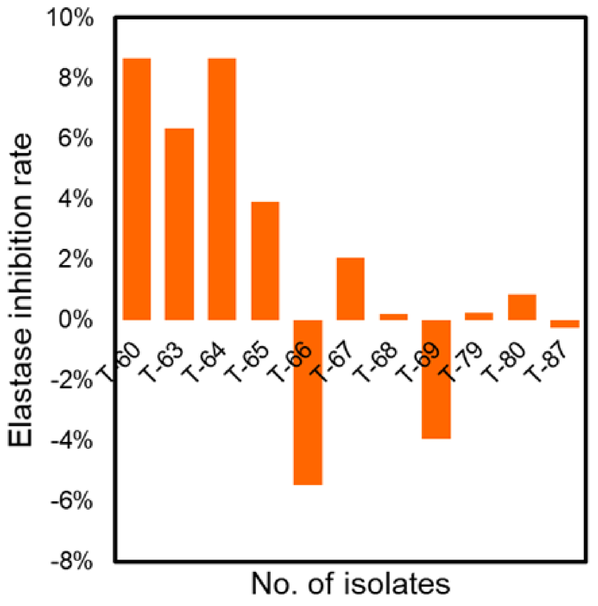
Strain T-68, T-69, T-79, T-80, T-87 had pretty good DPPH scavenging ability.



Strains T-67, T-69, and T-80 could inhibit the reproduction of *S.A* and promote the growth of *S.E*.



Strain T-79 exhibited great effect on *P. acnes* growth.



Strain T-66 and T-69 could reduce the amount of elastase.

Conclusions:

Total 31 strains of endophytes were isolated from *G. veitchiorum* and 11 of them were screen out for effect evaluation of fermentation liquid. Total solid, polyphenol content, polysaccharide content, antioxidant activity, antimicrobial activity, and elastase inhibition experiment were performed. The above results indicated that the ability of anti-oxidation and skin micro-ecological maintainment may closely be related with total polyphenols content and total polysaccharides. Strain T-68, T-69, T-79, T-80, T-87 had pretty good anti-oxidative ability. Strains T-67, T-69, and T-80 could inhibit the reproduction of *S.A* and promote the growth of *S.E*. These remarkable effects in skin micro-ecology maintainment and oxidation resistance reveal its potential application feasibility in cosmetics.

Aknowledgments:

None.

References:

1. Baser KHC, Honda G, Miki W (1986) Herb Drugs and Herbalists in Turkey. Studia culturae islamicae 27.
2. Suh HW, Lee KB, Kim KS, Yang HJ, Choi EK, Shin MH, Park YS, Park YC, Na, AKS, Jang YP, Um JY, Jang HJ (2015) A bitter herbal medicine Gentiana scabra root extract stimulates glucagon-like peptide-1 secretion and regulates blood glucose in db/db mouse. Ethnopharmacol 172:219-226.
3. Skinder BM, Ganai BA, Wani AH (2017) Scientific study of Gentiana kurroo Royle. Medicines 4 (4).
4. Zhang ZF, Liu Y, Lu LY, Luo P (2014) Hepatoprotective activity of Gentiana veitchiorum Hemsl. against carbon tetrachloride-induced hepatotoxicity in mice. Chinese Journal of Natural Medicines 12(7):488-94.
5. Khare E, Mishra J, Arora N.K (2018) Multifaceted interactions between endophytes and plant: evelopments and prospects. Front Microbiol 9:2732
6. Jakub P, Magdalena F, Marketa PM, Jachym S, Ondrej U (2020) The invisible life inside plants: Deciphering the riddles of endophytic bacterial diversity. Biotechnology Advances 44:107614.
7. Stierle A, Strobel G, Stierle D (1993) Taxol and taxane production by Taxomyces andreanae, an endophytic fungus of Pacific yew. Science 260(5105):214-216.
8. Qin S, Li J, Chen HH, Zhao GZ, Zhu WY, Jiang CL, Xu LH, Li WJ (2009) Isolation, diversity, and antimicrobial activity of rare actinobacteria from medicinal plants of tropical rain forests in Xishuangbanna, China. Appl Environ Microbiol 75(19):6176-6186.
9. Anon 2005 ISO 14502-1 (2005) Determination of substances characteristic of green and black tea- Part 1: Content of total polyphenols in tea-colorimetric method using Folin-Ciocalteu reagent. Int. Stand. ISO.
10. Michel, DuBois KA, Gilles JK, Hamilton PA, Rebers, Fred Smith (1956) Analytical Chemistry 28(3):350-356