

1 **Using Atopic Dermatitis Mice Model to Study the Improving Effects**
2 **and Concerted Mechanism of *Undaria pinnatifida* Water Extracts**
3 **and Sacha Inchi Oil**

4 黃璟瑀(5137)

5 03/29/2023

6 **Outline**

- 7 1. Introduction
8 2. Component Analysis of *Undaria pinnatifida* water extracts (UPw) and the
9 Antioxidant Ability of UPw, Sacha inchi oil methanol extracts
10 3. Effects of UPw and Sacha inchi oil emulsion on cell survival and degranulation
11 on P815 mast cell
12 4. Oral administration of UPw, SIO and their mixture alleviate DNCB-induced
13 atopic dermatitis by regulating immune responses in BALB/c mice
14 5. Conclusion

15 **Abstract**

16 Atopic dermatitis (AD) is an allergic skin disease accompanied by chronic
17 inflammation that is characterized by severe itching, redness, dryness, and eczematous
18 skin lesions. It is known to be caused by immune dysregulation resulting from the
19 complex interaction of environmental and genetic factors. *Undaria pinnatifida* is an
20 edible brown seaweed which has bioactivities such as antioxidant, anti-inflammatory,
21 antitumor, antiviral, and anti-obesity properties. Sacha inchi (*Plukenetia volubilis*) oil
22 (SIO) has high contents of omega-3 fatty acids that can prevent multiple diseases;
23 including arthritis, cancer, diabetes, and inflammatory skin diseases. Mice were divided
24 into seven groups: (1) Control (only soybean oil), (2) DNCB-ddH₂O (DNCB + ddH₂O),
25 (3) DNCB-soybean oil (DNCB + soybean oil), (4) Dex. (DNCB + Dexamethasone), (5)
26 UPw (DNCB + *Undaria pinnatifida* water extracts), (6) SIO (DNCB + Sacha inchi oil)
27 and (7) Mix (DNCB + *Undaria pinnatifida* water extracts + Sacha inchi oil). The results
28 showed that the antioxidant DPPH scavenging activity, hydrogen peroxide scavenging
29 activity and ferrous ion chelating activity of *Undaria pinnatifida* water extracts (UPw)
30 were 77.33 ± 0.74 %, 70.79 ± 2.72 % and 86.80 ± 0.94 %, while the antioxidant DPPH
31 scavenging activity, and ferrous ion chelating activity of SIO methanol extracts were
32 60.33 ± 2.60 % and 66.87 ± 8.64 %. When used in vitro 1 mg/mL of UPw and 3.125
33 mg/g of SIO with P815 mouse mast cells had anti-degranulation effect, but not
34 significant cytotoxicity. In vivo, UPw, SIO, and their combination showed they could
35 reduce DNCB-induced IgE expression, skin damage, subiliac lymph node swelling, and
36 spleen swelling while having no synergistic effects on alleviating DNCB-induced
37 symptoms in BALB/c mice. It suggests that UPw and SIO could serve as therapeutic
38 agents for inflammatory illnesses of AD.

References

- 1
- 2 **Cisneros, F. H., Paredes, D., Arana, A., & Cisneros-Zevallos, L. (2014).** Chemical
3 composition, oxidative stability and antioxidant capacity of oil extracted from
4 roasted seeds of Sacha-inchi (*Plukenetia volubilis* L.). *Journal of agricultural and*
5 *food chemistry*, 62(22), 5191-5197.
- 6 **Li, P., Huang, J., Xiao, N., Cai, X., Yang, Y., Deng, J., ... & Du, B. (2020).** Sacha
7 inchi oil alleviates gut microbiota dysbiosis and improves hepatic lipid
8 dysmetabolism in high-fat diet-fed rats. *Food & function*, 11(7), 5827-5841.
- 9 **Muangrat, R., Veeraphong, P., & Chantee, N. (2018).** Screw press extraction of
10 Sacha inchi seeds: Oil yield and its chemical composition and antioxidant
11 properties. *Journal of food processing and preservation*, 42(6), e13635.
- 12 **Tamagawa-Mineoka, R., & Katoh, N. (2020).** Atopic Dermatitis: Identification and
13 Management of Complicating Factors. *International journal of molecular sciences*,
14 21(8), 2671.
- 15 **Wang, L., Park, Y. J., Jeon, Y. J., & Ryu, B. (2018).** Bioactivities of the edible
16 brown seaweed, *Undaria pinnatifida*: A review. *Aquaculture*, 495, 873-880.
- 17