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Efficacy of Artemisia Capillaris for Atopic Dermatitis

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ABSTRACT

Atopic dermatitis (AD), an inflammatory, chronically relapsing skin disorder. AD is often accompanied by allergic inflammation, initiated by activation of immune response. Atopic dermatitis is caused by too much of the bacteria staphylococcus aureus on the skin. This displaces helpful bacteria and disrupts the skins barriers function. A weak skin barrier function might also trigger an immune system response that causes the inflamed skin and other symptoms. Artemisia capillaries has been evaluated for its anti-inflammatory and anti- allergic effects by measuring it's inhibition of nitric oxide and histamine production

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ATOPIC DERMATITIS

Eczema, also known as atopic dermatitis, is a disorder that results in dry, itchy, and inflammatory skin. The allergic inflammatory reaction of AD is brought on by the activation of the immune system.

In plasma cells, immunoglobulin E (IgE) is generated. Mast cells are bound in type Iallergic responses. Chemical mediators such histamine, leukotrienes (LTs), and prostaglandin D2 are released by IgE- primed mast cells (PGD2). Shortly after allergen-IgE binding, these mediators cause rapid phase reactions in the tissue, such as redness and itching. After several hours of allergen-antibody cross-linking, cytokines (IL-4 and IL-13) and chemokines are produced and released in the later stages of the illness.

Atopic dermatitis frequently starts at age 5 and can last into adolescence and adulthood. Some patients experience flare- ups followed by lengthy periods of improvement.

ARTEMISIA CAPILLARIS

A traditional medicine, Artemisia capillaris (AC), has a wide range of pharmacological qualities that can treat cancer and severe cirrhosis as well as liver malfunction. We searched internet databases, such as PubMed, Medline, and Google Scholar, using pertinent keywords to find scholarly works pertaining to this medicinal herb and its constituent parts. Previous research has demonstrated that the entire plant has anti- inflammatory, anti-steatosis, antiviral, antioxidant, and anticancer properties. The bioactive substances include coumarins (scopar- one, scopoletin, scopolin, etc.), flavonoids (isorhamnetin, quercetin, isoquercitrin, hyperoside, etc.), chromones (capil- larisin, 7-methylcapillarisin, etc.), phenylpropanoids (caffeic acid, chlorogenic acid, caffeoylquinic acids, etc.),lignans((+)-sesamin, pluviatide, honokiol, etc.), and essential oils (β-pinen β-caryophyllene, capillene, etc.).

The two main components in the AC extract were found to be isochlorogenic acid and chlorogenic acid. Isochlorogenic acid A also exhibits immunopotentiation characteristics. The generation of inflammatory mediators and cytokines has been shown to be inhibited by chlorogenic acid. Additionally, chlorogenic acid has antibacterial, antioxidant, anti-hepatotoxicity, and anti-allergic properties.

The main bioactive compounds in A. capillaris can reach their maximum concentrations through pharmacokinetics within an hour, but only chlorogenic acid has a particularly long

half-life. The dosage regimen of A. capillaris should be carefully considered when used by medical professionals to treat a variety of diseases in order to maximise therapeutic results while minimising potential side effects.

The harmful effects of blue light are successfully reduced (at least partially) by Artemisia capillaris extract due to the fact that it also protects against UV exposure therefore covers a larger solar spectrum than classical UV filters. Use of AC is suitable for the modern lifestyle because it can also block the blue light that is emitted from computer, phone, and tablet screens.

EXTRACTION

Artemisia capillaris plants were gathered and dried. Different methods can be used for the extraction process some are as follows:

Methods

- Hydrodistillation: Using the approved hydrodistillation method, the Cle-venger equipment was used to determine the amount of essential oil in SW.

- Soxhlet Extraction: Methylene chloride was used as the solvent in a soxhlet extraction of SW, with a solid to liquid ratio of 1:15 (g/mL). The extractions continued until all of the plant material had been used (8 h). After the extraction was finished, the extract's solvent was evaporated to dryness using a rotary vacuum evaporator, and the extraction yield (%, w/w) was calculated.

- Supercritical carbon dioxide extraction (SC-CO2): The extraction procedure was carried out using the laboratory-scale high pressure extraction equipment (HPEP, NOVA, Swiss, Effertikon, Switzerland). At two temperatures, 40 and 60°C, the SC-CO2 extraction of SW was carried out at pressures of 100, 200, and 300 bar. Three hours of extraction time and 0.194 kg/h of CO2 flow rate were also held constant. At 15 bar and 23 °C, the separator conditions remained constant.

HPLC ANALYSIS:

Using mobile phases made up of 1.0% (v/v) acetic acid in water (a) and 1.0% (v/v) acetic acid in acetonitrile, the contents of a. Capillaris chlorogenic acid, caffeic acid, hyperoside,

isoquercitrin, isochlorogenic acid a, and scoparone were simultaneously determined using the hplc-pda method (b). In the sample analysis, the six chemicals were eluted within 30 minutes using optimal chromatographic settings.

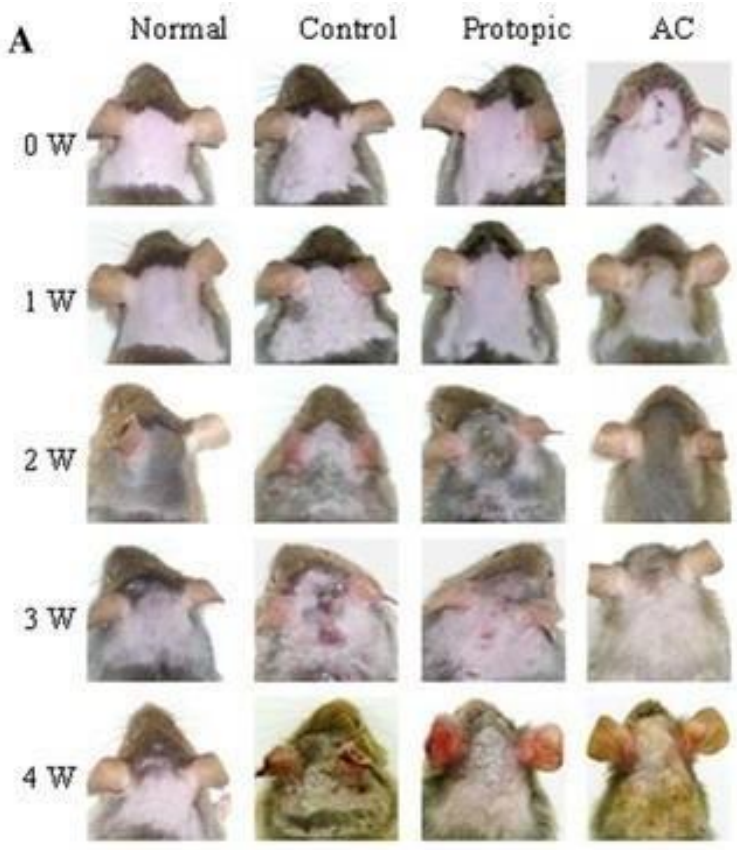
Compound	**Content(n:g/g)**		
	Mean	SD	RSD(%)
Chlorogenic acid	21.06	0.08	0.36
Caffeic acid	0.44	0.01	1.54
Hyperoside	8.44	0.03	0.38
Isoquercitrin	2.96	0.01	0.21
Isochlorogenic acid	43.14	0.12	0.27
Scoparone	5.56	0.02	0.43

Chlorogenic acid, caffeic acid, hyperoside, isoquercitrin, isochlorogenic acid A, and scoparone had respective retention durations of 11.63, 14.80, 19.53,19.78, 21.63, and 23.66.

EFFICACY TESTING

An imbalance of Th cells, the over expressions of COX-2 iNOS , which produce nitric oxide and prostaglandin E2, respectively, and lipopolysaccharide-stimulated macrophages are the three main contributing factors to atopic dermatitis, an inflammatory skin condition.

Six substances (chlorogenic acid, caffeic acid, isochlorogenic acid A, hyperoside, isoquercitrin, and scoparone) were simultaneously analysed using an HPLC machine to determine the composition of AC. NO generation in RAW264.7 cells treated with 1 g/mL LPS was assessed to assess AC's anti-inflammatory effects. In MC/9 cells treated with 50 nM PMA and 1 mM A23187, histamine levels were measured.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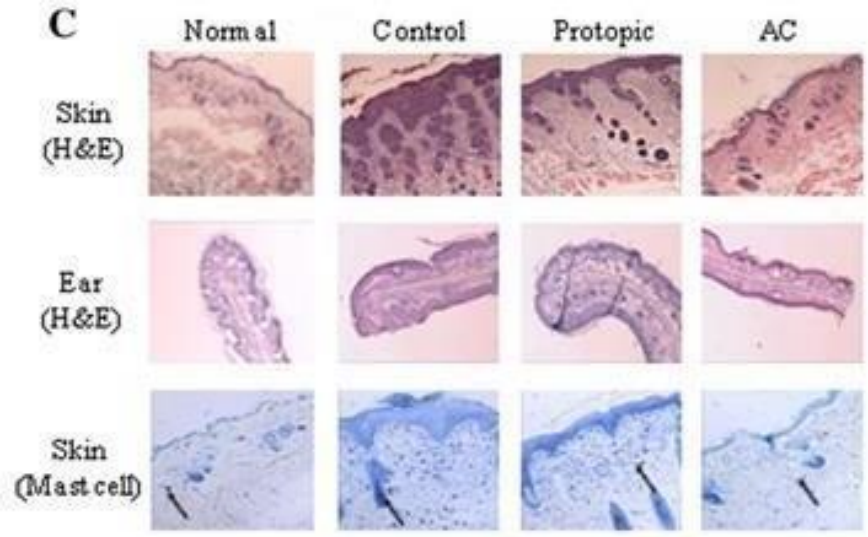
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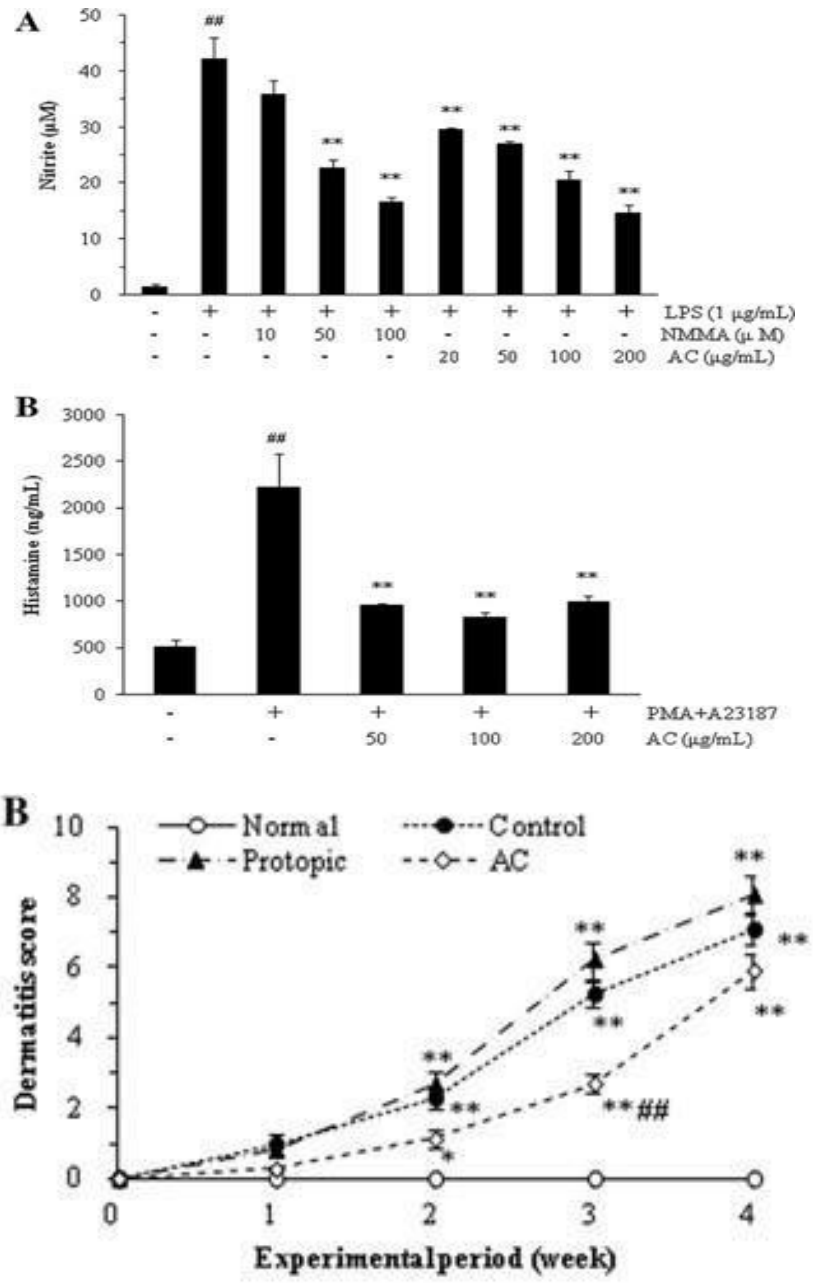

Dermatophagoidesfarinae-sensitized Nc/Nga mice received a topical application of A. capillaris for 4 weeks, which decreased their atopic dermatitis scores and plasma levels of histamine and IgE.

In mice with 2,4-dinitrofluorobenzene (DNFB)-induced atopic dermatitis, solid fermentation of Ganodermalucidum on A. capillaris leaves decreased the expression of endothelial nitric oxide synthase (eNOS).

In a mouse model of imiquimod (IMQ)- induced psoriasis-like disease, A. capillaris extract cream was applied locally to skin lesions, and the mice treated with the cream had

significantly lower intracellular adhesion molecule-1 (ICAM-1) and modified psoriasis area and severity index (PASI) scores than mice in other experimental groups.

DISCUSSION

The overexpression of IL-10 and elevated IgE levels in AD, a common chronic cutaneous illness, are its defining features. The most significant house dust mite allergens linked to human AD are D. farinae, the most prevalent house dust mite found in the environment.

In AD, inflammation manifests itself in two phases. An early Th2 phase is followed by a chronic phase including Th0 and Th1 cells [1]. The considerable side effects connected to their long-term usage place restrictions on the medications now used to treat AD.

Numerous research have recently attempted to find new options to treat AD with fewer adverse effects. The use of herbal treatments, including herbal medications, is a growing trend in complementary and alternative medicine.

In earlier studies, it was discovered that an A. capillaries extract may stop the 5-lipoxigenase (5-LOX) enzyme from working in the RBL-1 cell line. The activity of 5-LOX is linked to a number of allergy and inflammatory skin conditions.

CONCLUSION

Our results suggest that AC reduces the atopic dermatitis response of *D. farinae*-sensitized Nc/Nga mice via the inhibition of IgE-mediated mast cell degranulation. Additionally, our data indicate that there is a reduction in the release of preformed mediators, such as histamine. There- fore, we conclude that AC should be explored as a potential therapeutic agent.

REFERENCES

1) https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8533588/
2) https://www.researchgate.net/publication/336906760_Design_and_Evaluation_of_Topical_Hydrogel_Formulation_of_Aceclofenac_for_Improved_Therapy
3) https://www.aad.org/public/diseases/eczema/types/atopic-dermatitis
4) https://www.healthline.com/health/atopic-dermatitis/what-is-atopic-dermatitis
5) https://bmccomplementmedtherapies.biomedcentral.com/articles/10.1186/1472-6882-14-100
6) https://www.researchgate.net/publication/260808172_Artemisia_capillaris_inhibits_atopic_dermatitis-like_skin_lesions_in_Dermatophagoides_farinae-sensitized_NcNga_mice