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Immunomodulating Activity of *Allium hookeri* Extract on Cyclophosphamide-induced Immunocompromised Mice

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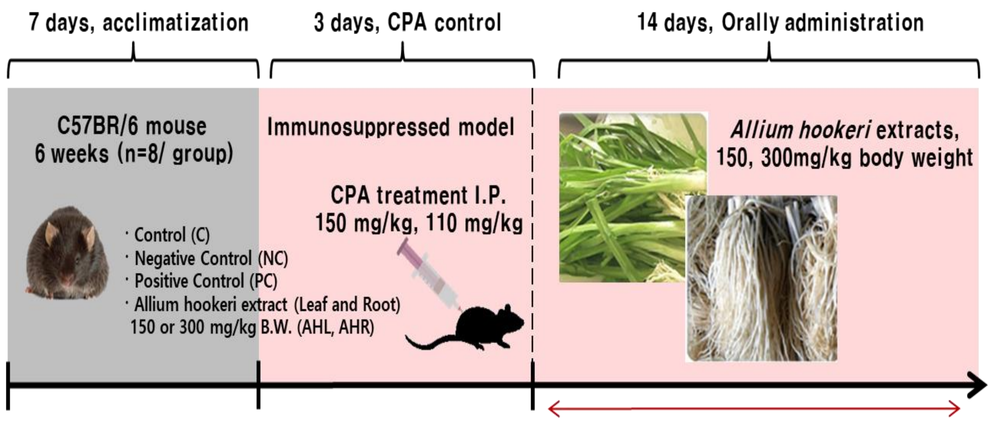
ABSTRACT

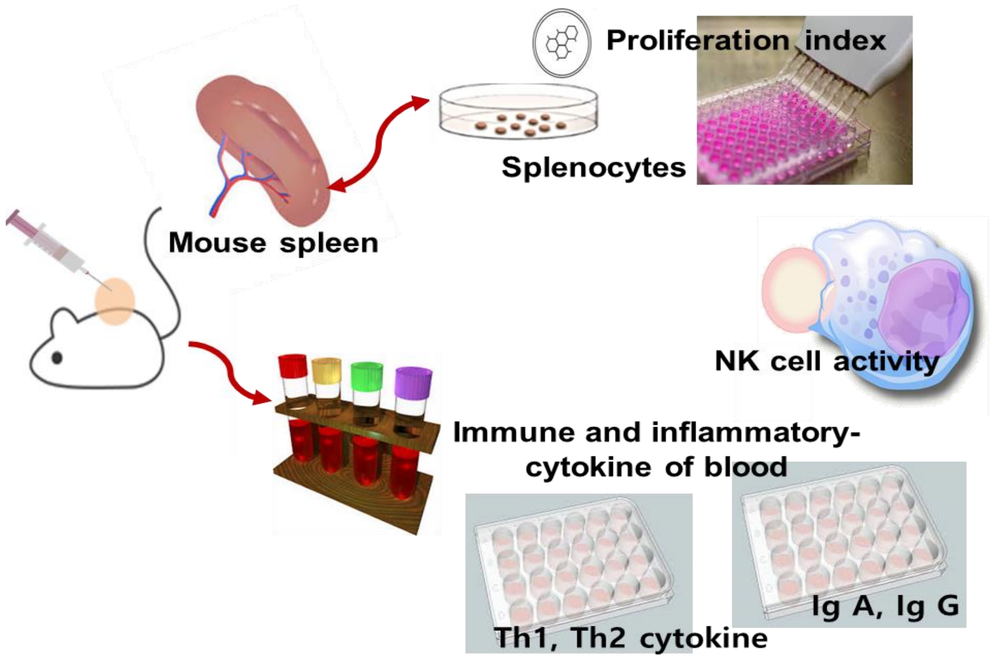
Allium hookeri (Liliaceae, AH) consumed in Korea, Southeast asia regions, etc as a medicinal plant has anti-diabetic, anti-oxidant, anti-inflammatory and various diseases treating effects. This study evaluated *in vivo* immunological activities of AH in immunosuppressed mice by cyclophosphamide (CPA). Immune-stimulating effects of AH extract in immunocompromised mice model for AHL (*Allium hookeri* leaf) and AHR (*Allium hookeri* root) groups at 150 and 300 mg/kg were confirmed by measuring the immunoglobulin (Ig) and cytokine levels, the splenocytes proliferation, and natural killer (NK) cell activity. The CPA-induced decrease of Ig A and G was improved in the AHL and AHR groups, and AHL and AHR administration effecting regulated serum cytokine levels (TNF-α, IL-6, IL-1β, IFN-γ) than those of the PC group in concentration dependent manner. Proliferation of splenic T lymphocytes increased in the AH groups, but B lymphocytes didn't show significant difference as compared to the NC group. Also, enhanced NK activity in the AHL and AHR groups. The results suggest that AH extracts may be used as a functional supplement to improve immunomodulatory activity.

METHOD

Animal experiments



Experimental schematic overview



Factor analysis

- Immunoglobulin assay : IgA, IgG
- Cytokine assay : TNF-α, IL-6, IL-1β, IFN-γ
  Ig and cytokine levels were determined by serum samples.
- Assay of Splenocyte Proliferation
  Determination of spleen T and B lymphocytes
- NK activity
  Whole blood with sandwich ELISA assay
  Standardized composition of antibodies(INF-γ) was measured using NK Vue.

RESULTS & DISCUSSION

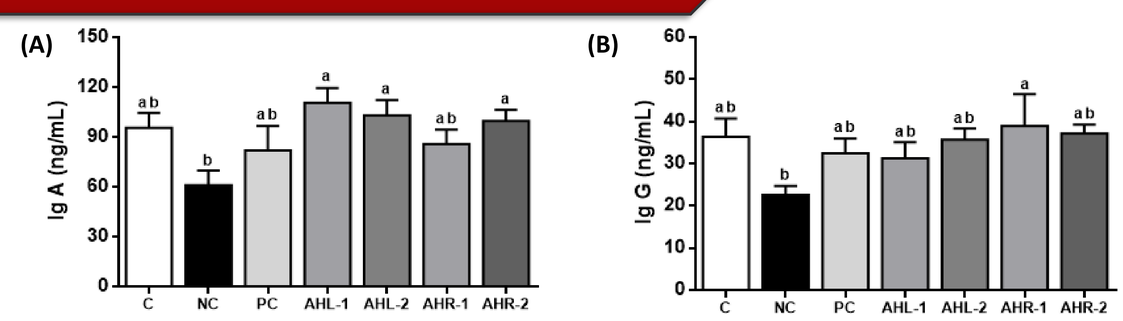


Fig. 1. Effects of AH extracts on the serum (A) IgA and (B) IgG level in C57BL/6 mice immunosuppressed by CPA. The data was analyzed by one-way ANOVA using SPSS software and each bar presents the mean±S.E. (n=8). [a,b]Different letters on bars are significantly different from each other by Duncan's multiple range test (p<0.05).

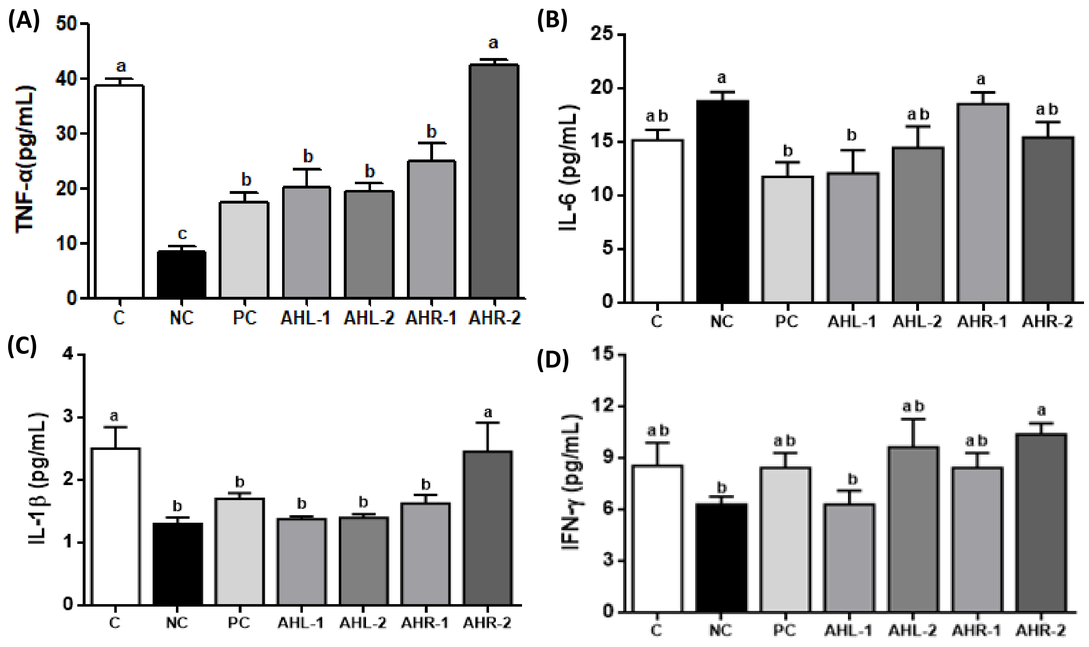


Fig. 2. Effects of AH extracts on the serum (A) TNF-α, (B) IL-6, (C) IL-1β, (D) IFN-γ levels of C57BL /6 mice immunosuppressed by CPA. [a-c]Different letters on bars are significantly different from each other by Duncan's multiple range test (p<0.05).

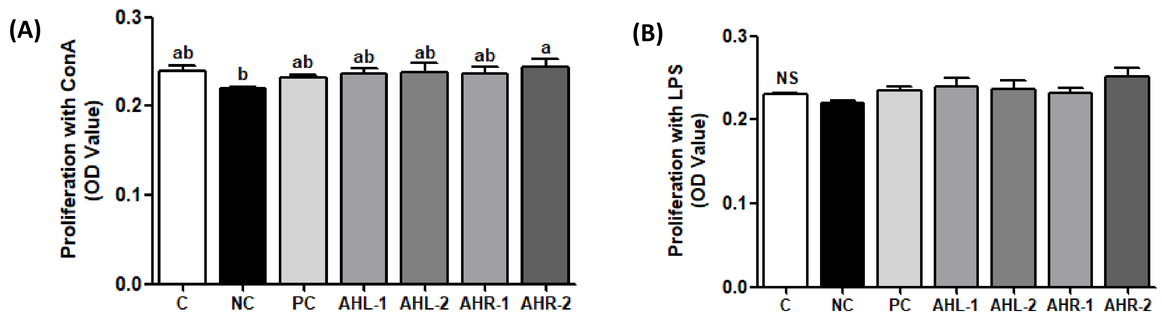


Fig. 3. Effects of AH extracts on T and B cell proliferation of splenocytes in C57BL/6 mice immunosupresed by CPA. [a,b]Different letters on bars are significantly different from each other by Duncan's multiple range test (p<0.05).

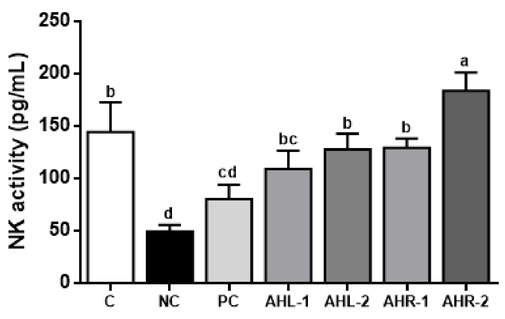


Fig. 4. Effects of AH extracts on natural killer cell activity of C57BL/6 mice immunosuppressed by CPA. [a-d]Different letters on bars are significantly different from each other by Duncan's multiple range test (p<0.05).

CONCLUSION

Screening of immunological activities in *Allium hookeri* was performed in immunosuppressed mouse. In the AHL and AHR groups, Ig A, G and cytokine levels were regulated and NK cell activity increased than that of the NC group immunocompromised by CPA. The results suggest that the possible mechanisms involved in AH and assist in the new development of immunomodulator. This study was supported by grant (PJ01586301) from Rural Development Administration Republic of Korea.

REFERENCE

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