INVESTIGATION OF THE ANTI-INFLAMMATORY EFFECT OF LIQUIDAMBAR ORIENTALIS LEAF EXTRACT ON RAW 264.7 MACROPHAGE CELLS

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OUTLINES

- Liquidambar Orientalis
- Aim of Research
- Method
- Results
- Conclusion
Altingiaceae Familia

L. Styraciflua

L. Orientalis

L. Formosana
Liquidambar *Orientalis* (Sweetgum)

- *L. Orientalis*, known as the Anatolian Sweetgum Tree, is an endemic species.

- Mainly, it is distributed in the southwestern regions of Türkiye, especially in Köycegiz, Fethiye and Marmaris.

- It has been used for centuries to treat diseases such as ulcers, gastritis, dermatitis and eczema by local people.
Aim Of The Research

1. The demonstration of anti-inflammatory effect of L. Orientalis leaf extract in vitro

2. Investigation of the potential mechanism underlying its anti-inflammatory activity

3. Comparison of L. Orientalis extract and methotrexate which is used commonly for treatment
METHOD
Figure 1: Preparation of L. Orientalis Leaf and Stem Extract

1. Leaf and stems collection of L. Orientalis
2. Drying and pulverizing leaves and stems
3. Leaf and stem samples mixed with 80% ethanol at the ratio of 1:20 (w/v)
4. Ethanol extract of samples was centrifuged after 60 minutes of ultrasound at 400 W and 45°C
5. All supernatants were concentrated in the lyophilizer and stored as powder extract.
2. Determination of Total Flavonoid and Phenolic Contents

- In different concentrations, leaf and stem extract solutions phenolic and flavonoid content were measured by spectrophotometer.
Figure 2: Preparation of Cell Culture and measurement of inflammatory markers by Western Blot and ELISA

Lipopolysaccharide (LPS), L. orientalis leaf extract (LOLE), Methotrexate (MTX), Nitric Oxide Synthase (iNOS), Nuclear Factor-kappa B (NF-κB), Tumor Necrosis Factor alfa (TNF-α), Interleukin-1β (IL-1β)
RESULTS
Figure 3: Dose-dependent comparison of total phenolic levels of L. Orientalis leaf and stem extract

Figure 4: Dose-dependent comparison of total flavonoid levels of L. Orientalis leaf and stem extract
**ELISA Results**

**Figure 5:** Demonstration of the changes in IL-1β levels within LPS-induced macrophage cells in response to the addition of LOLE or MTX at different concentration (p<0.05)

*(Lipopolysaccharide (LPS), L. orientalis leaf extract (LOLE), Methotrexate (MTX))
Figure 6: Demonstration of the changes in IL-6 and TNF-α levels within LPS-induced macrophage cells in response to the addition of LOLE or MTX at different concentration. (p<0.05)

(Lipopolysaccharide (LPS), L. orientalis leaf extract (LOLE), Methotrexate (MTX), Tumor Necrosis Factor alfa (TNF-α))
Western Blot results demonstrated that LOLE suppressed the expression of inflammation-related proteins iNOS and NF-κB in LPS induced macrophage cells, in a dose-dependent manner. (p<0,05)

(Nuclear Factor Kappa B (NF-κB), Inducible Nitric Oxide Synthase (iNOS))
**Potential Mechanism Of LOLE**

1. LPS binding TLR4 in Macrophage

2. Induction of NF-κB complex

3. NF-κB stimulates the cell nucleus

4. Changing gene expression

5. Production of inflammatory cytokines and iNOS
CONCLUSION

1- LOLE decreased inflammatory cytokines IL-1β, IL-6, and TNF-α through its anti-inflammatory effect.

2- *In vitro* studies have demonstrated that LOLE suppress IL-1β levels more than MTX.

3- One of the potential mechanisms underlying the anti-inflammatory effect of LOLE could be the modulation of NF-kB signaling pathways.
CONCLUSION

4- Since *in vitro* studies have limitations, the results should be supported by *in vivo* experiments.

5- Further analysis are required to explore other mechanisms underlying the anti-inflammatory effect.
REFERENCES


First Lab Day
19.09.2023
Thank you for contributions

- Associate Professor Dr. Ozge Pasin
- Research Assistant Ezgi Durmus
THANK YOU

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