

Artemisia herba-alba: A Promising Approach to Combating Arthritis Progression

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INTRODUCTION

• **Arthritis**, a widespread and debilitating condition characterized by joint inflammation, pain, and reduced mobility, presents a significant and growing healthcare challenge [1]. With the need for more effective therapies becoming increasingly evident, researchers are directing their focus toward natural products as potential sources of innovative treatments [2]. These compounds, such as those found in *Artemisia herba alba*, offer a diverse array of phytochemical properties and the potential to provide alternative approaches to managing arthritis. Additionally, there is a pressing need for new and improved animal models that accurately mimic the complexity of human arthritis [3]. This study explores the promise of natural remedies in addressing arthritis and emphasizes the importance of advanced animal models in this pursuit.

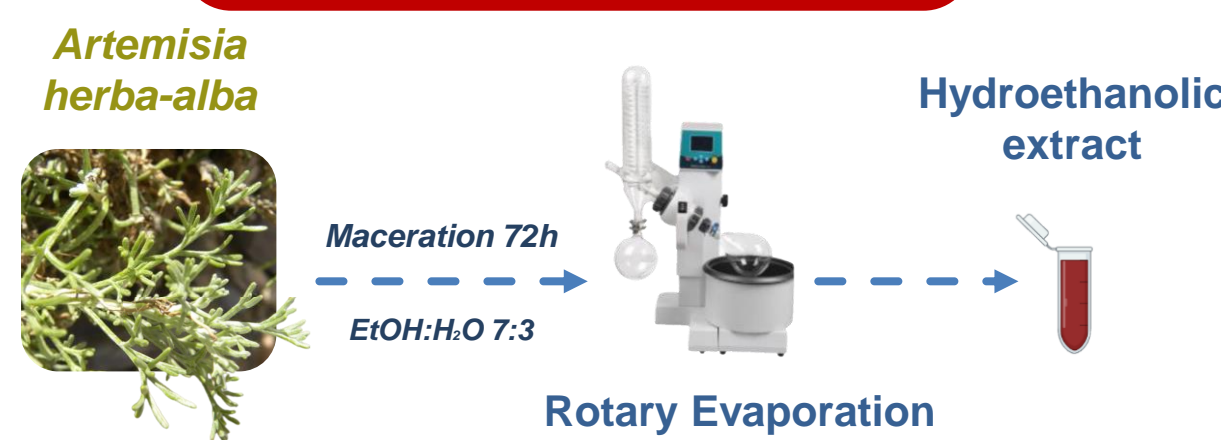
OBJECTIFS

- Analyzing *Artemisia herba alba*'s phytochemical composition.
- Investigate the therapeutic potential of *Artemisia herba alba* in addressing chronic arthritis using a new rat model, focusing on reducing inflammation, preventing bone and cartilage damage, and preserving muscle integrity.

In vitro

MATERIALS AND METHODS

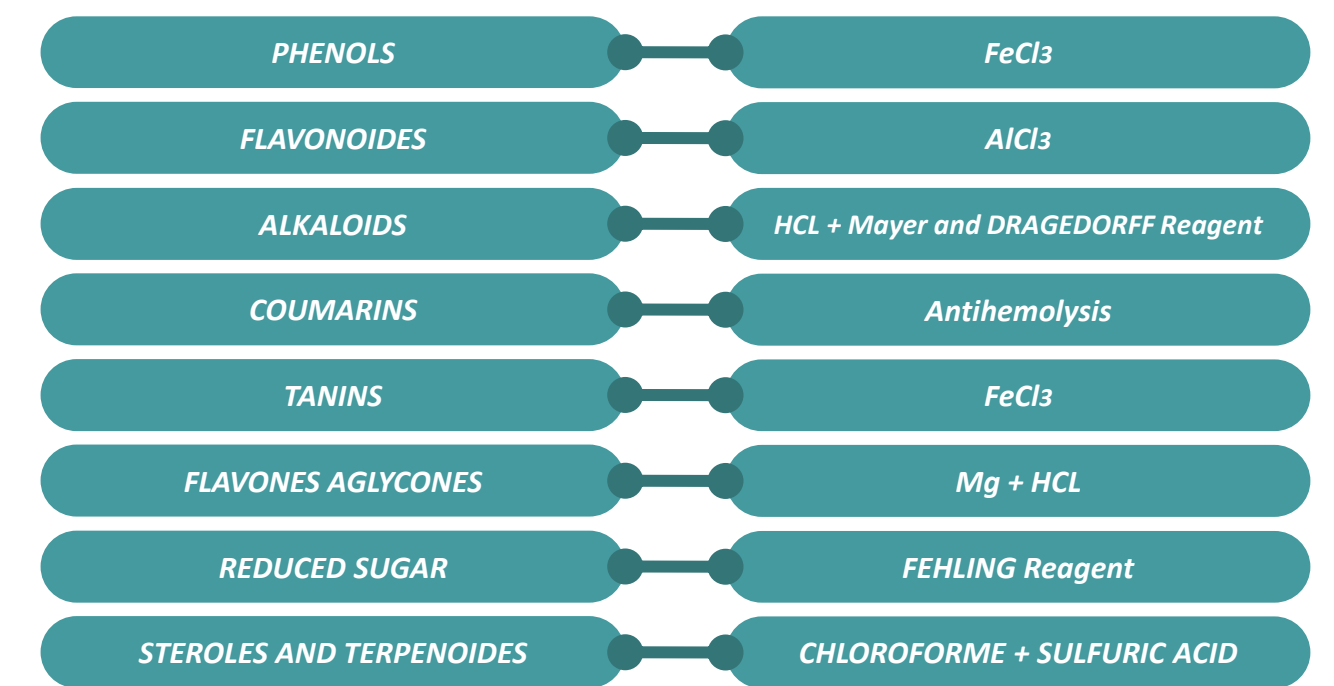
PHYTOCHEMICAL EXTRACTION



QUANTITATIVE SCREENING

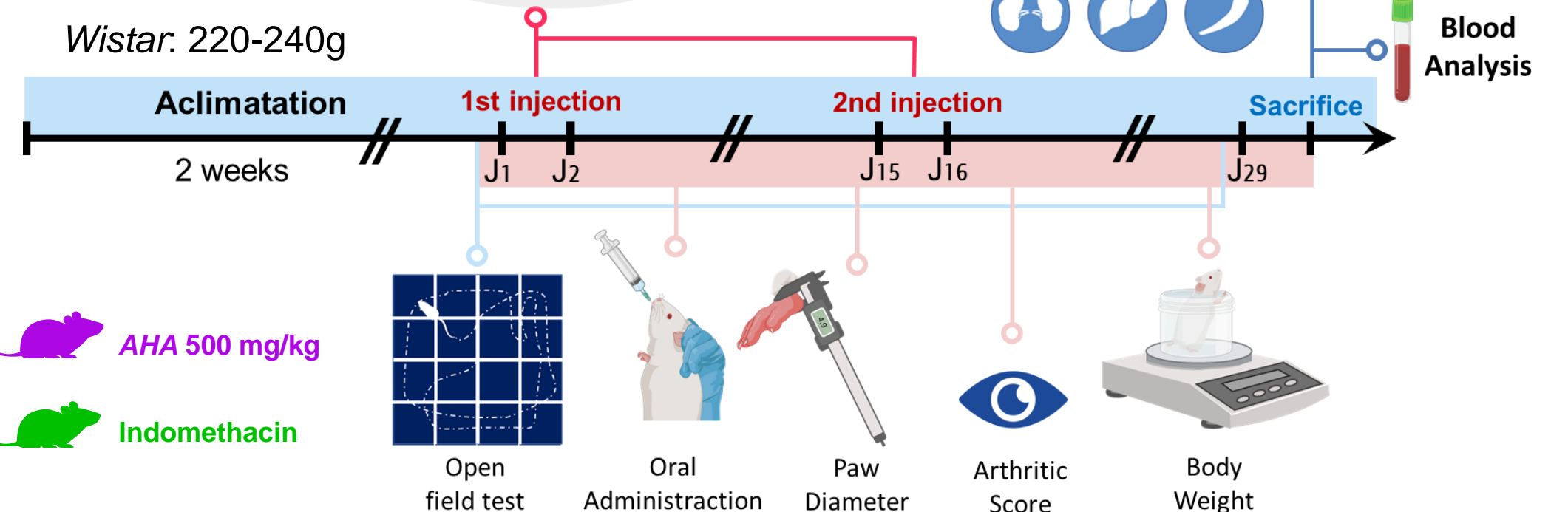
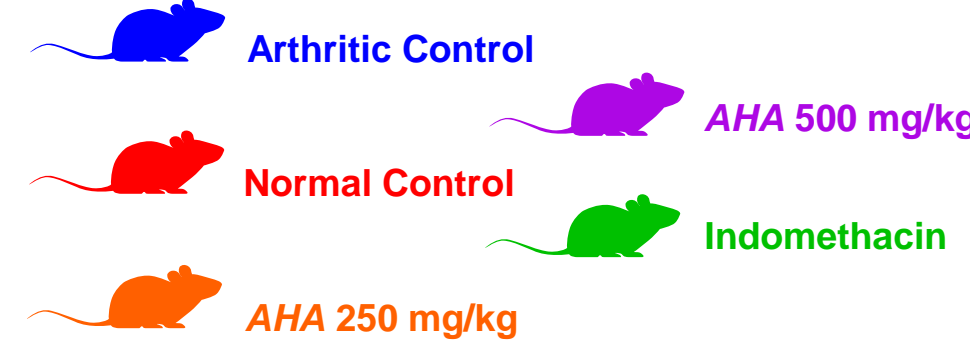


QUALITATIVE SCREENING



In vivo

Groups



RESULTS AND DISCUSSION

QUALITATIVE SCREENING

- Phenols ✓
- Tanins ✓
- Flavonoides ✓
- Flavones aglycones ✓
- Alkaloids ✓
- Reduced sugar ✗
- Coumarins ✓
- Steroles and Terpenoides ✗

QUANTITATIVE SCREENING

- The quantitative assessment indicated a significant amount of total phenolic content (TPC), measuring 44.346 ± 3.35 mg GAE/gDW. Additionally, the total flavonoid content (TFC) was determined to be 28.964 ± 1.392 mg QE/gDW.

IN VIVO ANTI-ARTHRITIC ACTIVITY

- The study's results underscore the effectiveness of *A. herba alba* in a novel arthritis model, offering prospects for further research and pharmaceutical development. In this study, the arthritic rats experienced significant **weight loss**, **paw swelling**, and increased **arthritic scores** Fig.1,2. *A. herba alba* and indomethacin restored **body weight** and reduced **paw edema**, indicating anti-inflammatory effects. **Arthritic scoring** was effectively attenuated by these treatments Fig.1. While **blood parameters** showed no major changes, indomethacin and *A. herba alba* at 500 mg/kg increased **liver index**, emphasizing the need for caution in liver-related effects Fig.1.
- Overall, *A. herba alba* and indomethacin demonstrated potential in mitigating arthritis-associated symptoms in rats, though careful monitoring of side effects is warranted.

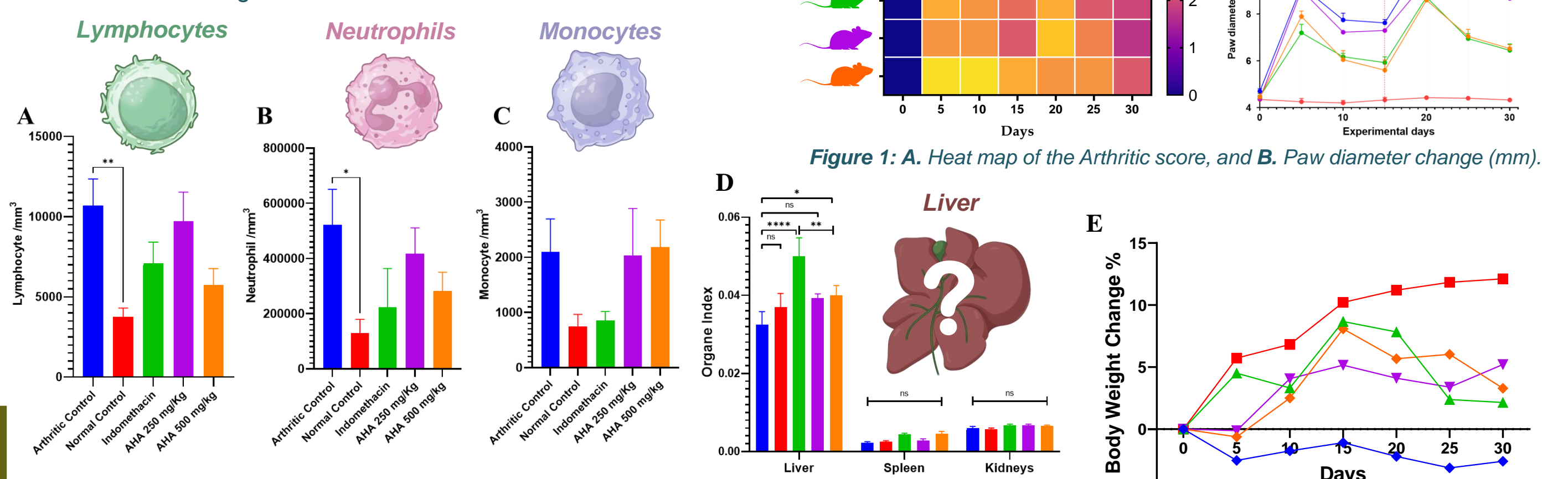


Figure 2: A,B, and C. Hematological parameters, D. Organe index, and E. Body weight change (%).

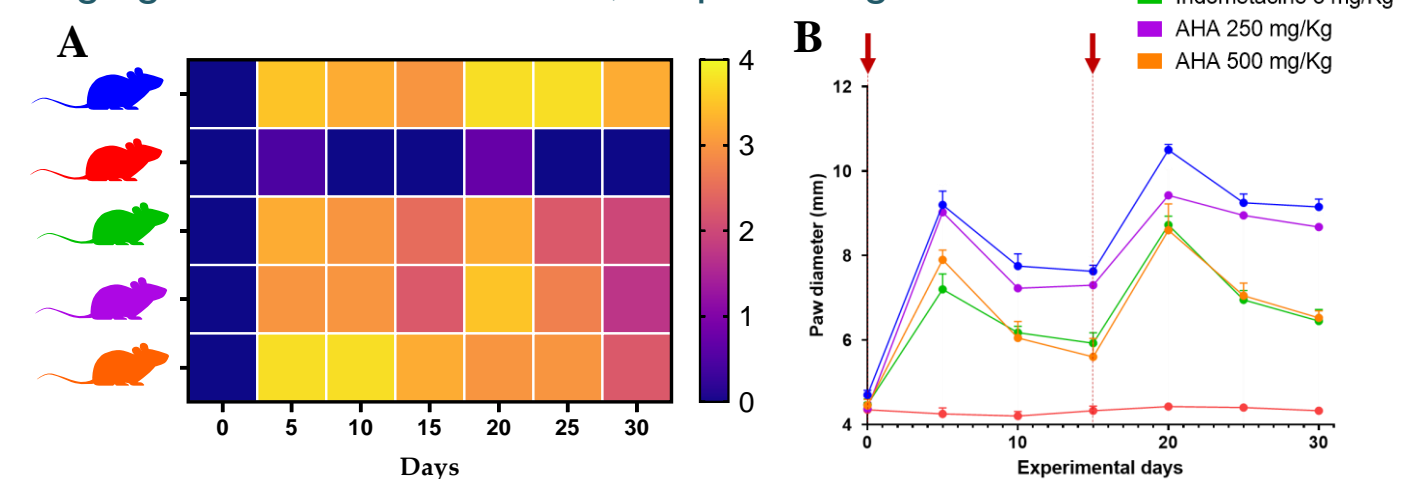


Figure 1: A. Heat map of the Arthritic score, and B. Paw diameter change (mm).

CONCLUSION

This study explored the therapeutic potential of *Artemisia herba-alba*'s hydroethanolic extract in addressing arthritis in a novel rat model induced by I-CGN and IFA, specifically by safeguarding the bone and muscle from damage. Additionally, the study assessed its in vivo effectiveness. Phytochemical analysis uncovered promising compounds with significant biological properties, and the extract demonstrated potent anti-inflammatory effects.

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- Histopathological analysis of bone and muscle tissues revealed the detrimental effects of chronic arthritis, including **structural damage** and **inflammation** Fig. 3. Treatment with *A. herba alba*, especially at the 500 mg/kg dose, effectively mitigated these changes, **preserving the integrity of bone and muscle tissues** Fig. 3. These positive histopathological improvements align with the observed **reductions in paw swelling and arthritic scores**, reinforcing *A. herba alba*'s potential therapeutic benefits in managing chronic arthritis Fig. 3.
- These collective results strongly suggest that treatment with *A. herba alba* hydroethanolic extract holds therapeutic potential in effectively managing **chronic arthritis**. This positive outcome is likely attributed to the presence of **phytochemicals** within the extract, such as **phenols** and **flavonoids**. These bioactive compounds are known for their **anti-inflammatory** and **antioxidant properties** [4], which could contribute to the observed mitigation of structural damage and inflammation in bone and muscle tissues.

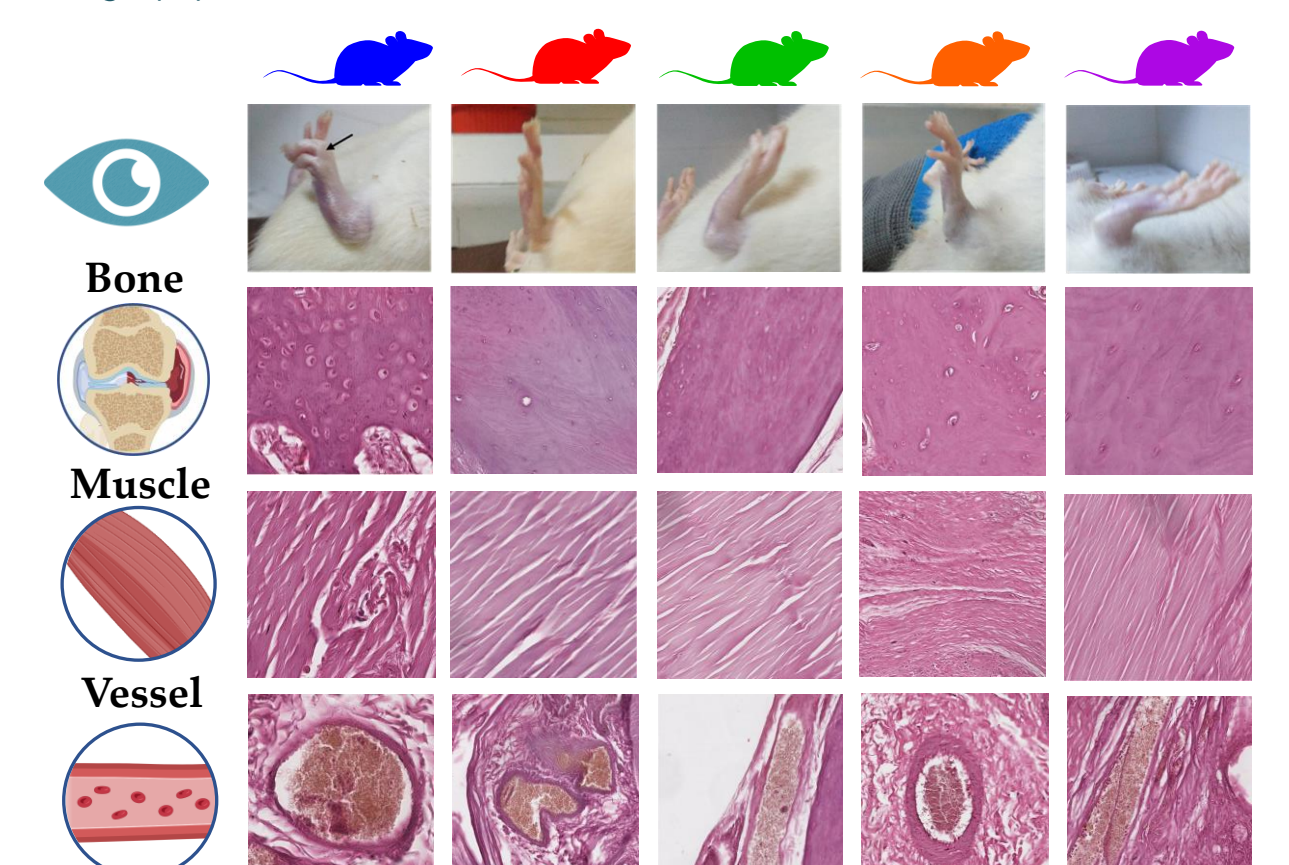


Figure 3: Representative pictures of rats left hind paw swelling joints and the histopathology examination of the bone, the muscle and the blood vessel.