

Evaluation of the Anti-inflammatory and Antioxidant Activities of Selected Resin Exudates

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Introduction

The adverse effects of oxidative stress on human health have become a serious issue. A lack of antioxidants in human diet, which can scavenge the reactive free radicals, facilitates the development of degenerative diseases, including cardiovascular diseases, cancers, neurodegenerative diseases and inflammatory diseases. One solution to this problem is to supplement the diet with antioxidant compounds that are contained in natural plant sources.

Owing to the potential medicinal value of plant exudates, we selected the resin of three plants for our current study; the oleo resin of *A. excelsa* (Salisb.), *A. bidwillii* Hook, and the kino resin of *E. maculata* which are abundant in Egypt to investigate their antioxidant and anti-inflammatory activities, and elucidate their possible mechanism(s) of action.

Material s and Methods

Plant material

The kino resin of *E. maculata* and oleo-resin of *A. bidwillii* were collected from the stem of the plants cultivated in the Zoo garden, Giza, Egypt, while oleo-resin of *A. excelsa* was collected from El-Muntaza Palace Garden, Alexandria, Egypt.

Preparation of the extracts

The air-dried powdered resin (10 g each) of *E. maculata* exudate (EME), *A. excelsa* exudate (AEE) and *A. bidwillii* exudate (ABE) were extracted with methanol (3 x100 mL) using a sonicator for 15 min. Each extract was concentrated under reduced pressure to a constant weight to yield dry methanol residue; (EME, 9.5 g), (AEE, 9.4 g) and (ABE, 8.9 g), respectively. The three extracts were kept in a desiccator over anhydrous CaCl₂.

Chemical analysis

The three methanol extracts were analyzed for their total phenolic content (TPC), total flavonoid content (TFC) and radical scavenging activity using DPPH assay. The most promising extract (*E. maculata*) was standardized using HPLC.

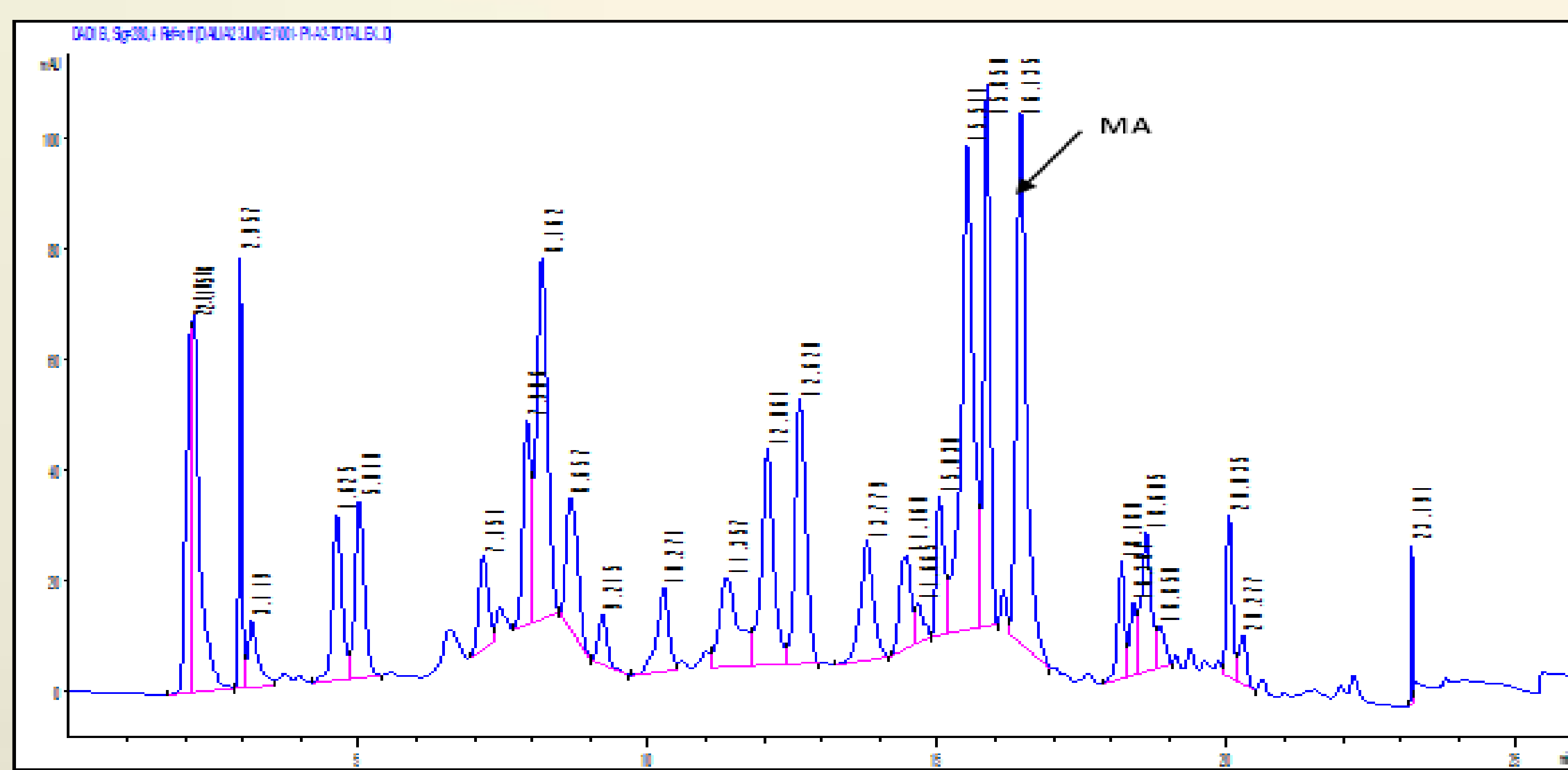


Fig.1: HPLC chromatogram of the methanol extract of *E. maculata* resin. (MA): 7-*O*-Methyl aromadendrin.

References

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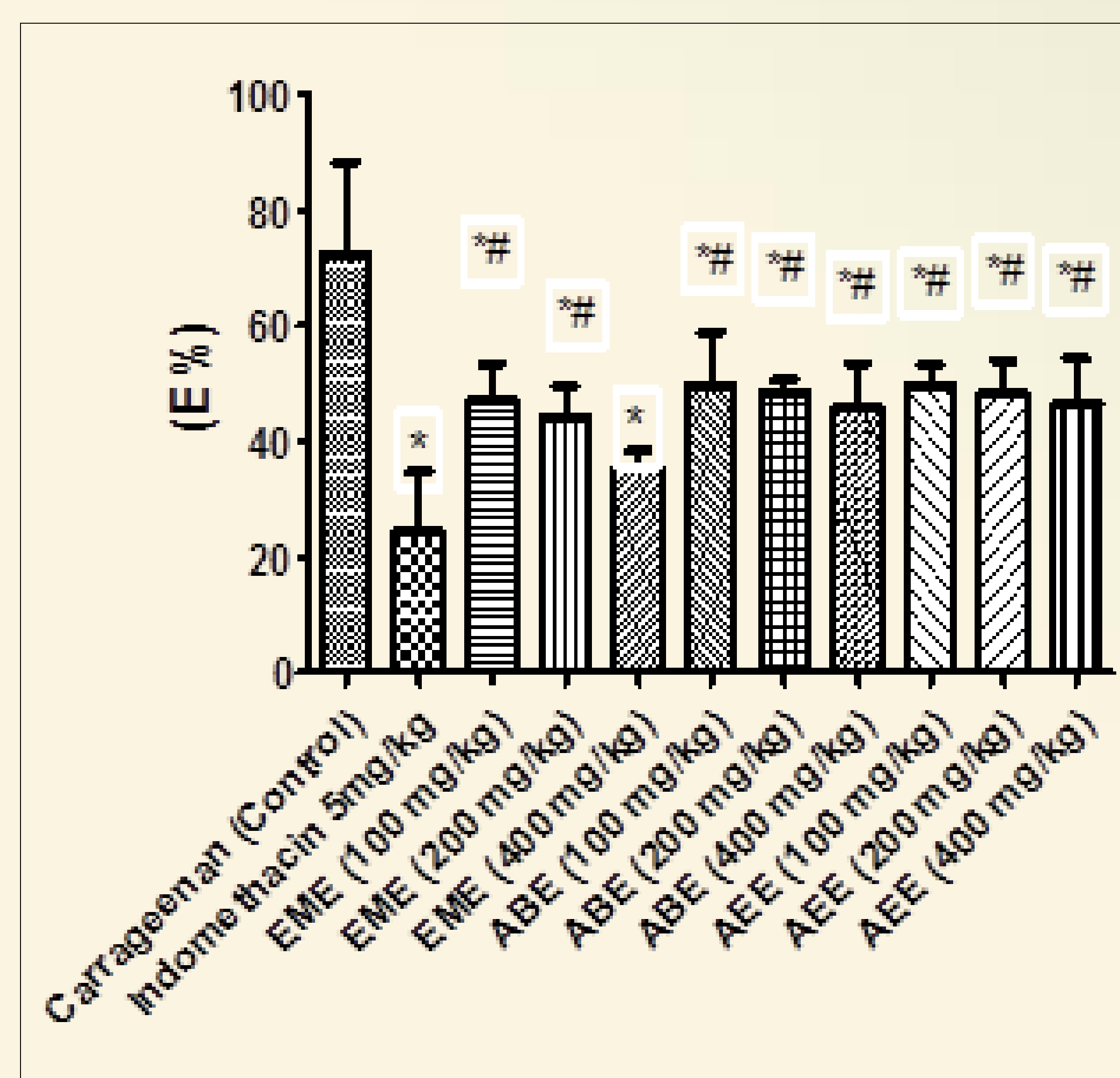


Fig.2. Percentage of oedema at 4h in carrageenan-induced oedema for the extracts of three resin exudates. **EME:** methanol extract of *Eucalyptus maculata* resin; **ABE:** methanol extract of *Araucaria bidwillii* oleo-resin; **AEE:** methanol extract of *Araucaria excelsa* resin.

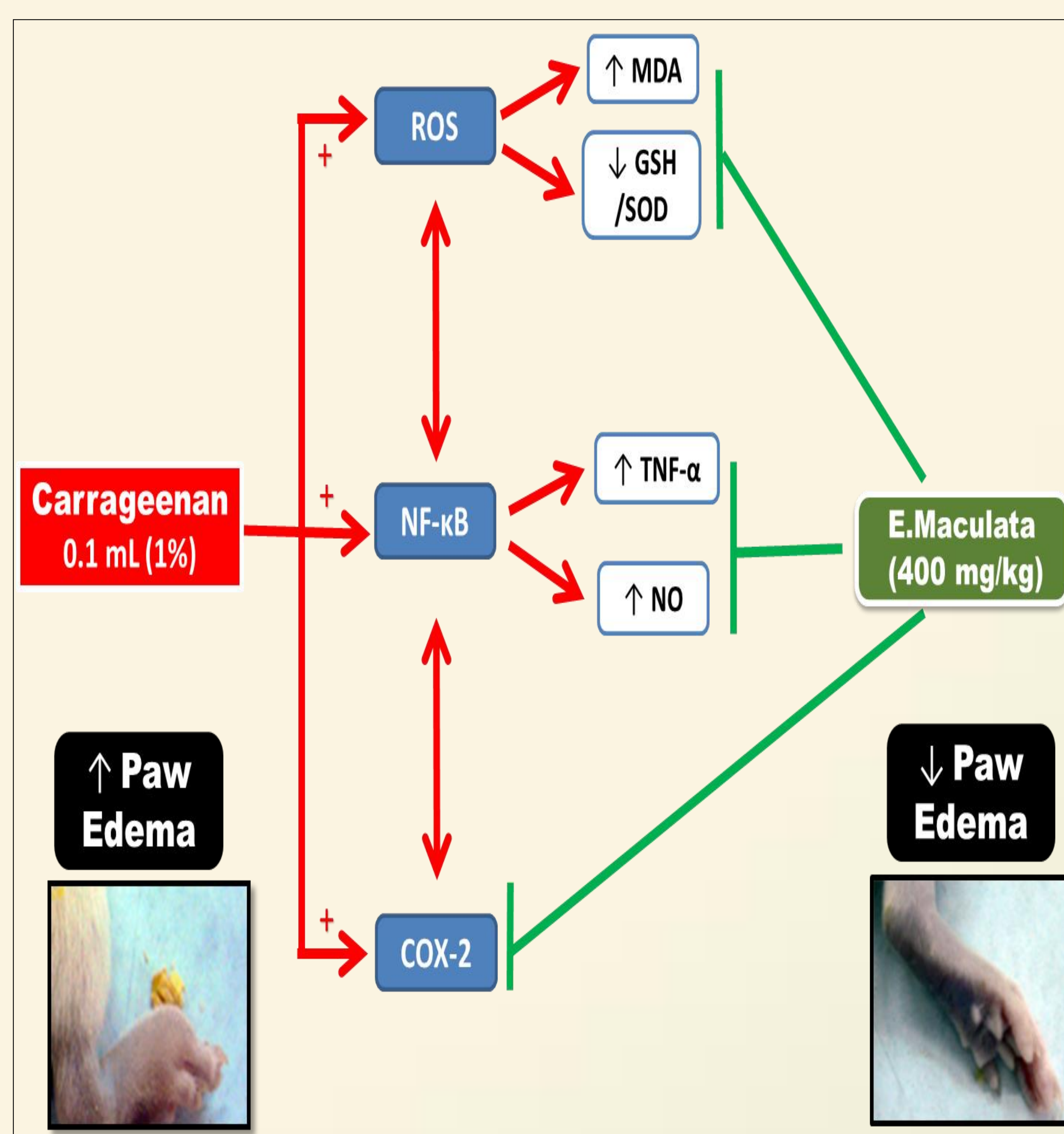


Fig.3. Effect of *E. maculata* resin extract on paw thickness and % of oedema at 4h in carrageenan-induced oedema.

Conclusion

In the current study, we evaluated the antioxidant and anti-inflammatory activities of *E. maculata* kino resin, *A. bidwillii* and *A. excelsa* resin exudates. Methanol extract of *E. maculata* (400 mg/kg) showed the highest antioxidant activity. The results confirmed that the methanol extract of *E. maculata* kino resin, *A. bidwillii* and *A. excelsa* oleo-resin (100, 200 and 400 mg/kg) reduced carrageenan-induced paw oedema in rats. The methanol extract of *E. maculata* kino resin (400 mg/kg) was the most potent through its anti-inflammatory and antioxidant activity in a TNF- α , NF κ -B and COX-2 dependent manner and this can be attributed to its high content in phenolics.