

Anti-Inflammatory Potential of *Albizia lebbbeck*: *In-Vivo* Evidence and Scientometric Analysis

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INTRODUCTION & AIM

Inflammation is considered as a primary physiologic defense mechanism that helps body to protect itself against infection, burn, toxic chemicals, allergens or other noxious stimuli. An uncontrolled and persistent inflammation may act as an etiologic factor for many of these chronic illnesses [1]. Currently, both steroidal and nonsteroidal anti-inflammatory drugs (NSAIDs) are used in the treatment of inflammatory disorders. Steroids have an obvious role in the treatment of inflammatory diseases, but, because of rate-limiting toxicities, they are only prescribed over short periods except in very severe cases where the risks are acceptable. NSAIDs are also associated with severe side effects, notably gastrointestinal haemorrhage [2]. Therefore, the development of potent anti-inflammatory drugs with fewer side effects is necessary.

In this regard, natural products have long gained wide acceptance among the public and scientific community [3]. Several natural compounds have been proven to show anti-inflammatory effects. In particular, flavonoid compounds have been given the most attention [4]. There is a paucity of information regarding the phytochemistry of the flavonoids content and the biological effects of *Alibizia lebbbeck*.

Albizia lebbbeck is widely used in traditional Indian folk medicine to treat several inflammatory pathologies, such as asthma and arthritis.

The present study aims to scientifically investigate *A. lebbbeck* claimed anti-inflammatory effect

METHOD

A.lebbbeck claimed anti-inflammatory effect was investigated using the rat paw edema model. Additionally, a co-occurrence analysis of the available literature from Scopus, Dimensions, PubMed, and lens.com databases was conducted using network and overlay visualization (VOS viewer) to present a detailed bibliometric and scientometric analysis concerning its potent anti-inflammatory potential and to explore the existing knowledge gaps and the required future research directions.

1. *In-vivo* study :

After preparing the ethanolic extract of *Albizzia lebbbeck* and filtering this extract to get the powder of *Albizzia lebbbeck* which contains the flavonoids which is confirmed to be present after performing the TLC profiling, the *in vivo* study was initiated , as follows:

Drugs and chemicals

Voltaren ® which contains diclofenac sodium as an active pharmaceutical ingredient manufactured by GlaxoSmithKline ® and carrageenan were used

Animals

Throughout the experiments, adult male rats weighing 150 g were used. Animals were housed at a temperature of 23 °C with free access to water and standard food pellets. Rats were acclimatized in the animal facility of faculty of pharmacy, AinShams University for at least 1 week prior to the experiment.

Pharmacological Screening:

Measurement of paw volume in carrageenan-induced rat edema model:

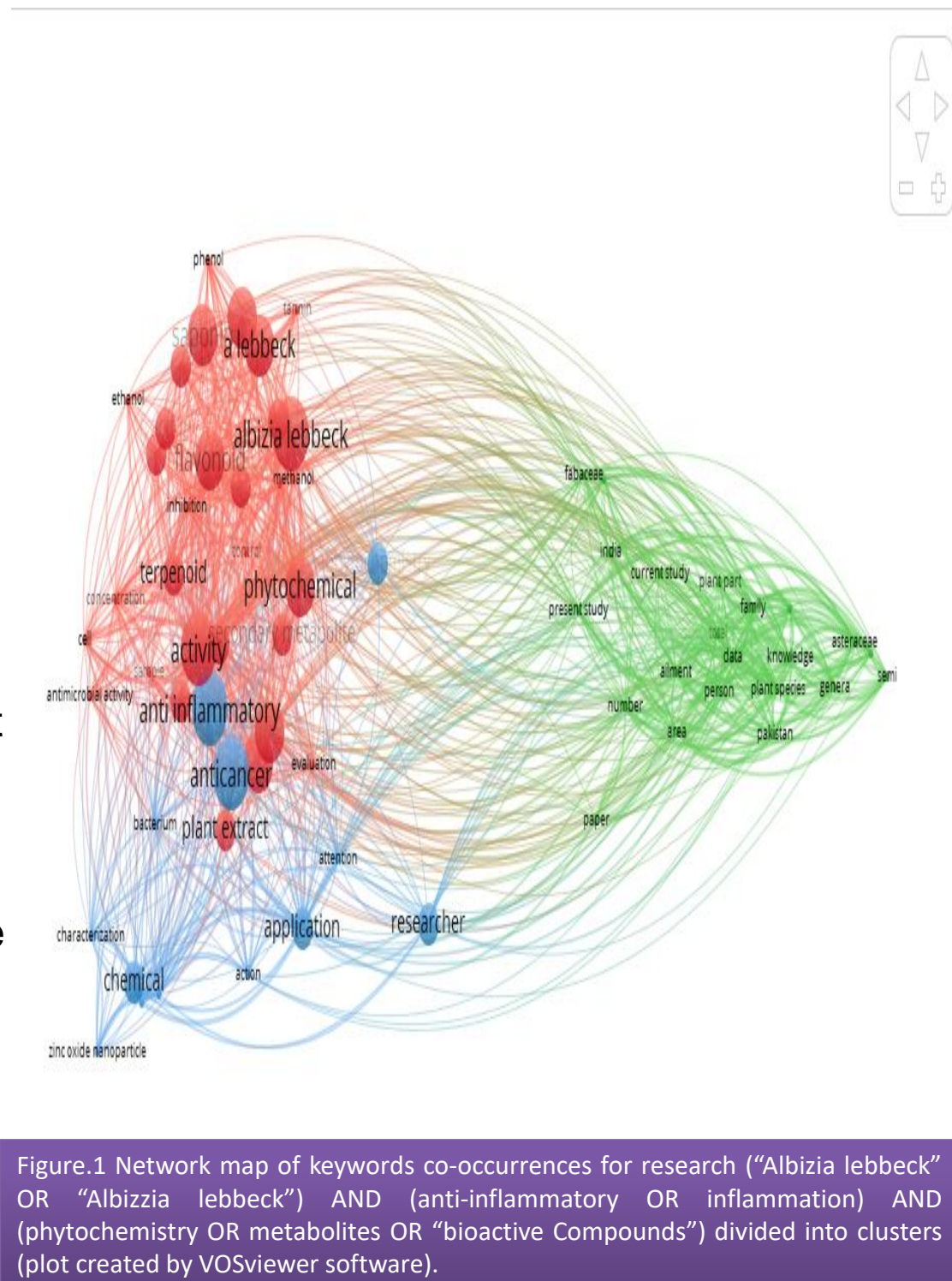
After determination of dose ,animals were subjected to Anti inflammatory activity and they were divided into 5 groups each of 6 rats, as follows:

- Group I (control)
- Group II voltaren® (100mg)(0.2ml each)
- Administered using intragastric tube as standard anti inflammatory drug .

- Groups (III) received the plant extract (E3) as oral doses of 100 mg/kg, respectively. Dosing volume was kept constant (0.2ml for each of 6 rats). Thirty minutes after oral treatment, animals in group I were injected s.c. with 0.1 ml carrageenan, as well as animals in groups III 0.1 ml carrageenan (1% solution in saline) on the plantar surface of the left hind paw. The left hind paw volume was measured 3 hours after carrageenan injection by saline displacement using UGO-BASILE 7140 plethysmometer (Comerio, Italy).

2. Scientometric analysis:

A co-occurrence analysis of the available literature from Scopus, Dimensions, PubMed , and lens.com databases was conducted using network and overlay visualization created via VOSviewer software to examine the role of *Albizzia Lebbbeck* as a potent anti-inflammatory.



RESULTS & DISCUSSION

The *in vivo* results revealed that *A. lebbbeck* (100 mg/kg) reduced significantly the edema volume by 37.27% and 31.43% compared to the carrageenan/diclofenac group (35.90% and 51.79%) after 1 and 3 hrs of carrageenan injection, respectively.

This observed anti-inflammatory potential represents 103.8% (1 hr) and 60.7% (3 hrs) of diclofenac sodium efficacy. Luteolin and kaempferol were detected in the extract under investigation and they contribute to the proven anti-inflammatory potential.

Networking analysis revealed that the *Journal of Ethnopharmacology* is the most productive publisher concerning *A. lebbbeck* anti-inflammatory potential. The publication volume showed steady growth, increasing from 65 documents in 2015 to 182 in 2025, with notable peaks observed in 2021 and 2024.

Over half of these publications were original research articles, with *Biomedical and clinical sciences* being the leading subject area.

Terms such as terpenoids, flavonoids, saponins, and tannins are common search terms exhibited strong associations with *A. lebbbeck* anti-inflammatory properties.

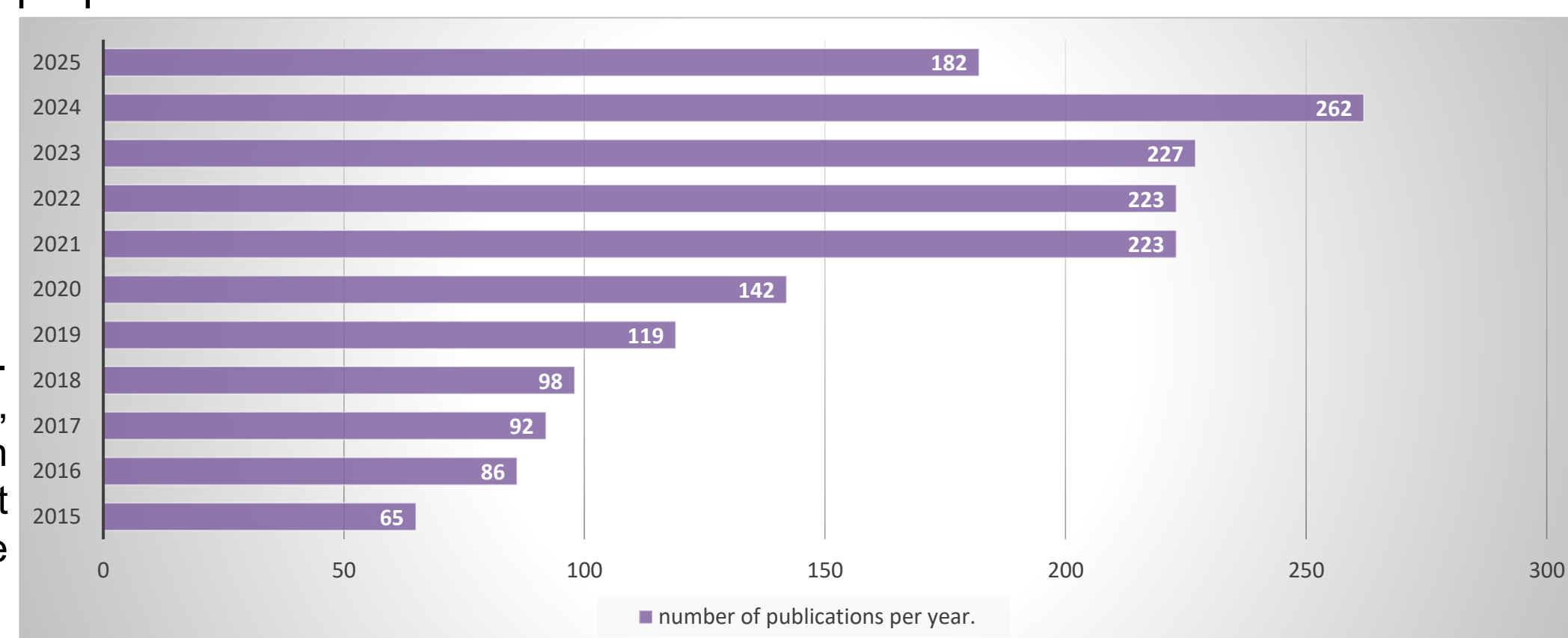


Figure. 2.Number of publications per year.

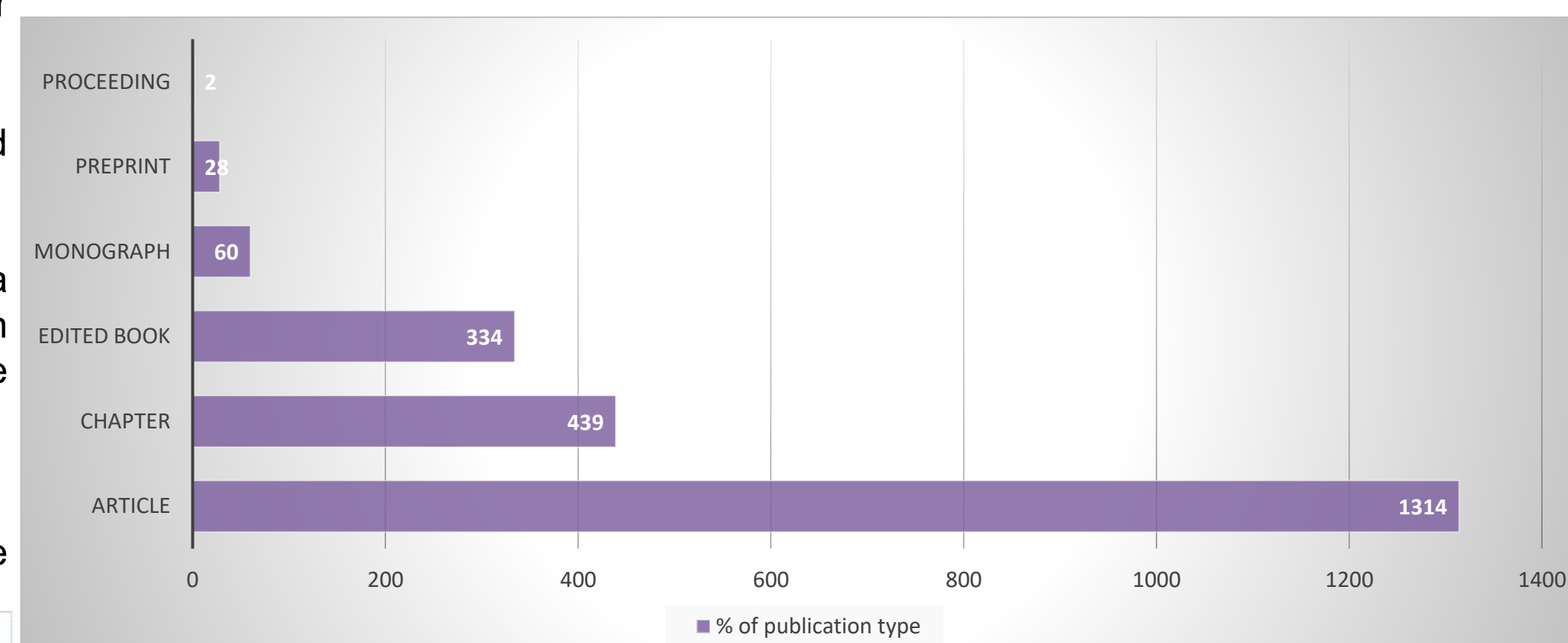


Figure. 3. Percentage of publication type.

CONCLUSION

This study scientifically supports the traditional anti-inflammatory use of *A. lebbbeck* and recommends further mechanistic studies on its isolated phytochemicals to link this potent activity with the bioactive compounds.

FUTURE WORK / REFERENCES

Detailed clinical studies are urgently needed to confirm its efficacy and therapeutic potential.

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