



Anti-Allergen Therapy from the Mango Tree

What Is: *Mangifera indica* L. Extract ?

The mango tree has been a rich source of medicinal folk remedies in many traditional societies. One part of the mango tree, namely the stem bark (known as *Mangifera indica* L.) has been used by such societies for the treatment of a variety of ailments ranging from anaemia to scabies to diarrhea.

Mangifera indica extract contains an impressive array of phytonutrients, of which mangiferin (a glucosylxanthone) is the largest as well as the greatest single source of biological activity. Other constituents of *Mangifera indica* extract include gallates, catechins, epicatechins, benzoic acid, triterpenes, phytosterols, fatty acids and trace amounts of vitamins and minerals. This diverse profile is reflected in the biological activity of *Mangifera indica*, which in both *in-vitro* and *in-vivo* studies has demonstrated antioxidant, analgesic, anti-inflammatory and immunomodulating properties. From such a broad spectrum of benefits, *Mangifera indica* extract seems to have found a practical application as an anti-allergen.

The Allergic Reaction and *Mangifera Indica*'s Role Within It

The aforementioned spectrum of pharmacokinetic activity, aside from the indication of the potency and potential of its source, also relates – to varying degrees – to how the body deals with an allergy. Antioxidants, for example, can inhibit the generation of reactive oxygen species (ROS-free radicals that can exacerbate an allergic reaction).¹ Analgesics can provide relief from the pain and discomfort caused by allergic reactions², while the importance of anti-inflammatories cannot be overstated. This is because

an allergic reaction is essentially an inflammatory response, with cytokines such as TNF α , IL-1, IL-4, IL-12, IL-13, IL-15, and IL-16 playing highly significant roles.³ Antioxidants, analgesics and anti-inflammatories all serve to strengthen the immune system as a whole.

Again, in the face of a spectrum of biological activity so broad that the risk of descending into ambiguity is very real, how does *Mangifera indica* extract specifically elicit an anti-allergy effect?

A Proactive Approach: IgE

IgE, or immunoglobulin E, is a type of antibody meant to protect against infections. However, allergy sufferers tend to produce IgE in excessive amounts, which is in response to their IgE recognizing a common allergen (i.e. pollens) as a threat. The IgE levels of non-allergy sufferers are much lower because their IgE only recognizes parasites in such a manner. IgE then attaches itself to mast cells, and when it does this in excessive amounts, the mast cells respond by granulating and releasing excessive amounts of histamines and cytokines. Very succinctly, the former leads to increased mucous production and the latter to inflammation, resulting in the most common symptoms of an allergic reaction, namely congestion, eye irritation, skin rashes and lung spasms, among others.

Supplements, unlike drugs, are more often than not proactive rather than reactive. They do not attack afflictions so much as they strengthen the defenses against them. Such a simplistic interpretation is more of a principle than a rule, with a more concise definition being that supplements elicit their effects on a more preliminary metabolic level than their pharmaceutical counterparts. In the case of allergic reactions, the standard pharmaceutical route of intervention is anti-histamines, which as their name implies, inhibits the action of histamine - usually by targeting the H1 histamine receptor.

Mangifera Indica: IgE Inhibitor

Since excessive IgE activity is a root cause of allergic reactions, inhibiting its production is a proactive way of limiting the frequency and effect of such reactions. This precedes the actions of standard allergy medications (anti-histamines) by one key biological step, since the adhesion of excessive IgE to the mast cells is what leads to the release of histamine in the first place, not to mention cytokines with subsequent inflammation and associated symptoms (irritated eyes, congestion, etc.).

In-vivo studies have demonstrated that *Mangifera Indica* extract (standardized for 10% mangiferin) can indeed inhibit IgE production by more than 22%.⁴ Mangiferin as an isolate has also been studied, and it was determined to lower IgE production by nearly 52%.⁵ These studies – conducted on laboratory mice–determined (predictably) that histamine release was also inhibited by both *Mangifera indica* and mangiferin supplementation, theoretically due to the precursory effect of lower IgE production. Ironically, however, *Mangifera indica* extract was slightly more effective than mangiferin in lowering both histamine levels and histamine-induced skin reactions. *Mangifera indica* lowered the latter by 66%, compared with 63% for mangiferin.⁶ Similar results were also seen when the two compounds were tested for their ability to inhibit the most severe allergic reactions of anaphylaxis.⁷

It must be noted that an extract offering advantages over its isolated main medicinal ingredient is nothing new. This has been seen with whole extracts and their respective isolates from grape seed, green tea, curcumin, and numerous others. While conclusive evidence is scarce, it would seem that whole extracts can offer a broader spectrum of support while isolates can provide a more concentrated potency within specifically set targets. In the case of *Mangifera indica* and mangiferin, it would appear that the most effective compromise is a *Mangifera indica* extract standardized to a degree higher than 10% mangiferin.

Other Benefits of *Mangifera Indica*

Like many natural ingredients, the beneficial applications of *Mangifera indica* extract are relatively widespread and cannot always be neatly categorized.

One recent study indicates that the extract may also possess the ability to alleviate iron-induced oxidative damage by increasing iron excretion from the liver.⁸ It does this in part due to an electrochemical capacity to bind to iron (as a chelator), and while this protects against iron-overload, *Mangifera indica* also acts synergistically with iron for an enhanced anti-oxidant effect, particularly against 2,2-diphenyl-1-picrylhydrazyl (DPPH) and superoxide free radicals.⁹ *Mangifera indica* also protects against lipid peroxidation and increases glutathione levels, leading researchers to suggest that it may provide 'therapeutically useful effects in iron overload diseases.'¹⁰

References

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