



DOSSIER · SUBSTANCE

Mangiferin

This page summarises scientific work on **Mangiferin**, including a series of human studies. The state of research shows broad interest in cognitive and metabolic effects, yet most studies are small and short. The most interesting finding: even in frequently cited work, observations predominate over controlled proof of effect.

73

STUDIES IN
TOTAL

17

IN HUMANS

9

OF WHICH
CONTROLLED

3

IN ANIMALS

15

IN THE LAB

Figures from the IHR study database · Last updated 2026-10-16

How to Read This Dossier

ESTABLISHED

measured in humans, with a comparison group

PLAUSIBLE

supported by mechanism, animal studies or observation

HYPOTHESIS

a likely connection that still needs to be tested

Mangiferin at a Glance

ORIGIN:

Mangiferin is a xanthone polyphenol that occurs primarily in the leaves, bark and fruits of the mango tree (*Mangifera indica* L.). It belongs to the secondary plant substances with antioxidant and inflammation-modulating properties and is used in traditional medicine in South Asia and Latin America. Industrially, it is obtained from plant extracts, often as a standardised component of food supplements or phytopharmaceuticals, whereby bioavailability varies depending on the application form and accompanying substances.

EVIDENCE BASE:

73 evaluated studies · 9 controlled human studies · 8 observational studies · 10 review articles · 3 animal studies · 10 cell culture studies

STRONGEST EVIDENCE:

- **Metabolism:** A 12-week, placebo-controlled study with 97 overweight participants showed significant reductions in triglycerides and free fatty acids as well as an increase in HDL cholesterol and ketone bodies with 150 mg mangiferin daily. Insulin resistance improved, while LDL cholesterol and glucose remained unchanged.
- **Cognition and psyche** An acute study with 70 healthy adults (300 mg mangiferin extract) showed significant improvements in attention, working memory and executive functions as well as positive mood effects. A further study with 60 participants showed improved mental speed, response inhibition and verbal memory after 7 days.
- **Musculoskeletal system:** A crossover study with 19 basketball players showed that a single dose of mangiferin (84 mg) in combination with quercetin improved athletic performance (circuit time) and subjective recovery, while perceived exertion decreased. The effect of mangiferin alone on the musculoskeletal system has therefore not been investigated. Blood lactate values showed a marginally significant effect.
- **Bioavailability** A pharmacokinetic study with 12 participants showed that salt formation of mangiferin (MLES) increases bioavailability 2.44-fold compared with water-insoluble extracts (MLE60), which expands the possible uses in water-based formulations.

LIMITATIONS:

- The cognitive effects of mangiferin are contradictory: one study showed no consistent improvements without additional stressors, while others demonstrated acute or short-term effects.
- The controlled human studies are small, short-term and use heterogeneous extract forms or dosages, which limits the comparability and transferability of the results.
- Long-term data on chronic applications, dose-dependent effects or clinically relevant outcomes (e.g. in neurodegenerative diseases) are still outstanding.

CLASSIFICATION:

Mangiferin, a xanthone polyphenol from the mango tree, showed effects on metabolism and cognition in small, short-term human studies. In combination with quercetin it showed effects on athletic performance and subjective recovery. Research is still at an early stage here and requires systematic long-term investigations.

1. What Mangiferin Is

Mangiferin is a **xanthone polyphenol** that occurs mainly in the leaves, bark and fruits of the mango tree (*Mangifera indica* L.). Industrially, mangiferin is obtained from plant extracts, often as a standardised component of food supplements or phytopharmaceuticals. The compound is water-soluble and is usually used in research as a pure substance or in extract form.

For the interpretation of the study situation it is crucial that **mangiferin** is investigated in different **extract forms** and **dosage protocols**. Most controlled human studies use standardised mango leaf extracts (e.g. *Zynamite®*), while basic research often uses isolated mangiferin. Bioavailability varies depending on the application form (oral, intravenous) and accompanying substances. In addition, mangiferin is frequently combined with other polyphenols, which makes it difficult to attribute specific effects. Measurement is usually carried out via plasma levels or markers of the oxidative stress response.

2. What the Studies Show in Detail

The key human studies and the most important reviews — by field of application, with population, duration, preparation, measured variable and result, as reported by the original studies. Numbers appear only where the study states them.

Distribution of **controlled human studies** by field of application — the numbers are not additive, as one study may be assigned to several fields:

FIELD OF APPLICATION	CONTROLLED STUDIES
Cognition and psyche	5
Fatigue and stress	4
Safety and tolerability	3
Metabolism	3
Heart and circulation	2

FIELD OF APPLICATION	CONTROLLED STUDIES
Musculoskeletal system	1
Inflammatory processes	1
Oxidative stress	1

Metabolism

In a double-blind, randomised, placebo-controlled study with 97 overweight participants with hyperlipidaemia (triglycerides ≥ 1.70 mmol/L, total cholesterol ≥ 5.2 mmol/L), the effect of mangiferin on the serum lipid profile was investigated. The participants received 150 mg mangiferin or a placebo daily for 12 weeks. Serum levels of triglycerides, free fatty acids (FFAs), total cholesterol, HDL and LDL cholesterol, glucose, insulin, L-carnitine, β -hydroxybutyrate, acetoacetate and lipoprotein lipase activity were measured. Compared with the placebo group, a significant reduction in triglycerides and FFAs as well as the insulin resistance index was observed. At the same time, serum levels of HDL cholesterol, L-carnitine, β -hydroxybutyrate and acetoacetate increased significantly. No differences were found for total cholesterol, LDL cholesterol, glucose and insulin. The study suggests that mangiferin improves the lipid profile by increasing fatty acid oxidation and lipoprotein lipase activity ¹.

A systematic review from 2023 summarises the results of 13 studies that investigated the effect of *Mangifera indica* and its by-products — including mangiferin — on metabolic and cardiovascular parameters. The included studies showed that various preparations (e.g. fruit powder, leaf extract) improved glycaemic control and the plasma lipid profile in some of the investigations. Positive effects on endothelial function, physical performance and mood were also observed. The authors emphasise that the use of mango by-products offers both health and ecological advantages. However, most findings are based on preclinical or small clinical studies, so transferability to broader populations has not yet been examined. The review covers many agents and preparations, therefore the specific role of mangiferin within these effects remains unclear ²⁷.

HYPOTHESIS The available controlled studies suggest that mangiferin may positively influence metabolic dysregulation. The mechanisms presumably include an increase in fatty acid oxidation, an improvement in insulin sensitivity and a modulation of lipid metabolism. However, long-term studies are still outstanding that would investigate the sustainability of these effects as well as possible dose-dependent effects.

Cognition and Psyche

In a double-blind, placebo-controlled crossover study with 70 healthy adults (18–45 years) the acute effect of a *Mangifera indica* leaf extract (standardised to >60 % mangiferin, 300 mg single dose) on cognitive functions and mood was investigated. Participants completed a test battery (COMPASS) and the POMS questionnaire at four time points (pre-dose, 30 min, 3 h, 5 h post-dose). Compared with placebo, a significant improvement in task accuracy was observed, particularly in the domains of attention, working memory and executive functions. Positive effects on mood were also noted. The study suggests that mangiferin-rich extracts can increase cognitive performance in the short term ².

A further double-blind, randomised, placebo-controlled study with 114 healthy participants (18–43 years) examined the acute effect of 300 mg *Mangifera indica* leaf extract (standardised to ≥ 60 % mangiferin) on cognitive functions and mood. Measurements were taken 30, 180 and 300 minutes post-dose. In contrast to the previous study, only a significant increase in errors in the subtraction tasks (Serial 3s and 7s) was observed, while no further cognitive or mood-related effects were noted. The authors conclude that the *Mangifera indica* leaf extract under investigation does not produce consistent improvements in cognitive performance in the absence of additional psychological stressors.

In a randomised, double-blind, placebo-controlled study with 60 healthy volunteers who regularly played digital games, the effect of 300 mg *Mangifera indica* extract (Stadice®, standardised to mangiferin) over seven days was investigated. Cognitive performance was measured using the NIMHANS Neuropsychological Battery and Auditory Verbal Learning Tests. The results showed significant improvements in mental speed, attention, working memory, response inhibition as well as verbal learning and memory. Positive effects on stress, anxiety and mood were also observed. The study suggests that mangiferin-containing extracts can improve cognitive flexibility and resilience under everyday conditions ⁴.

HYPOTHESIS The heterogeneous results regarding the cognitive effects of mangiferin could be attributable to differences in the study population (e.g. baseline cognition, stress level), dosage, extract composition or test procedures. The observed effects on attention and working memory suggest that mangiferin may be particularly effective under cognitive load or in the presence of mild deficits. However, studies investigating the long-term effect as well as possible neuroprotective effects in older populations or neurodegenerative diseases are lacking.

Musculoskeletal System

In a double-blind, randomised crossover study with 19 high-performance male basketball players the effect of a single dose of Mangiferin-Quercetin supplementation (84 mg mangiferin, 140 mg quercetin) on athletic performance was investigated. Participants completed a basketball simulation test (BEST) with 24 circuits of 30 seconds each. Mean heart rate, circuit and sprint times, blood lactate levels, subjective muscle fatigue (RPMS) and perceived exertion (RPE) were measured. Compared with the placebo condition, a significant improvement in mean circuit time (18.17 ± 2.08 s vs. 20.33 ± 1.96 s) and a reduction in RPE (12.42 ± 1.02 vs. 13.47 ± 1.22) were observed. Blood lactate levels showed a marginally significant effect ($p = 0.054$). The study provides an indication that the combination of mangiferin and quercetin can improve athletic performance during high-intensity training ⁵.

HYPOTHESIS The observed effects could be attributable to improved mitochondrial function, a reduction in oxidative stress or a modulation of the inflammatory response. However, studies investigating the effect of mangiferin alone on the musculoskeletal system as well as long-term studies on the sustainability of the effects and possible dose-dependent actions are still outstanding.

Oxidative Stress

A review from 2016 summarises the antioxidant properties of mangiferin. Mangiferin, a C-glucosylxanthone, exhibits high bioavailability and antioxidant capacity due to its structural characteristics (C-glycoside bond). In preclinical studies mangiferin showed protective effects against lipid peroxidation, DNA damage and oxidative cell damage. The antioxidant effect is attributed to the ability to neutralise reactive oxygen species (ROS) and to increase the activity

of endogenous antioxidant enzymes. Whether these effects occur in humans has not been investigated ⁷.

HYPOTHESIS The antioxidant properties of mangiferin could exert protective effects particularly in tissues with high oxidative stress (e.g. liver, brain, musculature). However, clinical testing of this hypothesis is still outstanding, especially with regard to optimal dosage and long-term safety.

Inflammatory Processes

A review from 2015 examined the role of non-nutritive phenolic compounds—including mangiferin—in the prevention and treatment of periodontal diseases. Oxidative stress is regarded as a central pathomechanism of inflammatory periodontal diseases. In preclinical studies mangiferin showed antioxidant and anti-inflammatory effects, including inhibition of cell signalling cascades involved in the production of reactive oxygen and nitrogen species.

A review from 2022 highlights the renoprotective effects of mangiferin. In preclinical models mangiferin reduced renal inflammation, oxidative stress and interstitial fibrosis. The underlying mechanisms include inhibition of pro-inflammatory cytokines, modulation of the NF-κB signalling pathway and enhancement of antioxidant defence mechanisms.

HYPOTHESIS The anti-inflammatory properties of mangiferin could be transferable to a broad range of diseases with a chronic inflammatory component (e.g. arthritis, periodontitis, nephropathies). However, clinical testing of this hypothesis is still at an early stage, particularly with regard to the optimal route of administration (systemic vs. local) and dosage.

Skin

A review from 2023 summarises the potential benefits of plant-derived active substances—including mangiferin—in the treatment of lupus erythematosus. In preclinical studies (cell cultures and animal models) mangiferin showed antioxidant, anti-inflammatory and immunomodulatory effects that could be relevant for the treatment of skin lesions and systemic inflammation. The effect in humans has not been investigated.

HYPOTHESIS The antioxidant and anti-inflammatory properties of mangiferin could be therapeutically relevant particularly in autoimmune skin diseases such as lupus erythematosus. However, clinical validation of this hypothesis is still outstanding.

Gut and Microbiome

A study from 2025 investigated the microbial conversion of mangiferin to norathyriol in human stool samples. Mangiferin, a C-glycosylxanthone with low bioavailability, was metabolised to norathyriol, an aglycone with higher bioavailability, in stool samples from healthy adults. The conversion varied inter-individually and was attributed to the presence of the uncultured bacterial strain CAKRHR01 sp934339005. While mangiferin itself had little influence on the composition of the microbiome, norathyriol led to a significant reduction in short-chain fatty acid-producing bacteria (e.g. *Faecalibacterium prausnitzii*) as well as urate-degrading bacteria (e.g. *Enterocloster boiteae*). The study suggests that microbial metabolism of mangiferin in stool samples can be accompanied by changes in the investigated bacterial community ⁹.

HYPOTHESIS The microbial conversion of mangiferin to norathyriol could substantially influence the systemic bioavailability and effect of mangiferin. The clinical relevance of this metabolism as well as possible long-term effects on gut health remain to be clarified.

Absorption and Availability

In a human pharmacokinetic study with 12 participants (6 women) the bioavailability of mangiferin from two standardised *Mangifera indica* leaf extracts was compared: MLE60 (60 % mangiferin, water-insoluble) and MLES (60 % mangiferin monosodium salt, water-soluble). Participants received the extracts in a crossover design with a 7-day washout phase. Plasma analysis showed that MLES exhibited a significantly higher AUC (2.44-fold) and C_{max} than MLE60, while T_{max} and T_{1/2} were similar. The study demonstrated that salt formation markedly improves the bioavailability of mangiferin and thereby extends its possible uses in water-based formulations ¹⁰.

HYPOTHESIS The improved bioavailability of mangiferin through salt formation could increase therapeutic efficacy in clinical applications. Long-term studies on the safety and tolerability of such formulations are still outstanding.

Viral Infections

A 2021 review summarises the antiviral properties of plant-derived active substances – including mangiferin. In preclinical studies (cell culture and animal models), mangiferin showed antiviral effects against a range of viruses, including influenza, dengue, HIV and SARS-CoV. The mechanisms of action include inhibition of viral replication and modulation of the host immune system. A clinical effect in humans has not been investigated, and the preclinical findings cannot be transferred to humans.

HYPOTHESIS The antiviral properties of mangiferin could be particularly relevant in the adjuvant therapy of viral infections.

Overall Picture

The studies available show that mangiferin and mangiferin-containing extracts exhibit pharmacological effects in preclinical and small clinical studies, particularly in the areas of metabolism, cognition, oxidative stress and inflammatory processes. While some of the controlled studies show promising effects on lipid profiles, cognitive functions and athletic performance, the results in other areas (e.g. cognition, viral infections) are heterogeneous or not yet sufficiently validated.

A central issue is the low bioavailability of mangiferin, which can be improved by innovative formulations (e.g. salt formation, nanoparticles). Long-term studies on the sustainability of the effects, possible dose-dependent actions and the safety of such formulations are still outstanding. The transferability of the preclinical results to humans has not yet been examined in many areas and would need to be investigated in clinical studies.

Methodology of the Evidence Base

The key works on mangiferin encompass a broad spectrum of study designs, including double-blind, randomised, placebo-controlled studies (n = 5), systematic reviews (n = 4), observational studies (n = 4) and preclinical investigations. The clinical studies in humans typically lasted from 7 days to 12 weeks and examined endpoints such as cognitive performance, lipid profiles, athletic performance, oxidative stress markers and inflammatory parameters. Systematic gaps exist in the investigation of long-term effects, optimal dosing, bioavailability in different formulations and effects in specific populations (e.g. older adults, patients with neurodegenerative or metabolic diseases). In addition, studies systematically examining the effect of mangiferin alone (without combination with other active substances) are lacking.

Cognition and Metabolism: What the Studies Can Really Support

The frequently cited 2015 study (61 citations) reports an **IMPROVEMENT IN SERUM LIPID PROFILES** in overweight patients with hyperlipidaemia. However, this is a **single controlled study** with a limited number of participants and short duration. The results have **not been replicated** or confirmed in larger cohorts. The situation is similar with the cognitive studies: the 2020 work (30 citations) shows **acute effects** on cognitive functions in healthy adults, yet the **clinical relevance** of the measured improvements (e.g. reaction times) remains unclear. In addition, data on long-term effects or transferability to patient groups are lacking.

A central issue is the **MIXING OF OBSERVATION AND CAUSALITY**. Many reviews (e.g. 2016, 41 citations) describe **possible mechanisms** (e.g. modulation of the PI3K/AKT signalling pathway) derived from cell culture or animal studies. These findings are **not equivalent** to a proven effect in humans. Even in controlled human studies, it remains open whether the observed effects are attributable to mangiferin itself or to accompanying substances in the extracts. Research has not yet provided a **differentiated answer** to the question of the **active component**.

3. How Robust the Research Is

The evaluated works span a broad methodological spectrum: a series of basic research studies, reviews on mechanisms and human studies, some of which are controlled. The **areas of application** focus on **cognition, fatigue and metabolism**. Individual works examine cardiovascular parameters, inflammatory markers and antioxidant capacity. Notably, there is a high proportion of **acute studies** (single administration or short intervention), while long-term data are lacking. The most frequently cited human studies date from 2015–2020 and primarily tested metabolic and cognitive effects, with controlled studies somewhat more common than observational studies.

The **robustness** of the data is limited by methodological constraints. The controlled human studies are predominantly **small** and **short-term**, with heterogeneous endpoints. Many works use **surrogate parameters** (e.g. lipid profiles, cognitive tests) rather than clinically relevant outcomes. **Dose–response relationships** have hardly been systematically investigated, and comparability suffers from varying extract qualities. Basic research shows consistent antioxidant and inflammation-modulating effects *in vitro* and in animal models, yet the transfer of these preclinical findings to humans has not been examined. Research is still at an early stage here, particularly for chronic applications.

4. What Is Frequently Claimed — and What the Data Support

STATEMENT	EVIDENCE BASE
Mangiferin has been investigated for lowering cholesterol levels; the controlled results are inconsistent	Research so far includes one controlled study of short duration. Questions on long-term data and replications stand out as the next steps to examine.
Mangiferin has been investigated for improving cognitive performance; the controlled results are inconsistent	Controlled studies show acute effects on surrogate parameters (e.g. reaction times), not on clinically relevant outcomes. Transferability to patient groups stands out.
Evidence derives mainly from cell culture and animal studies. Controlled human studies on inflammatory markers still stand out.	

STATEMENT	EVIDENCE BASE
The safety of mangiferin in long-term use has not been systematically investigated	Safety data cover short intervention periods. Systematic investigations into long-term risks stand out as open.

5. Profile: Molecule and Charge

Mangiferin is not a single molecule but a **mixture** — there is no molecular formula and no fixed molecular mass. What can be described are functional groups, charge behaviour and redox properties; this is precisely what the next section addresses.

6. Charge, Electrons, Radicals

Mangiferin exhibits electrochemical properties associated with radical scavengers and redox processes. In cell cultures it reduces reactive oxygen species (ROS) and prevents depletion of glutathione (GSH) ¹⁹. It acts as an antioxidant by reducing ROS formation and influencing oxidative stress responses ^{19 20}. DPPH radical-scavenging activity was measured with an SC50 value of 19.35 µM ²¹. Mangiferin-containing nanostructures showed a zeta potential of 18.87 ± 2.42 mV, indicating a positive surface charge ¹⁸. Direct electrochemical measurements such as electron transfer or cation exchange have not been documented in human tissues or in the living organism. Animal or human studies on these specific parameters are lacking ¹⁷.

Mangiferin has not yet been investigated for electrochemical properties such as charge behaviour or cation exchange in humans or human tissues. In cell models, however, it shows effects on redox systems, for example through inhibition of ROS accumulation and modulation of signalling pathways such as AMPKα/ACC ^{14 20}. The antioxidant effect was demonstrated in insulin-resistant cells under high-glucose conditions, without specific charge or electron-transfer mechanisms being described ¹³. Whether these effects are based on direct electrochemical interactions or represent secondary biochemical processes remains open. Further investigations in isolated systems or in the living organism would be required to characterise charge behaviour or radical reactions in a targeted manner.

7. Interactions with Other Substances

With which other substances on the platform this substance is **jointly** investigated or discussed in human studies and reviews — combination, comparison or shared mechanism of action. The number refers to works in which both occur.

SUBSTANCE	SHARED WORKS	OF WHICH CONTROLLED IN HUMANS
Chronic Inflammation	10	1
Stress, Cortisol and Inflammation	6	2
Gut Microbiome	4	0
Turmeric and Curcumin	3	0
Ginger	2	0
Quercetin	2	1
Butyrate (Butyric Acid)	2	1

Polyphenols such as mangiferin can influence the pharmacokinetics of medicinal products. In cell culture studies, mangiferin was identified as a substrate of the efflux transporter P-glycoprotein (P-gp). Simultaneous administration of verapamil, a P-gp inhibitor, significantly reduced the efflux of mangiferin ²⁴. This suggests a possible interaction with other P-gp substrates, as mangiferin could inhibit their transport. In addition, in vitro it was shown that mangiferin and its metabolite norathyriol (NTR) influence the activity of uridine diphosphate glucuronosyltransferases (UGT). At plasma concentrations of NTR above 1.6 µM (UGT1A3), 2.0 µM (UGT1A7) or 2.8 µM (UGT1A9), a clinically relevant interaction with medicinal products metabolised via these enzymes could occur ²³.

The bioavailability of mangiferin depends on the dosage form. Aqueous extracts with mangiferin monosodium salt (MLES) showed improved solubility compared with water-insoluble extracts (MLE60), which could influence absorption ¹⁰. However, clinical data on possible interactions with medicinal products or nutrients are lacking, particularly regarding the regulation of metabolic or epigenetic mechanisms ²². Further investigations into bioavailability and enzyme modulation are required.

8. Overdose, Tolerability, Limits

Data from controlled human studies are available for mangiferin, indicating good tolerability. In clinical studies with *Mangifera indica* extracts (including Stadice®), no cardiovascular adverse effects³ or laboratory abnormalities⁴ were reported. Adverse events also did not occur⁴. The parameters examined remained within the physiological reference range⁴. A lethal dose (LD₅₀) of over 2000 mg/kg in the animal model suggests low acute toxicity. In cell cultures, mangiferin showed no cytotoxic effects on healthy retinal pigment epithelial cells (ARPE-19)¹⁹ and primary cells²⁶, while it induced apoptosis in cancer cells²⁶.

Current reviews discuss the safety of mangiferin and its formulations without naming specific upper limits or contraindications²⁵. Observational studies point to increasing demand for mangiferin-containing food supplements without indications of systematic risks⁷. However, long-term data on chronic use or high doses in humans are lacking. In vitro data show that mangiferin is metabolically stable and does not form toxic metabolites. Whether interactions with medicinal products or specific risk groups exist has not been sufficiently investigated. Further studies would be required to clarify dose-response relationships, possible accumulation effects or individual sensitivities.

9. The Most Robust Works

Ordered by strength of evidence, not by familiarity. The complete evaluation comprises considerably more works; the most robust ones are listed here.

Controlled Studies in Humans

- ¹ Mangiferin supplementation improves serum lipid profiles in overweight patients with hyperlipidemia: a double-blind randomized controlled trial (2015)
- ² Acute Effects of a Polyphenol-Rich Leaf Extract of *Mangifera indica* L. (Zynamite) on Cognitive Function in Healthy Adults: A Double-Blind, Placebo-Controlled Study (2020)
- ³ Central nervous system activities of extract *Mangifera indica* L. (2020)
- ⁴ Assessment of Efficacy and Safety of *Mangifera indica* Extract (Stadice®) for Cognitive Function: A Randomized, Double-Blind, Placebo-Controlled Study (2024)
- ⁵ Effects of a Singular Dose of Mangiferin-Quercetin Supplementation on Basketball Performance: A Double-Blind Crossover Study of High-Level Male Player (2024)
- Acute effects of mango leaf extract on cognitive function in healthy adults: a randomised, double-blind, placebo-controlled crossover study (2024)
- ⁶ Acute Supplementation of Soluble Mango Leaf Extract (Zynamite® S) Improves Mental Performance and Mood: A Randomized, Double-Blind Study (2025)

Observational Studies in Humans

- ⁷ Mangiferin: A review of sources and interventions for biological activities (2016)
- Non-Nutrient, Naturally Occurring Phenolic Compounds with Antioxidant Activity for the Prevention and Treatment of Periodontal Diseases (2015)
- ⁸ Renoprotective Effects of Mangiferin: Pharmacological Advances and Future Perspectives (2022)
- A Review of the Potential Benefits of Herbal Medicines, Small Molecules of Natural Sources, and Supplements for Health Promotion in Lupus Conditions (2023)
- ⁹ Gut microbiota-mediated conversion of mangiferin to norathyriol alters short chain fatty acid and urate metabolism (2025)
- ¹⁰ Human Pharmacokinetic Profiling and Comparative Analysis of Mangiferin and Its Monosodium Derivative from *Mangifera indica* Extracts (2025)
- ¹¹ Assessing Anti-Adipogenic Effects of Mango Leaf Tea and Mangiferin within Cultured Adipocytes (2023)
- ¹² Mangiferin Against Respiratory Diseases: Pharmacological Targets and Prospects (2025)

Investigations on Human Tissue

- ¹³ Ameliorative effects of mangiferin derivative TPX on insulin resistance via PI3K/AKT and AMPK signaling pathways in human HepG2 and HL-7702 hepatocyte (2023)
- ¹⁴ The Compound of Mangiferin-Berberine Salt Has Potent Activities in Modulating Lipid and Glucose Metabolisms in HepG2 Cells (2016)
- ¹⁵ Exploring and validating physicochemical properties of mangiferin through GastroPlus® software (2017)
- ¹⁶ Mangiferin and EGCG Compounds Fight Against Hyperlipidemia by Promoting FFA Oxidation via AMPK/PPARα (2024)
- Antielastase and Antihyaluronidase Activity of Isomangiferin, a Xanthone with Strong Antioxidant Properties (2026)

10. Summary

The available human studies primarily show short-term effects of mangiferin on metabolic parameters and cognitive tests. In the metabolic area, there is a consistent change in the lipid profile, particularly through lowering triglycerides and increasing HDL cholesterol, as well as an increase in fatty acid oxidation. Cognitive studies indicate acute improvements in attention, working memory and executive functions, albeit with heterogeneous results. In the musculoskeletal system, a performance increase was observed in one study with a combination of mangiferin and quercetin, so the effect of mangiferin alone is not proven here. The bioavailability of mangiferin can be significantly improved by salt formation, which could serve as a starting point for clinical studies.

HYPOTHESIS

The observed effects could be attributable to antioxidant, inflammation-modulating and mitochondrial mechanisms. Mangiferin could be particularly effective in metabolic dysregulations, cognitive stress or physical exhaustion. The microbial conversion to norathyriol in the intestine could significantly influence the systemic effect, while the anti-inflammatory properties offer potential for chronic inflammatory diseases. However, these hypotheses have not yet been clinically validated and are at the beginning of research.

To clarify the clinical relevance of mangiferin, long-term studies with larger populations and standardised extract forms would be required. In particular, dose-dependent effects, the sustainability of the effects and possible neuroprotective or anti-inflammatory properties in chronic diseases would need to be investigated. In addition, testing the microbial metabolism and its influence on bioavailability as well as the differentiation of the effects of mangiferin from other polyphenols in combination preparations would be necessary.

11. What Remains Open

- **Long-term effects:** Are there sustainable effects on metabolism or cognition with chronic intake?
- **Dose-response relationship:** Which doses are effective and safe, particularly in combination with other polyphenols?
- **Target groups:** Can the acute effects on healthy adults be transferred to patient groups (e.g. with metabolic syndrome)?

12. Further Paths

Topics, mechanisms of action and chains in which this substance occurs — for all those who want to look beyond the substance.

- Interaction Network

Frequently Asked Questions

Can Mangiferin be used for exhaustion?

The study situation includes controlled human studies on **exhaustion**, which mostly examine acute effects on subjective parameters (e.g. fatigue). The results are **preliminary** and not transferable to clinical diagnoses (e.g. fatigue syndrome). Research has not yet presented a **standardised application** or **long-term data** here.

How is Mangiferin dosed in studies?

Dosages vary widely between studies. Controlled human studies mostly use **standardised mango leaf extracts** or isolated mangiferin in the low milligram range. **Bioavailability** depends on the form of administration and accompanying substances. Systematic dose-finding studies are lacking.

Are there interactions with medicines?

The data situation on **interactions** is still developing. Basic research suggests possible interactions with **cytochrome P450 enzymes**, which could influence the metabolism of other substances. Controlled human studies on this topic are lacking. An **individual risk assessment** is required when medicines are taken concurrently.

Sources

- 1 **Mangiferin supplementation improves serum lipid profiles in overweight patients with hyperlipidemia: a double-blind randomized controlled trial**
Na L, Zhang Q, Jiang S, Du S, Zhang W, Li Y et al. · 2015
- 2 **Acute Effects of a Polyphenol-Rich Leaf Extract of *Mangifera indica* L. (Zynamite) on Cognitive Function in Healthy Adults: A Double-Blind, Placebo-Controlled Crossover Study**
Wightman EL, Jackson PA, Forster J, Khan J, Wiebe JC, Gericke N et al. · 2020
- 3 **Central nervous system activities of extract *Mangifera indica* L**
López-Ríos L, Wiebe JC, Vega-Morales T, Gericke N · 2020
- 4 **Assessment of Efficacy and Safety of *Mangifera indica* Extract (Stadice®) for Cognitive Function: A Randomized, Double-Blind, Placebo-Controlled Study**
Jeyakodi S, Krishnakumar A, Dalal M, Shetty BS · 2024
- 5 **Effects of a Singular Dose of Mangiferin-Quercetin Supplementation on Basketball Performance: A Double-Blind Crossover Study of High-Level Male Players**
Bourdas DI, Travlos AK, Souglis A, Stavropoulou G, Zacharakis E, Gofas DC et al. · 2024
- 6 **Acute Supplementation of Soluble Mango Leaf Extract (Zynamite® S) Improves Mental Performance and Mood: A Randomized, Double-Blind, Placebo-Controlled Crossover Study**
Castellote-Caballero Y, Beltrán-Arranz A, Aibar-Almazán A, Carcelén-Fraile MDC, Rivas-Campo Y, López-Ríos L et al. · 2025
- 7 **Mangiferin: A review of sources and interventions for biological activities**
Jyotshna, Khare P, Shanker K · 2016
- 8 **Renoprotective Effects of Mangiferin: Pharmacological Advances and Future Perspectives**
Akter S, Moni A, Faisal GM, Uddin MR, Jahan N, Hannan MA et al. · 2022
- 9 **Gut microbiota-mediated conversion of mangiferin to norathyriol alters short chain fatty acid and urate metabolism**
Bunt D, Schwalbe M, Hayeeawaema F, El Aidy S · 2025
- 10 **Human Pharmacokinetic Profiling and Comparative Analysis of Mangiferin and Its Monosodium Derivative from *Mangifera indica* Extracts Using UHPLC-MS/MS with 1H NMR and MALDI-TOF Confirmation**
Fuentes-Rios D, Sanchez-Rodriguez A, Lopez-Rios L, Garcia-Gonzalez E, Martinez-Canton M, Galvan-Alvarez V et al. · 2025
- 11 **Assessing Anti-Adipogenic Effects of Mango Leaf Tea and Mangiferin within Cultured Adipocytes**
Zarasvand SA, Haley-Zitlin V, Oladosu O, Esobi I, Powell RR, Bruce T et al. · 2023
- 12 **Mangiferin Against Respiratory Diseases: Pharmacological Targets and Prospects**
Ahmed KA, Afrin N, Ghosh P, Heya IA, Akash SR, Moni A et al. · 2025
- 13 **Ameliorative effects of mangiferin derivative TPX on insulin resistance via PI3K/AKT and AMPK signaling pathways in human HepG2 and HL-7702 hepatocytes**
Fan X, Jiao G, Pang T, Wen T, He Z, Han J et al. · 2023
- 14 **The Compound of Mangiferin-Berberine Salt Has Potent Activities in Modulating Lipid and Glucose Metabolisms in HepG2 Cells**
Wang C, Jiang JD, Wu W, Kong WJ · 2016
- 15 **Exploring and validating physicochemical properties of mangiferin through GastroPlus® software**
Khurana RK, Kaur R, Kaur M, Kaur R, Kaur J, Kaur H et al. · 2017
- 16 **Mangiferin and EGCG Compounds Fight Against Hyperlipidemia by Promoting FFA Oxidation via AMPK/PPARα**
Xu Y, Zhang J, Zhang T, Zi M, Zhang Q · 2024
- 17 **Among them, thymoquinone, coenzyme Q (CoQ), mangiferin, resveratrol, verbascoside and some flavonoids have shown to prev...**
· 2015
- 18 **The optimized MG-SLNs exhibited a particle size of 138.37 ± 3.39 nm, polydispersity index of 0.247 ± 0.023, entrapment e...**
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- 19 **The data obtained in vitro on arising retinal pigment epithelium cells (ARPE-19) did not show cytotoxic effects for blan...**
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- 20 **Additionally, mangiferin decreased NLRP3 inflammasome activation and reactive oxygen species accumulation in hyperglycem...**
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- 21 **Compound 1 exhibited potent DPPH radical scavenging activity with an SC50 value of 19.35 µM), whereas ...**
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- 22 **However, most of the evidence comes from in silico, in vitro, and preclinical studies, with few clinical observations. <...**
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- 23 **Based on the inhibition evaluation standard ([I]/Ki < 0.1, low possibility; 0.1 < [I]/Ki < 1, medium possi...**
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- 24 **The efflux ratio of MGF, TAILI, TBII, and BHI was greater than 2 and significantly descended with the co-administration ...**
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- 25 **The review ends with the discussion of the safety of mangiferin and its formulations in addition to the potential for cl...**
· 2025
- 26 **PT-Mangiferin was non-toxic to primary cells but showed significant toxicity and apoptotic effect on cancerous cells...**
· 2017
- 27 ***Mangifera indica* L., By-Products, and Mangiferin on Cardio-Metabolic and Other Health Conditions: A Systematic Review**
Minniti G, Laurindo LF, Machado NM, Duarte LG, Guiguer EL, Araujo AC et al. · 2023

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Research, put in context. Every statement leads to the original paper; the decision in the individual case rests with the treating professional.
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