

# AACT Herbal Dietary Supplement Section

## Abstracts November 2023

### **1. Tejocote Root's Role in Symptomatic Mobitz Type 1 Heart Block: A Compelling Case Report.** Assi H, Najera C, Aboudawoud O, Nadella S, Bies JJ, Hassan M, Roongsritong C.

Cureus. 2023 Sep 14;15(9):e45228. doi: 10.7759/cureus.45228. eCollection 2023 Sep.

The clinical presentation and diagnosis of Tejocote root toxicity causing Mobitz Type 1 remains a scarcely clinical phenomenon, often resulting in delayed diagnosis and treatment. This case report highlights a 30-year-old female presenting with a constellation of symptoms, including fatigue, dizziness, chest pressure, myalgias, nausea, vomiting, and peripheral tingling. Significantly, the patient had been using Tejocote root as an over-the-counter laxative acquired from Mexico. Laboratory findings revealed detectable Digoxin levels in her bloodstream, while an electrocardiogram (EKG) indicated sinus bradycardia with Mobitz Type 1 heart block. The patient was treated with a single dose of atropine 0.5 mg IV push. A repeat EKG before discharge showed resolution of the Mobitz type 1. This case underscores the potential cardiovascular repercussions of Tejocote root consumption and emphasizes the importance of heightened clinical awareness, especially in regions where such herbal supplement usage is prevalent.

DOI: 10.7759/cureus.45228

PMCID: PMC10576468

PMID: 37842399

### **2. Case report: Hawthorne root (*Crataegus mexicana*) toxicity.** Espinosa J, Bassett R, Lucerna A, Finn D.

Am J Emerg Med. 2023 Nov 3:S0735-6757(23)00594-6. doi: 10.1016/j.ajem.2023.10.046.

Here we present the case of a patient who purchased a Hawthorne root (*Crataegus mexicana*) product, Raiz de Tejocote, for weight loss purposes. She presented with diffuse myalgias, dizziness and a heart rate of 52 beats per minute. At triage and at initial evaluation, the patient denied taking any medications, but on iterative questioning concerning over-the-counter, over-the-internet and herbal medications, she reported taking Hawthorne root tablets in the three days prior to the emergency department (ED) visit for the purpose of weight loss. The product was purchased through the internet. Her plasma digoxin concentration was 0.4 ng/ml the patient's constellation of symptoms, as well as the detectable plasma digoxin concentration, were consistent with hawthorne root toxicity. Hawthorne root has intrinsic cardiac glycoside activity. In addition, Hawthorne root may cause a range of toxicity. Mild symptoms can include flu-like syndrome with significant myalgias. However, in the more severe exposures the cardiac glycoside effects can result in bradycardia and hemodynamic instability. Symptoms resolved with ED observation. The heart rate normalized. This case reinforces the importance of asking a

patient about all medications, including over-the-counter, over-the-internet and herbal medications.

DOI: 10.1016/j.ajem.2023.10.046

PMID: 37973470

**2. Toxicokinetics of thebaine in those consuming non-food grade poppy seeds as a tea.** Penafiel R, Yoo D, Turner C, Brown JA, McDonald C, Tran J, Shaw V, Roberts DM.

Clin Toxicol (Phila). 2023 Nov 2:1-5. doi: 10.1080/15563650.2023.2271163. Online ahead of print.

**INTRODUCTION:** Thebaine is an alkaloid in poppy seeds that is neurotoxic to animals. Data on its clinical effects and toxicokinetics in people are minimal. In 2022, poppy seeds high in thebaine entered the Australian food market, and people consuming tea made from these poppy seeds developed poisoning. **METHODS:** Three patients who drank poppy seed tea and developed neuromuscular toxicity consented for thebaine to be quantitated in serial blood samples. Blood samples were analyzed by liquid chromatography with high-resolution mass spectrometry. **RESULTS:** Case 1: A man in his 60s presented with drowsiness, vomiting, malaise and myoclonus. He developed metabolic acidosis with hyperlactataemia, acute kidney injury requiring haemodialysis, convulsions, rhabdomyolysis, and was in the hospital for 18 days. The admission thebaine blood concentration was 2.1 mg/L, and the apparent elimination half-life was 14.8 h. Case 2: A man in his 30s presented with myoclonus, rigidity, vomiting, and dizziness. He developed metabolic acidosis with hyperlactataemia, acute kidney injury, and myalgias. The admission thebaine blood concentration was 4.1 mg/L, and the apparent elimination half-life was 11.6 h. Case 3: A man in his 30s presented with myoclonus, rigidity, clonus, diaphoresis, and abdominal pain. The admission thebaine blood concentration was 2.2 mg/L, and the apparent elimination half-life was 8.3 h. **DISCUSSION:** Neuromuscular toxicity, metabolic acidosis with hyperlactataemia, acute kidney injury, and gastrointestinal symptoms were prominent clinical features in these patients after drinking poppy seed tea. Effects persisted for days, and all survived, despite thebaine concentrations far exceeding those in published forensic reports, although human data are sparse. Compared to rats, the thebaine apparent elimination half-life is much longer in humans who develop symptoms at lower concentrations. **CONCLUSIONS:** Despite relatively high thebaine blood concentrations and moderate to severe poisoning, outcomes were favourable with early presentations. It is possible that acute kidney injury prolongs the apparent elimination half-life of thebaine.

DOI: 10.1080/15563650.2023.2271163

PMID: 37917043

**3. Toxic Elemental Impurities in Herbal Weight Loss Supplements; A Study Using ICP-OES Microwave-Assisted Digestion.** Al-Thani G, Ibrahim AE, Alomairi M, Salman BI, Hegazy MM, Al-Harrasi A, El Deeb S

Toxics. 2023 Mar 16;11(3):272. doi: 10.3390/toxics11030272

The tendency of using weight loss herbal preparations is continuously increasing, especially for the widespread consumption of junk food that is characterized by high calories. Weight loss herbal preparations are considered a type of food supplement product, and, as such, the regulations governing their quality control might be minimal. These products could be locally formulated in any country or internationally imported. Being non-controlled products, the herbal weight-loss products may contain high levels of elemental impurities that might exceed the permissible ranges. Moreover, these products contribute to the total daily intake (TDI) of such elements, which might represent concerns about their potential toxicological danger. In this research, the elemental contents in such products were investigated. The inductively coupled plasma with optical emission spectrometer (ICP-OES) was used to determine the levels of 15 elemental contents, namely, Na, K, Ca, Mg, Al, Cu, Fe, Li, Mn, As, Co, Cr, Cd, Ni and Pb. The results showed that seven micro-elements, namely Cd, Co, Ni, Cr, Pb, Li and Cu, were either not detectable or at a concentration much lower than their tolerable limits. However, all studied macro-elements (Na, K, Ca and Mg), together with Fe, were found at considerable, yet safe levels. On the other hand, Mn, Al and As contents showed perturbing levels in some of the studied products. Finally, a conclusion was highlighted for the necessity for stricter surveillance of such herbal products.

PMCID: PMC10053313

PMID: [36977037](#)

**4. Positive Outcome in Catastrophic Momordica charantia-Associated Herb-Induced Liver Injury: A Tale of Two Cities - From Gonaives, Haiti to New York City.** Kwentoh I, Adelodun A, Bortier T, Ogbovoh D, Scott E.

Cureus. 2023 Oct 6;15(10):e46597. doi: 10.7759/cureus.46597. eCollection 2023 Oct.

Herb-induced liver injury (HILI) is a global concern due to the uptrend in Complementary and Alternative Medicine (CAM). The authors add to the current literature by reporting a case of a 61-year-old man with recent travel to Haiti. His past medical history include hepatitis C virus treated in 2021 with a sustained virologic response (SVR). He presented with profound weakness and abnormal liver transaminases in the thousands. It was initially unclear what the etiology of the patient's hepatocellular necrosis was, however, the level of abnormality was most consistent with either toxic metabolic injury or vascular ischemic injury. We initiated N-acetylcysteine and vitamin K and had a positive outcome. Upon further questioning, he admitted to consuming an herbal product cleansing tea called "asowosi" in large quantities. We searched the botanical name of the extract and found the active ingredient was *Momordica charantia*. The team utilized the updated Roussel Uclaf Causality Assessment Method (RUCAM), and the results demonstrated a highly probable relationship with *M. charantia*.

DOI: 10.7759/cureus.46597  
PMCID: PMC10558137  
PMID: 37808602

### **5. Ashwagandha-induced liver injury-A case series from India and literature review.**

Philips CA, Valsan A, Theruvath AH, Ravindran R, Oommen TT, Rajesh S, Bishnu S, Augustine P; Liver Research Club India.

Hepatol Commun. 2023 Sep 27;7(10):e0270. doi: 10.1097/HC9.0000000000000270. eCollection 2023 Oct 1.

**BACKGROUND:** Ashwagandha herb is commonly used in Ayurveda and a "fad" dietary supplement for a host of indications based on low levels of evidence. Recently, ashwagandha was implicated in multiple reports of herb-induced liver injury (HILI), mainly from the United States. We present the first, and currently largest, series of ashwagandha-HILI from multiple centers in India. **METHODS:** We retrospectively analyzed the respective institutional electronic medical records for ashwagandha-HILI. Patients consuming ashwagandha as part of multiherbal formulations or along with other known hepatotoxic supplements or medicines were excluded. All patients underwent a detailed diagnostic workup to exclude competing causes reasonably. Where possible, the implicated herbal formulation was retrieved and subjected to chemical analysis. **RESULTS:** Out of 23 patients with liver injury from ashwagandha (January 2019 to December 2022), we report 8 patients with single-ingredient formulation-related HILI. Study cohort was male predominant, and cholestatic hepatitis was the commonest presentation. Five patients had underlying chronic liver disease; 3 presented with acute-on-chronic liver failure, and all 3 died on follow-up. In others, the liver injury was prolonged, nonetheless self-limiting. Liver biopsy revealed cholestatic features predominantly with hepatocellular necrosis and lymphocyte/eosinophil predominant portal-based inflammation. One patient progressed to chronic HILI. Chemical analysis revealed only natural phytochemicals without adulteration or contamination. **CONCLUSIONS:** Ashwagandha-HILI presents with cholestatic hepatitis and can lead to the syndrome of acute-on-chronic liver failure with high mortality in those with pre-existing liver disease. Educating the public on avoiding the use of potentially toxic and unrecommended herbal supplements can help mitigate the avoidable liver disease burden in the community.

DOI: 10.1097/HC9.0000000000000270  
PMCID: PMC10531359  
PMID: 37756041 [Indexed for MEDLINE]

## **6. Hepatotoxicity with High-Dose Green Tea Extract: Effect of Catechol-O-Methyltransferase and Uridine 5'-Diphospho-glucuronosyltransferase 1A4 Genotypes.**

Acosta L, Byham-Gray L, Kurzer M, Samavat H.

J Diet Suppl. 2023;20(6):850-869. doi: 10.1080/19390211.2022.2128501. Epub 2022 Sep 30.

The predominant catechin in green tea, epigallocatechin gallate (EGCG), may be hepatotoxic in high doses. Our objective was to investigate the influence of catechol-O-methyltransferase (COMT) and uridine 5'-diphospho-glucuronosyltransferase 1A4 (UGT1A4) genotypes on changes in liver injury biomarkers in response to long-term, high-dose green tea extract (GTE) supplementation among postmenopausal women. A secondary analysis was conducted using data from the Minnesota Green Tea Trial (N = 1,075), in which participants were randomized to consume high-dose GTE (843 mg/day EGCG) or placebo capsules for 12 months. Analysis of covariance adjusting for potential confounders was performed to examine changes in aspartate aminotransferase (AST), alanine aminotransferase (ALT), AST: ALT ratio, and alkaline phosphatase from baseline to months 3, 6, 9, and 12 across COMT and UGT1A4 genotypes. Mean age and BMI within the GTE group (n = 400) were 59.8 yrs and 25.1 kg/m<sup>2</sup>, respectively, and 98% of subjects were white. From baseline to month 3, mean AST: ALT ratio change was +1.0% in the COMT (rs4680) A/G genotype versus -4.8% in the A/A genotype (p = 0.03). From baseline to months 6 and 9, respectively, mean ALT change was +78.1% and +82.1% in the UGT1A4 (rs6755571) A/C genotype versus +28.0% and +30.1% in the C/C genotype (p < 0.001 and p = 0.004, respectively). The UGT1A4 (rs6755571) A/C genotype may be an important risk factor for clinically-relevant serum transaminase elevations with 6-9 months of high-dose GTE supplementation among postmenopausal women. Understanding the genetic underpinnings of GTE-related hepatotoxicity may allow for a genetically-informed paradigm for therapeutic use of GTE.

DOI: 10.1080/19390211.2022.2128501

PMCID: PMC10060436

PMID: 36178169 [Indexed for MEDLINE]

## **7. Interaction of *Garcinia cambogia* (Gaertn.) Desr. and Drugs as a Possible Mechanism of Liver Injury: The Case of Montelukast.** Di Giacomo S, Di Sotto A, Percaccio E, Scutto E, Battistelli C, Mazzanti G, Menniti-Ippolito F, Ippoliti I.

Antioxidants (Basel). 2023 Sep 16;12(9):1771. doi: 10.3390/antiox12091771.

Overweight and obesity prevalence has increased worldwide. Apart from conventional approaches, people also resort to botanical supplements for reducing body weight, although several adverse events have been associated with these products. In this context, the present study aimed at evaluating the toxicity of *Garcinia cambogia*-based products and shedding light on the mechanisms involved. The suspected hepatotoxic reactions related to *G. cambogia*-containing products collected within the Italian Phytovigilance System (IPS) were examined. Then, an *in vitro* study was performed to evaluate the possible mechanisms responsible for the liver toxicity, focusing on the modulation of oxidative stress and Nrf2 expression. From March 2002 to March 2022, the IPS collected eight reports of hepatic adverse reactions related to *G.*

cambogia, which exclusively involved women and were mostly severe. The causality assessment was probable in three cases, while it was possible in five. In the in vitro experiments, a low cytotoxicity of *G. cambogia* was observed. However, its combination with montelukast greatly reduced cell viability, increased the intracellular ROS levels, and affected the cytoplasmic Nrf2 expression, thus suggesting an impairment of the antioxidant and cytoprotective defenses. Overall, our results support the safety concerns about *G. cambogia*-containing supplements and shed light on the possible mechanisms underpinning its hepatotoxicity.

DOI: 10.3390/antiox12091771

PMCID: PMC10525400

PMID: 37760074

**8. Drug-induced liver injury associated to red yeast rice.** García-García MD, Bellido Muñoz F, Cordero Ruiz P, Caunedo Álvarez Á.

Rev Esp Enferm Dig. 2023 Jul 14. doi: 10.17235/reed.2023.9797/2023. Online ahead of print.

Hepatotoxicity is defined as a liver injury induced by a drug or a non-pharmacological agent like herbal medications or dietary supplements. Red yeast rice is rich in monacolin K, which has the same chemical structure as lovastatin, reason why it has been used for the management of hiperlipidemia. A 62 years old woman presented to the emergency service with 38.5°C fever, coluric orine and loss of weight in the previous 3 weeks. The patient was taking RYR since the week before to the initial symptoms. Mixed hepatocellular and cholestatic acute hepatitis was diagnosed. Autoimmune liver serology resulted positive. Total DILI RECAM Score was 8 (highly probable DILI). Conservative treatment with exclusion of RYR was decided and during follow-up bilirubin and transaminases gradually dropped off. It has been reported a few cases of hepatitis associated to the use of RYR, promoted by a toxic or immunogenic metabolite. Cross-reactions may justify positive autoantibodies so hepatotoxicity should not be discard as a diagnose.

DOI: 10.17235/reed.2023.9797/2023

PMID: 37449514

**9. Sub-acute toxicity evaluation of aqueous leaf extract from *Passiflora edulis* Sims f. *edulis* (Gulupa) in Wistar rats.** Rodríguez-Usaquén A, Sutachan JJ, Villarreal W, Costa GM, Acero Mondragon EJ, Ballesteros-Ramírez R, Albarracín SL.

Toxicol Rep. 2023 Oct 24;11:396-404.

Abstract: The genus *Passiflora* (Passifloraceae) comprises about 500 species. The *Passiflora edulis* stands out because of its economic and medicinal importance. It is widely planted in tropical and subtropical regions worldwide, especially in South America, the Caribbean, South Africa, and Asia. The aqueous extract of *Passiflora edulis* Sims f. *edulis* (Gulupa) leaves is used in traditional medicine for its soothing and tranquilizing effects on the central nervous system. Therefore, evaluating its safety for human use is a fundamental requirement to continue the

development of new therapies within the framework of regulatory, preclinical, and clinical guidelines. Here, the sub-acute toxicity study was conducted following the Organization for Economic Cooperation and Development (OECD) guideline 407 for 28 days in Wistar albino rats. The study showed that 1000 mg/kg/day of the aqueous extract in 10 adult Wistar rats (five males and five females) was well tolerated. The hematological results are at normal levels. However, monocytopenia and eosinopenia were observed with a significant difference ( $P < 0,05$ ) for both male and female rats treated with the aqueous extract of *Passiflora edulis*. The results show that liver and kidney function profiles were conserved. However, an increase in ALT is observed with significant differences between male and female rats treated with the extract compared to the controls. Study findings were limited to non-adverse histopathological results of a slightly increased incidence of focal periportal lymphocytic infiltrate in the liver and focal corticomedullary nephrocalcinosis in the kidney compared to control. Therefore, the aqueous extract of *Passiflora edulis* has a good safety profile in oral administration, was well tolerated, and did not cause any lethality or adverse effects in the sub-acute toxicity study in male and female rats. The NOAEL (no observed adverse effect level) for the 28-day subacute toxicity study was considered to be 1000 mg/kg.

DOI: 10.1016/j.toxrep.2023.10.013

PMCID: PMC10632121

PMID: 37955035

## **10. Interference of Herbal Medicine with Axitinib in Metastatic Renal Cell Cancer**

**Treatment: A Case Study.** Himmelreich F, Jetter A, Kiessling MK, Kadvany Y, Trojan A.

Case Rep Oncol. 2023 Nov 9;16(1):1362-1369. doi: 10.1159/000534595. eCollection 2023 Jan-Dec.

**INTRODUCTION:** The awareness and the clinical relevance of the potential interactions between standard and complementary medicine are increasing in medical oncology. Nonetheless, the research and experience of the efficacy, safety, and toxicity of herbal substances are poorly documented.

**CASE PRESENTATION:** Here, we report the case of a 68-year-old female patient who had been diagnosed with advanced renal cell cancer with metastasis in the liver and pancreas and had undergone surgical resection with hemi-hepatectomy and resection of metastasis in the pancreas in November 2021. Thereafter, chemotherapy was immediately initiated with three-weekly infusions of pembrolizumab and daily intake of the tyrosine kinase inhibitor axitinib. Surprisingly, 3 months after initiation of systemic treatment, the patient developed early progression and metastasis in the liver, which was then treated with selective internal radiotherapy. Despite continued axitinib and pembrolizumab treatment, a short-term follow-up in November 2022 revealed another metastatic lesion in her pancreas. Due to the presumed lack of response to treatment, the plasma concentration of axitinib was measured and found to demonstrate subtherapeutic levels of exposure. Upon extended anamnesis, the patient reported

regular intake of herbal substances prescribed by her oncology acupuncturist for gastrointestinal complaints associated with the primary operation.

**CONCLUSION:** Further clinical-pharmacological workup strikingly demonstrated a reduction of the therapeutic concentration of axitinib of about 90%, likely caused by herbal drugs such as Dang gui and Bai zhu.

DOI: 10.1159/000534595

PMCID: PMC10635677

PMID: 37954127

### **11. Vitamin D Toxicity from an Unusual and Unexpected Source: A Report of 2 Cases.**

Silva C, Fung AWS, Masson V, Assen K, Ward V, McKenzie J, Blydt-Hansen TD, Cosme J, van der Gugten G, Barakauskas VE, Fox DA.

Horm Res Paediatr. 2023;96(3):332-340. doi: 10.1159/000526755. Epub 2022 Aug 26.

**INTRODUCTION:** Hypervitaminosis D is a relatively uncommon etiology of hypercalcemia. Toxicity is usually caused by very high doses, mostly secondary to erroneous prescription or administration of vitamin D, and less commonly, contaminated foods or manufacturing errors of vitamin D-containing supplements.

**CASE PRESENTATION:** A 16-year-old male, previously healthy, presented with 2-week history of nonspecific symptoms (fatigue, gastrointestinal complaints). Investigations showed acute kidney injury and hypercalcemia (total calcium 3.81 mmol/L). Further diagnostic workup revealed markedly elevated 25-hydroxyvitamin D levels (1,910 nmol/L). He denied taking any vitamin D supplements; however, he reported consumption of creatine and protein supplements. Mass spectrometry analysis of the creatine supplement estimated a vitamin D content of 425,000 IU per serving (100 times the upper tolerable daily dose). A few months later, another previously healthy adolescent presented with severe hypercalcemia and acute kidney injury secondary to hypervitaminosis D. He was also using a creatine supplement, from the same manufacturer brand and lot. Both patients were treated with intravenous hydration, calcitonin, and pamidronate. They maintained normocalcemia after their initial presentation but required low-calcium diets and laboratory testing for months after this exposure.

**DISCUSSION/CONCLUSION:** We present 2 cases of hypervitaminosis D caused by a manufacturing error of a natural health product which did not claim to contain vitamin D. The use of dietary supplements is highly prevalent; this should be incorporated while taking medical history, and considered a potential source of toxicity when an alternative source cannot be found, regardless of the product label.

DOI: 10.1159/000526755

PMID: 36030768



**12. Mulberry leaf multi-components exert hypoglycemic effects through regulation of the PI-3K/Akt insulin signaling pathway in type 2 diabetic rats.** Zhang Y, Li L, Chai T, Xu H, Du HY, Jiang Y.

J Ethnopharmacol. 2024 Jan 30;319(Pt 3):117307

**ETHNOPHARMACOLOGICAL RELEVANCE:** Phytochemicals have unique advantages in the treatment of diabetes due to their multi-target activity and low toxicity.

Mulberry leaves, a traditional Chinese herbal medicine, have been used in the prevention and treatment of diabetes for centuries. The main active ingredients in mulberry leaves with regards to the hypoglycemic effect are 1-deoxynojirimycin, flavonoids, and polysaccharides. However, the combined hypoglycemic effects and mechanisms of mulberry leaf multi-components remain unclear.

**AIM OF THE STUDY:** This study explored the anti-diabetic effects of mulberry leaf multi-components (MMC) and the role of the PI-3K/Akt insulin signalling pathway in improving insulin resistance. **MATERIALS AND METHODS:** The main chemical components of MMC were analyzed using the phenol-sulfuric acid method, aluminum nitrate-sodium nitrite method, and HPLC-ultraviolet/fluorescence detection method. The T2DM rat model was created via feeding a high-fat diet and peritoneal injection of streptozotocin. T2DM rats were divided into four groups: model, model plus metformin, model plus low-dose, and model plus high-dose MMC groups (100 and 200 mg/kg body weight/day, respectively), and plus normal group for a total of five groups. MMC was administered by oral gavage for six weeks. Fasting blood glucose and serum lipid profiles were measured using a glucometer and an automatic biochemistry analyzer, respectively. Serum insulin and adipocytokine levels were analyzed by ELISA. Hepatic glucose metabolizing enzyme activity was evaluated by ELISA and the double antibody sandwich method. Expression of PI-3K/Akt signalling pathway proteins was analyzed by RT-PCR and Western blotting. **RESULTS:** Extracted 1-deoxynojirimycin, flavonoid, and polysaccharide purity was 70.40%, 52.34%, and 32.60%, respectively. These components were then mixed at a ratio of 1:6:8 to form MMC. MMC significantly reduced serum glucose, insulin, and lipid levels. In diabetic rats, MMC enhanced insulin sensitivity and alleviated inflammatory and oxidative damage by lowering adipocytokine levels and increasing anti-oxidative enzyme activity. Insulin resistance was also mitigated. MMC regulated the activity of key downstream enzymes of hepatic glucose metabolism via activating the expression of PI-3K, Akt, PDX-1, and GLUT4 at the mRNA and protein levels, thereby correcting hepatic glucolipid metabolism disorders and exerting a hypoglycemic effect.

**CONCLUSION:** MMC ameliorated hepatic glucolipid metabolism disorders and improved insulin resistance in T2DM rats by activating the PI-3K/Akt signaling pathway. These results highlight the multi-component, multi-target, and combined effects of MMC, and suggest it may be further developed as a hypoglycemic drug.

DOI: 10.1016/j.jep.2023.117307

PMID: 37939911

### **13. Improving the rigor and utility of botanical toxicity studies: Recommended resources.**

Patel D, Sorkin B, Mitchell CA, Embry MR, Rina-Kong S, Adams RE, DeTemple ER, Reddam A, Gafner S, Kelber O, Rider CV, Oketch-Rabah H, Roe AL, Marles RJ, Dever J, Dentali S

Regul Toxicol Pharmacol. 2023 Oct;144:105471. doi: 10.1016/j.yrtph.2023.105471. Epub 2023 Aug 19.

Interest in botanicals, particularly as dietary supplement ingredients, is growing steadily. This growth, and the marketing of new ingredients and combination products as botanical dietary supplements, underscores the public health need for a better understanding of potential toxicities associated with use of these products. This article and accompanying template outline the resources to collect literature and relevant information to support the design of botanical toxicity studies. These resources provide critical information related to botanical identification, characterization, pre-clinical and clinical data, including adverse effects and interactions with pharmaceuticals. Toxicologists using these resources should collaborate with pharmacognosists and/or analytical chemists to enhance knowledge of the botanical material being tested. Overall, this guide and resource list is meant to help locate relevant information that can be leveraged to inform on decisions related to toxicity testing of botanicals, including the design of higher quality toxicological studies.

DOI: 10.1016/j.yrtph.2023.105471

PMCID: PMC10591999

PMID: 37604297 [Indexed for MEDLINE]

### **14. Association between Consumption of Dietary Supplements and Chronic Kidney Disease Prevalence: Results of the Korean Nationwide Population-Based Survey.** Fang, Y.; Lee, H.; Son, S.; Oh, S.; Jo, S.-K.; Cho, W.; Kim, M.-G

Nutrients. 2023 Feb 5;15(4):822.

Abstract: Despite the enormous global market of dietary supplements, the impact of dietary supplements on kidney disease is still unclear. Based on the National Health and Nutrition Examination Survey from 2015 to 2017, this study evaluated the association between dietary supplement and chronic kidney disease (CKD) in 13,271 Korean adults. Among the dietary supplements, vitamin and mineral intake was the highest at 61.41%, followed by omega-3 fatty acids at 11.85%, and ginseng at 7.99%. The prevalence of CKD was significantly higher in those who consumed amino acids and proteins, ginseng and red ginseng, and herbal medicine (plant extract)-berries than in those who did not. Conversely, patients who consumed probiotic supplements had a significantly lower prevalence of CKD than those who did not. In the population without CKD risk factors or history of CKD, the prevalence of CKD was high in the group consuming ginseng and red ginseng. After adjusting for covariates, the herbal medicine (plant extract)-berry group showed an independent association with CKD incidence. In conclusion, it is suggested that dietary supplements may affect kidney function. Further large-

scale cohort studies are required to elucidate the exact effects of each dietary supplement on CKD

DOI: 10.3390/nu15040822.

PMID: 36839180;

PMCID: PMC9967330.