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Tropical Fruit Allergies in Dermatology: Mango Cross-Reactivity and Cutaneous Manifestations

Krupa Sara Thomas[1]; Tanmay Jape[2]; Arya Sreekumar[3]; Ruby Sunny Agbana[4]; Reddem Adi Lakshmi[5]

[1]Department of Medicine, Faculty of Medicine, Tbilisi State Medical University, Tbilisi, Georgia
[2]Department of Medicine, Faculty of Medicine, Georgian National University, Tbilisi, Georgia
[3]Department of Medicine, Emirates Health Services, Ras Al Khaimah, United Arab Emirates
[4]Department of Medicine, Faculty of Medicine, Caucasus University, Tbilisi, Georgia
[5]Department of Medicine, School of Health Sciences, The University of Georgia, Tbilisi, Georgia

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Abstract: Mango (Mangifera indica), an immensely common tropical fruit, has become a major but lesser known source of allergic reactions to food, especially those that damage the skin. Pistachio, cashew, poison oak and poison ivy are all members of the Anacardiaceae family. They share allergenic chemicals including urushiol and lipid transfer proteins, which help explain their complex clinical presentation and cross-reactivity. Both immediate (Type I) and delayed (Type IV) hypersensitivity reactions can be brought on by a mango allergy. Urticaria, angioedema, oral allergy syndrome (OAS) and in rare instances anaphylaxis are typical type I reactions. These are frequently brought on by allergens such as profilins and are mediated by IgE antibodies. Conversely, type IV reactions which often show up 8–72 hours after exposure are characterized by allergic contact dermatitis after skin contact with mango peel, sap or tree components. Even after being exposed to mangos for the first time, people who have previously become sensitized to plants that contain urushiol including poison ivy, may show increased sensitivity. Due to symptoms that coincide with those of other dermatoses such as atopic dermatitis, irritating contact dermatitis and skin disorders linked to pandemic masks, diagnosing mango allergy can be clinically challenging. Certain IgE assays, skin prick tests and patch testing are crucial tools for differentiating between various forms of hypersensitivity. Case studies show a range of manifestations from widespread systemic reactions to localized perioral dermatitis and they point out that workers in the food business are especially vulnerable to occupational allergies. According to studies, mango is the most prevalent fruit allergy in places like Taiwan and China. Geographical and nutritional factors affect prevalence. Mango allergies are mainly unreported and poorly understood. Effective care depends on improved clinician awareness, precise diagnosis and knowledgeable patient education. Further study is required to better understand cross-reactivity mechanisms, create more precise diagnoses and investigate possible immunotherapies. For prompt treatment and to avoid misdiagnosis, mango allergy must be acknowledged as a unique and important dermatological entity.

Keywords: *Mango Allergy; Cross-Reactivity; Contact Dermatitis; Lipid Transfer Proteins; Urushiol; Hypersensitivity Reactions.*

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I. INTRODUCTION

The prevalence of food allergy (FA) has risen steadily over recent decades in both developed and developing countries, possibly reflecting previous underrecognition of the condition [1]. In the United States 1 in 10 adults may be food allergic, as indicated by a recent nationwide survey. Both the prevalence of food allergy and the range of allergenic foods are increasing [2]. Fish, shrimp, soybeans, peanuts, milk, eggs, wheat and tree nuts comprise the "big eight" which are among the foods to which people are most frequently allergic. Tropical fruits represent a class of underrecognized yet emerging food allergens [3].

A cross-sectional survey in Taiwan found that the overall prevalence of fruit allergies was 5.6% out of 10,601 children. With a prevalence rate of 3.6%, mangos were the most common fruit among all of these allergies. Additionally, notable differences in the prevalence of mango allergies were observed in a study conducted in Southwest China amongst various age groups: infancy (0.91%), preschool (1.34%), school age (0.9%) and adolescence (2.34%). Mango allergies

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have gathered appreciable significance in recent years as an "emerging" allergen. Environmental exposures, genetic predispositions and regional food patterns may all have an impact on variations in prevalence. These elements also play a part in the significant differences in the prevalence of mango allergy observed among countries. Although fruit allergies are often mild, they may be more prevalent than other food allergies affecting up to 4.6% of the population. The structural similarities between major fruit allergens and vegetables, birch and other pollen are factors that contribute to this high incidence [3].

Mango (*Mangifera indica*) is phylogenetically classified under the Anacardiaceae family which also includes Pistachio, Cashew nuts, Pink peppercorn and Sumac [4,5]. Members of the Anacardiaceae family exhibit cross-reactivity. Mango allergies can manifest as either acute or delayed reactions, which are indicative of Type I and Type IV hypersensitivity pathways. Additionally, sensitization to other members of the Anacardiaceae family can cause contact dermatitis, even without direct exposure to mango or its components [6].

With an emphasis on its pathophysiology, cutaneous manifestations, diagnostic difficulties and the consequences of cross-reactivity with related plant species, this article attempts to present a thorough overview of mango allergy as a subgroup of tropical fruit allergies. It also highlights how clinical diagnosis might be made more difficult by skin conditions linked to pandemics.

II. MATERIALS AND METHODS

An extensive approach was applied to collect and evaluate relevant research on allergies to tropical fruit including mango cross-reactivity and cutaneous symptoms. A thorough search strategy, a narrative method, defined inclusion and exclusion standards for preferring studies and data extraction were all components of the process.

A. Search Strategy:

This present study was organised in the form of a Literature review. Targeting peer-reviewed publications, a literature search was conducted across scientific databases including PubMed, Research Gate, Google Scholar, ScienceDirect and Scopus. To find articles of interest from several fields, the following keywords were used in different combinations: "Mango allergy," "tropical fruit allergy," "contact dermatitis," "cross-reactivity," "cutaneous signs and symptoms" and "hypersensitivity reactions."

B. Criteria for Inclusion and Exclusion:

Studies were taken into consideration if they addressed tropical fruit allergies and its cutaneous symptoms, were published in English, between 2015 and 2025 in publication date. Excluded were studies not available in English, had no immunological or dermatological significance or insufficient methodological detail or unambiguous results.

C. Study Selection Process:

The study selection process was divided into many steps to ensure that only eminent and pertinent research was considered. Using the inclusion and exclusion criteria, the titles and abstracts of every article that was retrieved were first evaluated for relevancy.

D. Data Extraction and Analysis:

Following the evaluation, thorough text reviews were conducted on the papers. Papers were reviewed with full text to scope for types of cutaneous presentations, patient demographics, diagnosis and modalities of treatment. The results of the chosen studies were integrated in large scale to demonstrate the complete overview of the clinical features, diagnosis standards and treatment strategies for mango associated skin hypersensitivity.

III. RESULTS

A. Pathophysiology of Fruit Allergies

Food allergies are classified as IgE-mediated and non-IgE-mediated. The immune system's primary purpose is tolerance to innocuous dietary antigens. When regulatory mechanisms fail, the immune system may misrecognize these antigens as pathogens, initiating an IgE-mediated allergic cascade. Normal oral tolerance to foods occurs when food antigen crosses the mucosal barrier and is processed by non-activated dendritic cells, which induce suppressive cytokines like interleukin 10. These signals cause naïve T cells to develop into regulatory T cells (Treg) that inhibit Th2 cell growth. Food allergy patients are thought to have impaired Treg cell induction, which is substituted by the production of distinct antigen-specific Th2 cells that promote IgE class switching and the growth of allergic effector cells. A complex mechanism is responsible for this discrepancy in immune response in allergic patients. The gut epithelial cells express IL-33 in response to a variety of oral antigens. This causes CD103+ intestinal dendritic cells to produce the OX40 ligand, aggravating a Th2 response and encouraging B cell class switching to IgE. Sensitization (the presence of food-specific IgE) following a second exposure results in a food allergy or potentially anaphylaxis [7,8]. Type 4 hypersensitivity reactions also called delayed hypersensitivity reactions are mediated by Th1 cells. Delayed type reactions occur in a day or two after allergen interaction, and the onset of symptoms varies [9].

Key allergens responsible for fruit allergies include Profilins and Lipid transfer proteins (LTPs). The former are also known as Pan allergens because they are ubiquitous in eukaryotic cells and express similar folding processes from different sources hence making them cross reactive [6]. Profilins responsible for allergies are most commonly found in weeds, trees (eg:birch) and pollens of grass (eg:mugwort). In a patient with tree-pollen allergies the immune system is not able to differentiate between allergens present in pollen and fruits (eg: apple or melon) due to the similarity in the three dimensional structures between the profilins [10]. Additionally, patients with respiratory allergies to pollen profilins can also develop allergic responses such as Oral Allergy Syndrome (OAS) and anaphylaxis [9]. About 35% of

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patients may experience hay fever due to allergy to profilins present in pollen, and can experience mild allergy symptoms upon exposure to certain fruits[10]. Lipid transfer proteins (LTP) are also ubiquitous proteins that are found in various plant species. Similar to profilins, LTPs also share structural features and can exhibit cross reactivity. A wide range of adverse reactions can occur upon ingestion of a large array of plant food in patients sensitized to LTP. The epitome of LTP allergens is the peach protein Pru p, it can pass the gut epithelium by a fast transcellular route, hence breaking the "immunologic barrier" and making it more capable of inducing a Th2 allergic response. A high concentration of peach LTP is found in peach fuzz which can sensitize a patient for LTP allergy that can later present as severe food allergies to hazelnut, peanut, apricot, plum and tomato [11,12]. The cutaneous and clinical presentation of allergy to tropical fruits include OAS (itching/burning sensation in the mouth, along with the lips, throat and tongue as well as swelling), respiratory and digestive system reactions, skin reactions and rarely fatal anaphylaxis [13].

B. Mango Allergy in Focus

Mango or Mangifera indica, belong to the Anacardiaceae family, which also includes cashew, pistachio, sumac, poison ivy, and poison oak [14]. This family of flowering plants is also home to the allergenic compound urushiol, which is commonly associated with poison oak and poison ivy. Their high urushiol content increases the risk of delayed hypersensitivity reactions to mango, and exposure to these plants has been associated with tracheitis and pulmonary edema. The antigenic similarity between 5-resorcinol in mango and urushiol in plants like poison ivy is thought to underlie the secondary cross-sensitization observed between them [15].

Mango allergy can be triggered by two types of reactions: Type I hypersensitivity reactions, which include symptoms like urticaria, angioedema, wheezing, OAS and anaphylactic reactions, that occur within 1 minute to few hours after ingestion of the triggering food item. These symptoms occur due to allergenic proteins like man i1, i2, i4(profilin) present in mango.Type IV hypersensitivity reactions, include contact dermatitis and periorbital edema. This may arise by coming into close proximity with the antigen found in tree bark or mango fruit and starts within 8-12 hours after exposure, resulting in blister formation within 72 hours [3,14]. Patch tests using mango peel, saps, pulp, leaf, resorcinol fractions and urushiol along with prick to prick testing, can confirm the diagnosis of mango-induced allergic contact dermatitis [14].

A study on 37 patients revealed a unique pattern of contact dermatitis related to mango exposure. Most had never been familiar with mangos or lived in mango growing areas, while a smaller group came from areas with poison ivy or oak. The fewest were from countries cultivating mangos. People with no prior contact developed sensitivity to urushiol, causing their immune systems to perceive similar allergens as the same threat [9]. In a case report, a 41-year-old man with a past history of poison ivy contact dermatitis, presented with a pruritic rash with a history of eating mangos two days ago. His wife also had a history of mango consumption two days ago but without prior exposure to poison oak or ivy. When comparing mango pickers with severe rashes to those with mild or no rashes, Hershko et al. discovered that the former had been exposed to poison oak or ivy [15]. In 2015, Ta et al documented a case of an 8-month-old infant with rare non-cutaneous manifestations of mango allergy which lead to the diagnosis of Food protein-induced enterocolitis syndrome [16,17]. In 2017, Valk et al. published a study on 29 toddlers with a proven cashew nut allergy. An oral challenge test using mango and pistachios was done by the children and none showed mango hypersensitivity, indicating a low chance of cashew nut cross-reactivity compared to cashew nut and pistachio nut cross-reactivity [16,18]. Mango allergy prevalence varies globally due to factors like mango type, temperature, regional geography, genetics, and dietary habits. The first documented case of allergic reactions to mango was in 1939 by Zakon [3]. Rubin and Shapiro were the first to report an anaphylactic reaction after ingestion [19]. Food processing industry personnel, such as cooks and kitchen employees, are at a higher risk of developing occupational food allergies due to handling large amounts of mango [20]. Mango is the second most common allergen among Chinese schoolchildren with a sensitisation rate of 22.6%. It is also the most prevalent fruit allergy in Taiwan, with a prevalence of 5.6% [3]. Skin symptoms were reported by 63.9% of respondents with self-reported food allergy [21]. The clinical features of mango allergy, the distinct immunological types, their onset, triggers and associated symptoms are outlined in Table 1.

Table 1: Immunological Types of Mango Allergy

Type of Reaction	Immune Mechanism	Clinical Features	Onset Time	Trigger	References
Type I Hypersensitivity	IgE-mediated	Urticaria, angioedema, wheezing, oral allergy syndrome (OAS), anaphylaxis	Within minutes to a few hours	Ingestion of mango flesh; exposure to profilins (Man i1, i2, i4)	[3, 14, 22, 25]
Type IV Hypersensitivity	T-cell mediated (delayed-type)	Allergic contact dermatitis, periorbital edema, systemic rash	8–72 hours after exposure	Direct contact with mango peel, sap, leaves, or bark; urushiol exposure	[9, 14, 15, 19]

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C. Cutaneous Manifestation of Mango Allergy

Mango allergy is a rare hypersensitivity; immediate or delayed, that can manifest with different cutaneous symptoms.

➢ *Common Dermatological Presentations*

Urticaria and angioedema are acute manifestations of this igE mediated food allergy occurring within minutes to hours after mango ingestion presenting type I hypersensitivity. In 2017, a case was reported of a 30-year-old female patient who was admitted after consuming a mango fruit. Within minutes of ingestion, the patient developed abdominal discomfort, watery diarrhoea, facial edema and widespread urticaria [16,22].

Some individuals may develop OAS also called pollen food syndrome; an IgE mediated reaction that affects people who are sensitive to pollen. It presents with swelling and a burning feeling around the mouth and throat, pruritus as well as gastrointestinal issues and in rare cases, anaphylaxis [9]. Cross-reactivity between specific pollen and other allergens can result in this kind of hypersensitive reaction [3]. One case involved a male adult patient, age 26, who complained of 25 episodes of sneezing, an itchy throat and puffiness in his face after eating a mango [23].

Another common manifestation is allergic contact dermatitis, a type IV hypersensitivity. According to Edpuganti et al., mango-related cutaneous symptoms include perioral dermatitis, pruritus and erythema often after direct contact with peel or sap and can be either regional or systemic [9]. Symptoms often appear 8–12 hours after exposure and include redness and induration, followed by blister formation 72 hours later. A history of exposure to poison oak and poison ivy has been associated with mango contact dermatitis, which can result in sensitisation through urushiol. Therefore, those who are first exposed to mangos through direct touch with the tree and fruit or after consuming fruit may develop mango allergic contact dermatitis [14,19]. A 23-year-old male was assessed following two instances of delayed reactions to eating mangos. In both cases, a perioral, itchy rash that was accompanied by dry, cracked lips appeared one day after eating an unpeeled mango and persisted for a week. In the second episode, the rash spread to the abdomen and extremities, and there was severe periorbital and lip oedema [24].

➢ *Clinical Severity Spectrum*

The spectrum of these reactions ranges from localized to systemic, where it could be limited to areas exposed to allergen or more widespread and involve multiple organs. A series of cases were reported where skin lesions appeared at the contact site in patients who had come into direct touch with mangos [3]. Systemic responses have been recorded in around 8.7% of cases which range from mild (generalised urticaria) to severe (anaphylaxis) [25].

Severity is largely linked to the mode of exposure, with peel contact it is largely associated with allergic contact dermatitis, peel handling increases the likelihood of hypersensitivity reactions in patients with past poison ivy or poison oak hypersensitivity reactions [15,23]. Man i 1 and man i 2 are mango allergens that help the sensitization and cross reactivity with pollen [26]. Ingestion exposure generally causes a type I response, within minutes of ingesting mango, patients may develop systemic manifestations [27].

IV. DISCUSSION

A. Diagnostic Approach to Mango Allergy

A thorough clinical history is essential in diagnosing mango allergy, particularly to determine the type of hypersensitivity reaction and mode of exposure. Distinct hypersensitive reactions are observed. These correspond to IgE mediated or delayed hypersensitivity reactions respectively [14]. Type 1 hypersensitivity is a prevalent type of allergic reaction associated with OAS seen in atopic patients sensitive to pollen and fruit allergies. The clinical manifestation includes itching or burning sensations, with swellings around the mouth, lips, tongue, and throat [14, 22, 25]. Contact exposure to mango fruit, peel, stem, and sap can elicit type 4 hypersensitivity reaction which manifests as dermatitis or periorbital edema. These symptoms typically take eight hours to three days to manifest, and are seen in occupations such as farmers [14,22]. It is crucial to comprehend seasonal variations since pollination occurs at different times in different places, besides dual hypersensitivity of the allergy for diagnosis and occupational sensitivity in persons [22, 25].

➢ *Patch Testing:*

Mango allergy induces acute contact dermatitis due to a type 4 hypersensitivity reaction, confirmed using patch test, histological and pathological results used for diagnosis [14,28]. Patch testing consists of applying a number of allergens directly to the skin, primarily the upper back, in particular chambers. The allergens will then elicit a delayed hypersensitivity reaction. Mango pulp, stem, leaf and urushiol are used for testing [14].

Patch testing with urushiol may yield variable results depending on previous exposure levels [29]. Type 4 hypersensitivity reactions are frequently diagnosed using this technique. When photo patch testing is used to test for contact dermatitis, sunlight is used to trigger the reaction [30]. In cases of unavailability of standardized allergens, the open patch test is an alternative option [14,30]. It is also the gold standard used in diagnosing contact dermatitis [31].

➢ *Specific IgE Testing:*

For type 1 hypersensitivity reactions, specific IgE testing is very important. However, availability might be restricted in some areas [32]. Mangos and foods derived from plants contain profilins. These profilins create cross-reactivity and cross-reaction with other foods like apples, pears, pollen and so on, due to similar IgE antibodies [3,14,25].

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➢ *Skin Prick Test (SPT):*

Mango allergies can be identified with this test, specific for Type 1 hypersensitivity [14]. However, because IgE allergens are unstable and difficult to diagnose, it can only be done when the patient's exposure history is known [33].

Therefore, the combination of clinical history and specific diagnostic tests such patch testing, IgE assays and SPT is necessary for an accurate diagnosis of mango allergy. Clinicians can offer individualized treatment choices by determining the specific form of hypersensitivity.

B. Diagnostic Challenges and Differential Diagnosis in Mango Allergy

Diagnosing mango allergy can be challenging due to its clinical overlap with other dermatologic conditions such as irritant contact dermatitis (ICD), allergic contact dermatitis (ACD), and atopic dermatitis (AD). The most common clinical manifestation of a Type IV hypersensitivity reaction to mango is contact dermatitis (local or disseminated) which presents with rash, pruritus, eczema and blisters. ACD and Contact dermatitis due to mango allergy, have similar clinical presentations which include erythema, edema, vesicles, oozing and intense pruritus. These similar presentations and overlapping features make it quite challenging to distinguish the different eczema entities from each other. Additionally, there is clinical overlap between FA and AD [6,14,34]. Due to prior sensitization to plants that contain urushiol, mainly those in the Anacardiaceae family (poison ivy, poison oak), contact dermatitis may develop even upon the first exposure to mango. The most common causes of contact dermatitis in North America are poison oak and poison ivy [35]. Symptoms might appear anywhere from a few hours (4–5 hours) to several days (up to 9 days) [6,15]. Patch tests and patient history are used to diagnose allergic contact dermatitis [36]. A thorough history of previous responses and allergies can be helpful in determining the cause of an undifferentiated rash [15]. Patch test is initially read at 48 hours, which should be done around 30 minutes after the test is removed , then 72 hours, and finally 96 hours later, particularly if the results at 72 hours are suspicious. To avoid missing a delayed reaction, it is strongly advised to take another reading after a week [14]. Measurements of total and allergen-specific serum IgE (sIgE) levels and skin prick tests (SPTs) are recommended to identify the causative food if an IgE mediated food allergy is suspected. Elevated sIgE levels could indicate a food allergy, and for certain food allergens, sIgE criteria with a 95% positive predictive value have been established. SPTs cause wheal-and-flare reactions by inducing allergen-mediated mast cell degranulation in the skin. A sIgE of 0.35 kU/L or an SPT wheal diameter that is 3 mm greater than the negative control have historically been used to indicate positive results. However, these tests only indicate sensitization, not clinical allergy. Many individuals with positive sIgE or SPT results may still tolerate the food without symptoms [37,38]. Thus, integrating patient history with targeted diagnostic tools remains essential to differentiate mango allergy from other eczematous dermatoses and food allergy presentations.

Table 2 presents a comparison of mango-induced contact dermatitis with other common eczematous conditions to aid in clinical differentiation and diagnostic accuracy.

Table 2: Differential Diagnosis of Mango-Induced Cutaneous Reactions

Condition	Key Clinical Features	Typical Onset	Diagnostic Tools	References
Mango Contact Dermatitis	Erythema, pruritus, vesicles, perioral rash, periorbital edema	8–72 hours post-exposure	Patch test with mango peel/sap; exposure history	[6, 14, 15, 19]
Allergic Contact Dermatitis (ACD)	Erythema, edema, vesicles, oozing, pruritus (due to various allergens)	1–3 days post-exposure	Patch testing; allergy history	[6, 34, 36]
Atopic Dermatitis (AD)	Chronic relapsing eczema, lichenification, personal/family history of atopy	Variable (chronic)	Clinical history; serum IgE	[6, 14, 34]
Irritant Contact Dermatitis (ICD)	Burning, dryness, fissures; no sensitization	Immediate to a few hours	Clinical history; exclusion of allergens	[34, 35]

C. Confounding Effects of Pandemic-Related Skin Conditions

Dermatological conditions have increased due to COVID-19, particularly in those who need to wear masks and personal protective equipment for extended periods of time, most notably healthcare workers and medical students [39]. Prolonged use of masks (maskne) can lead to atopic dermatitis, contact dermatitis, perioral dermatitis, rosacea, folliculitis, acne and other skin conditions by disrupting the skin's biological processes [39,40,41]. Extensive research has concluded that more than 75% of people with facial dermatoses report worsening or new onset following frequent mask use; the risk increases with prolonged duration and use of various mask types [40,42]. The mask-covered area or the face's O-zone is where most skin problems are found [39,40]. Symptoms of mango allergy overlap with mask-related

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dermatosis [42,43]. During the pandemic, home confinement caused less exposure to sunlight, which led to vitamin D deficiency and multiple skin conditions [44]. Further complicating the medical scenario, it has been demonstrated that stress brought on by pandemics can worsen pre-existing dermatoses, including urticaria and eczema [43, 45]. These pandemic-related dermatological changes can imitate and lead to an ambiguous diagnosis of mango allergy, complicating clinical evaluation [41]. Recently, an increase in stress-related dermatological conditions, which includes telogen effluvium and seborrheic dermatitis in medical students, notably during the pandemic, potentially confounding allergic diagnoses by overlapping with symptoms such as pruritus and erythema [45].

To understand the mechanism behind the skin complications, the medical specialist requires a detailed medical history that includes information on the patient's diet, stress, duration and the type of mask used.

D. Cross Reactivity and Clinical Implications

Mango, cashew, pistachio and poison ivy are part of the Anacardiacaea family and share allergenic compounds such as urushiols, resorcinols and lipid proteins which trigger IgE and T cell mediated reactions [5].

- *Mango Cashew and Pistachio Cross Reactivity*

Phylogenetically, mangos (Mangifera indica) belong to the Anacardiaceae family and may cause allergic reactions in people sensitized to cashew or pistachio because they share similar allergenic proteins specifically, profilins and non specific lipid transfer proteins (nsLTPs) which can cross react immunologically [5]. Mangos, however, seem to be well tolerated by most people who are sensitive to cashew and pistachio nuts. At the Paediatric Allergy Unit of the Complejo Hospitalario a prospective study comprising 18 patients with pistachio or cashew nut allergies occurred. 4 patients reacted first to cashew nuts and 11 patients (61.1%) to pistachio nuts. SPT using extracts from cashew and pistachio nuts and positive prick-by-prick results using the entire nut were demonstrated by all patients. Using mango pulp prick by prick, just 1patient's result came out positive [4,18].

- *Mango and Poison Ivy Cross Reactivity*

Poison ivy contains one well-known substance called urushiol which causes a type IV hypersensitivity reaction. A few studies revealed a cross-hypersensitivity reaction between urushiol and 5-resorcinol, a substance mostly found in the skin, leaves and stems of mango fruits. Hershko et al. discovered that mango pickers with severe rashes had previously been exposed to poison oak or poison ivy when compared to individuals with mild or no rashes operating under the same conditions [15].

- *Patient Education*

Patient education should emphasize that IgE sensitization does not necessarily mean allergy [18]. Oral food challenges have been proven to be the gold standard for diagnosing IgE mediated food allergy so avoidance recommendations should rely on them [46]. Patients with known urushiol hypersensitivity should avoid direct contact with mango peel as it can lead to dermatitis [14]. Learning to read ingredients labels, identifying hidden derivatives and carrying epinephrine autoinjectors when necessary should be encouraged [47]. Further directions in research include molecular epitope mapping to better identify cross reactive proteins, development of diagnostics for better specificity and targeted immunotherapy [48]. Large scale studies are needed to clarify the prevalence of clinically significant cross reactivity and personalized allergy management.

V. CONCLUSION

Although it is not common, mango allergies are becoming increasingly recognized as a cause of cutaneous hypersensitivity reactions. From mild urticaria and oral allergy syndrome to severe contact dermatitis and in rare cases, anaphylaxis, its symptoms can vary widely. Allergens including lipid transfer proteins, profilins and urushiol-like substances present in mango peel, sap and tree parts cause these reactions, which are the consequence of both Type I and Type IV hypersensitivity mechanisms. Particularly in those who have already been sensitized, cross-reactivity with other members of the Anacardiaceae family such as poison ivy, cashew and pistachio, further muddies the clinical picture.

Diagnosis is often challenging due to symptom overlap with other eczematous dermatoses and an increase in skin illnesses associated with pandemics. A comprehensive clinical history, as well as patch testing, specific IgE assays and skin prick tests are required for accurate identification. Regional dietary trends and occupational exposure particularly among food handlers determine sensitization patterns. Increased knowledge of the various manifestations of mango allergy is essential as is patient education and accurate diagnostic techniques. More research is required on cross-reactivity, molecular allergens and focused testing to enhance results and direct clinical management.

REFERENCES

[1]. Hossny E, Ebisawa M, El-Gamal Y, Arasi S, Dahdah L, El-Owaidy R, et al. Challenges of managing food allergy in the developing world. World Allergy Organization Journal. 2019 Nov 1;12(11):100089. https://doi.org/10.1016/j.waojou.2019.100089

[2]. Feng H, Liu Y, Xiong X, Xu Q, Zhang Z, Wu Y, et al. Epidemiological survey of self-reported food allergy among university students in China. Medicine. 2022;101(31):e29606. https://doi.org/10.1097/MD.0000000000029606

[3]. Zhao J, Camus-Ela M, Zhang L, Wang Y, Rennie GH, Wang J, et al. comprehensive review on mango allergy: Clinical relevance, causative allergens, cross-reactivity, influence of processing techniques, and management strategies. Comprehensive Reviews in Food Science and Food Safety. 2024;23(2):e13304. https://doi.org/10.1111/1541-4337.13304

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25jul933

[4]. Azcona, O. M., Romero, L., Bartolome, B., Balboa, V., & Vila, L. (2020). Clinical cross-reactivity among mango, pistachio nut, and cashew nut in allergic children. *The journal of allergy and clinical immunology. In practice*, *8*(9), 3234–3236.e2. https://doi.org/10.1016/j.jaip.2020.05.047

[5]. Bastiaan-Net S, Reitsma M, Cordewener JHG, van der Valk JPM, America TAH, Dubois AEJ, Gerth van Wijk R, Savelkoul HFJ, de Jong NW, Wichers HJ. IgE cross-reactivity of cashew nut allergens. Int Arch Allergy Immunol. 2019;178(1):19–32. https://doi.org/10.1159/000493100

[6]. Terán MG, García-Ramírez B, Mares-Mejía I, Ortega E, O'Malley A, Chruszcz M, Rodríguez-Romero A. Molecular basis of plant profilins' cross-reactivity. Biomolecules. 2023;13(4):608. https://doi.org/10.3390/biom13040608

[7]. Anvari S, Miller J, Yeh CY, Davis CM. IgE-mediated food allergy. Clin Rev Allergy Immunol. 2019;57(2):244–260. https://doi.org/10.1007/s12016-018-8710-3

[8]. Sicherer SH, Mahr T, American Academy of Pediatrics Section on Allergy and Immunology. Management of food allergy in the school setting. Pediatrics. 2010;126(6):1232–1239. https://doi.org/10.1542/peds.2010-2575

[9]. Edpuganti S, Gaikwad JR, Maliyil BT, Koshy RR, Potdar R, Latheef S, et al. The not-so-sweet side of mango: Mango allergy. Cosmoderma. 2025 Jan 28;5:18. https://doi.org/10.25259/csdm_212_2024

[10]. Wang J, Vanga SK, Raghavan V. Effect of pre-harvest and post-harvest conditions on the fruit allergenicity: A review. Crit Rev Food Sci Nutr. 2019;59(7):1027–1043. https://doi.org/10.1080/10408398.2017.1389691

[11]. Van Winkle RC, Chang C. The biochemical basis and clinical evidence of food allergy due to lipid transfer proteins: a comprehensive review. Clin Rev Allergy Immunol. 2014;46(3):211–224. https://doi.org/10.1007/s12016-012-8338-7

[12]. Valenta, R., Hochwallner, H., Linhart, B., & Pahr, S. (2015). Food allergies: the basics. *Gastroenterology*, *148*(6), 1120–31.e4. https://doi.org/10.1053/j.gastro.2015.02.006

[13]. Ramírez-Marín HA, Singh AM, Ong PY, Silverberg JI. Food allergy testing in atopic dermatitis. JAAD Int. 2022;9:50–56. https://doi.org/10.1016/j.jdin.2022.08.004

[14]. Berghea EC, Craiu M, Ali S, Corcea SL, Bumbacea RS. Contact allergy induced by mango (Mangifera indica): A relevant topic? Medicina (Kaunas). 2021;57(11):1240. https://doi.org/10.3390/medicina57111240

[15]. Yoo MJ, Carius BM. Mango dermatitis after urushiol sensitization. Clin Pract Cases Emerg Med. 2019;3(4):361–363. https://doi.org/10.5811/cpcem.2019.6.43196

[16]. Ukleja-Sokołowska N, Gawrońska-Ukleja E, Lis K, Żbikowska-Gotz M, Sokołowski Ł, Bartuzi Z. Anaphylactic reaction in patient allergic to mango. Allergy Asthma Clin Immunol. 2018;14:78. https://doi.org/10.1186/s13223-018-0294-1

[17]. Ta V, Tsang RS, Mannino Avila E, Ann Leonard S. Delay in diagnosis of severe food protein-induced enterocolitis syndrome caused by mango. Ann Allergy Asthma Immunol. 2015;115(2):157–158. https://doi.org/10.1016/j.anai.2015.05.022

[18]. van der Valk JPM, Bouche RE, Gerth van Wijk R, de Groot H, Wichers HJ, Dubois AEJ, et al. Low percentage of clinically relevant pistachio nut and mango co-sensitisation in cashew nut sensitised children. Clin Transl Allergy. 2017;7:8. https://doi.org/10.1186/s13601-017-0145-z

[19]. Hassan AK, Venkatesh YP. An overview of fruit allergy and the causative allergens. Eur Ann Allergy Clin Immunol. 2015;47(6):180–187.

[20]. Fukutomi Y. Occupational food allergy. Curr Opin Allergy Clin Immunol. 2019;19(3):243–248. https://doi.org/10.1097/ACI.0000000000000530

[21]. Feng H, Zhou J, Lu Y, Zhao Q, Yang Z, Xiong X, et al. Prevalence of self-reported food allergy among adults in Jiangxi, China. World Allergy Organ J. 2023;16(5):100773. https://doi.org/10.1016/j.waojou.2023.100773

[22]. Guo H, Cong Y. Recent advances in the study of epitopes, allergens and immunologic cross-reactivity of edible mango. Food Sci Hum Wellness. 2024;13(3):1186–1194. https://doi.org/10.26599/FSHW.2022.9250098

[23]. Shadakshari A, Karthik V, Gurudatta M, Nanjundappa SM. Case report: mango consumption induced oral allergy syndrome – a rare case report. J Pharmacol Drug Res. 2024;5(2):25–27. https://jpadr.com/index.php/jpadr/article/view/147

[24]. Kim AS, Christiansen SC. Mango: pulp fiction? Contact Dermatitis. 2015;73(2):123–124. https://doi.org/10.1111/cod.12398

[25]. Krikeerati T, Rodsaward P, Nawiboonwong J, Pinyopornpanish K, Phusawang S, Sompornrattanaphan M. Revisiting fruit allergy: prevalence across the globe, diagnosis, and current management. Foods (Basel). 2023;12(22):4083. https://doi.org/10.3390/foods12224083

[26]. Cardona EEG, Heathcote K, Teran LM, Righetti PG, Boschetti E, D'Amato A. Novel low-abundance allergens from mango via combinatorial peptide libraries treatment: a proteomics study. Food Chem. 2018;269:652–660. https://doi.org/10.1016/j.foodchem.2018.06.113

[27]. Ortega-Martín L, Sastre B, Rodrigo-Muñoz JM, Cañas JA, Valverde-Monge M, Del Pozo V. Anaphylaxis after mango fruit intake: identification of new allergens. J Investig Allergol Clin Immunol. 2022;32(5):401–403. https://doi.org/10.18176/jiaci.0766

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25jul933

[28]. Wei G, Hanlon K, Gonzalez-Estrada A, Correa-Selm L. Reflectance confocal microscopy as a diagnostic aid in allergic contact dermatitis to mango sap. Cutis. 2024;114(3):E10–E13. https://doi.org/10.12788/cutis.1101
[29]. Kim Y, Longenecker A, ElSohly MA, Gul W, Hage RJ Jr, Hamann CP, et al. Urushiol patch test using the T.R.U.E. TEST system. Dermatitis. 2018;29(3):127–131. https://doi.org/10.1097/DER.0000000000000360
[30]. Pesqué D, Aerts O, Bizjak M, Gonçalo M, Dugonik A, Simon D, et al. Differential diagnosis of contact dermatitis: a practical-approach review by the EADV Task Force on contact dermatitis. J Eur Acad Dermatol Venereol. 2024;38(9):1704–1722. https://doi.org/10.1111/jdv.20052
[31]. Schmidlin K, Sani S, Bernstein DI, Fonacier L. A hands-on approach to contact dermatitis and patch testing. J Allergy Clin Immunol Pract. 2020;8(6):1883–1893. https://doi.org/10.1016/j.jaip.2020.02.009
[32]. Riggioni C, Leung AS, Wai CY, Davies JM, Sompornrattanaphan M, Pacharn P, et al. Exploring geographical variances in component-resolved diagnosis within the Asia-Pacific region. Pediatr Allergy Immunol. 2025;36(3):e70054. https://doi.org/10.1111/pai.70054
[33]. Santos AF, Riggioni C, Du Toit G, Skypala I. An algorithm for the diagnosis and management of IgE-mediated food allergy, 2024 update. Allergy. 2025;80(2):629–632. https://doi.org/10.1111/all.16321
[34]. Kostner L, Anzengruber F, Guillod C, Recher M, Schmid-Grendelmeier P, Navarini AA. Allergic contact dermatitis. Immunol Allergy Clin North Am. 2017;37(1):141–152. https://doi.org/10.1016/j.iac.2016.08.014
[35]. Alipour Tehrany Y, Coulombe J. Mango allergic contact dermatitis. Contact Dermatitis. 2021. Advance online publication. https://doi.org/10.1111/cod.13818
[36]. Rosenberg-Bezalel S, Elbirt D, Mahlab-Guri K. Patch testing in an allergy clinic: real-world experience. Isr Med Assoc J. 2022;24(10):649–653.
[37]. Yu W, Freeland DMH, Nadeau KC. Food allergy: immune mechanisms, diagnosis and immunotherapy. Nat Rev Immunol. 2016;16(12):751–765. https://doi.org/10.1038/nri.2016.111
[38]. Foong RX, Dantzer JA, Wood RA, Santos AF. Improving diagnostic accuracy in food allergy. J Allergy Clin Immunol Pract. 2021;9(1):71–80. https://doi.org/10.1016/j.jaip.2020.09.037
[39]. Rathi SK, Dsouza JM. Maskne: a new acne variant in Covid-19 era. Indian J Dermatol. 2022;67(5):552–555. https://doi.org/10.4103/ijd.ijd_1054_21
[40]. Choi ME, Lee WJ, Ko JY, Kim KJ, Kim JE, Kim HS, et al. Facial dermatoses associated with mask-wearing in the COVID-19 era: a nationwide, cross-sectional, multicenter, questionnaire-based study. Ann Dermatol. 2024;36(2):81–90. https://doi.org/10.5021/ad.23.061
[41]. Perera MH, Joshi M, Govindan AK, Edpuganti S, Korrapati NH, Kiladze N. Impact of mask wear on the skin of clinical year medical students during the COVID-19 pandemic: A cross-sectional study. Cosmoderma. 2022 Oct 18;2:96. https://doi.org/10.25259/csdm_100_2022
[42]. Spigariolo CB, Giacalone S, Nazzaro G. Maskne: the epidemic within the pandemic: from diagnosis to therapy. J Clin Med. 2022;11(3):618. https://doi.org/10.3390/jcm11030618
[43]. Nahm WJ, Nagler AR, Milam EC. Association of perioral dermatitis with facial mask usage during the COVID-19 pandemic: a retrospective study. JAAD Int. 2023;10:86–87. https://doi.org/10.1016/j.jdin.2022.12.001
[44]. Imran M, Jin X, Ali M, Tapfumaneyi P, Lelasseur P, Carlo L, et al. The pandemic and your skin—direct and indirect impact of COVID-19. Cosmetics. 2023;10(1):34. https://doi.org/10.3390/cosmetics10010034
[45]. Perera MH, Ahmed NK, Korrapati NH, Edpuganti S, Bhowmik P, Govindan AK, et al. Hair Loss in Medical Students: A Global approach. International Journal of Progressive Sciences and Technologies. 2021 Sep 30;28(2):608–18. https://ijpsat.org/index.php/ijpsat/article/view/3572
[46]. Calvani M, Bianchi A, Reginelli C, Peresso M, Testa A. Oral food challenge. Medicina. 2019;55(10):651. https://doi.org/10.3390/medicina55100651
[47]. Kadivec S, Košnik M. The ability to use epinephrine autoinjector in patients who receive prescription immediately after anaphylaxis. Int Arch Allergy Immunol. 2021;182(7):625–630. https://doi.org/10.1159/000513421
[48]. Matricardi PM, van Hage M, Custovic A, Korosec P, Santos AF, Valenta R. Molecular allergy diagnosis enabling personalized medicine. J Allergy Clin Immunol. 2025. Advance online publication. https://doi.org/10.1016/j.jaci.2025.01.014