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ANAPHYLACTIC SHOCK DUE TO BEE BROOD AND DRONE CONSUMPTION: A RARE CASE

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ABSTRAK

Syok anafilaksis merupakan suatu manifestasi dari reaksi anafilaksis berat. Anafilaksis sendiri adalah reaksi hipersensitivitas sistemik dengan onset cepat yang dapat menyebabkan kematian. Faktor pemicu anafilaksis beraneka ragam salah satunya adalah racun dari hewan salah satunya adalah lebah madu dari ordo hymenoptera. Kasus anafilaksis akibat konsumsi larva, pupa, dan lebah muda sendiri masih jarang dilaporkan. Pada laporan kasus kali ini akan dipaparkan tentang seorang laki-laki berusia 19 tahun datang ke Instalasi Gawat Darurat dengan hipotensi, takikardia, angioedema, urtikaria generalisata, dan peningkatan leukosit setelah mengonsumsi makanan olahan dari tawon. Saat di Instalasi Gawat Darurat pasien diberikan injeksi epinefrin 0,3 ml secara intravena segera setelah pasien datang dan dilakukan stabilisasi hemodinamik serta rawat inap di Rumah Sakit. Satu hari setelah perawatan tidak ada gejala tambahan dan terdapat perbaikan kondisi, atas advis dokter spesialis penyakit dalam, pasien dipulangkan. Alergi makanan olahan dari tawon memang jarang dilaporkan, namun dapat menjadi kasus yang mengancam nyawa. Tatalaksana yang cepat dan tepat sangat diperlukan pada kasus seperti ini untuk dapat memberikan output yang baik.

Kata kunci : *Syok Anafilaksis, Larva Lebah, Lebah Muda, Racun Lebah, Mengonsumsi*

ABSTRACT

Anaphylactic shock is severe manifestation of anaphylactic reaction. Anaphylactic is rapid onset systemic hypersensitivity reaction and potentially life threatening. The trigger factors of anaphylactic is various. One of them is animal venom such as honey bee venom from *Hymenoptera* order. Anaphylactic due to bee drone brood consumption is rarely reported. In this case, will be presented a 19-year-old male who comes to emergency department with hypotension, tachycardia, angioedema, general urticarial, and high level of leucocyte after an hour consumed bee drone and brood food product. In emergency department, soon after he came, was given epinephrine 0,3 ml intravena, hemodynamics stabilization, and he was treated in hospital. After one day treated, there was no other symptoms and there was improvement of conditions. By the advice of internist, patient was discharged. Food allergy by the honeybee and the product is rarely reported but it can be a life-threatening case. The right and rapid therapy is very needed in this case for giving the best output for the patient.

Keywords : *Anaphylactic shock, bee brood, bee drone, bee venom, consumption.*

INTRODUCTION

Anaphylaxis is widely recognized as a rapid onset systemic hypersensitivity reaction that possesses a critical, potentially fatal nature. A severe anaphylactic episode is primarily characterized by life threatening symptoms involving the airway, breathing, or circulation, and it can notably occur without any preceding skin manifestations or immediate circulatory shock

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(Council, 2021). Furthermore, severe anaphylactic manifestations happen when tissue perfusion becomes critically inadequate, ultimately leading to organ failure; this extreme medical condition is clinically defined as anaphylactic shock. Pathophysiologically, anaphylaxis operates as a type 1 hypersensitivity reaction that is strictly mediated by immunoglobulin E. This severe biological reaction is fundamentally caused by the sudden release of potent biochemical mediators from mast cells and basophils. Specifically, the mast cell becomes violently activated by a cross reaction between the offending antigen and the specific immunoglobulin E binding to the FcεRI receptor located on the cell membrane (De Turk et al., 2019). Recognizing these intricate pathophysiological mechanisms is incredibly crucial for medical professionals to consistently deliver prompt, effective, and vital life saving therapeutic interventions.

The various trigger factors responsible for anaphylaxis are numerous, with venom from animals like the *Hymenoptera* order, *Vespidae*, and *Formicidae* being particularly dangerous. Such venom frequently induces fatal systemic anaphylactic reactions (Gelincik & Büyüköztürk, 2012). Furthermore, allergies derived from *Apidae* honey bee products, which include venom, honey, bee pollen, bee breed, royal jelly, propolis, and bee brood, represent the second most common allergy type within this category. According to World Allergy Organization, Hymenoptera Venom Allergy frequently causes severe reactions in adults. Specific immunoglobulin E antibodies to this venom exist in 20% of the entire population, while antibodies to honey bee venom specifically appear in 30% of honey allergy cases (Cardona et al., 2020). In Poland, *Hymenoptera* stings cause 41.4% of anaphylaxis, surpassing food at 29.8% and drugs at 17.4% overall. Sensitivity affects up to 40% of adults and exceeds 50% in infants (Burzyńska & Piasecka-kwiatkowska, 2021). Additionally, bee brood, comprising eggs, larvae, and pupae, possesses potential allergic risks despite being rarely documented by researchers today worldwide (Matuszewska-Mach et al., 2025).

Ideally, the general public should possess a comprehensive understanding regarding potential allergens hidden within their daily diets to proactively prevent severe anaphylactic shock. Health authorities continuously advocate for meticulous food safety education, emphasizing that people must carefully verify every ingredient before consumption. However, an alarming gap exists between this idealized standard of dietary vigilance and the actual reality observed in society today. In reality, numerous individuals regularly consume unverified local delicacies without fully comprehending the profound medical risks attached. Foods containing exotic honey bee products, notably the Indonesian dish known as *botok tawon*, which incorporates raw bee brood and drone, are not commonly consumed nationwide. Nevertheless, this dish is widely celebrated as an extreme or typical culinary specialty in several specific regions. Unfortunately, because these rare culinary items are deeply embedded in regional traditions, consumers naturally assume they are entirely safe, remaining completely oblivious to the severe latent danger of suddenly triggering a fatal immunoglobulin E mediated type 1 hypersensitivity reaction almost instantly upon their routine oral ingestion every day.

Even though it is highly uncommon in mainstream urban diets, this particular traditional food is steadfastly believed by locals to possess remarkable medical benefits. Consequently, many people eagerly attempt to consume this unusual dish to allegedly improve their vitality and overall health. They do this blindly, operating without knowing that there are severe hidden side effects associated with ingesting *Hymenoptera* tissues. The vast majority of the population wrongly equates natural traditional remedies with absolute physiological safety, creating a perilous misconception. This stark contrast between the perceived medicinal advantages and the actual physiological threat perfectly illustrates the dangerous gap between folk medicine

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idealism and evidence based clinical reality. Instead of experiencing the anticipated health improvements, unsuspecting individuals may suddenly suffer from a massive allergic response. The unexpected onset of such a reaction quickly escalates into full anaphylactic shock, abruptly compromising their respiratory and circulatory systems. This dire situation frequently catches both the victims and local medical practitioners entirely off guard, severely delaying critical emergency interventions in rural community healthcare centers worldwide.

To bridge this concerning knowledge gap, it is absolutely essential to thoroughly document and analyze these unusual clinical occurrences. Most existing medical literature primarily discusses anaphylaxis triggered by direct *Hymenoptera* stings, leaving a significant void regarding reactions caused by oral ingestion of these insects. The notable novelty of this research lies in its specific focus on this highly unusual trigger mechanism. This case report will explicitly explain the profound anaphylactic shock experienced as the direct side effect of the ingestion of honey bee food products. By meticulously detailing this rare clinical presentation, this study introduces a vital new perspective to the current understanding of food borne allergies. It serves as an innovative educational tool for emergency physicians, significantly enhancing their diagnostic awareness when treating patients with unexplained sudden shock following exotic meals. Ultimately, this comprehensive report aims to foster greater public awareness and scientific inquiry, ensuring that both consumers and healthcare providers are definitively better prepared to handle such life threatening immunological emergencies successfully in the modern clinical setting today.

METHOD

This study employs a qualitative descriptive approach through a clinical case report design to observe a specific medical emergency. The methodology focuses on documenting the clinical course, diagnostic workflow, and therapeutic interventions of a single patient without manipulating experimental variables. The clinical observation was conducted at the Emergency Department of Karangkembang Hospital in Lamongan, East Java, Indonesia. The primary subject is a 19-year-old male presenting with acute, systemic hypersensitivity symptoms. The investigation details the patient's physiological responses from the initial point of admission through a 24-hour hospitalization period. Medical records, laboratory results, and attending physician consultations serve as the primary descriptive data sources to establish a comprehensive timeline of the pathological event.

The operational procedure commenced immediately upon patient admission, using diagnostic instruments including automated sphygmomanometers, cardiac monitors, and emergency laboratory blood analyzers. Clinical assessment revealed critical vital signs, specifically a blood pressure of 80/50 mmHg and a heart rate of 113 beats per minute, alongside a total leukocyte count of 20,200 cells per microliter. Therapeutic materials administered for hemodynamic stabilization included a rapid volume loading of 1000 cc Ringer's Lactate solution over 30 minutes, followed by a continuous infusion of 500 cc every 6 hours. Emergency pharmacological intervention utilized a 1:1000 preparation of intravenous epinephrine administered at a precise dose of 0.3 ml, combined with supportive intravenous doses of 10 mg diphenhydramine, 40 mg omeprazole, and 40 mg ondansetron. Data analysis involved a narrative reconstruction of the treatment timeline, comparing clinical outcomes against standard international emergency allergy guidelines to verify procedural efficacy.

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RESULT AND DISCUSSION

Case

19-year-old male comes to emergency department with anaphylactic shock after an hour consumption of botok tawon (honey bee product contain bee brood and bee drone) for the first time. The symptoms were nausea, vomiting, diarrhea, bumps all over the bodies, pruritus, angioedema, palpitation, dyspnea, and cold extremity. While in the emergency room, the patient was still conscious and able to communicate and the patient admitted that he had taken antihistamine, namely Chlorpheniramine Maleate (CTM), at home. Previous history of allergies was denied. Family history of allergies was also denied. On examination of vital signs, hypotension (80/50 mmHg), tachycardia (113 x/minute), dyspnea (24 x/minute), and temperature of 36.8 C were found. On physical examination, the patient found restlessness, angioedema, and generalized urticaria. There was no airway obstruction, lung examination showed no wheezing, and other examinations were within normal limits. Laboratory examination showed an increase in leukocytes (20,200), with an increase in the number of granulocytes (79).

The treatment given in the emergency room immediately after the patient arrives and has been consulted by an internist is loading IVFD Ringer Lactate 1000 cc in 30 minutes, Epinephrine 1:1000 given as 0.3 ml IV, Diphenhydramine 10 mg IV, Omeprazole 40 mg IV, Ondansetron 4 mg IV, and attapulgite 2 tabs if diarrhea. The patient was closely observed for 2 hours and there was no worsening of symptoms. After the patient was stable, the patient was transferred to the inpatient room and given therapy by an internist IVFD Ringer Lactate 500 cc/6 hours, Diphenhydramine 3x10 mg IV, Omeprazole 2x40 mg IV, Ondansetron 3x4 mg IV, Attapulgit 3x2 tab. Patients are educated that there may be allergies to honey bee and their products such as honey bee nests, royal jelly and honey. The patient's condition during hospitalization improved and after 1 day of hospitalization the patient was discharged and there were no additional symptoms from this incident.

Discussion

The World Allergy Organization defines anaphylaxis as a rapid and potentially fatal systemic hypersensitivity reaction that demands immediate medical intervention. A severe reaction often compromises airways, breathing, or circulation, occasionally manifesting without prominent cutaneous presentations or circulatory shock (Council, 2021). Diagnostic criteria established by Cardona et al. (2020) dictate that anaphylaxis is confirmed when an acute illness involves skin or mucosal tissues alongside respiratory compromise, reduced blood pressure, or severe gastrointestinal distress. In this clinical scenario, the patient developed immediate angioedema, itching, decreased blood pressure, nausea, vomiting, and diarrhea shortly after consuming *botok tawon*, a traditional dish incorporating bee products. This symptomatic presentation aligns precisely with established diagnostic frameworks for food-induced systemic hypersensitivity. Statistically, external triggers such as medications, latex, and specific foods like nuts, fish, milk, eggs, and flour commonly precipitate these acute episodes (McLendon & Sternard, 2023; (Khalil et al., 2025; Krishna et al., 2023; Selmanoğlu et al., 2025; Tedner et al., 2021). Identifying these specific dietary triggers remains paramount for preventing recurrent life-threatening events, as food-induced systemic reactions often progress rapidly, necessitating a heightened clinical suspicion and prompt diagnostic verification during emergency evaluations (Charatcharoenwitthaya & Thongngarm, 2024; Junaid-ur-Rahman et al., 2021; Onyimba et al., 2021).

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Epidemiological data highlights the profound severity of venom and insect-derived allergens, noting that 33.9 of fatal anaphylaxis cases are attributed directly to *Hymenoptera* stings, frequently accompanied by postmortem findings of pulmonary hyperinflation or mucosal obstruction (Dewi & Suardamana, 2022). The underlying pathophysiology of honeybee venom allergy involves potent components including phospholipase A2, hyaluronidase, melittin, glycoproteins, and enzymes like acid phosphatase and dipeptidyl peptidase. These substances induce enzymatic activity that stimulates specific immunoglobulin E, though non-immune mechanisms involving bradykinin mediators also contribute to respiratory symptoms like tracheal bronchospasm, heavily influenced by melittin acting as a phospholipase A2 activator (Wehbe et al., 2019). While bee venom is widely studied, the allergenic risk associated with ingesting bee brood and drone larvae remains poorly understood in current literature. Prior to recent investigations, only 1 case report published in 2018 documented a severe systemic reaction in a 29-year-old male following his first consumption of raw drone larvae. Emerging research identifies specific proteins such as arginine kinase, thioredoxin, and alpha-glucosidase as the primary driving allergens (Matuszewska-Mach et al., 2025; Stoevesandt & Trautmann, 2018; (Ma et al., 2023; Matuszewska-Mach et al., 2024, 2025).

The acute management of systemic hypersensitivity demands an immediate clinical assessment focused heavily on sustaining the patency of the patient's airway, breathing, and circulatory parameters. Intramuscular epinephrine remains the absolute primary therapeutic intervention, administered promptly at a precise dose of 0.01 milligram per kilogram up to a maximum threshold of 0.5 milligram, repeatable every 5 to 15 minutes as clinically required to stabilize blood pressure (Sampson et al., 2006; (Bilò et al., 2020; Quoc et al., 2021). For cases complicated by profound cardiovascular failure or a complete lack of response to intramuscular injections, intravenous epinephrine must be carefully titrated. Clinical guidelines recommend an intravenous bolus of 5 to 10 micrograms, equivalent to 0.2 microgram per kilogram, for severe hypotension, or a larger dose of 0.1 to 0.5 milligram if full cardiovascular collapse occurs. Simultaneously, high-flow oxygen therapy delivered via a non-rebreathing mask is mandatory for any patient exhibiting respiratory compromise or hemodynamic instability. Refractory bronchospasm that resists epinephrine can be managed effectively with inhaled beta-2 agonists like albuterol, providing targeted bronchodilation to secure ventilation during the acute phase.

Addressing the vascular changes associated with distributive shock requires aggressive fluid resuscitation and strategic patient positioning to optimize central blood volume. Patients in shock must be placed in a flat supine position with lower limbs elevated to increase stroke volume, provided they are not experiencing severe shortness of breath or active vomiting. This positioning counteracts the massive vascular shifts where more than 35 of effective blood volume can extravasate into the interstitial space within the initial 10 minutes of a severe reaction (Sampson et al., 2006). Massive fluid vasodilation causes extensive blood pooling, necessitating rapid intravenous crystalloid or colloid boluses calculated at 10 to 20 milliliter per kilogram within a tight 5 to 10 minute window. When aggressive fluid resuscitation and epinephrine infusions fail to keep systolic blood pressure above 90 millimeter of mercury, potent vasopressors such as noradrenaline, vasopressin, or metaraminol must be initiated immediately. These intensive circulatory interventions are vital to preserve vital end-organ perfusion and prevent irreversible ischemic injury during prolonged distributive shock states (Backer et al., 2022; Hashimoto et al., 2022; Jones et al., 2025; Mauriello et al., 2026).

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Secondary therapeutic agents are utilized to manage cutaneous symptoms and minimize the risk of biphasic reactions, although they exert minimal direct impact on acute cardiovascular instability. Antihistamines serve as a secondary option, with adults receiving 25 to 50 milligram of intravenous diphenhydramine, while children are dosed at 1 milligram per kilogram up to 50 milligram (Sampson et al., 2006). Combining histamine 1 and histamine 2 antagonists provides superior efficacy against urticaria, angioedema, and severe pruritus compared to using single agents alone. Systemic corticosteroids, such as intravenous methylprednisolone administered at 1.0 to 2.0 milligram per kilogram every 6 hours, are reserved for preventing delayed-phase symptoms due to their slow onset of action. The emergency management provided to this patient, which successfully combined rapid fluid resuscitation, epinephrine injections, and antihistamines, effectively reversed the systemic hypotension and stabilized the patient's condition. A critical limitation of this analysis is the lack of long-term tracking data regarding the patient's adherence to dietary restrictions, making strict education against consuming bee products essential to prevent future fatal recurrences.

CONCLUSION

This case study concludes that the ingestion of exotic honeybee culinary products can trigger a rapid, life-threatening *anaphylactic* shock, even though food-borne allergies from insect tissues are rarely documented in mainstream medical literature. The clinical presentation of the patient demonstrates how an *immunoglobulin* E-mediated systemic reaction can swiftly compromise vital systems, leading to severe hypotension, tachycardia, generalized urticaria, and gastrointestinal distress shortly after consumption. This rare occurrence highlights a significant gap between the traditional belief in the medicinal health benefits of such delicacies and evidence-based clinical reality. Ultimately, the report emphasizes that immediate diagnostic awareness and a rapid, well-coordinated emergency workflow are paramount to reverse severe distributive shock, preserve vital organ perfusion, and ensure a favorable survival outcome for patients experiencing acute immunological crises.

Emergency physicians and healthcare providers should maintain a high index of diagnostic suspicion for systemic hypersensitivity when treating patients presenting with unexplained sudden shock following the consumption of unusual traditional foods. Medical facilities must ensure immediate access to primary therapeutic interventions, specifically intramuscular epinephrine and aggressive fluid resuscitation protocols, to effectively counteract massive vascular shifts during acute distributive collapse. Furthermore, comprehensive patient education regarding hidden dietary allergens is absolutely essential to prevent future life-threatening exposure to honeybee products, including honey, royal jelly, and nests. Future scientific research should focus on isolating the specific driving proteins found in bee brood and drone larvae to enrich global toxicological literature. This enhanced clinical understanding will definitively optimize emergency workflows and diagnostic accuracy in community healthcare settings worldwide.

REFERENCES

Backer, D. D., Cecconi, M., Chew, M. S., Hajjar, L. A., Monnet, X., Ospina-Tascón, G. A., Ostermann, M., Pinsky, M. R., & Vincent, J. (2022). A plea for personalization of the hemodynamic management of septic shock. *Critical Care*, 26(1), Article 354. https://doi.org/10.1186/s13054-022-04255-y

Bilò, M. B., Corsi, A., Pravettoni, V., Bignardi, D., Bonadonna, P., Quercia, O., Mauro, M., Novembre, E., Micheletti, R., & Papa, R. (2020). Development of a model care

https://doi.org/10.51878/healthy.v6i3.11358

pathway for the management of Hymenoptera venom allergy: Evidence-based key interventions and indicators. *Clinical and Translational Allergy*, 10(1), Article 32. https://doi.org/10.1186/s13601-020-00312-3

Burzyńska, M., & Piasecka-kwiatkowska, D. (2021). A review of honeybee venom allergens and allergenicity. *International Journal of Molecular Sciences*, 22(16), Article 8371. https://doi.org/10.3390/ijms22168371

Cardona, V., Ansotegui, I. J., Ebisawa, M., El-Gamal, Y., Fernandez Rivas, M., Fineman, S., Geller, M., Gonzalez-Estrada, A., Greenberger, P. A., Sanchez Borges, M., Senna, G., Sheikh, A., Tanno, L. K., Thong, B. Y., Turner, P. J., & Worm, M. (2020). World allergy organization anaphylaxis guidance 2020. *World Allergy Organization Journal*, 13(10), Article 100472. https://doi.org/10.1016/j.waojou.2020.100472

Charatcharoenwitthaya, K., & Thongngarm, T. (2024). Food-dependent exercise-induced anaphylaxis: A challenging life-threatening condition. *Siriraj Medical Journal*, 76(9), 655–660. https://doi.org/10.33192/smj.v76i9.269446

Council, U. R. (2021). Guidelines for anaphylaxis. *Resuscitation Council UK*, 15(28), 7–7. https://doi.org/10.7748/ns.15.28.7.s17

DeTurk, S., Reddy, S., Pellegrino, A. N., & Wilson, J. (2019). Anaphylactic shock. Dalam *Clinical management of shock: The science and art of physiological restoration* (hlm. 1–7).

Dewi, P. S. L., & Suardamana, I. K. (2022). A case report of anaphylactic shock due to hornet sting with multiple organ dysfunction complications. *Open Access Macedonian Journal of Medical Sciences*, 10(C), 252–256. https://doi.org/10.3889/oamjms.2022.10487

Gelincik, A., & Büyüköztürk, S. (2012). Anaphylaxis: Etiology, clinical manifestations, diagnosis and management. *Journal of Experimental and Clinical Medicine*, 29(s1), 1–7.

Hashimoto, R., Takahashi, J., Shirakura, K., Funatsu, R., Kosugi, K., Deguchi, S., Yamamoto, M., Tsunoda, Y., Morita, M., Muraoka, K., Tanaka, M., Kanbara, T., Tanaka, S., Tamiya, S., Tokunoh, N., Kawai, A., Ikawa, M., Ono, C., Tachibana, K., … Okada, Y. (2022). SARS-CoV-2 disrupts respiratory vascular barriers by suppressing claudin-5 expression. *Science Advances*, 8(38), Article eabo6783. https://doi.org/10.1126/sciadv.abo6783

Jones, D. W., Ferdinand, K. C., Taler, S. J., Johnson, H. M., Shimbo, D., Abdalla, M., Altieri, M., Bansal, N., Bello, N. A., Bress, A. P., Carter, J., Cohen, J. B., Collins, K. J., Commodore-Mensah, Y., Davis, L. L., Egan, B., Khan, S. S., Lloyd-Jones, D. M., Melnyk, B. M., … Ziai, W. C. (2025). 2025 AHA/ACC/AANP/AAPA/ABC/ACCP/ACPM/AGS/AMA/ASPC/NMA/PCNA/SGIM guideline for the prevention, detection, evaluation, and management of high blood pressure in adults. *Journal of the American College of Cardiology*, 86(18), 1567–1678. https://doi.org/10.1016/j.jacc.2025.05.007

Junaid-ur-Rahman, S., Chughtai, M. F. J., Khaliq, A., Mehmood, T., Liaqat, A., Ahsan, S., Pasha, I., Tanweer, S., Nadeem, M., & Tahir, A. B. (2021). Food-induced anaphylaxis: Causes, risk factors and clinical management. *Food and Agricultural Immunology*, 32(1), 253–264. https://doi.org/10.1080/09540105.2021.1911959

https://doi.org/10.51878/healthy.v6i3.11358

Khalil, S., Rahim, S., Mobayed, H., Al-Nesf, M., & Bahna, S. L. (2025). Case report: Not all recurrent "idiopathic" anaphylaxis is idiopathic. *Frontiers in Allergy*, 6, Article 1661992. https://doi.org/10.3389/falgy.2025.1661992

Krishna, S. S., Farhana, S. A., T.P., A., Hussain, S. M., Viswanad, V., Nasr, M. H., Sahu, R. K., & Khan, J. (2023). Modulation of immune response by nanoparticle-based immunotherapy against food allergens. *Frontiers in Immunology*, 14, Article 1229667. https://doi.org/10.3389/fimmu.2023.1229667

Ma, Z., Mondor, M., Goycoolea, F. M., & Hernández-Álvarez, A. J. (2023). Current state of insect proteins: Extraction technologies, bioactive peptides and allergenicity of edible insect proteins. *Food & Function*, 14(18), 8129–8156. https://doi.org/10.1039/d3fo02865h

Matuszewska-Mach, E., Borysewicz, P., Królak, J., Juzwa-Sobieraj, M., & Matysiak, J. (2025). Ensuring the safe use of bee products: A review of allergic risks and management. *International Journal of Molecular Sciences*, 26(24), 1–31. https://doi.org/10.3390/ijms262412074

Matuszewska-Mach, E., Packi, K., Rzetecka, N., Wieliński, W., Kokot, Z. J., Kowalczyk, D., & Matysiak, J. (2024). Insights into the nutritional value of honeybee drone larvae (Apis mellifera) through proteomic profiling. *Scientific Reports*, 14(1), Article 248. https://doi.org/10.1038/s41598-024-79479-9

Mauriello, A., Correra, A., Maratea, A. C., Cetoretta, V., Giallauria, F., Esposito, G., Desiderio, A., Marrazzo, G., Liccardo, B., Russo, V., Trambaiolo, P., & D'Andrea, A. (2026). Modulation of the vasopressin system in distributive and cardiogenic shock: Theoretical principles and practical applications. *Journal of Clinical Medicine*, 15(5), Article 1953. https://doi.org/10.3390/jcm15051953

McLendon, K., & Sternard, B. T. (2026). Anaphylaxis. Dalam *StatPearls*. StatPearls Publishing. Diambil dari https://www.ncbi.nlm.nih.gov/books/NBK482124/

Onyimba, F., Crowe, S. E., Johnson, S., & Leung, J. (2021). Food allergies and intolerances: A clinical approach to the diagnosis and management of adverse reactions to food. *Clinical Gastroenterology and Hepatology*, 19(11), 2230–2239. https://doi.org/10.1016/j.cgh.2021.01.025

Quoc, Q. L., Cao, T. B. T., Jang, J. H., & Park, H. S. (2021). Recent update on the management of anaphylaxis. *Clinical and Experimental Emergency Medicine*, 8(3), 160–172. https://doi.org/10.15441/ceem.21.121

Sampson, H. A., Muñoz-Furlong, A., Campbell, R. L., Adkinson, N. F., Bock, S. A., Branum, A., Brown, S. G. A., Camargo, C. A., Cydulka, R., Galli, S. J., Gidudu, J., Gruchalla, R. S., Harlor, A. D., Hepner, D. L., Lewis, L. M., Lieberman, P. L., Metcalfe, D. D., O'Connor, R., Muraro, A., … Decker, W. W. (2006). Second symposium on the definition and management of anaphylaxis: Summary report - Second National Institute of Allergy and Infectious Disease/Food Allergy and Anaphylaxis Network symposium. *Journal of Allergy and Clinical Immunology*, 117(2), 391–397. https://doi.org/10.1016/j.jaci.2005.12.1303

Selmanoğlu, A., Yörüsün, G., Geniş, C., Kuzucu, F. N., Emeksiz, Z. Ş., & Mısırlıoğlu, E. D. (2025). Inpatient pediatric allergy referrals: A one-year review of consultation trends. *Dicle Medical Journal*, 52(3), 569–576. https://doi.org/10.5798/dicletip.1785132

https://doi.org/10.51878/healthy.v6i3.11358

Stoevesandt, J., & Trautmann, A. (2018). Freshly squeezed: Anaphylaxis caused by drone larvae juice. *European Annals of Allergy and Clinical Immunology*, 50(5), 232–234. https://doi.org/10.23822/EurAnnACI.1764-1489.43

Tedner, S. G., Asarnoj, A., Thulin, H., Westman, M., Konradsen, J. R., & Nilsson, C. (2021). Food allergy and hypersensitivity reactions in children and adults—A review. *Journal of Internal Medicine*, 291(3), 283–302. https://doi.org/10.1111/joim.13422

Wehbe, R., Frangieh, J., Rima, M., Obeid, D. E., Sabatier, J. M., & Fajloun, Z. (2019). Bee venom: Overview of main compounds and bioactivities for therapeutic interests. *Molecules*, 24(16), 1–13. https://doi.org/10.3390/molecules24162997

https://doi.org/10.51878/healthy.v6i3.11358