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Short Communication

Allergen-Specific IgE Sensitization in Dogs with Suspected Allergic Dermatitis in Northern Vietnam

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Abstract | Canine allergic dermatitis is a common chronic pruritic skin disorder, but data on allergen-specific immunoglobulin E (IgE) sensitization in Vietnamese dogs remain limited. This cross-sectional study described serum allergen-specific IgE profiles in 100 client-owned dogs with clinical signs suggestive of allergic dermatitis in Hanoi, northern Vietnam, between January 2024 and June 2025. Serum samples were tested using the ANITIA Canine IgE I assay, which screens IgE reactivity against 64 food, environmental, and parasite/fungal allergens. Overall, 96/100 dogs (96.0%) were positive for at least one allergen-specific IgE reaction. Among 96 IgE-positive dogs, 90 (93.8%) reacted to at least one food allergen, 82 (85.4%) to at least one parasite/fungal allergen, and 76 (79.2%) to at least one environmental allergen. Polysensitization to all three major allergen groups was observed in 64/96 IgE-positive dogs (66.7%). Frequently detected IgE reactions included those against lamb, beef, pork, storage mite (*Tyrophagus putrescentiae*), European house dust mite (*Dermatophagoides pteronyssinus*), and selected pollen extracts. These findings provide preliminary regional baseline data for interpreting broad, multi-group IgE sensitization patterns in dogs with suspected allergic dermatitis in northern Vietnam.

Keywords | Canine allergic dermatitis, dog, Food allergy, IgE sensitization, Serum allergen testing, Vietnam

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INTRODUCTION

Canine allergic dermatitis, including canine atopic dermatitis, is a common chronic inflammatory skin disorder characterized by pruritus, erythema, alopecia, recurrent dermatitis, otitis externa, and secondary bacterial or yeast infections. In affected dogs, allergen exposure may contribute to T helper 2-mediated immune responses and the production of allergen-specific immunoglobulin E (IgE), which is involved in allergic inflammation and pruritus (Galli and Tsai, 2012; Hensel *et al*., 2015; Eisenschenk *et al*., 2024).

In clinical practice, allergen-specific IgE testing is often used as a supportive tool for identifying sensitization patterns and guiding allergen management strategies. However, serum IgE positivity indicates immunological sensitization and does not necessarily confirm that a specific allergen is clinically responsible for skin disease. Therefore, IgE results should be interpreted together with clinical history, lesion distribution, exclusion of differential diagnoses, flea control, elimination diet trials, and treatment response. In canine dermatology, allergy testing is most useful after a compatible clinical diagnosis has been established and after major differential diagnoses have been considered; it should not be used as a stand-alone diagnostic test for food allergy or canine atopic dermatitis (Hensel *et al*., 2015; Mueller and Olivry, 2017; Morales-Romero *et al*., 2025).

Allergen sensitization patterns may vary considerably among geographic regions because of differences in climate, humidity, vegetation, household environment, feeding practices, and ectoparasite exposure (Bizikova *et al*., 2015; Marsella, 2021). To our knowledge, peer-reviewed information on allergen-specific IgE sensitization profiles in Vietnamese dogs remains very limited. This study therefore aimed to provide preliminary regional data on serum allergen-specific IgE sensitization profiles in dogs with clinical signs suggestive of allergic dermatitis in Hanoi, northern Vietnam.

MATERIALS AND METHODS

A cross-sectional descriptive study was conducted in Hanoi from January 2024 to June 2025. A total of 100 client-owned dogs presented to veterinary clinics with clinical signs suggestive of allergic dermatitis, such as recurrent or persistent pruritus, erythema, alopecia, dermatitis, pustules, otitis externa, or lesions affecting typical allergic dermatitis sites. Dogs with severe systemic illness, inadequate serum volume, or hemolyzed or contaminated serum samples were excluded. Because samples were submitted from multiple veterinary clinics under routine diagnostic conditions, complete dermatological diagnostic work-up information was not consistently available for all cases. Enrolled animals were therefore classified as suspected allergic dermatitis cases rather than confirmed canine atopic dermatitis or confirmed food allergy cases. According to information available from the attending veterinarians, dogs with known recent use of systemic corticosteroids or other immunomodulatory drugs before blood sampling were excluded. However, complete medication histories could not be independently verified for every dog under routine clinical submission conditions.

Serum samples were submitted immediately after collection, stored at −20°C, and analyzed within 1–2 days without repeated freeze–thaw cycles. Serum allergen-specific IgE was measured using the ANITIA Canine IgE I kit (ProteomeTech Inc., Seoul, Korea) according to the manufacturer's instructions. The assay screens IgE reactivity against 64 allergens grouped into food, environmental, and parasite/fungal allergens. Results were read using a Q-Smart Analyzer and expressed as AU/mL. IgE reactivity was classified according to the manufacturer's criteria as: class 0, not detected; class 1, weak; class 2, moderate; class 3, moderately strong; class 4, strong; class 5, very strong; and class 6, extremely strong. Values ≥0.35 AU/mL were considered positive.

Data were entered into Microsoft Excel and summarized using descriptive statistics. The number and percentage of dogs positive for each allergen and each major allergen group were calculated. The number of positive allergens per IgE-positive dog was summarized using mean ± standard deviation (SD), median, interquartile range (IQR), and range.

RESULTS AND DISCUSSION

Of the 100 enrolled dogs, 96 were positive for at least one allergen-specific IgE reaction, corresponding to an overall seropositivity rate of 96.0%. Among IgE-positive dogs, food was the most frequently detected allergen category, with 90/96 dogs positive for at least one food allergen (93.8%). Parasite/fungal allergens were detected in 82/96 dogs (85.4%), whereas environmental allergens were detected in 76/96 dogs (79.2%). Polysensitization was common, with 64/96 IgE-positive dogs (66.7%) reacting to allergens from all three major allergen groups. Among the 96 IgE-positive dogs, no dog showed IgE positivity to all 64 tested allergens. The number of positive allergens per IgE-positive dog ranged from 2 to 46, with a mean ± SD of 18.16 ± 10.5 and a median of 16.5 (IQR, 11.0–23.25). The four seronegative dogs were submitted as suspected allergic dermatitis cases, but incomplete case records prevented meaningful characterization of their clinical features, medication history, or disease duration.

Among individual food allergens, animal-derived proteins showed the highest frequencies of IgE positivity. Lamb was the most common allergen, detected in 67 of 96 IgE-positive dogs (69.8%), followed by beef in 58 dogs (60.4%) and pork in 57 dogs (59.4%). Milk was also frequently detected, with 47 positive dogs (49.0%). Codfish showed the highest positivity among seafood allergens, being detected in 45 dogs (46.9%) (Table 1). High food-specific IgE positivity may reflect dietary exposure, immunological sensitization without clinical disease, or cross-reactivity; clinically relevant food allergy cannot be inferred without elimination and provocation trials. Beef and pork are common dietary proteins in Vietnam and may be encountered through homemade diets, table scraps, or commercial pet foods. Lamb is less common in traditional household diets, but it is present in some commercial dog foods available in Vietnam. Cross-reactivity among mammalian meat proteins, particularly bovine and ovine proteins, is biologically plausible and may partly explain lamb-specific IgE positivity (Martin *et al*., 2004). Thus, lamb IgE positivity should not be interpreted as evidence that lamb is necessarily a common causative food allergen in Hanoi dogs. Because detailed dietary histories were unavailable, codfish-specific IgE positivity should be interpreted cautiously and may reflect cross-reactivity with conserved fish allergens rather than direct codfish exposure. Parvalbumin, a conserved calcium-binding muscle protein, is a major fish allergen and may

Table 1: Frequency of allergen-specific IgE positivity to selected food, parasite/fungal, and environmental allergens among IgE-positive dogs (n = 96).

	Allergen group	Allergen Component	Number of dogs with IgE positivity (n = 96)	IgE positivity rate (%)
Food	Protein	Lamb	67	69.8
		Beef	58	60.4
		Pork	57	59.4
		Chicken	32	33.3
	Seafood	Codfish	45	46.9
	Vegetables	Corn	34	35.4
		Tomato	24	25.0
	Cereals/starches/nuts	Rice	27	28.1
		Sweet potato	23	24.0
	Dairy	Milk	47	49.0
		Cheese (Gouda/Cheddar)	35	36.5
Parasite/ fungal	Mites/flea	Storage mite (*Tyrophagus putrescentiae*)	60	62.5
		European house dust mite (*Dermatophagoides pteronyssinus*)	50	52.1
		Flour mite (*Acarus siro*)	41	42.7
		American house dust mite (*Dermatophagoides farinae*)	40	41.7
		Flea	40	41.7
	Fungi	*Aspergillus fumigatus*	32	33.3
Environmental	Plant	Ryegrass	49	51.0
		Common ragweed	40	41.7
		Bermuda grass	32	33.3
	Epithelia/dander	Cat epithelium & dander	20	20.8

Footnote: Values are calculated among dogs positive for at least one allergen-specific IgE reaction (n = 96). Allergen-specific counts are not mutually exclusive because one dog could react to more than one allergen.

mediate IgE cross-reactivity among fish species (Imanishi *et al.*, 2020; Kuehn *et al.*, 2014; Leung *et al.*, 2014). In dogs, adverse food reactions require confirmation through a properly conducted elimination diet followed by dietary provocation. Published evidence indicates that serum food-specific IgE and IgG tests in dogs have low repeatability and highly variable diagnostic accuracy, with inconsistent agreement with clinical food challenge outcomes (Mueller and Olivry, 2017). Therefore, the present findings are most useful for guiding dietary history evaluation and identifying candidate ingredients for carefully designed elimination diet trials rather than for establishing a definitive diagnosis of food allergy. Mite allergens were prominent within the parasite/fungal allergen group. Storage mite (*T. putrescentiae*) was detected in 60 of 96 IgE-positive dogs (62.5%), followed by European house dust mite (*D. pteronyssinus*) in 50 dogs (52.1%), flour mite (*Acarus siro*) in 41 dogs (42.7%), flea in 40 dogs (41.7%), and American house dust mite (*D. farinae*) in 40 dogs (41.7%) (Table 1). Overall, 68/96 IgE-positive dogs (70.8%) were positive to at least one of the four mite allergens included in the assay. Among these 68 mite-positive dogs, 16 were positive to only one mite allergen and 52 were positive to two or more mite allergens, including 12 positive to two mite allergens, 9 positive to three mite allergens, and 31 positive to all four mite allergens. These mutually exclusive categories indicate that mite-related sensitization was frequent and often occurred as multi-mite sensitization rather than isolated positivity to a single mite allergen. House dust mites and storage mites have been recognized as important allergen sources in canine atopic dermatitis and other allergic skin diseases, particularly in environments favorable for mite survival and allergen accumulation (Randall *et al.*, 2003; Nuttall *et al.*, 2006). Nevertheless, no household-level mite allergen measurements, such as Der p 1 or Der f 1, were performed in this study. The link between local climatic conditions and mite sensitization should therefore be regarded as contextual interpretation rather than a conclusion directly demonstrated by environmental sampling. Flea-specific IgE was detected in a substantial proportion of IgE-positive dogs. However, information on visible fleas, flea dirt, previous flea control, or flea control

Table 2: Distribution of IgE reactivity classes for selected common allergens among all enrolled dogs (n = 100). Values are shown as number of dogs.

Allergens	Not detected	Weak	Moderate	Moderately strong	Strong	Very strong	Extremely strong
Lamb	33	10	14	14	5	0	24
Beef	42	14	9	6	4	0	25
Pork	43	26	20	5	3	2	1
Codfish	55	13	20	10	1	0	1
Milk	53	5	8	6	3	0	25
Cheese (Gouda/Cheddar)	65	10	8	10	3	0	4
Storage mite (*Tyrophagus putrescentiae*)	40	10	26	10	6	1	7
European house dust mite (*Dermatophagoides pteronyssinus*)	50	13	17	8	5	1	6
Flour mite (*Acarus siro*)	59	12	13	6	4	1	5
American house dust mite (*Dermatophagoides farinae*)	60	10	12	9	4	1	4
Flea	60	13	21	5	1	0	0
Aspergillus fumigatus	68	10	17	4	1	0	0
Ryegrass	51	15	23	4	3	1	3
Common ragweed	60	15	19	3	2	0	1
Bermuda grass	68	10	13	5	1	2	1

trials was not systematically collected. Therefore, flea-specific IgE positivity may represent current flea exposure, historical exposure, flea allergy dermatitis, or cross-reactivity with other arthropod allergens. The finding reinforces the practical importance of strict ectoparasite control, but it does not establish flea allergy dermatitis in individual dogs (Favrot *et al*., 2010; Olivry *et al*., 2015). Fungal allergens were detected less frequently than food and mite allergens, although *A. fumigatus* was positive in 32 of 96 IgE-positive dogs (33.3%). Environmental allergens were also detected in a considerable proportion of dogs. Ryegrass was the most common environmental allergen, detected in 49 of 96 IgE-positive dogs (51.0%), followed by common ragweed in 40 dogs (41.7%), and Bermuda grass in 32 dogs (33.3%) (Table 1). Common ragweed (*Ambrosia artemisiifolia*) is not generally recognized as a common native weed in Vietnam, and botanical or aerobiological data confirming local exposure in Hanoi were not collected. Local exposure to ryegrass pollen in Hanoi is also uncertain. Positive serum IgE results to ragweed and ryegrass extracts may reflect sensitization to the commercial allergen extracts included in the assay, possible cross-reactivity with botanically related local pollens, or exposure to non-local allergen sources, but they do not by themselves prove local exposure or clinical relevance. Cross-reactive IgE responses between mugwort and ragweed pollen have been reported and may involve shared allergenic structures (Hirschwehr *et al*., 1998). These considerations highlight the limitation of using a commercial allergen panel that was not specifically developed or validated for Vietnamese environmental allergens. Most positive IgE reactions were classified as weak, moderate or moderately strong, although strong or extremely strong reactions were observed for selected allergens, particularly animal proteins and mites (Table 2, Figure 1). Clinically, these results should be interpreted cautiously. A high IgE class may indicate a higher level of sensitization, but it does not prove that the allergen is responsible for the observed skin disease. IgE-mediated immune responses are involved in allergic inflammation, but the relationship between sensitization, clinical allergy and disease severity is complex and cannot be established by serology alone (Galli and Tsai, 2012; Hensel *et al*., 2015; Mueller and Olivry, 2017).

This study provides preliminary baseline data on allergen-specific IgE sensitization in dogs with suspected allergic dermatitis in Vietnam, where published information remains limited. The most practically relevant finding is that dogs with suspected allergic dermatitis in Hanoi commonly showed broad, multi-group IgE sensitization rather than sensitization restricted to a single allergen category. These data support a structured diagnostic approach integrating dietary history, ectoparasite control, environmental exposure assessment, clinical examination, elimination diet trials, and, where available, additional allergy testing. However, serum IgE results should be interpreted as supportive evidence of sensitization rather than as a stand-alone diagnosis of food allergy or canine atopic dermatitis. The present study should be interpreted within the context of its clinical and exploratory design. The enrolled dogs were recruited from veterinary clinics in Hanoi; therefore, the results primarily reflect the sensitization profile of client-owned dogs presented for dermatological evaluation rather than the general canine population.

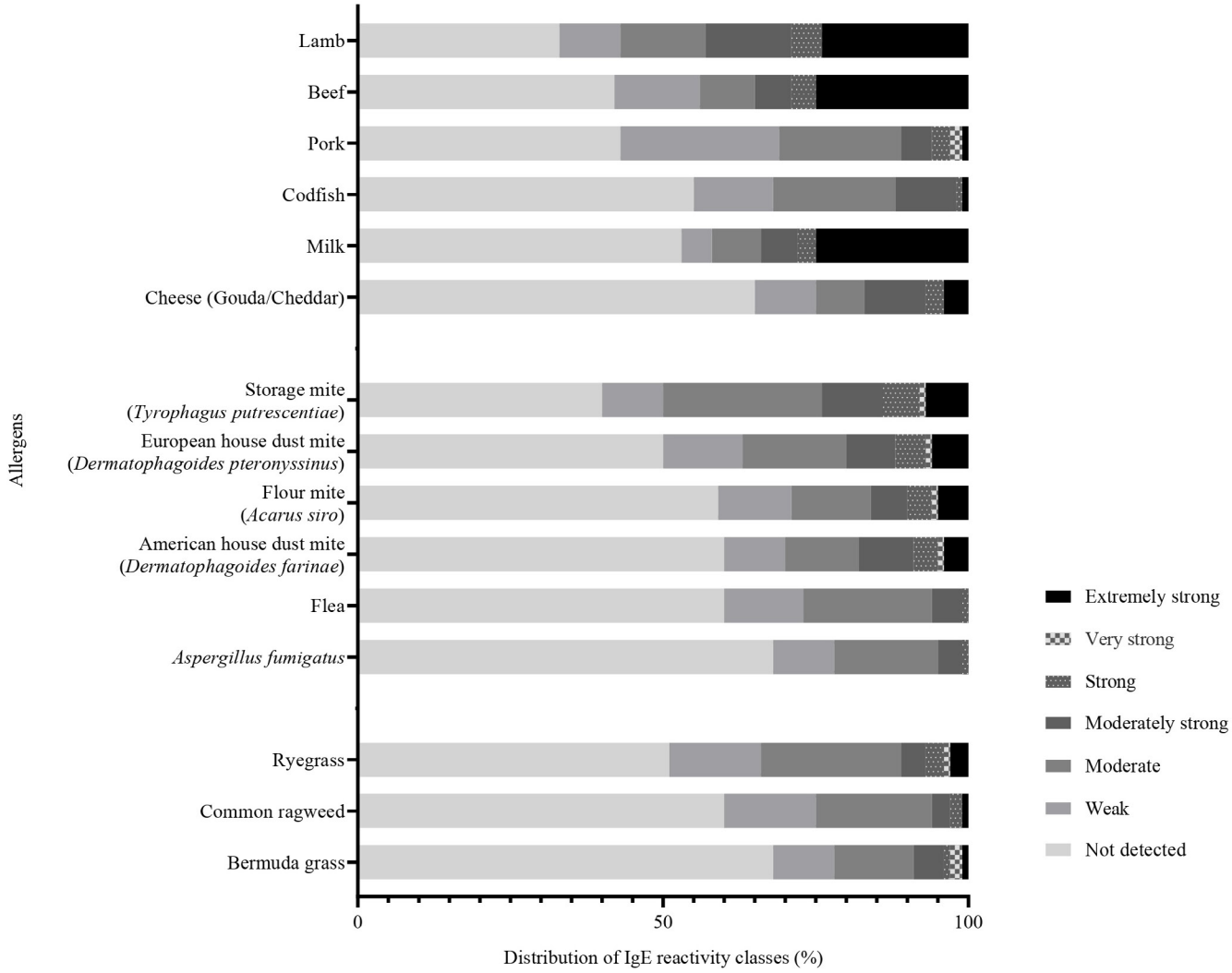

Figure 1: Distribution of IgE reactivity classes for selected common allergens in dogs with suspected allergic dermatitis in Hanoi, Vietnam. IgE reactivity was classified according to the manufacturer-defined categories: Class 0, not detected; Class 1, weak; Class 2, moderate; Class 3, moderately strong; Class 4, strong; Class 5, very strong; and Class 6, extremely strong. Data are expressed as percentages of all enrolled dogs (n = 100).

Because the cases were included under routine clinical conditions, confirmed diagnoses of canine atopic dermatitis or food allergy were not established by the study protocol. Confirmatory procedures, including intradermal testing, standardized elimination diet trials, and allergen provocation, were not performed. In addition, diet history, household environment, medication exposure, and detailed phenotypic classification were not consistently available, limiting refined subgroup analyses. Despite these considerations, the study provides initial regional evidence on serum IgE sensitization patterns in dogs with suspected allergic dermatitis in Hanoi. These findings may serve as a useful baseline for future prospective multicenter studies incorporating standardized clinical scoring, detailed signalment and dietary history, environmental assessment, medication records, serology, intradermal testing, elimination diet trials, and longitudinal follow-up. Such studies will help clarify the clinical relevance of individual allergens and strengthen the interpretation of IgE sensitization profiles in Vietnamese dogs.

CONCLUSION

This study provides preliminary regional data on serum allergen-specific IgE sensitization in dogs with suspected allergic dermatitis in Hanoi, northern Vietnam. Most dogs were positive for at least one allergen-specific IgE reaction, and polysensitization to food, parasite/fungal, and environmental allergens was common. These findings suggest that dogs with suspected allergic dermatitis in northern Vietnam may show broad, multi-group IgE sensitization. Serum allergen-specific IgE testing may provide supportive information for clinical history-taking, dietary review, ectoparasite control, environmental management advice, and planning of subsequent confirmatory diagnostic approaches, but positive results should be interpreted as evidence of sensitization rather than definitive evidence of clinical allergy.

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NOVELTY STATEMENT

To our knowledge, this study provides the first peer-reviewed regional baseline data on serum allergen-specific IgE sensitization profiles in dogs with suspected allergic dermatitis in Vietnam. The findings demonstrate frequent broad, multi-group polysensitization involving food, parasite/fungal, and environmental allergens in this population. These preliminary data may support more structured dietary history-taking, ectoparasite control, environmental assessment, and planning of confirmatory allergy diagnostics in Vietnamese veterinary dermatology practice.

AUTHOR'S CONTRIBUTION

HDD conceived and designed the study, supervised sample collection, interpreted the data, and drafted the manuscript. NTMV contributed to laboratory testing, data management, and manuscript revision. NHV contributed to sample collection, clinical information management, and interpretation of results. All authors read and approved the final manuscript.

Data availability

The datasets generated and analyzed during the current study are available from the corresponding author upon reasonable request.

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Ethical approval and consent to participate

This study used serum samples collected from client-owned dogs during routine diagnostic investigation after informed owner consent. No experimental treatment, allergen challenge, or additional invasive procedure beyond routine venipuncture was performed for the purpose of this study. The study was observational and descriptive in nature and was based on routine diagnostic submissions from participating veterinary clinics. Owner consent was obtained before sample collection and allergen-specific IgE testing. Institutional confirmation or exemption for the use of routine diagnostic submissions can be provided upon request.

Generative AI and AI assisted technology statement

The authors declare that no generative AI and AI assisted technology was used in the creation of this manuscript.

Conflict of interest

The authors have declared no conflict of interest.

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