



Prevalence and Monthly Variation of *Argas persicus* Infestation in Domestic Chickens in Baghdad, Iraq

Sondos Abdul Karim

Department of Biology, College of Science, University of Al-Hamdaniya, Mosul, IRAQ

Email: sondos-abdulkarim@al-hamdaniya.edu.iq

Abstract

The fowl tick, *Argas persicus*, is an important soft tick ectoparasite of domestic poultry and can adversely affect bird health and productivity. Its occurrence is influenced by host availability and environmental conditions, particularly conditions within poultry shelters. However, information concerning its occurrence among household-reared chickens in Baghdad, Iraq, remains limited. A cross-sectional survey was conducted between November 2023 and February 2024 in Abu Ghraib District, Baghdad Governorate in Iraq. A total of 520 domestic chickens (*Gallus gallus*) were examined, with 130 birds sampled during each study month. Birds and their housing environments were inspected for *A. persicus*. Suspected ticks were collected and preserved in 70% ethyl alcohol before morphological preparation and microscopic examination. Monthly differences in infestation prevalence were evaluated using the chi-square test at a significance level of 5%. Of the 520 examined chickens, 308 were infested with *A. persicus*, corresponding to an overall prevalence of 59.2%. Marked monthly variation was observed. The highest prevalence was recorded in December, when 124 of 130 chickens were positive (95.4%), whereas the lowest prevalence occurred in January, with 14 of 130 birds positive (10.8%). The prevalence was 65.4% in November and 65.4% in February. The variation in infestation prevalence among the four study months was statistically significant ($\chi^2 = 200.88$, $df = 3$, $P < 0.001$). The findings demonstrate a high overall prevalence of *A. persicus* among household chickens in Abu Ghraib District, with pronounced temporal variation during the study period. The exceptionally high prevalence recorded in December indicates a period of increased infestation risk. Regular inspection and appropriate ectoparasite-management practices in both chickens and their housing environments are recommended. Further longitudinal studies incorporating quantitative temperature, humidity, housing characteristics, and tick developmental stages are required to clarify the environmental determinants of *A. persicus* infestation.

Keywords: *Argas persicus*; fowl tick; domestic chicken; ectoparasite; prevalence

Received: July 2026; **Revised:** August 2026; **Accepted:** September 2026; **Published:** October 2026

1. Introduction

Poultry production represents an important component of livestock production and household food security in many developing countries. Domestic chickens are frequently maintained under backyard or household production systems, where birds may be exposed to a variety of ectoparasites. These parasites can negatively affect poultry health through blood feeding, irritation, tissue damage, stress, reduced productivity, and, in some circumstances, transmission of infectious agents. Among the ectoparasites associated with poultry, soft ticks belonging to the genus *Argas* are particularly important. *Argas persicus*, commonly known as the fowl tick or poultry tick, is a soft-bodied tick associated primarily with domestic and wild birds. The species has a broad geographic distribution and occurs particularly in warm and subtropical environments (Marchiondo, 2019). Unlike many hard ticks, *A. persicus* spends much of its life away from the host. Ticks may shelter in cracks, crevices, nests, and other protected areas within poultry houses, emerging to feed on birds. Consequently, examination of the bird alone may underestimate the extent of infestation, making inspection of the poultry housing environment an important component of surveillance.

The biological characteristics of *A. persicus* enable it to persist within poultry environments. Different developmental stages can survive for prolonged periods without feeding, while favorable environmental conditions can support completion of the life cycle. Warm conditions are particularly relevant to tick activity and development. The veterinary importance of *A. persicus* extends beyond direct parasitism. The species is recognized as a vector of *Borrelia anserina*, the causative agent of avian spirochetosis, and has also been associated with transmission of other avian pathogens. Consequently, substantial tick infestations may represent an important component of poultry-health risk.

Studies from different geographical regions demonstrate considerable variation in the prevalence of *A. persicus*. For example, a study of domestic fowl in Khyber Pakhtunkhwa, Pakistan, identified *A. persicus* as the predominant soft tick and reported substantial numbers of ticks within poultry shelters, emphasizing the importance of environmental reservoirs. More recently, a survey of domestic hens in Pakistan reported a tick infestation prevalence of approximately 69.9%, demonstrating that high infestation levels can occur in domestic poultry populations. Evidence from Iraq also demonstrates the occurrence of *A. persicus* in domestic chickens. In Sulaimani Region, *A. persicus* was among the ectoparasites detected in local chickens, with the parasite identified particularly among birds carrying ectoparasitic infestations.

A recent systematic review and meta-analysis further demonstrated that ectoparasite infestation is widespread among chickens globally and identified *A. persicus* among the important acarine ectoparasites affecting poultry. The review also indicated substantial variation among countries and production systems, with backyard and free-range systems generally showing higher ectoparasite infestation than intensive systems.

Despite the veterinary importance of *A. persicus*, information concerning its prevalence among household-reared chickens in Baghdad Governorate remains limited. Therefore, the present study was designed to determine the prevalence of *A. persicus* infestation in domestic chickens in Abu Ghraib District, Baghdad, and to investigate variation in infestation prevalence among the study months.

2. Materials and Methods

2.1 Study area and study period

The study was conducted in Abu Ghraib District, Baghdad Governorate, Iraq, between November 2023 and February 2024. The investigation focused on domestic chickens maintained in household environments. The original study proposed evaluating the relationship between infestation and temperature fluctuations. However, the supplied dataset does not provide numerical temperature observations for the individual sampling periods. Therefore, the present analysis evaluates monthly variation in infestation prevalence rather than calculating a direct temperature–prevalence association.

2.2 Study population and sample size

A total of 520 domestic chickens (*Gallus gallus*) were examined. The sample was distributed equally across the four study months, with 130 chickens examined each month: These values correspond directly to the supplied study data.

2.3 Collection and preliminary examination

The birds were examined using visual inspection and a magnifying glass. The chickens and their housing environments were inspected for the presence of ticks, particularly areas where *A. persicus* may occur. The supplied study reports that ticks were observed beneath the wings and around the beak and comb. Each collected specimen was placed in a clean test tube containing 70% ethyl alcohol for preservation. Information recorded for individual samples included sample number, sex of the bird, and collection date.

2.4 Preparation and microscopic examination

The collected specimens were processed according to the procedure attributed in the original study to Abu Al-Hab (1975). Briefly, specimens were initially preserved in 70% ethyl alcohol. They were subsequently transferred to 10% potassium hydroxide (KOH) for approximately 24 hours to facilitate clearing. The specimens were then washed with distilled water and transferred to xylene for approximately two minutes. Following clearing, specimens were mounted on glass slides using Canada balsam and covered with coverslips. After drying, the prepared specimens were examined using an insect dissection microscope at 40× magnification and photographed using a microscope camera.

2.5 Identification of infestation

Infestation was recorded when *A. persicus* specimens were detected during examination. The original study identified the parasite morphologically as *Argas persicus*. Because the supplied methodology does not provide a

detailed taxonomic key or a list of diagnostic morphological characters, the manuscript does not introduce additional identification criteria beyond those documented in the source material.

2.6 Statistical analysis

The original study used the chi-square (χ^2) test at a significance level of 0.05 to evaluate differences in infestation prevalence among study months. Using the reported monthly counts, the association between month and infestation status was highly significant: $\chi^2 = 200.88$, $df = 3$, $P < 0.001$. Thus, infestation prevalence differed significantly across the four sampling months.

3. Results

3.1 Overall prevalence

A total of 520 domestic chickens were examined during the study period. *Argas persicus* infestation was detected in 308 birds, giving an overall prevalence of 59.2%. The estimated 95% confidence interval for the overall prevalence is approximately 54.9–63.4%, indicating that infestation was common within the surveyed population.

3.2 Monthly prevalence

Marked variation was observed among the four study months. In November, 85 of 130 examined chickens were positive, corresponding to a prevalence of 65.4%. The prevalence increased markedly in December, when 124 of 130 chickens were positive, corresponding to 95.4%, the highest prevalence observed during the investigation.

In contrast, infestation prevalence declined dramatically in January, when only 14 of 130 chickens were positive (10.8%). In February, prevalence increased again to 65.4%, with 85 positive birds among the 130 examined. The monthly data are summarized in (Table.1). The reported December prevalence was approximately 8.8 times the January prevalence, illustrating the pronounced temporal fluctuation observed during the study.

Table (1) Monthly prevalence of *Argas persicus* infestation among domestic chickens, the difference among months was statistically significant ($\chi^2 = 200.88$, $df = 3$, $P < 0.001$)

Study month	Examined	Positive	Negative	Prevalence (%)
November	130	85	45	65.4
December	130	124	6	95.4
January	130	14	116	10.8
February	130	85	45	65.4
Total	520	308	212	59.2

4. Discussion

The present study demonstrated a relatively high overall prevalence of *Argas persicus* infestation among domestic chickens in Abu Ghraib District, Baghdad, with 59.2% of the examined birds found to be infested. This finding indicates that the fowl tick may represent an important ectoparasitic problem in household poultry production in the study area.

The observed prevalence is broadly comparable with reports from other regions, although considerable geographical variation has been documented. For example, a study in Iraq reported *A. persicus* among ectoparasites of local chickens in Sulaimani Region, with soft-tick infestation detected in a substantial proportion of the examined birds. Similarly, investigations in Pakistan have reported substantial infestation of domestic poultry, including a prevalence of approximately 69.9% among examined domestic hens. Such differences may reflect variation in climate, poultry housing, husbandry practices, host density, tick-control practices, and sampling design.

The relatively high prevalence observed in the current investigation may partly be related to the household production system. *Argas persicus* is particularly well adapted to poultry shelters because the parasite can remain in cracks, crevices, nests, and other protected locations and periodically emerge to feed on birds. This behavior is epidemiologically important because treating individual birds without addressing contaminated housing may not be sufficient to control an established infestation.

An important finding of the present investigation was the pronounced monthly variation in prevalence. The prevalence increased from 65.4% in November to 95.4% in December, subsequently declined to only 10.8% in

January, and increased again to 65.4% in February. The statistical analysis confirmed that these differences were highly significant.

The December peak may indicate that environmental conditions during this period were particularly favorable for tick activity, survival, reproduction, or host contact. *Argas persicus* is known to be associated with warm environments, and its activity is affected by environmental conditions within poultry houses. However, because the current dataset does not include actual temperature or humidity measurements, the December peak cannot be attributed statistically to temperature alone.

This distinction is important. The original study objective included assessment of temperature fluctuations, but monthly infestation counts alone cannot establish a temperature–prevalence relationship. A proper environmental analysis would require recording daily or weekly temperature and relative humidity at the poultry-house level and then examining their relationship with infestation using correlation or regression models.

The very low prevalence recorded in January is particularly noteworthy. Only 14 of 130 chickens were positive. Such a substantial decline over a relatively short period suggests that factors other than temperature may have contributed. Potential explanations include changes in poultry-house conditions, host management, tick developmental dynamics, environmental disturbance, or differences in exposure. These explanations remain hypotheses because corresponding measurements were not included in the supplied dataset.

The observation of ticks beneath the wings and around the beak and comb is consistent with the biology of poultry-associated ticks, which commonly seek relatively protected areas on the host. Nevertheless, *A. persicus* should not be regarded exclusively as a parasite of the chicken itself. A major component of its population may remain within the poultry environment. Studies of domestic fowl have shown that many post-larval stages can occur in shelters and crevices rather than directly on birds.

From a veterinary-health perspective, the presence of *A. persicus* is important because the species can act as a vector of avian pathogens, particularly *Borrelia anserina*, which causes avian spirochetosis. Therefore, a high tick burden could potentially increase the risk of pathogen transmission within susceptible poultry populations.

5. Conclusions

The findings are also consistent with broader evidence showing that ectoparasites are widespread in chickens worldwide. A recent systematic review and meta-analysis estimated an overall chicken ectoparasite prevalence of approximately 70.2%, although prevalence varied considerably according to geography, production system, and host characteristics. *Argas persicus* was among the important acarine ectoparasites reported from chickens.

The present study has several limitations. First, the investigation was restricted to a single district and a relatively short four-month period, which limits generalization to the wider Baghdad poultry population. Second, numerical temperature and humidity data were not provided, preventing a direct assessment of environmental effects. Third, the study reports prevalence but does not quantify the number of ticks per bird, tick developmental stage, sex, or feeding status. Fourth, detailed information regarding poultry-house construction, sanitation, stocking density, free-ranging behavior, and acaricide use was not available.

Future investigations should therefore adopt a longitudinal design covering at least one complete year and simultaneously record temperature, relative humidity, housing conditions, poultry-management practices, tick abundance, developmental stage, and host characteristics. Molecular identification could also be incorporated to confirm morphological identification and investigate the population structure of *A. persicus*. Such an approach would provide stronger evidence concerning the ecological determinants of infestation in Iraqi poultry.

References

- Abdullah S. H., and Mohammed A.A. (2013). Ecto and Endo Parasites Prevalence in Domestic Chickens in Sulaimani Region. *Iraqi Journal of Veterinary Medicine*. 37(2):149–155. doi:10.30539/iraqijvm.v37i2.275 .
- Al-Rawi K. M. (1984). Introduction to Statistical Methods. The chi-square procedure was cited in the original study as the statistical approach used to compare infestation rates. The uploaded manuscript cites Al-Rawi for this analysis .
- Khan, B., Batool, S., Shah Nawaz, S., Ullah, S., Naeem, M., Habiba, U., & Iqbal, F. (2025). A higher infection rate of *Toxoplasma gondii* in soft ticks infesting domestic hens: a novel report from Pakistan. *Veterinary Parasitology: Regional Studies and Reports*, 57, 101147 .
- Marchiondo, A. A., Cruthers, L. R., & Fourie, J. J. (2019). Parasiticide Screening: Volume 1: In Vitro and In Vivo Tests with Relevant Parasite Rearing and Host Infection/Infestation Methods. Academic Press.
- Murillo A.C. (2026). Fowl ticks. *Merck Veterinary Manual*. Description of *Argas persicus*, its distribution, biology, and role as a vector of *Borrelia anserina* and other avian pathogens .

- Mustafa S., Batool T., Bajwa H. U. R., Ahmad M., Habib M. S., et al.(2023) Global prevalence and some other important aspects of *Argas persicus* (Ixodida-Argasidae) in commercial poultry farms—a mini review. Continental Veterinary Journal. 3(1):17–25.
- Nahal, A., Loucif, K., Boucheikhchoukh, M., Benakhla, A., & Righi, S. (2026). Global prevalence of chicken ectoparasites: a systematic review and meta-analysis. World's Poultry Science Journal, 82(1), 229-250. DOI:10.1080/00439339.2025.2600415
- Tavassoli M., Rezanejad Sabeghi Z., Ghorbanzadeh B., Shamsi S., Arjmand J., Golabi M.(2015) The underwater survival of adult and larval stages of *Argas persicus* (Acari: Argasidae). Persian Journal of Acarology. 4(2). doi:10.22073/pja.v4i2.11442.
- Tsai, K. H., Batool, S., Khan, A., Cossío-Bayúgar, R., Swelum, A. A., Niaz, S., & Khan, A. (2024). Infestation prevalence, spatio-temporal distribution, phylogenetic positioning, and pathogen investigation of *Argas persicus* ticks in domestic hens (*Gallus gallus domesticus*) from Pakistan. Veterinary Parasitology: Regional Studies and Reports, 52, 101044. DOI:10.1016/j.vprsr.2024.101044 .
- Zahid, H., Muñoz-Leal, S., Khan, M. Q., Alouffi, A. S., Labruna, M. B., & Ali, A. (2021). Life cycle and genetic identification of *Argas persicus* infesting domestic fowl in Khyber Pakhtunkhwa, Pakistan. Frontiers in Veterinary Science, 8, 664731.
-