Tikrit Journal of Pure Science Vol. 31 (1) 2026

DOI:https://doi.org/10.25130/tjps.v31i1.2125

IRAQI Academic Scientific Journals

Tikrit Journal of Pure Science

ISSN: 1813 – 1662 (Print) --- E-ISSN: 2415 – 1726 (Online)

Journal Homepage: https://tjpsj.org/

Tikrit Journal of Pure Science

Study on the German cockroach *Blattella germanica* (L) and identify the types of parasites that it transmits automatically on the surface of its external body and inside its intestines.

Alaa Emad Tawfeeq[1], **Ali Hossen Altaef Al Tikriti**[2], **Ashraf Jamal Mahmoud**[1]

[1] *Department of Biology, College of Education for Women, University of Tikrit, Iraq*

[2] *Department of Biology, College of Education for Pure Sciences, University of Tikrit, Iraq*

Received: 15 Dec. 2025 **Received in revised forum:** 9 Feb. 2026 **Accepted:** 12 Feb. 2026

Final Proofreading: 21 Feb. 2026 **Available online:** 25 Feb. 2026

ABSTRACT

This study was conducted on German cockroaches, identifying the types of parasites they mechanically transmit via their external body surfaces and the parasites present in their intestines that they transmit to humans. The study was conducted in Tikrit. 150 German cockroaches (Blattella germanica) were collected, comprising 63 males (49 adults and 15 immature) and 87 females (69 adults and 18 immature). The collection process was carried out from various locations, including rooms in homes, bathrooms, and sewers. It was observed that most cockroaches carried parasites, either on their external body surfaces or within their intestines, at a rate exceeding 89%. Parasites were isolated and their types identified, revealing that the internal parasites transmitted by these cockroaches were more numerous than those on their external bodies. The study also found that cockroaches collected from bathrooms had higher parasite loads than those collected from other locations.

Keywords: German cockroach, diseases, parasites, extracorporeal, intestinal.

Name: Emad Tawfeeq **E-mail:** Alaa.altikrity@tu.edu.iq

Tikrit Journal of Pure Science Vol. 31 (1) 2026

DOI:https://doi.org/10.25130/tjps.v31i1.2125

دراسة عن الصراصير الالمانية Blattella germanica (L) ومعرفة انواع الطفيليات التي تنقلها الياً على سطح جسمها الخارجي وداخل امعائها

الاء عماد توفيق[1]، علي حسين لطيف[2]، أشرف جمال محمود[1]

[1]قسم علوم الحياة، كلية التربية للبنات، جامعة تكريت، تكريت، العراق

[2]قسم علوم الحياة، كلية العلوم، جامعة تكريت، تكريت، العراق

الملخص

تم اجراء هذه الدراسة حول الصراصير الالمانية والتعرف على انواع الطفيليات التي تنقلها بصورة الية على سطح جسمها الخارجي والطفيليات المتواجدة داخل امعائها والتي تنقلها للإنسان والتي تمت في مدينة تكريت ، وتم جمع 150 صرصر من النوع الالماني Blattella germanica حيث كان عدد الذكور 63 (49 بالغ ،و 15 غير بالغ) وعدد الاناث 87 (69 بالغات ، و 18 غير بالغات) ، وتمت عملية الجمع من اماكن مختلفة شملت غرف المنازل والحمامات والمجاري ، وتم ملاحظة انه معظم الصراصر كانت تحمل الطفيليات اما على سطح جسمها الخارجي او داخل امعائها بنسبة تجاوزت 89% ، حيث تمت عملية عزل الطفيليات ومعرفة انواعها ومن خلال النتائج تم ملاحظة ان الطفيليات الداخلية التي تنقلها هذه الصراصر هي اكثر مما متواجد على اجسامها الخارجية . وايضاً اوضحت نتائج الدراسة ان الصراصر التي تتواجد في الحمامات كانت تحمل طفيليات بنسب اعلى من التي تم جمعها من الاماكن الاخرى.

INTRODUCTION

As is well known, cockroaches are insects belonging to the order Dictyoptera. This order is one of the oldest, classified into numerous families and has fossils dating back more than 300 million years. They are found in many places, including human homes, and transmit many diseases, in addition to causing harm. (1). While cockroaches are the most common and widespread household insect, the German cockroach, *Blattella germanica* (L.), is one of the most common species in these areas. (2). One of the main reasons cockroach control is difficult is their diverse diet, the large number of their hosts, and their ability to feed on a wide range of human foods. They can even feed on paper and paint. (3). Since they are nocturnal and crawl over everything in kitchens and food, they can transmit many pathogens to humans. (4).

MATERIALS AND METHODS

Sample Collection: This study was conducted in Tikrit, and samples were collected manually from various locations throughout the city.

Materials and Tools Used: Dissection tools, Petri dishes, slides, slide covers, a pipette, plastic tubes, a light microscope, a centrifuge, formalin, ethyl alcohol, and saline.

The study was conducted in two stages:

1- Identifying parasites carried or present on the external surface of cockroaches: In this stage, the external surface of the cockroach was washed with a saline solution inside a Petri dish. The cockroach was held with large forceps and slowly and continuously moved to ensure that all parasites at all stages (adults, eggs, and larval stages) were removed. The contents of the Petri dish were then placed in plastic tubes and centrifuged for 5 minutes at 2,000 rpm. The tubes were then removed, the contents examined for parasites, and the results recorded.

2-Identifying parasites and their stages inside the cockroach intestine: At this stage, the cockroach was dissected inside a Petri dish. This was accomplished by killing the cockroach, separating its head, removing parts of its legs and wings, then

DOI:https://doi.org/10.25130/tjps.v31i1.2125

opening the cockroach's body from above with a scalpel to reach its digestive system. A piece of the beginning of the digestive system was taken and placed on a slide. A drop of saline solution was added, and the remaining internal parts of the cockroach's body were [5].

RESULTS AND DISCUSSION

This study confirmed that German cockroaches play a major role in transmitting pathogenic and non-pathogenic intestinal protozoa to humans. The most important parasites present on the external surfaces were *Entamoeba hartmani, Endolimax nana*, and *Isospora belli*. Inside the digestive system, the numbers were as shown in Table 1.

Table 1: Shows the types of parasites present in the digestive system

No	Types of parasites	Infection rates
1-	*Entamoeba histolytica*	37.0
2-	*Entamoeba coli*	20.2
3-	*Girdia lamblia*	18.7
4-	*L. butschli*	2.44

The results of this study are consistent with many previous studies, including those by [6] in Nigeria, and also with [7], although the number obtained is higher than in their study, as they only found two types of parasites: *E. histolytica* and E. coli, while in our study, more than four types of parasites were found. Cockroaches harbor parasites at higher rates in their intestines due to their frequent movement and the friction between their bodies and surfaces such as floors, furniture, and other objects. [8]. Parasites that enter the digestive system exit unchanged. This is why large numbers of parasites were found in the intestines during dissections. This study is consistent with [9] study in Taiwan, where the proportion of German cockroaches carrying parasites in their intestines was higher than that found on their external surfaces. The study results also indicate that cockroaches collected from various locations, including bathrooms, toilets, and sewers, had higher parasite counts than those collected from rooms and found on furniture. This finding is consistent with numerous previous studies, including. [6] study, as cockroaches collected from bathrooms and toilets are often found in areas where human waste is present, which contains many parasites. In addition, females recorded higher infection rates than males, consistent with this study.

REFERENCES

1. Melville H, Horth L. Correspondence: Northwestern University Press; 1993.

2. Lee C. Control of insecticide-resistant German cockroaches, Blattella germanica (L.)(Dictyoptera: Blattellidae) in food-outlets with hydramethylnon-based bait stations. Tropical Biomedicine. 1998;15(1):45-52.

3. Barson G. Cockroach control and its importance. 1979.

4. Šrámová H, Daniel M, Absolonová V, Dědičová D, Jedličková Z, Lhotova H, et al. Epidemiological role of arthropods detectable in health facilities. Journal of Hospital Infection. 1992;20(4):281-92. http://dx.doi.org/10.1016/0195-6701(92)90006-8

5. Chamavit P, Sahaisook P, Niamnuy N. The majority of cockroaches in Samut Prakan province, Thailand, are carriers of parasitic organisms. EXCLI journal. 2011;10:218.

6. Tatfeng Y, Usuanlele M, Orukpe A, Digban A, Okodua M, Oviasogie F, et al. Mechanical transmission of pathogenic organisms: the role of cockroaches. Journal of Vector-Borne Diseases. 2005;42(4):129.

7. Kinfu A, Erko B. Cockroaches as carriers of human intestinal parasites in two localities in Ethiopia. Transactions of the Royal Society of Tropical Medicine and Hygiene. 2008;102(11):1143-7. http://dx.doi.org/10.1016/j.trstmh.2008.05.009

8. Baumholtz MA, Parish LC, Witkowski JA, Nutting WB. The medical importance of cockroaches. International journal of dermatology. 1997;36(2):90-6. http://dx.doi.org/10.1046/j.1365-4362.1997.00077.x

9. Pai H-H, Ko Y, Chen E. Cockroaches (Periplaneta americana and Blattella germanica) as potential mechanical disseminators of Entamoeba

histolytica. Acta tropica. 2003;87(3):355-9. http://dx.doi.org/10.1016/S0001-706X(03)00140-2