
ORIGINAL ARTICLE

Survey of Species Insects Indoor in Different Localities of Iraq

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ABSTRACT

*The aim of this study to determine the insects associated human indoor; this survey showed (29) species belonging to (26) under (20) families and (8) orders. The specimens were collected from several spaces indoor from several regions of Iraq. The species of *Musca domestica* Linnaeus, 1758 was most abundant compared with other insects, whereas the species of *Tenebrio obscurus* Fabricius, 1792 was the least population in the present study.*

Key words: Indoor, Insects, Iraq, Localities, Survey.

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INTRODUCTION

Several species of flies infest homes; among the more important are the house fly, face fly, green bottle fly, fruit fly, stable fly, the lesser house fly, blowflies, and cluster fly; most of the flies found in homes breed in decaying organic matter. The common house fly reproduces rapidly in such material and may carry germs to the food of man [1].

he indoor invasions by arthropods can have many causes; often buildings are periodically attractive to the nuisance invader, providing moisture sources, favorable temperature, humidity, shelter, or some other environmental need. Many nuisance invaders seeking overwintering sites enter homes in the fall, others are more commonly found in homes during hot and dry periods in summer; sometimes nuisance problems are largely accidental and result when buildings are located adjacent to sites where local conditions allow the development of large populations of an invader species [2].

Insect species have been living and evolving with humans for all of our history, it has been proposed that many arthropod species that are now associated with human houses were originally caving dwellers such as bed bug species [3].

According to the above, and due to the absence of studies on this subject in Iraq, the current study was suggested to identify the diversity of insects inside houses that collecting from different localities of Iraq.

MATERIAL AND METHODS

Collecting of insects

The adult specimens were collected from indoors during 2018 from different localities of Iraq; specimens collected by hand using forceps, aspirators and insect nets, both living and dead small insects were collected in this manner into vials containing 80% ethanol; whereas the large specimens are mounted by insect pins, labeled, mounted and put into collection boxes. The specimens were stored in the Iraq Natural History Research Center and Museum, University of Baghdad .

Identification

All specimens are identified to family level, and determined the genera and species when possible; in this case, they used many different keys to identify the specimens such as: (4, 5, 6, 7, 8, 9, 10, 11, 12 and 13). Also, the specimens were compared with the specimens that stored in the collection of the Iraq Natural History Research Center and Museum, University of Baghdad .

RESULTS AND DISCUSSION

In the current investigations, they are 29 species, 26 genera, 20 families and 8 orders; the species of *Musca domestica* Linnaeus was most frequented, whereas the species of *Tenebrio obscurus* Fabricius was least found at indoors throughout the regions selected in our study; these species are :

(A) Order, Zygentoma

Family, Lepismatidae

Neasterolepisma evansi Silvestri, 1923

Common name: Silver fish.

Materials examined (5 specimens): They were collected from old room with stored things from Baghdad, Al Hurriya at 5.IV.2018.

Distribution: Iraq (14); Iran [11].

Thermobia domestica Packard, 1873

Common name: Firebrat.

Materials examined (6 Specimens): They collected from old library under books from Baghdad governorate, Al -Kadhumiya at 7. III.2018.

Distribution: Iraq (15); Canada [16]; Cosmopolitan [17].

(B) Order, Blattodea

1 -Family, Blattidae

Periplaneta americana (Linnaeus, 1758)

Synonyms:

Blatta aurelianensis Fourcroy, 1785

Periplaneta americana colorata Rehn, 1902

Blatta domicola Risso, 1826

Blatta ferrugineofusca Gronovius, 1764

Blatta heros Eschscholtz, 1822

Blatta americana Linnaeus, 1758

Blatta orientalis Sulzer, 1776

Blatta siccifolia Stoll, 1813

Periplaneta stolidia Walker, 1868

Common name: American cockroach.

Materials examined (68 specimens): Baghdad governorate (55 specimens), Bab Al- Muadham, 8 specimens, 21.III.2018; Kadhumiya, 7 specimens, 25.III.2018; 28 specimens, 2.VII.2018; Hay Al-Shurtaa Al Khamssa, 12 specimens. Babil governorate (51 specimens), Musayyib district, 20 specimens, 13.V.2019; Mahawil district, 31 specimens, 11.VII.2018. Saladin governorate (21 specimens), Tikrit city, 13 specimens, 19.IV.2018; 8 specimens, 22.IX.2018.

Distribution: Cosmopolitan (18); in Iraq this species registered by Khalaf [19].

2-Family: Corydiidae (=Polyphagidae)

Polyphaga aegyptiaca (Linnaeus 1758)

Synonymy:

Blatta lata Gistel, 1856

Blatta omega Costa, 1839

Heterogamia punctata Fischer, 1846

Blatta sphaerica Gistel, 1856

Blatta spinifer Kirby, 1910

Heterogamia spinipes Fischer, 1846

Steleopyga trichoprocta Fischer, 1833

Blatta aegyptiaca Linnaeus, 1758

Common name: Egyptian desert cockroach.

Materials Examined (10 specimens): Baghdad governorate, Hay Al-Sha'ab, 6 specimens, 4.V.2018. Karbala governorate, Ain Al-Tamur district, 4 specimens, 5.VI.2018

Distribution: Iraq (19); Iran [20]; Bulgaria [12].

3-Family: Ectobiidae

Blattella germanica (Linnaeus, 1767)

Synonyms:

Blatta asiatica Pallas, 1773

Blatta bivittata Serville, 1838

Eublattella cuneivittata Hanitsch, 1925

Phyllodromia cuneivittata Hanitsch, 1925

Blatta daurica Laxmann, 1769
Phyllodromia magna Tepper, 1895
Phyllodromia niitakana Shiraki, 1931
Blatta obliquata Daldorf 1794 ,
Ischnoptera paralella Tapper, 1893
Blatta germanica Linnaeus, 1767
Ischnoptera paralella Princis, 1969
Blattella germanica shuguroffi Karny, 1908
Blatta transfuga Brünnich, 1763
Common name: German cockroach.

Materials examined (15 specimens): Baghdad governorate, Palestine Street, 6 specimens, 10.III.2018; Al-Hurriya district, 4 specimens, 4.IV.2018; Al-Za'franiya district, 5 specimens, 11.V.2018.

Distribution: Iraq [19]; Iran [21]; throughout the world [22].

(C) Order, Orthoptera

Family, Gryllidae

Acheta domesticus Linnaeus, 1758

Common name: House cricket .

Materials examined (34): Baghdad, Al-Kadhimiya, 6 specimens, 25.IV.2018; Al-Shrtaa Al Khamssa, 2 specimens, 11.VII. 2018. Karbala governorate, Al-Husseiniya district, 6 specimens, 20.VII.2018. Wasit governorate, Az Zubaidiyah, 4 specimens, 30.VII. 2018. Babil governorate: Al Musayyib district, 10 specimens, 30.VI.2018; Al-Mahawil District, 6 specimens, 27.VII. 2018.

Distribution: Iraq (19); Kuwait (23); Saudi Arabia (24); Libya [25]; India [26]; wide-distribution in Europe (27).

Gryllus bimaculatus De Geer, 1773

Common name: Field cricket.

Materials examined (11 specimens): Wasit, Az Zubaidiyah, 30.VI.2018 .

Distribution: This species has a global distribution, Africa, Asia and southern Europe [28, 29]. In Iraq the species is registered by Messrs [30].

(D) Order, Hemiptera

Family: Cimicidae

Cimex hemipterus Fabricius, 1803.

Common name: Tropical bed bug.

Materials examined: 5 specimens Baghdad, Al- Hurriya, 24.II.2018

Distribution: Tropical and subtropical regions (31); Iraq [32, 33].

Cimex lectularius Linnaeus, 1758

Common name: Bed bug.

Materials examined: (10 specimens): Baghdad, Al- Chikuk, 5 specimens, 20.I.2018; 3 specimens, Al-Taji, 22.II.2018, Al-Hurriya, 2 specimens 4.IV.2018 .

Distribution: Cosmopolitan distributed [34]; in Iraq this species was registered by Abul-Hab [35]; Malaysia [36].

(E) Order, Diptera

1-Family, Culicidae

Culex pipiens (Linnaeus, 1758)

Common name: Common house mosquito .

Materials examined (17 specimens): Baghdad governorate, Hay Al-Shurtaa Al Khamssa, 7 specimens, 18.IV.2018. Wasit governorate (10 specimens), Az Zubaidiyah, 4 specimens, 25.III. 2018, 6 specimens, 28.IV.2018.

Distribution: Iraq [35]; Argentina, Austria, Belgium, Bulgaria, Canada, Croatia, Cyprus, Czech Republic, Egypt, France, Germany, Greece, Hungary, Iran, Ireland, Palestine, Italy, Japan, Jordan, Republic of Korea, Latvia, Lebanon, Lithuania, Luxembourg, Morocco, Pakistan, Poland, Portugal, Romania, Russia, Saudi Arabia, Serbia, Slovakia, Spain, Sweden, Tajikistan, Tunisia, Turkey, UK, USA, Uruguay, Netherlands and Montenegro [37].

2-Family, Drosophilidae

Drosophila melanogaster Meigen, 1830

Common name: Vinegar fly .

Materials examined (70 specimens): Baghdad governorate (23 specimens): Al-Shrtaa Al Khamssa, 10 specimens, 2.IV.2018; Al- Kadhumyia, 13 specimens, 5.VI.2018. Wasit governorate (15 specimens): Az

Zubaidiya, 7 specimens, 19.IV.2018; Al `Aziziyah, 8 specimens, 4.V.2018. Babil governorate, Jbela district, 9 specimens, 21.V.2018. Dhi Qar governorate, Al-Rifa'i district, 23 specimens, 15.III.2018.

Distribution: Iraq [38]; America [13].

3-Family, Fanniidae

Fannia canicularis (Linnaeus, 1761)

Synonyms:

Anthomyia tuberosa Ruricola, 1845

Fannia lateralis (Linnaeus, 1758)

Fannia socio (Harris, 1780)

Fannia sociominor (Harris, 1780)

Fannia tuberosa (Ruricola, 1845)

Musca canicularis Linnaeus, 1761

Musca lateralis Linnaeus, 1758

Musca socio Harris, 1780

Common name: Lesser house fly.

Material examined (14 specimens): Baghdad governorate Al-Taji, 9 specimens, 7.III.2018; Al-Rashidiya, 5 specimens, 10.IV.2018.

Distribution: Iraq [35]; Syria [39]; Turkey [40].

4-Family, Muscidae

Musca domestica Linnaeus, 1758

Common name: House fly.

Materials examined (210 specimens): Baghdad governorate (93 specimens), Bab Al- Muadham, 40 specimens, 2.III.2018; Kadhimiya, 18 specimens, 20.III.2018; 28 specimens, 2.VII.2018; Hay Al-Shurtaa Al Khamssa, 7 specimens, 13.VI.2018. Karbala governorate (32 specimens), Karbala city, 15 specimens, 11.IV.2018; Aon district, 17 specimens, 19.X.2018. Wasit governorate (64 specimens), Az Zubaidiyah, 13 specimens, 25.III. 2018, 20 specimens, 13.V.2018, 31 specimens, 11.VII.2018. Saladin governorate (21 specimens), Tikrit city, 13 specimens, 19.IV.2018; 8 specimens, 22.IX.2018.

Distribution: Europe, America, Asia: Lebanon, Syria, Iraq, Palestine, Turkey, Iran, Afghanistan, Mongolia, Korea, China, Japan, North Africa: Morocco, Algeria, Tunisia, Libya, Egypt, Azores, Madeira, Canary Islands [7, 40].

5- Family: Phoridae

Megasilia sp.

Materials examined (16 specimens): Baghdad governorate, Bab Al-Muadham, 10 specimens, 11.III.2018; Hay Al-Shurtaa Al Khamssa, 6 specimens, 17.III.2018.

Distribution: Cosmopolitan (41).

6- Family, Psychodidae

Phlebotomus papatasi (Scopoli, 1786)

Common name: Sand fly .

Materials examined (16 specimens): Wasit governorate, Az Zubaidiyah, 10 specimens 25.III.2018; 6 specimens, 28.IV.2018 .

Distribution: Iraq [35]; Wide distribution [42]; Italy [10]; Afghanistan, Algeria, Azerbaijan, Egypt, Iran, Algeria, Azerbaijan, Egypt, Jordan, Kazakhstan, Libya, Morocco, Oman, Pakistan, Palestine, Saudi Arabia, Sudan, Syria, Tunisia, Turkmenistan, Uzbekistan and Yemen [43].

Psychoda alternata Say, 1824

Synonyms:

Psychoda albimaculata Welch, 1912

Psychoda dakotensis Dyar, 1926

Psychoda floridica Haseman, 1907

Psychoda nocturnala Haseman, 1907

Psychoda schizura Kincaid, 1899

Common name: The trickling filter fly.

Materials examined: (20 specimens) Baghdad Governorate, Bab Al-Muadham, 5 specimens, 20.II.2018; Al-Taji, 10 specimens, 15.III.2018; Al-Hurriya, 5 specimens, 30.I.2018.

Distribution: Iraq [44]; cosmopolitan [45].

(F) Order: Hymenoptera

Family: Formicidae

Paratrechina longicornis (Latreille, 1802)

Materials examined: (159 specimens): Baghdad governorate (83 specimens): Bab Al-Muadham, 10 workers, 16. X.2018; Al-Shurtaa Al Khamssa, 31 workers, 2.XI.2018; Al- Kadhimiya, 14 workers, 3.VIII.2018; Jaddria, 11 workers, 11.X.2018; Zayona, 17 workers, 7.XI.2018. Wasit Governorate (22 specimens): Az Zubaidiyah, 8 workers, 9.IX.2018; Al `Aziziyah, 14 workers, 30.VIII.2018. Babil Gov. (51 specimens): Musayyib district, 9 workers, 21.V.2018; 16 workers, 29.V.2018; Al-Mahawil, 6 workers, 3.VIII.2018; 20 workers, 20.IX.2018. Saladin governorate, Tikrit city, 3 workers, 23.IX.2018.

Distribution: Africa and Asia (46); Southeast Asia and Melanesia (47). Australasia-Pacific Region, Europe, North America, and South America (48, 49).

Tapinoma simrothi Krausse, 1911 Materials examined: (39 specimens): Baghdad governorate (22 specimens), Bab Al- Muadham, 8 workers, 2.X.2018, 14 workers, 7.XI.2018. Wasit governorate. (17 specimens), Az Zubaidiyah, 5 workers, 8.IX.2018; 12 workers, 3.X.2018 .

Distribution: Iran, Iraq, Israel, Saudi Arabia, United Arab Emirates; Greece, Italy, Spain, Portugal, Morocco [50].

(G) Order, Lepidoptera

1- Family, Pterophoridae

Pterophorus ischnodactyla (Treitschke, 1835).

Note: The adults of this species found in paths during the day.

Materials examined (13 specimens): Baghdad governorate, Bab Al- Muadham, 8 specimens, 23.IV.2018; 5 specimens, 3.V.2018.

Distribution: Iraq (38); Albania, Algeria, Bahrain, Belgium, Bulgaria, Croatia, France, Italy, Spain, Libya, Sicily, Malta, Slovakia, Austria, Hungary, Macedonia, Romania, Greece, Ukraine, Turkey, Syria, Palestine, Lebanon, Oman, Yemen, Mongolia, Republic of South Africa [51].

2-Family: Pyralidae

Ephestia cautella Walk. 1863

Synonym: *Cadra cautella* Walker, 1863

Common name: Almond moth, fig moth, date moth.

Materials examined (20 specimens): this specie collected from date palm stored; Baghdad city); Al-Kadhumiya district, 10 specimens, 20.III.2018. Al Chikuk, 10 specimens, 20.IV.2018

Distribution: Cosmopolitan [17]; Iraq [52].

Ephestia kuehniella (Zeller, 1879)

Synonym: *Anagasta kuehniella* (Zeller, 1879).

Common name: Mediterranean flour moth.

Materials examined (12 specimens): This species collected from date palm stored; Babil governorate; Musayyib district, 7 specimens, 11.III.2018. Saladin governorate, Al Alam district, 5 specimens, 14.IV.2018.

Distribution: Cosmopolitan [17]; Iraq [53].

(H) Order, Coleoptera

Family, Bostrichidae

Rhyzopertha dominica (Fabricius, 1792).

Synonyms:

Synodendron dominicum Lesne, 1898

Common name: Lesser grain borer .

Materials examined (17 specimens): This species collected from stored grains; Wasit governorate, Aziziyah district, 10 specimens, 21.VI.2018. Babil governorate, Musayyib district, 7 specimens, 21.VII.2018.

Distribution: Iraq [32]; Cosmopolitan [54].

2-Family: Chrysomelidae

Callosobruchus maculatus Fabricius, 1775

Common name: cowpea seed beetle

Material examined: (200 specimens) the specimens were collected from stored cowpea grains, Baghdad city: Al-Kadhimiya, 20. IV.2018 to 30.V.2018.

Distribution: Iraq [32]; cosmopolitan [17].

3-Family, Dermestidae

Anthrenus verbasci (Linnaeus, 1767)

Synonyms:

Byrrhus verbasci Linnaeus, 1767

Bostrichus varius Fabricius, 1775

Anthrenus florilegus Fourcroy, 1785

Anthrenus verbasci Gmelin, 1790

Anthrenus adpersus Herbst, 1797

Anthrenus tricolor Herbst, 1797

Anthrenus pictus Germar, 1813

Anthrenus pictus, Heer, 1837

Common name: Carpet beetle.

Materials examined (46 specimens): This species collected from insects dead that stored in museum and carpets that stored in dark room; Baghdad governorate; Bab Al Muadham, 20 specimens, 22.IV.2018; 10 specimens, 31.IV.2018; 16 specimens, 3.V.2018.

Distribution: Cosmopolitan [55].

Trogoderma granarium Everts, 1898

Synonyms

Trogoderma quinquefasciata Leesberg, 1906

Trogoderma koningsbergeri Pic, 1933

Trogoderma afrum Priesner, 1951

Common name: Khabra beetle.

Materials examined (30 specimens): This species collected from stored grain. Baghdad governorate; Bab Al Muadham, 20 specimens, 22.IV.2018; Babil governorate, Musayyib district, 10 specimens, 3.V.2018.

Distribution: Iraq (32); Egypt [56]; Afghanistan, Iran, Turkey, Yemen, Algeria, Libya, Morocco, Sudan, USA, and Germany [57].

4-Family, Silvanidae

Oryzaephilus surinamensis (Linnaeus, 1758).

Common name: Saw-toothed grain beetle.

Materials examined (31 specimens): This species collected from stored grains; Baghdad governorate, Taji district, 9 specimens, 11.V.2018. Wasit governorate, Az Zubaidiyah district, 14 specimens, 21.VI.2018. Babil governorate, Musayyib district, 8 specimens, 21.VII.2018.

Distribution: Iraq [58]; World-wide distributed [59].

5-Family, Tenebrionidae

Tribolium castaneum (Herbst, 1797)

Synonym: *Colydium castaneum* Herbst, 1797

Common name: Rust-red flour beetle.

Materials examined (76 specimens): This species collected from flour of wheat; Baghdad governorate ; Hay Al Shurta Al Khamsa, 24 specimens, 3.VI.2018; Al-Hurriya, 21 specimens, 19.VII.2018. Wasit governorate, Az Zubaidiyah district, 30 specimens, 12.VI.2018. Babil governorate, Musayyib district, 31 specimens, 29.VII.2018.

Distribution: Iraq [58]; cosmopolitan [56].

Tribolium confusum Jacquelin du Val, 1868

Common name: Confused flour beetle.

Materials examined (125 specimens): This species collected from flour of wheat; Baghdad governorate; Hay Al Shurta Al Khamsa, 24 specimens, 13.VI.2018; Al-Hurriya, 31 specimens, 19.VII.2018. Wasit governorate, Az Zubaidiyah district, 29 specimens, 22.VI.2018. Babil governorate, Musayyib district, 41 specimens, 21.VII.2018.

Distribution: Iraq (19); cosmopolitan [17].

Tenebrio obscurus Fabricius, 1792

Common name: Dark meal worm.

Materials examined (3 specimens): Maysan, Amara city, Al-Kahla District, 13.VI.2018.

Distribution: [17]; Iraq [60].

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