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ORIGINAL ARTICLE

REVISION OF THE GENUS *CHLAENIUS* BONELLI, 1810 (COLEOPTERA, CARABIDAE), WITH A NEW RECORD SPECIES FROM IRAQ

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ABSTRACT

In this paper, the species of the genus of *Chlaenius* Bonelli, 1810 (Coleoptera, Carabidae) were reviewed, and it was revealed that there are 21 confirmed species in Iraq; among them, the species of *Chlaenius hamifer* Chaudoir, 1856 was recorded for the first time in Iraq.

Diagnostic characters, a redescription of some of the morphological features, photographs and illustrations are provided for the new record species in this investigation.

Keywords: Carabidae, *Chlaenius*, Ground beetles, Iraq, New Record.

INTRODUCTION

Beetles are considered the most taxonomical various insect groups that contain major components of ecosystems in terms of biomass; species richness and ecological roles (Stack, 2015). One of the most important families of beetles is ground beetles (Carabidae). This family includes 24 subfamilies, 110 tribes, and more than 40,000 species dating back to 1927 genera described worldwide (Larochelle and Lariviere, 2007).

Carabidae members play important roles in pollination, predator-prey interaction, granivore, decomposition and nutrient cycling, and soil disturbances (Huffaker and Gutierrez, 1999). Many members are considered generalist predators, meaning they feed on a wide-range of pests including: aphids, beetle larvae, moth larvae and mites; a few specialists feed on snails (Kromp, 1999). The tribe of Chlaeniini is found in all zoogeographical regions of the world (Hegde and Manthen, 2017).

Löbl and Smetana (2003) indicated that there are 860 species and 62 subspecies belonging to the genus *Chlaenius* in the world, and this genus represents 650 species in Afrotropical and Oriental regions. Among them 20 species were recorded in Iraq:

Chlaenius spoliatus (Rossi, 1792), *C. syriacus* Chaudoir, 1876; *C. amarae* Andrewes, 1920 (Andrews, 1927); *C. festivus* (Panzer, 1796) (Roubal, 1932); *C. iraqkensis* Jedlička, 1959 (Jedlička, 1959); *C. coeruleus* (Steven, 1809) (Sage, 1961). *C. richardsi* Ali, 1965; *C. aeratus* (Quensel, 1806); *C. canariensis* Dejean, 1831; *C. dejeanii* (Dejean, 1831); *C. flavipes* Ménétriés, 1832; *C. velutinus* (Duftschmid, 1812); *C. vestitus* (Paykull, 1790); *C. viridis* (Ménétriés, 1832) (Ali, 1966, 1967); *C. circumscriptus* (Duftschmid, 1812); *C. dimidiatus* Chaudoir, 1842; *C. lucasii* Peyron, 1858; *C. virens* Rambur, 1837 (Derwesh, 1965); *C. decipiens* (L. Dufour, 1820) (Shalaby *et al.*,1966); *C. ernesti* Gory, 1833 (Koack and Kemal, 2010).

The current study aimed to revise and update the information of the species that belong to the genus *Chlaenius* Bonelli, 1810 in Iraq.

MATERIALS AND METHODS

The specimens were collected from different localities in the middle of Iraq by hand picking from fields under stones and light trap; the specimens were identified using different taxonomic keys such as Ali (1964, 1966), Lindroth (1974), Arnett and Thomas (2001), Park and Park (2013) and Yaiphabi Chanu and Swaminathan (2017). Synonyms are provided according to GBIF Secretariat (2021). The male genitalia and mouthparts were dissected, examined and photographed by an OPTIKA microscope Italy and Samsung A30S mobile camera.

RESULTS AND DISCUSSION

In this study, there were 21 species identified that belong to the genus of *Chlaenius*, one of them (*C. hamifer* Chaudoir, 1856) was given as a new record for first time in Iraq; these species were revised as follow:

Subfamily, Callistinae
Tribe, Chlaeniini
Genus, *Chlaenius* Bonelli, 1810
Synonyms: *Anomoglossus* de Chaudoir, 1856
Aulacosomus Grundmann, 1955
Baidochlaenius Basilewsky, 1950
Barymorphus de la Ferté-Sénectère, 1851
Basilewskyellus Grundmann, 1956
Brachylobus de Chaudoir, 1876
Callistometus Grundmann, 1956
Calochlaenius Kuntzen, 1913
Capsochlaenius Basilewsky, 1950
Chaelinus Basilewsky & Grundmann, 1954
Chaelinus Lucnik, 1933
Chinelaus Basilewsky & Grundmann, 1954
Chinelaus Lucnik, 1933
Chlaeniodromus Basilewsky, 1950

Chlaenionus Kuntzen, 1913
Chlaeniopus Grundmann, 1955
Chlaeniostenodes Basilewsky, 1953
Chlaeniostenus Kuntzen, 1919
Chlaenites Motschoulsky, 1860
Chlaenitidius Jeannel, 1949
Chlaenius Dejean, 1826
Chloenius Brullé, 1832
Compsochlaenius Alluaud, 1916
Cyaneodinodes Jeannel, 1949
Diaphoropsophus de Chaudoir, 1850
Dibolochilus Lacordaire, 1854
Dilobochilus Ferté-Sénectère, 1851
Epomis Dejean, 1826
Eudinodes Basilewsky, 1965
Eurydactylus Ferté-Sénectère, 1851
Glyptoderus de la Ferté-Sénectère, 1851
Goniodinoides Jeannel, 1949
Iberodinodes Basilewsky & Grundmann, 1954
Iberodinodes Wagner, 1932
Ilaenchus Basilewsky & Grundmann, 1954
Ilaenchus Lucnik, 1933
Laenichus Lucnik, 1933
Leptodinodes Jeannel, 1949
Lissauchenius Macleay, 1825
Lissauchenus Desmarest, 1851-22
Merochlaenius Grundman, 1955
Naelichus Lucnik, 1933
Nectochlaenius Antoine, 1961
Ocybatoides Jeannel, 1949
Ocybatus Laferté-Sénectère, 1851
Ocydromus Laferté-Sénectère, 1851
Oochlaenius Alluaud, 1933
Pachychlaenius Grundmann, 1955
Pachydinodes Kuntzen, 1919
Parachlaenites Jeannel, 1949
Paradinodes Apfelbeck, 1904
Paratrachelus Basilewsky, 1950
Pelasmomimus Grundmann, 1955
Pelasmus Motschoulsky, 1850
Platychlaenius Jeannel, 1949
Prochlaeniellus Basilewsky, 1965
Pseudanomoglossus Bell, 1960
Pseudochlaeniellus Jeannel, 1949

Randallius Bousquet, 2012
Rhizotrachelus Lacordaire, 1854
Rhysotrachelus Boheman, 1848
Rhyzotrachelus Chaudoir, 1876
Sericochlaenius Grundmann, 1955
Spilochlaenius Jeannel, 1949
Stenodinodes Kuntzen, 1919
Syntelestes Gistl, 1857
Terraleus Fairmaire, 1899
Tomochilus Laferté-Sénéctère, 1851
Trachychlaenites Kuntzen, 1919
Umtalius Péringuey, 1926
Wilmernstus Basilewsky, 1965

Subgenus, ***Amblygenius*** LaFerte-Senectere, 1851
Chlaenius* (*Amblygenius) dimidiatus Chaudoir, 1842
Synonym: *Chlaenius Palaestinus* Reiche & Saulcy, 1855
World distribution: Iraq (Derwesh, 1965); Argentina, Turkey, Egypt, Syria, India, Turkmenistan and Afghanistan (Löbl and Smetana, 2003); Iran and Palestine (GBIF Secretariat, 2021).

Subgenus**, *Trichochlaenius*** Seidlitz, 1887
Chlaenius* (*Trichochlaenius*) *aerates (Quensel, 1806)
Synonyms: *Aeratochlaenius aerates* (Quensel, 1806)
Carabus aerates Quensel, 1806
Chlaenius algerinus Gory, 1833
Chlaenius varvasi Laporte, 1834
Trichochlaenius aerates (Quensel, 1806)
World distribution: Iraq (Ali, 1966); France, Algeria and Tunisia (Ghannem *et al*., 2017).

Chlaenius* (*Trichochlaenius*) *virens Rambur, 1837
Synonyms: *Chlaenius coelestinus* Chaudoir, 1856
Trichochlaenius virens (Rambur, 1837)
World distribution: Iraq (Derwesh, 1965); Spain, Morocco (Löbl and Smetana, 2003).

Subgenus ***Pseudochlaeniellus*** Jeannel, 1949
Chlaenius* (*Pseudochlaeniellus*) *lucasii Peyron, 1858
Synonyms: *Chlaenius irakensis* Jedlicka, 1959
Chlaenius mesopotamicus (Mandl, 1979)
Pseudochlaeniellus mesopotamicus Mandl, 1979
World distribution: In Iraq Derwesh (1965) listed this species under the name *Chlaenius lucasii* Peyron, 1858; whereas Mandl (1979) reported it under the name of *Chlaenius mesopotamicus*; Turkey (Löbl and Smetana, 2003).

Subgenus, ***Epomis*** Bonelli, 1810
Chlaenius* (*Epomis*) *amarae Andrewes, 1920
Synonym: *Epomis amarae* (Andrewes, 1920)
World distribution: Iraq (Andrewes, 1927); Iran (Motevalli and Mehr, 2019), Afghanistan (Löbl and Smetana, 2003).

Chlaenius* (*Epomis*) *circumscriptus (Duftschmidt, 1812)
Synonyms: *Carabus circumscriptus* Duftschmidt, 1812
Chlaeniellus circumscriptus (Duftschmidt, 1812)
Chlaenius africanus Kuntzen, 1919
Chlaenius brevicollis (Chaudoir, 1843)
Chlaenius capensis (Gory, 1833)
Chlaenius cicatricosus (Motschulsky, 1865)
Chlaenius goryi (Gray, 1832)
Chlaenius pharaonis (Motschulsky, 1865)
Chlaenius turcmenicus (Motschulsky, 1865)
Epomis brevicollis Chaudoir, 1843
Epomis capensis Gory, 1833
Epomis cicatricosus Motschulsky, 1865
Epomis circumscriptus (Duftschmid, 1812)
Epomis goryi Gray, 1832
Epomis karelinii Mannerheim, 1844
Epomis pharaonis Motschulsky, 1865
Epomis senegalensis Gory, 1833
Epomis turcmenicus Motschulsky, 1865
World distribution: Iraq (Derwesh, 1965); Albania, Argentina, Italy, Bulgaria, France, Croatia, Kazakhstan, Portugal, Slovakia, Spain, Turkey, United Kingdom, Egypt, Thailand, Uzbekistan, Bahrain (Löbl and Smetana, 2003).

Chlaenius* (*Epomis*) *dejeanii Dejean, 1831
Synonyms: *Chlaenius armeniacus* (Motschulsky, 1865)
Epomis armeniacus Motschulsky, 1865
Epomis dejeanii Dejean, 1831
World distribution: Iraq (Ali, 1966); Germany, Hungary, Italy, Turkey, Ukraine, Syria (Löbl and Smetana, 2003); Russia (GBIF Secretariat, 2021).

Subgenus, ***Chlaeniostenodes*** Basilewsky, 1953
Chlaenius* (*Chlaeniostenodes*) *canariensis Dejean, 1831
Synonyms: *Chlaeniostenus canariensis* (Dejean, 1831)
Nectochlaenius canariensis (Dejean, 1831)
World distribution: Iraq (Ali, 1966); Spain (Telenius and Shah, 2016).

Subgenus, ***Stenochlaenius*** Reitter, 1908
Chlaenius* (*Stenochlaenius*) *coeruleus (Steven, 1809)

Synonyms: *Carabus coeruleus* Steven, 1809
Stenochlaenius coeruleus (Steven, 1809)
World distribution: Iraq (Sage, 1961); Argentina and Turkey (Löbl and Smetana, 2003); Armenia, Russia and Georgia (GBIF Secretariat, 2021).

Subgenus, ***Dinodes*** Bonelli, 1810
Chlaenius* (*Dinodes*) *decipiens (Dufour, 1820)
Synonyms: *Carabus azureus* Duftschmid, 1812
Chlaenius algericus Raffray, 1873
Chlaenius ambiguous Csiki, 1931
Chlaenius peyroni Gemminger & Harold, 1868
Chlaenius rotundicollis (Dejean, 1826)
Chlaenius schaumi Apfelbeck, 1904
Dinodes decipiens (L.Dufour, 1820)
Dinodes laticollis Chaudoir, 1843
Dinodes rotundicollis Dejean, 1826
Dinodes rufipes Dejean, 1826
Harpalus decipiens L.Dufour, 1820
World distribution: Iraq (Shalaby *et al*.,1966); Albania, Argentina, Bulgaria, Costa Rica, France, Germany, Hungary, Italy, Kazakhstan, Macedonia, Portugal, Romania, Slovakia, Spain, Turkey, United Kingdom, Morocco and Tunisia (Löbl and Smetana, 2003); Croatia, Ukraine, Russia, Nepal and India (GBIF Secretariat, 2021).

Chlaenius* (*Dinodes*) *viridis (Ménétriés, 1832)
Synonyms: *Chlaenius pallidecornis* Ballion, 1871
Dinodes viridis Ménétriés, 1832
World distribution: Iraq (Ali, 1966); Cyprus (Austin *et al.*, 2011).

Subgenus, ***Chlaenius*** Bonelli, 1810
Chlaenius* (*Chlaenius*) *festivus (Panzer, 1796)
Synonyms: *Carabus festivus* (Panzer, 1796)
Carabus zonatus Panzer, 1796
Chlaenius caspicus Motschulsky, 1850
Chlaenius fischeri Krynicki, 1829
Chlaenius imitatus Reitter, 1895
Chlaenius pseudocaspicus Gridelli, 1925
Chlaenius reitteri Jakobson, 1906
Chlaenius tecuciensis Marcu, 1932
Chlaenius tenuistriatus Krynicki, 1832
Chlaenius vexator Reitter, 1889
Chlaenius zonatus (Panzer, 1796)
World distribution: Iraq (Roubal,1932); Albania, Argentina, Azerbaijan, Bulgaria, Costa Rica, France, Italy, Hungary, Russia, Turkey, Egypt, Lebanon, Tunisia, India, Afghanistan, Syria, Uzbekistan and Iran (Löbl and Smetana, 2003); Austria, Greece,

Switzerland, Spain, Portugal, Israel, Afghanistan, Armenia and Algeria (GBIF Secretariat, 2021).

Chlaenius* (*Chlaenius*) *velutinus (Duftschmid, 1812)
Synonyms: *Carabus cinctus* Olivier, 1795
Carabus marginatus P. Rossi, 1790
Crabus velutinus Duftschmid, 1812
Chlaenius borgiae Dejean, 1826
Chlaenius carlogenei Klrschenhofer, 2017
Chlaenius faillae Ragusa, 1884
Chlaenius geniculatus Motschulsky, 1865
Chlaenius subvelutinus Fiori, 1913
World distribution: Iraq (Ali, 1966); Algeria, Morocco, Palestine, Tunisia, France, Spain, Italy and Austria (GBIF Secretariat, 2021).

Subgenus, ***Chlaeniellus*** Reitter, 1908
Chlaenius* (*Chlaeniellus*) *flavipes Ménétriés, 1832
Synonyms: *Chlaeniellus flavipes* (Ménétriés, 1832)
Chlaeniellus laetiusculus (Chaudoir, 1856)
Chlaeniellus rapyllii Morvan, 1975
Chlaenius asara Kirschenhofer, 2014
Chlaenius atupus Andrewes, 1923
Chlaenius confinis Motschulsky, 1865
Chlaenius exutus I.Frivaldszky von Frivald, 1845
Chlaenius flaviventris Mandl, 1989
Chlaenius kuluensis Bates, 1891
Chlaenius laetiusculus Chaudoir, 1856
Chlaenius rapyllii (Morvan, 1975)
World distribution: Iraq (Ali, 1966); Albania, Argentina, Bulgaria, Costa Rica, Germany, Greece, Hungary, Kazakhstan, Macedonia, Turkey, Ukraine, Afghanistan and India (Löbl and Smetana, 2003); Iran (GBIF Secretariat, 2021).

Chlaenius richardsi Ali, 1967
Synonyms: *Chlaeniellus richardsi* (Ali, 1967)
World distribution: Iraq (Ali, 1967).

Chlaenius syriacus Chaudoir, 1876
Synonyms: *Chlaeniellus koenigi* (Semenov, 1888)
Chlaeniellus syriacus (Chaudoir, 1876)
Chlaenius koenigi Semenov, 1888
World distribution: Iraq (Andrewes, 1927); India (Löbl and Smetana, 2003) .

Chlaenius vestitus (Paykull, 1790)
Synonyms: *Agostenus vestitus* (Paykull, 1790)

Carabus dubius Hoppe, 1796
Carabus marginatus Linnaeus, 1767
Carabus vestitus Paykull, 1790
Chlaeniellus vestitus (Paykull, 1790)
Chlaenius coerulescens J.Sahlberg, 1903
Chlaenius distinctus Chaudoir, 1856
Chlaenius oreteus Ragusa, 1881
Chlaenius viridipunctatus Bedel, 1879

World distribution: Iraq (Ali, 1966); Albania, Argentina, Australia, Bulgaria, Costa Rica, France, Germany, Greece, Hungary, Italy, Kazakhstan, Macedonia, Turkey, Spain and India (Löbl and Smetana, 2003); Croatia, Austria, UK, Serbia, Sweden, Switzerland and Russia (GBIF Secretariat, 2021).

Subgenus, ***Chlaenites*** Motschulsky, 1860
Chlaenius spoliatus (P. Rossi, 1792)
Synonyms: *Carabus spoliatus* P. Rossi, 1792
Chlaenites spoliatus (P. Rossi, 1792)

World distribution: Iraq (Andrewes,1927); Albania, Argentina, Bulgaria, Costa Rica, Croatia, France, Germany, Italy, Romania, Spain, Ukraine, Greece, Egypt, Lebanon, Morocco, Tunisia, Afghanistan, India, Syria, Uzbekistan and Kazakhstan (Löbl and Smetana,2003); Algeria, Austria, Russia, Hungary, Turkey, Iran, Japan, China, Korea and Switzerland (GBIF Secretariat, 2021).

Subgenus, ***Pseudochlaeniellus*** Jeannel, 1949
Chlaenius iraqkensis Jedlička, 1959
World distribution: Iraq (Jedlička, 1959)

Subgenus ***Paracallistoides*** Basilewsky, 1965
Chlaenius* (*Paracallistoides*) *ernesti Gory, 1833
Synonyms: *Chlaenius speciosus* Chaudoir, 1876
World distribution: Iraq (Koack and Kemal, 2010).

Subgenus, ***Pachydinodes*** Kuntzen, 1919
Chlaenius* (*Pachydinodes*) *hamifer Chaudoir, 1856
Synonyms: *Chlaenius bihamatus* Chaudoir, 1856
Chlaenius colombensis Jedlicha, 1964
Chlaenius queenslandicus Sloane, 1910
Dinodes bihamatus (Chaudoir, 1856)
Dinodes hamifer (Chaudoir, 1856)
Pachydinodes hamifer (Chaudoir, 1856)

Material examined: Baghdad Province, Ghazaliya, 1 ♀ 21.iii. 2021; Wasit Province, Al-Suwaira, 2 ♀♀ 15.v. 2021; Diyala Province, 2 ♂♂, 21.v.2021.

World distribution: Australia, Sri Lanka, India, Japan, China, Nepal, Pakistan, Korea and United Arab Emirates (Park and Park, 2013); Iran (Azadbakhsh *et al*., 2015); Chinese Taipei (GBIF Secretariat, 2021). Newly record in Iraq through this study.

Redescription of *C. hamifer*

Female: body bicolor, length 13.0- 13.5 mm and width 5.3- 5.7 mm (Pl. 1.A). Head and pronotum in dorsal view with strong reddish coppery lustre, Elytra green is covered with thick brown hair and erect, with two yellowish bends. Antennae, mandibles, palpi, labrum, and legs yellowish brown. Head elongated, and convex, dorsal side with punctures, eyes prominent (Pl. 2.A). Clypeus with one normal setae on each side, three basal segments of antenna glabrous and remainder with fine hairs (Pl.2.B); palpi cylindrical shaped.

Thorax is wider and longer than the head, pronotum green with strong reddish coppery reflection, slightly convex and with numerous deeply punctures that present denser at the base, also it contains broad and long fovea, the median line is pale, basal angle rounded. Legs: yellowish brown, tarsomeres normal. Hind trochanter elongates and extended, about half the length of the leg, claws are simple. Elytra: length 8.2 mm and width 3.0 mm, reaching to the tip of abdomen with regular intervals, the surface of elytra with small punctuate at the interval, striae with strongly and deeply punctuate, apices of elytra with distinct yellowish comma-like shaped fasciae or spot at interval 3 to 8, that present at apical 1/3 part of elytra (Pl.3.A) and reaching at the apex.

Abdomen with six visible sternites, last abdominal segment rounded third segment with thick hair at middle and rest with two setae (Pl.3.B). Female genitalia: Appendage of the 8^{th} and 9^{th} abdominal segments (Pl.4) basal gonocoxite 1 flat, broad and glabrous, gonocoxite 2 small and convex with a pointed tip and with three fringes setae, two of them on the outside and the other on the inside. Eight latero-tergite like triangle shaped, membranous and outer margin with row of hairs.

Male: descriptions of males are similar to females; with exception: three basal tarsomeres of protarsi much dilated, fifth tarsomeres with rows of ventral setae (Pl.1.B). Male genitalia (Aedeagus): Median lobe with sickle shape, apex twisted and very hooked on dorsal view, left paramere narrowed and right paramere rounded and wide (Pl.5).

Diagnostic characters: head and pronotum greenish color in dorsal, yellowish bend at apex of elytra and spot located at interval 3 to 8. This species is determined from the closely species by many features: it differ from *C. tetragonoderus* Chaudoir, 1876 by having spot connected to apex of elytra; on the other hand, this species differs from *C. virgulifer* Chaudoir, 1876 and *C. pictus* Chaudoir, 1856, by the body size, its length is under 13 mm, dorsal color with strong green or greenish glossy color.

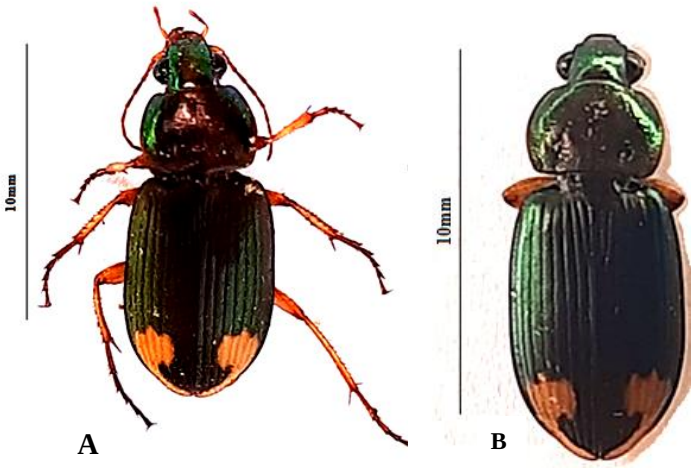

Plate (1): Dorsal view of *C. hamifer*; (A) Female, (B) Male.

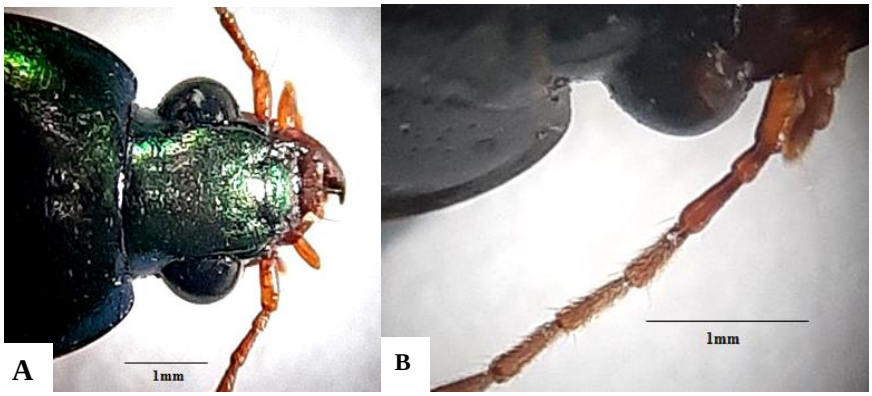

Plate (2): Female of *Ch. Hamifer*; (A) Head and prominent eyes, dorsal view, (B) glabrous three basal antennomer

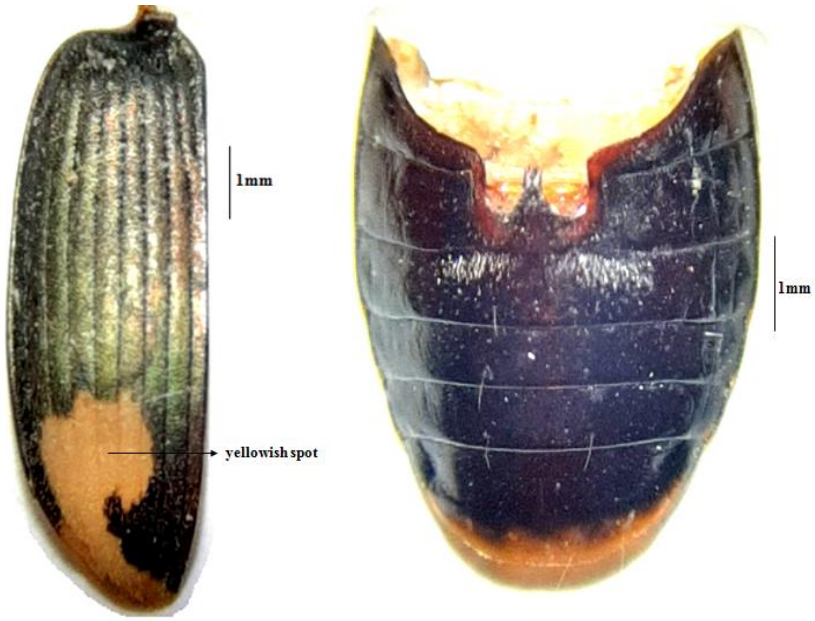

Plate (3): Female of *Ch. hamifer*; (A) Yellowish spot on elytra, (B) Abdomen (ventral view).

Plate (4): *Ch. hamifer*; ventral view of gonocoxites in female. (Gc1 gonocoxa1, Gc2 gonocoxa 2, Ltg lateral tergite)

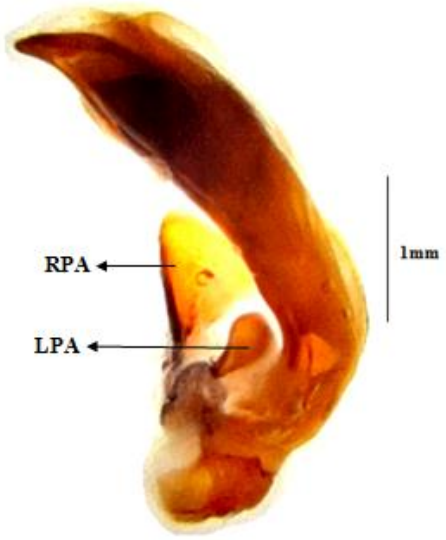

Plate (5): Aedeagus of *Ch. hamifer* (Dorsal view), right paramere (RPA), left paramere (LPA).

CONCLUSIONS

According to the database, references and checklists that related to this group, the genus *Chlaenius* is one of the most widespread genera in Iraq. Therefore, it is necessary to complete the investigation of its species in the different regions of Iraq, especially the desert areas in the western and southwestern Iraq to update the database of Carabidae. So we expect to add more species to the Iraqi fauna; from the other hand, it is expected that we find that the recorded numbers do not match those actually present in the field, which is may be due to various reasons, including misidentification and others related to the environmental changes, especially in the recent years, which is characterized by the climate of Iraq with a relative rise in temperature and lack of rain.

Chlaenius hamifer Chaudoir, 1856 is worldwide distribution, but it was not recorded in the north and south of Iraq. In the previous studies, we find that Ramzi (2014) recorded two species in the northern regions that included: *C. festivus* (Panzer, 1796) and *Ch.* (*Pseudochlaeniellus*) *lucasii* Peyron, 1858, while Al-Ibadi (2021) recorded 3 species: *C. festivus* (Panzer, 1796), *Ch. velutinus* (Duftschmid, 1812) and *Ch. nigricornis* (Fabricius, 1787) and neither of them recorded the species *Ch. hamifer* Chaudoir, 1856.

CONFLICT OF INTEREST STATMENT

The results of the present study are part of the requirements of Ph.D. in Insects, Department of Plant Protection, College of Agriculture Engineering Sciences-University of Baghdad for the first author. On the other hand, we are the authors of this article,

declare and confirm that no significant financial or other relationship with any official institution.

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مراجعة للجنس *Chlaenius* Bonelli , 1810 رتبة غمدية الاجنحة Coleoptera،عائلة الخنافس الارضية Carabidae، مع تسجيل نوع جديد من العراق

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الخلاصة

في هذا البحث تمت مراجعة الأنواع من جنس، 1810 *Chlaenius* Bonelli رتبة غمدية الاجنحة، عائلة الخنافس الارضية؛ اذ تم الكشف عن وجود 20 نوعًا مؤكدًا في العراق، من بينها سجل النوع *Chlaenius hamifer* Chaudoir, 1856، لأول مرة للمجموعة الحيوانية العراقية.

ذكرت الصفات التشخيصية مع وصف مظهري موجز مدعوماً بالصور التوضيحية للنوع الجديد في العراق.