



**RESEARCH ARTICLE - Biology**

**New record of species *Anaulacus Aephnidius ampliusculus* (Coleoptera: Carabidae: Masoreini ) in Iraq**

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| Article Info.  | Abstract   |
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| Article history:<br>Received<br>09 December 2023<br><br>Accepted<br>07 February 2023<br><br>Publishing<br>30 June 2024   | A new record of species <i>Anaulacus Aephnidius ampliusculus</i> in Iraq which belong to family Carabidae in order Coleoptera when study the diversity of insects in Canaan forests in Diyala governorate. With highest density recorded in May and September. |
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**1. Introduction**

The genus *Anaulacus* MacLeay, 1825, was classified as a genus belonging to the tribe Masoreini in the eastern hemisphere in the ancient world, as a result of the difference in the lower jaw. It was divided into three genera: *Masoreus* Dejean 1812, *Leuropus* Andrewes 1947, and *Atlantomasoreus* Mateu, 1984.

*Anaulacus* includes several subgenres *Aephnidius* W. S. MacLeay, 1825, *Caphora* Schmidt-Göbel, 1846, *Microus* Chaudoir, 1876, *Macracanthus* Chaudoir, 1846, *Ophryognathus* Chaudoir, 1876, and *Odontomasoreus* Darlington, 1968, the sub genres *Aephnidius* includes three species are *piceolus*, *exiguus*, and *ampliusculus*, the last one includes four subspecies: *A. ampliusculus*, *A. bonariensis*, *A. ciliatus*, and *A. humeralis*, (Ball and Shpeley, 2002).

The genus *Anaulacus* within this tribe as a result of adaptations Living in desert areas that live in sandy soils with soft moving sand dunes. One of these adaptations is the long appendages at the end of metatibia and meso. They have been called long-hoofed Lebiomorphs, referring to the bumps or appendages in the adults of these taxa, which differ from other types of ground beetles (Mateu, 1984). The sub-genera *Aephnidius*, *Anaulacus* through molecular analysis they are related with each other, and there is a systematic relationship between the genera *Anaulacus* (*Masoreus* + *Atlantomasoreus*), (Assmann *et al*, 2015) Most species live in a variety of habitats, from evergreen tropical forests, some live in subtropical forests, to dry and open areas.

**2. Material and methods**

**2.1 Study area:**

The study area is located in Diyala Governorate, east of Baghdad, in the Canaan sub-district, which belongs to Baqubah district in Iraq. It is owned by the Ministry of Agriculture / Forestry and Desertification Control Department / Diyala Forest Project / Canaan Forest Site, is located between longitudes 44.83472E and 44.

8875E east of the Greenwich meridian and latitudes 33.60555 N and 33.658333N north of the equator, with an average height above sea level of about 41M, and it is a forest area planted with different types of trees, in addition to a group of short grasses and annual.

## 2.2 Sampling

The species were caught by ground traps (falling traps) and preserved with alcohol at a concentration of 70% and deposited in the Museum of Natural History / University of Baghdad. The samples were diagnosed and classified using taxonomic keys according to the phenotypic characteristics of the samples using a dissecting microscope of the type (Holland Novex). As for the soil samples, it collected at a depth of (5) cm, according to what was stated in (Labaune, and Magnin , 2001) to study the chemical and physical properties of soil.

## 3. Result and Discussion

### 3.1. Classification

Tribe: *Masoreini* Chaudoir, 1870

Genues : *Anaulacus* MacLeay, 1825

Sub genres : *Aephnidius* MacLeay, 1825

Species: *Amplusculus* Chaudoir, 1876. ( Shpeley and Ball, 2000).

### 3.2. Characteristic

s *Anaulacu (Aephnidius) amplusculus* (Fig.1)The first specimen collected by Bates in the state of Pará in Brazil in 1876 and described by Chaudoir 1876, the elytra is dilated, the body size is large, about 6-10 mm, the color of the dorsal surface of the head and the elytra is defined by one color, black, dark, dark, dull or glossy Intermittent, the lines of the elytra are elongated and a slightly reticulated pattern (Ball and Shpeley ,2002) the distance between the lines is narrow, the stalk, the edge of the elytra, the anterior thorax, the antennae and the legs, the maxillary texture is reddish to dark brown, the male genital organ is elongated with warping before the base of its end, and the basal region is slightly narrower than The middle region, the shin contains a spur in the middle and end of the leg, and the edge of the leg is smooth, not serrated, the lower jaw has a lateral edge extending to the back, and the elytra from the top contains a medial longitudinal slit from the beginning of the elytra, and it also contains four long and prominent lateral hairs tilted towards red, and the bases of the hind legs contain bulges on both sides (Ball and Shpeley ,2002), (Assmann *et al* , 2015).



Fig.1 *Anaulacus amplusculus*. dorsal view and ventral view

It is distribution in areas far from the population, open areas, in sandy coastal areas, in disturbed tropical areas. It lives symbiotically in the nests of leaf-cutter ants, in open sandy areas, and in fallen leaves. It is widespread in the countries of South America, Panama, Honduras, Guatemala, Mexico, Costa Rica, El Salvador, and the West Indies. This species is considered It is a neotropical species. It is also widespread in the regions of the Middle East, Palestine, Lebanon, Jordan, and Syria (Assmann *et al* , 2015). It prefers humid and non-humid habitats, which are abundant near Tamarix trees, fresh and brackish water, and well water, also near gardens and parks. It has a high dispersal power because it has large, good wings. The formation has the ability to fly long distances and a fast running force. It is nocturnal and is attracted to light. It is active in January, February, and May until August (Mateu, 1984), (Assmann *et al* , 2015), and (Ball and Shpeley ,2002).

In this study the highest density were recorded in March, April, and May which considered the spring months( fig.2) also increase in autumn months (September, and October) due to raise the activity of individuals. the values of density begin to decline in the summer months with weak vegetation cover in June, July, and August. that increase in their density and activity during the rainy seasons because rain leads to an increase in vegetation cover and its diversity because It is a herbivore that feeds on grasses, and because our study stations are hot in summer months, and as a result of drought and high temperatures, the vegetation area disappeared , that prompts *Anaulacus ampliulusculus* to disperse and spread to Neighboring agricultural fields planted with various agricultural crops due to their ability to do so because they have well-formed wings as all Carabidae and some of them have the ability to walk distances to obtain food (Lövei, G.L. and Magura, T., 2022) . It was found with in a temperature that ranged between (7.9 -37.1) °C, while the pH values were neutral and weak alkaline ranged between (7.0-8.7), the salinity ranged between (0.1 -8.73‰), The percentage of soil moisture ranged between (1.4 - 20.64)%, while the organic matter ranged between (1.6 - 8.2%), and the calcium content ranged between (5.2 -12.2) mg / kg, the soil was classified as a loam soil .

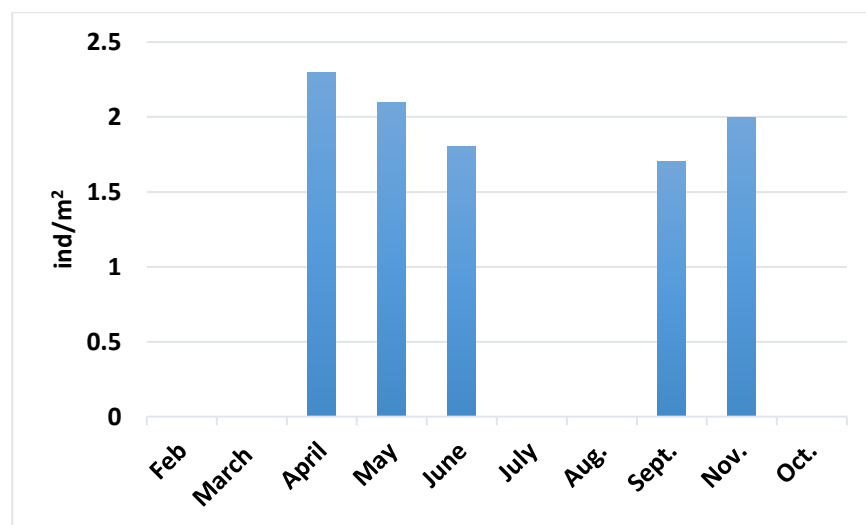


Figure 2. Density *Anaulacus ampliulusculus* (ind/ m<sup>2</sup>) in study site through the study months'

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