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RECORD A NEW SPECIES OF GROUND BEETLES: ORDER: COLEOPTRA: FAMILY: CARABIDAE: SUBFAMILY: CICINDELINAE: *CYLINDERA DESCENDENS* (FISCHER, 1825): FOR THE FIRST TIME IN IRAQ

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Abstract

This study was conducted on a family Carabidae For the period from 1/12/2018 to 30/11/2019 In the province of Maysan, the research included a diagnostic and environmental study of the species *Cylindera descendens* (Fischer, 1825), which it depends on the classification of species, genera and families of ground beetles on the study of adult insects. The results showed registration of the type mentioned above for the first time in Iraq in the province of Maysan (Qal'at Salih area), it recorded the highest numerical density of adult insects in May and June. The most important diagnostic character of adult insects: Medium sized insects; labrum having one middle tooth, 8 submerginal setae; mandilbles large; pronotum convex in sides; humeral lunule spot is Small, middle band separate and spacious, apical lunule crescent.

Key words: Coleoptera, Carabidae, *Cylindera descendens*, Maysan, Iraq.

Introduction

Considered the order of Coleoptera one of the largest orders known for its many types it contains approximately 360,000 described species (Bouchard *et al*., 2009). The morphological diversity of beetles led to the spread of their species, outperforming the various orders, most families of this order are universal (Arnett, R.H. and Thomas, M.C., 2000). It accounts for 40% of all known insects in the world (Hangay and Zborowski, 2010). Ground beetles of the Carabidae family of the predatory insect groups that have studied in most countries of the world, it consists of more than 40,000 species spread over 1927 genera around the world, she lives in lands various and on almost all continents, most are nocturnal, but some are diurnal, most of them cannot fly (Larochelle and Lariviere, 2007). The subfamily Cicindelinae of Carabidae consists of approximately 2,600 species, they are predatory and widely distributed, except for the polar regions (Cassola and Pear-son 2000; Pearson and Vogler 2001). Most prefer different sandy habitats where both larvae and adult beetles live (Pearson & Cassola, 2005), both as adults and larvae are predators that prey on various small invertebrates, they can be used to control pests that cause economic damage (Rodriquez *et al*., 1988).

Among them, *Cylindera* Westwood, 1831 is a diverse genus and widely distributed throughout the world (Pearson and Cassola 2005).

Genera *Cylindera* is distributed in tropical, semi-tropical and temperate regions, especially in the regions of East Asia, it includes 147 species from the Old World and 44 species from, in the Old World it is found in Africa, Madagascar, Eurasia, and Asia, with the most species-rich areas being South and South-east Asia)Yonekura *et al*., 2001).

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Materials and Methods

Sample collection

Ground traps were used type of Plastic pitfall it is one of the most common methods for collecting ground beetles samples (Skvarl *et al*., 2014; Lovei and sunderland, 1996), they are glass-like transparent plastic containers diameter 15cm and height 15cm perforation from the sides in the upper area of the container for the purpose of

insects entering it, cover from the top with a plastic cover to protect it from rain and other animals, such as mice, traps are placed in pits in the ground so that the side holes are at ground level, and fill up to 40% of them with a solution of ethyl alcohol 70% with a few drops of odorless cleaning fluid to break the surface tension and some drops of glycerin, three alternate lines work each line containing three traps, the distance between the trap and the other 10 meters and the distance between one line and another is 10 meters, It is distributed in three locations in the region, the distance between one location and another is 100 meters, the numbers of full insects are collected in the traps every two weeks, and it takes the monthly rate (Karem and Fadl, 2010).

Internal dissection and making microscopic slides

After transferring samples to the laboratory and preserved with 70% alcohol wash with distilled water, then transferred to a 100 ml beaker Contains 10% sodium hydroxide she left for 15 days or placed in sodium hydroxide 15% Leave it for 10 days at room temperature or according to the type of sample then I washed the samples with distilled water several times (Gebara, 1986); (Khudair, 2014). Then, passed up the ethyl alcohol ascending (60%, 70%, 80% and 90%) for 15 minutes per dilution. Then it was placed in a Petri dish containing 90% alcohol until it was dissected, the insect can be dissected before placing it with sodium hydroxide by placing it in a Petri dish after placing a filter paper in the dish it helps to insure the insect in the dish and not to slip, after slicing the parts with a fine needle, put them in sodium hydroxide.

The glass slides were made for transparent and delicate parts after dissection of the insect kept in 70% ethyl alcohol under the dissection microscope using a very fine needle (insulin syringe) by cutting the head , separating the parts of the mouth, antennae, pronotum and the rest of the body transferred from dish to filter paper for the purpose of alleviating ethyl alcohol and passed over the xylol then put it on a glass slide containing the Canada Balsam then put the slide cover on it, after making sure that the form is placed in the form it is intended for the purpose of the study next, put the glass slides in a heat oven under 60°C for 24 hours.

The large parts that cannot be covered with the slide cover are installed on the glass slides as required for the purpose of inspection and drawing by a quick-dry, transparent nail polish (Shaaban, 2018). Used the Lucida camera, which is installed on the optical microscope to draw transparent and small, Lucida's camera was mounted on a dissecting microscope to draw large portions. Full insect lengths were measured and lengths of the parts of ImageJ program, the unit Mm of measurement of the body and its parts is adopted. The insect and its parts were photographed by the Canon 40-pixel camera.

Results

Description of genera: The size is small to medium, the body is elongated narrow, glabrous dorsally; legs are long; proepisternum glabrous; eyes not prominent; the Elytra holds spots on the side margin, sometimes it is reduced to small points or completely absent; adults in some species do not fly actively.

Description of species:

Body: Medium size, gray similar to the color of the earth with a metallic luster, the head and the pronotum are copper- green, its average length is 10.699 mm. Picture 1 A-B.

Head: Fig. 1 Picture 2 the head is small compared to the body of the insect, length 2.950 mm, width 2.519 mm ; the eyes are swollen and visible from above; clypeo labral suture clear; vertex and front crispy; gena smooth; clypus gray-green with no setae; antennae implanted just below the eyes on the front, length 5.576 mm, the first piece is swollen, the second is small in size, the third is the longest ring, and the fourth is elongated, shorter than the third, the remaining pieces are equal in size, pieces 1-4 are magenta and 5-11 are black and pubescent.

Mouth parts: Labrum is visible from the front, short, length 0.686 mm, width 1.227 mm, having one medial tooth, yellow, with 8 submerginal setae, Fig. 2-A; the mandibles Fig. 2-B are large, strong and a sickle-like, each mandible has three teeth, pointed from the front, base is yellow and the foreground is black, teeth are pointed and sharp, right mandible length 1.860 mm, left mandible length 1.890 mm; maxillae palpi have four pieces, the first piece is small, the second piece is the largest piece in size, is light in color and holds a number of hairs, last piece is black spindle, penultimate piece is smaller than the last black, length 1.368 mm; labial palp consists of three pieces, end piece is black from the tip, penultimate piece is long, yellow, with a number of hairs, length 1.637 mm; the first piece of galea is black and the second is yellow; lacinia is black.

Thorax: pronotum Picture 2-B, length 1.835 mm, wide 2.135 mm, convex sides, copper-gray, white hairs on the sides, middle line runs along its length, Fig, 3-A; scutellum is visible with a copper-black triangle, instill between the elytra bases, length 0.108 mm, width 0.178

mm, Fig. 3-D; from the ventral side: Prosternum black and a little blue in the middle, no setae on the sides (Proepisternum), there are setae on the procoxal cavity, Fig. 3-B-C; mesosternum and metasternium black, mesepisternum and metepisternum black.

Legs: Long and slender; trochanter reddish; femur is dark copper except for the distal end, on her white hair; tibia is reddish except for the distal dark end, it has a number of setae and two apical spurs; the five tarsus pieces are long and slender and each piece contains white setae, last piece ends with a pair of claws, front leg length is 8.712 mm, the length of the middle leg is 8.999 mm, the length of the hind leg is 12.986 mm.

Elytra: Picture 2-C Fig. 4-A: Long boat shape, black - pale green, length 6.974 mm, width 1.883 mm; humeral lunule is small; middle band is in the middle separate and wide; broad apical lunule at the top, crescent; there is a density of granular (dimple-like) tubers in blue and green all over the surface. Picture 2-D.

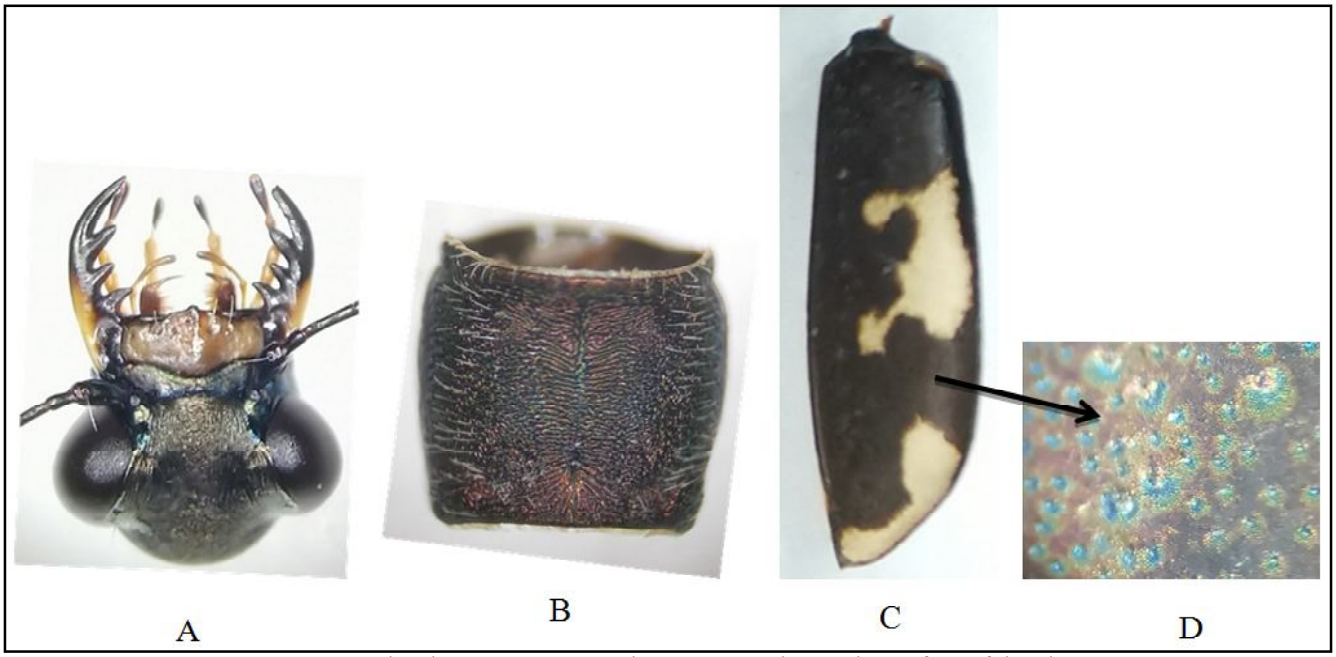
Picture 1: A- the dorsal surface of adult insect B- the ventral surface of adult insect.

Abdomen: Glossy black color; there are no setae on the sides except for sensual setae; ambulatory pairs of setiferous punctures on sterna 4-6; last sternum often with a single pair of ambulatory setae in the male and two pairs in the female.

Male genitalia: Male copulatory organ consisting of the aedeagus, swollen from the middle, tight from the back end, tapered from the front end; parameres (lateral lobes) fixed laterally and basally to the aedeagus, long and thin; average length aedeagus 3.490 mm. Fig. 4-B.

Environmental study:

Numerical density of the species *cylindera descendens*: The results of the study showed the presence of the *cylindera descendens* during two months of the year, the months of May and June, in the Qal'at Salih area / Maysan Governorate, which is characterized by the area studied abundantly natural herbs for being uncultivated for almost two years and located near pools filled with water, which provides suitable conditions for insects from high humidity and provides prey from arthropods and other insects, the results indicate that the highest numerical density of adult insects was during the months of May, when it reached 6 adult insects / trap and the insect activity decreased or disappeared during the hot summer months and cold winter months. Fig. 5.



Picture 2: A- head B- pronotum C- elytra D- granules on the surface of the elytra.

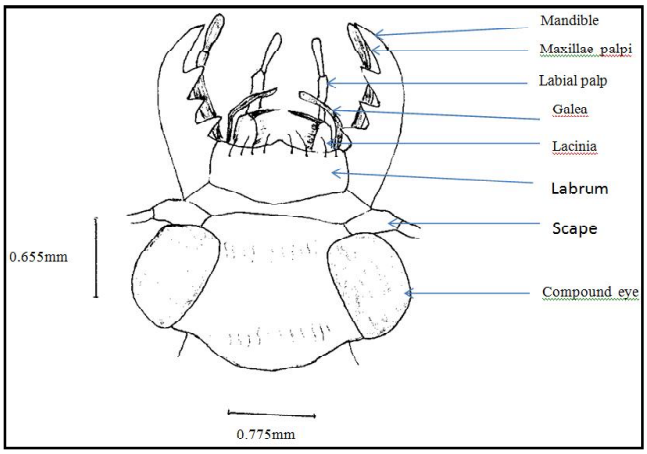


Fig. 1: the dorsal surface of the head.

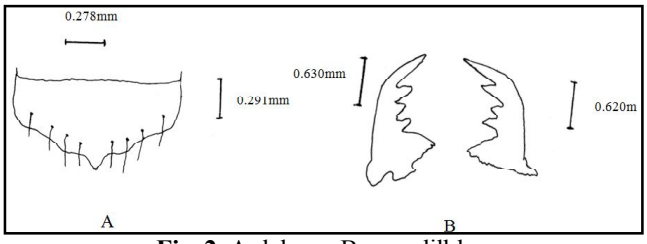


Fig. 2: A- labrum B- mandilbles.

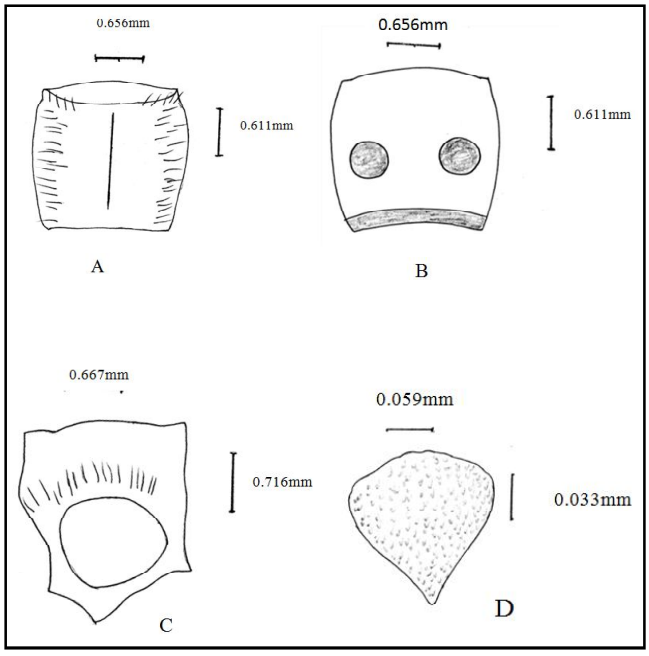


Fig. 3: A- The dorsal surface of pronotum. B- The ventral surface of pronotum C- The lateral surface of pronotum D- Scutellum.

Discussion

Taxonomic study: L. Krishtalka and J.L. Carter (1989) mention, the diagnostic traits of adult insects, body is small to medium, head and pronotum are coppery to green, labrum stumpy with one medial tooth, 6-8 submarginal setae, elytra consists of a small humeral lunule spot, a separate middle band spot, broad apical lunule spot. Antennae: 1-4 purple metallic, 5-11 blackish,

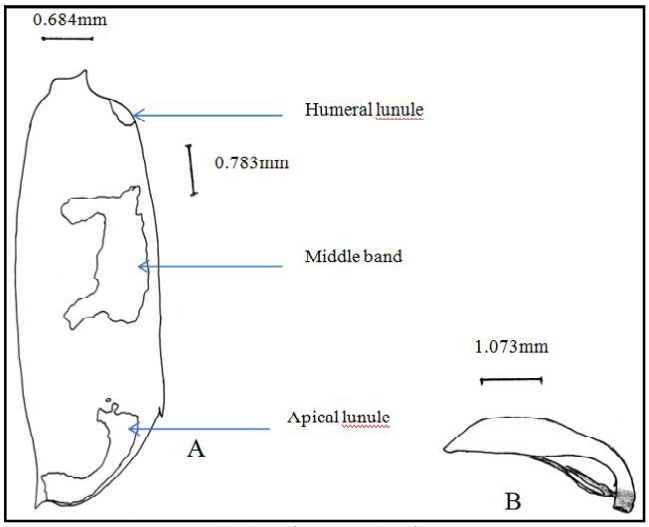
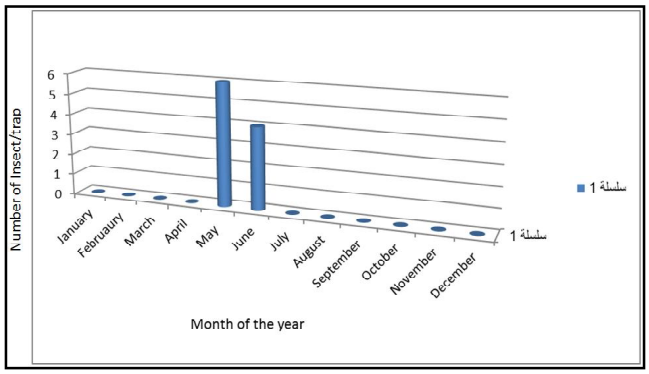


Fig. 4: A- Elytra B- Aedeagus.



L.S.d. 0.26 (5% level)

Fig. 5: The numerical density of *Cylindera descendens* adults during a year in the Qal'at Salih area.

elytra widened towards the summit (R. Naviaux, 2011).

Environmental study: Fig. 5 shows that the insect is active during the spring months and that the highest density rates are in March, L. Krishtalka and J.L. Carter (1989) explained Adult insects are active in open grassland and wet soils during May to August. The presence of water ponds in the studied area provides suitable conditions for the insect, it also provides a suitable environment for spawning and larval growth. Where most of the tiger beetles live on the edges of rivers (Ganeshaiah and Belavadi 1986; Brust *et al*., 2005; Cardoso and Vogler 2005) and sandy beaches (Vogler and DeSalle 1993; Satoh *et al*., 2004) and salty marshes (Diogo *et al*., 1999; Hoback *et al*., 2000) soil moisture provides a suitable place for spawning and larval growth larvae may die from losing soil moisture because they are unable to dig holes (Hoback *et al*., 2000).

Conclusion

The Iraqi environment is abundant with Carabidae species, and this species is one of the few species in the world, which have a great role in the natural balance, as

they are non-specialized predators of many insect pests.

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