A first record of seven species of terrestrial isopoda-crustacea in central Iraq

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Abstract. This study is the first kind of it in Iraq. The samples were collected from April to January 2018, we recorded seven species for the first time in Iraq (Procellio laevis, P. cingendus, Lacasius pallidus, Armadillidium album, A. assimile, Orthodillo chiltoni, Cylisticus convexus). These species belong to four families (Procellionidae, Armadillidae, Armadillidae, Cylistieidae). The samples were saved in the natural history museum in Baghdad-Iraq.

Keywords. Isopoda, Porcellionidae, Armadillidae, Armadillidae, Cylistieidae.

1. Introduction

There are about 3000 species recorded of terrestrial isopoda belong to 18 families in the world [1]. The isopoda vary in size, it ranges from 0.3-50 cm [2], at the end of its body there is a telson which varies in size and form between species. In addition there are the uropods which used to distinguish between types, and an essential characteristics of classification of them are long and concise such Porcellides, other are short, truncated or similar of hounglass like Armadillidium [3]. The color of the isopoda varies from white to grey [4], some are red, green or brown, depending on the type of feeding [5]. It's study is important because of its role in the food chain in stimulating the soil [6].

2. Materials and Methods

Central Iraq has been identified for this study, it included specific areas that were distinguished by their geographical nature, as they varied between agricultural, gardens and residential areas (Figure 1). 560 samples were collected for the period (April to January 2018) from various places on the surface of the soil and under it to a depth of 6 cm and between trees, weeds, dead decomposing plants, fresh fruits and cracks of buildings randomly. The samples were collected manually, then isolated and then stored in 70% ethanol [7] in the laboratory. The samples were identified by using a dissecting microscope 1x and 2x . A phone camera Galaxy note 5 was using to photographed., Identification of isopods species were done on the basis of their morphological characters by using taxonomic keys available in the local and regional publications [8, 9, 10, 11, 12, 13].
3. Results and Discussion

This samples were diagnosed using some distinct parts of the isopods body, included the difference in the thoracic region and distribution of the ocelli, the frontal lobes of the head, the shape of the endo and exopod and the difference of the telson. The recorded species were distinguished in lengths from 4 to 17 mm. Seven species of four families were diagnosed which were:

3.1. Family: Procellionidae (Brandl, 1831)

The outline of its body in cross section not strongly arched, then the flagella of antennae two sections, we found three species as first record in Iraq which were:

3.1.1. Procellio laevis (Latreille, 1804).

Its mean length was 17 mm and dark grey with brown spots in color (Figure 2-a), cephalothorax with three lobs, black eyes with 18 ocelli. The dorsal surface is smooth and the posterior edge of the pereonite is convex (Figure 2-b). The edge of pereon straight with poleon, the exopod was spear-shaped (Figure 2-c (A, B)), this compatible with [14, 15].

3.1.2. Procellionides cingendus (Kinahan, 1857).

Its mean length was 7 mm, reddish brown with yellow spots in color (Figure 3-a), cephalothorax was small and not convex, large eyes with 32 ocelli and without lobes (Figure 3-b). The edge of pereon narrower than edge of pereon, exopod is long and thin and the uropod was small not tapered (Plat2-c). it was observed that this diagnosis is appropriate with [16].

3.1.3. Lucasius pallidus(Budde-Lund, 1885).

Its mean length was 8 mm, it's color is bright orange with white short tentacle (Figure 4-a). The cephalothorax is small in size without lobes and triangular, small black eyes (Figure 4-b). The endopod and exopod are small white the telson was distinguished by its wide and triangular basal (Figure 4-c (A, B)). The results of this study were consistent with the diagnostic samples in Australia [17].
Figure 2. *Procellio laevis* (a-The mean length, b-The cephalothorax, c-A-Dorsal view of the uropod and telson, c-B-Ventral view of uropod and telson).

Figure 3. *Procellionides cingendus* (a-The mean length (mm), b-The cephalothorax, c-The plecan and pereon not straited, the uropod and telson).
3.2. Family: Armadillididae (Brandt, 1833).

It control itself into a ball, we found two species as a new record in Iraq it was:

3.2.1. Aramadillidium album (Dollfus, 1887).

It is pale sand with yellow spots in color, the mean length was 4 mm, with small spines on the dorsal surface and it roll into a not completely ball (Plate 5-a (A, B)). The cephalothorax was small not lobed with small eyes consisting 9 ocilli (Plate 5-b). The exopod was truncated and the endopod was very small than telson is flat and curved (Plate 5-c (A, B)). So [18] has demonstrated the same characteristics to the species.

3.2.2. Aramadillidium assimile (Budde-Lund, 1885).

It's mean length 6 mm, brown in color with yellow anterior region (Plate 6-a). small oval cephalothorax with small eyes consisting 12 ocilli (Plate 6-b) its fifth pleon with keel, and the edge pleon narrower than pereon (Plate 6-c). The exopod was wide, the endopod was small narrow and the telson was wide triangular (Plate 6-d). It was noted that this study was similar to other studies in U.K [19].

![Figure 4. Lucusius pallidus (a-The mean length (mm), b-The cephalothorax, c-A-A dorsal view of the uropod and telson, c-B- A ventral view of uropod and telson).](image-url)
Figure 5. *Armadillidium album* (a-A, B- The total length, b- The cephalothorax, c-A, B- the dorsal and ventral view of uropod and telson).
3.3. Family: Armadillidae (Brandt, 1831).

This family is distinguished by its rough surface, the uropods was small and the telson hour-glass shaped [20], there was one species as a first record in Iraq which was:

3.3.1. Orthodillo chiltoni (Vandel, 1973).

It's mean length was 15 mm, dark grey in color (Plate 7-a), the cephalothorax was small with black eyes consisting 10 ocelli (Plate 7-b), the exopod was square shape and the endopod was small and cylindrical than the telson quad-angle and it's holy edge was hour-glass shaped (Plate 7-c (A, B)). This results came compatible with the results of [21].

Figure 6. Armadillidium assimile (a-the mean length, b-The cephaloothorax, c: lateral view showing the keel, d-the uropod and telson).

Figure 7. Orthodillo chiltoni (a-The mean length, b-The cephalothorax, c-A, B: The dorsal and ventral vieiw of uropod and telson).
3.4. Family: Cylisticidae (Verthaff, 1949).

This family has distinguished by its curry surface, we found one species as a first record in Iraq which was:

3.4.1. Cylisticus convexus (DeGeer, 1778).

It's mean length was 17 mm, and dark brown in color (Plate 8-a), the cephalothorax with three lobs, dark grey eyes with 22 ocelli a,d long antenna (Plate 8-b). The edge of peleon very narrower than the edge of pereon (Plate 8-c). The exopod was large and long while the endopod was small and the telson was square in shape (Plate 8-d). This study is similar with [22].

Figure 8. Cylisticus convexus (a-The mean length, b-The cephalothorax, c-The pereon and peleon, d-Dorsal view of uropod and telson).

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