

# Taxonomic Study of some Isopoda in Najaf, Iraq

Aliaa H. Mizhir

Department of Ecology and Pollution, Faculty of Science, University of Kufa, Iraq

(Received 14 August, 2021; Accepted 19 September, 2021)

## ABSTRACT

304 individual of isopods were collected for the period from June 2019 to September 2019 from different areas of Najaf Governorate. The results showed recording of three species of Isopoda: *Porcellio Leavis*, *Porcellio scaber* and *Porcellio spinicornis* for the first time in Najaf. The highest percentage of appearance of *Porcellio Leavis* was (40.8%), while the lowest percentage of *P. spinicornis* was (22.7%), due to the high temperature in the summer in which the samples were collected, as well as the different environments for collecting samples in terms of organic matter available in the soil.

*Key words* : Isopoda, Najaf, Iraq

## Introduction

Isopoda is one of the largest groups belonging to the subphyla Crustacea, to the class Malacostraca, the subclass Eumalacostraca and to the higher order Peracarida, of which about (2450) species have been diagnosed, most of which inhabit the coastal and freshwater environment, while some live in various terrestrial environments. With nearly (500) species, these species are distributed in ten sub-orders, the most prominent of which is the order Oniscidea, known as Terrestrial isopoda or woodlice, and it includes (17) families, the most important of which are the families Armadillidae and Procellionidae, as the second includes species belonging to the genus *Porcellio*, known as Sow bugs (Martin and Davis, 2005; Al-Moussawi, 2009; Al-Salman, 2012).

Among most important taxonomic characteristics of Isopods is the fusion of the first surface segment (and rarely the second) with the head, dorsal ventral compression, absence of carapace, sessile compound eyes. Monophyte and Antennae have atrophic Exopodite, and there are pairs of Maxillipedes and Thoracic appendages that are largely identical without clear differentiation, unlike Amphipoda which

have a functional specialization for their different legs. Abdominal appendages are plate-shaped and thin, stacked on top of each other in the form of book pages. The last abdominal segment fuses with the telson. In males, the first and second ventral appendages mutate into gonads. Males are usually larger than females. The wild isopod individuals are characterized by the presence of a marsupium brood pocket to protect the young, consisting of broad plates on the isopodite of some thoracic appendages, and protruding towards the inner face of a table above each other, forming the floor of the brooding pocket, while the sternum pectoral plates are the roof of this pocket (Carina *et al.*, 2011).

Several taxonomic and ecological studies have been conducted on wild isopods in the Arab countries, including Zeini (2019) which collected samples of wild isopod crustaceans randomly from different regions of Lattakia. The results of his taxonomic study showed the registration of (6 types) of crustaceans, (5) of which were recorded for the first time in Syria, namely, *Armadillium vulgare*; *Armadillo officinalis*; *Porcellio laevis*; *Porcellio scaber*; *pruinosis procelliondes* and the last species already recorded is *Ligia italic*. These species were described phenotypi-

cally and their existence was linked with the most important environmental factors that affect their distribution, such as temperature and humidity.

In Iraq, some studies were conducted on the wild isopod crustaceans, including the study of Al-Amin (2011) in which the genus *Porcellio* as a vital guide to measure the level of contamination of some heavy metals in the city of Baghdad, as the study included collecting samples from four areas in Baghdad: Al-Jadriya, Al-Sadr City, Al-Dora and Al-Ghazaliya. The results showed that the highest levels of lead and cobalt contamination were in Al-Ghazaliya. This increase was attributed to the traffic momentum and the increase in the number of cars that still use the addition of tetraethyl lead, which causes problems to the environment and poses a threat to human health, in addition to the increase in human waste and the lack of vegetation cover that is important in reducing the damage of heavy elements to the environment. Due to the lack of studies on wild crustaceans widespread in Najaf Governorate, the current study came with the aim of shedding light on the species of wild isopoda crustaceans for the purpose of benefiting from them in laboratory, environmental and subsequent studies.

## Materials and Methods

Collecting samples of wild Isopoda requires knowledge of its environment, as it abounds in wet areas, under stones, among rotten leaves and bark, and in soils rich in humic materials. The samples were collected during the period extending from June 2019 to September 2019 by placing plastic containers in pits at ground level in the home gardens of different areas of Najaf Governorate, including (Al-Naft neighborhood, Al-Wafa neighborhood, Al-Amir neighborhood, Abbasiya district, Al-Hurriya district). The samples were preserved in the field using 75% alcohol, plus drops of formalin 4%, in plastic containers with the place, date and temperature of the samples collected. The taxonomic keys were adopted (Taiti and Ferrara, 1996; Franck and Emmanuel, 2007; Shultz, 2018).

The following classifications have been adopted for the purpose of classifying the species:

- Body color, is it brown or black. Are there decorations...etc.
- Head shape and vertical lobes.
- Are the dorsal and ventral plates smooth or rough?

- Is there a shield (protrusion) triangular in shape on the side of head?

## Results and Discussion

During the period from June 2019 to September 2019 (304) individuals of wild Isopoda crustaceans were collected from home gardens as shown in Table 1. As a result of the examination, three types of terrestrial crustaceans isopoda were found, as Table 2 shows the taxonomic position of these crustaceans.

**Table 1.** Number and percentage of appearance of similar-footed species collected from different areas of Najaf Governorate.

Similar-footed species	No. of Species	Appearance %
<i>Porcellio leavis</i>	124	%40.8
<i>Porcellio scaber</i>	111	%36.5
<i>Porcellio spinicornis</i>	69	%22.7
Total	304	

**Table 2.** The taxonomic position of the homozygous feet recorded in the current study

Kingdom: Animalia
Phylum: Arthropoda
Class: Crustacea
Order: Isopoda
Family: Porcellionidae
Genus: <i>Porcellio</i>
Species: <i>Scaber</i> (Laterlile,1804)
Species: <i>leavis</i> (Laterlile,1804)
Species: <i>spinicornis</i> say, 1818

### *Porcellio leavis* (Laterlile, 1804)

Figure No. 1 shows the body is oval in shape, wide from the front and narrowing towards the back and it is difficult to distinguish between the chest area and the abdominal area (there is no reduction between the thoracic pieces and the abdominal pieces). The dorsal surface is smooth without any protrusions. The body color is brown and the eyes are black. The lateral lobes of the head are visible, while the frontal lobe is not prominent, and the posterior edge is not. The posterior edge of the first pectoral piece is slightly concave. The type is rare. The general description agrees with Zeini (2019) but it differs from it in terms of abundance, as the results showed that the percentage of appearance of this

species is (40.8%), which is higher than the rest of the species recorded in the current study.



Fig. 1. The external appearance of the type *Porcellio leavis*

#### *Porcellio scaber* (Laterille, 1804)

Figure 2 shows that the body is oval, wide from the front, narrowing towards the back, and it is difficult to distinguish between the chest and abdomen (the waist is not present). The color is reddish brown or gray. The head with three lobes frontal lobe is triangular in shape. The antenna flagella consist of only two pieces. The surface of the body is rough due to the presence of a large number of tubercles. There are two pairs of clear lungs in living individuals, and difficult to see in individuals preserved in alcohol 70%. The external legs of the caudal leg are clearly visible behind the end of the abdomen and are more linear with a pointed end and shorter in length than in the species *Porcellio leavis*. This species ranked second in terms of prevalence, as it has a narrow stenobiont ecological adaptation and is especially widespread in gardens rich in organic matter and on olive tree trunks (Zeini, 2019).

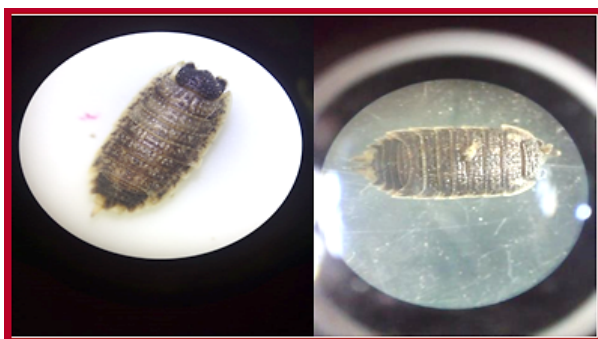


Fig. 2. The external appearance of the type *Porcellio scaber*

#### *Porcellio spinicornis* Say, 1818

This species differs from *P. scaber* in that it is brown

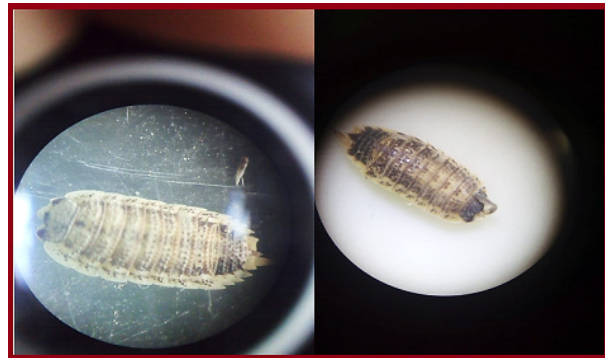


Fig. 3. The external appearance of *Porcellio spinicornis*

in color and the dorsal surface has two rows of white dots on both sides. The head is darker than the rest of the body. The front center of the head is circular, while the genus *P. scaber* is the center of the head pointed (Fig. 3). The results showed that the percentage of it was (22%), less than the other two species, and this is due to the period during which the samples were collected (summer season). It depends on the effect of temperature. It has been observed that this factor has a great influence on the life cycle, reproduction and behavior of this animal (Judd and Horwitz, 2001; Glazier *et al.*, 2001).

#### References

- Al-Amin, N. E. 2011. Use genus *Porcellio* sp. as bioindicator to measure the level of pollution of some heavy metals in the city of Baghdad. *Iraqi Journal of Science* 52(4) : 415- 419.
- Al-Moussawi, E. J. 2009. *A study of population dynamics and secondary production of four species of Isopods in the Jadiriya region Baghdad, Iraq*. M.Sc. thesis College of Science for Girls University of Baghdad Iraq, 98.
- Al-Salman, I. M. 2012. Testing the ability of Porcellionides pruinosus to analyze and consume cellulosic residues of different ecosystems. *Journal of Baghdad Science*. 39: 397-405.
- Carina, A., Aline, F. Q. and Paula, B. A. 2011. Marsupial extension interrestrial isopods (Crustacea, Isopoda, Oniscidea). *Nauplius*. 19(2): 123-128.
- Franck, N. and Emmanuel, S. 2007. Crustacés Isopodes terrestres du Nord Ouest, de la France (Crustacea, Isopoda, Oniscidea). *Invertébrés Armoricaïns*. 2: 148.
- Glazier, D., Galbraith, H., Kelly, C., White, J. and Wolf, J. 2001. Reproductive ecology of aquatic and terrestrial isopods. *Of the 5<sup>th</sup> Internat symp on Biol of terrestrial Isopoda Irakleio Grete Greece*. 19- 23.
- Judd, S. and Horwitz, P. 2001. Terrestrial isopods as indicators of environmental change? 1. regional patterns from the forests of south-western Australia. *Of 5<sup>th</sup>*

- International symposium on the Biology of terrestrial isopods Irakleio Grete Greece*, 19- 23.
- Martin, J. W. and Davis, G. E. 2005. An update classification of the recent crustacean, Natural history museum of Los Angeles. *Sciences Series*. 39-124: 1-891276-21-1
- Shultz, J.W. 2018. A guide to the identification of the terrestrial Isopoda of Maryland U.S.A. (Crustacea). In Hornung E, Taiti S, Szlavecz K (Eds) Isopods in a Changing World. *Zoo Keys*. 801 : 207–228.
- Taiti, S. and Wynne, J. J. 2015. The terrestrial Isopoda (Crustacea, Oniscidea) of Rapa Nui (Easter Island), with descriptions of two new species. In: Taiti S, Hornung E, Štrus J, Bouchon D (Eds). *Trends in Terrestrial Isopod Biology Zookeys*. 515-9477.
- Zeini, A. H. 2019. Taxonomical study of Terrestrial Isopods (Crustacea) in some regions of Lattakia. *Tishreen University Journal. Biological Sciences*. 11 (5) : 11-7.