

---

# International Journal of Advanced Research in Biological Sciences

ISSN : 2348-8069

www.ijarbs.com

---

## Research Article



### New record of freshwater Harpacticoida (Copepod) from Some water bodies of Markazii Province

Eskandari E., Shayestehfar A.\* and Noori M.

Department of Biology, Faculty of Science, Arak University, Arak-38156-8-8349, Iran

\*Corresponding author

---

#### Abstract

Today more than 21000 species, 2600 genus, 250 families and 10 orders are identified among copepods, out of which only four orders, that is; Cyclopoida, Calanoida, Harpacticoida and Gelyelloid are more or less fresh water habitat and approximately most of them are free living. The aim of this study is to species identification of order Harpacticoida (copepods) from Markazii Province. The present study covered one entire year of 2014 (Jan, to Dec.) The sampling was done at different stagnant and running water surface bodies of Markazi Province. Collections were made with a dip net of no. 10 mesh aperture. In the present investigation only one genus (*Canthocamptus*) represented with one species *C. staphylinus* belonging to the family Canthocamptidae was recognized.

**Keywords:** freshwater, harpacticoida, Markazii Province, New record.

---

#### Introduction

Up to present, few works regarding invertebrates and especially fresh water crustaceans and particularly copepod, takes place in Iran. The aim of this study is to species identification of order Harpacticoida (copepods) from Markazii Province. Copepods are small animals range from micron to centimeter. They are a group of small crustaceans (Phylum Arthropod) found in the sea and nearly every freshwater habitat (Hickman *et al*, 2014). They live in different kinds of water and like the other zooplankton are typically the tiny animals found near the surface in aquatic environments. They are usually weak swimmers and always drift along with the currents; fishes use them as food and therefore are important as the second link of food chain in aquatic habitat. They also are very important in water pollution studies and many scientists consider them as the water indicator (Shayestehfar and Seyfoddin, 2010). Today more than 21000 species, 2600 genus, 250 families and 10 orders are identified among copepods, out of which only four orders, that is; Cyclopoida, Calanoida, Harpacticoida

and Gelyelloid are more or less fresh water habitat and approximately most of them are free living (Yamani *et al*, 2011).

Among the members of Harpacticoida, more than 3000 known species are marine habitat, but approximately 945 known species are living in fresh water habitat (Karaytuğ and Sak, 2006). Up to present, they are considering with 53 families, but only 3 families (Ameiridae, Canthocamptidae and Parastenocarididae) are fresh water. Harpacticoida habituated to live in water sediments (Dole *et al*, 2000). Their body is divided in to two main parts, the anterior one called as Prosome, and the posterior one is called as Urosome Ward and Whipple (1959). They are 63 to 500 micrometer in length (Jayabarathi *et al* 2012), worm like in shape and laterally compressed, with very short antennas (5 to 9 segment in females), both antennules are curved in male, the metasoma have the same wide size with the urosoma (Witty, 2004). The urosome in females with 4 and in males

with five to six segments, the fifth leg and the endopod form the baseo-endopod (Gardner Szabo (1982). With some exceptions the females carry only one egg sac (Dole *et al*, 2000)..

### Materials and Methods

The present study covered one entire year of 2014 (Jan, to Dec.) The sampling was done at different stagnant and running water surface bodies of Markazi Province (Fig.1), the Global Positioning System (GPS) of sampling sites are shown in Table 1.

Collections were made with a dip net of no. 10 mesh aperture. The collected samples kept in clean bottles, labeled and were transferred to research laboratory of

Arak University for further study (Fig. 2 A). The water samples were kept in room temperature for 24 Hours, 1 cc of water samples (from Bottles) transferred to different cavity blocks randomly. Under the stereo microscope the different zooplanktons (particularly) crustaceans and specially Harpacticoida were selected and transferred to ependurph bottles including 7% glico-alcohol (Fig2 B). With the help of dropper the samples were introduced to a clean lam and them dissected and studied under light microscope (Olympus-BX51). The procedure was repeated many times. The 5<sup>th</sup> leg was drawn with the help of camera lucida. The method of preservation and identification was based on Ward and Whipple (1959), and Jeje and Fernando (1986). The mean studied identification keys are shown in table 2.

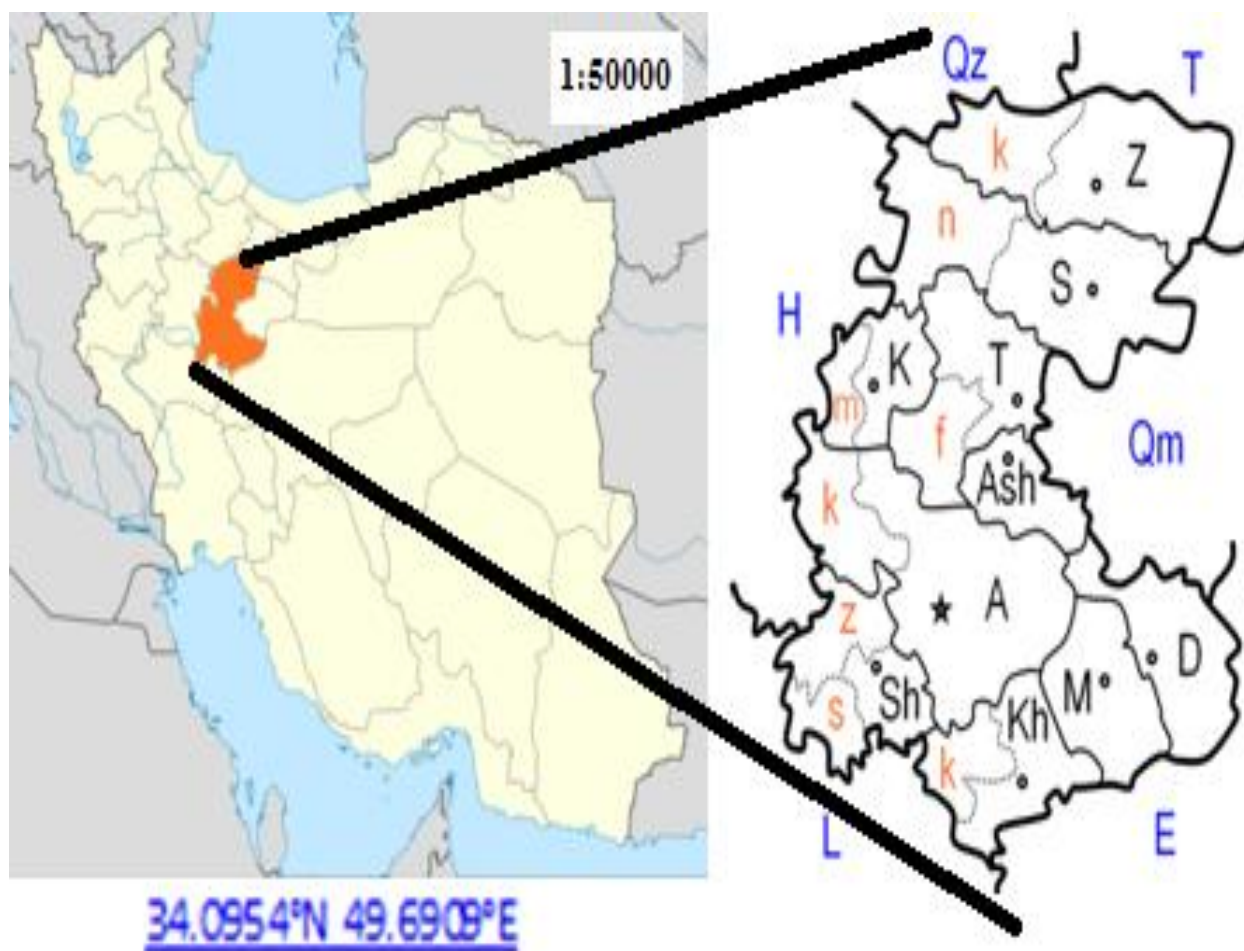


Fig. 1) The topography of sampling site

Table 1) Water sampling sit's name, pH, temperature, sea level and location (Jan. to Dec. 2014)

Serial Number	Sampling Site (Name)	pH (%)	GPS	Water Sea Level (M)	Water Temperature (Oc)
1	Ashtiyan Damp	8.22	N: 34°31' 32/4'' E: 050°02' 17/5''	2088	14
2	Deh Sefid	7.66	N: 33° 46' 21/3'' E: 049° 24' 23/4''	1903	18/5
3	Delijan	8.18	N: 33°52' 55/3'' E: 050°33' 32/8''	2029	22
4	Farmahin	8.73	N: 34°18' 13/9'' E: 049°33' '16/0''	1950	17
5	Hendo Dar	8.13	N: 33°46' 58/9'' E: 049°15' 15/5''	2123	20
6	Khomeyn	8.27	N: 33°30' 41/8'' E: 049°57' 41/2''	2023	28
7	Komeyjan	8.22	N: 34°32' 45/9'' E: 049°17' 20/5''	1795	20
8	Khondab	8.73	N: 34°22' 3/4'' E: 049°13' 0/27''	2125	22
9	Mahalat	8.37	N: 33°55' 43/4'' E: 050°27' 00/0''	2020	20
10	Sarough	8.22	N: 34°23' 03/6'' E: 0 49°29' 40/0''	1822	12
11	Tafresh	8.34	N: 34°37' 55/7'' E: 049°57' 20/7''	2054	11

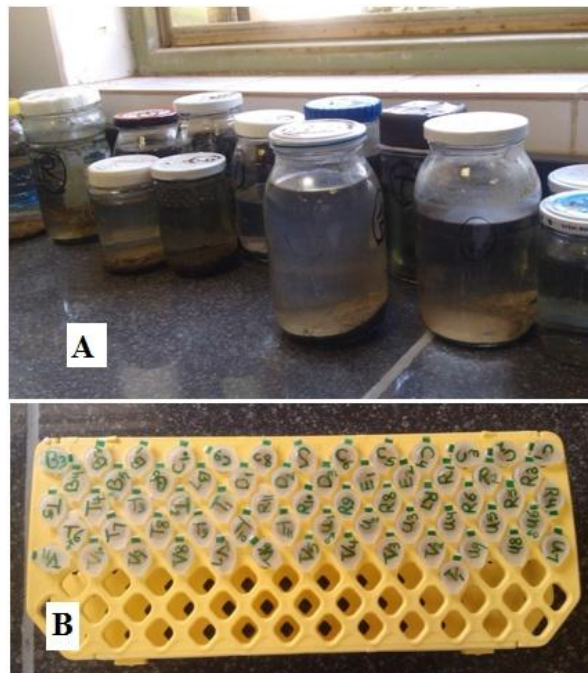


Fig 2) A: The water samples collections in clean bottles kept in room temperature  
 B: The identified copepods were preserved in endurph including 7% glycol–alcohol

Table 2) The mean identification keys during the present study

Characters	Abbreviation
Prosome	Pro
Urosome	Uro
First antenna(antennul)	A1
Second antenna(antenna)	A2
First swimming leg	P1
second swimming leg	P2
third swimming leg	P3
Forth swimming leg	P4
Fifth leg	P5
Six leg	P6
Exopod	Exp
Endopod	Enp
Maxilla	Mx
Mandibles	Mb
Maxilliped	Mxp
Baseo endopodit	Benp
Caudal ramus	CR

## Results and Discussion

In the present investigation only one genus (*Canthocamptus*) represented with one species (*C. staphylinus*) belonging to the family Canthocamptidae was recognized.

Females in the genus *Canthocamptus* are characterized by a greatly reduced second seta on the leg 5 basal expansion, while males have the outer corner of the leg 4 endopod segment 2 produced into a spinous process (Fig. 3).



Fig.3) Harpacticoida, Females in the genus *Canthocamptus*

***Canthocamptus staphylinus* (Jurine, 1820)**

1. The length of the body in male as well as female 0.1 to 0.7 mm.
2. The first antenna in female with eight segments.
3. The exopod and endopod of first leg, with three segments (Fig. 4 A).
4. The last body segment, with external spin like spiculs (Fig. 4 B).
5. Triangular protuberance distolaterally of the anal somit (Fig. 4 C).
6. In fifth leg, the second seta of basal expansion reduced.
7. Exopod of fifth leg with sis seta.
8. Caudal seta not articulated basally.
9. *Canthocamptu staphylinus* was collected from sampling stations 1, 4, 5, 9 and 10.



Fig.4) *Canthocamptus staphylinus*

A. Pleopod    B. Caudal ramus    C. Fifth Leg of Female

**References**

- Dole-Olivier MJ, Galassi D, Marmonier P, Creuzé des Châtelliers M. (2000) The biology and ecology of lotic microcrustaceans. *Fresh Water Biol.*;44 (1):63-91.
- Fernando C. (1980), The freshwater zooplankton of Sri Lanka, with a discussion of tropical freshwater zooplankton composition. *Internationale. Revue der gesamten Hydrobiologie und Hydrographie.* 65 (1):85-125.
- Gardner GA, Szabo I. (1982) *British Columbia pelagic marine Copepoda: an identification manual and annotated bibliography.* Department of Fisheries and Oceans. Published by Government of Canada (Ottawa K1A OE6).536 Pp.
- Hickman CP; Roberts LS; Keen SL; Eisenhour DJ; Larson A. and Anson H L (2014) *Integrated principles of zoology.* 16<sup>th</sup> edition, McGraw-Hill, USA. 876 Pp.
- Jayabarathi R, Padmavati G, and Anandavelu I.(2012) Abundance and Species Composition of Harpacticoid Copepods from a Sea Grass Patch of South Andaman, India. *Current Research Journal of Biological Sciences*, 4(6):717-24.
- Jeje, C. Y., and C. H. Fernando (1986). *A Practical Guide to the Identification of Nigerian Zooplankton.* Kainji Lake. Research Institute, Nigeria.
- Karaytuğ S and Sak S. (2006) A contribution to the marine harpacticoid (Crustacea, Copepoda) fauna of Turkey. *EU Journal of Fisheries and Aquatic Sciences.* 23:403-405.
- Shayestehfar Alireza and Seyfoddin Vahid (2010) Diurnal Fluctuations in Population Density of Ostracoda in Relation to Some Physical and Chemical Parameters from Yassbolagh Dam, Yassbolagh village, Markazi, Iran. *Int. J. Lakes and Rivers* 3, 119-125.
- Ward H B and Whipple G C (1959) *Fresh water biology.* 2nd Edition, John Wiley and Sons, INC, USA, Pp. 248.
- Witty M L (2004) *Practical guide to identifying freshwater crustacean zooplankton.*Cooperative freshwater ecology union. Sudbury. Onthario, Canada. 50Pp.
- Yamani FY, Skryabin V, Gubanova A, Khvorov S, Prusova I. (2011) *Marine Zooplankton: Practical Guide for the Northwestern Arabian Gulf.* Kuwait Institute for Scientific Research, 196 Pp