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A Check List of Zooplankton Species in Saudi Arabia

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Abstract. A preliminary survey of the perennial freshwater reservoirs and valleys in Saudi Arabia was carried out to determine the zooplankton species. Nine species of zooplankton were reported for the first time from five major sites in Saudi Arabia.

Introduction

The discussion of the freshwater coleopterans and hemipterans in Saudi Arabia by Balfoure-Browne [1] was the first attempt to examine the freshwater fauna of this Country. Following that work, other studies reported the distribution and the taxonomy of the local freshwater fishes [2-3]. The most recent qualitative investigation of the freshwater invertebrates in Saudi Arabia are those of Rahim [4] who listed the representatives of four major common invertebrate groups (Mollusca, Copepoda, Oligochaeta and Odonata) and that of Siddiqui [5] who reported three subclasses of zooplankton (Rotifera, Copepoda and Ostracoda), but both authors have not mentioned the particular species of these invertebrates. In this study, a preliminary survey was undertaken to investigate zooplankton species of the major freshwater bodies in Saudi Arabia.

Materials and Methods

Monthly visits were made to three major reservoirs (The Gizan and the Abha reservoirs, southern mountanous region of Saudi Arabia and to the Al-Dariyah reservoir, central region) and a survey was also made to one large valley, Al-Mahalla valley, south western, and to one drainage canal (Al-Hassa Drainage canal) eastern Saudi Arabia (Fig. 1), for studying their zooplankton species. With the help of a small boat and a zooplankton net (54 μm mesh size) zooplankton smaples were col-

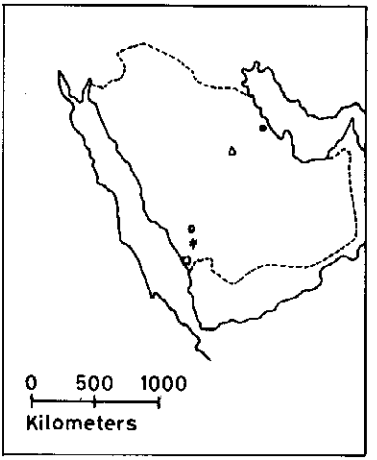

Fig. 1. Map of Saudi Arabia showing the five water bodies surveyed.

Al-Hassa Drainage canal.

Al-Dariyah reservoir.

The Abbha reservoir.

The Al-Mahalla valley.

The Gizan reservoir.

lected. The identification of zooplankton species was made using the keys published by Edmonson [6], Needham and Needham [7], Flossner [8], Kiefer [9] and Negrea [10].

Results

The zooplankton recorded at the five sites over the study period are shown in Table 1 and Fig. 2. Zooplankton species like *Thermocyclops hyalinus, Mesocyclops* sp., *Moina micrura* and species of the genous *Brachionus* were reported from the five sites investigated. The three species of the genus Brachionus (*B. falcatus, B. caudatus* and *B. calyciflorus)* were only found at one time in one site (the Gizan reservoir) and decreased towards the central and eastern sites. Generally, the southern sites have shown the highest varieties of zooplankton species compared with the central and eastern sites; *Polyarthra* sp. for instance has only been reported from one southern site (the Gizan reservoir).

Table 1. Species of zooplankton from five major freshwater bodies in Saudi Arabia

Site	Zooplankton species	
The Gizan reservoir	Cyclopidae, Copepoda:	
	Thermocyclops hyalinus	(Rehberg, 1880)
	Mesocyclops sp.	
	Rotifera:	
	Brachionus falcatus	(Zacharias, 1898)
	Brachionus calyciflorus	(Pallas, 1766)
	Brachionus caudatus	(Barrios, 1894)
	Filina longiseta	(Ehrenberg, 1834)
	Polyarthra sp.	
	Daphnidae, Cladocera:	
	Moina Micrura	(Kurz, 1874)
The Abbha reservoir	Cyclopedae, Copepoda:	
	Thermocyclops hyalinus	(Rehberg, 1880)
	Mesocyclops sp.	
	Rotifera:	
	Brachionus falcatus	(Zacharias, 1898)
	Brachionus calyciflorus	(Palla, 1766)
	Daphnidae, Cladocera:	
	Moina micrura	(Kurz, 1874)
The Al-Mahalla valley	Cladocera, Copepoda:	
	Thermocyclops hyalinus	(Rehberg, 1889)
	Mesocyclops sp.	
	Rotifera:	
	Brachionus falcatus	(Zacharias, 1898)
	Brachionus calyciflorus	(Palla, 1766)
	Filina longiseta	(Ehrenberg, 1834)
	Daphnidae, Cladocera:	
	Moina micrura	(Kurz, 1874)
The Dariyah reservoir	Cladocera, Copepoda:	
	Thermocyclops hyalinus	(Rehberg, 1889)
	Mesocyclops sp.	
	Rotifera:	
	Brachionus calyciflorus	(Pallas, 1766)
	Daphnidae, Cladocera:	
	Moina micrura	(Kurz, 1874)
The Al-Hassa Drainage Canal	Cladocera, Copepoda:	
	Thermocyclops hyalinus	(Rehberg, 1889)
	Mesocyclops sp.	
	Rotifera:	
	Brachionus caudatus	(Barrios, 1894)
	Filina longiseta	(Ehrenberg, 1834)

Brachionus caudatus

Fig. 2. a

Thermocyclops hyallinus
(Tip of 5 legs)

Fig. 2. b

Mesocyclops sp.

Filina longiseta

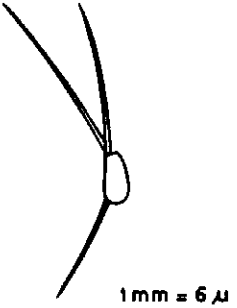

Fig. 2. c

Moina micrura

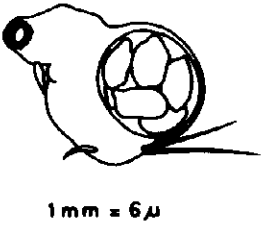

Fig. 2. d

Fig. 2 (a–d). Species of zooplankton in Saudi Arabia

Moina micrura
postabdomen

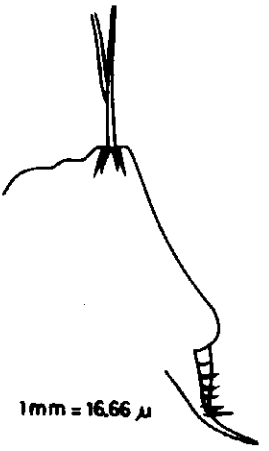

Fig. 2.e

Brachions falcatus

Fig. 2.f

Brachionus Calyciflorus

Fig. 2. 9

Thermocyclops hyallinus

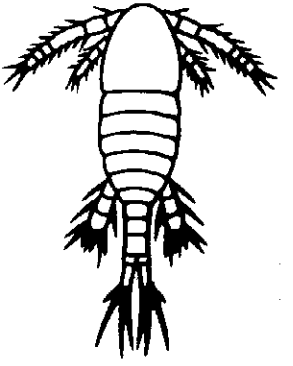

Fig. 2. i

Naupilius larva

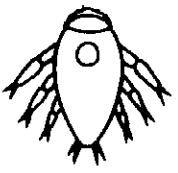

Fig. 2. h

Fig. 2 (e–i). Species of zooplankton in Saudi Arabia

Discussion

The species of the genus *Thermocyclops* was thought to be *T. neglectus*, but following the recent key of Kiefer [9] who emphasized on closely examining the all important 5th thoracic limb, this species turned out to be *T. hyalinus*. Burgis [11] went through the same procedure for her Lake George *Thermocyclops* species. Also judjing from Flossner [8] and Negrea [10] *Moina dubia* is now termed *M. micrura*.

The concentration of the species of *Brachionus* and *Polyarthra* sp. at the southern regions of Saudi Arabia could be related to the habitat being almost desert at the central and eastern regions and mountanous with some scattered water bodies at the southern regions. The scarcity of zooplankton species from the Al-Hassa Drainage canal and from the Dariyah reservoir could be due to the nature of these reservoirs as both receive drainage water and the latter sometimes dries completely during summer seasons. The presence of some species like *Polyarthra* sp. and *Brachionus caudatus* in the Gizan reservoir and their absence from the Al Mahalla valley could be attributed to the probability that these species might have escaped through our net as both sites are located in the same southern region. Further research, with nets of different mesh sizes, is therefore needed to confirm this event.

References

[1] **Balfoure-Browne, J.**" Coleoptera. Expedition to South-West Arabia. 1937–8." *Brit. Mus. (N.H.)* **1**(1951), 179–220.

[2] **Trewavas, E.** "Freshwater Fishes. The First Expedition to South West Arabia (1937–1938)." *Brit. Mus.* (N.H.) **1**(1941), 7–15.

[3] **Banister, K.E.** and **Clark, M.A.** "The Freshwater Fishes of the Arab Peninsula." *J. Oman Stud. Special Rep.* **2**(1977), 111–154.

[4] **Rahim, M.A.** "Qualitative Analysis of the Fauna of a Stream Near Al-Kharj, Saudi Arabia." *Proc. Saudi Biol. Soc.* **3**(1979), 257–263.

[5] **Siddique, A.O.** "Possibilities of Fish Culture Utilizing the Drainage Water." *Proc. Saudi Biol. Soc.* **3**(1979), 329–336.

[6] **Edmondson, W.T.** *Ward and Whipple's Freshwater Biology. 2nd* Ed., New York: John Wiley and Sons Inc., 1959.

[7] **Needham, J.G.** and **Needham, P.R.** *A Guide to the Study of Freshwater Biology.* California, U.S.A.: Holden Day Inc., 1966.

[8] **Flossner, D.** Krebstiere, Crustacea. Kiemen-und Blattfusser, Branchiopoda. Fischlause, Branchiura. Tierwelt Deutschland, 60, Jena. Fischer, 1972.

[9] **Kiefer, F.** Das Zooplankton der Binnengewasser Die Binnengewasser XXVI (2), Stuttgart, 1978.

[10] **Negrea, S.** "Cladocera, Crustacea." *Fauna Republicii Socialiste Romania.* **4** (1983), 12, 399.

[11] **Burgis, E.** "The Ecology and Production of Copepods, Particularly *Thermocyclops hyallinus* in the Tropical Lake George, Uganda." *Freshwater Biol.* **1**(1971), 169–192.

قائمة تسجيلية لأنواع الحيوانات المجهرية في المملكة العربية السعودية

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(أستلم في ١٠ ربيع الآخر ١٤٠٦هـ، قُبل للنشر في ١١ شعبان ١٤٠٨هـ)

ملخص البحث. لقد أُجريت دراسة أولية على المياه العذبة في المملكة العربية السعودية لتسجيل أنواع الحيوانات المجهرية الموجودة فيها وقد تم تحديد تسعة أنواع من هذه الحيوانات جمعت لأول مرة من خمس مناطق رئيسة في المملكة العربية السعودية.