

# COMMUNICATIONS

DE LA FACULTÉ DES SCIENCES  
DE L'UNIVERSITÉ D'ANKARA

Série C<sub>3</sub>: Zoologie

---

TOME 24

ANNÉE 1980

---

**The Occurrence of *Diacyclops antricola* Kiefer (Crustacea, Copepoda) in Subterranean Waters of Turkey, and Remarks on Its Variability and Distribution.**

By

by GIUSEPPE L. PESCE

1

Faculté des Sciences de l'Université d'Ankara  
Ankara, Turquie

# Communications de la Faculté des Sciences de l'Université d'Ankara

Comité de Rédaction de la Série C<sub>3</sub>

S. Küçükkeksi, Ş. Yazgan, J. Tanyolac

Secrétaire de publication

A. Yalçın

---

La Revue "Communications de la Faculté des Sciences de l'Université d'Ankara" est un organe de publication englobant toutes les disciplines scientifiques représentées à la Faculté.

La Revue, jusqu'à 1975 à l'exception des tomes I, II, III était composée de trois séries:

Série A : Mathématiques, Physique et Astronomie.

Série B : Chimie.

Série C : Sciences naturelles.

A partir de 1975 la Revue comprend sept séries:

Série A<sub>1</sub>: Mathématiques

Série A<sub>2</sub>: Physique

Série A<sub>3</sub>: Astronomie

Série B : Chimie

Série C<sub>1</sub>: Géologie

Série C<sub>2</sub>: Botanique

Série C<sub>3</sub>: Zoologie

En principe, la Revue est réservée aux mémoires originaux des membres de la Faculté. Elle accepte cependant, dans la mesure de la place disponible, les communications des auteurs étrangers. Les langues allemande, anglaise et française sont admises indifféremment. Les articles devront être accompagnés d'un bref sommaire en langue turque.

Adresse: Fen Fakültesi Tebliğler Dergisi, Fen Fakültesi Ankara, Turquie

**The Occurrence of *Diacyclops antrincola* Kiefer (Crustacea, Copepoda) in Subterranean Waters of Turkey, and Remarks on Its Variability and Distribution.**

by GIUSEPPE L. PESCE

Zoological Institute, University of L' Aquila, Italy

(Received 11 December 1979, and accepted 11 January 1980)

**Abstract**

The hypogean cyclopoid copepod *Diacyclops antrincola* Kiefer is for the first time reported from subterranean waters of Turkey. The record let us to better know the variability of this species, as well as greatly enlarges to East its geographical range.

In the course of researches on the underground waters fauna in Eastern Mediterranean, promoted by the Zoological Institute of the University of L'Aquila (Italy), some specimens of the interesting cyclopoid copepod (*Diacyclops antrincola*) Kiefer were collected from brackish wells along the coast of the Marmara Sea (Turkey).

The above record is noteworthy and of some biogeographical and ecological value, as it greatly enlarges to East the geographical range of this species, adding a new and interesting feature to the cyclopoid fauna of Europe, as well as it suggests that *D. antrincola* could be a true stygobiont, which likely lives in slightly brackish waters only, in coasting phreatic systems.

*D. antrincola* was described by Kiefer (1967) on materials from the cave "Grotta del Fiume", Ancona (central Italy); secondly, Petkovski (1971) reported the species from subterranean waters of Montenegro (Yugoslavia); later on, Pesce and coll. (1978, 1979), Pesce and Fabrizi (1979) and Pesce and Maggi (in press) widely enlarged its geographical range, including the southern Italy (Apulia), the continental Greece and some ionian islands.

The new data, here reported, besides the biogeography, let us to better know the systematic and the ecology of this species, as well as to define its real variability.

In particular, in the present paper, we report the main morphological features of the examined specimens, compared to those from the previous descriptions and illustrations, together with some remarks on the variability, the ecology and the geonomy of the species.

*Diacyclops antrincola* Kiefer 1967

*D.antrincola* : Kiefer 1967, pp. 133-138, figs. 1-6, central Italy

*D.antrincola* : Petkovski 1971, pp. 93-95, figs. 35-37, Yugoslavia

*D.antrincola* ; Pesce and coll. 1978, pp. 39-43, fig. 7, southern Italy

*D.antrincola* : Maggi and Pesce (in press), Greece

### MATERIALS

3 ♀♀ , 2 ♂♂ and some juveniles (cop. IV-V) from brackish wells (Tu. 8, Tu. 10) along the southern coast of the Marmara Sea, near the village of Lapseki (depth of water: 2.0-2.4 m; temperature: 15.7-15.8 °C; pH: 7; bottom sediment composed of thin organogenic sandstone detritus); April 15, 1979; coll. Pesce and Silverii.

In the same localities *D.antrincola* lives in association with other cyclopids copepods as *Paracyclops fimbriatus* (Fischer), *Diacyclops languidoides* (Lilljeborg) and *Cyclops* sp. and with the following other groups: harpacticoids copepods, asellids isopods, amphipods, oligochaetes and ostracods.

Materials, some dissected and mounted on coverlips in Faure-solution, are in the author's collections, at the Zoological institute of the University of L'Aquila (Italy).

### Description

Body length 0.85-0.98 mm, including furcal rami, not including furcal setae, Genital segment slightly longer than large. Antennula ( $A_1$ ), 12-segmented, reaching the posterior margin of the first thoracal segment; segments 1, 8 and 9 much longer than others; aesthetasc on the article 9 reaching 1/2 the article 10; comparative lengths of the articles as follows: 37-10-5-13-10-5-14-29-24-11-15-18.

Antenna ( $A_2$ ) without particular characteristics.

Swimmings legs with rami 3-segmented; uniting lamella of  $P_1$ - $P_3$  with two sets of thin hairs, that of  $P_4$  with two sets of hairs and a row of small sinules; spine formula of the exopodites: 2 3 3 3. Inner margin of the median segments of endopod  $p_2$ - $P_3$  with one seta only. Setae formula of swimmings legs, as follows:

$P_1$	$P_2$	$P_3$	$P_4$
1   1	1   1	1   1	1   1
1   1	1   1	1   1	1   2
4   4	4   4	4   4	4   2

$P_4$ , article 3 of endopodite 1.56-1.70 times longer than large and armed with two long apical, divaricate spines, the inner 1.3 times longer than the outer one and slightly longer than the article.  $P_5$ , distal article long ( $L/1 = 2.2-2.4$ ); distal spine 1.2 times longer than the article itself.

$P_6$  armed with a very long seta and two shorter spiniform setae.

Furcal rami subparallel, 4.18-4.35 times longer than large (width measured at the insertion of the lateral seta); lateral setae inserting about at the distal quarter of each ramus; inner apical setae 1.70-1.75 times longer than the outers and about as long as each ramus; dorsal setae relatively long, and about as long as the rami and the inner apical setae.

Some body comparative measurements among the known populations of *D. antrincola* are presented in the Table 1.

Table 1

<i>D. antrincola</i>	Furca			$P_4$	
	L/1	Ti/Te	ds/Ti	L/1	ratio: inner/outer spines
1. Central Italy	4.87-5.38	1.57-1.67	about 0.80	1.66-1.77	1.05-1.11
2. South Italy	4.20-4.50	1.71-1.79	0.95-1.0	1.65-1.70	1.19-1.25
3. Yugoslavia	about 5	about 1.90	about 0.75	about 2	about 1.30
4. Greece	4.10-4.30	1.89-1.94	0.95-1.0	1.68-1.76	1.05-1.17
5. Turkey	4.18-4.35	1.70-1.75	about 1	1.65-1.70	1.29-1.31

1. after Kiefer, 1967
2. after Pesce and coll., 1978
3. after Petkovski, 1971
4. after Maggi and Pesce, in press
5. after present records.

## REMARKS

*D. antrincola* is included in the group ("crassicaudis") of *Di-n cyclops* which are characterized by a 12-segmented antennula, i. e.: *D. alticola* (Kiefer, 1935), *D. crassicaudis* (Sars, 1863), *D. karamani* (Kiefer, 1932) and *D. skopljensis* (Kiefer, 1932).

Within this group it is easily distinguishable, as Kiefer (1967) suggested, and Petkovski (1971) and Pesce and coll. (1978) corroborated, by numerous features, as the coxal plates of  $P_1-P_4$ , the terminal spines of the segment 3 of endopod  $P_4$  (slender, slightly differing in length and well divaricate) and mainly by the presence of one seta only on the inner margin of the median segment of the endopod  $P_2-P_3$ .

From an ecological point of view, the existing data strongly suggest that *D. antrincola* is to be considered a stygobiont species, which lives in underground waters only; moreover, as far as we know, it lives in slightly brackish waters, in subterranean systems, along the sea coasts.

As for the biogeography, on evidence of the present records, *D. antrincola* could be considered as a nord-mediterranean oriental element in the subterranean aquatic biocoenosis.

## REFERENCES

- KIEFER, F. 1967 - *Ein neuer Cyclopide (Crustacea, Copepoda) aus einer Höhle in Mittelitalien*. Riv. Idrobiol., 6 (2-3), pp. 133-138
- MAGGI, D. and G.L. PESCE. in press - *Cyclopides des eaux souterraines phreatiques de la Grèce du nord (Crustacea: Copepoda)*. Biol. Gallo-Hellenica.
- PESCE, G.L. and R.FABRIZI. in press - *Ciclopidi delle acque sotterranee d'Abruzzo (Crustacea: Copepoda). Contributo alla conoscenza della fauna delle acque sotterranee dell'Italia centro-meridionale: VII. Natura*.
- PESCE, G.L., G. FUSACCHIA, D.MAGGI and P.TETE. 1978 - *Ricerche faunistiche in acque freatiche del Salento. Contributo alla conoscenza della fauna delle acque sotterranee dell'Italia centro-meridionale: V. Thalassia Salentina*, 8, pp. 1-51
- PESCE, G.L., D.MAGGI, A.CIOCCA and R. ARGANO. in press - *Biological reserches on the subterranean phreatic waters of northern Greece*. Biol. Gallo-Hellenica
- PESCE, G.L. and D.MAGGI. in press - *Cyclopides des eaux souterraines phreatiques de la region des Marche, Italie centrale (Crustacea: Copepoda). Contribution a la connaissance de la faune des eaux souterraines de l'Italie centrale et meridionale: XIV. Acta Mus. Maced. Skopje*
- PETKOVSKI, T. 1971 - *Einige neue und seltene subterrane Cylopiden (Crustacea Copepoda) aus Jugoslawien*. Acta Mus. Maced., 12, pp. 77-144

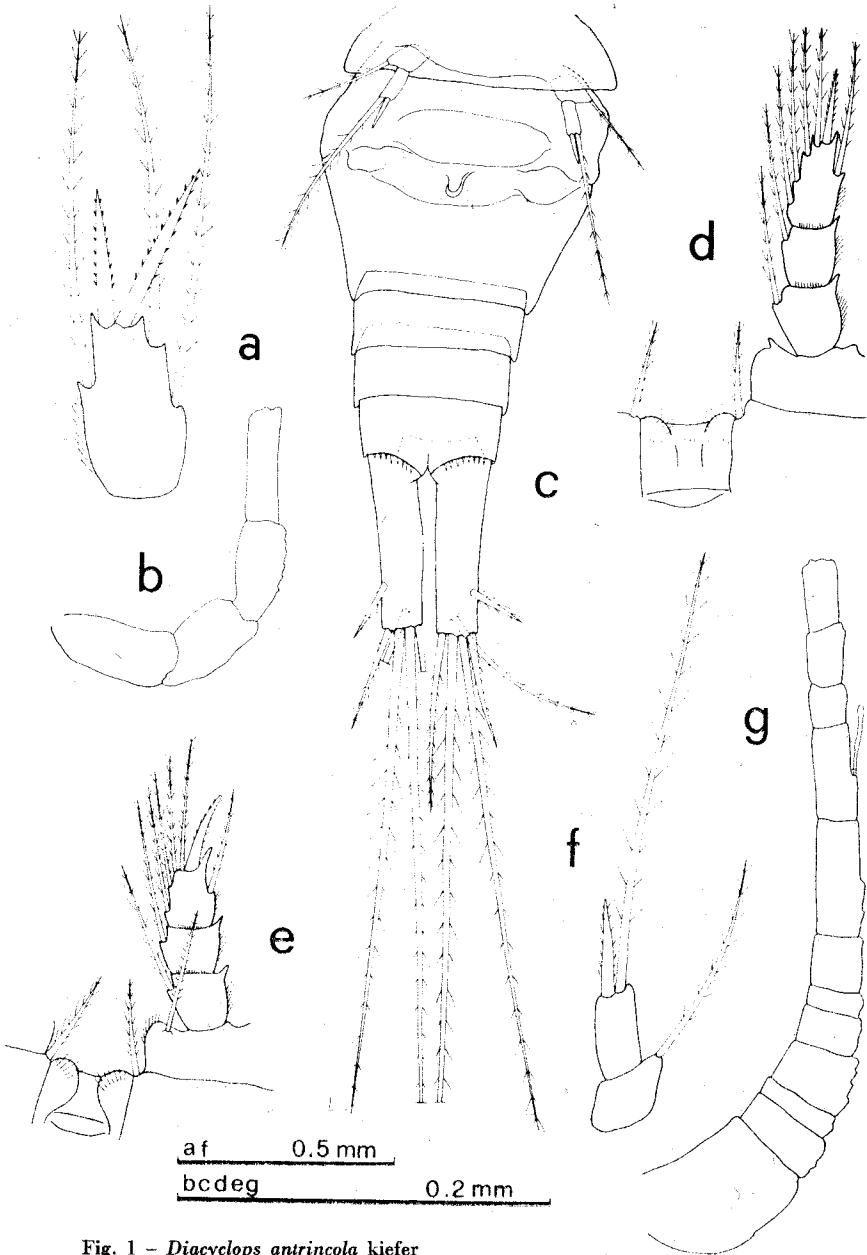


Fig. 1 - *Diacyclops antrincola* kiefer  
 a. endopodite  $P_4$ , article 3; b. antenna; c. abdomen and furcal rami, ventral view;  
 d. endopodite  $P_3$ ; e. endopodite  $P_1$ ; f.  $P_2$ ; g. antennula

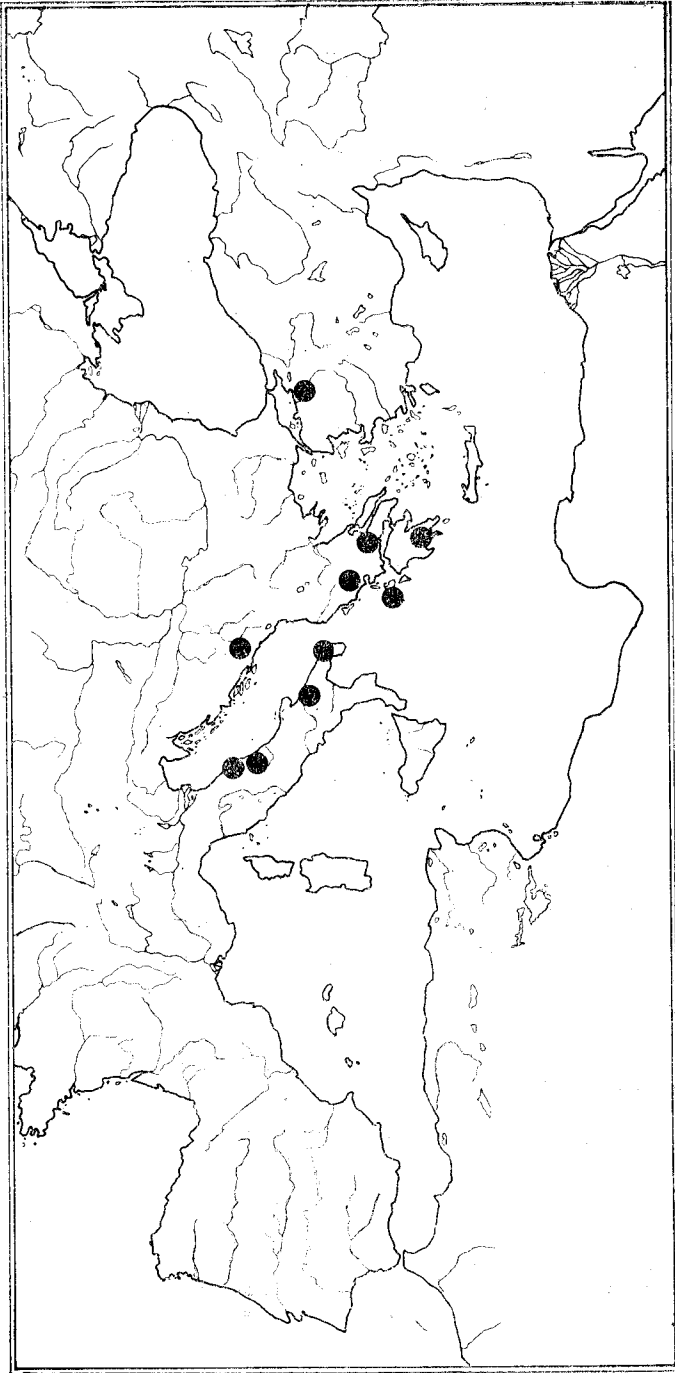


Fig.2 - Distribution of *Diacyclops antrincola* Kiefer



**Prix de l'abonnement annuel**

Turquie: 15 TL; Etranger: 30 TL.

Prix de ce num ero: 5 TL (pour la vente en Turquie).

Pri ere de s'adresser pour l'abonnement  : Fen Fak ultesi  
Dekanlıđı Ankara, Turquie.