Revue suisse Zool.	Tome 92	Fasc. 3	p. 605-612	Genève, octobre 1985

A new Harpacticoid from phreatic waters of Lesbos, Greece, and notes on the «Rassenkreise» of *Elaphoidella elaphoides* (Chappuis) (Copepoda: Ameiridae)

by

Giuseppe Lucio PESCE *

With 14 figures

ABSTRACT

The new species *Elaphoidella silverii* n. sp. is described and figured. The taxonomic status of *Elaphoidella elaphoides* (Chappuis) is discussed.

During recent researches on the stygofauna of the island of Lesbos, Greece, promoted by the Zoological Institute of the University of L'Aquila (Italy) (PESCE 1983; PESCE, in press), a remarkable collection of harpacticoid copepods was obtained.

Among these materials, besides a new *Nitocrella* which has been recently described as *N. maggii* (PESCE, in press), we identified a new species of the genus *Elaphoidella* Chappuis, which is herein described as *Elaphoidella silverii* n. sp., as well as some specimens of the interesting and very problematic species *Elaphoidella elaphoides* Chappuis.

This paper deals with the description of the new species, discusses its relationship, and presents also notes on the wide variability and taxonomic status of *Elaphoidella elaphoides* in relation to other closely related species, such as *E. helenae* Chappuis, *E. minos* Chappuis, *E. varians* Chappuis and *E. juxtaputealis* Damian & Botosaneanu.

I appreciate the assistance of Prof. R. Rouch for helpful suggestions and the precious collaboration of the friends and colleagues Dr. G. Silveri and Dr. D. Maggi in collecting all the materials here reported.

* Università degli studi di L'Aquila, Istituto di Zoologia, Piazza Regina Margherita, 7, 67 100 L'Aquila, Italy.

Family CANTHOCAMPTIDAE Sars 1906, Lang 1948

Genus **Elaphoidella** Chappuis 1928

Elaphoidella silverii n. sp.

(Figs. 1-9)

M a t e r i a l : 21 ♀ ♀. Holotype 1 ♀, dissected and mounted on coverlips in Faure's medium, 2 ♀ ♀, paratypes, dissected and mounted on coverlips in Faure's medium, at the «Museum d'Histoire Naturelle», Genève; other paratypes, also dissected and mounted as above, in the Author's collections, No. HLB.28.8-25. All the specimens were from the type-locality, a fresh-water well at Moria, Mytilene (Lesbos, Greece); 28.VII.1982, coll. Pesce, Silveri and Maggi.

D e s c r i p t i o n (female) : Based on mature females, length 0.63 to 0.71 mm, excluding antennae, antennulae and furcal setae. Posterior dorsal and ventral margin of the abdominal segments denticulate; 3-4 rows of hair-like spinules on each abdominal segment, both on ventral and dorsal surface; last abdominal segment naked at the basis of furcal rami. Genital field as in fig. 7. Anal operculum slightly convex and bearing 9-11 stout spines.

Furcal rami subconical, longer than wide (L/1 = 1.40 to 1.45), armed with long spinules on the inner margin; outer margin with 2 setae and 3 short spinules; distal margin with 3 setae, the outer about 2.5 times longer than the inner one, the medial the longest; dorsal seta long, slightly longer than the furcal rami, and implanted on a chitinous lamella.

Antenna 1,8-segmented, aesthetasc on the segment 4, long, well overreaching the tip of the last segment. Antenna 2, exopod 1-segmented, elongated and bearing 2 apical and 2 subapical setae.

Mouthparts without particular characteristics as compared to the other species of the genus.

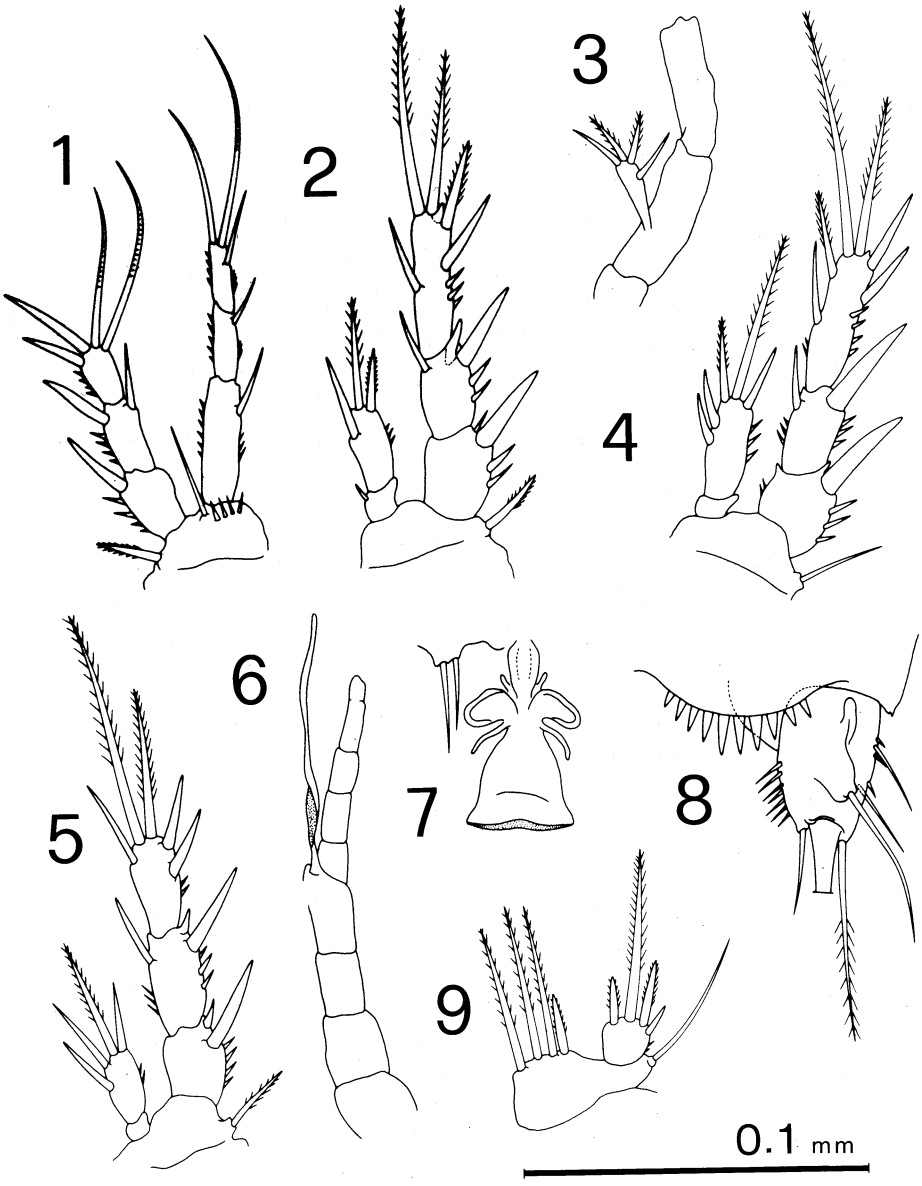
Leg 1: both rami 3-segmented. Exopod, segment 1 with 1 outer spine, segment 2 with 1 inner and 1 outer spine, segment 3 with 2 setae and 2 spines. Endopod, segment 1, long, about as long as the first two segments of the corresponding exopod, and armed with 1 inner seta, segment 2 with 1 inner seta, segment 3 with 1 inner and 2 apical setae.

Leg 2: exopod 3-segmented, endopod 2-segmented. Exopod, segment 1 with 1 stout, outer spine, segment 2 with 1 outer spine and 1 inner seta, segment 3 with 1 inner seta, 2 apical setae and 2 external spines. Endopod segment 1 armed with a short spine, segment 2 armed with 1 inner and 2 apical spines.

Leg 3: exopod 3-segmented, endopod 2-segmented. Exopod, segment 1 with 1 outer spine, segment 2 with 1 outer spine and 1 inner seta, segment 3 with 2 outer spines and 2 apical and 2 inner setae. Endopod segment 1 with or without spine, segment 2 with 2 inner spines and 2 apical and 1 outer setae.

Leg 4: exopod 3-segmented, endopod 2-segmented. Exopod segment 1 with 1 outer spine, segment 2 with 1 outer spine and 1 inner seta, segment 3 with 2 outer spines and 2 apical and 1 inner setae. Endopod segment 1 naked, segment 2 with 2 inner and 2 apical spines.

Leg 5: basiendopod not much protruding, armed with 4 spiniform setae, the outer short; exopod subquadrangular, armed with 4 plumose spines, the 3th from the outer margin, the longest.



FIGS. 1-9.

Elaphoidella silverii n. sp.
1. Leg 1; 2. Leg 2; 3. Antenna and exopod; 4. Leg 3; 5. Leg 4; 6. Antennula; 7. Genital field and Leg 6; 8. Furcal ramus and anal operculum, dorsal view; 9. Leg 5.

Leg 6 consisting of a chitinous lamella bearing 2 long setiform elements.
Male unknown.
Setal formula of legs 1-4 as follows:

	Exp.			Enp.		
P_1	0	1	022	1	1	120
P_2	0	1	122	–	1	120
P_3	0	1	222	–	1-0	221
P_4	0	1	122	–	0	220

Etimology: Name after the friend and colleague Dr. G. Silveri who collected the new species.

Ecology and distribution: *Elaphoidella silverii* n. sp. lives in a fresh-water well at Moria, in the eastern part of the island of Lesbos, Greece (depth of well: 2.5; water level on 0.5 m; temperature: 14.1°C; pH: 6.9; bottom sediment: organogenic sandstone) in association with other harpacticoid copepods, such as *Nitocrella maggii* Pesce (1983) and *Attheyella crassa* (Sars), with the cyclopid copepod *Diacyclops antrincola* Kiefer and other remarkable stygobionts, viz. asellid and microparasellid isopods of the genus *Asellus, Microparasellus* and *Microcharon,* amphipods of the genus *Niphargus*, water mites, ostracods, gastropods and oligochaetes.

At present time, *E. silverii* n. sp. is to be considered a stygobiont species, endemic for the island of Lesbos.

Remarks: *E. silverii* n. sp., except for the armature of the distal segment of the P_4 exopod, quite clearly belongs to the "group IV" of *Elaphoidella* sensu Lang (1948). Within this group the new species is closely related to *E. elaphoides* Chappuis, due to the armature of both the endopods and exopods P_1-P_3; moreover, it shares its particular armature of the distal segment of the P_4 exopod with *E. leruthi* Chappuis and *E. karamani* Chappuis.

From the above species *E. silverii* n. sp. differs as follows: from *E. elaphoides* in the armature of the distal segment of the P_4 exopod, the longer furcal rami and the morphology of the genital field; from *E. leruthi* in the different armature of both the exopod and the basiendopod of P_5 and in the absence of seta on the first segment of the P_4 endopod; from *E. karamani* due to the armature of the last segment of the P_3 exopod and the armature of the basiendopod of P_5.

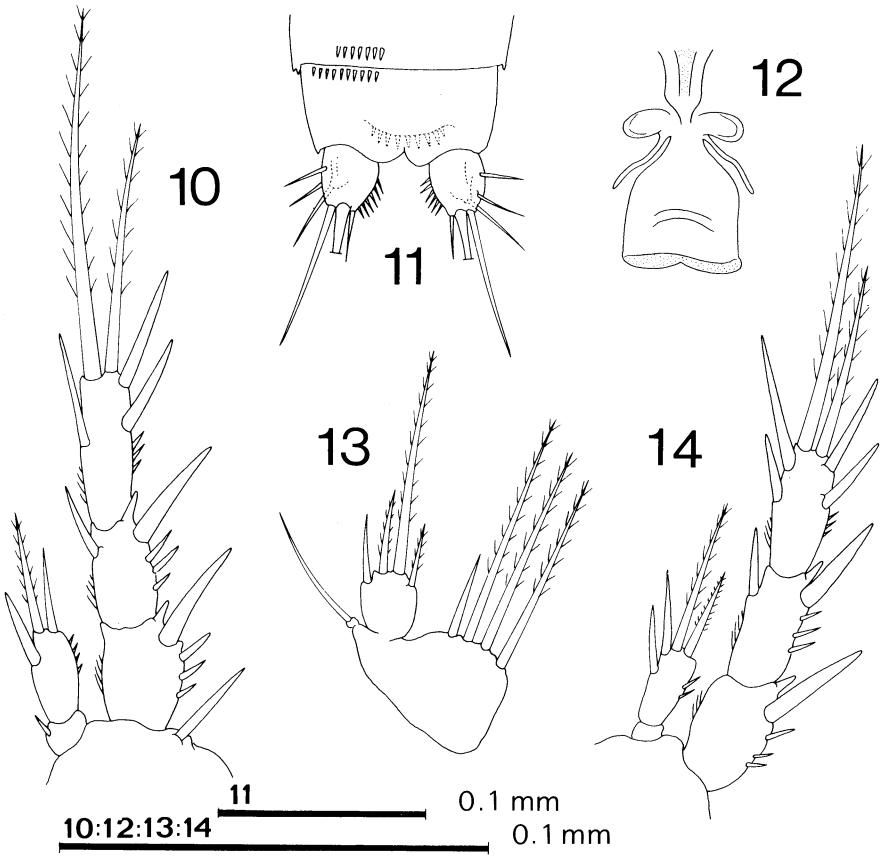
From all the other species *E. silverii* n. sp. is easily distinguishable from its setal formula of P_2-P_4.

Elaphoidella elaphoides (Chappuis, 1923)

(Figs. 10-14)

Canthocamptus elaphoides Chappuis, 1923: 6-14
Elaphoidella helenae Chappuis, 1953: 11-12
Elaphoidella juxtaputealis Damian & Botosaneanu, 1954: 1164-1166
Elaphoidella varians Chappuis, 1955: 89-101
Elaphoidella minos Chappuis, 1956: 9
Elaphoidella elaphoides; Petkovski 1956: 198
Elaphoidella borutzky Michailova, 1972: 22
Elaphoidella angelovi Michailova, 1967: 62

Material: 2♀♀, fresh-water well along the road Petra-Skoutaros, northern part of the island of Lesbos, Greece (depth of well: 4.5 m; water level on 0.75 m; temperature: 14.9°C; pH: 7; bottom sediment: organogenic sandstone; associated fauna: cyclopid



Figs. 10-14.

Elaphoidella elaphoides Chappuis
10. Leg 2; 11. Furcal rami and anal operculum, ventral view; 12. Genital field; 13. Leg 5; 14. Leg 4.

and calanoid copepods, amphipods, ostracods, asellid isopods, water mites); 29.VII.1982, coll. Pesce, Silveri and Maggi; 14 ♀ ♀, fresh-water well at Metimna, Lesbos (depth of well: 3.8 m; water level on 1.2 m; temperature: 15.1°C; pH: 7; bottom sediment: organogenic sandstone; associated fauna: cyclopid and calanoid copepods, ostracods, rotifers, water mites, oligochaetes); 30.VII.1982, coll. Pesce, Silveri and Maggi.

All the materials, dissected and mounted on coverlips in Faure's medium, in the Author's collections, No. HLB.15.1-2, HLB.33.3-16, Zoological Institute of the University of L'Aquila, Italy.

D e s c r i p t i o n (female): Length range, excluding antennae, antennulae and furcal setae, 0.60 to 0.68 mm. Body form similar to other species of the group (group "IV" sensu Lang, 1948). Genital field as in fig. 12. Abdominal segments with distal rows of spinules; anal segment with lateral groups of spinules proximal to base of each furcal ramus. Anal operculum armed with 9-10 spines. Caudal rami armed with long spines on the inner margin; outer distal seta long, about 3 times longer than the inner one.

Antenna and antennula without particular characteristics. Setae formula for legs 1-4 as follows:

	Exp.			Enp.		
P_1	0	1	022	1	1	111
P_2	0	1	122	–	0-1	111
P_3	0	1	222	–	0-1	221
P_4	0	1	222	–	0	220

Leg 5, basiendopod not much protruding, armed with 4 spines, the outer very short; exopod subquadrangular, with 4 setae, the 3th, from the outer, the longest.

R e m a r k s : All the specimens we examined undoubtedly belong to the species *E. elaphoides,* as described and illustrated by CHAPPUIS (1923, 1940) and, later on, by numerous other AA (PETKOVSKI 1956, 1959; DAMIAN 1959; MICHAILOVA-NEIKOVA 1966; APOSTOLOV 1976; PESCE 1980, 1981).

However, the following differences were pointed out in the materials from Lesbos, in comparison to the original description and illustrations of the species: 1) outer distal seta of furcal rami about 3 times longer than the inner one; 2) caudal rami quite longer than wide; 3) first segment of the P_2-P_3 endopod armed with 1 or no spines; 4) distal segment of the P_4 endopod with 4 setae (3 in the original description); 5) relative length of setae and spines on both the basiendopod and exopod of leg 5; 6) armature of the anal operculum, which in our specimens may range from 9 to 10 spines (very different numbers in the original and successive descriptions).

According to PETKOVSKI (1956, 1959) and PESCE (1981), *Elaphoidella elaphoides* shows a wide morphological variability, also among specimens from the same population; in fact, as far as we know, the caudal rami may range, in this species, from a ratio 1.20 to a ratio 1.75, the inner margin of the furcal rami may be armed with spines or naked,

the ratio between the outer and the inner seta of furcal rami may range from 2.0 to 3.9; the anal operculum may be armed by 9 to 18 spines; moreover, we have the problem of the great variability of the endopod of legs 2-4 in the females, which may display the following, very different variants:

P_2:	0	1	121	MICHAILOVA-NEIKOVA, 1966 (Bulgaria); PETKOVSKI, 1956, 1959 (Yugoslavia); PESCE, in press (central Italy)
	0	1	111	CHAPPUIS, 1923, 1940 (Greece); MICHAILOVA-NEIKOVA, 1966 (Bulgaria)
	0	1	220	APOSTOLOV, 1976 (Bulgaria)
	0	0	2/120	PESCE, 1980 (central Italy)
	0	0-1	111	PESCE, present data
P_3:	0	1	221	CHAPPUIS, 1940, 1955 (Greece); MICHAILOVA-NEIKOVA, 1966 (Bulgaria); APOSTOLOV, 1976 (Bulgaria); DAMIAN, 1970 (Roumanie)
	0	0-1	221	PETKOVSKI, 1959 (Yugoslavia); PESCE, present data
	0	0	121	CHAPPUIS, 1923 (Greece)
	0	0	2/111	PESCE, 1980 (central Italy)
	0	1	111	MICHAILOVA-NEIKOVA, 1966 (Bulgaria)
P_4:	0	0	220	PETKOVSKI, 1956 (Yugoslavia); PESCE, present data
	0	0	120	PETKOVSKI, 1956, 1959 (Yugoslavia); DAMIAN, 1970 (Roumanie)
	0	0	111	Other AA.

Some of the above variants quite correspond to some species of *Elaphoidella* from the Balkan Peninsula, viz. *E. varians* Chappuis, *E. minos* Chappuis, *E. helenae* Chappuis and *E. juxtaputealis* Damian & Botosaneanu, which PETKOVSKI (1959) supposed as forming a "Rassenkreise" around *E. elaphoides.*

Now, our present data, as well as many others we recently obtained from Italy and Greece (PESCE, in press), well confirm the wide variability of this species and the hypothesis by PETKOVSKI; therefore, I suggest to consider, henceforth, all the above species as synonyms of *E. elaphoides.*

At present time *E. elaphoides* is to be considered a stygophil species, of recent immigration in the aquatic subterranean biotopes (cave, hyporheic and phreatic waters), widespread in both epigean and underground waters of Europe (Yugoslavia, Germany, Roumania, Bulgaria, Czechoslovakia, Italy, Greece, Turkey).

In regard to Greece, *E. elaphoides,* is known from numerous localities (phreatic and cave waters) of Epirus, Peloponnesus, Crete, Lesbos and Northern Sporades.

RIASSUNTO

Viene descritta *Elaphoidella silverii* n. sp., di acque sotterranee freatiche dell'isola di Lesbo (Grecia) e riportate nuove stazioni di raccolta per la specie *Elaphoidella elaphoides* Chappuis in territorio greco. Per quest'ultima specie si conferma l'ampia variabilità morfologica e geonemia, e si suggeriscono le sinonimie delle specie *E. helenae* Chappuis, *E. minos* Chappuis, *E. varians* Chappuis ed *E. juxtaputealis* Damian & Botosaneanu.

LITERATURE

APOSTOLOV, A. 1976. New species of Harpacticoida (Copepoda) from Bulgaria. *Zool. Zh.* 55: 453-458.

CHAPPUIS, P. A. 1923. Nouveaux Copépodes cavernicoles des genres *Cyclops* et *Canthocamptus*. *Bul. Soc. Sti. Cluj* 1 (4): 584-590.

— 1940. Die Harpacticoiden des Grundwassers des unteren Maintales. *Arch. Hydrobiol.* 36: 286-305.

— 1955. Notes sur les Copépodes. 18. Nouveaux Harpacticoides des Pyrénées. 19. Harpacticoides cavernicoles de Grèce. 20. Copépodes Harpacticoides des îles du Pacifique. *Notes biospéol.* 10: 89-101.

DAMIAN, A. 1970. Fauna Republicii Socialiste Romania. Copepoda Harpacticoida. *Ed. Acad. Rep. Soc. Romania:* 1-248.

MICHAILOVA-NEIKOVA, M. 1966. Harpacticoida (Copepoda) from the Thracian Lowland. *Bulg. Acad. Sci. Hydrobiol.* 3: 201-216.

— 1967. *Elaphoidella angelovi* n. sp. from a cave in Rhodopes mountains. *Annls. Univ. Sofia* 62 (1): 61-70.

— 1972. A study of the freshwater phreatic Harpacticoida (Crustacea, Copepoda) in Bulgaria. *Annls. Univ. Sofia* 67 (1): 15-30.

PESCE, G. L. 1980. Ricerche faunistiche in acque freatiche delle Marche e stato attuale delle conoscenze sulla fauna interstiziale italiana. Contributo alla conoscenza della fauna delle acque sotterranee dell'Italia centro-meridionale: XIII. *Riv. Idrobiol.* 19 (3): 547-590.

— 1981. Some harpacticoids from subterranean waters of Greece (Crustacea: Copepoda). *Boll. Zool.* 48 (3-4): 263-276.

— 1983. A key to the *Nitocrella* species of the "*hirta*-group", including a new species from phreatic waters of Lesbos, Greece (Copepoda Harpacticoida: Ameiridae). *Bull. zool. Mus. Univ. Amsterdam* 9 (12): 109-113.

— in press. Stygobiological researches in phreatic subterranean waters of Lesbos (Greece). *Fragm. balcan.*

PETKOVSKI, T. K. 1956. Über einige Copepoden aus Höhlen und Grundgewässern Jugoslaviens. *Izdanja* 1: 185-208.

— 1959. Neue und bemerkenswerte Harpacticoide Ruderfußkrebse (Crust. Cop.) aus den Grundgewässern Jugoslaviens. *Acta Mus. maced. Sci. nat.* 6 (5): 101-119.