

Report on the Monogenean *Cyclocotyla bellones* and Three Cymothoids Parasitizing Two Fish Species from the Aegean Sea Coasts of Turkey

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SUMMARY: In this paper, three separate instances of an association between an ectoparasite, *Cyclocotyla bellones* (Otto, 1821) (Monogenea: Diclidophoridae) and ectoparasitic isopods have been reported for the first time from the Aegean Sea coasts of Turkey. The isopods were all of the family Cymothoidae: *Ceratothoa oestroides*, *C. parallela*, *Emetha audouini*.

Key Words: *Cyclocotyla*, *Ceratothoa*, *Emetha*, Turkey

Türkiye'nin Ege Denizi Kıyılarından İki Balık Türünü Parazitleyen Üç Cymothoid Türünden Monogenean, *Cyclocotyla bellones* Üzerine Rapor

ÖZET: Bu çalışmada, Türkiye'nin Ege Denizi Kıyılarından ilk kez, ektoparazit olan *Cyclocotyla bellones* (Otto,1821) (Monogenea: Diclidophoridae) ile ektoparazitik isopodlar arasındaki üç farklı ortak yaşam örneği sunulmuştur. Isopodların hepsi Cymothoidae familyasındandır; *Ceratothoa oestroides*, *C. parallela*, *Emetha audouini*.

Anahtar Sözcükler: *Cyclocotyla*, *Ceratothoa*, *Emetha*, Türkiye

INTRODUCTION

Cyclocotyla bellones (Otto, 1821) (Monogenea, Diclidophoridae) has been found on some cymothoids (Crustacea, Isopoda, Flabellifera) parasitizing several mediterranean fishes. The list of recorded hosts is given by Radujkovic and Euzet (5). *Cyclocotyla louisianensis* also was recently reported on *Livoneca ovalis* and *Menticirrhus saxatilis* from the coasts of USA by Bullard et al. (2), as concern the other monogenean-isopod associations.

Cyclocotyla bellones has been recorded from *Boops boops* in the Aegean Sea by Akmirza (1), but nothing has been published regarding *Cyclocotyla bellones*/cymothoid associations in Turkey.

MATERIAL AND METHOD

45 bogue [*Boops boops* (L.,1758)] and 55 blotched picarel [*Spicara maena* (L., 1758)] were caught using beach seining from Torba Limanı, on the South coast of Turkey (37°04' N and 27°20' E). Parasites (monogeneans and isopods) were collected from the fish and preserved in 70 % alcohol. Monogeneans were cleared in lactic acid and transferred to polyvinyl lactophenol for permanent mounting. Size of parasites was evaluated using an ocular micrometer or from camera lucida drawings. Identification of species was performed according particularly to Euzet and Trilles (3) and Radujkovic and Euzet (5) for monogeneans and to Trilles (6) and Öktener and Trilles (4) for cymothoids.

RESULTS

Along the Aegean Sea coasts of Turkey, specimens of *Cyclocotyla bellones* were collected on the body surface of three buccal parasitic cymothoid species: *Ceratothoa oestroides* (Risso, 1826) and *Emetha audouini* (Milne Edwards, 1840), from *Spicara maena*; *C. parallela* (Otto, 1828) from *Boops boops*.

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Case I: In Turkey, *Ceratothoa oestroides* is recorded from the Mediterranean, the Aegean Sea and the Sea of Marmara parasitizing several fishes, *Spicara maena*, *S. smar*, *Scomber japonicus*, *Boops boops*, *Diplodus annularis*, *D. vulgaris*, *Sparus auratus*, *Raja alba*, *Trachurus mediterraneus*, *Dicentrarchus labrax*, *Mullus surmuletus*, *Sardina pilchardus* (4).

Regarding the *Cyclocotyla bellones*/*Ceratothoa.oestroides*/*Spicara maena* association prevalence, mean intensity, min-max number of parasites, total number of parasites were 25%; 1; 1; 3, respectively.

Case II: *Ceratothoa parallela* was identified in Turkey from the Aegean Sea and the Sea of Marmara on *Boops boops*, *Citharus macrolepidotus*, *Diplodus annularis*, *Spicara maena* (4).

As regards the *Cyclocotyla bellones* / *Ceratothoa Parallela* / *Boops boops* association, prevalence, mean intensity, min-max number of parasites, total number of parasites were 23 %; 1,3; 1-2; 4, respectively.

Case III: In the Turkish waters, *Emetha audouini* is known from the Aegean Sea and the Sea of Marmara infecting *Spicara maena*, *Spicara smar*, *Boops boops* (4).

For the *Cyclocotyla bellones*/*Emetha audouini*/*Spicara maena* association, prevalence, mean intensity, min-max number of parasites, total number of parasites were 50%; 1; 1; 2, respectively.

DISCUSSION

Ceratothoa oestroides, *C. parallela*, *Emetha audouini* are new host records for *Cyclocotyla bellones* in Turkish waters.

In this study, it is shown that in Turkey, *Cyclocotyla bellones* is associated with the same species of Cymothoids identified in other Mediterranean areas. Prevalences are quite similar to those reported by Euzet and Trilles (3) in the Western Mediterranean: *Ceratothoa oestroides*, 44%, *C. parallela*, 14 %, *Emetha audouini*, 31%, *C. oxyrhynchaena*, 20%. However, they are very different from the prevalence 6.25% mentioned by Radujkovic and Euzet (5) for the Montenegro.

REFERENCES

1. **Akmırza A**, 1998. Parasites in Bogue (*Boops boops* L.,1758). *J Ege Univ Aquatic Sci*, 15(3-4): 183-198.
2. **Bullard SA**, Soto A, Overstreet RM, 2000. *What the heck is going on: observations of Cyclocotyla louisianensis on Livoneca ovalis and Menticirrhus saxatilis*. Late breaker session of the American Society of Parasitologists and the Society of Nematodologists, Monterey, California. June 28 th. Abstract.
3. **Euzet L, Trilles JP**, 1961. Sur l'anatomie et la biologie de *Cyclocotyla bellones* (Otto, 1821) (Monogenea-Polyopisthocotyla). *Rev Suisse Zool*, 68(9-28): 182-193.
4. **Öktener A, Trilles JP**, 2004. Report on the Cymothoids (Crustacea, Isopoda) collected from marine fishes in Turkey. *Acta Adriat.*, 45(2): 145-154.
5. **Radujkovic BM, Euzet L**, 1989. Parasites des poissons marins du Montenegro: Monogenes. *Acta Adriat*, 30(1-2): 51-135.
6. **Trilles JP**, 1972. Les Cymothoidae (Isopoda, Flabellifera) des côtes françaises (Systématique, faunistique, écologie et répartition géographique). I-Les Ceratothoinae Schioedte et Meinert, 1883. *Bull Mus Natin Hist Nat*, Paris, 3ème série, N° 91 (Zool. 70): 1191-1230.