

1-1-2004

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POLAT, SEVİM (2004) "New Record for a Dinoflagellate Species (*Citharistes regius* Stein) in the Northern Levantine Basin (Eastern Mediterranean)," *Turkish Journal of Botany*. Vol. 28: No. 5, Article 5. Available at: <https://journals.tubitak.gov.tr/botany/vol28/iss5/5>

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New Record for a Dinoflagellate Species (*Citharistes regius* Stein) in the Northern Levantine Basin (Eastern Mediterranean)

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Received: 30.10.2003

Accepted: 08.03.2004

Abstract: The presence of a dinoflagellate species, *Citharistes regius* Stein belonging to genus *Citharistes* Stein, is reported for the first time from the eastern Mediterranean coast of Turkey. This species is also a first report for all Turkish seas and the Levantine Basin. Morphological characteristics of this species are described in detail and information about its ecological distribution is given.

Key Words: *Citharistes regius*, dinoflagellate, phytoplankton, Levantine Basin, eastern Mediterranean.

Kuzey Levantin Baseni'nde (Doğu Akdeniz) Bir Dinoflagellat Türü (*Citharistes regius* Stein) İçin Yeni Kayıt

Özet: Dinoflagellatlardan *Citharistes* Stein cinsine ait *Citharistes regius* Stein türü Türkiye'nin doğu Akdeniz kıyısız sularında ilk kez rapor edilmiştir. Bu tür aynı zamanda tüm Türkiye denizleri ve Levantin Baseni için ilk kayıttır. Bu çalışmada, *C. regius* türünün morfolojik özellikleri ayrıntılı olarak açıklanmış ve ekolojik dağılımı ile ilgili bilgiler verilmiştir.

Anahtar Sözcükler: *Citharistes regius*, dinoflagellat, fitoplankton, Levantin Baseni, doğu Akdeniz.

Introduction

The dinoflagellates are important members of the marine phytoplankton. They are predominantly unicellular, eukaryotic, flagellated organisms including photosynthetic and non-photosynthetic members (Taylor, 1987). The number of living species of dinoflagellates is estimated to be about 2000, and more than 50% of the thecate dinoflagellates of the world oceans are represented in the Mediterranean Sea (Kimor, 1983).

The Levantine Sea is a sub-basin located in the south-eastern corner of the Mediterranean Sea. This area is described as the most oligotrophic part of the Mediterranean Sea. This oligotrophy results in low species diversity compared to that of the western Mediterranean. The high temperatures prevailing in the eastern Mediterranean, especially compared to its western basin, give this region a tropical character with regard to planktonic biota (Kimor, 1983). The dinoflagellates in the Mediterranean consist of cosmopolitan eurythermal species, together with tropical-

subtropical species and a small group of autochthonous Mediterranean forms (Halim, 1990). The migration of Red Sea and even Indopacific species into the Mediterranean Sea through the Suez Canal contributes to the increased plankton diversity in the eastern Mediterranean. In addition, marine vessels play an important role in the transportation of phytoplankton from one site to another.

A dinoflagellate species, *Citharistes regius* Stein, is reported for the first time from the eastern Mediterranean coast of Turkey. Information about its morphology and ecology is provided.

Materials and Methods

Phytoplankton identification was performed from the net samples taken from İskenderun Bay (lat. 36° 41' N – 36° 44' N and long. 35° 52' E – 35° 49' E), on the eastern Mediterranean coast of Turkey (Figure 1). Sampling was conducted in late winter 2001. Samples

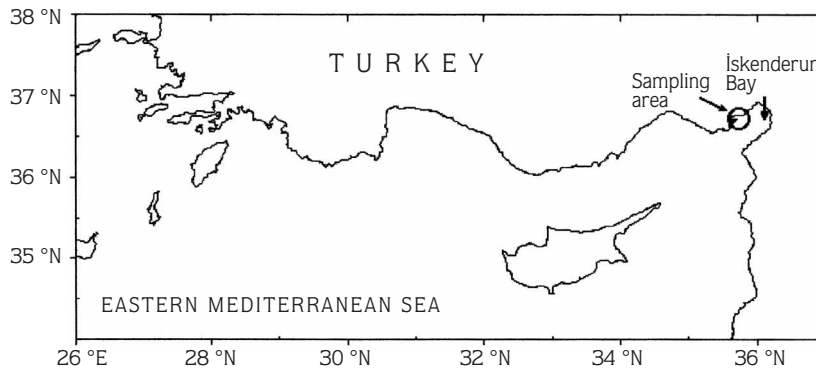


Figure 1. The location of the sampling area.

were taken from surface water using a standard plankton net with a 55 μm mesh size. The samples were preserved in 4% formaldehyde solution. Surface water temperatures were between 16.5 and 17.5 $^{\circ}\text{C}$ and salinity was between 37 and 38‰ during the sampling time. An Olympus BX-50 phase-contrast microscope was used in the identification of the species and photomicrography. For identification and taxonomy Wood (1968), Taylor (1976), Rampi & Bernhard (1980), Balech (1988), Tomas (1997) and Fensome et al. (1993) were used as references.

Results and Discussion

The dinoflagellate species *Citharistes regius* is very rare and only a few specimens have been found. The taxonomy of this species is as follows:

Division: *Dinoflagellata*

Subdivision: *Dinokaryota*

Class: *Dinophyceae*

Subclass: *Dinophysiphyidae*

Order: *Dinophysiales*

Family: *Dinophysiaceae*

Genus: *Citharistes* Stein 1883

Citharistes is a unique genus consisting of two species. The cell body is C-shaped with the dorsally excavated hypotheca forming a phaeosome (symbiont) chamber. Its posterior margin is semicircular and its girdle is strongly anterior. The anterior girdle list is wide and flaring

whereas the posterior girdle list is narrow (Wood, 1968). The species of this genera are heterotrophic and they do not have chloroplasts. They form symbiotic associations with cyanobacteria (Gordon et al., 1994).

Citharistes regius Stein

This is a rare species. It has a C-shaped body in right lateral view ranging from small to medium size. Cell surface is areolate with pores. The left sulcal list extends with ribs from the posterior girdle area to the vicinity of the posterior of the cell. This species is distinguished from *Citharistes apsteinii* Schütt in that its phaeosome chamber is smaller. *C. regius* is an oceanic species and is distributed in tropical, subtropical and temperate seas (Wood, 1968; Tomas, 1997). Cells are 38-40 μm long and 22-25 μm wide (Figure 2 a,b).

C. regius has been reported from the south-west Atlantic and western Mediterranean (Rampi & Bernhard 1980; Balech, 1988). This species has not been recorded in Turkish seas (Koray et al., 1999; Koray, 2001) or the Levantine Sea (Gomez, 2003) before.

One weak possibility is that it was not encountered in the previous studies. It is also possible that it has recently been transported into the eastern Mediterranean through the Suez Canal or via ballast waters. Subtropical characteristics of the eastern Mediterranean such as high temperatures and salinity may favour the acclimatisation of tropical species. In addition, the progressive warming of the Mediterranean Sea might have caused a change in biodiversity and an increase in warm-water species

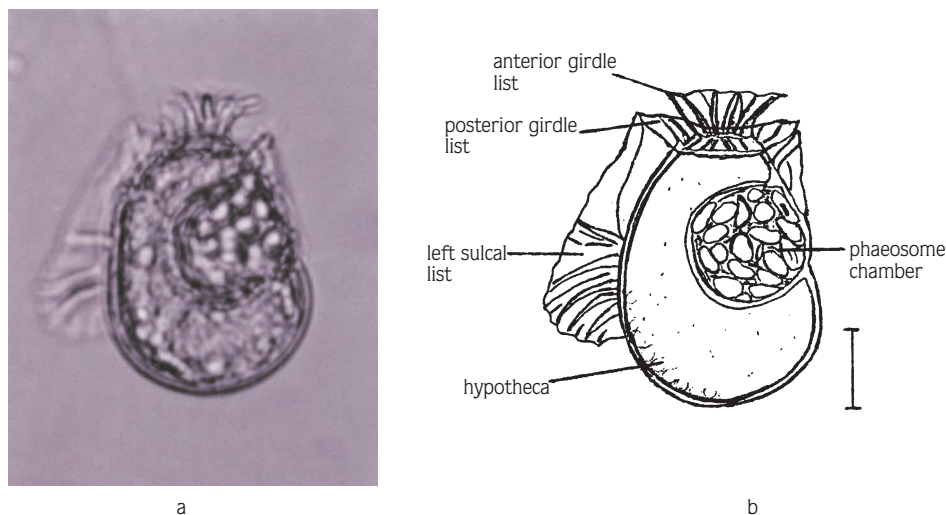


Figure 2. a) Light microscopy photograph of *Citharistes regius*, b) Cell structure details (original) (Scale 10 μ m).

(Gomez&Claustre, 2003). The investigation of phytoplankton communities of the eastern Mediterranean is receiving greater attention as regards observing the variation of biodiversity in this changing environment.

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Acknowledgements

The author would like to thank Prof. Dr. Tufan Koray for his valuable advice during the preparation of the manuscript.