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New Records of the Genus *Histioneis* F.R. von Stein (*Dinophyceae*) from Turkish Coastal Waters

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Abstract: The dinoflagellate genus *Histioneis* F.R. von Stein 1883 and six species belonging to this genus are reported for the first time from the coastal waters of Turkey (north-eastern Mediterranean, lat. 36° 06' N - 36° 07' N, long. 33° 28' E - 33°30' E). Descriptions of the species *Histioneis depressa* J.Schiller, *H. expansa* L.Rampi, *H. para* Murray & Whitting, *H. marchesonii* L.Rampi, *H. striata* Kof. & J.R.Michener and *H. elongata* Kof. & J.R.Michener are given.

Key Words: *Histioneis*, dinoflagellate, phytoplankton, Turkey.

Türkiye Kıyusal Sularında Dinoflagellat Cinsi *Histioneis* F.R. von Stein (*Dinophyceae*) Üzerine Yeni Kayıtlar

Özet: Bu çalışmada dinoflagellatlara ait *Histioneis* F.R. von Stein 1883 cinsi ve bu cinsine ait altı tür Türkiye kıyusal sularında (Kuzeydoğu Akdeniz, enlem: K 36° 06' - K 36° 07', boylam: D 33° 28' - D 33° 30') ilk kez rapor edilmiştir.

Bu cinsine ait *Histioneis depressa* J.Schiller, *H. expansa* L.Rampi, *H. para* Murray & Whitting, *H. marchesonii* L.Rampi, *H. striata* Kof. & J.R.Michener, *H. elongata* Kof. & J.R.Michener türlerinin betimleri verilmiştir.

Anahtar Sözcükler: *Histioneis*, dinoflagellata, fitoplankton, Türkiye.

Introduction

The genus *Histioneis* F.R. von Stein is a characteristic member of *Dinoflagellata* (Bütschli, 1885) Fensome et al., 1993b. The genus *Parahistioneis* Kofoid & Skogsberg has been accepted as a synonym of *Histioneis* (Sournia, 1986). This genus is characterized by a very variable form and occurrence preferentially in deeper layers and as a consequence little is known of the individual variabilities of the species, their detailed morphology and or their bio-geographic distribution (Taylor, 1976).

From the biogeographical point of view, a total of about 40 species from this genus have been recorded from the world's oceans (Abé, 1967); however, only nine species from the Indian Ocean (Taylor, 1976), 13 species from the south-west Atlantic Ocean (Balech, 1988) and 18 species from the Mediterranean (Rampi and Bernhard, 1980) are really valid. There are no records of the genus *Histioneis* or species previously recorded in Turkish seas (Koray et al., 1999).

The aim of this study is to add this genus and its six species to the regional check-list of the microplankton species of Turkish seas.

Materials and Methods

The samples were collected from Babadillimanı Bight (Silifke-İçel) off the north-eastern Mediterranean coast of Turkey (lat. 36° 06' N - 36° 07' N, long. 33° 28' E - 33° 30' E). The study area and the location of the sampling points are shown in Figure 1. The phytoplankton samples were collected from surface water with a 55 µm. mesh standard plankton net and the samples were preserved in 4% formaldehyde. An Olympus BX-50 phase-contrast research microscope was used for identification of the species and photomicrography. For identification and taxonomy Schiller (1933), Wood (1968), Taylor (1976, 1987), Rampi & Bernhard (1980), Balech (1988), Tomas (1997) and Fensome et al. (1998) were used.

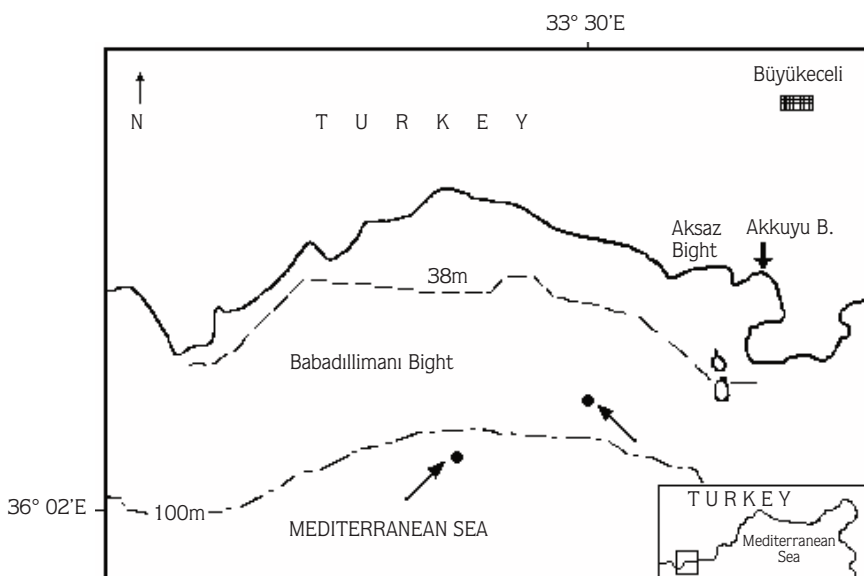


Figure 1. The study area and the location of sampling points.

Results and Discussion

The six species identified were very rare specimens in the surface samples. All species were found during winter sampling (temperature 16.6 °C, salinity 36.7‰).

The taxonomy of this genus and the species are given as follows (Fensome et al., 1998):

Division: Dinoflagellata

Subdivision: Dinokaryota

Class: Dinophyceae

Subclass: Dinophysiphysidae

Order: Dinophysiales

Family: Dinophysiaceae

Histioneis F.R. von Stein 1883

The genus is characterized by a very variable form and an anteroposteriorly flattened body, oval from lateral view, approximately as high as wide, thick, often similar to Y or L shapes. *Histioneis* cells show asymmetry and the left side of the body tends to display enlargement relative to the right side. Therefore, the left sulcal list is more developed than the right sulcal list. Furthermore, the girdle lists project forward apically much more (Taylor, 1987). The cingulum has a very long dorsal edge, is almost horizontal and very concave. The two girdle lists are robust and symbiotic cyanobacteria usually occur between the lists.

For the identification of the species, the cell size and shape, ribs on the left sulcal list, features of the girdle list and structure of hypothecal wall are important characteristics. The epitheca has been reduced to a minute disc in this genus.

H. depressa J.Schiller

The cells are small and are reniform in lateral view. The left sulcal list is directed dorsally. Total length of the cells 60-65 µm, width 20-25 µm. (Fig. 2, a).

H. expansa L.Rampi

A relatively large species, cells 60-65 µm in total length, 25-30 µm in width. The left sulcal list is enlarged. The upper girdle list is also a prominent structure (Fig. 2, b).

H. para Murray & Whitting

The strong reticular structure on the hypotheca is clear and the posterior side of the hypotheca is ovoid rather than rounded. Furthermore, the girdle lists show enlarged structure. Total length 75-85 µm, width 30-35 µm (Fig. 2, c).

H. marchesonii L.Rampi

A small species which has a rounded body in lateral view. Upper girdle list is extended forward. Cells 38-40 µm in length, 18-20 µm in width (Fig. 2, d).

H. striata Kof. & J.R.Michener

A small species which has a rounded body. The left sulcal list shows expanded structure and the ribs on the list are prominent. Cells 40-45 μm in length, 18-20 μm in width (Fig. 2, e).

H. elongata Kof. & J.R.Michener

This species has a characteristic left sulcal list. The list is extended to the posterior side of the cell and the end of this part has a pointed structure. Length of the cells 110-120 μm , width 35-40 μm (Fig. 2, f, g).

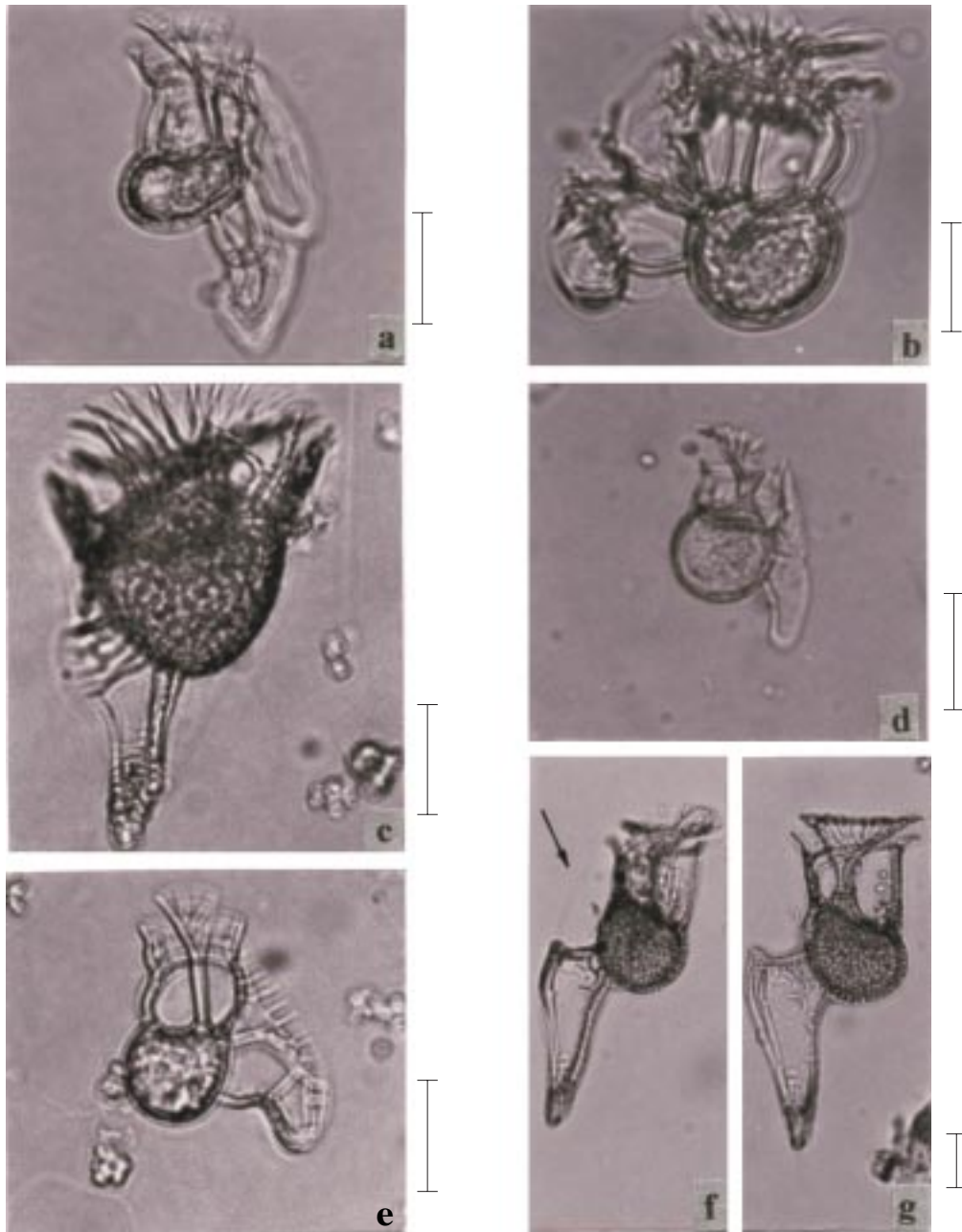


Figure 2. Microscopic photographs of *Histioneis* species.
 a. *H. depressa*, b. *H. expansa*, c. *H. para*, d. *H. marchesonii*, e. *H. striata*, f, g. *H. elongata* (same specimen), there is a hardly visible extension between the lower girdle list and left sulcal list (scale 20 μm).

All members of this genus are known as warm to temperate species. However, because of their rare occurrence, transparency of the body and small cell sizes, species of this genus may have been neglected in previous studies carried out in the north-eastern Mediterranean. On the other hand, although there have been a number of studies conducted in the bays of İskenderun and Mersin, studies on the north-eastern Mediterranean coast are especially scarce. Consequently, the recording of these species for the first time in this study may be related to the lack of adequate studies in this area. Another possibility is that these species may have recently been

transported to the area by effective current systems. The previous record of this genus in the eastern Mediterranean (Kimor and Wood, 1975) leads to the assumption that this genus may have been transported by the current systems. According to Halim (1990) the Suez Canal plays a major role in the migration to the Mediterranean of Red-Sea and Indo-Pacific dinoflagellates such as the genus *Histioneis*. In addition, it also should be pointed out that in recent years ballast waters may have caused the transportation of marine organisms from one site to another.

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