Anders Langangen

Charophytes from some Aegean islands (Khios, Lesvos and Limnos) in Greece

Abstract

Langangen, A.: Charophytes from some Aegean islands (Khios, Lesvos and Limnos) in Greece. — Fl. Medit. 18: 379-384. 2008. — ISSN 1120-4052.

In this article charophytes are reported from the three Aegean Islands, Khios, Lesvos and Limnos, where they have been found in freshwater, brackish water and in saline lakes. Chara vulgaris was found in four freshwater localities in Khios. One of these is a spring where also Chara gymnophylla was found. This find is interesting as the species is rare in the Greek islands. In Limnos the brackish water species Chara canescens and Lamprothamnium papulosum were found. Two of the localities here were saline lakes. One of these saline lakes, Asprolimni lake has no traces of human activities, and should be protected as a reference locality for saline lakes in Greece.

Key words: Saline lake, *Lamprothamnium papulosum*, *Chara canescens, C. vulgaris, C. gymnophylla.*

Introduction

In the summer of 2007 I visited the Aegean islands Khios, Lesvos and Limnos (Fig. 1). Charophytes were found on all the islands, in freshwater, brackish water and saline lakes. Charophytes are of special interest, as most of the species are biological indicators for water quality. As the knowledge of the Greece charophyte flora is relatively poor (Koumpli-Sovantzi 1997), I here present my observations.

Materials and Methods

The specimens collected are deposited at the Botanical Museum, University of Oslo (Herb. O). Literature used for determination is Wood & Imahori (1964), Wood (1965) and Krause (1997). The salt content and conductivity was measured with a Hack conductivitimeter (Model 44600/CND/TDS). Calcium was measured with Aquamerck 11110 Calcium.

Fig. 1. Location of the visited islands.

Table 1. Salt content, conductivity, calcium and charophytes in the examined localities.

Locality	**Salt content %**	**Conductivity uS/cm**	**Ca^{2+} mg/L**	**Charophytes**
Khios *Viki*	-	346	22	*Chara vulgaris*
Khios *Diefcha*	-	654	100	*C. vulgaris, C. gymnophylla*
Khios *Zifias*	-	616	30	*C. vulgaris*
Lesvos *Messa*	4.1	-	-	*C. canescens*
Limnos *Asprolimni*	3.3	-	-	*C. canescens, Lamprothamnium papulosum*
Limnos *Alyki*	-	-	-	*L. papulosum*

Results

The localities

Khios

Freshwater dam by Viki

Half of the bottom in this dam is covered with plastic, the rest has a soil bottom where *Chara vulgaris* grew scattered in open places and in dense stands in more protected places. In a nearby tank connected to the inlet the species grew in a small, compact stand.

Spring by Diefcha

This is a small brook coming from a spring. In very shallow parts, close to a road edge several small specimens of *Chara vulgaris* were found (Fig. 2). In slightly deeper water, also close the road I found dense stands of *Chara gymnophylla*. This is a unusual locality for charophytes.

Zifias dam

This old water reservoir is today polluted and eutrophicated. The growth of filamentous algae is conspicuous. Scattered, single specimens of *Chara vulgaris* were found along the shore.

Fig. 2. The locality, seen from the road. X- *Chara vulgaris*, XX- *C. gymnophylla*.

Lesvos

Messa (brackish water lagoon under the bridge at the road crossing)

This is a shallow brackish water lagoon filled up with vegetation, mostly *Ruppia maritima* and *Chara canescens*. The area where this lagoon is situated seems to be under development, which perhaps can be a threat for the locality. A nearby lake, 700 m southeast from the lagoon is used for husbandry and is heavily polluted, and filled with *R. maritima.* No charophytes were found here.

C. canescens has also been reported from the island by Koumpli-Sovantzi (1997).

Limnos

Alyki lake (*Almyra*)

This is the largest saline lake on the Greece islands. It is surrounded by belts of different halophytes or salt plants.

When I visited the lake, the water level was very low and large parts of the shore were covered with white salt crystals (Fig. 3). On wet soil I found parts of *Ruppia maritima* and the charophyte *Lamprothamnium papulosum* with both bulbils and oogonia. The lake is regulated and the condition for the charophytes not optimal.

Asprolimni lake

This is a relatively small saline lake, with shallow water and white salt shores. On the grey-white bottom I found small, transparent species of *Lamprothamnium papulosum* They were only a few cm high and had numerous ripe, black oospores. Among these specimens I found small fragments of *Chara canescens*, also with black, ripe oospores.

This lake is not affected by any visible human activity. But there is a beginning development on a nearby beach, and therefore the lake should be protected.

Another nearby lake, Hortaralimni lake, has unfortunately been drained out, and is today dry land.

Fig. 3. Alyki lake, east part.

The charophytes

Of the six examined localities with charophytes four are freshwater, one is brackish water and two are saline lakes (Langangen 2004).

Lamprothamnium papulosum (Wallroth) J. Groves.

This species was found in two saline lakes in Limnos, Alyki and Asprolimni. In Alyki lake the water level was very low and only fragments of the alga were found. In Aspolimni lake the plants were up to 4-5 cm long. They were transparent, without chlorophyll, but had numerous ripe, black oospores.

Chara canescens Desvaux & Loiseleur

Chara canescens was found as small fragments among specimens of *L. papulosum* in Asprolimni lake. In Lesvos the conditions were better, and in a brackish water lagoon I found 10-20 cm long specimens, which were very rich fertile and had large quantities of ripe oospores. The specimens studied had shorter branchlets than the normal type.

Chara vulgaris Linne

This species was found in three localities in Khios. In the localities in Viki and Zilias dam I found *C. vulgaris* f. *longibracteata*. The species was best developed in Viki, where I found specimens up to 16 cm long. In a nearby tank specimens were up to 30 cm long, rich fertile and with plenty of ripe, brown oospores. The specimens found in the spring by Diefcha were small, compact, and up to 6 cm long, rich fertile and with ripe, brown oospores. The bract cells were verticillate and the spine cells were long and depressed against the stem.

Chara gymnophylla A. Braun

This species was found in Khios, in a natural spring. The species grew together with *Chara vulgaris* and the locality would be suitable to study the difference between these two species. As the species is rare in the islands I have described my finds in more details below.

Plants up to 13 cm long and stem diameter to 0.8 mm. Moderately incrusted and green in colour. The internodes are 1-2 times as long as the branchlets (up to 10 mm long). The cortex is regularly diplostichous, aulacanthous. The spine cells are scattered, varying from short (papillous) to long (up to 3.5 mm) and always single. The stipulodes are well developed, the upper to 2 mm, the lower to 1.5 mm long. The branchlets are 8-10 in a whorl, and have 2-3 segments which are up to 10 mm long. The branchlets were normally without cortex. In one single specimen I found partly developed cortex in one lowest branchlet segment.

The number of bract cells are 6, and they are more or less verticillate and up to 10 mm long. The plants are monoecious and richly fertile. The gametangia are conjoined. The oogonia are up to 1 mm long and the oospores to 0.5 mm long, brown. The antheridia are 0.5 mm in diameter.

Discussion

In summer 2007, I visited three of the Aegean Islands. I found charophytes in six localities, three fresh water in Khios, one brackish water in Lesvos and two saline lakes in Limnos (see Table 1). The saline lakes were of the same type as in the Cyclades (Langangen 2004, 2007). *Lamprothamnium papulosum* is a common species in such localities, but in Asprolimni lake (Limnos) I found it in association with *Chara canescens*.

Of special interest is the locality by Diefcha in Khios. In a shallow spring here, I found two closely related species, *Chara vulgaris* and *C. gymnophylla*. The most obvious difference between these two species is the branchlet cortication, which is lacking in *C. gymnophylla*. A closer examination of specimens from this locality, could perhaps reveal intermediate forms. Several authors have *C. gymnophylla* as a subspecies or variety of *C. vulgaris* (Wood 1965; Corillion 1957; Moore 1986).

Charophytes are rare in the Greek islands, and in these Aegean islands I have found six localities. Asprolimni lake in Limnos is nearly unaffected by human activities and is a typical salt lake. Therefore it should be protected as a type for salt lakes in Greece.

Acknowledgements

I am indebted to Professor Henry Mann, Memorial University of Newfoundland, who has helped me with the language.

References

Corillion, R. 1957: Les Charophycees de France et d'Europe Occidentale. – Angers.

Koumpli-Sovantzi, L. 1997: The charophyte flora of Greece, I. – Fl. Medit. **7:** 173-179.

Krause, W. 1997: *Charales* (*Charophyta*): Band 18 in Süsswasserflora von Mitteleuropa. – Jena.

Langangen, A. 2004: Charophytes from four Cyclade Islands (Mykonos, Naxos, Paros and Antiparos) in Greece. – J. Biol. Res. **1:** 31-38.

— 2007: Some charophytes from the Western Cyclades (Greece). – J. Biol. Res. **7:** 109-113.

Moore, J. 1986: Charophytes of Great Britain and Ireland. – BSBI Handbook No. 5. – London.

Wood, R. D. 1965: Monograph of the *Characeae.*– in: Wood R. D, & Imahori K, eds. Revision of the *Characeae*. –Weinheim.

— & Imahori, K. 1964: Iconograph of the *Characeae*. – in: Wood R. D, & Imahori K, eds. A revision of the *Characeae*. – Weinheim.

Address of the author:
Anders Langangen,
Hallagerbakken 82b, 1256 Oslo, Norway. E-mail: alangang@getmail.no