

ISSN 1996-3351

Asian Journal of  
**Biological**  
Sciences

## ***Ulva multiramosa* sp. nov.: A New Interpretation of *Enteromorpha multiramosa* Bliding Ined. (Chlorophyta)**

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### **ABSTRACT**

*“Enteromorpha multiramosa”* was proposed but was invalid because a type was not designated. The name *Ulva multiramosa* sp. nov. (Ulvaceae, Chlorophyta) is validated on the basis of collections from Ayvalik, Turkey (Aegean Sea).

**Key words:** Chlorophyta, green algae, Aegean Sea, *Ulva multiramosa* sp. nov., Ulvaceae

### **INTRODUCTION**

*“Enteromorpha multiramosa”* was proposed by Bliding (1960) but his failure to cite a holotype rendered that name invalid. Bliding based his species account on two syntype collections, namely, from Split (Croatia) in September 1957 and Naples (Italy) in March 1958. The thalli were stated to be a few cm high (2 cm), very ramified, with mostly opposite, often verticillated branches. *Enteromorpha multiramosa* has been recorded from the Adriatic, Spain, Morocco, the Balearic Islands, Corsica, France, Italy, Greece (Gallardo *et al.*, 1993), the Canary Islands (Haroun *et al.*, 2002; John *et al.*, 2004), the Salvage Islands (John *et al.*, 2004), South Africa (Silva *et al.*, 1996), Papua New Guinea (Coppejans *et al.*, 2001) and Fiji (Nyeurt *et al.*, 1996; South and Skelton, 2003), Brazil (Villaca *et al.*, 2010). Earlier report of *E. ramulosa* from Lord Howe Island was later described by Kraft (2000), as the new species *Ulva polyclada* and distinguished from the Bliding taxon (Kraft, 2007).

Hayden *et al.* (2003) reported that *“Enteromorpha multiramosa”* was not validly published because Bliding did not indicate a type as required by the Code ICBN (2006) (Art. 37.1). Bliding (1963) subsequently indicated that the holotype of *E. ramuosa* was in “Bot. Mus. Univ. Lund” but this also is not an indication of the type.

In this study, *Ulva multiramosa* sp. nov. (Ulvaceae, Chlorophyta) is described on the basis of collections from Ayvalik, Turkey (Aegean Sea).

### **MATERIAL AND METHODS**

Collections of the proposed new species of *Ulva* were made in the midlittoral zone at Ayvalik, Turkey (Aegean sea) by snorkeling, in March, 2011. The specimens were preserved in 4% formalin in seawater. Voucher specimens are deposited in the botanic garden and Herbarium center, Ege University, Izmir, Turkey (EGE, holotype) and the personal Herbarium of the author. Specimens were studied using light microscopy (Nikon SE) and photographs were taken with an Olympus PM-C35 mounted on an Olympus BX 50 microscope. Magellan SporTrak Color GPS device was used to measure the co-ordinates of the collection site.

## RESULTS AND DISCUSSION

*Ulva multiramosa* E. Taskin, sp. nov. (Fig. 1a-c)

**Diagnosis:** Plantae ad 2 cm longa, cum habitu epilithico; laete viridis; ramificatio opposito, in cellulis quadratus, rectangula, leviter polygoniae in parte media, 30-45  $\mu\text{m}$  longa, 20-26  $\mu\text{m}$  lata, in longitudinem thallus basi, et maxime pueris in ramis quadratus; pyrenoidibus 2-6 in quaque cellula.

**Holotype:** One kilometer west Ayvalik city centre (39°18'43"N; 26°41'03"E), Turkey (Aegean sea), 20 March, 2011, collected by E. Taskin, 1 m depth. It was deposited in EGE 41066 (Herbarium, Ege University, Izmir, Turkey). A microscope slide of the type specimen is treated as an isotype and also deposited in EGE 41067 Seawater temperature: 15°C, salinity: 37%. Other species that were present at the collection site: *Cladophora* spp., *Dictyota dichotoma* (Hudson) J.V. Lamouroux, *Kuckuckia spinosa* (Kutzing) Kornmann, *Ectocarpus siliculosus* (Dillwyn) Lyngbye, *Asperococcus fistulosus* (Hudson) W. J. Hooker, *Corallina elongata* J. Ellis et Solander, *Laurencia obtusa* (Hudson) J.V. Lamouroux, *Padina pavonica* (L.) Thivy, *Stictyosiphon adriaticus* Kutzing, *Striaria attenuata* (Greville) Greville, *Scytosiphon lomentaria* (Lyngbye) Link, *Stypocaulon scoparium* (L.) Kutzing, *Ulva* spp., *Zostera* sp.

Plants are 2 cm long (Fig. 1), axes 150-300 inches diameter, with an epilithic habitat; light green in color; mostly oppositely branched (Fig. 1); the cells quadrangular, rectangular and slightly polygonal in the middle part, 30-45 inches long and 20-26 inches broad, longitudinal at base of thallus and mostly quadrangular in the young branches; pyrenoids 3.5-4 inches diameter, 2-6 per cell (Fig. 1c).

**Etymology:** From the Greek *multi*-(many) and *ramosa* (branching).

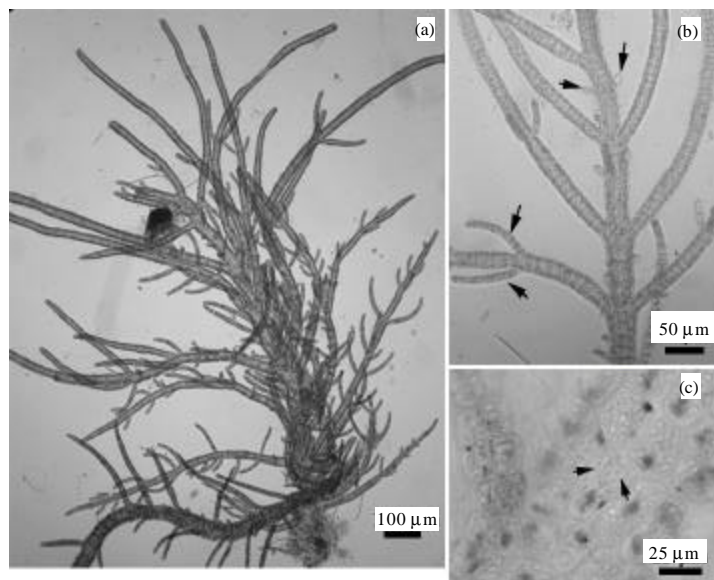


Fig. 1(a-c): *Ulva multiramosa* sp. nov. (a) General view of plant, (b) branching and young branches (arrows) and (c) the cells in surface view and pyrenoids (arrows)

**Type species of genus:** *Ulva lactuca* Linnaeus (1753).

At present, *Ulva* contains 101 taxa (species and infraspecific). The check-list by Gallardo *et al.* (1993) reported 39 taxa of *Ulva sensu lato* at the specific and infraspecific level in the Mediterranean sea. The first paper in which marine algae from Turkey were reported is that by Forsskal (1775) who recorded *Ulva intestinalis* L. from the islands of Gokceada and Bozcaada (Aegean sea, Turkey).

## CONCLUSION

In light of the proposal by Hayden *et al.* (2003) to merge *Enteromorpha* with *Ulva*, a revised list of the taxa of the Ulvaceae occurring in Turkey was reported by Taskin (2007) who reported a total of 25 taxa from Turkey.

In this study, green alga *Ulva multiramosa* sp. nov. (Ulvaceae, Chlorophyta) is described on the basis of collections from Turkey.

## ACKNOWLEDGMENT

I am grateful to Prof. Michael J. Wynne (University of Michigan, Ann Arbor, USA) for critically reviewing the manuscript and for nomenclatural information.

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