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Two new combinations for the endemic taxa of *Ulva* from India

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भारत से *अल्वा* के स्थानिक प्रजातियों के लिए दो नवीन संयोजन

अरोन संतोष कुमार वाई एवं पलनिसामी एम

सारांश

क्लोरोफायसी के अंतर्गत अल्वेलस श्रेणी में *अल्वा* एक अति महत्वपूर्ण वंश है इस वंश का अधिकांश द्विपद नामकरण अनिश्चित होते हैं। आण्विक अध्ययन के मतानुसार *अल्वा* एवं *इंटेरोमोर्फा* मूल प्रकृति में पेराफायलेटिक होते हैं। अतः वंश *इंटेरोमोर्फा* को *अल्वा* में स्थानांतरित किया गया। हालाँकि, भारत से प्राप्त *इंटेरोमोर्फा* के स्थानिक प्रजातियों को इस जाति के परिग्रहण पर रिक्तिका होने के कारण वंश *अल्वा* के रूप में मान्यता नहीं दिया गया है। अतः वर्त्तमान का यह प्रयास इंटेरोमोर्फा वंश के *अल्वा* यथा *अल्वा गुजरातेंसिस* (एस.आर. काले) ए.एस. कुमार एवं पलनिसामी एवं *अल्वा लिंजा* प्रभेद *बाइकोर्नुटा* (एच. जोशी एवं वी. कृष्णन) ए.एस कुमार एवं पलनिसामी के अंतर्गत स्थानिक प्रजातियों के दो नवीन संयोजनों के प्रस्ताव पर केंद्रित है।

ABSTRACT

Ulva is an imperative genus of the order Ulvales under Chlorophyceae. Most of the binomials of this genus are uncertain in status. Molecular study opined that, genera *Ulva* and *Enteromorpha* are paraphyletic in origin. Hence, genus *Enteromorpha* was transferred to *Ulva*. However, the endemic taxa of *Enteromorpha* from India have not been authenticated to the genus *Ulva,* due to the lacuna on the accession of the species. Therefore, the present endeavour is focused on the proposal of two new combinations for the endemic taxa under *Ulva* namely *Ulva gujaratensis* (S.R.Kale) A.S. Kumar & Palanisamy and *Ulva linza* var. *bicornuta* (H.Joshi & V.Krishnam.) A.S. Kumar & Palanisamy from the genus *Enteromorpha* in India.

Keywords: Combination nova, Endemic taxa, *Enteromorpha*, Paraphyletic origin, *Ulva*

INTRODUCTION

The genus *Ulva* L. is generally referred as sea lettuce; it is a thallophytic, green algae exhibit ubiquitous distribution ranges from tropical to temperate regions with exclusive environment. Taxonomically, it has been placed under the order Ulvales belongs to the family Ulvaceae of Chlorophyceae and treated as feminine genus. This genus has the morphological plasticity and variability expressed in many taxa (Hayden & al., 2003). The historical event of *Ulva* is notable and made a discrepancy concept on this genus.

Ray (1724) has defined this genus as "Leafy moss" in *Synopsis Methodica*. The genus name *Ulva* was proposed by Linnaeus (1753) with 9 species under the section cryptogams. Later, Gleditsch (1764) mentioned this algal group to the class Algacea in *Systema Plantarum*. Link (1820) has recommended a new generic concept towards splitting of the monostromatic blades with tubular thallus as *Enteromorpha* and distromatic blades with flattened thallus as *Ulva*. After so long, Papenfuss (1960) carried out the remarkable contribution on the order Ulvales and lumped the unrelated taxa of *Ulva* to other genera. Also, he stated on Linnaeus's diagnosis of *Ulva* and suggested for the typification of *Ulva* and *Enteromorpha* by *E. intestinalis.* But, the genus *Ulva* is recently conserved with *U. lactuca* L. (Greuter & al., 2000). Earlier studies and researches on this genus were treated *Ulva* into two distinct genera i.e., *Enteromorpha* and *Ulva*.

The molecular study towards the uncertain status of these genera was resulted to transfer the genus *Entermorpha* into *Ulva* on the basis of the similarity of the ITS nrDNA

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sequences from 29 taxa which examined the similar molecular orientations, simple morphology and high degree of phenotypic plasticity (Hayden & al., 2003). Hence, genus *Enteromorpha* was transferred to *Ulva*. There are about 412 binomials were proposed and 148 taxa have been legitimated under this genus on the basis of standard literature (Guiry & Guiry, 2021). Among them, 31 taxa have been reported from India (Rao & Gupta, 2015).

Binomials of *Enteromorpha* are currently regarded as synonyms of other valid names and applied for current usage (Kumar & Palanisamy, 2021). Hayden & al., (2003) have not transferred the Indian binomials of *Enteromorpha* into *Ulva* due to the lacuna towards assessment of types for the identity of the taxa. However, the distribution and diversity of these endemic taxa were regularly reported in different decades (Silva & al., 1996; Krishnamurthy, 2000; Oza & Zaidi, 2001; Jha & al., 2009; Rao & Gupta, 2015).

In India, Kale (1967) proposed a new species *Enteromorpha gujaratensis* from the channels of Saurashtra Salt Works, Porbandar district of Gujarat. Likewise, Joshi & Krishnamurthy (1972) discovered the novel taxa *E. ovata* and *E. linza* var. *bicornuta* of Ulvaceae. The description furnished by Kale (1967), Joshi & Krishnamurthy (1972), Krishnamurthy (2000) and Jha & al., (2009) evidently support the distinctiveness of *E. gujaratensis* and *E. linza* var. *bicornuta* which indicate that these two taxa have shared the identical characters of genus *Ulva* rather than other genera. The uncertain status of *Enteromorpha* for the Indian taxa should be treated to *Ulva*. Therefore, the following combinations are proposed as per the articles (6.10 and 41.2) of International Code of Nomenclature for algae, fungi, and plants (Turland & al., 2018).

NOMENCLATURE TREATMENT

Ulva gujaratensis (S.R.Kale) A.S. Kumar & Palanisamy, *comb. nov.*

Basionym: *Enteromorpha gujaratensis* S.R. Kale, Phykos 6 (1 & 2): 29.1967.

Type: INDIA. Gujarat, Porbandar District, Channels of Saurashtra Salt Works, 27.01.1961, *S. R. Kale 3625* (Holo: NFMAH!).

Distribution: India (Gujarat) – Endemic (Oza & Zaidi, 2001).

Notes: It is closely resembling with *Ulva prolifera*, but the characters of irregular branches, spine-like uniseriate filaments with a single pyrenoid in each cell are expressing the compatible identity of this species.

Ulva linza var. **bicornuta** (H.Joshi & V.Krishnam.) A.S.Kumar & Palanisamy, *comb. nov.*

Basionym: *Enteromorpha linza* var. *bicornuta* H.Joshi & V.Krishnam. Bot. J. Linn. Soc., 65: 125. 1972.

Type: INDIA. Gujarat, Bhavnagar District, Mahuva, 24.09.1961, *Thivy 538* (Holo: NFMAH!).

Distribution: India (Gujarat) – Endemic (Oza & Zaidi, 2001).

Notes: Apex with two marginal horn-like prolongations, monostromatic tubes at the base, and distromatic sheath at the apical zone are the ideal characters of this taxon to distinguish from other taxa under this genus.

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