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Review article

Checklist of seaweeds and seagrasses of Egypt (Mediterranean Sea): A review

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ABSTRACT

This work provides the first revised and updated checklist of the seaweeds and seagrasses of the Egyptian Mediterranean coast, based on literature records. 187 seaweed species are recorded, including 107 red, 45 green and 35 brown algae. 29 *taxa excludenda* and 3 *taxa inquirenda* are briefly discussed. The total number of alien seaweeds currently accepted is 10. In addition, 6 cryptogenic species, 11 species pending confirmation and 3 excluded alien species are discussed. A total of 5 seagrass species are recorded, among which *Halophila stipulacea* is introduced via the Suez Canal.

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Contents

Introduction	00
Methodology of data collection and treatment	00
Macroalgae of the Mediterranean coast of Egypt	00
Taxa inquirenda	00
Taxa excludenda	00
Alien seaweeds	00
Accepted alien seaweeds	00
Alien species pending confirmation of their presence	00
Cryptogenic species	00
Excluded alien species	00
Seagrasses of the Mediterranean coast of Egypt	00
Seaweeds and seagrasses of the Northern lakes	00
Discussion	00
Acknowledgement	00
References	00

Introduction

The Mediterranean coast of Egypt extends to about 970 km from Rafah (Sinai Peninsula) to Salloum (east of the border with Libya), with five natural lakes extending from northern Sinai to

Alexandria (Fig. 1). In 1943, the highly esteemed oceanographer, Anwar Abdel Aleem, had undertaken the first prolonged study of marine algae and seagrasses along the Egyptian Mediterranean coast, where previous attempts had been sparse depending on short visits to our shores by marine algologists (Nasr and Aleem, 1948). Recently, there have been insufficient and discontinuous taxonomic studies, with the seaweeds and seagrasses described randomly in terms of spatial and temporal distributions. The lack of information regarding seagrass and seaweeds of Egypt

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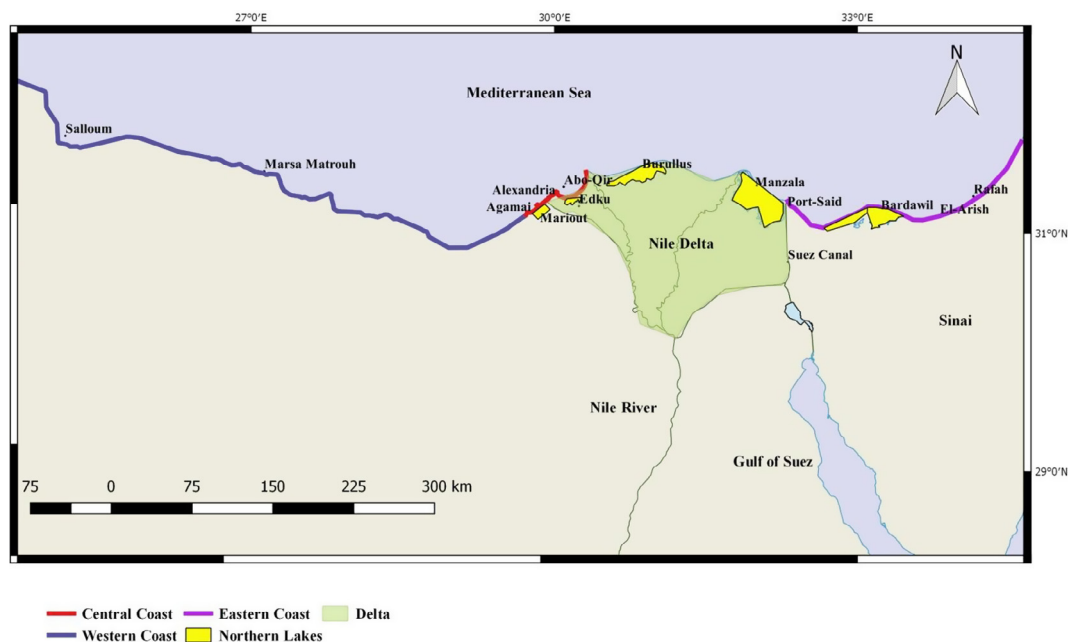


Fig. 1. Mediterranean Coast of Egypt, showing the coastline sectors described in the text.

(Coll et al., 2010) urges for a further exploration and a robust taxonomic work for the conservation of these important ecosystems. The objective of this review is to revise and organize all the available existing taxonomic data for seaweeds and seagrasses of the Mediterranean coast of Egypt.

Methodology of data collection and treatment

The Mediterranean coast of Egypt was divided into four sectors; the Eastern Coast (North Sinai from El-Arish to Port-Said), the Northern lakes (Bardawil on the Eastern Coast, Manzala, Burullus, Edku on the Deltaic zone and Mariout on the Central Coast), the Central Coast (Alexandria), and the Western Coast (from Al-Agami to Salloum) (Fig. 1). Data were compiled from available published literature from the mid 20th century till the present time. Species names were updated and checked for distribution from Algaebase (Guiry and Guiry, 2018). The lists contain currently accepted seaweeds and their synonyms, grouped by the major divisions; Rhodophyceae (red algae), Ulvophyceae (green algae), and Phaeophyceae (brown algae). The alien seaweeds were separately discussed as well as seagrasses. The Published data were critically reviewed, based on the current taxonomic and nomenclatural key references in the Mediterranean Sea. Original data collected from the Central Coast and Lake Bardawil were provided.

Macroalgae of the Mediterranean coast of Egypt

A total of 187 accepted seaweed species from El-Arish to Salloum were listed (107 red, 45 green and 35 brown algae), constituting 16% of the Mediterranean seaweeds (Coll et al., 2010) (Tables 1–3). In addition, 29 species were listed as *taxa excludenda* and 3 species as *taxa inquirenda*. 45 accepted species were listed for The Eastern Coast (22 red, 18 green and 5 brown algae). 27 species were recorded in El-Arish (12 red, 12 green, 3 brown algae), and 37 species in Port-Said (18 red, 17 green and 2 brown). The Central Coast showed the highest number of seaweeds with 168 recorded species (97 red, 36 green, and 35 brown algae), while 36 seaweed species were recorded on the Western Coast (20 red, 12 green, and 4 brown algae). In addition, 10 alien seaweeds were accepted,

including 4 green and 6 red algae. 11 alien species are awaiting confirmation for their presence, 6 are cryptogenic and 3 species were excluded.

Taxa inquirenda

***Cladophora crystallina* (Roth) Kützing:** This species has uncertain taxonomic position, it has been considered as *taxon inquirendum* in the Mediterranean Sea (Cormaci et al., 2014). According to Van den Hoek (1963), this species is referable either to *C. glomerata* or *C. vagabunda*. With the absence of descriptions and illustrations, the record by El-Shoubaky (2013) in El-Arish should have been a misidentification.

***Cladophora refracta* (Roth) Kützing:** Van den Hoek (1963) cited this species as a taxon with obscure status, based on *Conferva refracta* Roth, an illegitimate superfluous name for *C. hirta* O.F. Müller, a taxon of uncertain application (Guiry and Guiry, 2018; Tsiamis et al., 2014a). The single Greek record from the Aegean Sea has been listed as a *taxon inquirendum* (Tsiamis et al., 2014a). It was recorded in Alexandria (Khalil, 1987).

***Sargassum salicifolium* (J.Agardh) J.Agardh, nom. illeg:** The record by Khalil (1987) along Alexandria shores is most probably a misidentification. In the Mediterranean Sea, *S. vulgare* C. Agardh nom. illeg, as cited by Aleem (1951), Khalil (1987), and Shams El-Din and El-Sherif (2012), was misidentified for *S. salicifolium* (Thibaut et al., 2015; Tsiamis et al., 2013). The latter species has a complex nomenclature history for its entity (Guiry and Guiry, 2018).

Taxa excludenda

***Bryopsis pennata* var. *minor* J.Agardh:** This species has not been recorded from the Mediterranean Sea (Guiry and Guiry, 2018). The single recorded from Alexandria (Khalil, 1987) should be excluded.

***Chaetomorpha indica* (Kützing) Kützing:** Cormaci et al. (2014) considered this species as a *taxon excludendum* from the Mediterranean Sea flora. It was recorded in El-Arish (El-Shoubaky, 2013).

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