

Note

First record of the invasive alga *Caulerpa racemosa* (Caulerpales, Chlorophyta) on the coast of Algeria

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Abstract – The first record of the invasive green alga *Caulerpa racemosa* near the port of Alger, far away from the other affected areas, is reported, reinforcing the hypothesis of anthropogenic dissemination of this alga in the Mediterranean Sea.

Invading species / *Caulerpa racemosa* / dissemination / Mediterranean Sea

Résumé – Première observation de l'algue invasive *Caulerpa racemosa* (Caulerpales, Chlorophyta) sur la côte de l'Algérie. L'algue invasive *Caulerpa racemosa* vient d'être découverte aux environs du port d'Alger, loin des autres zones déjà atteintes en Méditerranée. Cette nouvelle introduction renforce l'hypothèse de la dissémination anthropique dans l'expansion de l'algue en Méditerranée.

Espèces invasives / *Caulerpa racemosa* / dissémination / Mer méditerranée

Caulerpa racemosa (Forsskål) J. Agardh var. *cylindracea* (Sonder) Verlaque, Huisman *et* Boudouresque, a temperate Australian variety first found in Mediterranean in 1990, is in continuous expansion throughout the Mediterranean Sea (Verlaque *et al.*, 2000; 2003; 2004; Piazzini *et al.*, 2005; Ruitton *et al.*, 2005) and recently in the western Atlantic Ocean (Canarian Islands: Verlaque *et al.*, 2004).

The study related to the invasion of this highly invasive strain of alga is well documented. Its rapid spread within a local area occurs through means of vegetative reproduction, which is very efficient (involving fragmentation or the formation of propagules – Renoncourt & Meinesz, 2002) and probably through

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sexual reproduction where zygotes are moved around by the currents. Panayotidis & Žuljević (2001) described fertile plants in the field and gamete release in laboratory but other observations of sexual reproduction have not been reported.

However, it is important to point out that there has not been a continuous spread across the affected zones and that major harbours are present inside most of the independent zones of first discovery. This is particularly noticeable in the north part of the western Mediterranean Sea, where first reported discoveries on a regional level are near the following harbours: Siracusa, Salerno, Napoli, Livorno, Genova and Cagliari in Italy, Marseille and Bastia in France, Palma de Mallorca and Alicante in Spain. Furthermore *C. racemosa* has spread in the narrow bay of Villefranche on the French coast, used mainly by large cruise liners. When *C. racemosa* was first found in this location the nearest other known colonies of the alga were 200 km to the east (Genova) and 200 km to the west (Marseille) (Ruitton *et al.*, 2005). Thus anthropogenic dissemination seems to be the most probable cause of the rapid and global spread in the Mediterranean Sea. Several experiments with other similar invasive species such as *Caulerpa taxifolia* (Vahl) C. Agardh have shown that this alga is able to survive long periods (up to 10 days) of time on board boats under the particular conditions prevailing in anchor lockers or in fishing nets (Sant *et al.*, 1996)

In this context the discovery of a new colonised zone, isolated from previous ones and close to a major Mediterranean harbour (Alger), has to be documented.

The first finding was at 45 km west of Alger's port, at the beach of Bou-Ismaïl ($36^{\circ}39'7''\text{N}$ et $2^{\circ}41'47''\text{E}$) (Fig. 1). The nearest affected site on the north African coast is in Tunisia 720 km away, where the alga had been observed in 2002 in the region of Bizerte (Langar *et al.*, 2002). In European coasts, the nearest

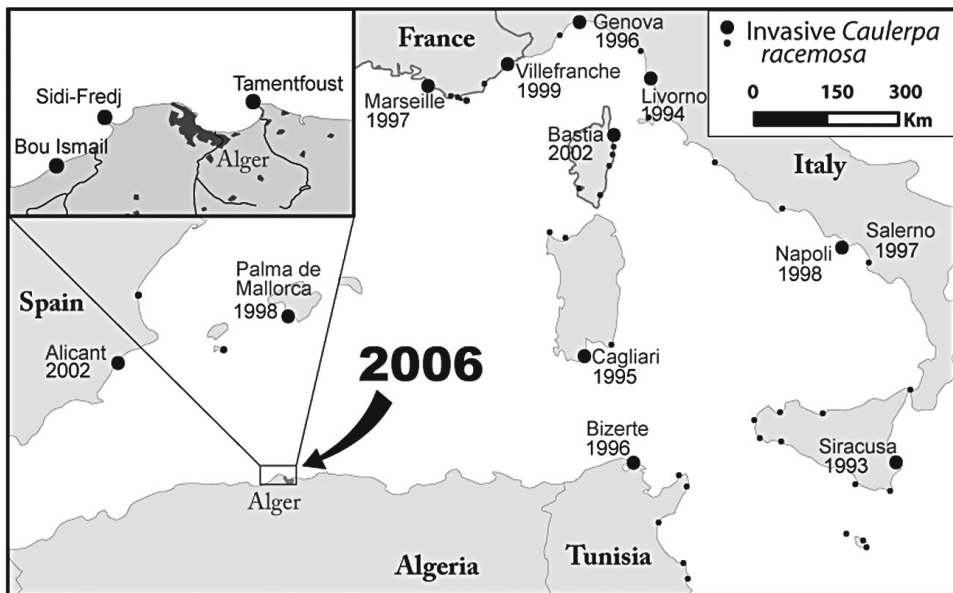


Fig. 1. Location of the invasive of *Caulerpa racemosa* in the region of Alger and in the western Mediterranean basin, including nearest ports, and the year in which it was first recorded.

invaded site is in Alicante (400 km north) (Pena Martin *et al.*, 2003) (Fig 1). After this first finding, a large information campaign directed at fishermen and divers was carried out and led to new findings in the east and the west of the port of Alger at Tamenfoust and Sidi-Fredj (Fig. 1). An anthropogenic introduction linked to shipping traffic to this major port is therefore probable in this region.

The alga develops in shallow waters (– 0.5 to – 3 m) where it forms scattered patches and is also found as debris on the beach.

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