

## What we must do – An exotic invasive species in paradise

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### Abstract

The soft coral *Chromonephthea braziliensis* was first recorded at Arraial do Cabo, on the southeastern Brazilian coast. Following studies showed that the presence of *C. braziliensis* may be a real threat to regional biodiversity, especially to endemic coral species. This study provides a new record of this exotic invasive species in the region. Taking into account the environmental damage caused by this species, its known distribution and dispersal potential, the study presents recommendations for the eradication and monitoring of *C. braziliensis* in the region, before its control becomes unfeasible.

**Key words:** *Chromonephthea braziliensis*, exotic species, invasive exotic species, soft coral, decision-making, Brazil

### Resumo

**O que nós devemos fazer – Uma espécie exótica invasora no paraíso.** O coral mole *Chromonephthea braziliensis* foi primeiramente registrado em Arraial do Cabo, costa sudeste do Brasil. Estudos subsequentes demonstraram que a presença de *C. braziliensis* pode ser uma ameaça real a diversidade biológica da região, especialmente para as espécies endêmicas de corais. O presente estudo reporta um novo registro desta espécie exótica invasora ao largo de Cabo Frio. Considerando os danos ambientais causados por esta espécie, sua atual distribuição e seu potencial de dispersão, são apresentadas recomendações para a erradicação e monitoramento de *C. braziliensis* da região, antes que seu controle torne-se inviável.

**Unitermos:** *Chromonephthea braziliensis*, espécie exótica, espécie exótica invasora, Brasil, coral-mole, tomada de decisão

The soft coral *Chromonephthea brazilensis* Ofwegen, 2005 (Octocorallia: Alcyonacea) was first recorded at Arraial do Cabo, on the southeastern Brazilian coast, as *Stereonephthya* aff. *curvata*, by Ferreira (2003). Ferreira indicated that this species was accidentally introduced into the region at the beginning of 1990, possibly by fouling from oil platforms. This region is known to sustain both tropical and subtropical marine components with high levels of biodiversity, and thus can be considered a hot spot for conservation (Ferreira et al., 2006). Lages et al. (2006) demonstrated experimentally that the presence of *C. brazilensis* could threaten the biological integrity of the region, especially the endemic species of corals. The introduced species produces allelopathic compounds that play advantageous roles in its relationship with native species, helping to defend it against predators and enhancing its success in competition for space and reproduction. According to Lages et al. (2006), its chemical compounds produce large necroses on tissues of the endemic Brazilian gorgonian *Phyllogorgia dilatata*. The success of the allelotoxins thus seems likely to facilitate the perpetuation and spread of this invasive species in the region. A recent record of *C. brazilensis* in Cabo Frio (Silva, personal communication), 9km from Arraial do Cabo, is a further example of its invasive potential. The present study reports a new record of *C. brazilensis* at Papagaio Isle (22°53'41"S – 41°58'56"W), Cabo Frio, Rio de Janeiro State.

Apparently, the population of *C. brazilensis* is still confined to Arraial do Cabo and Cabo Frio, but the growth of docking operations in Arraial do Cabo harbor, as well as the use of that area for oil-platform repairs, give the region important potential as a point of distribution for alien species. The recent increase of offshore oil exploitation at Campos Basin, close to the areas where *C. brazilensis* was first recorded, will likely lead to an increase in ship traffic and platforms, and thus to further invasions of this species.

The consensus is that prevention is the best defense against invasions, but if prevention is not possible, efforts towards eradication which incorporate early detection and rapid response become necessary (NISC, 2003). For this reason, the eradication of invasive species is an

increasingly important component of the conservation and management of natural ecosystems (Zavaleta et al., 2001). The efficiency of the eradication requires a good monitoring program and a rapid response mechanism. Other factors conducive to successful eradication include a thorough understanding of the biology of the target organism, sufficient resources to carry the project to completion, and regulatory powers to enforce cooperation in such matters as quarantines (Wotton and Malmqvist, 2004).

The fact that *C. brazilensis* populations so far remain small and geographically restricted has great significance for the management of this important region. It is also important to consider that if eradication fails or is not attempted very early, it tends to be more difficult and expensive to achieve when the invasive species is well established. Successful eradication of invasive species has only been met in a tiny fraction of all known harmful invasions, and usually only achieved at great cost. In the great majority of cases, initially successful invasions show long term success (Simberloff, 2005).

At this moment, undertaking the eradication of *C. brazilensis* is both urgent and justifiable because Brazil is one of the signatories of the Convention of Biological Diversity. Art. 8 of the Convention, which addresses *in situ* conservation, concerns the prevention of introductions, and control or eradication of alien species that threaten native species, habitats and ecosystems. In addition, we must observe that close to the area where *C. brazilensis* was recorded there is an important marine harvest reserve. The existence of a protected area where local resources are exploited and managed by local fishermen strongly reinforces the necessity of undertaking this effort towards eradication.

The long-term environmental consequences of the recommended eradication program are not well known, but based on the observed threats to native species and the high risk of spreading, we strongly recommend urgent action aimed at eradicating the soft coral *C. brazilensis* from the Arraial do Cabo and Cabo Frio regions. In addition we recommend preeradication and post-removal assessments, to monitor the ecological effects of eradication as well as its success.

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