Molecular phylogeny and systematics of the marine red algal family *Liagoraceae sensu lato* (Nemaliales, Rhodophyta)

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The marine red algal family *Liagoraceae sensu lato* currently includes genera previously placed in the families *Nemaliaceae*, *Helminthocladiaceae* (= *Liagoraceae sensu stricto*), and *Dermonemataceae*. The life history of the *Liagoraceae* is shown to have an alternation of a microscopic, filamentous tetrasporophyte with a conspicuous gametophyte. The filamentous phase produces either monosporangia or tetrasporangia or both, the tetraspores generally germinating to form monoecious or dioecious gametophytes; in some species both states are recorded. The taxonomic features separating the *Nemaliaceae*, *Liagoraceae sensu stricto* and *Dermonemataceae* were based basically on post-fertilization stages, such as the orientation of the first division of the fertilized carpogonia, the production of gonimoblast initials from the upper cell of the divided fertilized carpogonia, and the presence of involucral filaments associated with the carposporophyte. The phylogenetic relationships among the genera placed in the *Liagoraceae sensu stricto* (bearing compact gonimoblasts, e.g. *Liagora*) and the *Dermonemataceae* (with diffuse gonimoblast filaments, e.g. *Yamadaella*) are obscure and largely unexplored. In our study, we will re-examine the reproductive structures of the genera that have different patterns of carposporophyte development from the *Liagoraceae sensu stricto* (i.e. *Nemalion*, *Liagoropsis*, *Yamadaella*, and *Dermonema*) with an emphasis on their post-fertilization events, and provide some additional information on *Helminthora* and *Helminthocladia*. The significance of the differences found in the carposporophyte development among the genera in the *Liagoraceae sensu lato* will be assessed, and their phylogenetic relationships inferred based on *rbc*L and *psa*A sequence analyses.

Increase of health promoting and defense phytochemicals of Brassicae crops following application of commercial seaweed extracts (*Ascophyllum nodosum*)

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Brassicae crops are one of the main vegetable crops grown in Ireland. A diet rich in brassicas has been associated with the inhibition of chemically induced carcinogenesis in humans. The effect of commercial extracts of *Ascophyllum nodosum* on the phytochemical content of broccoli and cabbage plants was evaluated in separate field experiments. AlgaeGreenTM extracts were evaluated in two different broccoli cultivars (Ironman and Red Admiral) as well as on cabbage (cv Caraflex), over a two year period. Treatments in the broccoli crops included a water control, liquid seaweed application of 3L ha^{-1}, 30L ha^{-1} and 300L ha^{-1}. These were applied once a month to the respective treatments. Treatments on the cabbage crop were a water control, 3.5 and 5L ha^{-1} liquid seaweed. Cold process seaweed extracts increased all bioactive

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