Long-term persistence of the floating bull kelp Durvillaea antarctica from the South-East Pacific: Potential contribution to local and transoceanic connectivity

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Current knowledge about the performance of floating seaweeds as dispersal vectors comes mostly from mid latitudes (30°?40°), but phylogeographic studies suggest that long-distance dispersal (LDD) is more common at high latitudes (50°?60°). To test this hypothesis, long-term field experiments with floating southern bull kelp Durvillaea antarctica were conducted along a latitudinal gradient (30°S, 37°S and 54°S) in austral winter and summer. Floating time exceeded 200d in winter at the high latitudes but in summer it dropped to 90d, being still higher than at low latitudes (<45d). Biomass variations were due to loss of buoyant fronds. Reproductive activity diminished during long floating times. Physiological changes included mainly a reduction in photosynthetic (Fv/Fm and pigments) rather than in defence variables (phlorotannins and antioxidant activity). The observed long floating persistence and long-term acclimation responses at 54°S support the hypothesis of LDD by kelp rafts at high latitudes.