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Reproductive longevity of drifting kelp *Macrocystis pyrifera* (Phaeophyceae) in Monterey Bay

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Drifting Macrocystis pyrifera (L.) C. Agardh sporophytes have long been viewed as the primary long-distance dispersal vector; yet, few data exist that support the ability of reproductive viable sporophytes to actually travel the presumed hundreds to thousands of kilometers. This study addressed the reproductive longevity of experimental and naturally occurring M. pyrifera drifters. Temporal variability in sporophyte size and reproduction was estimated for experimental drifting sporophytes that were tethered to surface buoys and compared with attached plants (controls). Reproductive viability was also studied for beach-cast drifters (BCD), and naturally drifting sporophytes observed during field surveys in Monterey Bay. Detached drifting sporophytes were tracked with radio transmitters to follow drifter trajectories and to measure drifting speed. Experimental drifters (ED) experienced a 74% reduction in frond length after 35 days, a 76% reduction in average frond number after 70 days, and a reduction in average sorus area by 83% after 28 days. Although zoospore production was reduced following detachment, sporophytes remained fertile with high zoospore germination success as long as sori were present (125 days). Zoospore production and germination success for natural and BCD was similar to ED. The average displacement of radio-tagged drifters was 7.12 km · day^{-1}, suggesting that a sporophyte adrift for 125 days disperses viable propagules (zoospores) over 890km (± 363). Dispersal of propagules is important for population restoration, distribution, and genetic diversity. Such dispersal distances are long enough to connect potentially all Northern Hemisphere Macrocystis populations across a generational timescale and may facilitate inter-hemispheric gene flow.

Palabras clave: Macrocystis, Reproduction, kelp, germination, dispersal, drifting, longevity, Monterey Bay, rafts