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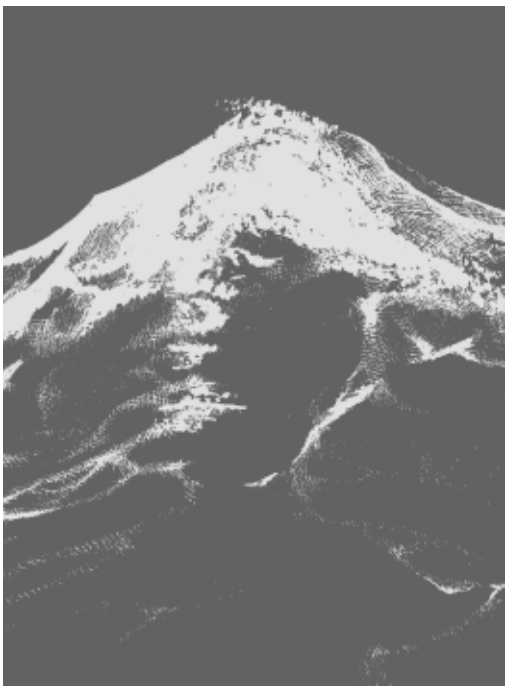

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Influence of asexual reproduction on the structure and dynamics of Holothuria (Halodeima) atra and Stichopus chloronotus populations of the Great Barrier Reef

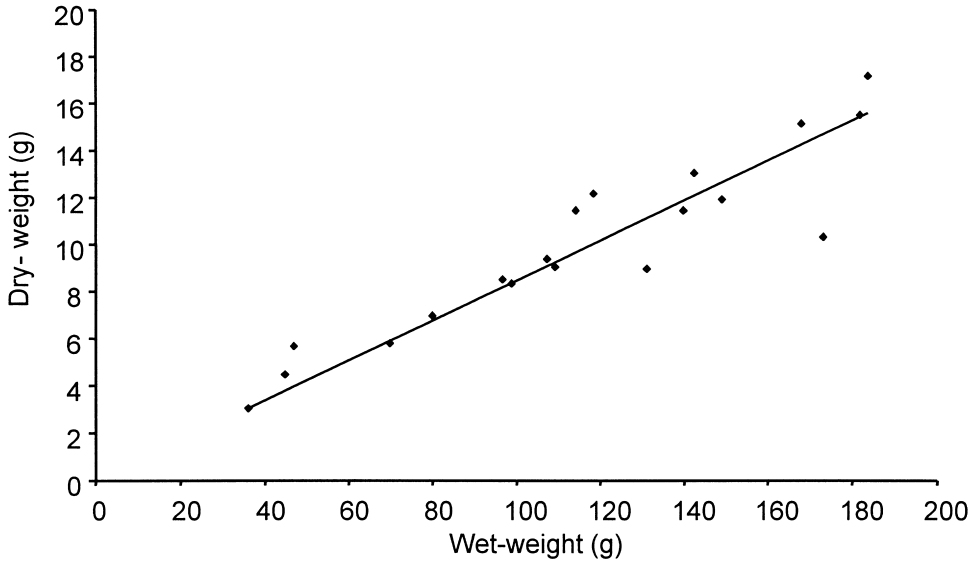
S. Uthicke

To obtain a conversion factor from the wet-weight based biomass estimates to dry-weight 54, animals of Stichopus chloronotus and 19 Holothuria atra (both species collected at Great Palm Island between July 1995 and February 1996) were weighed. The animals were than dried for 48 h (60ºC) and their dry-weight determined. To convert these weights to organic carbon and nitrogen units, eight individuals of H. atra and S. chloronotus were sampled both in November 1996 and April 1997 at Great Palm Island. The body wall of the animals, which constitutes the bulk of the animal's biomass, was dried (see above) and ground to a fine powder. The nitrogen content was then determined on an ANTEK C/N analyser. The organic carbon content was determined with a Shimadzu total organic carbon analyser (TOC-5000) after acidification of the sample.

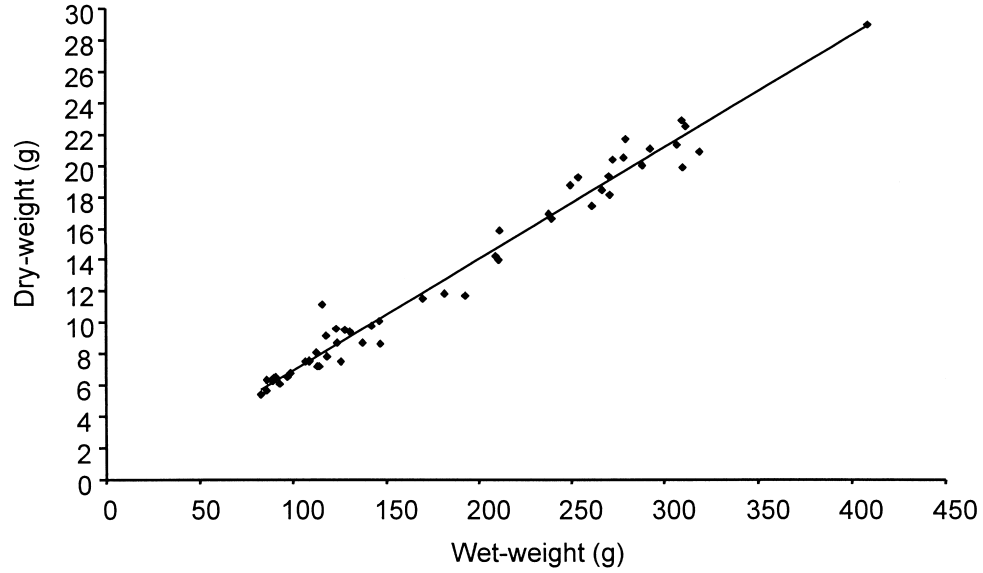
The dry-weight of Stichopus chloronotus was described by a significant linear regression of the wet-weight ($R2 = 0.97$, $p < 0.001$, Supplementary Figure 1), and the dry weight can thus be assumed as 6.94 % of the wet-weight for the size range observed. Similarly, a linear regression function described the relation between the two weight-measures in Holothuria atra ($R2 = 0.85$, $p < 0.001$, Supplementary Figure 2). The dry weight in the latter species is 8.61 % of the wet-weight. Hence, the water contents of S. chloronotus is somewhat higher than in H. atra. The organic carbon contents of the bodywall was 23.9 % DW (SD: 1.91) in S. chloronotus and 28.8 % (SD: 1.76) in H. atra. The nitrogen concentration was 5.53 % (SD: 0.48) for S. chloronotus and 7.06 % for H. atra (SD: 0.33).

In the April 1997 I measured body weights, lengths and the widths of the sole of more than 200 individuals of both species in both bays at Great Palm Island to obtain conversion factors between these parameters. Since the sole of S. chloronotus is flattened, the width for this species is easily determined with a calliper. H. atra, however, is almost round in cross-section, and the sole was defined as an area with higher densities of the tube feet. For both species the width of the sole is taken as a measure for the area that is in direct contact with the sediment.

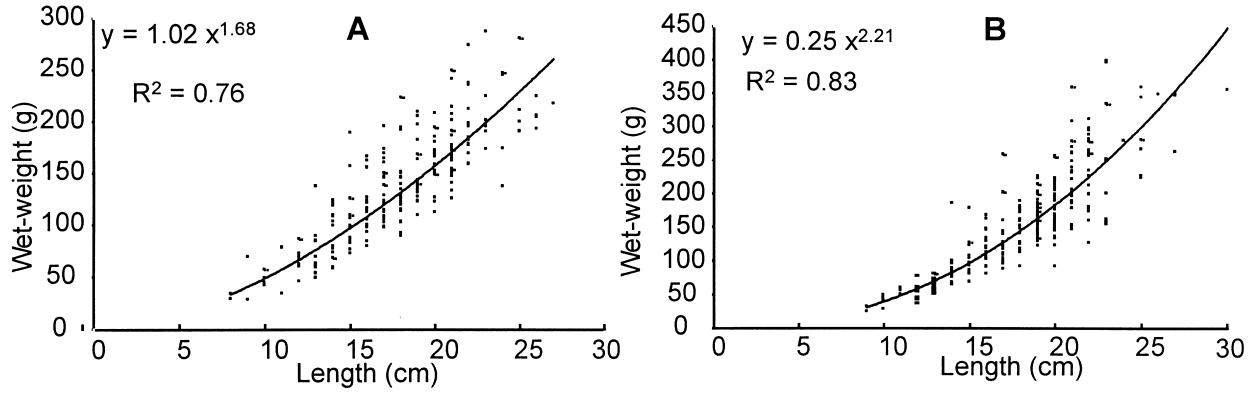
The relationship between length and wet-weight for Holothuria atra (Supplementary Figure 3 A) and for Stichopus chloronotus (Supplementary Figure 4 A) were described with power functions. The exponent of these functions is well under 3, which is typical for many holothurian species. Although slightly more variable, the width of the sole was also described satisfactory by power functions of the wet-weight for H. atra (Supplementary Figure 3 B) and S. chloronotus (Supplementary Figure 4 B).



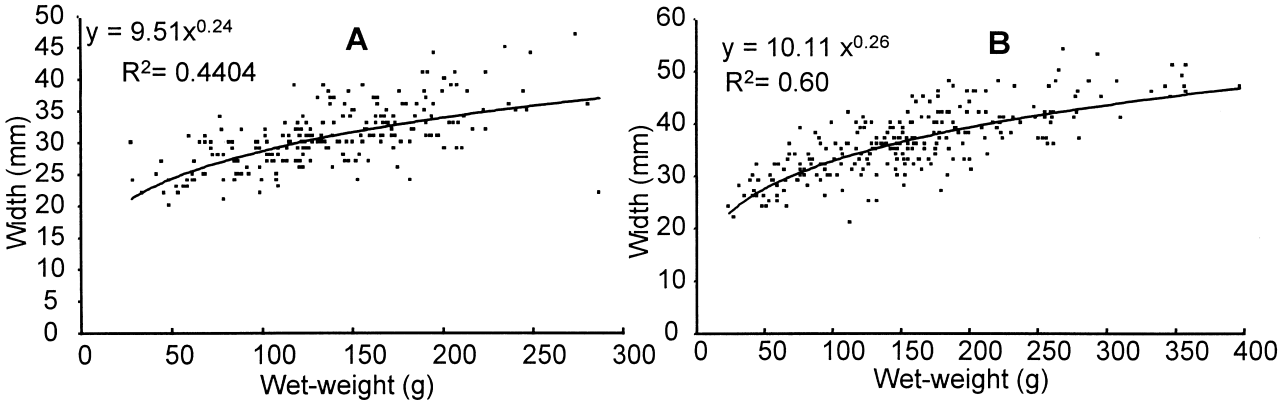
SUPPLEMENTARY FIGURE 1 Relationship between wet-weight and dry-weight of Holothuria atra. The slope is significantly different from zero ($p < 0.001$).



SUPPLEMENTARY FIGURE 2 Relationship between wet-weight and dry-weight of Stichopus chloronotus. The slope is significantly different from zero ($p < 0.001$).



SUPPLEMENTARY FIGURE 3 Relationship of length to wet-weight (A) and wet-weight to width of the sole (B) of Holothuria atra, formulae of power functions are shown in the respective graphs, both slopes are significantly different from zero ($p < 0.05$).



SUPPLEMENTARY FIGURE 4 Relationship of length to wet-weight (A) and wet-weight to width of the sole (B) of Stichopus chloronotus, formulae of power functions are shown in the respective graphs, both slopes are significantly different from zero ($p < 0.05$).