

Supplementary information

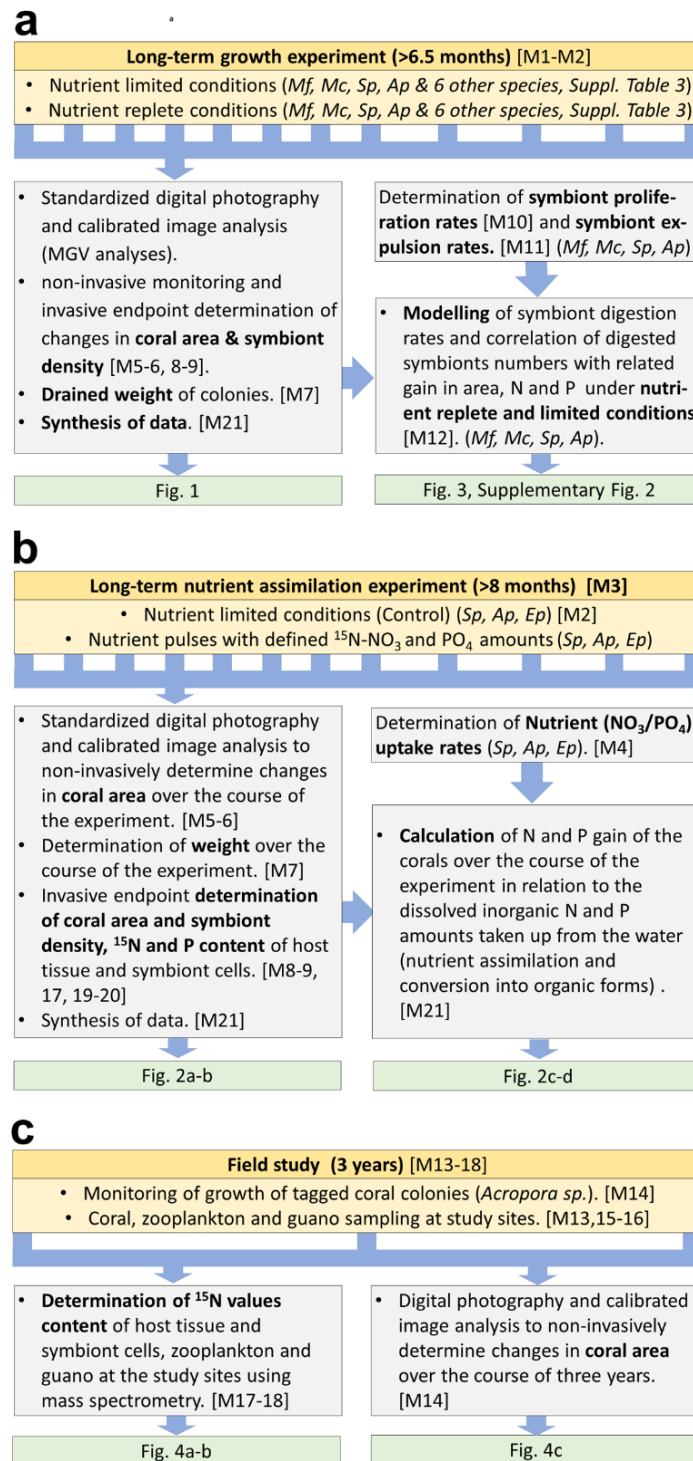
Reef-building corals farm and feed on their photosynthetic symbionts

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Reef-building corals farm and feed on their photosynthetic symbionts

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Supplementary Information



Supplementary Figure 1: Overview of experiments and associated methods. (a) Long-term experiment to determine the growth of corals under replete and limited concentrations of dissolved inorganic N and P in the absence of particulate organic food. (b) Long-term experiment to quantify the uptake and partitioning of ¹⁵N-nitrate and phosphate and incorporation as organic N and P in host and symbiont cells in the absence of particulate organic food. (d) Field study to analyse growth and ¹⁵N isotopic values and potential nitrogen sources (guano, zooplankton) in corals close to islands with dense seabird colonies and with low seabird numbers. *Mf*, *Montipora foliosa*; *Mc*, *Montipora capricornis*; *Sp*, *Stylophora pistillata*; *Ap*, *Acropora polystoma*; *Ep*, *Euphyllia paradivisa*. Method [M] Numbers in brackets refer to relevant paragraphs in the method section.

Supplementary Table 1: Experimental corals and their symbionts

Experimental coral species	Symbiont species associated with experimental coral (ITS2 sequence) ^(a)	Growth morphology	Global distribution of coral species ^(c)
<i>Acropora polystoma</i>	<i>Cladocopium sp.</i> (C3cc) (Clade C)	Branching	<ul style="list-style-type: none"> • 46.7% of global ecoregions • 52.6% of ecoregions in the IndoPacific realm • Red Sea
<i>Montipora capricornis</i>	<i>Cladocopium sp.</i> (C26a) (Clade C)	Foliose	<ul style="list-style-type: none"> • 26% of global ecoregions • 29.3% of ecoregions in the IndoPacific realm
<i>Montipora foliosa</i>	<i>Cladocopium sp.</i> (C15) (Clade C)	Foliose	<ul style="list-style-type: none"> • 58% of global ecoregions • 65.4% of ecoregions in the IndoPacific realm • Red Sea
<i>Porites lichen</i>	<i>Cladocopium sp.</i> (C96) (Clade C)	Encrusting	<ul style="list-style-type: none"> • 68.7% of global ecoregions • 77.4% of ecoregions in the IndoPacific realm • Red Sea & Persian/Arabian Gulf • Eastern Pacific
<i>Seriatopora hystrix</i>	<i>Durusdinium trenchii / glynnii</i> (Clade D)	Branching	<ul style="list-style-type: none"> • 58% of global ecoregions • 65.4% of ecoregions in the IndoPacific realm • Red Sea
<i>Stylophora pistillata</i>	<i>Symbiodinium microadriaticum</i> (Clade A)	Branching	<ul style="list-style-type: none"> • 68.7% of global ecoregions • 77.4% of ecoregions in the IndoPacific realm • Red Sea & Persian/Arabian Gulf
<i>Turbinaria reniformis</i>	<i>Cladocopium sp.</i> (C21) <i>Cladocopium sp.</i> (C3) (Clade C)	Foliose	<ul style="list-style-type: none"> • 67.3% of global ecoregions • 75.9% of ecoregions in the IndoPacific realm • Red Sea & Persian/Arabian Gulf
<i>Euphyllia paradivisa</i>	<i>Cladocopium sp.</i> (C1) (Clade C) ^(b)	Phaceloid	<ul style="list-style-type: none"> • Central Indopacific ^(d) • Red Sea ^(e)
<i>Pavona cactus</i>	<i>n.d.</i>	Contorted fronds	<ul style="list-style-type: none"> • 60% of global ecoregions • 67.7% of ecoregions in the IndoPacific realm
<i>Hydnophora grandis</i>	<i>n.d.</i>	Encrusting or subarborescent.	<ul style="list-style-type: none"> • Central Indopacific^(d)
<i>Pocillopora damicornis</i>	<i>n.d.</i>	Branching	<ul style="list-style-type: none"> • 85.3% of global ecoregions • 96.2% of ecoregions in the IndoPacific realm • Red Sea & Persian/Arabian Gulf • Eastern Pacific
<i>Lobophytum crassum</i>	<i>n.d.</i>	Leather (soft) coral	<ul style="list-style-type: none"> • Australia, India, Japan, Madagascar, Red Sea, Seychelles, South Africa, Tanzania^(d)

(a) From ⁶⁶

(b) From ⁴⁴

(c) From “Corals of the World – online” (<http://www.coralsoftheworld.org/page/home/>) unless indicated otherwise

(d) “World Register of Marine Species – online” (<https://www.marinespecies.org/index.php>)

(e) From ⁶⁷