

Table S1: Representative examples of metazoans with their corresponding symbionts along with referenced evidence of photosynthetic (PS) activity of the symbiont *in situ*. Examples were compiled from the sources listed along with reviews by Trench, 1993, Lee et al., 2001, Carpenter and Foster, 2002, Venn et al., 2008 and Usher, 2008. Underlined animals are represented in Figure 1.

SYMBIONT		HOST			Evidence of PS Activity	Reference
Phylum/Class	Genus species/Clade	Phyla	Organism	Genus Species		
<b>Cyanobacteria</b>						
<i>6 genera of cyanobacteria have been found in over 100 sponge species</i>						
	<i>Synechococcus spongiarum</i>	Porifera	Sponge	Multiple	<sup>14</sup> C/P:R	Wilkinson, 1979,1980,1983*
				<i>Aplysina aerophoba</i>		
				<i>A. archeri</i>		
				<i>A. fulva</i>	P:R/growth rates	Erwin and Thacker, 2008
				<u><i>Neopetrosia subtriangularis</i></u>	P:R/growth rates	Erwin and Thacker, 2008
				<i>Theonella swinhoei</i>		
				<i>Xestospongia muta</i>		
	<i>Aphanocapsa feldmanni</i>			<i>Ircinia variabilis</i>	<sup>14</sup> C	Hentschel et al., 2002
				<i>Petrosia ficiformis</i>		
	<i>A. raspaigellae</i>			<i>I. variabilis</i>		
				<i>Terpios hoshinota</i>		
	<i>Prochloron</i>			<i>Dictyonella funicularis</i>		
				<i>D. arenosa</i>		
				<u><i>Didemnum molle</i></u>		
				<i>Lendenfeldia dendyi</i>		
				<i>T. swinhoei</i>		
	<i>Synechocystis spongeliae</i>			<i>Ulosa funicularis</i>		
	<i>S. trididemni</i>			<i>Fasciospongia chondrodes</i>		
				<i>Prianos</i> aff. <i>melanos</i>		
				<i>Spirastrella</i> aff. <i>decumbens</i>		
	<i>Oscillatoria spongeliae</i>			Multiple		
	Unclassified <i>Cyanobacterium</i>			Multiple		

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<b><u>Cyanobacteria</u></b>						
<i>Predominantly Prochloron sp. are found in ascidians</i>						
	<i>Oscillatoria sp.</i>	Chordata	Ascidians	<i>Pyura cancellata</i>		
	<i>Prochloron didemnum</i>			<i>Diplosoma virens</i>	<sup>14</sup> C	Akazawa et al., 1978
	<i>Prochloron sp.</i>			<i>Didemnum molle</i>	P:R	Koike et al., 1993
	<i>Prochloron sp.</i>			<i>Lissoclinum patella</i>	<sup>14</sup> C	Pardy and Lewin, 1981
	<i>Synechocystis trididemni</i>			<i>Trididemnum solidum (and others)</i>		
<i>Uncharacterized cyanobacteria in the Echiurid worms</i>						
	Unknown cyanobacteria	Echiura	Spoon Worms	<i>Bonellia fuliginosa</i>		
	Unknown cyanobacteria			<i>Ikedosoma gogoshimense</i>		
<b><u>Chlorophyceae</u></b>						
	<i>Chlorella sp.</i>	Acoelomorpha	Flatworm	<i>Dalyellia viridis</i>	<sup>14</sup> C	Douglas, 1987
	<i>Chlorella sp.</i>	Acoelomorpha	Flatworm	<i>Typhloplana viridata</i>	<sup>14</sup> C	Douglas, 1987
	<i>Chlorella sp.</i>	Cnidaria	Hydra	<i>Hydra viridis</i>	<sup>14</sup> C	Muscatine and Lenhoff, 1963
	<i>Chlorella sp.</i>	Mollusca	Bivalve	<i>Anodonta grandis</i>	<sup>14</sup> C	Pardy, 1980
	<i>Chlorella sp.</i>	Porifera	Sponge	<i>Spongilla sp.</i>	<sup>14</sup> C	Gilbert and Allen, 1973
	<i>Elliptochloris marina</i> sp nov**	Cnidaria	Anenome	<i>Anthopleura xanthogrammica</i>	<sup>14</sup> C	O'Brien, 1980
	<i>Elliptochloris marina</i> sp nov**	Cnidaria	Anenome	<i>A. elegantissima</i>	O <sub>2</sub> Evol/CZAR***	Verde and McCloskey, 1996
	<i>Elliptochloris marina</i> sp nov**	Mollusca	Nudibranch	<i>Aeolidia papillosa</i>	<sup>14</sup> C	McFarland and Müller-Parker, 1993
	<i>Symbiococcum hydrae</i>	Cnidaria	Hydra	<i>Hydra magnipapillata</i>		
<b><u>Prasinophyceae</u></b>						
	<i>Tetraselmis convolutae</i>	Acoelomorpha	Flatworm	<i>Symsagittifera roscoffensis</i>	<sup>14</sup> C	Muscatine et al., 1974
	<i>Tetraselmis-like</i>			<i>Convolutriloba retrogemma</i>	Weight Difference	Shannon et al., 2009
<b><u>Bacillariophyceae</u></b>						
	<i>Licmophora</i>	Acoelomorpha	Flatworm	<i>Convoluta convoluta</i>		
	<i>Nitzschia sp.</i>	Porifera	Sponge	<i>Prianos melanos</i>		

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<b><u>Dinophyceae</u></b>						
<i>Eight clades of Symbiodinium are symbionts with marine invertebrates from at least 8 metazoan genera</i>						
	<i>Symbiodinium</i> sp. (Clades A-H)	Acoelomorpha	Flatworm	<i>Waminoa</i> sp.		
		Cnidaria	Sea Anenome	<i>A. xanthogrammica</i>	CZAR	Fitt et al., 1982
		Cnidaria	Sea Anenome	<i>Aiptasia pulchella</i>	<sup>14</sup> C	Clark and Jensen, 1982
		Cnidaria	Sea Anenome	<i>Anthopleura elegantissima</i>	<sup>14</sup> C	Muscatine and Hand, 1958
		Cnidaria	Jellyfish	<i>Cassiopea</i> sp.	CZAR	Verde an McCloskey, 1998
		Cnidaria	Jellyfish	<i>Mastigias</i> sp.	CZAR	McCloskey et al., 1994
		Cnidaria	Corals	<i>All species</i>	<sup>14</sup> C	Muscatine and Cernichiaro 1969; Muscatine, 1965
		Mollusca	Nudibranch	<i>Aeolidia papillosa</i>	<sup>14</sup> C	McFarland and Muller-Parker, 1993
		Mollusca	Nudibranch	<i>Dermatobranchus</i> sp.	Fv/Fm	Wägele and Johnsen, 2001
		Mollusca	Nudibranch	<i>Pteraeolidia ianthina</i>	O <sub>2</sub> evolution	Hoeghuldberg and Hinde, 1986
		Mollusca	Nudibranch	<i>Pteraeolidia ianthina</i>	Fv/Fm	Yamamoto et al., 2009
		Mollusca	Bivalves	<i>Tridacna gigas</i>	<sup>14</sup> C	Muscatine, 1967
		Porifera	Sponge	<i>Cliona cf. orientalis</i>	Fv/Fm	Schonberg et al., 2008
	<i>Amphidinium klebsii</i>	Acoelomorpha	Flatworm	<i>Amphiscolops langerhansi</i>	<sup>14</sup> C	Taylor, 1971
	<i>A. belauense</i>	Acoelomorpha	Flatworm	<i>Haplodiscus</i> sp.		Trench and Winsor, 1987
	<i>Scrippsiella velletae</i>	Cnidaria	Jellyfish	<i>Veleva veleva</i>		
	<i>S. chattonii</i>	Cnidaria	Jellyfish	<i>Veleva veleva</i>		
	<i>Gymnodinium linucheae</i>	Cnidaria	Jellyfish	<i>Linuche unguiculata</i>		
	<i>Gloeodinium viscum</i>	Cnidaria	Hydra	<i>Millepora dichotoma</i>		
	<i>Prorocentrum concavum</i>	Acoelomorpha	Flatworm	<i>Amphiscolops</i> sp.		

\*Initial surveys by Wilkinson (1979, 1980, 1983) on multiple sponge symbioses led to the acceptance of transfer of photosynthate from cyanobacteria to sponges.

\*\* Revised nomenclature for zoochlorella/chlorella based on Letsch et al., 2009.

\*\*\* Contribution of Zooxanthellae to Animal Respiration.