

Table 1. Kinetic data for Rubiscos from various bacteria, algae, and higher plants

	Rubisco CO ₂ :O ₂ environment	S _{C/O}	K _C , μM [pH]	k _{cat} ^c , s ⁻¹	E _s for k _{cat} ^c , kJ mol ⁻¹	Δ ¹³ C,* ‰	Δ ¹⁸ O,* ‰	CABP release, t _{0.5} , d
Bacteria								
<i>Riftia pachyptila</i> symbiont	Anaerobic	6.2 (42)				19.5 (42)		
<i>Rhodospirillum rubrum</i>	Anaerobic	12.3 (43)	80 [7.8] (44)	7.3 (44)		23.0 (25)	21.4 (25)	1.4 (45)
<i>Chromatium vinosum</i>	Anaerobic	41 (46)	37 [8.0] (46)	6.7 (46)				
Cyanobacteria								
<i>Anabaena variabilis</i>	CCM [†] present	43 (47)			65.7 (47)			
<i>Synechococcus 7002</i>	CCM present	52 (48)	246 [7.8] (48)	13.4 (48)				
<i>Synechococcus 6301</i>	CCM present	43 (49)	340 [7.8] (49)	11.6 (49)	48.1 (50)	22.0 (25)	21.6 (25)	
Green algae								
<i>Euglena gracilis</i>	CCM present	54 (9)			41.8 (51)			
<i>Chlamydomonas reinhardtii</i>	CCM present	61 (9)	29 [8.3] (9)	5.8 [‡]				
C ₄ higher plants								
<i>Amaranthus hybridus</i>	CCM present	82 (9)	16 [8.3] (9)	3.8 [§]				
<i>Sorghum bicolor</i>	CCM present	70 (10)	30 [8.3] (10)	5.4 (52)				
<i>Zea mays</i>	CCM present	79 (43)	34 [8.3] (9)	4.4 (52)				
C ₃ higher plants								
<i>Triticum aestivum</i>	CCM absent	90 (43)	14 [8.0] (50)	2.5 (50)	80.3 (50)			
<i>Oryza sativa</i>	CCM absent	85 (43)			68.6 (53)			
<i>Spinacia oleracea</i>	CCM absent	82 (43)	14 [8.3] (9)	3.7 (52)	68.6 (50)	30.3 (25)	21.1 (25)	530 (15)
<i>Atriplex glabriuscula</i>	CCM absent	87 (54)			64.9 (54) [¶]			
<i>Nicotiana tabacum</i>	CCM absent	82 (55)	11 [8.3] (55)	3.4 (55)				
Nongreen algae								
<i>Phaeodactylum tricornutum</i>	CCM present	113 (55)	28 [8.3] (55)	3.4 (55)				
<i>Griffithsia monilis</i>	CCM absent?	167 (55)	9.3 [8.3] (55)	2.6 (55)		31.5		
<i>Galdieria sulfuraria</i>	CCM absent?	166 (55)	3.3 [8.3] (55)	1.2 (55)	76.1 ^{**}			

Unless otherwise specified, the data apply to 25°C. Where necessary, S_{C/O} and K_C values were adjusted using the Henderson-Hasselbalch equation to a common pK_a of 6.25 for the CO₂/HCO₃⁻ equilibrium.

^aUnless stated otherwise, the ¹³C and ¹⁸O isotope fractionations were measured with the isolated enzymes *in vitro*. The limited data for Δ¹⁸O are supported by a recent observation of 21.3‰ for the Δ¹⁸O of the oxygenase reaction of *Pisum sativum* Rubisco (56).

[†]CCM, CO₂ concentrating mechanism that increases the CO₂ concentration in the subcellular environment of Rubisco by 10¹- to 10³-fold above ambient, either by accumulation of CO₂ or HCO₃⁻ directly or by intermediate accumulation and decarboxylation of C₄ dicarboxylic acids.

[‡]Determined at 30°C (57) and adjusted to 25°C using the E_s listed for *Euglena gracilis*.

[§]For Rubisco isolated from the related species, *Amaranthus retroflexis* (52).

[¶]E_s for temperatures >15°C.

^{||}Inferred from the carbon-isotope fractionation at saturating CO₂ of whole tissues of another temperate floridiophycean macrophyte, *Lamanea mamillosa* (58).

^{**}For Rubisco isolated from the closely related species *Galdieria partita* (33).