Table 1. Photosynthetic carbon metabolism of isolated mesophyll and bundle sheath cells

Cell type and activity	Additions	Species	Comments	Rate (μmol/min/mg chlorophyll)		References[a]
				Light	Dark	
Mesophyll cells						
$^{14}CO_2$ fixation	$H^{14}CO_3^-$ ± ribose-P, ADP	Several spp.	Negligible activity	–	–	1, 6, 7, 9
	Pyruvate + oxaloacetate	*D. sanguinalis*	Light-dependent	0.9	0	7
	PEP	Several spp.	High rate, light or dark	7–17	7–17	1, 6, 7, 9
O_2 evolution	Oxalacetate or PEP + HCO_3^-	*Digitaria* sp.	Light-dependent	2.3–3	0	4
Bundle sheath cells						
$^{14}CO_2$ fixation	$H^{14}CO_3^-$ only	*A. spongiosa*	To PCR cycle products	2.3	0	10
	$H^{14}CO_3^-$ only	Several species	Products not determined	0.5–1.5	0	2, 9
	Ribose-P, ADP	*D. sanguinalis*	Endogenous activity low, 3-PGA major product, only partially light-dependent with ADP, variety of PCR cycle products with *C. gayana*	1.1 2–2.8	0.4 –	1 5
	Ribose-P, ADP	*Cyperus, rotundus*		1.4	1.0	6
	Ribose-P	*Z. mays*		0.5–1.1	<0.1	3, 11
	Ribose-P	*C. gayana*		1.16	0	11
	PEP	Several spp.	Low versus mesophyll	–	–	1, 6, 9
O_2 evolution	HCO_3^- or C_4 acids	*A. spongiosa*	Dependent on additions	1.9–2.0	0	10
C_4 acid decarb-oxylation	Malate	*A. spongiosa*	Aspartate, 2-oxoglutarate also required	2.3	1.4	10
	Malate, NADP, Mg^{2+}	*D. sanguinalis*	NADP and Mg^{2+} essential	5	5	5
C-4 of C_4 acids to PCR cycle	Malate	*A. spongiosa*	Fixation following C_4 acid decarboxylation	1.6	0	10
		Z. mays		0.9	0	11

[a] References: (1) EDWARDS and BLACK (1971); (2) EDWARDS and GUTIERREZ (1972); (3) CHOLLET and OGREN (1973); (4) SALIN et al. (1973); (5) HUBER et al. (1973); (6) CHEN et al. (1974); (7) HUBER and EDWARDS (1975); (8) GUTIERREZ et al. (1975); (9) GUTIERREZ et al. (1974b); (10) KAGAWA and HATCH (1974b); (11) HATCH and KAGAWA, Arch. Biochem. Biophys., in press.