Supplementary Table S5: Substrate utilization of *Bradyrhizobium* strains a described *Bradyrhizobium* type strains of the *B. elkanii* supergroup.

Substrate utilization	*Bradyrhizobium* strains[a]														*Bradyrhizobium* type strains[b]										
	B. oropedii				*B. acaciae*				*B. brasilense*				*B. ivorense*	*B. altum*											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	a	b	c	d	e	f	g	h	i	j	k
Reduction of nitrates to nitrogen	+	-	-	-	+	-	+	+	-	-	-	+	-	+	+	+							+	-	+
L-tryptophane (indole production)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-								-		
D-glucose (glucose fermentation)	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-						+	-
L-arginine DiHydrolase	+	-	+	-	-	+	-	-	-	+	-	-	+	-	-	-							+	+	+
Urease	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+	+			+	-	+	+	+
Esculin ferric citrate (hydrolysis β-glucosidase)	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	w						+	+	w	+
gelatin (bovin origin)	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-								-	-	-
4-nitrophenyl-βD-galactoyranoside (β-galactosidase)	+	+	-	w	+	w	+	+	-	w	-	-	-	-	-	-							-	-	-
Potassium gluconate	-	+	-	+	+	+	+	+	-	-	w	+	+	-	+		+	-			-	-		+	
Capric acid	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-									-	
Adipic acid	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-										
Malic acid	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-								-	w	-
Trisodium citrate (Citrate utilization)	+	-	-	-	-	-	-	-	-	w	-	-	-	-	-	-								w	
Phenylacetic acid	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-								w	
α-cyclodextrin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
Dextrin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
Glycogen	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-		+	-			-	v			
Tween 40	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+				+	+					
Tween 80	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+				-	+					
N-acetyl-D-galactosamine	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-										
N-Acetyl-D-glucosamine	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-			-	-		+	
Adonitol	-	-	-	-	-	-	-	-	+	-	-	-	-	+	-		-	w			w	w			
L-arabinose	+	+	-	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	-	+	+	+	+	+	+
D-arabitol	+	+	-	+	-	-	-	-	+	w	+	+	+	+	+		w	w	+	+	w	v			
D-cellobiose	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-			-				
i-erythritol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						-	v			
D-fructose	+	+	+	w	w	-	-	-	+	w	w	+	+	+	+	+		w	+	+	+	+	+	+	w
L-fructose	w	+	+	+	+	+	+	+	+	+	+	+	+	+	+										

D-galactose	w	+	-	w	+	+	+	+	+	+	+	+	+	+	+		+	+	-	+	w	+		+	
Gentiobiose	-	w	-	-	-	-	-	-	-	-	-	-	-	+	-		+	-	-	-	-	-			
α-D-glucose	w	w	+	-	w	w	w	+	w	w	+	+	w	+	w				-	+					
m-inositol	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-		-				-	v			
α-D-lactose	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-								w		w
Lactulose	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-										
Maltose	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	v	-	-			-	v	-	+	-
D-mannitol	+	+	+	+	-	-	-	-	+	w	-	+	w	+	+	+	w	w	+	+	w	+	+	+	+
D-mannose	-	w	+	-	w	-	w	-	-	-	-	-	w	+	w	-	+	+	-	-	+	+		+	
D-melibiose	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-						-				
β-methyl-D-glucoside	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-										
D-psicose	w	-	-	-	-	-	-	-	w	-	-	-	-	+	-										
D-raffinose	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-		-	-			-				
L-rhamnose	+	w	-	-	+	w	+	+	w	w	w	+	w	+	w	+	w	w	+	+	w	w			
D-sorbitol	w	+	+	-	-	-	-	-	-	w	w	w	w	+	w		w	w	-	+	w	+			
Sucrose	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-			-			-	-	-		-
D-trehalose	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-		-	-			-	-			
Turanose	-	-	-	-	w	-	-	-	-	-	-	-	-	+	-		-	-			-	w			
Xylitol	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-		-	-			w	+			
mono-methyl-succinate	+	+	-	+	+	+	+	+	+	+	+	+	w	+	+										
acetic acid	w	w	-	-	-	-	-	w	-	-	-	-	-	-	w				+	+					
cis-aconitic acid	w	-	-	-	-	-	-	-	-	-	-	-	-	+	-				+	-					
citric acid	w	w	-	-	w	+	w	+	-	+	w	+	+	+	+				+	+			-		-
formic acid	w	w	+	-	w	+	w	+	-	+	w	+	+	+	+				+	+					
D-galactonic acid lactone	w	w	-	-	w	w	w	w	-	+	w	+	+	+	w				+	+					
D-galacturonic acid	w	w	-	-	w	w	w	-	+	-	-	w	-	+	w				-	+					
D-gluconic acid	+	+	+	w	+	+	+	+	w	+	+	+	+	+	+				-	-					
D-glucosaminic acid	w	w	-	-	-	-	-	-	-	+	+	+	+	+	+				+	+					
D-glucoronic acid	w	-	-	-	-	-	-	-	w	-	-	-	-	+	-				-	-					
α-hydroxy butyric acid	+	+	+	w	+	+	+	+	+	+	+	+	+	-	+				+	+					
β-hydroxy butyric acid	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+										
γ-hydroxy butyric acid	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+				+	+					
p-hydroxy phenylacetic acid	w	+	+	+	w	+	+	+	+	+	+	+	+	+	+				-	-					
itaconic acid	-	w	-	-	-	-	-	-	-	-	-	w	+	-	-				+	+					
α-keto butyric acid	+	+	-	+	+	+	+	+	w	+	+	+	+	-	+				+	+					
α-keto glutaric acid	+	w	+	-	+	+	+	w	w	+	+	+	+	+	w				+	+					
α-keto valeric acid	-	w	-	-	+	+	-	w	-	w	w	w	+	-	w				+	-					
D,L-lactic acid	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+				-	+					

malonic acid	w	-	-	-	-	-	-	-	-	-	-	w	+	+	-				+	-							
propionic acid	w	+	-	w	w	+	-	+	-	w	w	+	+	+	+				+	+							
quinic acid	w	-	-	-	-	-	-	-	-	-	-	-	-	+	-				+	-							
succinic acid	+	+	+	-	+	+	+	+	-	+	+	+	+	+	+				+	+							
D-saccharic acid	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+				-	+							
sebacic acid	+	+	-	w	+	+	+	+	+	+	+	+	+	+	+				+	+							
bromo succinate acid	+	w	-	-	+	+	+	+	w	w	w	w	+	+	+				+	+							
succinamic acid	+	+	-	w	+	+	+	+	+	+	+	+	+	+	+												
Glucuronamide	+	-	+	-	+	+	+	w	+	w	+	+	w	+	+				-	+							
L-alaninamide	+	+	+	w	+	+	+	+	w	+	+	+	+	w	+				+	+							
D-alanine	+	+	-	w	+	+	w	+	w	+	+	+	+	w	w				+	+							
L-alanine	+	+	-	w	+	+	+	+	w	+	+	+	+	+	w				-	+							
L-alanyl-glycine	+	+	-	w	+	+	w	+	w	-	w	w	+	+	w				+	+							
L-asparagine	+	w	-	-	+	+	+	+	-	+	+	+	+	+	w				+	+			w		-		
L-aspartic acid	+	w	-	-	+	w		+	-	+	w	+	+	+	w				+	+							
L-glutamic acid	+	w	-	-	+	+	+	+	-	+	w	+	+	+	w				+	+			+		+		
glycyl-L-aspartic acid	w	w	-	-	-	-	-	-	-	-	w	w	-	-	-												
glycyl-L-glutamic acid	w	+	-	-	+	+	+	+	-	w	+	+	w	-	+												
L-histidine	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-												
hydroxy-L-proline	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-												
L-leucine	+	+	+	w	+	+	+	+	w	+	+	+	+	+	+				+	+							
L-ornithine	w	-	-	-	-	-	-	-	-	-	-	-	-	+	-												
L-phenylalanine	+	w	+	-	w	+	w	w	-	-	w	w	+	+	w				+	+							
L-proline	+	w	-	-	w	-	w	-	-	-	w	w	-	+	w				-	-							
L-pyroglutamic acid	+	+	-	w	+	+	+	+	w	+	+	w	+	+	+				+								
D-serine	w	w	-	-	w	-	w	-	w	-	-	-	-	-	-				+	+							
L-serine	w	-	-	-	w	-	w	-	-	-	-	-	-	-	-				+	-							
L-threonine	-	-	-	-	+	-	w	-	-	-	-	w	-	-	-				-	+							
D,L-carnitine	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-												
γ-amino butyric acid	-	-	-	-	-	-	w	-	-	-	-	-	w	+	w				+	-							
urocanic acid	+	+	+	w	+	+	+	+	+	w	w	+	+	+	w				+	+							
Inosine	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-												
Uridine	-	-	-	-	-	-	-	-	-	-	w	-	-	-	-												
Thymidine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-												
Phenyethylamine	w	-	-	-	-	-	-	-	-	-	-	-	-	-	-				+	-							
Putrescine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-												
2-aminoethanol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-												
2,3-butanediol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-												

Glycerol	+	+	-	+	+	+	+	+	w	+	+	+	-	+	+			w	+	+	+	+	w		w
D,L-α-glycerol phosphate	w	-	-	-	-	-	-	-	-	-	-	-	-	+	-										
glucose-1-phosphate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
glucose-6-phosphate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
Oxidase	+	+	+	+	+	+	+	+	+	+	+	+	+	+										+	
Catalase	+	+	+	+	+	+	+	+	+	+	+	+	+	+										-	

Results are indicated as '+' positive for substrate utilization, 'w' weak for substrate utilization, '-' negative for substrate utilization, 'v' for variable results between strains within a species and grey blocks indicates no data available. Thick black lines are used to separate strains of the same species.

[a] Isolates are numbered (1-14): (1) Pear128, (2) Pear129, (3) Pear76^T, (4) Leo176, (5) 19AH, (6) 19AJ, (7) 10BB^T, (8) 16BA no1,) (9) Arg62, (10 R5, (11) Cham227, (12) Cham231, (13) Arg68 (14) Pear77^T.

[b] *Bradyrhizobium* type strains: (a) *B. elkanii* USDA6^T (This study), (b) *B. pachyrhizi* PAC48^T (Ramírez-Bahena et al., 2009), (c) *B. embrapense* SEMIA6208^T (Delamuta et al., 2015), (d) *B. tropiciagri* SEMIA6148^T (Delamuta et al., 2015), (e) *B. erythrophlei* CCBAU 53325^T (Yao et al., 2015), (f) *B. ferriligni* CCBAU 51502^T (Yao et al., 2015), (g) *B. viridifuturi* SEMIA690^T (Helene et al., 2015), (h) *B. mercantei* SEMIA6399^T (Helene et al., 2017), (i) *B. brasilense* (da Costa et al., 2017), (j) *B. ivorense* CI-1B^T (Fossou et al., 2019), (k) *B. uaiense* UFLA03-164^T (Michel et al., 2020). Results of API 20NE and Biolog test for each respective *Bradyrhizobium* described species (i.e. based on results available for all strains within a species) was obtained from published species descriptions.