

The fate of mamaku gum in the gut: Effect on *in vitro* gastrointestinal function and colon fermentation by human faecal microbiota

Supplementary Information

Akshay Bisht^{a,b}, Kelvin K. T. Goh^a, Lara Matia-Merino^{a*}

^a School of Food and Advanced Technology, Massey University, Palmerston North, New Zealand. AB: A.Bisht@massey.ac.nz; KKTG K.T.Goh@massey.ac.nz; LMM: L.Matia-Merino@massey.ac.nz

*** Corresponding author:**

A/Prof. Dr. Lara Matia-Merino

School of Food and Advanced Technology, Massey University, Private Bag 11222, Palmerston North, 4442, New Zealand

Email: l.matia-merino@massey.ac.nz

Telephone: +6469516016

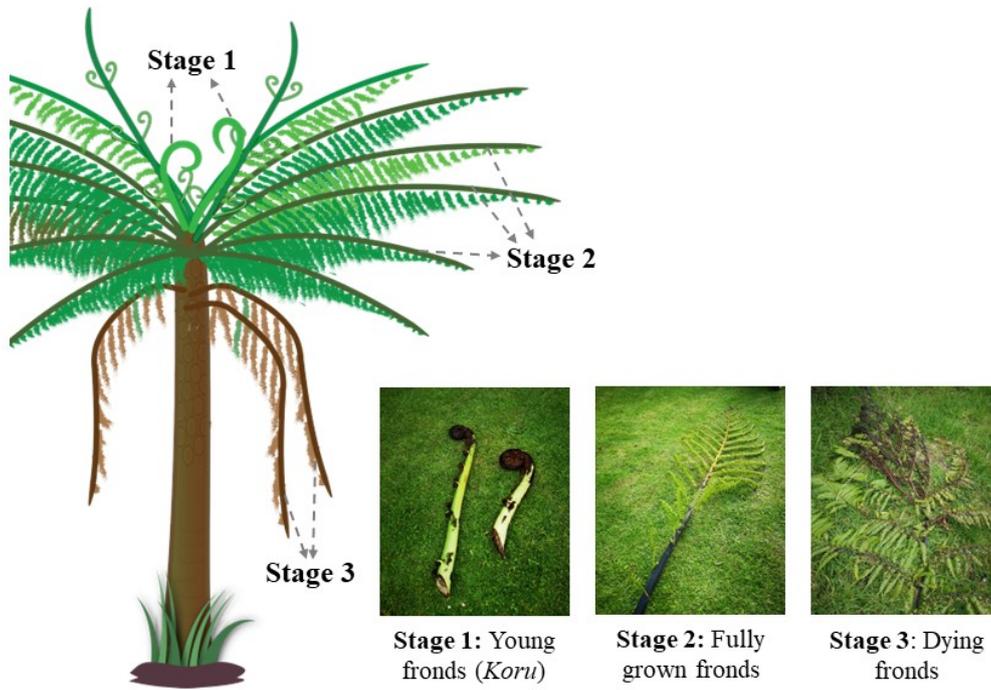


Fig. S1 Pictorial representation of mamaku frond with three stages of harvesting age (stage 1, stage 2 and stage 3).

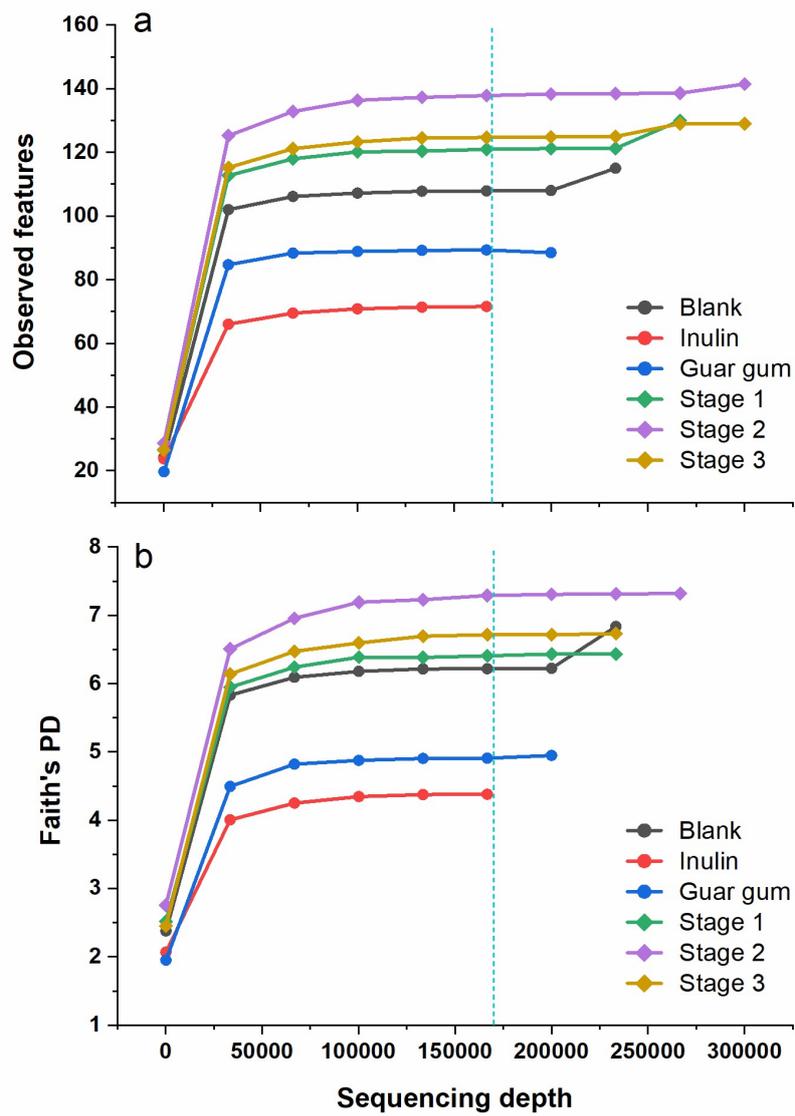


Fig. S2 Alpha rarefaction curve using (a) observed features and (b) Faith's phylogenetic diversity (PD). Dash line represents a sequencing depth of 172,862. Stage 1, 2 and 3 refers to the harvesting age of the mamaku fronds.

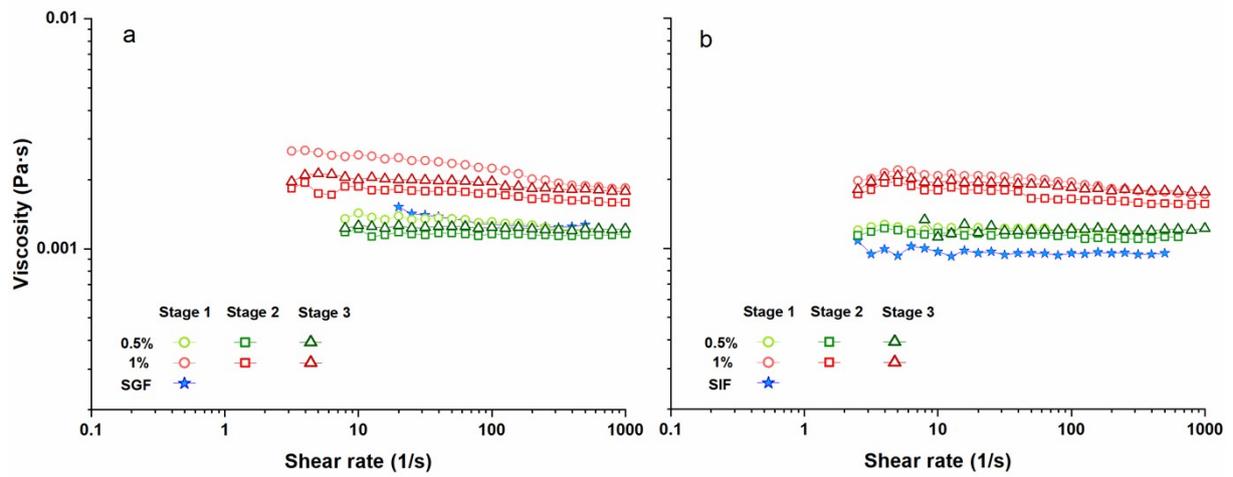


Fig. S3 Viscosity profiles of mamaku gum (0.5% and 1% w/w) in (a) simulated gastric fluid (SGF) and (b) simulated intestinal fluid (SIF) as a function of shear rate. Measurements were taken using double gap geometry at 20°C.

Table S1 Composition of simulated fluids used during *in vitro* digestion.

Salt	Concentration (mM)		
	SSF (pH 7)	SGF (pH 3)	SIF (pH 7)
KCl	15.1	6.9	6.8
KH ₂ PO ₄	3.7	0.9	0.8
NaHCO ₃	13.6	25	85
NaCl	-	47.2	38.4
MgCl ₂ ·6H ₂ O	0.15	0.12	0.33
(NH ₄) ₂ CO ₃	0.06	0.5	-
HCl	1.1	15.6	8.4
CaCl ₂ ·2H ₂ O	1.5	0.15	0.6

SSF, simulated salivary fluid; SGF, simulated gastric fluid; SIF, simulated intestinal fluid.

Table S2 Molecular parameters of purified mamaku gum (stage 1, 2 and 3) at 0, 1 and 2 h during gastric and intestinal digestion, analysed by size-exclusion chromatography coupled with multi-angle laser light scattering (SEC-MALLS).

	Weight-average molar mass, $M_w \times 10^6$ (Da)	Root mean square radius, R_z (nm)	Polydispersity (M_w/M_n)
<i>Gastric digestion</i>			
Stage 1			
0h	3.98±0.57 ^a	147.19±1.11 ^a	1.08±0.01 ^a
1h	4.01±0.79 ^a	146.44±2.18 ^a	1.07±0.01 ^a
2h	4.03±0.18 ^a	148.03±2.87 ^a	1.08±0.01 ^a
Stage 2			
0h	2.51±0.04 ^c	124.05±3.35 ^b	1.11±0.01 ^a
1h	2.45±0.14 ^c	122.27±1.01 ^b	1.12±0.01 ^a
2h	2.44±0.06 ^c	122.57±1.27 ^b	1.12±0.01 ^a
Stage 3			
0h	2.03±0.05 ^e	108.65±1.07 ^c	1.08±0.01 ^a
1h	2.04±0.01 ^e	109.15±0.25 ^c	1.09±0.01 ^a
2h	2.03±0.05 ^e	107.5±1.98 ^c	1.08±0.01 ^a
<i>Intestinal digestion</i>			
Stage 1			
0h	4.06±0.17 ^a	148.17±4.11 ^a	1.09±0.01 ^a
1h	4.12±0.06 ^a	147.04±1.18 ^a	1.08±0.01 ^a
2h	4.11±0.1 ^a	147.64±2.87 ^a	1.08±0.01 ^a
Stage 2			
0h	2.69±0.01 ^b	121.8±2.99 ^b	1.12±0.01 ^a
1h	2.75±0.08 ^b	120.47±2.43 ^b	1.12±0.02 ^a
2h	2.65±0.07 ^b	122.47±0.96 ^b	1.13±0.01 ^a
Stage 3			
0h	2.20±0.08 ^d	107.7±1.27 ^c	1.1±0.01 ^a
1h	2.15±0.07 ^d	106.75±1.91 ^c	1.1±0.02 ^a
2h	2.23±0.95 ^d	106.2±2.65 ^c	1.1±0.01 ^a

Values are expressed as means ± standard deviation (n=3). Values in the same column denoted with different superscripts are significantly different ($p \leq 0.05$).