

Morpho-genetic characterization of diploid and tetraploid taro (*Colocasia esculenta* L. Schott) cv. Kaliurang – An Indonesian local cultivar

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Electronic Supplementary Material (ESM)

The authors are fully responsible for both the content and the formal aspects of the electronic supplementary material. No editorial adjustments were made.

Table S1. Description of digitation consensus of Kaliurang taro leaf (abaxial) for geometric morphometric analysis

Landmark	Character code	Description
1	S	sagittate leaf
2, 3, 4, 14, 15, 16	Vp	V pattern
5, 13	Vn1	venation 1 pattern
6, 12	Vn2	venation 2 pattern
7, 11	Vn3	venation 3 pattern
9	Ts	leaf tips
8, 10	M	midrib leaf
17	Pi	petiole insertion

Table S2. Variation of plant morphological characters between diploid clone (K0) and 3 tetraploid clones (K1, K2, and K3) of Kaliurang taro

Character code	Character	Character state*	Clones			
			K0	K1	K2	K3
M1	length of I pattern (cm)	0 = <2.9; 1 = >2.9	1	0	0	0
M2	length of leaf end (cm)	0 = 0.1; 1 = 0.2	0	1	1	1
M3	length of submarginal venation to the edge at Z (cm)	0 = 0.08; 1 = 0.1	0	1	1	1
M4	length of submarginal venation to the edge at Y (cm)	0 = 0.08; 1 = 0.1	0	1	1	1
M5	leaf blade abaxial colour	0 = GG138B; 1 = GG138D	0	1	1	1
M6	leaf blade adaxial colour	0 = GG137A; 1 = GG137B	0	1	1	1
M7	leaf blade margin	0 = Entire; 1 = Sinuate	0	1	1	1
M8	leaf margin colour	0 = Green; 1 = Purple	0	1	1	1
M9	leaf submarginal colour	0 = GG137A; 1 = GG137B	0	1	1	1
M10	adaxial colour of midrib	0 = GG 137C; 1 = GG137B	0	1	1	1
M11	lateral venation colour of adaxial leaf 1	0 = GG137C; 1 = GG137B	0	1	1	1
M12	lateral venation colour of adaxial leaf 2	0 = GG137C; 1 = GG137B	0	1	1	1
M13	lateral venation colour of adaxial leaf 3	0 = GG137C; 1 = GG137B	0	1	1	1
M14	sheath tip type	0 = symmetric; 1 = asymmetric	0	1	1	1
M15	sheath tip colour	0 = GYG147A; 1 = GPG N187A	0	1	1	1
M16	leaf sheath edge colour	0 = purple-green line; 1 = purple	0	1	1	1
M17	sheath colour (dominant)	0 = GYG147A; 1 = GPG N187A	0	1	1	1
M18	sheath pattern (inner side)	0 = irregular green curved lines; 1 = irregular purple curved lines	0	1	1	1
M19	sheath pattern	0 = irregular green curved lines; 1 = irregular purple curved lines	0	1	1	1
M20	petiole colour of middle third	0 = GYG147A; 1 = GPG N187A	0	1	1	1
M21	petiole strips colour	0 = green; 1 = purple	0	1	1	1
M22	petiole colour	0 = GYG147A; 1 = GPG N187A	0	1	1	1

*Code of colour character based on RHS colour chart

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Table S3. Sequence of twelve ISSR primer used on molecular analysis of DNA genome of Kaliurang taro based on Singh et al. (2012) publication which produces repeatable band

No.	Code	Primer	Sequence (5'-3')*
1	UBC-14	(CT) ₈ A	CTCTCTCTCTCTCTCTA
2	UBC-15	(CT) ₈ G	CTCTCTCTCTCTCTCTG
3	UBC-22	(AG) ₈ YT	AGAGAGAGAGAGAGAGYT
4	UBC-23	(AG) ₈ YC	AGAGAGAGAGAGAGAGYC
5	UBC-25	(AG) ₈ YA	AGAGAGAGAGAGAGAGYA
6	UBC-50	(CA) ₈ ART	CACACACACACACACAART
7	UBC-54	(TC) ₈ RG	TCTCTCTCTCTCTCTCRG
8	UBC-64	(AC) ₈ CYT	ACACACACACACACACCYT
9	UBC-66	(CTC) ₆	CTCCTCCTCCTCCTCCTC
10	UBC-67	(GGC) ₆	GGCGGCGGCGGCGGCGGC
11	UBC-68	(AC) ₈ YG	ACACACACACACACACYG
12	UBC-92	(CA) ₈ YC	CACACACACACACACAYC

Table S4. DNA bands produced from ISSR primer amplification in Kaliurang taro DNA genome

No	Primer (5'-3')	Temperature (°C)	Fragmen size (bp)	No. of bands	No. of polymorphic bands	Percentage of polymorphic bands (%)
1	(CT) ₈ A	37.5	250–500	3	2	66.6
2	(CT) ₈ G	36	500–1000	3	2	66.6
3	(AG) ₈ YT	45	400–500	2	0	0
4	(AG) ₈ YC	36	300–750	5	3	60
5	(AG) ₈ YA	45	375–625	4	0	0
6	(CA) ₈ ART	45	375–750	3	1	33.3
7	(TC) ₈ RG	36	250–750	6	3	50
8	(AC) ₈ CYT	36	300–500	4	2	50
9	(CTC) ₆	55	500–1000	2	2	100
10	(GGC) ₆	55	250–300	2	1	50
11	(AC) ₈ YG	45	350–650	4	1	25
12	(CA) ₈ YC	55	250–750	4	2	50
Total				42	19	–
Averages				3.5		45.2

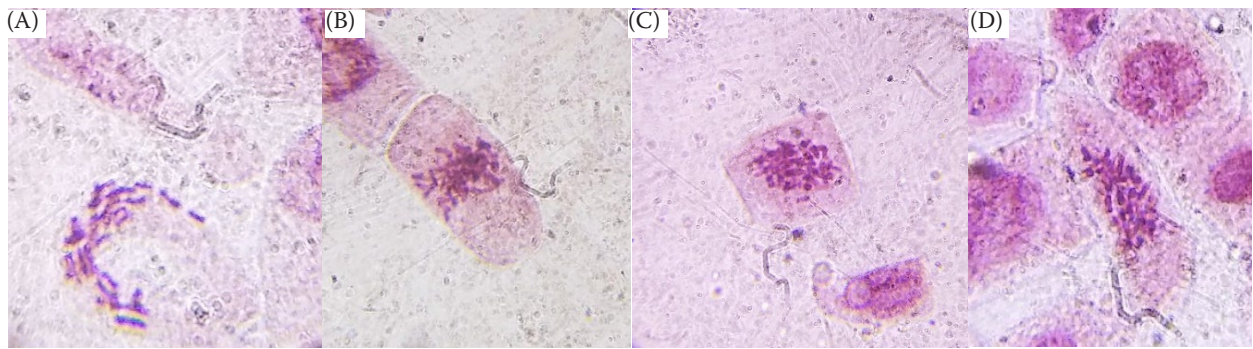


Figure S1. Chromosome metaphase with squashing method of *in vitro* Kaliurang taro root tips observed with light microscope; magnification 100×10 : clone K0 diploid (A); clone K1 tetraploid (B); clone K2 tetraploid (C) and clone K3 tetraploid (D)

Ermayanti et al. (2018), unpublished data

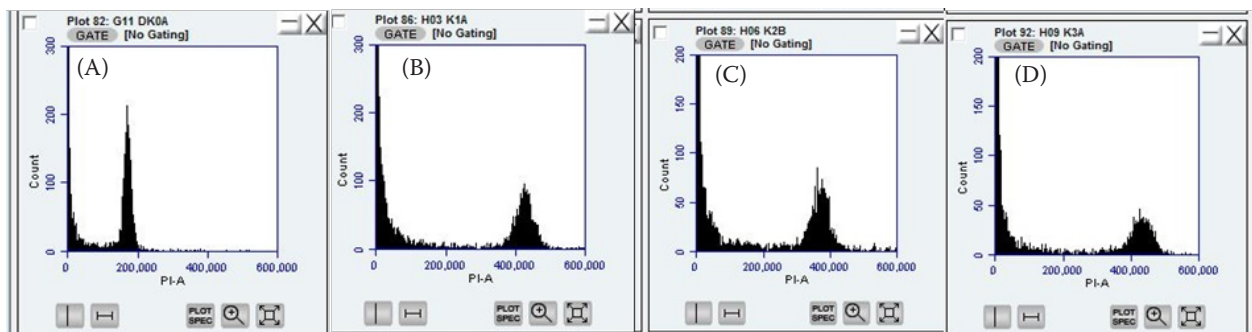


Figure S2. Reconfirm the taro clones' ploidy level using leaves samples of taro growth in the greenhouse by flowcytometric analysis: clone K0 diploid (A); clone K1 tetraploid (B); clone K2 tetraploid (C) and clone K3 tetraploid (D)

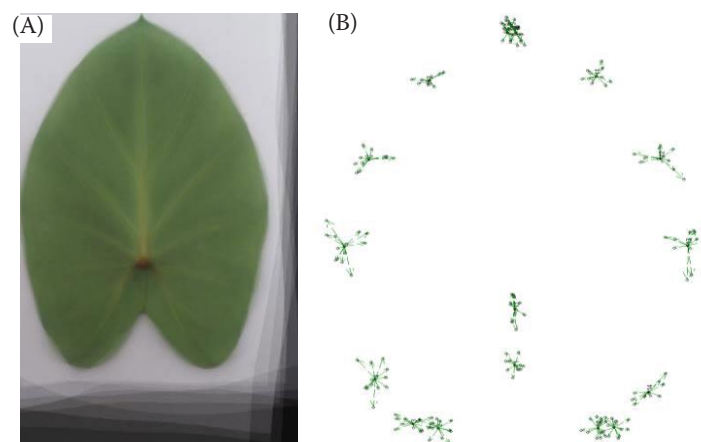


Figure S3. Average leaf shape as result of geometric morphometric analysis: an illustration of the shape of the leaf of Kaliurang taro with an average of 17 digitization points from 12 individual leaves (A); a vector plot showing the average value of 17 digitization points for each individual clone (B)

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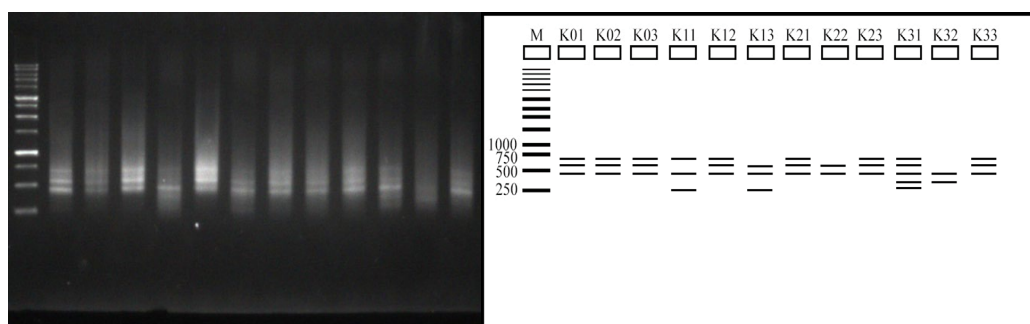


Figure S4. Amplification of ISSR marker with $(TC)_8RG$ primer, resulted in a total of 6 bands (3 polymorphic and 3 monomorphic bands)

M – DNA ladder 1 kb, K0_{1,2,3} – diploid clone (K0), K1_{1,2,3} – tetraploid clone (K1), K2_{1,2,3} – tetraploid clone (K2), K3_{1,2,3} – tetraploid clone (K3)

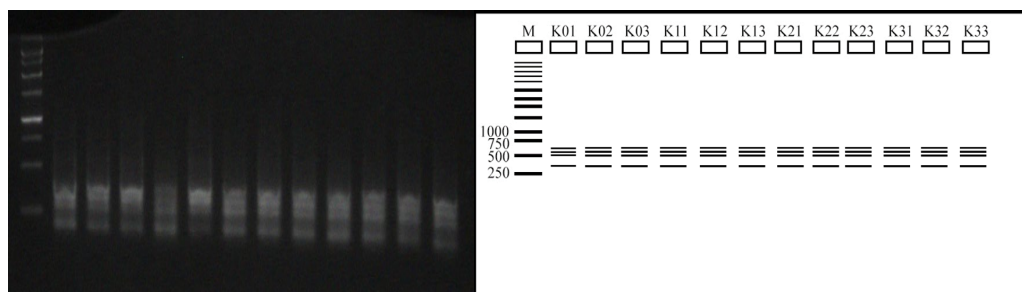


Figure S5. Amplification of ISSR marker with $(AG)_8YA$ primer, resulted monomorphic bands on all clones

M – DNA ladder 1 kb, K0_{1,2,3} – diploid clone (K0), K1_{1,2,3} – tetraploid clone (K1), K2_{1,2,3} – tetraploid clone (K2), K3_{1,2,3} – tetraploid clone (K3)

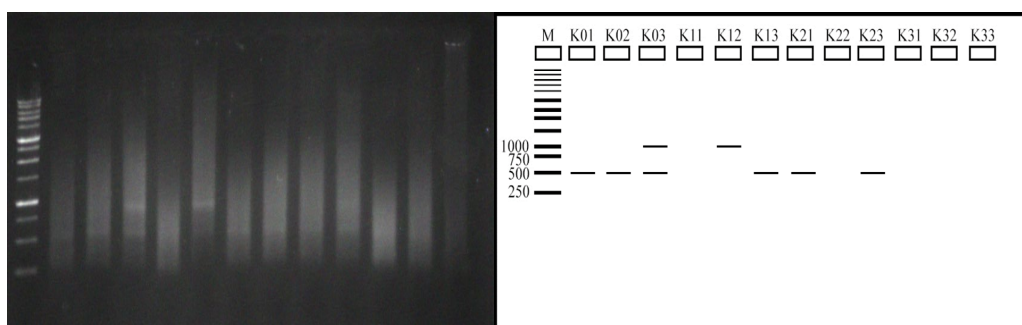


Figure S6. The amplification of the ISSR marker with primer $(CTC)_6$, resulted in a 100% polymorphic band; The 500 bp band was amplified in clones K0, K1, and K2; the 1 000 bp band was amplified in clones K0 and K1

M – DNA ladder 1 kb, K0_{1,2,3} – diploid clone (K0), K1_{1,2,3} – tetraploid clone (K1), K2_{1,2,3} – tetraploid clone (K2), K3_{1,2,3} – tetraploid clone (K3)

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