



DNA PROFILING OF CACAO (*Theobroma cacao* L.) VARIETIES IN THE PHILIPPINES USING MICROSATELLITE MARKERS

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VARIETY AUTHENTICATION CONCERNS

VARIETY REGISTRATION SOLELY BASED ON MORPHO- HORTICULTURAL DATA

The National Seed Industry Council (NSIC) performs the registration of varieties for perennials *in-situ*.

There is very little information then on the degree of relatedness of registered and recommended varieties.

MISLABELING OF THE PLANTING MATERIALS

A problem in nurseries have no means to authenticate the trueness of the varuety being sold to farmers.

OBJECTIVE



To establish the genetic characteristics of Philippine cacao collection by use of simple sequence repeat (SSR) technology to aid in the conservation and variety identification and development efforts.

MATERIAL USED

CACAO COLLECTION

14 varieties

NO. OF CLONES PER VARIETY

7	BR25	2	S5
6	K1	1	USMCH1
5	K2	1	USMCH2
5	UF18	1	DR1
4	PBC123	1	P7
4	UIT1	7	Criollo
3	ICS40	Criollo Red	Criollo (NL)
3	K9	Criollo Green	Criollo (M)
		Criollo 21	Criollo (Q)
		Criollo 22	

total of **50** accessions in the collection

METHODS

SAMPLE COLLECTION



DNA EXTRACTION



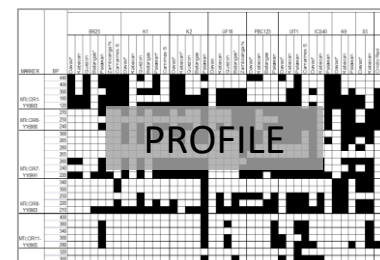
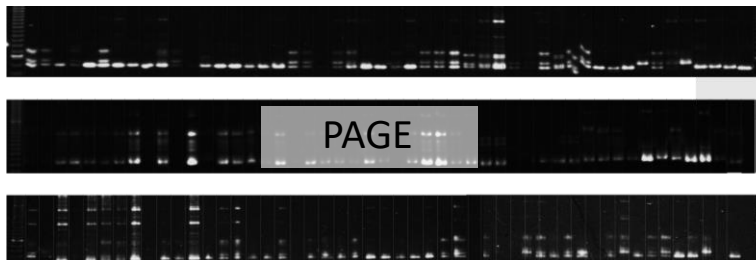
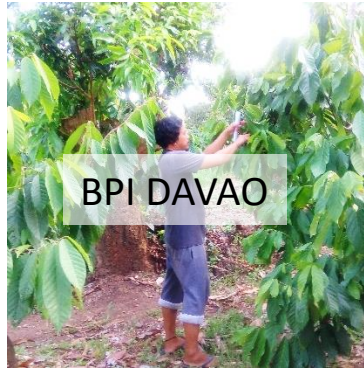
MARKER SCREENING



PCR AMPLIFICATION



DNA PROFILE



RESULTS

Table 1. Observed no. of bands, size range of amplicons, no. of polymorphic alleles and computed PIC values of 15 microsatellite markers.

Primer	No. of bands	Size range (bp)	No. of polymorphic alleles	PIC
MTcCIR1	3	160-200	3	0.6491
MTcCIR6	5	160-290	5	0.7005
MTcCIR7	4	160-220	4	0.6835
MTcCIR8	6	210-350	6	0.7844
MTcCIR11	4	180-400	4	0.7485
MTcCIR12	9	190-310	9	0.8679
MTcCIR15	4	240-290	4	0.7424
MTcCIR18	6	240-420	6	0.7887
MTcCIR22	6	280-420	6	0.8249
MTcCIR24	4	185-280	4	0.7293
MTcCIR26	4	280-320	4	0.6341
MTcCIR33	9	260-530	9	0.8702
MTcCIR37	6	140-280	6	0.8154
MTcCIR40	9	200-400	9	0.8308
MTcCIR60	5	190-300	5	0.7557



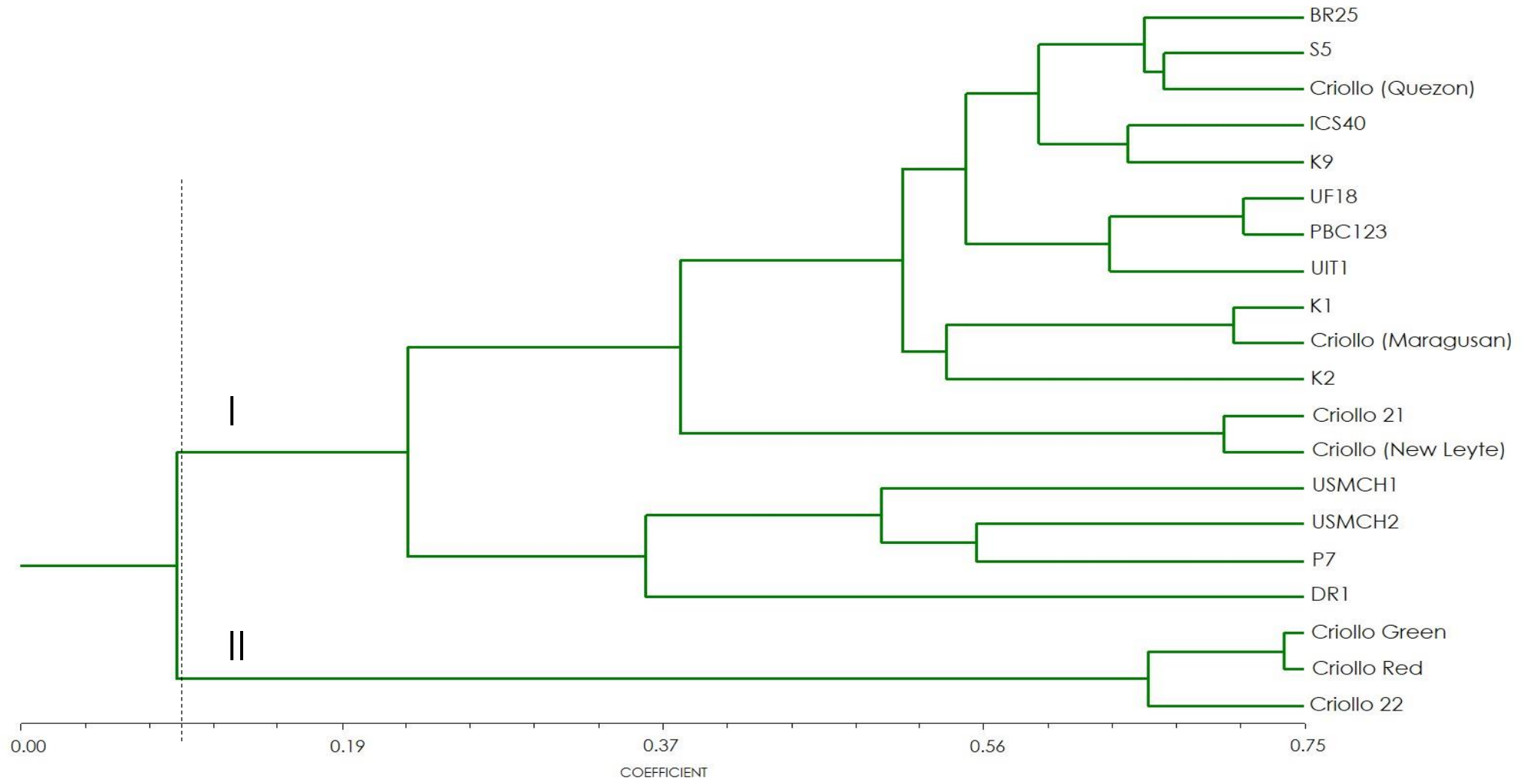


Figure 2. Dendrogram of 13 standard cacao varieties and 7 Criollo clones generated from 15 SSRs by unweighted pair-group mean average (UPGMA) cluster analysis.

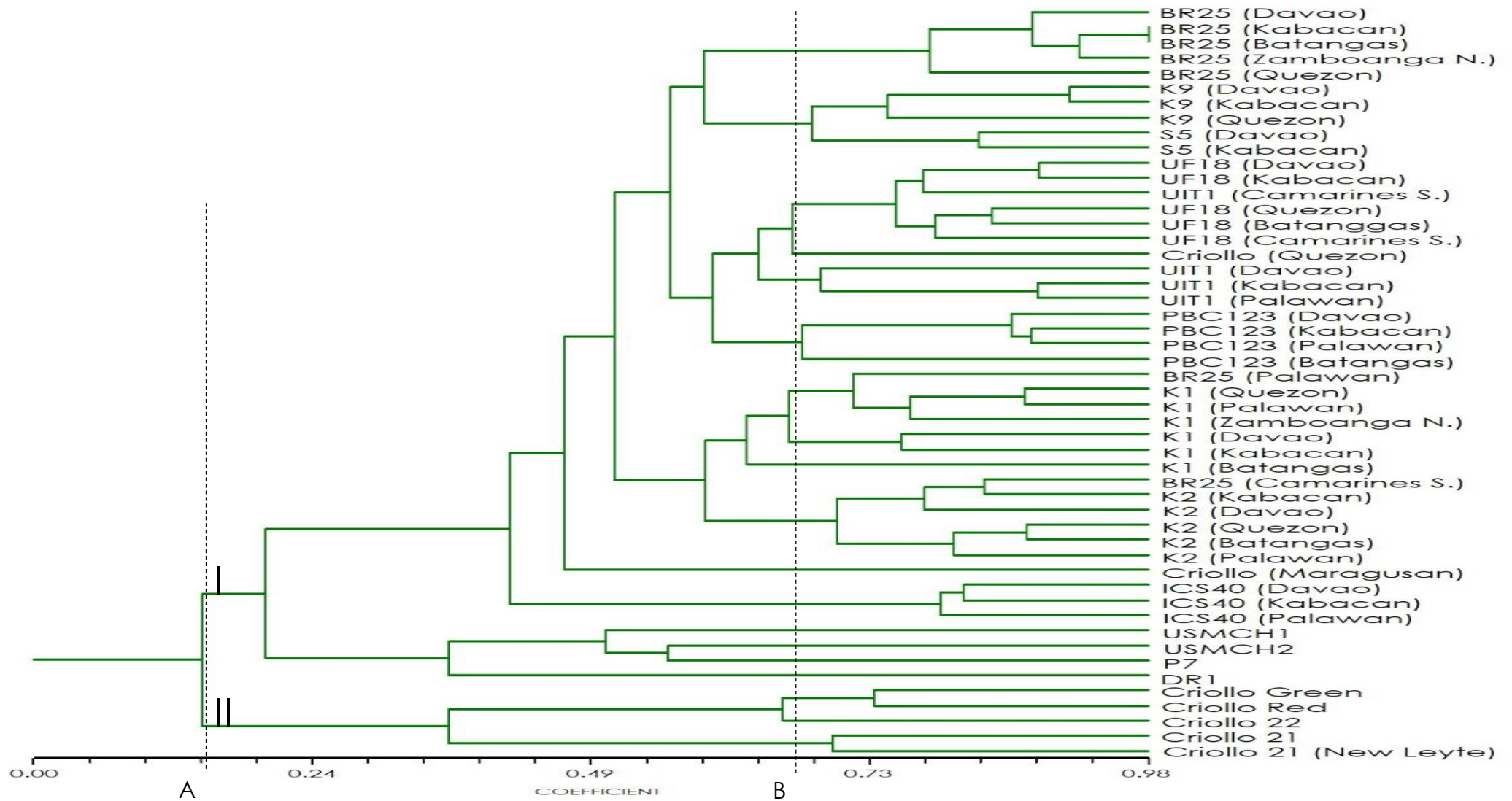


Figure 3. Dendrogram of 50 cacao clones generated from 15 SSRs by unweighted pair-group mean average (UPGMA) cluster analysis.



CONCLUSION

Cacao microsatellites used in this study were sufficient in constructing the DNA profile of the cacao Philippine collection.

Clones were distinct from each other, meaning there is a quantified degree of genetic difference between the accessions that can be useful for identification.

Degree of relatedness was assessed between varieties and putative clones within varieties.

DNA profiles represented as a haplotype map was developed for the cacao collection in the Philippines.



THANK YOU AND MABUHAY!