



The Population Genetic Structure Analysis of Pin-Pu Black Pig in Taiwan

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PINPU BLACK PIG

平埔黑豬

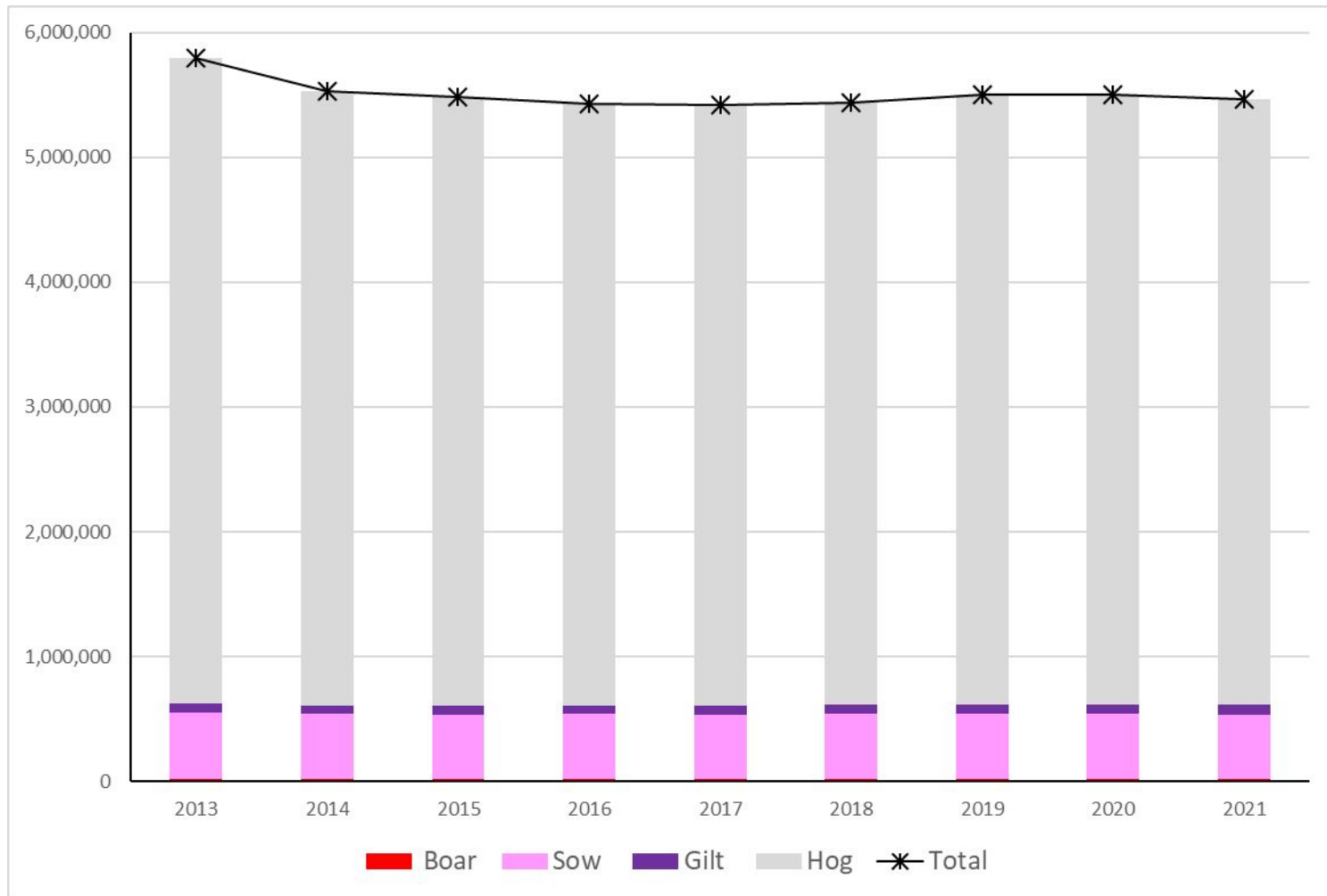


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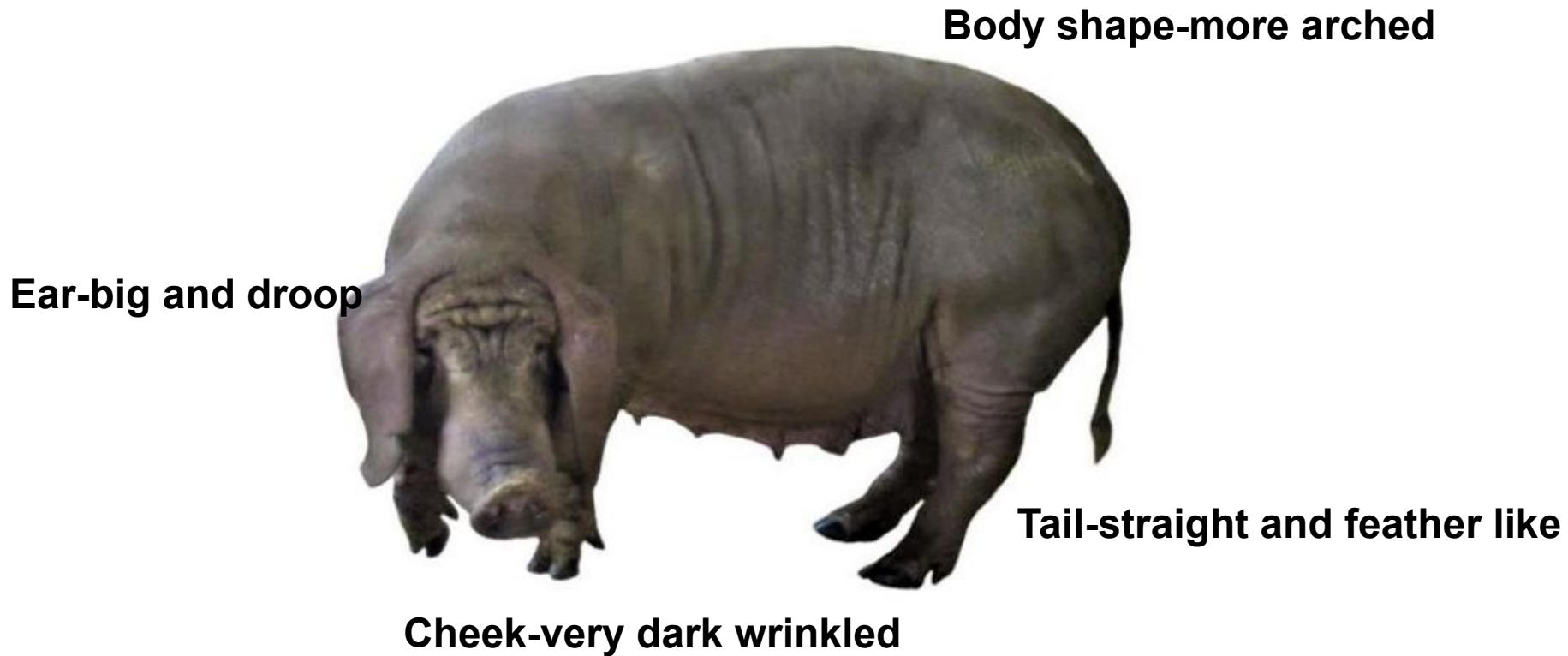
The trend of pig inventory in Taiwan, 2013~2021



Data from the National Animal Industry Foundation (NAIF)

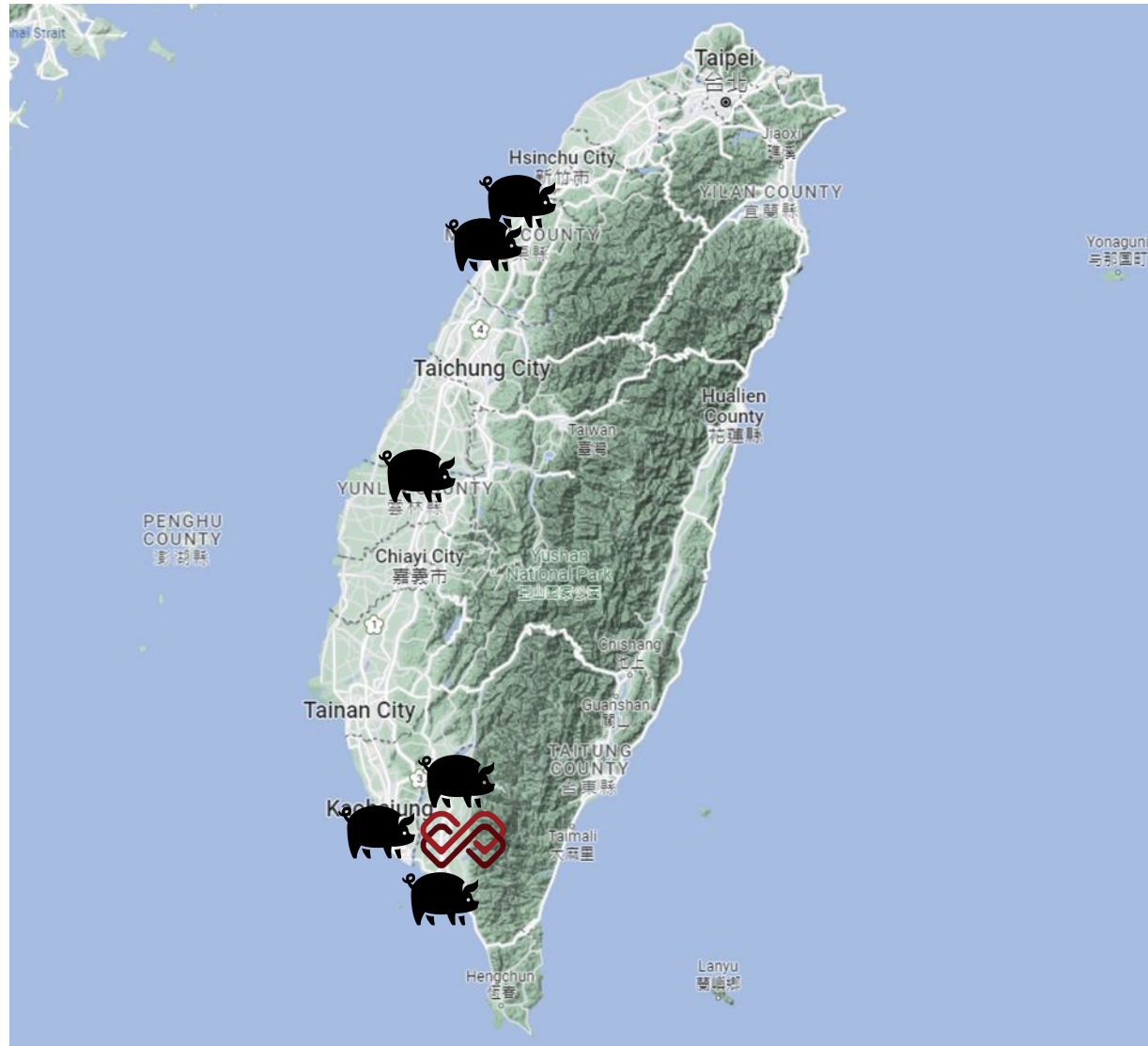


The breed characteristics of Pin-Pu black pig





- Collected from 2008
- Form 10 black pig farms
- By phenotypes





The breeding program of Pin-Pu black pig

Generation	Breeding combination	Sires, dams and years
G0	Commercial black ♂ x ♀	Sire: 2, Dam 53, 2009/6-2010/10
G1	P1♀ x P1♂	Sire: 3, Dam 24, 2010/7-2013/3
G2	P2♀ x P♂	Dam 25, 2011/9-2013/11
G3	P3♀ x P♂	Dam 37, 2013/11-2015/6
G4	P4♀ x P♂	Dam 30, 2014/9-2016/5
G5	P5♀ x P♂	Dam 30, 2016/4-2018/12



表 2. 平埔黑豬之選育工作項目

世代	系譜繁殖 資料	微衛星分 子鑑定	基因鑑定 與篩選 (MSTN)	體型評分	生長性能 檢定	屠體性狀	肉質性狀
G0	✓		✓	✓			
G1	✓	✓	✓	✓		✓	✓
G2	✓	✓	✓	✓	✓	✓	✓
G3	✓	✓	✓	✓	✓	✓	✓
G4	✓	✓		✓	✓	✓	✓
G5	✓	✓		✓	✓	✓	✓

✓ 表示各世代已進行之工作項目。



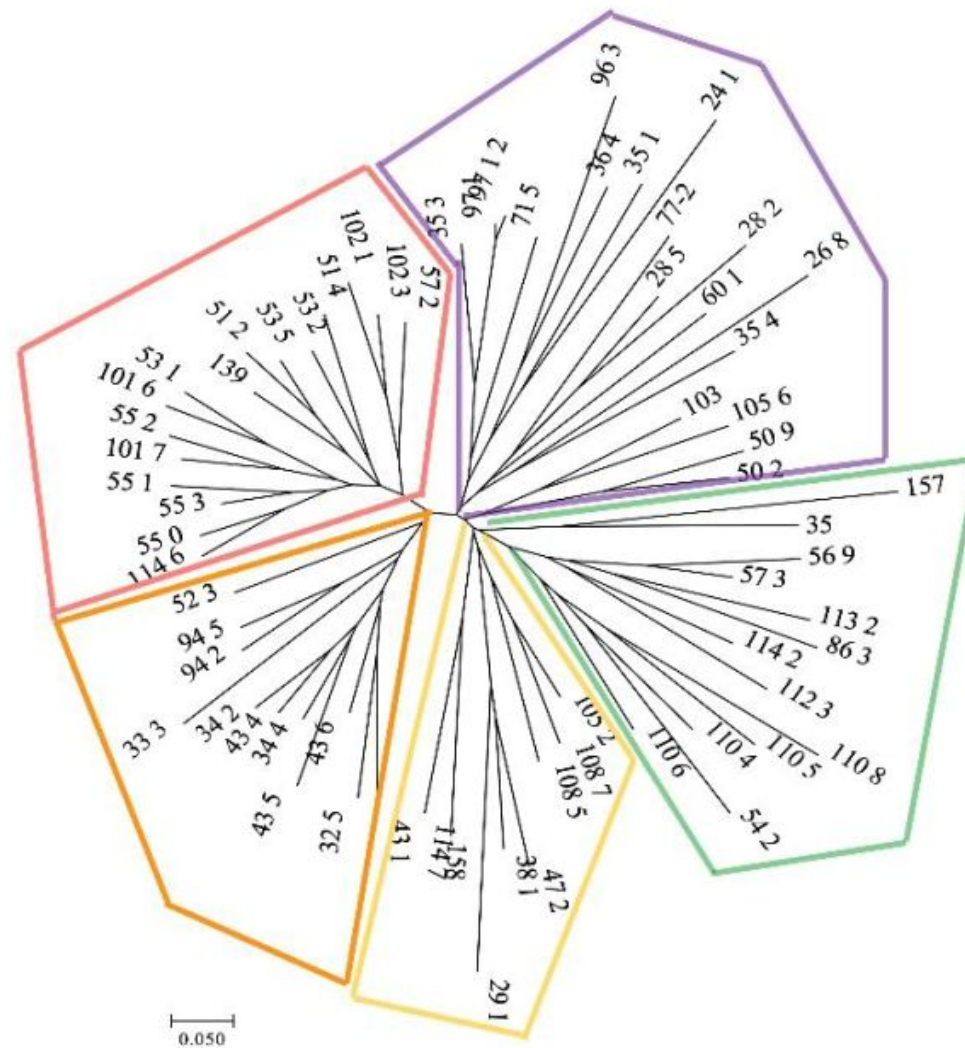
- Pin-Pu black pigs were selected and breed through MAS, and their offspring characteristics were relatively stable.
 - Microsatellites markers
 - MSTN
 - CRC
 - ESR
 - H-FABP



表 3. 平埔黑豬群之遺傳變異

基因座	交替基因數	有效交替基因數	觀測異質度	期望異質度	多態性訊息含量	F _{IS}	HW
SW936	4	1.19	0.17	0.16	0.15	-0.05	NS
SW911	6	2.54	0.71	0.61	0.56	-0.17	NS
S0101	6	3.15	0.71	0.69	0.63	-0.03	NS
S0228	7	5.56	0.89	0.83	0.80	-0.08	NS
SW72	5	3.74	0.77	0.74	0.69	-0.05	NS
S0227	5	3.81	0.85	0.74	0.69	-0.14	NS
SW24	9	5.29	0.80	0.82	0.79	0.03	NS
S0155	6	1.35	0.23	0.26	0.24	0.12	NS
S0090	6	3.94	0.80	0.75	0.70	-0.06	NS
SW857	6	3.2	0.68	0.69	0.66	0.02	NS
SW951	6	4.29	0.85	0.77	0.73	-0.10	NS
S0005	11	3.69	0.73	0.73	0.70	0.01	NS
SW240	8	4.63	0.94	0.79	0.76	-0.19	NS
S0355	6	3.98	0.85	0.75	0.71	-0.13	NS
Mean±SD	6.5 ± 1.8	3.6 ± 1.3	0.71 ± 0.2	0.67 ± 0.2	0.63 ± 0.2	-0.1 ± 0.1	

1. PIC: Polymorphism information content; F_{IS}: Wright's F-statistics, within subpopulation inbreeding estimate; HW: Hardy-Weinberg equilibrium test. *p < 0.05; NS: 無顯著差異 (p > 0.05)。



The neighbor-joining (NJ) tree among Pin-Pu black pig individuals based on the 14 sets of novel microsatellite markers.



表 9. 平埔黑豬各世代基因型分布頻率

基因種類	交替基因數	G1	G2	G3	G4	G5
CRC						
	AA	1.00 (21)	1.00 (5)	1.00 (4)	1.00 (7)	1.00 (14)
	AB	0.00	0.00	0.00	0.00	0.00
	BB	0.00	0.00	0.00	0.00	0.00
ESR						
	NN					0.18
	MN					0.14
	MM					0.68
肉質基因						
HFABP_A	AA	0.89 (16)	1.00 (5)	1.00 (3)	-	-
	Aa	0.055 (1)	0.00	0.00	-	-
	aa	0.055 (1)	0.00	0.00	-	-
HFABP_B	BB	0.285 (4)	3.33 (1)	0.67 (2)	-	-
	Bb	0.43 (6)	3.33 (1)	0.33 (1)	-	-
	bb	0.285 (4)	3.33 (1)	0.00	-	-
HFABP_D	DD	0.90 (19)	1.00 (5)	1.00 (4)	-	-
	Dd	0.05 (1)	0.00	0.00	-	-
	dd	0.05 (1)	0.00	0.00	-	-
HFABP_N	HH	0.94 (16)	0.75 (3)	0.67 (2)	-	-
	Hh	0.06 (1)	0.25 (1)	0.33 (1)	-	-
	hh	0.00	0.00	0.00	-	-
MYO	AA	0.85 (17)	1.00 (5)	1.00 (4)	-	-
	AB	0.15 (3)	0.00	0.00	-	-
	BB	0.00	0.00	0.00	-	-
MYF6_A	AA	0.95 (20)	1.00 (5)	1.00 (4)	-	-
	AB	0.05 (1)	0.00	0.00	-	-
	BB	0.00	0.00	0.00	-	-
MYF6_B	AA	0.00	0.00	0.00	-	-
	AB	0.17 (2)	0.00	0.00	-	-
	BB	0.83 (10)	1.00 (4)	1.00 (1)	-	-
H-FABP_	LL0	0.00	0.00	0.00	-	-

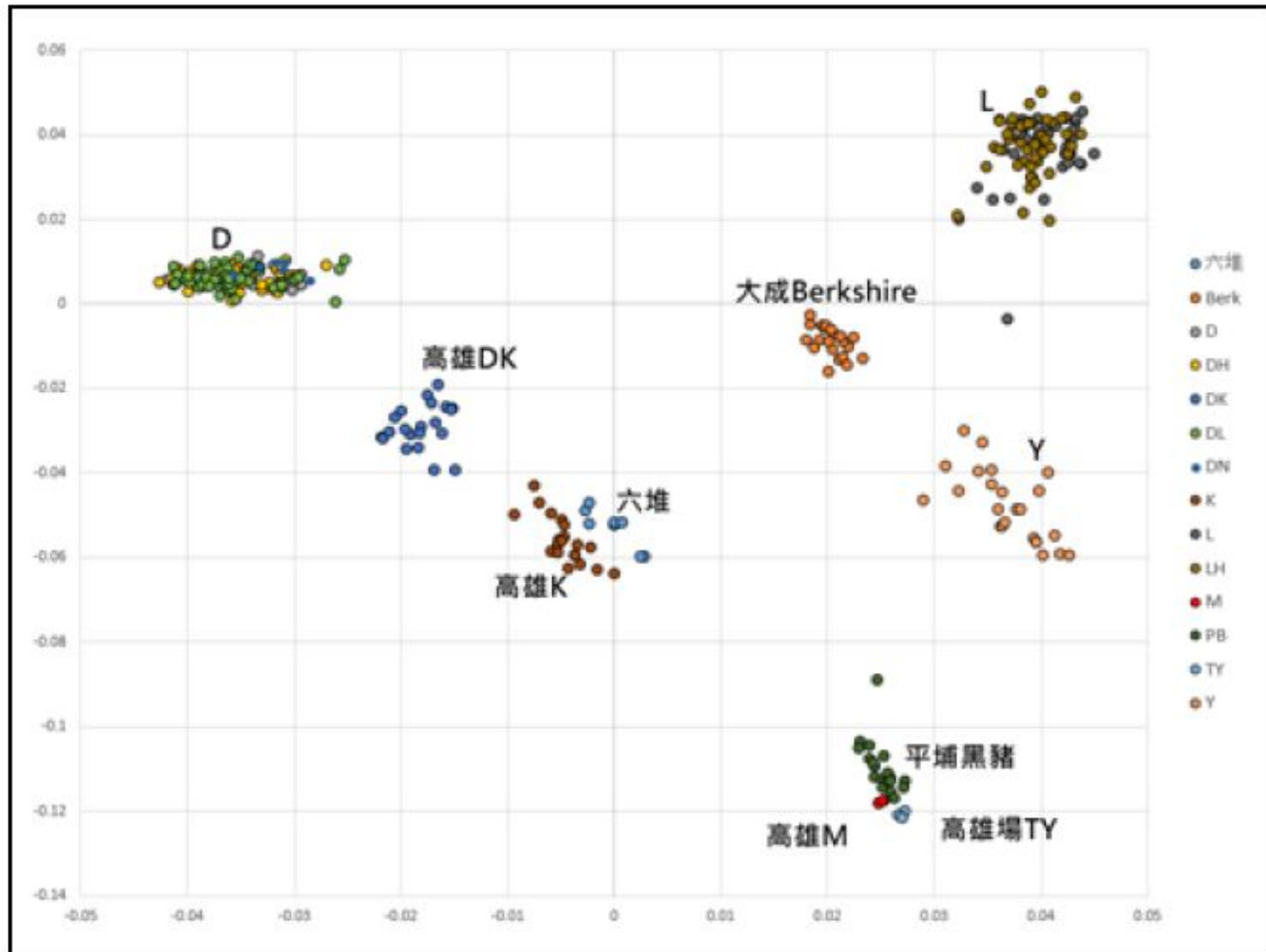


圖 5 平埔黑豬與其他主要黑豬族群之 PCA 分析結果

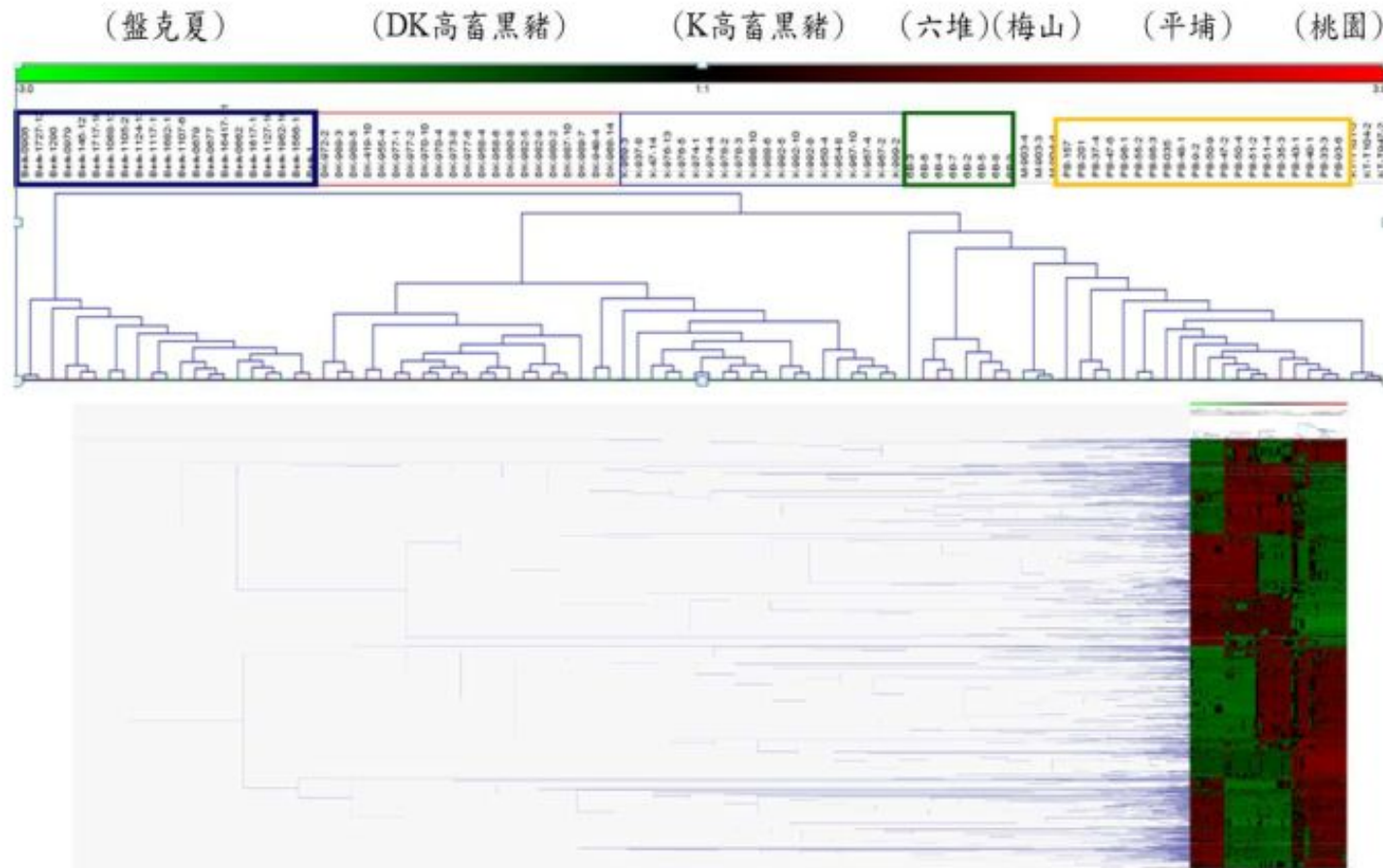


圖 6 平埔黑豬與其他黑豬族群類源關係(樹)



4P
4P



保種永續
Sustainable Origin



DNA雙螺旋
DNA double spiral



豬鼻子
Pig Snout



Pingtung PinPu black Pig

完美
Perfect

優質
Premium

專業
Profession

承諾
Promise



Odiva

優脂好肉 一脈香傳



 平埔黑豬 PINPU BLACK PIG



 PINPU BLACK PIG



 PINPU BLACK PIG
平埔黑豬



Conclusions

- The application of comprehensive phenotypes and genotypes identification breed program in Pin-Pu black pigs.
- Compared with other commercial black pigs, Pin-Pu black pigs are more similar to traditional Taiwan black pigs.



Thank you for listening

