**The supplementary materials of *Animal* journal**

[**Genetic and morphology analysis**](D:/Dict/8.5.1.0/resultui/html/index.html#/javascript:;) **among the pentaploid F1 hybrid fishes (*Schizothorax wangchiachii* ♀× *Percocypris pingi* ♂) and their parents**

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**Supplementary Table S1** *Karyotype comparison between Schizothorax fishes*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Species | Karyotype formula | 2n | NF | NF/2n | References |
| *S. grahami* | 2n=52m+30sm+66st-t | 148 | 230 | 1.55 | Zan *et al.*, 1985 |
| *S. taliensis* | 2n=48m+30sm+70st-t | 148 | 226 | 1.52 | Zan *et al.*, 1985 |
| *S. prenanti* | 2n=28m+40sm+36st+44t | 148 | 216 | 1.45 | Li *et al.*, 1987 |
| *S. lissolabiatus* | 2n=44m+36sm+20st+48t | 148 | 228 | 1.54 | Dai and Han, 2018 |
| *S. davidi* | 2n=20m+34sm+24st+20t | 98 | 152 | 1.55 | Li *et al.*, 1987 |
| *S. waltoni* | 2n=26m+28sm+22st+16t | 92 | 146 | 1.59 | Yu and Li, 1990 |
| *S. oconnori* | 2n=30m+26sm+20st+16t | 92 | 148 | 1.61 | Yu and Li, 1990 |
| *S. kozlovi* | 2n=18m+14sm+16st+44t | 92 | 124 | 1.34 | Dai and Han, 2018 |
| *S. macropogon* | / | 90-98 | / | / | Yu, 1989 |
| *S. richardsonii* | 2n=16m+40sm+42t | 98 | 154 | 1.57 | Lakara *et al.*, 1997 |
| *S. kumaonensis* | 2n=18m+10sm+70t | 98 | 126 | 1.29 | Lakara *et al.*, 1997 |
| *S. curvifrons* | 2n=26m+20sm+20st+28t | 94 | 140 | 1.49 | Ganai *et al.*, 2011 |
| *S. esocinus* | 2n=30m+22sm+10st+36t | 98 | 150 | 1.53 | Ganai *et al.*, 2011 |
| *S.* *labiatus* | 2n=24m+20sm+2st+52t | 98 | 142 | 1.45 | Ganai *et al.*, 2011 |
| *S. niger* | 2n=24m+32sm+22st+20t | 98 | 154 | 1.57 | Ganai *et al.*, 2011 |
| *S. plagiostomus* | 2n=24m+18sm+54t | 96 | 138 | 1.43 | Ganai *et al.*, 2011 |
| *S. zarudnyi* | 2n=18m+28sm+50st | 96 | 142 | 1.48 | Kalbassi *et al.*, 2008 |
| *S.* *progastus* | 2n=16m+40sm+42t | 98 | 154 | 1.57 | Rishi *et al.*, 1983 |
| *S. wangchiachii* | 2n=36m+34sm+12st+66t | 148 | 218 | 1.47 | This study |

m= metacentric chromosome; sm= submetacentric chromosome; st= subterminal chromosome; t= terminal chromosome. NF= the total numbers of chromosome arms.

**Supplementary Table S2** *Number of polymorphic loci and the percentage in the hybrid fishes and their parents with a single primer by inter-simple sequence repeat (ISSR) analysis*

|  |  |  |  |
| --- | --- | --- | --- |
| Primers | No. of amplified bands | No. of polymorphic bands | Percentage of polymorphic bands (%) |
| (AG)8G | 8 | 5 | 62.5 |
| (AG)8T | 7 | 5 | 71.4 |
| (AG)8C | 20 | 14 | 70.0 |
| (AG)8YC | 7 | 4 | 57.1 |
| (AG)8YT | 11 | 10 | 90.9 |
| (AG)8YA | 10 | 8 | 80.0 |
| (AG)8GT | 12 | 8 | 66.7 |
| (AG)8CTA | 17 | 14 | 82.4 |
| (TC)8C | 4 | 3 | 75.0 |
| (TC)8RG | 5 | 4 | 80.0 |
| (TG)8RC | 6 | 6 | 100.0 |
| (CT)8RG | 3 | 2 | 66.7 |
| (CT)8A | 6 | 4 | 66.7 |
| (GA)8YT | 11 | 9 | 81.8 |
| (GA)8YG | 7 | 5 | 71.4 |
| (GA)8A | 7 | 6 | 85.7 |
| (GA)8CTA | 16 | 14 | 87.5 |
| (GACA)4 | 12 | 11 | 91.7 |
| (GAA)6 | 13 | 13 | 100.0 |
| Total | 178 | 149 | 83.7 |

R=(A, G); Y=(C, T).

**Supplementary Table S3** *The karyotype date of S. wangchiachii*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Chromosome No. | Relative length % | Arm ratio L/S | Type | Chromosome No. | Relative length % | Arm ratio L/S | Type |
| 1 | 1.66±0.16 | 1.33±0.18 | m | 38 | 0.67±0.08 | 3.78±0.63 | st |
| 2 | 1.27±0.12 | 1.42±0.25 | m | 39 | 0.63±0.11 | 3.76±0.50 | st |
| 3 | 1.08±0.11 | 1.41±0.19 | m | 40 | 0.59±0.13 | 3.69±0.39 | st |
| 4 | 1.07±0.07 | 1.28±0.23 | m | 41 | 0.58±0.08 | 3.49±0.31 | st |
| 5 | 1.11±0.12 | 1.33±0.23 | m | 42 | 0.74±0.08 | ∞ | t |
| 6 | 1.04±0.12 | 1.37±0.15 | m | 43 | 0.68±0.12 | ∞ | t |
| 7 | 0.88±0.10 | 1.32±0.18 | m | 44 | 0.66±0.12 | ∞ | t |
| 8 | 0.87±0.08 | 1.45±0.18 | m | 45 | 0.60±0.08 | ∞ | t |
| 9 | 0.85±0.08 | 1.43±0.21 | m | 46 | 0.59±0.11 | ∞ | t |
| 10 | 0.77±0.11 | 1.26±0.17 | m | 47 | 0.59±0.10 | ∞ | t |
| 11 | 0.70±0.09 | 1.36±0.21 | m | 48 | 0.58±0.06 | ∞ | t |
| 12 | 0.71±0.10 | 1.28±0.22 | m | 49 | 0.57±0.06 | ∞ | t |
| 13 | 0.68±0.10 | 1.39±0.21 | m | 50 | 0.57±0.07 | ∞ | t |
| 14 | 0.64±0.06 | 1.48±0.14 | m | 51 | 0.57±0.09 | ∞ | t |
| 15 | 0.60±0.09 | 1.23±0.15 | m | 52 | 0.56±0.10 | ∞ | t |
| 16 | 0.59±0.09 | 1.29±0.20 | m | 53 | 0.55±0.05 | ∞ | t |
| 17 | 0.59±0.09 | 1.43±0.18 | m | 54 | 0.54±0.09 | ∞ | t |
| 18 | 0.57±0.07 | 1.32±0.24 | m | 55 | 0.54±0.11 | ∞ | t |
| 19 | 1.63±0.21 | 2.55±0.36 | sm | 56 | 0.53±0.11 | ∞ | t |
| 20 | 1.17±0.11 | 2.44±0.31 | sm | 57 | 0.52±0.12 | ∞ | t |
| 21 | 1.07±0.13 | 2.21±0.30 | sm | 58 | 0.52±0.13 | ∞ | t |
| 22 | 0.93±0.10 | 2.45±0.36 | sm | 59 | 0.51±0.12 | ∞ | t |
| 23 | 0.97±0.12 | 2.52±0.26 | sm | 60 | 0.50±0.11 | ∞ | t |
| 24 | 0.89±0.12 | 2.20±0.27 | sm | 61 | 0.48±0.06 | ∞ | t |
| 25 | 0.87±0.12 | 2.41±0.46 | sm | 62 | 0.46±0.11 | ∞ | t |
| 26 | 0.84±0.10 | 2.22±0.27 | sm | 63 | 0.45±0.08 | ∞ | t |
| 27 | 0.71±0.06 | 2.25±0.44 | sm | 64 | 0.45±0.07 | ∞ | t |
| 28 | 0.67±0.11 | 2.43±0.34 | sm | 65 | 0.44±0.08 | ∞ | t |
| 29 | 0.65±0.12 | 2.28±0.28 | sm | 66 | 0.44±0.03 | ∞ | t |
| 30 | 0.63±0.08 | 2.40±0.39 | sm | 67 | 0.43±0.06 | ∞ | t |
| 31 | 0.58±0.07 | 2.92±0.49 | sm | 68 | 0.41±0.09 | ∞ | t |
| 32 | 0.58±0.08 | 2.26±0.40 | sm | 69 | 0.41±0.10 | ∞ | t |
| 33 | 0.56±0.09 | 2.36±0.37 | sm | 70 | 0.40±0.08 | ∞ | t |
| 34 | 0.53±0.08 | 2.84±0.60 | sm | 71 | 0.39±0.08 | ∞ | t |
| 35 | 0.51±0.11 | 2.77±0.47 | sm | 72 | 0.37±0.09 | ∞ | t |
| 36 | 0.90±0.09 | 3.73±0.41 | st | 73 | 0.36±0.07 | ∞ | t |
| 37 | 0.71±0.11 | 3.71±0.52 | st | 74 | 0.27±0.10 | ∞ | t |

m= metacentric chromosome; sm= submetacentric chromosome; st= subterminal chromosome; t= terminal chromosome. L/S= long arm/short arm

**Supplementary Table S4** *The karyotype date of the hybrid fishes*

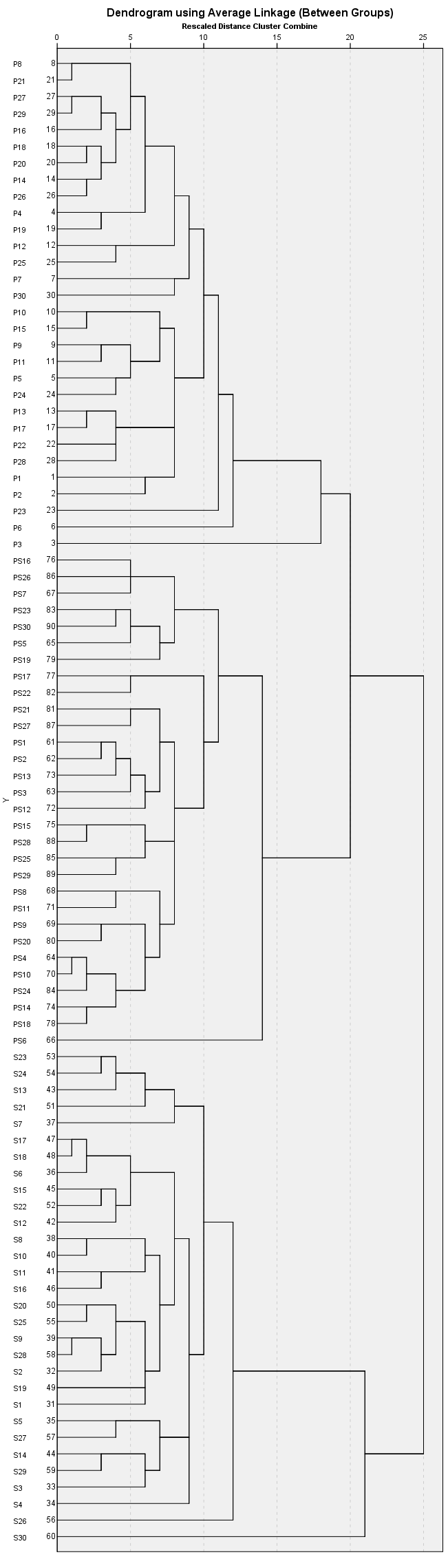
|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Chromosome No. | Relative length % | Arm ratio L/S | Type | Chromosome No. | Relative length % | Arm ratio L/S | Type |
| 1 | 1.54±0.08 | 1.63±0.10 | m | 63 | 0.75±0.03 | 2.43±0.12 | sm |
| 2 | 1.53±0.02 | 1.43±0.06 | m | 64 | 0.75±0.03 | 2.22±0.12 | sm |
| 3 | 1.53±0.03 | 1.32±0.04 | m | 65 | 0.71±0.04 | 2.13±0.16 | sm |
| 4 | 1.25±0.04 | 1.53±0.03 | m | 66 | 0.71±0.04 | 2.43±0.22 | sm |
| 5 | 1.25±0.07 | 1.61±0.05 | m | 67 | 0.70±0.03 | 2.31±0.26 | sm |
| 6 | 1.10±0.07 | 1.61±0.07 | m | 68 | 0.89±0.04 | 3.53±0.27 | st |
| 7 | 1.08±0.05 | 1.59±0.07 | m | 69 | 0.85±0.09 | 3.49±0.22 | st |
| 8 | 1.08±0.03 | 1.69±0.12 | m | 70 | 0.85±0.13 | 3.57±0.18 | st |
| 9 | 1.03±0.04 | 1.42±0.14 | m | 71 | 0.78±0.10 | 3.12±0.09 | st |
| 10 | 1.03±0.05 | 1.45±0.09 | m | 72 | 0.64±0.06 | 3.11±0.18 | st |
| 11 | 1.02±0.04 | 1.33±0.05 | m | 73 | 0.87±0.04 | ∞ | t |
| 12 | 1.01±0.04 | 1.20±0.12 | m | 74 | 0.87±0.07 | ∞ | t |
| 13 | 1.01±0.06 | 1.59±0.09 | m | 75 | 0.85±0.11 | ∞ | t |
| 14 | 0.98±0.04 | 1.60±0.03 | m | 76 | 0.85±0.05 | ∞ | t |
| 15 | 0.97±0.03 | 1.55±0.02 | m | 77 | 0.84±0.06 | ∞ | t |
| 16 | 0.95±0.02 | 1.05±0.04 | m | 78 | 0.80±0.02 | ∞ | t |
| 17 | 0.95±0.01 | 1.32±0.03 | m | 79 | 0.79±0.03 | ∞ | t |
| 18 | 0.94±0.03 | 1.64±0.07 | m | 80 | 0.79±0.01 | ∞ | t |
| 19 | 0.93±0.03 | 1.40±0.08 | m | 81 | 0.77±0.02 | ∞ | t |
| 20 | 0.93±0.02 | 1.40±0.06 | m | 82 | 0.77±0.05 | ∞ | t |
| 21 | 0.90±0.03 | 1.42±0.15 | m | 83 | 0.76±0.02 | ∞ | t |
| 22 | 0.88±0.06 | 1.34±0.10 | m | 84 | 0.75±0.02 | ∞ | t |
| 23 | 0.88±0.02 | 1.51±0.04 | m | 85 | 0.75±0.04 | ∞ | t |
| 24 | 0.87±0.02 | 1.03±0.03 | m | 86 | 0.75±0.02 | ∞ | t |
| 25 | 0.87±0.03 | 1.50±0.03 | m | 87 | 0.75±0.02 | ∞ | t |
| 26 | 0.86±0.04 | 1.48±0.04 | m | 88 | 0.75±0.01 | ∞ | t |
| 27 | 0.81±0.08 | 1.54±0.05 | m | 89 | 0.74±0.04 | ∞ | t |
| 28 | 0.81±0.06 | 1.52±0.03 | m | 90 | 0.73±0.02 | ∞ | t |
| 29 | 0.81±0.04 | 1.42±0.07 | m | 91 | 0.73±0.03 | ∞ | t |
| 30 | 0.80±0.03 | 1.23±0.04 | m | 92 | 0.72±0.02 | ∞ | t |
| 31 | 0.79±0.02 | 1.44±0.11 | m | 93 | 0.72±0.05 | ∞ | t |
| 32 | 0.79±0.04 | 1.65±0.06 | m | 94 | 0.71±0.01 | ∞ | t |
| 33 | 0.76±0.03 | 1.35±0.10 | m | 95 | 0.70±0.02 | ∞ | t |
| 34 | 0.76±0.02 | 1.61±0.15 | m | 96 | 0.69±0.03 | ∞ | t |
| 35 | 0.75±0.02 | 1.44±0.05 | m | 97 | 0.69±0.01 | ∞ | t |
| 36 | 0.75±0.03 | 1.24±0.10 | m | 98 | 0.68±0.03 | ∞ | t |
| 37 | 0.72±0.04 | 1.67±0.06 | m | 99 | 0.68±0.03 | ∞ | t |
| 38 | 0.72±0.04 | 1.24±0.05 | m | 100 | 0.67±0.05 | ∞ | t |
| 39 | 0.69±0.04 | 1.37±0.12 | m | 101 | 0.67±0.04 | ∞ | t |
| 40 | 1.54±0.12 | 1.93±0.10 | sm | 102 | 0.66±0.05 | ∞ | t |
| 41 | 1.50±0.08 | 2.23±0.08 | sm | 103 | 0.65±0.03 | ∞ | t |
| 42 | 1.42±0.05 | 2.87±0.13 | sm | 104 | 0.65±0.06 | ∞ | t |
| 43 | 1.02±0.03 | 2.74±0.23 | sm | 105 | 0.63±0.02 | ∞ | t |
| 44 | 1.01±0.05 | 2.14±0.13 | sm | 106 | 0.63±0.01 | ∞ | t |
| 45 | 0.96±0.04 | 1.77±0.03 | sm | 107 | 0.61±0.05 | ∞ | t |
| 46 | 0.93±0.04 | 2.84±0.23 | sm | 108 | 0.59±0.03 | ∞ | t |
| 47 | 0.93±0.05 | 2.80±0.14 | sm | 109 | 0.58±0.03 | ∞ | t |
| 48 | 0.92±0.02 | 2.53±0.14 | sm | 110 | 0.57±0.03 | ∞ | t |
| 49 | 0.92±0.03 | 1.75±0.06 | sm | 111 | 0.56±0.01 | ∞ | t |
| 50 | 0.91±0.04 | 2.66±0.11 | sm | 112 | 0.55±0.02 | ∞ | t |
| 51 | 0.91±0.07 | 2.76±0.12 | sm | 113 | 0.55±0.01 | ∞ | t |
| 52 | 0.90±0.04 | 2.84±0.10 | sm | 114 | 0.54±0.04 | ∞ | t |
| 53 | 0.88±0.04 | 2.56±0.06 | sm | 115 | 0.54±0.03 | ∞ | t |
| 54 | 0.84±0.04 | 1.85±0.11 | sm | 116 | 0.53±0.02 | ∞ | t |
| 55 | 0.81±0.04 | 1.84±0.07 | sm | 117 | 0.53±0.04 | ∞ | t |
| 56 | 0.80±0.04 | 1.85±0.11 | sm | 118 | 0.52±0.01 | ∞ | t |
| 57 | 0.80±0.03 | 1.85±0.12 | sm | 119 | 0.50±0.03 | ∞ | t |
| 58 | 0.80±0.04 | 1.85±0.11 | sm | 120 | 0.44±0.03 | ∞ | t |
| 59 | 0.79±0.05 | 2.61±0.07 | sm | 121 | 0.41±0.06 | ∞ | t |
| 60 | 0.79±0.05 | 2.63±0.04 | sm | 122 | 0.33±0.05 | ∞ | t |
| 61 | 0.79±0.08 | 2.83±0.17 | sm | 123 | 0.31±0.04 | ∞ | t |
| 62 | 0.76±0.08 | 1.81±0.06 | sm |  |  |  |  |

The chromosomes are not paired. m= metacentric chromosome; sm= submetacentric chromosome; st= subterminal chromosome; t= terminal chromosome. L/S= long arm/short arm.

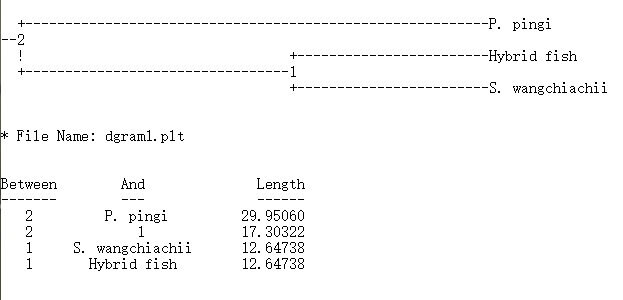
**Supplementary Table S5** *Genitic distance based on inter-simple sequence repeat (ISSR) between 24 individuals of the hybrid fishes and their parents*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | PS1 | PS2 | PS3 | PS4 | PS5 | PS6 | PS7 | PS8 |
| P1 | \*\*\*\* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| P2 | 0.0674 | \*\*\*\* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| P3 | 0.0733 | 0.0388 | \*\*\*\* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| P4 | 0.0445 | 0.0674 | 0.0969 | \*\*\*\* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| P5 | 0.0164 | 0.0616 | 0.0674 | 0.0388 | \*\*\*\* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| P6 | 0.0332 | 0.0674 | 0.0969 | 0.0220 | 0.0275 | \*\*\*\* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| P7 | 0.0791 | 0.0559 | 0.0850 | 0.0559 | 0.0616 | 0.0445 | \*\*\*\* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| P8 | 0.1090 | 0.0733 | 0.1029 | 0.0733 | 0.0910 | 0.0733 | 0.0388 | \*\*\*\* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| S1 | 0.9383 | 0.9109 | 0.8711 | 0.9109 | 0.9245 | 0.9109 | 0.9109 | 0.8974 | \*\*\*\* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| S2 | 0.9109 | 0.9383 | 0.8711 | 0.9383 | 0.9245 | 0.9109 | 0.9383 | 0.9245 | 0.0910 | \*\*\*\* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| S3 | 0.9109 | 0.9383 | 0.8974 | 0.9383 | 0.9245 | 0.9109 | 0.9383 | 0.9245 | 0.0910 | 0.0559 | \*\*\*\* |  |  |  |  |  |  |  |  |  |  |  |  |  |
| S4 | 0.9109 | 0.9383 | 0.8974 | 0.9383 | 0.9245 | 0.9109 | 0.9383 | 0.9245 | 0.0910 | 0.0559 | 0.0000 | \*\*\*\* |  |  |  |  |  |  |  |  |  |  |  |  |
| S5 | 0.8711 | 0.8711 | 0.8582 | 0.8974 | 0.8842 | 0.8711 | 0.8711 | 0.8582 | 0.1335 | 0.0733 | 0.0850 | 0.0850 | \*\*\*\* |  |  |  |  |  |  |  |  |  |  |  |
| S6 | 0.9245 | 0.9245 | 0.8842 | 0.9808 | 0.9383 | 0.9245 | 0.9523 | 0.9664 | 0.1212 | 0.1212 | 0.0850 | 0.0850 | 0.1273 | \*\*\*\* |  |  |  |  |  |  |  |  |  |  |
| S7 | 0.9109 | 0.9109 | 0.8711 | 0.9383 | 0.9245 | 0.9109 | 0.8842 | 0.8711 | 0.1398 | 0.1523 | 0.1273 | 0.1273 | 0.1460 | 0.1460 | \*\*\*\* |  |  |  |  |  |  |  |  |  |
| S8 | 0.8455 | 0.8711 | 0.8582 | 0.8711 | 0.8582 | 0.8455 | 0.8205 | 0.8082 | 0.1335 | 0.1335 | 0.1090 | 0.1090 | 0.1273 | 0.1523 | 0.1090 | \*\*\*\* |  |  |  |  |  |  |  |  |
| PS1 | 0.5610 | 0.5998 | 0.6300 | 0.5802 | 0.5900 | 0.5421 | 0.5421 | 0.5705 | 0.4028 | 0.3551 | 0.3551 | 0.3551 | 0.3171 | 0.3787 | 0.3397 | 0.3321 | \*\*\*\* |  |  |  |  |  |  |  |
| PS2 | 0.5802 | 0.5610 | 0.5900 | 0.5421 | 0.5705 | 0.5421 | 0.5236 | 0.5328 | 0.4191 | 0.3866 | 0.3551 | 0.3551 | 0.3474 | 0.3787 | 0.3551 | 0.3321 | 0.1273 | \*\*\*\* |  |  |  |  |  |  |
| PS3 | 0.5236 | 0.5610 | 0.5705 | 0.5236 | 0.5328 | 0.4875 | 0.5054 | 0.5328 | 0.4528 | 0.4028 | 0.3866 | 0.3866 | 0.3947 | 0.3947 | 0.3707 | 0.3787 | 0.0910 | 0.0791 | \*\*\*\* |  |  |  |  |  |
| PS4 | 0.5145 | 0.5705 | 0.5802 | 0.5328 | 0.5421 | 0.5145 | 0.5145 | 0.5236 | 0.3787 | 0.3629 | 0.3474 | 0.3474 | 0.3397 | 0.3551 | 0.3474 | 0.2950 | 0.0850 | 0.0969 | 0.0850 | \*\*\*\* |  |  |  |  |
| PS5 | 0.5610 | 0.5421 | 0.5328 | 0.5802 | 0.5705 | 0.5610 | 0.5236 | 0.5328 | 0.3707 | 0.3551 | 0.3707 | 0.3707 | 0.3474 | 0.3629 | 0.3246 | 0.3171 | 0.1651 | 0.1523 | 0.1651 | 0.1587 | \*\*\*\* |  |  |  |
| PS6 | 0.5515 | 0.5705 | 0.5802 | 0.5515 | 0.5421 | 0.5328 | 0.4964 | 0.5236 | 0.3787 | 0.3787 | 0.3629 | 0.3629 | 0.3707 | 0.3707 | 0.3171 | 0.3551 | 0.1212 | 0.1335 | 0.0969 | 0.0791 | 0.1460 | \*\*\*\* |  |  |
| PS7 | 0.5236 | 0.5236 | 0.5515 | 0.5421 | 0.5328 | 0.5236 | 0.4875 | 0.5145 | 0.3866 | 0.3707 | 0.3866 | 0.3866 | 0.3321 | 0.3787 | 0.3397 | 0.2877 | 0.1911 | 0.1911 | 0.1780 | 0.1587 | 0.0910 | 0.1460 | \*\*\*\* |  |
| PS8 | 0.5515 | 0.5515 | 0.5802 | 0.5515 | 0.5610 | 0.5515 | 0.5145 | 0.5236 | 0.3474 | 0.3629 | 0.3629 | 0.3629 | 0.3397 | 0.3707 | 0.3171 | 0.3246 | 0.1977 | 0.1715 | 0.1977 | 0.1780 | 0.0850 | 0.1651 | 0.0850 | \*\*\*\* |

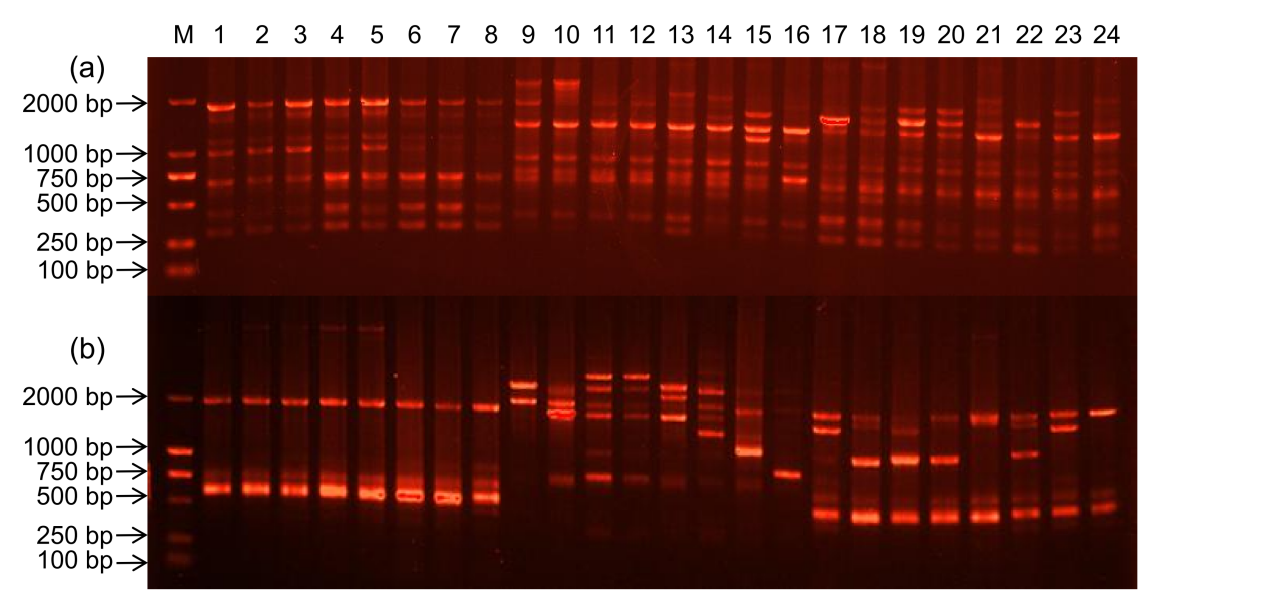
P=*P. ping*; S=*S. wangchiachii*; PS=The hybrid fishes.



#### Supplementary Figure S1 The morphological clustering by euclidean distance in the hybrid fishes and their parents; *P=P. pingi*, n=30; S=*S. wangchiachii*, n=30; PS= the hybrid fishes, n=30.



#### Supplementary Figure S2 The [original](D:/Dict/8.5.1.0/resultui/html/index.html#/javascript:;) inter-simple sequence repeat (ISSR) genetic clustering based on unweighted pair group method average (UPGMA) in the hybrid fishes and their parents by Popgen 1.32; *P. pingi*, n=8; *S. wangchiachii*, n=8; the hybrid fishes, n=30



#### Supplementary Figure S3 The inter-simple sequence repeat (ISSR) patterns in the hybrid fishes and their parents; (a) ISSR pattern amplified by primer (GA)8CTA; (b) ISSR pattern amplified by primer (GAA)6; 1-8: *P. pingi*; 9-16: *S. wangchiachii*; 17-24: the hybrid fishes

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