

# Evolution and phylogeography analysis of diploid and polyploid *Misgurnus anguillicaudatus* populations across China

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**Table S1.** Material examined for *Misgurnus anguillicaudatus* arranged by geographic basin. The sampled number and its different ploidy percentage (%) are shown.

| Code              | Locality                                                | Sampled number | % of triploids | % of tetraploids |
|-------------------|---------------------------------------------------------|----------------|----------------|------------------|
| Pearl River basin |                                                         |                |                |                  |
| BS                | Baise city, West River, Guangxi                         | 45             | -              | -                |
| CH                | Conghua district, Pearl River Delta, Guangdong          | 45             | -              | -                |
| CAZ               | Chaozhou city, Hanjiang River, Guangdong                | 45             | -              | -                |
| COZ               | Chongzuo city, West River, Guangxi                      | 45             | -              | -                |
| DA                | Du'an Yao Autonomous county, West River, Guangxi        | 45             | -              | -                |
| FOS               | Foshan city, Pearl River Delta, Guangdong               | 45             | -              | -                |
| GG                | Guigang city, West River, Guangxi                       | 45             | -              | -                |
| GP                | Guiping city, West River, Guangxi                       | 45             | -              | -                |
| HY                | Heyuan city, East River, Guangdong                      | 41             | -              | -                |
| HEZ               | Hezhou city, West River, Guangxi                        | 45             | -              | -                |
| HUZ               | Huizhou city, Pearl River Delta, Guangdong              | 45             | -              | -                |
| LD                | Luodian county, West River, Guizhou                     | 48             | -              | -                |
| MZ                | Meizhou city, Hanjiang River, Guangdong                 | 45             | -              | -                |
| NN                | Nanning city, West River, Guangxi                       | 45             | -              | -                |
| PL                | Pingle county, West River, Guangxi                      | 45             | -              | 8.89             |
| RJ                | Rongjiang county, West River, Guizhou                   | 45             | -              | -                |
| SG                | Saoguan city, North River, Guizhou                      | 45             | -              | -                |
| SJ                | Dong Autonomous County of Sanjiang, West River, Guangxi | 45             | -              | -                |
| SHZ               | Shenzhen city, Pearl River Delta, Guangdong             | 45             | -              | -                |

|                     |                                                              |    |      |       |
|---------------------|--------------------------------------------------------------|----|------|-------|
| TE                  | Tiane county, West River, Guangxi                            | 22 | -    | -     |
| TX                  | Tengxian county, West River, Guangxi                         | 45 | -    | -     |
| XYI                 | Xingyi city, West River, Guizhou                             | 45 | -    | -     |
| XZ                  | Xiangzhou county, West River, Guangxi                        | 55 | -    | 7.27  |
| YGD                 | Yingde city, North River, Guangdong                          | 45 | -    | -     |
| YZ                  | Yizhou district, West River, Guangxi                         | 45 | -    | -     |
| ZQ                  | Zhaoqing city, West River, Guangdong                         | 45 | -    | -     |
| ZS                  | Zhongshan city, Pearl River Delta, Guangdong                 | 45 | -    | -     |
| GL                  | Guilin city, West River, Guangxi                             | 45 | 4.44 | 68.89 |
| LP                  | Lipu city, West River, Guangxi                               | 45 | -    | -     |
| LZ                  | Liuzhou city, West River, Guangxi                            | 45 | -    | -     |
| Yangtze River basin |                                                              |    |      |       |
| SZ                  | Suizhou city, Han River, Hubei                               | 41 | 4.88 | 9.76  |
| ZX                  | Zhongxiang city, Han River, Hubei                            | 43 | 4.65 | 9.30  |
| ES                  | Enshi Tujia and Miao Autonomous Prefecture, Han River, Hubei | 27 | 3.70 | 25.93 |
| YD                  | Yidu city, Middle Yangtze River, Hubei                       | 45 | -    | -     |
| YUX                 | Yunyang district, Han River, Hubei                           | 45 | -    | -     |
| LHK                 | Laohekou city, Han River, Hubei                              | 46 | -    | 30.43 |
| YM                  | Yunmeng county, Han River, Hubei                             | 42 | 2.38 | -     |
| LIY                 | Liuyang city, Dongting Lake, Hunan                           | 45 | -    | -     |
| HEY                 | Hengyang city, Dongting Lake, Hunan                          | 45 | -    | -     |
| SY                  | Shaoyang city, Dongting Lake, Hunan                          | 56 | 1.79 | 14.29 |
| HH                  | Huaihua city, Dongting Lake, Hunan                           | 60 | 5    | 8.33  |
| ZJJ                 | Zhangjiajie city, Dongting Lake, Hunan                       | 70 | 2.86 | 5.71  |
| CHD                 | Changde city, Dongting Lake, Hunan                           | 65 | -    | 1.54  |
| YUY                 | Yueyang city, Dongting Lake, Hunan                           | 45 | -    | -     |
| WN                  | Wuning county, Poyang Lake, Jiangxi                          | 45 | 8.89 | 62.22 |
| JJ                  | Jiujiang city, Poyang Lake, Jiangxi                          | 45 | -    | 44.44 |
| XUC                 | Xuancheng city, Lower Yangtze River, Anhui                   | 45 | -    | -     |
| WX                  | Wuxi city, Lower Yangtze River, Jiangsu                      | 45 | -    | -     |
| HZ                  | Huzhou city, Taihu Lake, Zhejiang                            | 45 | -    | -     |
| AQ                  | Anqing city, Lower Yangtze River, Anhui                      | 45 | -    | -     |
| JA                  | Jian city, Poyang Lake, Jiangxi                              | 45 | -    | -     |
| WUH                 | Wuhu city, Lower Yangtze River, Anhui                        | 43 | -    | -     |
| CAH                 | Chaohu city, Lower Yangtze River, Anhui                      | 46 | -    | -     |
| TOL                 | Tongling city, Lower Yangtze River, Anhui                    | 45 | -    | -     |
| XG                  | Xingguo county, Poyang Lake, Jiangxi                         | 45 | -    | -     |
| JDZ                 | Jingdezhen city, Poyang Lake, Jiangxi                        | 45 | -    | 11.11 |
| GX                  | Guixi city, Poyang Lake, Jiangxi                             | 45 | -    | -     |
| FZ                  | Fuzhou city, Poyang Lake, Jiangxi                            | 45 | -    | 13.33 |
| XY                  | Xinyu city, Poyang Lake, Jiangxi                             | 45 | -    | 6.67  |
| YX                  | Yongxiu county, Poyang Lake, Jiangxi                         | 45 | -    | 8.89  |
| NT                  | Nantong city, Poyang Lake, Jiangxi                           | 45 | -    | -     |

|                    |                                                      |    |      |       |
|--------------------|------------------------------------------------------|----|------|-------|
| SH                 | Shanghai city, Lower Yangtze River, Shanghai         | 45 | -    | -     |
| JX                 | Jinxian county, Poyang Lake, Jiangxi                 | 45 | -    | -     |
| MY                 | Mianyang city, Upper Yangtze River, Sichuan          | 45 | -    | -     |
| DJY                | Dujiangyan city, Upper Yangtze River, Sichuan        | 47 | -    | -     |
| LS                 | Leshan city, Upper Yangtze River, Sichuan            | 45 | -    | -     |
| NEJ                | Neijiang city, Upper Yangtze River, Sichuan          | 45 | -    | -     |
| LUZ                | Luzhou city, Upper Yangtze River, Sichuan            | 46 | -    | -     |
| CS                 | Chishui city, Upper Yangtze River, Guizhou           | 44 | -    | -     |
| ZY                 | Zunyi city, Upper Yangtze River, Guizhou             | 45 | -    | -     |
| NP                 | Nanping county, Upper Yangtze River, Chongqing       | 45 | -    | -     |
| WL                 | Wulong county, Upper Yangtze River, Chongqing        | 43 | -    | -     |
| YB                 | Yibin city, Upper Yangtze River, Sichuan             | 45 | -    | -     |
| WZ                 | Wanzhou district, Upper Yangtze River, Chongqing     | 45 | -    | -     |
| NC                 | Nanchong city, Upper Yangtze River, Sichuan          | 45 | -    | -     |
| GY                 | Guangyuan city, Upper Yangtze River, Sichuan         | 45 | -    | -     |
| DZ                 | Dazhou city, Upper Yangtze River, Sichuan            | 45 | -    | -     |
| LZH                | Liangzihu Lake, Middle Yangtze River, Hubei          | 45 | -    | -     |
| HS                 | Huangshi city, Middle Yangtze River, Hubei           | 36 | 2.78 | 2.78  |
| XZX                | Xingzi county, Poyang Lake, Jiangxi                  | 28 | -    | 7.14  |
| WXU                | Wuxue city, Middle Yangtze River, Hubei              | 45 | -    | -     |
| HUK                | Hukou county, Poyang Lake, Jiangxi                   | 45 | -    | -     |
| XT                 | Xiantao city, Han River, Hubei                       | 40 | -    | 2.50  |
| QJ                 | Qianjiang city, Han River, Hubei                     | 45 | -    | -     |
| SAY                | Shayang county, Han River, Hubei                     | 45 | -    | -     |
| CD                 | Caidian district, Han River, Hubei                   | 45 | -    | 28.89 |
| HOH                | Honghu city, Han River, Hubei                        | 45 | -    | -     |
| HAC                | Hanchuan city, Han River, Hubei                      | 45 | -    | -     |
| JY                 | Jiayu county, Middle Yangtze River, Hubei            | 36 | -    | 25.00 |
| YL                 | Yangluo county, Middle Yangtze River, Hubei          | 53 | -    | 9.43  |
| HP                 | Huangpi county, Middle Yangtze River, Hubei          | 41 | -    | 7.32  |
| Huaihe River basin |                                                      |    |      |       |
| XNY                | Xinyang city, Upper Huaihe River, Henan              | 45 | -    | -     |
| XX                 | Xixian county, Upper Huaihe River, Henan             | 42 | -    | -     |
| TB                 | Tongbai county, Upper Huaihe River, Henan            | 45 | -    | -     |
| LA                 | Luan city, Upper Huaihe River, Anhui                 | 45 | -    | -     |
| GS                 | Gushi county, South coast of the Huaihe river, Henan | 45 | -    | -     |
| GZ                 | Guzhen county, Middle Huaihe River, Anhui            | 48 | -    | -     |
| WH                 | Wuhe county, Middle Huaihe River, Anhui              | 45 | -    | -     |
| HB                 | Huaibin county, Middle Huaihe River, Henan           | 45 | -    | -     |
| HN                 | Huainan city, Middle Huaihe River, Anhui             | 45 | -    | -     |
| LB                 | Lingbi county, Middle Huaihe River, Anhui            | 45 | -    | -     |
| YIS                | Yishui county, Lower Huaihe River, Shandong          | 45 | -    | -     |
| ZC                 | Zhucheng city, Lower Huaihe River, Shandong          | 45 | -    | -     |

|                    |                                               |    |       |      |
|--------------------|-----------------------------------------------|----|-------|------|
| SQ                 | Suqian city, Lower Huaihe River, Jiangsu      | 45 | -     | -    |
| TC                 | Tancheng county, Lower Huaihe River, Shandong | 45 | -     | -    |
| ZZ                 | Zaozhuang city, Lower Huaihe River, Shandong  | 45 | -     | -    |
| LY                 | Linyi city, Lower Huaihe River, Shandong      | 45 | -     | -    |
| WF                 | Weifang city, Lower Huaihe River, Shandong    | 45 | -     | -    |
| GAY                | Gaoyou city, Upper Huaihe River, Jiangsu      | 45 | -     | -    |
| HA                 | Huaian city, Middle Huaihe River, Anhui       | 45 | -     | -    |
| FN                 | Funing county, Upper Huaihe River, Jiangsu    | 45 | -     | -    |
| XS                 | Xiangshui county, Upper Huaihe River, Jiangsu | 45 | -     | -    |
| YS                 | Yingshang county, Middle Huaihe River, Anhui  | 45 | -     | -    |
| XUY                | Xuyi county, Lower Huaihe River, Jiangsu      | 45 | -     | -    |
| XC                 | Xiangcheng city, Middle Huaihe River, Henan   | 45 | -     | -    |
| Yellow River basin |                                               |    |       |      |
| DP                 | Dongping county, Lower Yellow River, Shandong | 45 | -     | -    |
| LJ                 | Lijin county, Lower Yellow River, Shandong    | 45 | -     | -    |
| HC                 | Hancheng city, Middle Yellow River, Shanxi    | 41 | -     | -    |
| HD                 | Hongdong county, Middle Yellow River, Shanxi  | 45 | -     | -    |
| KF                 | Kaifeng city, Lower Yellow River, Henan       | 45 | -     | -    |
| LN                 | Luoning county, Middle Yellow River, Henan    | 45 | -     | -    |
| QY                 | Qinyang city, Middle Yellow River, Henan      | 45 | -     | -    |
| SMX                | Sanmenxia city, Middle Yellow River, Henan    | 45 | -     | -    |
| XAY                | Xianyang city, Middle Yellow River, Shanxi    | 47 | -     | -    |
| YCA                | Yichuan county, Middle Yellow River, Henan    | 45 | -     | -    |
| YIC                | Yinchuan city, Upper Yellow River, Ningxia    | 46 | -     | -    |
| Haihe River basin  |                                               |    |       |      |
| CED                | Chengde city, Luanhe River, Hebei             | 45 | -     | -    |
| SJZ                | Shijiazhuang city, Ziya River, Hebei          | 45 | -     | -    |
| DIZ                | Dingzhou city, Ziya River, Hebei              | 45 | -     | -    |
| AX                 | Anxin county, Daqing River, Hebei             | 24 | 16.67 | -    |
| HUR                | Huairou district, Chaobai River, Beijing      | 45 | -     | -    |
| SAH                | Sanhe city, Jiyun River, Hebei                | 45 | -     | -    |
| QX                 | Qianxi county, Luanhe River, Hebei            | 45 | -     | -    |
| NH                 | Ninghe district, Chaobai River, Tianjin       | 45 | -     | -    |
| NL                 | Nanle county, Zhangwei River, Henan           | 48 | 2.08  | -    |
| GT                 | Guantao county, Zhangwei River, Hebei         | 45 | 4.44  | -    |
| LC                 | Liaocheng city, Zhangwei River, Shandong      | 45 | 4.44  | 8.89 |
| YUC                | Yucheng city, Tuhai River, Shandong           | 45 | -     | -    |
| ZH                 | Zhanhua district, Tuhai River, Shandong       | 45 | -     | -    |
| QYU                | Qingyun county, Tuhai River, Shandong         | 45 | -     | -    |
| DEZ                | Dezhou city, Zhangwei River, Shandong         | 45 | -     | -    |
| HES                | Hengshui city, Ziya River, Hebei              | 45 | -     | -    |
| CZ                 | Cangzhou city, Daqing River, Hebei            | 45 | -     | 4.44 |
| BZ                 | Bazhou city, Yongding River, Hebei            | 45 | -     | -    |
| ZUZ                | Zhuozhou city, Daqing River, Hebei            | 45 | -     | -    |

|                     |                                            |    |   |   |
|---------------------|--------------------------------------------|----|---|---|
| Liaohe River basin  |                                            |    |   |   |
| PJ                  | Panjin city, Liaohe River, Liaoning        | 30 | - | - |
| BX                  | Benxi city, Taizi River, Liaoning          | 45 | - | - |
| FS                  | Fushun city, Hunhe River, Liaoning         | 45 | - | - |
| TL                  | Tieling city, Liaohe River, Liaoning       | 22 | - | - |
| ZW                  | Zhangwu county, Liuhe River, Liaoning      | 45 | - | - |
| SL                  | Shuangliao city, West Liaohe River, Jilin  | 45 | - | - |
| HR                  | Huanren county, Hunhe River, Liaoning      | 45 | - | - |
| Songhua River basin |                                            |    |   |   |
| JL                  | Jilin city, Songhua River, Jilin           | 45 | - | - |
| SOY                 | Songyuan city, Songhua River, Jilin        | 45 | - | - |
| QQ                  | Qiqihaer city, Nen River, Heilongjiang     | 45 | - | - |
| NJ                  | Nenjiang county, Nen River, Heilongjiang   | 45 | - | - |
| HEB                 | Haerbin city, Mudan River, Heilongjiang    | 70 | - | - |
| MDJ                 | Mudanjiang city, Mudan River, Heilongjiang | 70 | - | - |
| YIL                 | Yilan county, Mudan River, Heilongjiang    | 45 | - | - |
| FY                  | Fuyuan city, Wusuli River, Heilongjiang    | 47 | - | - |
| FJ                  | Fujin city, Songhua River, Heilongjiang    | 22 | - | - |
| MS                  | Mishan city, Wusuli River, Heilongjiang    | 45 | - | - |

**Table S2.** Haplotype distributions in 22 populations of *M. anguillicaudatus* based on *cyt b* and CR data sets. Bold numbers indicate shared haplotypes among populations.

| Seq          | Code | Locality   | Haplotypes(diploid numbers/tetraploid numbers)                                                                                                                                                                         |
|--------------|------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cyt <i>b</i> | LC   | Hai River  | <b>H2(9/2), H10(1/1)</b> , H11(1/0), H138(0/1)                                                                                                                                                                         |
|              | CZ   | Hai River  | H1(1/0), <b>H2(6/2)</b> , H3(1/0), <b>H4(1/0)</b> , H5(1/0)                                                                                                                                                            |
|              | LHK  | Han River  | <b>H7(0/1), H44(8/4)</b> , H45(1/0), H146(0/1)                                                                                                                                                                         |
|              | ZX   | Han River  | <b>H2(1/0), H7(1/0), H40(2/0), H44(3/3)</b> , H81(1/0), H82(2/0), H113(0/1)                                                                                                                                            |
|              | CD   | Han River  | <b>H39(1/2), H44(2/0)</b> , H59(1/0), H60(1/0), H61(1/0), H62(1/0), H63(1/0), H64(1/0), H65(1/0), H108(0/1), H109(0/2), H110(0/1), H111(0/1), <b>H112(0/1)</b> , H139(0/1), H140(0/1), H141(0/1), H142(0/1), H152(0/1) |
|              | HP   | Han River, | <b>H9(4/0), H40(0/1)</b> , H83(3/0), H84(1/0), H85(1/0), H102(1/0), <b>H112(0/2)</b>                                                                                                                                   |
|              | JY   | Han River  | <b>H39(1/0), H40(1/5), H44(1/0)</b> , H69(1/0), H70(1/0), H71(1/0), H72(1/0), H73(1/0), H74(1/0), H75(1/0), <b>H104(0/1), H112(0/1)</b> , H145(0/1)                                                                    |
|              | YL   | Han River  | <b>H39(2/0), H40(0/1)</b> , H93(1/0), H94(1/0), H95(1/0), H96(2/0), H97(1/0), H103(1/0), <b>H104(0/1)</b> , H105(0/1), H106(0/1), H107(0/1)                                                                            |
|              | ES   | Han River  | H19(3/0), H20(3/3), H21(4/4)                                                                                                                                                                                           |
|              | SZ   | Han River  | <b>H7(1/3)</b> , H86(7/1), H87(2/0)                                                                                                                                                                                    |

|     |               |                                                                                                                                                                           |
|-----|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ZJJ | Dongting Lake | <b>H9(2/0), H40(0/2), H98(3/0), H99(2/0), H100(1/0), H101(2/0),</b><br>H134(0/1), H135(0/1)                                                                               |
| SY  | Dongting Lake | H46(3/0), <b>H47(1/0),</b> H48(1/0), H49(1/0), H50(1/0), <b>H51(1/0),</b><br><b>H52(1/1),</b> H58(1/0), <b>H68(0/1), H100(0/1),</b> H125(0/4), H126(0/1)                  |
| HH  | Dongting Lake | <b>H2(1/0), H14(1/0), H47(0/1), H51(2/0), H52(1/0), H66(2/1),</b><br>H67(1/0), <b>H68(2/2),</b> H119(0/1)                                                                 |
| JJ  | Poyang Lake   | <b>H38(1/0), H39(3/0), H40(1/1), H41(1/0),</b> H42(2/0), H43(1/0),<br>H121(0/7), H122(0/1), H123(0/2)                                                                     |
| WN  | Poyang Lake   | H76(1/3), H77(4/0), H78(1/0), H79(1/1), H80(1/1), H127(0/2),<br><b>H128(0/1),</b> H147(0/1), H148(0/2), H149(0/1), H150(0/1)                                              |
| YX  | Poyang Lake   | <b>H38(2/0), H39(1/0),</b> H53(2/0), H54(4/0), H55(1/0), H132(0/2),<br>H133(0/1), H151(0/1)                                                                               |
| JDZ | Poyang Lake   | H29(1/1), H30(1/0), H31(1/0), H32(1/0), H33(2/0), H34(1/0),<br>H35(1/0), H36(1/2), H37(1/0), H120(0/2)                                                                    |
| FZ  | Poyang Lake   | H22(1/0), H23(1/0), H24(2/0), H25(1/0), H26(1/0), H27(1/0),<br>H28(1/0), H56(1/0), H57(1/0), H114(0/1), H115(0/1), H116(0/1),<br>H117(0/1), H118(0/1)                     |
| XY  | Poyang Lake   | <b>H41(3/0),</b> H88(2/0), H89(1/0), H90(1/0), H91(1/0), H92(2/0),<br><b>H128(0/1),</b> H129(0/1), H130(0/1)                                                              |
| GL  | Pearl River   | <b>H2(1/2), H4(0/2),</b> H6(1/0), <b>H7(5/1),</b> H8(1/0), <b>H9(1/0), H10(1/0),</b><br><b>H66(0/3), H131(0/1),</b> H137(0/2), H143(0/1), H144(0/1)                       |
| PL  | Pearl River   | <b>H4(1/0), H7(1/1), H9(4/0),</b> H12(1/0), H13(1/0), <b>H14(1/0),</b><br>H15(1/0), <b>H98(0/1),</b> H124(0/1), H136(0/1)                                                 |
| XZ  | Pearl River   | <b>H9(0/1),</b> H16(2/0), H17(1/0), H18(7/0), <b>H98(0/2), H131(0/1)</b>                                                                                                  |
| LC  | Hai River     | <b>H1(4/1), H2(6/2)</b>                                                                                                                                                   |
| CZ  | Hai River     | <b>H1(3/0), H2(3/0),</b> H3(2/2), H4(1/0)                                                                                                                                 |
| LHK | Han River     | <b>H5(0/2), H45(8/5),</b> H46(1/0)                                                                                                                                        |
| ZX  | Han River     | <b>H5(2/1), H45(1/2), H79(2/2),</b> H89(2/0), H90(2/0), H91(1/0),<br>93(0/1)                                                                                              |
| CD  | Han River     | <b>H27(3/0), H45(2/0),</b> H68(1/0), H69(1/0), H70(1/0), H71(1/0),<br>H72(1/0), H94(0/1), H95(0/2), H96(0/1), H97(0/1), H98(0/1),<br>H99(0/1), H100(0/1)                  |
| HP  | Han River     | <b>H9(10/0), H79(0/2), H103(0/1)</b>                                                                                                                                      |
| CR  | JY            | <b>H27(2/0), H42(1/0), H45(2/0),</b> H76(2/0), H77(1/0), H78(1/0),<br><b>H79(1/3), H101(0/4),</b> H102(0/1)                                                               |
| YL  | Han River     | <b>H27(3/0), H61(4/0),</b> H62(1/0), H63(1/0), H64(1/0), <b>H79(0/2),</b><br><b>H101(0/1), H103(0/1),</b> H104(0/1)                                                       |
| ES  | Han River     | H32(2/0), H33(3/3), H34(1/0), H35(4/4)                                                                                                                                    |
| SZ  | Han River     | <b>H5(7/1), H9(1/0), H10(0/3),</b> H80(1/0), H81(1/0)                                                                                                                     |
| ZJJ | Dongting Lake | <b>H9(1/0), H15(5/0),</b> H65(2/0), <b>H66(1/0),</b> H67(1/0), <b>H79(0/2),</b><br>H133(0/1), H134(0/1)                                                                   |
| SY  | Dongting Lake | H47(1/0), H48(2/0), <b>H49(1/0),</b> H50(1/0), H51(1/0), H52(1/0),<br><b>H53(1/0), H54(1/1),</b> H55(1/0), <b>H74(0/1),</b> H123(0/3), H124(0/1),<br>H125(0/1), H126(0/1) |

|     |               |                                                                                                                                                              |
|-----|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| HH  | Dongting Lake | <b>H5(1/0), H49(0/1), H53(2/0), H54(2/1), H61(1/0), H73(1/1), H74(2/1),</b> H75(1/0), H120(0/1)                                                              |
| JJ  | Poyang Lake   | <b>H18(1/0), H27(5/0), H28(1/0), H42(1/0),</b> H43(1/0), H44(1/0), <b>H101(0/4),</b> H110(0/1), H111(0/1), H112(0/1), H113(0/1), H114(0/2)                   |
| WN  | Poyang Lake   | <b>H73(1/0),</b> H82(1/6), H83(1/0), H84(1/2), H85(1/0), H86(1/1), H87(1/0), H88(1/0), H115(0/1)                                                             |
| YX  | Poyang Lake   | H26(1/0), <b>H27(1/0), H28(2/0),</b> H29(1/0), H30(4/0), H31(1/0), H130(0/2), H131(0/1), H132(0/1)                                                           |
| JDZ | Poyang Lake   | <b>H36(2/1),</b> H37(1/0), H38(4/0), H39(1/0), H40(1/2), H41(1/0), H109(0/2)                                                                                 |
| FZ  | Poyang Lake   | <b>H18(2/0),</b> H19(1/0), H20(1/0), H21(1/0), H22(1/0), H23(1/0), H24(1/0), H25(1/0), <b>H36(0/1),</b> H92(1/0), H105(0/1), H106(0/1), H107(0/1), H108(0/1) |
| XY  | Poyang Lake   | <b>H18(4/0),</b> H56(2/0), H57(1/0), H58(1/0), H59(1/0), H60(1/0), H127(0/1), H128(0/1), H129(0/1)                                                           |
| GL  | Pearl River   | <b>H5(8/1),</b> H6(1/0), H7(1/0), <b>H9(0/1), H11(0/3), H73(0/1),</b> H117(0/1), H118(0/2), H119(0/1)                                                        |
| PL  | Pearl River   | <b>H5(0/1),</b> H8(1/0), <b>H9(3/0), H10(1/0), H11(1/0), H12(1/0),</b> <b>H13(1/0), H14(1/0), H66(1/0), H116(0/1),</b> H121(0/1), H122(0/1)                  |
| XZ  | Pearl River   | <b>H9(0/2), H15(2/2),</b> H16(6/0), H17(2/0), <b>H116(0/1)</b>                                                                                               |

**Table S3.** Matrix of pairwise population geographic distances (km).

| Code | CZ     | LC     | GL    | XZ    | PL    | HP    | ES    | LHK   | ZX    | CD    | YL    | JY    | SZ    | WN    | JJ    | JDZ   | FZ    | XY    | YX    | SY    | HH    | ZJJ |
|------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----|
| CZ   | -      |        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |     |
| LC   | 216.2  | -      |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |     |
| GL   | 1578.8 | 1362.9 | -     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |     |
| XZ   | 1730.7 | 1512.7 | 148.5 | -     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |     |
| PL   | 1628.5 | 1410.3 | 81.8  | 119.6 | -     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |     |
| HP   | 860.9  | 637.0  | 750.2 | 895.3 | 785.4 | -     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |     |
| ES   | 1135.5 | 912.9  | 566.6 | 704.0 | 640.0 | 472.4 | -     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |     |
| LHK  | 809.0  | 602.5  | 805.4 | 951.9 | 864.7 | 303.8 | 310.6 | -     |       |       |       |       |       |       |       |       |       |       |       |       |       |     |
| ZX   | 883.9  | 666.1  | 699.9 | 848.9 | 751.0 | 173.4 | 311.8 | 157.1 | -     |       |       |       |       |       |       |       |       |       |       |       |       |     |
| CD   | 896.3  | 677.5  | 705.0 | 850.8 | 741.3 | 46.7  | 436.7 | 296.9 | 151.7 | -     |       |       |       |       |       |       |       |       |       |       |       |     |
| YL   | 876.4  | 658.6  | 741.0 | 884.6 | 772.5 | 31.3  | 489.0 | 332.6 | 197.1 | 51.5  | -     |       |       |       |       |       |       |       |       |       |       |     |
| JY   | 964.3  | 746.1  | 642.9 | 787.1 | 677.0 | 109.4 | 430.5 | 341.6 | 185.4 | 68.9  | 96.6  | -     |       |       |       |       |       |       |       |       |       |     |
| SZ   | 801.9  | 581.0  | 782.2 | 931.2 | 829.7 | 131.0 | 450.8 | 176.4 | 95.4  | 137.8 | 161.4 | 199.3 | -     |       |       |       |       |       |       |       |       |     |
| WN   | 1018.5 | 805.7  | 660.1 | 795.7 | 677.6 | 194.1 | 554.5 | 474.6 | 321.7 | 179.5 | 181.0 | 136.9 | 317.1 | -     |       |       |       |       |       |       |       |     |
| JJ   | 958.9  | 750.0  | 759.9 | 892.6 | 775.1 | 203.8 | 631.2 | 505.2 | 365.3 | 212.8 | 173.4 | 200.3 | 334.4 | 100.1 | -     |       |       |       |       |       |       |     |
| JDZ  | 1006.0 | 806.6  | 823.8 | 947.9 | 827.3 | 322.5 | 751.5 | 626.8 | 488.6 | 336.3 | 295.0 | 322.5 | 452.4 | 200.8 | 123.9 | -     |       |       |       |       |       |     |
| FZ   | 1152.3 | 946.9  | 683.6 | 798.6 | 678.1 | 377.4 | 716.6 | 663.7 | 528.4 | 368.7 | 346.5 | 324.5 | 505.3 | 190.1 | 197.9 | 167.0 | -     |       |       |       |       |     |
| XY   | 1178.8 | 966.0  | 552.2 | 673.7 | 553.0 | 343.6 | 595.1 | 592.8 | 434.9 | 319.3 | 316.6 | 257.1 | 455.3 | 160.0 | 234.5 | 273.5 | 142.6 | -     |       |       |       |     |
| YX   | 1036.5 | 827.2  | 698.7 | 826.5 | 707.4 | 248.7 | 627.4 | 541.2 | 390.4 | 243.5 | 217.2 | 209.0 | 377.2 | 73.5  | 78.9  | 135.9 | 130.3 | 159.6 | -     |       |       |     |
| SY   | 1327.9 | 1109.3 | 258.1 | 404.1 | 302.2 | 491.9 | 407.1 | 569.2 | 449.8 | 447.4 | 483.1 | 387.6 | 528.1 | 420.4 | 520.5 | 603.1 | 488.1 | 345.7 | 469.3 | -     |       |     |
| HH   | 1352.6 | 1137.1 | 283.1 | 401.5 | 332.6 | 561.5 | 307.0 | 556.7 | 472.8 | 515.9 | 561.0 | 467.6 | 563.3 | 533.4 | 632.7 | 727.3 | 626.7 | 484.8 | 591.1 | 149.4 | -     |     |
| ZJJ  | 1177.4 | 962.7  | 432.2 | 577.8 | 500.0 | 423.9 | 162.5 | 378.0 | 304.2 | 379.9 | 429.5 | 347.9 | 398.9 | 448.9 | 539.8 | 650.1 | 588.7 | 457.2 | 518.5 | 230.3 | 178.6 | -   |



**Table S4.** Genetic diversity indices in 5 lineages based on *cyt b* and CR datasets.

| Sequence     | Group       | n   | h  | <i>Hd</i> | $\pi$   |
|--------------|-------------|-----|----|-----------|---------|
| <i>Cyt b</i> | Lineage I   | 200 | 75 | 0.961     | 0.02120 |
|              | Lineage II  | 94  | 56 | 0.986     | 0.03953 |
|              | Lineage III | 22  | 8  | 0.697     | 0.00249 |
|              | Lineage IV  | 14  | 6  | 0.802     | 0.00361 |
|              | Lineage V   | 8   | 2  | 0.250     | 0.00041 |
| CR           | Lineage I   | 198 | 68 | 0.956     | 0.01399 |
|              | Lineage II  | 94  | 50 | 0.973     | 0.01471 |
|              | Lineage III | 22  | 5  | 0.407     | 0.00105 |
|              | Lineage IV  | 14  | 5  | 0.670     | 0.00469 |
|              | Lineage V   | 8   | 2  | 0.429     | 0.00072 |

n, number of samples; h, number of haplotypes; *Hd*, haplotype diversity;  $\pi$ , nucleotide diversity; numbers in bold indicate statistically significant results ( $P < 0.05$ ).

**Table S5.** Genetic diversity indices in 22 populations including diploids and tetraploids based on *cyt b* and CR datasets.

| Seq | Code | Region        | Diploid |           |        | Tetraploid |           |        |
|-----|------|---------------|---------|-----------|--------|------------|-----------|--------|
|     |      |               | n/h     | <i>Hd</i> | $\pi$  | n/h        | <i>Hd</i> | $\pi$  |
| CR  | JY   | Han River     | 10/7    | 0.933     | 0.0118 | 8/3        | 0.679     | 0.0022 |
|     | CD   | Han River     | 10/7    | 0.911     | 0.0142 | 8/7        | 0.964     | 0.0116 |
|     | YL   | Han River     | 10/5    | 0.800     | 0.0046 | 5/4        | 0.900     | 0.0054 |
|     | LHK  | Han River     | 9/2     | 0.222     | 0.0004 | 7/2        | 0.476     | 0.0056 |
|     | ZX   | Han River     | 10/6    | 0.911     | 0.0077 | 6/4        | 0.867     | 0.0072 |
|     | ES   | Han River     | 10/4    | 0.778     | 0.0111 | 7/2        | 0.571     | 0.0077 |
|     | SZ   | Han River     | 10/4    | 0.533     | 0.0166 | 4/1        | 0.000     | 0.0000 |
|     | HP   | Han River     | 10/1    | 0.000     | 0.0000 | 3/2        | 0.667     | 0.0011 |
|     | HH   | Dongting Lake | 10/7    | 0.933     | 0.0168 | 5/5        | 1.000     | 0.0199 |
|     | SY   | Dongting Lake | 10/9    | 0.978     | 0.0130 | 8/6        | 0.893     | 0.0128 |

|              |     |               |       |       |        |       |       |        |
|--------------|-----|---------------|-------|-------|--------|-------|-------|--------|
|              | ZJJ | Dongting Lake | 10/5  | 0.756 | 0.0211 | 4/3   | 0.833 | 0.0117 |
|              | JJ  | Poyang Lake   | 10/6  | 0.778 | 0.0192 | 10/6  | 0.844 | 0.0127 |
|              | WN  | Poyang Lake   | 8/8   | 1.000 | 0.0313 | 10/4  | 0.644 | 0.0041 |
|              | JDZ | Poyang Lake   | 10/6  | 0.844 | 0.0061 | 5/3   | 0.800 | 0.0064 |
|              | FZ  | Poyang Lake   | 10/9  | 0.978 | 0.0033 | 5/5   | 1.000 | 0.0091 |
|              | XY  | Poyang Lake   | 10/6  | 0.844 | 0.0042 | 3/3   | 1.000 | 0.0056 |
|              | YX  | Poyang Lake   | 10/6  | 0.844 | 0.0101 | 4/3   | 0.833 | 0.0079 |
|              | GL  | Pearl River   | 10/3  | 0.378 | 0.0160 | 10/7  | 0.911 | 0.0217 |
|              | PL  | Pearl River   | 10/8  | 0.933 | 0.0280 | 4/4   | 1.000 | 0.0245 |
|              | XZ  | Pearl River   | 10/3  | 0.622 | 0.0470 | 5/3   | 0.800 | 0.0284 |
|              | LC  | Hai River     | 10/2  | 0.533 | 0.0009 | 3/2   | 0.667 | 0.0011 |
|              | CZ  | Hai River     | 9/4   | 0.806 | 0.0019 | 2/1   | 0.000 | 0.0000 |
| Cyt <i>b</i> | JY  | Han River     | 10/10 | 1.000 | 0.0088 | 8/4   | 0.643 | 0.0021 |
|              | CD  | Han River     | 10/9  | 0.978 | 0.0281 | 13/11 | 0.974 | 0.0147 |
|              | YL  | Han River     | 9/7   | 0.944 | 0.0058 | 5/5   | 1.000 | 0.0083 |
|              | LHK | Han River     | 10/3  | 0.378 | 0.0059 | 7/4   | 0.714 | 0.0132 |
|              | ZX  | Han River     | 10/6  | 0.889 | 0.0153 | 4/2   | 0.500 | 0.0140 |
|              | ES  | Han River     | 10/3  | 0.733 | 0.0117 | 7/2   | 0.571 | 0.0123 |
|              | SZ  | Han River     | 10/3  | 0.511 | 0.0402 | 4/2   | 0.500 | 0.0008 |
|              | HP  | Han River     | 10/5  | 0.800 | 0.0018 | 3/2   | 0.667 | 0.0011 |
|              | HH  | Dongting Lake | 10/7  | 0.933 | 0.0226 | 5/4   | 0.900 | 0.0248 |
|              | SY  | Dongting Lake | 10/8  | 0.933 | 0.0203 | 8/5   | 0.786 | 0.0123 |
|              | ZJJ | Dongting Lake | 10/5  | 0.867 | 0.0491 | 4/3   | 0.833 | 0.0085 |
|              | JJ  | Poyang Lake   | 9/6   | 0.889 | 0.0472 | 11/4  | 0.600 | 0.0406 |
|              | WN  | Poyang Lake   | 8/5   | 0.786 | 0.0562 | 13/9  | 0.936 | 0.0076 |
|              | JDZ | Poyang Lake   | 10/9  | 0.978 | 0.0112 | 5/3   | 0.800 | 0.0089 |
|              | FZ  | Poyang Lake   | 10/9  | 0.978 | 0.0063 | 5/5   | 1.000 | 0.0149 |
|              | XY  | Poyang Lake   | 10/6  | 0.889 | 0.0071 | 3/3   | 1.000 | 0.0132 |
|              | YX  | Poyang Lake   | 10/5  | 0.822 | 0.0270 | 4/3   | 0.833 | 0.0129 |
|              | GL  | Pearl River   | 10/6  | 0.778 | 0.0413 | 13/8  | 0.923 | 0.0300 |
|              | PL  | Pearl River   | 10/7  | 0.867 | 0.0644 | 4/4   | 1.000 | 0.0550 |
|              | XZ  | Pearl River   | 10/3  | 0.511 | 0.0555 | 4/3   | 0.833 | 0.0635 |
|              | LC  | Hai River     | 10/2  | 0.200 | 0.0003 | 3/2   | 0.667 | 0.0044 |
|              | CZ  | Hai River     | 10/4  | 0.533 | 0.0013 | 2/1   | 0.000 | 0.0000 |

n, number of samples; h, number of haplotypes; *Hd*, haplotype diversity;  $\pi$ , nucleotide diversity.

**Table S6.** Hierarchical analyses of molecular variance (AMOVA) based on *cyt b* and CR datasets. F statistics (fixation indices):  $F_{ST}$  (among specimens among populations),  $F_{SC}$  (among populations within groups), and  $F_{CT}$  (among groups).

| Source of variation | d.f. | Variance | % of | Fixation | <i>P</i> |
|---------------------|------|----------|------|----------|----------|
|---------------------|------|----------|------|----------|----------|

|                                      |     | component | variation | index             |        |
|--------------------------------------|-----|-----------|-----------|-------------------|--------|
| <i>Cyt b</i> group 1 (ploidy-based)  |     |           |           |                   |        |
| Between ploidies                     | 1   | -0.286    | -1.52     | $F_{CT} = -0.015$ | 0.659  |
| Among populations within ploidies    | 42  | 12.575    | 66.91     | $F_{SC} = 0.659$  | <0.001 |
| Within populations                   | 307 | 6.505     | 34.61     | $F_{ST} = 0.654$  | <0.001 |
| <i>Cyt b</i> group 2 (region-based)  |     |           |           |                   |        |
| Between regions                      | 4   | 7.043     | 34.02     | $F_{CT} = 0.340$  | <0.001 |
| Among populations within regions     | 17  | 5.346     | 25.82     | $F_{SC} = 0.391$  | <0.001 |
| Within populations                   | 329 | 8.312     | 40.15     | $F_{ST} = 0.598$  | <0.001 |
| <i>Cyt b</i> group 3 (lineage-based) |     |           |           |                   |        |
| Between lineages                     | 5   | 19.371    | 70.83     | $F_{CT} = 0.708$  | <0.001 |
| Among populations within lineages    | 24  | 2.807     | 10.26     | $F_{SC} = 0.352$  | <0.001 |
| Within populations                   | 322 | 5.170     | 18.91     | $F_{ST} = 0.811$  | <0.001 |
| CR group 1 (ploidy-based)            |     |           |           |                   |        |
| Between ploidies                     | 1   | -0.100    | -1.00     | $F_{CT} = -0.010$ | 0.728  |
| Among populations within ploidies    | 42  | 6.183     | 61.56     | $F_{SC} = 0.609$  | <0.001 |
| Within populations                   | 298 | 3.962     | 39.44     | $F_{ST} = 0.606$  | <0.001 |
| CR group 2 (region-based)            |     |           |           |                   |        |
| Between regions                      | 4   | 2.577     | 23.97     | $F_{CT} = 0.240$  | <0.001 |
| Among populations within regions     | 17  | 3.006     | 27.95     | $F_{SC} = 0.368$  | <0.001 |
| Within populations                   | 320 | 5.170     | 48.08     | $F_{ST} = 0.519$  | <0.001 |
| CR group 3 (lineage-based)           |     |           |           |                   |        |
| Between lineages                     | 4   | 9.657     | 68.10     | $F_{CT} = 0.681$  | <0.001 |
| Among populations within lineages    | 25  | 1.521     | 10.73     | $F_{SC} = 0.336$  | <0.001 |
| Within populations                   | 312 | 3.002     | 21.17     | $F_{ST} = 0.788$  | <0.001 |

**Table S7.** Pairwise  $F_{ST}$  (below diagonal), average Kimura 2-parameter (K2P) genetic distance values within populations (underlined along diagonal) and between pairs of populations (above diagonal) based on *cyt b* and CR data set. Bold numbers indicate statistical significance after sequential Bonferroni corrections.

| Seq          | Code | CZ            | LC            | GL            | XZ            | PL            | HP            | ES            | LHK           | ZX            | CD            | YL            | JY            | SZ            | WN            | JJ            | JDZ           | FZ            | XY            | YX            | SY            | HH            | ZJJ    |
|--------------|------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--------|
| <i>Cyt b</i> | CZ   | <u>0.0011</u> | 0.0011        | 0.0226        | 0.1518        | 0.0733        | 0.1011        | 0.0257        | 0.0217        | 0.0199        | 0.0285        | 0.0243        | 0.0235        | 0.0208        | 0.0933        | 0.0505        | 0.1083        | 0.1146        | 0.1161        | 0.1037        | 0.0277        | 0.0227        | 0.0805 |
|              | LC   | 0.0035        | <u>0.0013</u> | 0.0227        | 0.1518        | 0.0734        | 0.1015        | 0.0258        | 0.0218        | 0.0199        | 0.0286        | 0.0244        | 0.0236        | 0.0209        | 0.0937        | 0.0508        | 0.1089        | 0.1151        | 0.1166        | 0.1043        | 0.0277        | 0.0227        | 0.0806 |
|              | GL   | <b>0.1640</b> | <b>0.2858</b> | <u>0.0381</u> | 0.1491        | 0.0742        | 0.0910        | 0.0374        | 0.0348        | 0.0336        | 0.0397        | 0.0365        | 0.0360        | 0.0358        | 0.0926        | 0.0579        | 0.1052        | 0.1104        | 0.1118        | 0.1018        | 0.0382        | 0.0352        | 0.0817 |
|              | XZ   | <b>0.3354</b> | <b>0.4740</b> | <b>0.1613</b> | <u>0.1058</u> | 0.1383        | 0.1399        | 0.1475        | 0.1473        | 0.1473        | 0.1437        | 0.1441        | 0.1454        | 0.1525        | 0.1409        | 0.1416        | 0.1344        | 0.1401        | 0.1400        | 0.1354        | 0.1434        | 0.1453        | 0.1304 |
|              | PL   | <b>0.2409</b> | <b>0.3851</b> | 0.0299        | <b>0.1385</b> | <u>0.0828</u> | 0.0747        | 0.0722        | 0.0723        | 0.0718        | 0.0724        | 0.0717        | 0.0721        | 0.0751        | 0.0961        | 0.0803        | 0.0988        | 0.1033        | 0.1038        | 0.0987        | 0.0713        | 0.0718        | 0.0788 |
|              | HP   | <b>0.2737</b> | <b>0.4167</b> | <b>0.0964</b> | <b>0.1730</b> | 0.0159        | <u>0.0433</u> | 0.0901        | 0.0925        | 0.0916        | 0.0880        | 0.0899        | 0.0896        | 0.0917        | 0.0980        | 0.0907        | 0.0938        | 0.0959        | 0.0962        | 0.0960        | 0.0888        | 0.0915        | 0.0883 |
|              | ES   | <b>0.3776</b> | <b>0.5067</b> | <b>0.2090</b> | <b>0.2972</b> | <b>0.2118</b> | <b>0.2383</b> | <u>0.0117</u> | 0.0134        | 0.0157        | 0.0194        | 0.0139        | 0.0155        | 0.0402        | 0.0835        | 0.0410        | 0.0955        | 0.1025        | 0.1028        | 0.0919        | 0.0205        | 0.0217        | 0.0750 |
|              | LHK  | <b>0.4618</b> | <b>0.5891</b> | <b>0.2660</b> | <b>0.3784</b> | <b>0.2869</b> | <b>0.3211</b> | <b>0.4154</b> | <u>0.0091</u> | 0.0123        | 0.0174        | 0.0120        | 0.0141        | 0.0367        | 0.0833        | 0.0412        | 0.0962        | 0.1030        | 0.1039        | 0.0923        | 0.0218        | 0.0217        | 0.0773 |
|              | ZX   | <b>0.2669</b> | <b>0.4049</b> | <b>0.1114</b> | <b>0.2198</b> | <b>0.1229</b> | <b>0.1485</b> | <b>0.2653</b> | 0.0515        | <u>0.0148</u> | 0.0190        | 0.0137        | 0.0144        | 0.0351        | 0.0836        | 0.0411        | 0.0968        | 0.1035        | 0.1044        | 0.0931        | 0.0220        | 0.0217        | 0.0760 |
|              | CD   | <b>0.2018</b> | <b>0.3220</b> | <b>0.0553</b> | <b>0.1295</b> | <b>0.0472</b> | <b>0.0650</b> | <b>0.1726</b> | <b>0.1966</b> | <b>0.0648</b> | <u>0.0228</u> | 0.0167        | 0.0179        | 0.0420        | 0.0825        | 0.0423        | 0.0939        | 0.1004        | 0.1009        | 0.0905        | 0.0250        | 0.0257        | 0.0756 |
|              | YL   | <b>0.2175</b> | <b>0.3574</b> | <b>0.0579</b> | <b>0.1374</b> | <b>0.0495</b> | <b>0.0696</b> | <b>0.1848</b> | <b>0.2660</b> | <b>0.0952</b> | 0.0023        | <u>0.0105</u> | 0.0116        | 0.0391        | 0.0804        | 0.0373        | 0.0914        | 0.0986        | 0.0992        | 0.0881        | 0.0201        | 0.0210        | 0.0747 |
|              | JY   | <b>0.2489</b> | <b>0.3776</b> | <b>0.0944</b> | <b>0.1726</b> | <b>0.0878</b> | <b>0.0812</b> | <b>0.2170</b> | <b>0.2644</b> | <b>0.0753</b> | <b>0.0444</b> | 0.0260        | <u>0.0119</u> | 0.0385        | 0.0808        | 0.0374        | 0.0925        | 0.0997        | 0.1003        | 0.0894        | 0.0204        | 0.0211        | 0.0740 |
|              | SZ   | <b>0.4036</b> | <b>0.5410</b> | <b>0.1658</b> | <b>0.3187</b> | <b>0.1980</b> | <b>0.2583</b> | <b>0.3604</b> | <b>0.4319</b> | <b>0.2708</b> | <b>0.1891</b> | <b>0.2033</b> | <b>0.2350</b> | <u>0.0340</u> | 0.0955        | 0.0611        | 0.1095        | 0.1147        | 0.1163        | 0.1060        | 0.0416        | 0.0377        | 0.0844 |
|              | WN   | <b>0.2335</b> | <b>0.3565</b> | <b>0.0836</b> | <b>0.1597</b> | <b>0.0765</b> | <b>0.1008</b> | <b>0.2031</b> | <b>0.2763</b> | <b>0.1288</b> | <b>0.0478</b> | <b>0.0500</b> | <b>0.0870</b> | <b>0.2203</b> | <u>0.0458</u> | 0.0672        | 0.0372        | 0.0380        | 0.0378        | 0.0414        | 0.0807        | 0.0834        | 0.0940 |
|              | JJ   | <b>0.2695</b> | <b>0.3938</b> | <b>0.1161</b> | <b>0.1944</b> | <b>0.1108</b> | <b>0.1288</b> | <b>0.2375</b> | <b>0.3116</b> | <b>0.1513</b> | <b>0.0619</b> | <b>0.0570</b> | <b>0.0820</b> | <b>0.2556</b> | <b>0.1090</b> | <u>0.0488</u> | 0.0683        | 0.0739        | 0.0743        | 0.0685        | 0.0432        | 0.0451        | 0.0805 |
|              | JDZ  | <b>0.2331</b> | <b>0.3698</b> | <b>0.0747</b> | <b>0.1540</b> | <b>0.0670</b> | <b>0.0921</b> | <b>0.2005</b> | <b>0.2802</b> | <b>0.1214</b> | <b>0.0379</b> | <b>0.0397</b> | <b>0.0780</b> | <b>0.2189</b> | <b>0.0670</b> | <b>0.1009</b> | <u>0.0107</u> | 0.0186        | 0.0185        | 0.0204        | 0.0932        | 0.0965        | 0.0961 |
|              | FZ   | <b>0.2088</b> | <b>0.3457</b> | <b>0.0516</b> | <b>0.1300</b> | <b>0.0430</b> | <b>0.0680</b> | <b>0.1769</b> | <b>0.2567</b> | <b>0.0975</b> | <b>0.0148</b> | <b>0.0157</b> | <b>0.0545</b> | <b>0.1950</b> | <b>0.0437</b> | <b>0.0776</b> | <b>0.0333</b> | <u>0.0099</u> | 0.0098        | 0.0226        | 0.0993        | 0.1028        | 0.1023 |
|              | XY   | <b>0.2414</b> | <b>0.3846</b> | <b>0.0782</b> | <b>0.1595</b> | <b>0.0706</b> | <b>0.0962</b> | <b>0.2073</b> | <b>0.2901</b> | <b>0.1261</b> | <b>0.0409</b> | <b>0.0429</b> | <b>0.0817</b> | <b>0.2265</b> | <b>0.0670</b> | <b>0.0945</b> | <b>0.0606</b> | <b>0.0365</b> | <u>0.0093</u> | 0.0225        | 0.0995        | 0.1034        | 0.1024 |
|              | YX   | <b>0.2566</b> | <b>0.3962</b> | <b>0.0947</b> | <b>0.1758</b> | <b>0.0879</b> | <b>0.1134</b> | <b>0.2225</b> | <b>0.3038</b> | <b>0.1429</b> | <b>0.0489</b> | <b>0.0508</b> | <b>0.0949</b> | <b>0.2418</b> | <b>0.0871</b> | <b>0.1054</b> | <b>0.0779</b> | <b>0.0539</b> | <b>0.0817</b> | <u>0.0273</u> | 0.0898        | 0.0930        | 0.0962 |
|              | SY   | <b>0.2319</b> | <b>0.3608</b> | <b>0.0784</b> | <b>0.1558</b> | <b>0.0710</b> | <b>0.0956</b> | <b>0.2006</b> | <b>0.2767</b> | <b>0.1242</b> | <b>0.0422</b> | <b>0.0441</b> | <b>0.0817</b> | <b>0.2183</b> | <b>0.0709</b> | <b>0.1042</b> | <b>0.0613</b> | <b>0.0379</b> | <b>0.0648</b> | <b>0.0817</b> | <u>0.0206</u> | 0.0213        | 0.0713 |
|              | HH   | <b>0.2185</b> | <b>0.3533</b> | <b>0.0603</b> | <b>0.1732</b> | <b>0.0818</b> | <b>0.1114</b> | <b>0.2193</b> | <b>0.2990</b> | <b>0.1365</b> | <b>0.0535</b> | <b>0.0589</b> | <b>0.0967</b> | <b>0.2381</b> | <b>0.0854</b> | <b>0.1195</b> | <b>0.0762</b> | <b>0.0524</b> | <b>0.0799</b> | <b>0.0971</b> | <b>0.0483</b> | <u>0.0225</u> | 0.0730 |

|    |     |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |
|----|-----|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
|    | ZJJ | <b>0.2454</b> | <b>0.3851</b> | <b>0.0785</b> | <b>0.1293</b> | 0.0220        | 0.0502        | <b>0.2118</b> | <b>0.2930</b> | <b>0.1138</b> | <b>0.0472</b> | <b>0.0397</b> | 0.0421        | <b>0.2308</b> | <b>0.0765</b> | <b>0.0979</b> | <b>0.0670</b> | <b>0.0430</b> | <b>0.0706</b> | <b>0.0879</b> | <b>0.0673</b> | <b>0.0862</b> | <u>0.0685</u> |
| CR | CZ  | <u>0.0019</u> | 0.0017        | 0.0135        | 0.1070        | 0.0302        | 0.0406        | 0.0170        | 0.0132        | 0.0131        | 0.0180        | 0.0158        | 0.0167        | 0.0097        | 0.0302        | 0.0198        | 0.0305        | 0.0321        | 0.0308        | 0.0300        | 0.0188        | 0.0171        | 0.0342        |
|    | LC  | 0.1143        | <u>0.0009</u> | 0.0133        | 0.1068        | 0.0300        | 0.0404        | 0.0168        | 0.0130        | 0.0129        | 0.0178        | 0.0156        | 0.0165        | 0.0095        | 0.0300        | 0.0196        | 0.0303        | 0.0319        | 0.0306        | 0.0297        | 0.0186        | 0.0169        | 0.0340        |
|    | GL  | <b>0.2140</b> | <b>0.3358</b> | <u>0.0198</u> | 0.1039        | 0.0305        | 0.0356        | 0.0218        | 0.0183        | 0.0182        | 0.0219        | 0.0199        | 0.0213        | 0.0161        | 0.0323        | 0.0236        | 0.0314        | 0.0324        | 0.0314        | 0.0310        | 0.0237        | 0.0223        | 0.0338        |
|    | XZ  | <b>0.2186</b> | <b>0.3486</b> | <b>0.2093</b> | <u>0.0839</u> | 0.0989        | 0.0980        | 0.1058        | 0.1052        | 0.1042        | 0.1058        | 0.1048        | 0.1062        | 0.1030        | 0.1037        | 0.1030        | 0.0992        | 0.1000        | 0.0996        | 0.0999        | 0.1050        | 0.1054        | 0.0918        |
|    | PL  | <b>0.1224</b> | <b>0.2568</b> | <b>0.0753</b> | <b>0.0966</b> | <u>0.0341</u> | 0.0308        | 0.0331        | 0.0304        | 0.0305        | 0.0319        | 0.0309        | 0.0331        | 0.0285        | 0.0392        | 0.0333        | 0.0358        | 0.0373        | 0.0363        | 0.0361        | 0.0341        | 0.0336        | 0.0329        |
|    | HP  | <b>0.4125</b> | <b>0.5385</b> | <b>0.3567</b> | <b>0.3296</b> | <b>0.1716</b> | <u>0.0177</u> | 0.0417        | 0.0387        | 0.0376        | 0.0378        | 0.0380        | 0.0396        | 0.0341        | 0.0425        | 0.0378        | 0.0368        | 0.0391        | 0.0386        | 0.0381        | 0.0405        | 0.0404        | 0.0355        |
|    | ES  | <b>0.2755</b> | <b>0.3998</b> | <b>0.2654</b> | <b>0.2726</b> | <b>0.1825</b> | <b>0.4468</b> | <u>0.0098</u> | 0.0090        | 0.0113        | 0.0135        | 0.0101        | 0.0130        | 0.0202        | 0.0300        | 0.0181        | 0.0296        | 0.0316        | 0.0296        | 0.0291        | 0.0172        | 0.0171        | 0.0323        |
|    | LHK | <b>0.4621</b> | <b>0.5788</b> | <b>0.3880</b> | <b>0.4426</b> | <b>0.3495</b> | <b>0.6266</b> | <b>0.4880</b> | <u>0.0029</u> | 0.0056        | 0.0099        | 0.0062        | 0.0079        | 0.0160        | 0.0286        | 0.0147        | 0.0281        | 0.0296        | 0.0278        | 0.0273        | 0.0160        | 0.0151        | 0.0308        |
|    | ZX  | <b>0.1645</b> | <b>0.2939</b> | <b>0.0877</b> | <b>0.1674</b> | <b>0.0628</b> | <b>0.3162</b> | <b>0.2211</b> | <b>0.2569</b> | <u>0.0072</u> | 0.0120        | 0.0083        | 0.0090        | 0.0158        | 0.0287        | 0.0150        | 0.0281        | 0.0300        | 0.0284        | 0.0275        | 0.0174        | 0.0166        | 0.0308        |
|    | CD  | <b>0.1196</b> | <b>0.2465</b> | <b>0.1227</b> | <b>0.1238</b> | <b>0.0328</b> | <b>0.2928</b> | <b>0.1769</b> | <b>0.2729</b> | <b>0.0546</b> | <u>0.0141</u> | 0.0107        | 0.0136        | 0.0200        | 0.0302        | 0.0183        | 0.0294        | 0.0317        | 0.0299        | 0.0292        | 0.0190        | 0.0191        | 0.0328        |
|    | YL  | <b>0.1538</b> | <b>0.2854</b> | <b>0.1551</b> | <b>0.1571</b> | <b>0.0643</b> | <b>0.3172</b> | <b>0.2117</b> | <b>0.3812</b> | <b>0.0752</b> | 0.0312        | <u>0.0073</u> | 0.0097        | 0.0181        | 0.0279        | 0.0150        | 0.0275        | 0.0300        | 0.0281        | 0.0272        | 0.0161        | 0.0164        | 0.0311        |
|    | JY  | <b>0.1539</b> | <b>0.2801</b> | <b>0.1550</b> | <b>0.1570</b> | <b>0.0663</b> | <b>0.3034</b> | <b>0.2098</b> | <b>0.3090</b> | 0.0334        | <b>0.0356</b> | 0.0321        | <u>0.0105</u> | 0.0192        | 0.0300        | 0.0159        | 0.0296        | 0.0323        | 0.0308        | 0.0293        | 0.0195        | 0.0190        | 0.0328        |
|    | SZ  | <b>0.2826</b> | <b>0.4125</b> | 0.0179        | <b>0.2721</b> | <b>0.1243</b> | <b>0.4314</b> | <b>0.3317</b> | <b>0.4676</b> | <b>0.1339</b> | <b>0.1809</b> | <b>0.2165</b> | <b>0.2143</b> | <u>0.0126</u> | 0.0304        | 0.0215        | 0.0293        | 0.0314        | 0.0303        | 0.0296        | 0.0232        | 0.0218        | 0.0329        |
|    | WN  | <b>0.1886</b> | <b>0.3141</b> | <b>0.1851</b> | <b>0.1905</b> | <b>0.1000</b> | <b>0.3603</b> | <b>0.2427</b> | <b>0.4036</b> | <b>0.1404</b> | <b>0.0980</b> | <b>0.1301</b> | <b>0.1307</b> | <b>0.2480</b> | <u>0.0228</u> | 0.0255        | 0.0182        | 0.0203        | 0.0189        | 0.0203        | 0.0323        | 0.0326        | 0.0393        |
|    | JJ  | <b>0.1485</b> | <b>0.2721</b> | <b>0.1500</b> | <b>0.1518</b> | <b>0.0621</b> | <b>0.3170</b> | <b>0.2036</b> | <b>0.3595</b> | <b>0.1028</b> | 0.0205        | 0.0309        | 0.0203        | <b>0.2080</b> | <b>0.1260</b> | <u>0.0175</u> | 0.0223        | 0.0249        | 0.0237        | 0.0228        | 0.0233        | 0.0232        | 0.0336        |
|    | JDZ | <b>0.1687</b> | <b>0.3000</b> | <b>0.1689</b> | <b>0.1714</b> | <b>0.0787</b> | <b>0.3489</b> | <b>0.2258</b> | <b>0.3954</b> | <b>0.1202</b> | <b>0.0774</b> | <b>0.1095</b> | <b>0.1107</b> | <b>0.2309</b> | <b>0.1441</b> | <b>0.1061</b> | <u>0.0066</u> | 0.0109        | 0.0090        | 0.0100        | 0.0334        | 0.0334        | 0.0372        |
|    | FZ  | <b>0.1096</b> | <b>0.2420</b> | <b>0.1133</b> | <b>0.1143</b> | 0.0212        | <b>0.2910</b> | <b>0.1694</b> | <b>0.3386</b> | <b>0.0634</b> | <b>0.0213</b> | <b>0.0524</b> | <b>0.0545</b> | <b>0.1734</b> | <b>0.0879</b> | <b>0.0441</b> | <b>0.0541</b> | <u>0.0061</u> | 0.0057        | 0.0099        | 0.0344        | 0.0335        | 0.0372        |
|    | XY  | <b>0.1523</b> | <b>0.2885</b> | <b>0.1537</b> | <b>0.1558</b> | <b>0.0611</b> | <b>0.3397</b> | <b>0.2119</b> | <b>0.3889</b> | <b>0.1035</b> | <b>0.0603</b> | <b>0.0925</b> | <b>0.0940</b> | <b>0.2169</b> | <b>0.1281</b> | <b>0.0754</b> | <b>0.1071</b> | 0.0085        | <u>0.0052</u> | 0.0088        | 0.0328        | 0.0321        | 0.0363        |
|    | YX  | <b>0.1506</b> | <b>0.2845</b> | <b>0.1521</b> | <b>0.1541</b> | <b>0.0604</b> | <b>0.3345</b> | <b>0.2095</b> | <b>0.3825</b> | <b>0.1025</b> | <b>0.0484</b> | <b>0.0784</b> | <b>0.0859</b> | <b>0.2143</b> | <b>0.1268</b> | <b>0.0654</b> | <b>0.1060</b> | <b>0.0485</b> | <b>0.0888</b> | <u>0.0110</u> | 0.0323        | 0.0318        | 0.0360        |
|    | SY  | <b>0.1196</b> | <b>0.2465</b> | <b>0.1227</b> | <b>0.1238</b> | <b>0.0328</b> | <b>0.2928</b> | <b>0.1769</b> | <b>0.3374</b> | <b>0.0742</b> | <b>0.0327</b> | <b>0.0634</b> | <b>0.0654</b> | <b>0.1809</b> | <b>0.0980</b> | <b>0.0613</b> | <b>0.0774</b> | <b>0.0213</b> | <b>0.0603</b> | <b>0.0597</b> | <u>0.0167</u> | 0.0168        | 0.0333        |
|    | HH  | <b>0.1440</b> | <b>0.2757</b> | <b>0.1130</b> | <b>0.1476</b> | <b>0.0502</b> | <b>0.3247</b> | <b>0.2023</b> | <b>0.3665</b> | <b>0.0851</b> | <b>0.0541</b> | <b>0.0692</b> | <b>0.0873</b> | <b>0.1756</b> | <b>0.1142</b> | <b>0.0830</b> | <b>0.1000</b> | <b>0.0429</b> | <b>0.0829</b> | <b>0.0820</b> | 0.0102        | <u>0.0172</u> | 0.0333        |
|    | ZJJ | <b>0.1733</b> | <b>0.3066</b> | <b>0.1702</b> | <b>0.0793</b> | <b>0.0633</b> | <b>0.3035</b> | <b>0.2310</b> | <b>0.4042</b> | <b>0.0917</b> | <b>0.0810</b> | <b>0.0962</b> | <b>0.0855</b> | <b>0.2324</b> | <b>0.1482</b> | <b>0.1098</b> | <b>0.1278</b> | <b>0.0703</b> | <b>0.1110</b> | <b>0.1099</b> | <b>0.0810</b> | <b>0.1038</b> | <u>0.0280</u> |

**Table S8.** Migration estimates (number of migrants per generation) among lineages of *M. anguillicaudatus* calculated in MIGRATE using *cyt b* and CR.

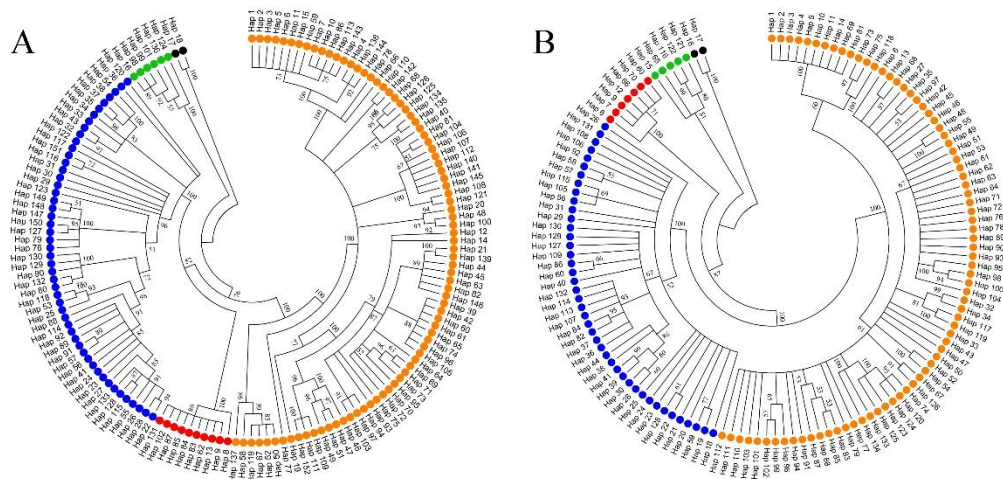
| Ploidy      | From        | To          | Mean   | 95% credibility interval | Nm    |
|-------------|-------------|-------------|--------|--------------------------|-------|
| Diploids    | Lineage II  | Lineage I   | 286.25 | 223.33-350               | 2.062 |
|             | Lineage III | Lineage I   | 267.31 | 203.33-332.67            | 1.926 |
|             | Lineage IV  | Lineage I   | 263.6  | 200.67-326               | 1.899 |
|             | Lineage V   | Lineage I   | 152.56 | 0-35.33                  | 1.099 |
|             | Lineage I   | Lineage II  | 269.45 | 206.67-332               | 3.553 |
|             | Lineage III | Lineage II  | 269.28 | 208-329.33               | 3.550 |
|             | Lineage IV  | Lineage II  | 272.57 | 211.33-335.33            | 3.594 |
|             | Lineage V   | Lineage II  | 270.49 | 202-338.67               | 3.566 |
|             | Lineage I   | Lineage III | 296.65 | 232-362                  | 0.279 |
|             | Lineage II  | Lineage III | 310.49 | 244-377.33               | 0.292 |
|             | Lineage IV  | Lineage III | 298.83 | 234.67-362.67            | 0.281 |
|             | Lineage V   | Lineage III | 280.96 | 212-354.67               | 0.264 |
|             | Lineage I   | Lineage IV  | 299.45 | 228.67-370               | 1.229 |
|             | Lineage II  | Lineage IV  | 304.51 | 238.67-370               | 1.250 |
|             | Lineage III | Lineage IV  | 284.31 | 221.33-348               | 1.167 |
|             | Lineage V   | Lineage IV  | 291.09 | 228.67-354               | 1.195 |
|             | Lineage I   | Lineage V   | 281.97 | 217.33-348               | 0.422 |
|             | Lineage II  | Lineage V   | 296.91 | 230-364.67               | 0.445 |
|             | Lineage III | Lineage V   | 286.82 | 223.33-350.67            | 0.430 |
|             | Lineage IV  | Lineage V   | 295.06 | 228.67-360.67            | 0.442 |
| Tetraploids | Lineage II  | Lineage I   | 273.31 | 211.33-335.33            | 1.781 |
|             | Lineage III | Lineage I   | 271.45 | 210.23-324.33            | 1.768 |
|             | Lineage IV  | Lineage I   | 283.46 | 219.33-348               | 1.847 |
|             | Lineage I   | Lineage II  | 279.3  | 214.67-344               | 1.576 |
|             | Lineage III | Lineage II  | 294.4  | 226.67-362               | 1.661 |
|             | Lineage IV  | Lineage II  | 281.81 | 218-346                  | 1.590 |

|             |             |        |               |       |
|-------------|-------------|--------|---------------|-------|
| Lineage I   | Lineage III | 296.81 | 228.67-364.67 | 0.979 |
| Lineage II  | Lineage III | 300.86 | 233.33-368.67 | 0.993 |
| Lineage IV  | Lineage III | 298.97 | 233.33-365.33 | 0.987 |
| Lineage I   | Lineage IV  | 296.44 | 230.67-362    | 1.934 |
| Lineage II  | Lineage IV  | 295.65 | 230.67-361.33 | 1.928 |
| Lineage III | Lineage IV  | 298.95 | 232.67-366    | 1.950 |

**Table S9.** Migration estimates (number of migrants per generation) among regions of *M. anguillicaudatus* calculated in MIGRATE using *cyt b* and CR.

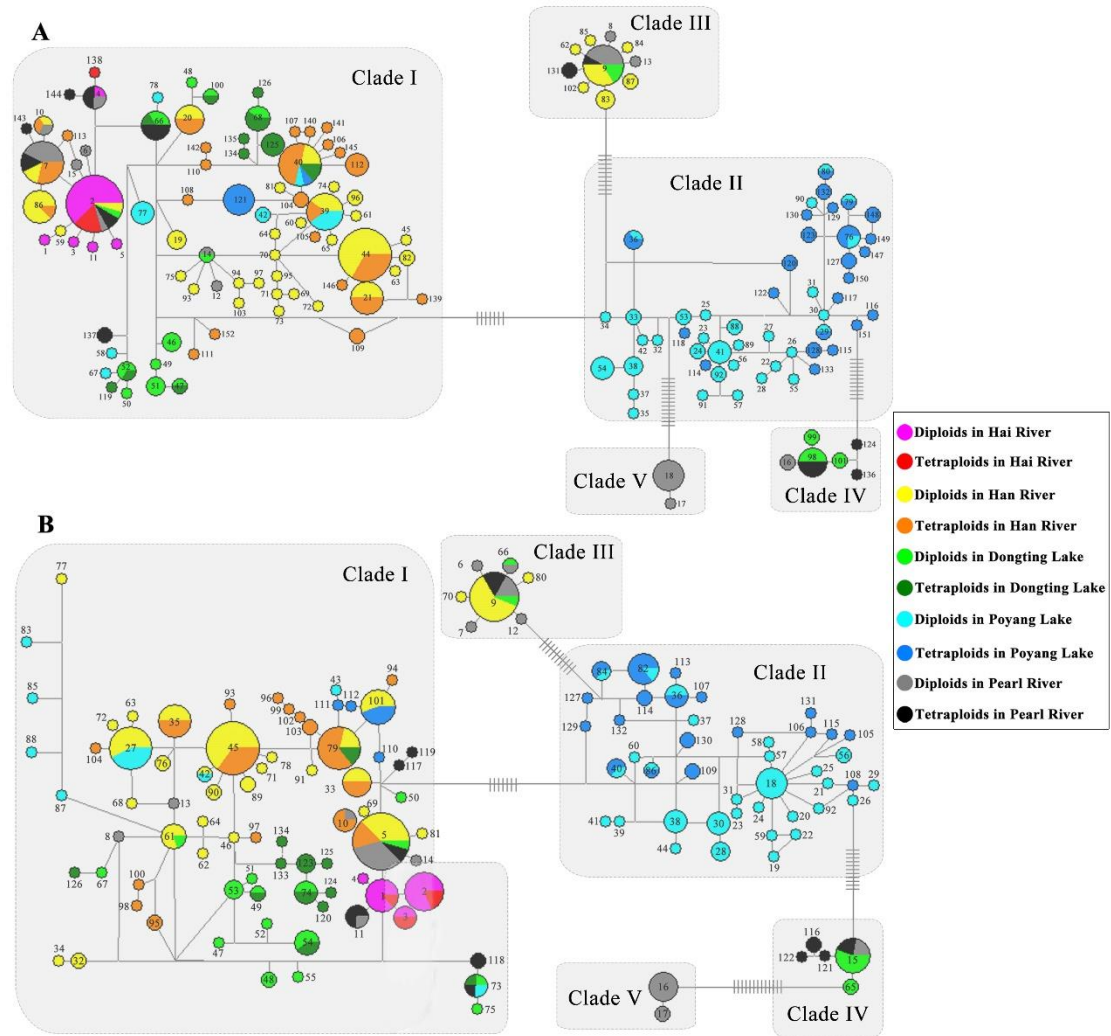
| Ploidy      | From          | To            | Mean   | 95% credibility interval | Nm    |
|-------------|---------------|---------------|--------|--------------------------|-------|
| Diploids    | Han River     | Haihe River   | 316.42 | 250.00-384.00            | 0.092 |
|             | Dongting Lake | Haihe River   | 127.32 | 0.00-28.67               | 0.037 |
|             | Poyang Lake   | Haihe River   | 296.55 | 230.67-362.67            | 0.086 |
|             | Pearl River   | Haihe River   | 298.65 | 233.33-365.33            | 0.087 |
|             | Haihe Rvier   | Han River     | 305.36 | 240.00-371.33            | 1.111 |
|             | Dongting Lake | Han River     | 294.50 | 229.33-359.33            | 1.071 |
|             | Poyang Lake   | Han River     | 274.60 | 213.33-336.67            | 0.999 |
|             | Pearl River   | Han River     | 294.50 | 229.33-360.67            | 1.071 |
|             | Haihe Rvier   | Dongting Lake | 284.69 | 222.00-348.00            | 0.799 |
|             | Han River     | Dongting Lake | 305.17 | 240.00-370.67            | 0.856 |
|             | Poyang Lake   | Dongting Lake | 296.74 | 232.67-361.33            | 0.832 |
|             | Pearl River   | Dongting Lake | 315.71 | 250.67-380.67            | 0.886 |
|             | Haihe Rvier   | Poyang Lake   | 165.92 | 13.33-70.67              | 1.035 |
|             | Han River     | Poyang Lake   | 287.11 | 225.33-350.00            | 1.790 |
|             | Dongting Lake | Poyang Lake   | 273.86 | 212.67-335.33            | 1.708 |
|             | Pearl River   | Poyang Lake   | 263.53 | 205.33-322.67            | 1.643 |
|             | Haihe Rvier   | Pearl River   | 304.53 | 240.67-368.00            | 0.687 |
|             | Han River     | Pearl River   | 279.04 | 216.67-342.00            | 0.629 |
|             | Dongting Lake | Pearl River   | 303.40 | 238.67-369.33            | 0.684 |
|             | Poyang Lake   | Pearl River   | 281.18 | 218.00-346.00            | 0.634 |
| Tetraploids | Han River     | Haihe River   | 299.75 | 232.67-366.67            | 0.694 |
|             | Dongting Lake | Haihe River   | 299.10 | 231.33-366.00            | 0.692 |
|             | Poyang Lake   | Haihe River   | 300.20 | 233.33-367.33            | 0.695 |
|             | Pearl River   | Haihe River   | 298.23 | 232.00-364.67            | 0.690 |
|             | Haihe Rvier   | Han River     | 296.64 | 230.67-362.67            | 0.521 |
|             | Dongting Lake | Han River     | 298.95 | 233.33-365.33            | 0.525 |
|             | Poyang Lake   | Han River     | 279.33 | 220.67-364.67            | 0.490 |
|             | Pearl River   | Han River     | 296.57 | 230.00-363.33            | 0.520 |

|               |               |        |               |       |
|---------------|---------------|--------|---------------|-------|
| Haihe Rvier   | Dongting Lake | 298.43 | 232.00-366.00 | 0.654 |
| Han River     | Dongting Lake | 303.25 | 236.00-371.33 | 0.664 |
| Poyang Lake   | Dongting Lake | 297.35 | 230.67-365.33 | 0.651 |
| Pearl River   | Dongting Lake | 301.41 | 235.33-367.33 | 0.660 |
| Haihe Rvier   | Poyang Lake   | 134.31 | 0.00-42.67    | 0.609 |
| Han River     | Poyang Lake   | 159.13 | 0.00-46.00    | 0.721 |
| Dongting Lake | Poyang Lake   | 283.55 | 220.67-348.00 | 1.285 |
| Pearl River   | Poyang Lake   | 283.45 | 219.33-348.00 | 1.285 |
| Haihe Rvier   | Pearl River   | 307.26 | 240.00-376.67 | 0.604 |
| Han River     | Pearl River   | 303.70 | 236.67-371.33 | 0.597 |
| Dongting Lake | Pearl River   | 299.18 | 232.00-366.00 | 0.588 |
| Poyang Lake   | Pearl River   | 301.16 | 235.33-367.33 | 0.592 |

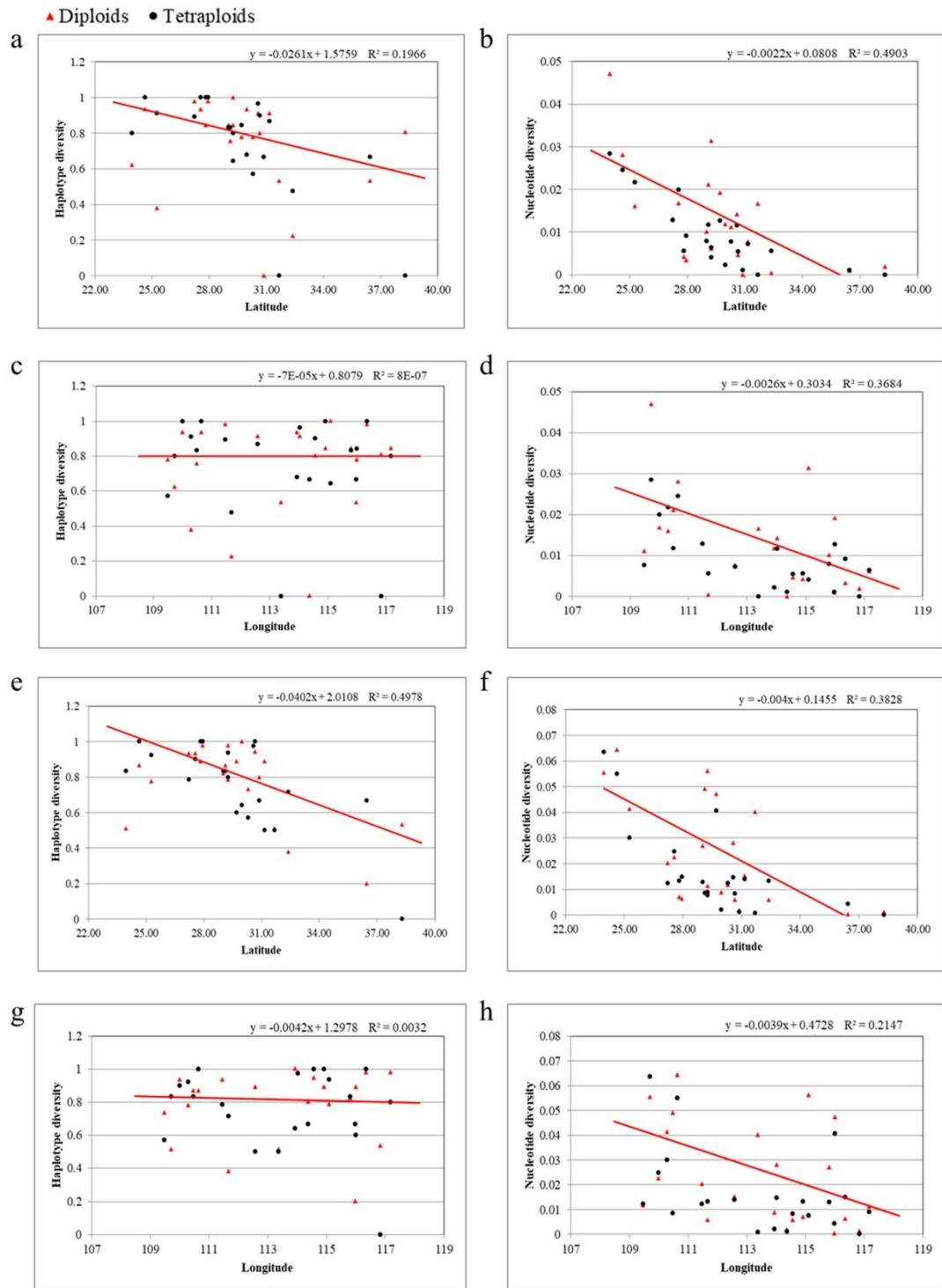


**Fig. S1** Bayesian phylogenetic tree for 22 mixed-ploidy *M. anguillicaudatus* populations based on *cyt b* (A) and CR (B) datasets. Numbers above the branches correspond to the bootstrap support values (only values > 50% are shown). Clades are highlighted with different colours: yellow - lineage I, blue - lineage II, red - lineage III, green - lineage IV and black - lineage V.

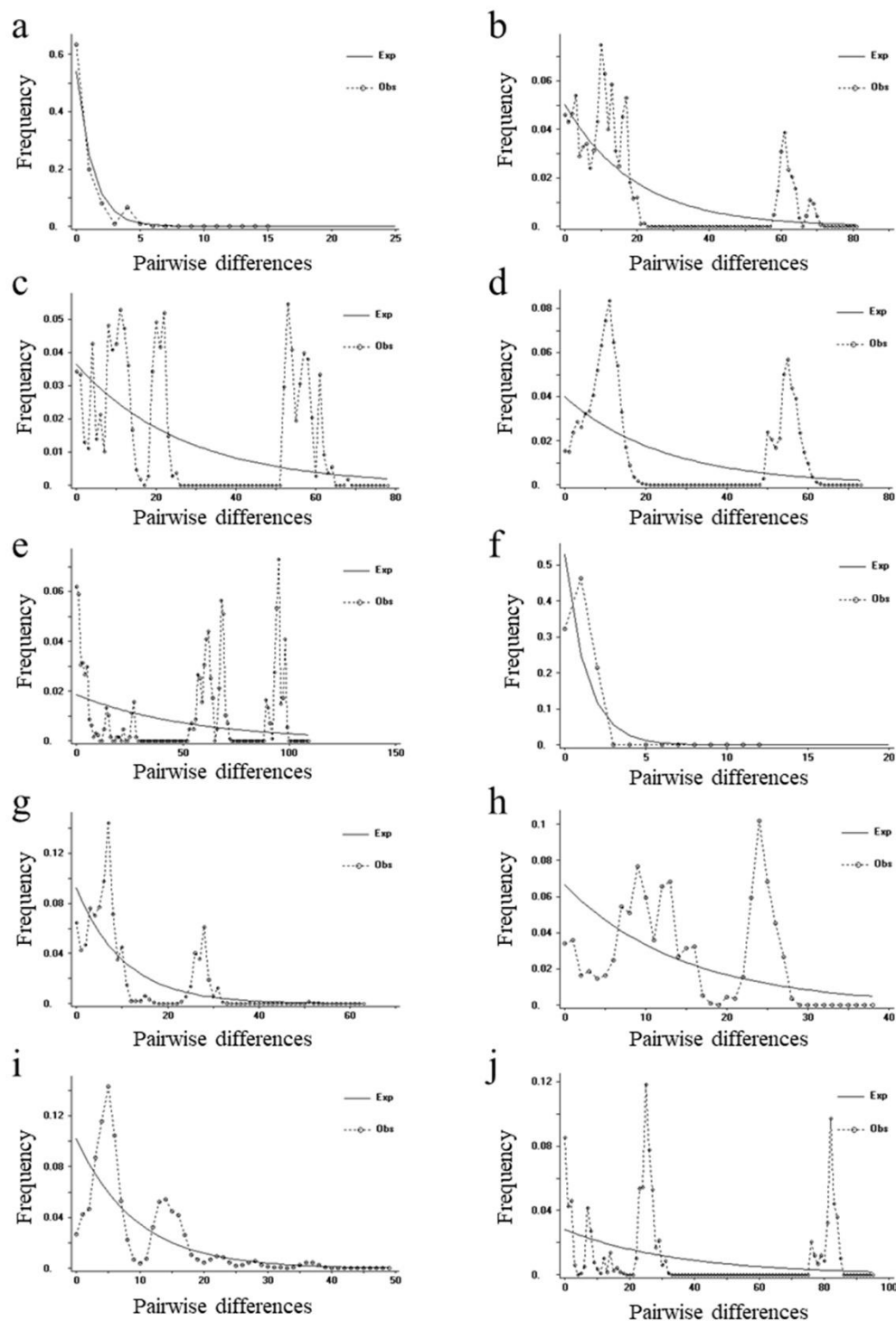




**Fig. S2** Median-joining network of *cyt b* (a) and CR (b) haplotypes from 22 populations of *Misgurnus anguillicaudatus*. The circle size of a haplotype denotes the number of specimens. Colors correspond to different ploidy levels and regions.



**Fig. S3** Haplotype (**a, c, e, g**) and nucleotide diversity (**b, d, f, h**) of *M. anguillicaudatus* plotted against latitude and longitude for diploid populations (red) and tetraploid populations (black) based on CR (**a, b, c, d**) and cyt *b* (**e, f, g, h**). The regression lines with equations and explained variances ( $R^2$ ) are based on all population types.



**Fig. S4** Observed and expected mismatch distributions for *M. anguillicaudatus* in the (a) Haihe River, (b) Han River, (c) Dongting Lake, (d) Poyang Lake and (e) Pearl River for the cyt b dataset, and in the (f) Haihe River, (g) Han River, (h) Dongting Lake, (i) Poyang Lake and (j) Pearl River for the CR dataset. Dashed line, observed distribution; solid line, theoretical expected distribution under a population expansion model.