**Table S1.** Pairwise comparisons between $F_{ST}$ values of *nad4* gene fragment from 18 *Bactrocera minax* populations.

| Population | SY | ZG | YC | JZ | XX | TY | LL | FC | LZ | QL | GY | WL | ZX | WZ | YY | WS | HZ | JY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SY | — | | | | | | | | | | | | | | | | | |
| ZG | 0.192** | — | | | | | | | | | | | | | | | | |
| YC | 0.592** | 0.463** | — | | | | | | | | | | | | | | | |
| JZ | 0.204** | 0.169** | 0.629** | — | | | | | | | | | | | | | | |
| XX | 0.384** | 0.206** | 0.637** | 0.441** | — | | | | | | | | | | | | | |
| TY | 0.056* | 0.109** | 0.549** | 0.033 | 0.238** | — | | | | | | | | | | | | |
| LL | 0.004 | 0.107** | 0.517** | 0.050* | 0.203** | -0.004 | — | | | | | | | | | | | |
| FC | 0.502** | 0.381** | 0.657** | 0.541** | 0.254* | 0.425** | 0.362** | — | | | | | | | | | | |
| LZ | 0.458** | 0.357** | 0.630** | 0.481** | 0.226** | 0.388** | 0.334** | -0.018 | — | | | | | | | | | |
| QL | 0.293** | 0.267** | 0.545** | 0.335** | 0.232** | 0.253** | 0.228** | 0.247** | 0.238** | — | | | | | | | | |
| GY | 0.386** | 0.367** | 0.619** | 0.478** | 0.331** | 0.374** | 0.331** | 0.317** | 0.300** | 0.035* | — | | | | | | | |
| WL | 0.388** | 0.330** | 0.566** | 0.414** | 0.247** | 0.350** | 0.309** | 0.142** | 0.141** | 0.117** | 0.135** | — | | | | | | |
| ZX | 0.502** | 0.253** | 0.712** | 0.643** | 0.150* | 0.315** | 0.277** | 0.547** | 0.463** | 0.368** | 0.474** | 0.409** | — | | | | | |
| WZ | 0.720** | 0.649** | 0.744** | 0.761** | 0.681** | 0.693** | 0.639** | 0.550** | 0.530** | 0.570** | 0.617** | 0.480** | 0.796** | — | | | | |
| YY | 0.659** | 0.586** | 0.717** | 0.716** | 0.602** | 0.634** | 0.567** | 0.399** | 0.391** | 0.470** | 0.524** | 0.358** | 0.752** | 0.198** | — | | | |
| WS | 0.495** | 0.411** | 0.647** | 0.517** | 0.323** | 0.438** | 0.378** | 0.064* | 0.060 | 0.272** | 0.343** | 0.161** | 0.534** | 0.455** | 0.252** | — | | |
| HZ | 0.228** | 0.165** | 0.630** | 0.045 | 0.313** | 0.062* | 0.075* | 0.443** | 0.393** | 0.249** | 0.387** | 0.332** | 0.528** | 0.735** | 0.679** | 0.443** | — | |
| JY | 0.418** | 0.335** | 0.542** | 0.420** | 0.249** | 0.367** | 0.330** | 0.165** | 0.177** | 0.272** | 0.326** | 0.214** | 0.398** | 0.468** | 0.363** | 0.208** | 0.367** | — |

Population abbreviations are defined in Table 1. $^{*}$ $P < 0.05$, $^{**}$ $P < 0.01$

**Table S2.** Estimates of gene flow between 18 *Bactrocera minax* populations.

| Population | $\theta$ | M | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SY→*i* | ZG→*i* | YC→*i* | JZ→*i* | XX→*i* | TY→*i* | LL→*i* | FC→*i* | LZ→*i* | QL→*i* | GY→*i* | WL→*i* | ZX→*i* | WZ→*i* | YY→*i* | WS→*i* | HZ→*i* | JY→*i* |
| SY | 0.003 | — | 451.7 (110.0–563.3) | 401.0 (36.0–750.7) | 583.7 (234.0–1000.0) | 210.3 (0.0–610.7) | 322.3 (0.0–844.7) | 510.3 (109.3–1000.0) | 430.3 (80.0–836.7) | 281.7 (0.0–754.0) | 499.7 (120.7–944.0) | 427.7 (38.0–808.7) | 250.3 (0.0–597.3) | 282.3 (0.0–518.0) | 391.7 (0.0–825.3) | 333.7 (0.0–756.7) | 381.7 (15.3–784.7) | 621.0 (301.3–988.0) | 499.0 (0.0–470.1) |
| ZG | 0.040 | 319.7 (30.0–487.3) | — | 131.0 (0.0–379.3) | 219.0 (0.0–429.3) | 268.3 (0.0–561.3) | 533.7 (290.0–982.7) | 99.0 (0.0–292.0) | 180.3 (20.7–580.7) | 180.3 (0.0–488.7) | 300.3 (0.0–704.7) | 317.0 (2.7–743.3) | 217.0 (0.0–722.7) | 185.0 (0.0–538.7) | 47.0 (0.0–182.0) | 117.7 (0.0–378.0) | 172.3 (0.0–548.7) | 295.7 (0.0–663.3) | 153.7 (0.0–518.0) |
| YC | 0.002 | 593.7 (224.7–990.7) | 143.0 (0.0–442.7) | — | 188.3 (0.0–691.3) | 141.7 (0.0–587.3) | 257.7 (0.0–668.0) | 299.0 (0.0–690.0) | 351.0 (0.0–542.0) | 335.7 (0.0–769.3) | 411.7 (25.3–643.3) | 307.7 (2.7–571.3) | 167.0 (0.0–420.0) | 317.7 (0.0–643.3) | 301.7 (3.3–718.0) | 389.0 (0.0–530.7) | 141.0 (0.0–451.3) | 469.7 (114.7–864.7) | 415.7 (0.0–429.4) |
| JZ | 0.001 | 501.3 (0.0–543.0) | 610.3 (316.0–1000.0) | 476.3 (130.0–781.3) | — | 715.7 (340.0–995.3) | 357.7 (0.0–761.3) | 838.3 (562.0–1000.0) | 622.3 (496.7–1000.0) | 605.7 (398.0–1000.0) | 621.7 (224.7–1000.0) | 451.0 (0.0–462.7) | 733.7 (320.7–1000.0) | 627.0 (444.0–993.3) | 293.0 (0.0–712.7) | 477.1 (0.0–529.0) | 470.3 (0.0–838.7) | 641.0 (220.7–1000.0) | 481.2 (0.0–492.3) |
| XX | 0.001 | 475.0 (0.0–531.3) | 631.0 (351.3–996.7) | 559.7 (202.0–1000.0) | 715.0 (528.7–1000.0) | — | 578.3 (185.3–990.7) | 519.0 (92.7–852.0) | 665.7 (472.0–995.3) | 667.7 (296.0–1000.0) | 566.3 (129.3–1000.0) | 325.0 (0.0–600.0) | 665.7 (304.0–1000.0) | 719.7 (390.0–1000.0) | 537.6 (516.3–993.3) | 496.3 (122.0–916.0) | 534.3 (526.6–978.7) | 476.2 (445.0–1000.0) | 387.7 (0.0–752.0) |
| TY | 0.027 | 804.3 (488.7–1000.0) | 435.0 (134.7–757.3) | 557.0 (154.0–989.3) | 554.3 (184.7–999.3) | 650.3 (288.0–984.0) | — | 441.7 (68.7–697.3) | 108.3 (0.0–462.7) | 171.7 (0.0–451.3) | 141.7 (0.0–457.3) | 345.0 (0.0–589.3) | 211.7 (0.0–549.3) | 246.3 (0.0–553.3) | 280.3 (0.0–6–7.3) | 510.2 (0.0–521.0) | 494.3 (32.7–888.7) | 203.0 (0.0–443.3) | 182.3 (0.0–495.3) |
| LL | 0.021 | 395.7 (0.0–784.7) | 331.7 (0.0–706.7) | 225.7 (0.0–634.7) | 341.7 (0.0–721.3) | 111.0 (0.0–349.2) | 508.3 (367.3–1000.0) | — | 172.3 (0.0–762.0) | 492.3 (88.7–718.7) | 367.7 (4.0–790.0) | 603.7 (502.0–998.0) | 547.0 (103.0–992.0) | 452.3 (0.0–888.0) | 542.3 (130.0–900.7) | 473.7 (246.7–745.3) | 322.3 (0.0–763.3) | 697.7 (396.7–990.7) | 767.7 (399.3–1000.0) |
| FC | 0.001 | 653.7 (337.3–1000.0) | 625.0 (261.3–994.0) | 621.0 (120.7–978.0) | 543.5 (536.3–1000.0) | 679.7 (292.0–996.0) | 603.0 (241.0–1000.0) | 510.3 (90.7–679.3) | — | 603.7 (230.0–984.0) | 707.7 (494.7–1000.0) | 489.6 (459.0–989.3) | 579.0 (535.3–1000.0) | 701.0 (300.7–1000.0) | 739.7 (285.3–1000.0) | 377.0 (0.0–590.0) | 472.3 (0.0–844.7) | 450.5 (414.3–1000.0) | 652.3 (280.0–1000.0) |
| LZ | 0.001 | 582.3 (392.7–978.0) | 398.3 (0.0–418.9) | 459.0 (0.0–491.0) | 671.0 (380.0–1000.0) | 558.3 (502.0–983.3) | 723.0 (430.0–1000.0) | 655.0 (384.7–1000.0) | 581.7 (203.3–994.0) | — | 473.0 (140.0–810.7) | 375.0 (0.0–780.7) | 659.0 (323.0–1000.0) | 389.7 (0.0–552.7) | 542.3 (480.0–1000.0) | 659.7 (510.0–1000.0) | 487.2 (0.0–495.0) | 540.3 (514.1–1000.0) | 394.3 (0.0–399.3) |
| QL | 0.006 | 676.3 (490.7–998.7) | 627.7 (532.7–994.0) | 583.7 (152.7–1000.0) | 337.7 (0.0–787.3) | 639.0 (448.7–1000.0) | 687.0 (325.3–1000.0) | 622.3 (292.0–976.0) | 199.0 (0.0–612.0) | 491.7 (108.7–907.3) | — | 481.7 (0.0–493.0) | 115.0 (0.0–484.0) | 136.3 (0.0–426.7) | 113.0 (0.0–386.0) | 248.3 (0.0–691.3) | 271.0 (0.0–744.0) | 140.3 (0.0–655.3) | 253.7 (0.0–690.7) |

| Population | $\theta$ | M | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SY→*i* | ZG→*i* | YC→*i* | JZ→*i* | XX→*i* | TY→*i* | LL→*i* | FC→*i* | LZ→*i* | QL→*i* | GY→*i* | WL→*i* | ZX→*i* | WZ→*i* | YY→*i* | WS→*i* | HZ→*i* | JY→*i* |
| GY | 0.0026 | 277.0 (0.0–694.7) | 364.3 (0.0–708.0) | 240.3 (0.0–484.0) | 683.0 (391.3–1000.0) | 272.3 (0.0–762.0) | 283.7 (0.0–361.3) | 481.0 (0.0–844.0) | 354.3 (0.0–803.3) | 235.7 (0.0–630.0) | 237.7 (0.0–598.7) | — | 469.7 (40.7–827.3) | 685.0 (300.0–988.7) | 337.0 (22.7–603.3) | 453.0 (0.0–845.3) | 490.3 (122.0–811.3) | 265.0 (0.0–522.7) | 600.3 (497.3–989.3) |
| WL | 0.003 | 555.7 (527.8–1000.0) | 631.7 (229.3–1000.0) | 259.0 (0.0–666.0) | 578.3 (188.7–1000.0) | 256.3 (0.0–774.0) | 568.5 (0.0–602.3) | 498.8 (0.0–581.0) | 479.0 (95.3–591.3) | 632.3 (492.0–1000.0) | 593.7 (287.3–1000.0) | 759.7 (462.7–1000.0) | — | 189.7 (0.0–545.3) | 323.7 (0.0–528.7) | 428.3 (0.0–429.9) | 215.7 (0.0–704.7) | 170.3 (0.0–464.7) | 218.3 (0.0–629.3) |
| ZX | 0.001 | 229.7 (0.0–556.0) | 346.3 (0.0–550.0) | 331.0 (16.7–655.3) | 188.3 (0.0–505.3) | 175.7 (0.0–504.7) | 457.0 (110.7–817.3) | 255.7 (0.0–689.3) | 281.7 (0.0–700.0) | 231.7 (0.0–671.3) | 139.7 (0.0–430.7) | 349.0 (0.0–783.3) | 130.3 (0.0–436.7) | — | 378.3 (4.7–751.3) | 337.7 (0.0–759.3) | 377.0 (11.3–824.7) | 200.3 (0.0–627.3) | 157.0 (0.0–460.0) |
| WZ | 0.002 | 143.7 (0.0–396.7) | 302.3 (0.0–599.3) | 223.7 (0.0–586.0) | 228.3 (0.0–794.7) | 258.3 (0.0–674.0) | 182.3 (0.0–657.3) | 131.0 (0.0–414.7) | 307.7 (0.0–660.7) | 133.7 (0.0–375.3) | 278.3 (0.0–668.0) | 244.3 (0.0–601.3) | 324.3 (0.0–691.3) | 275.0 (0.0–543.3) | — | 429.7 (0.0–603.3) | 598.3 (328.7–990.0) | 377.0 (0.0–432.0) | 412.3 (18.0–500.0) |
| YY | 0.002 | 254.3 (0.0–627.3) | 722.3 (322.0–1000.0) | 214.3 (0.0–548.0) | 299.7 (0.0–681.3) | 589.0 (213.3–1000.0) | 566.3 (386.7–1000.0) | 722.3 (321.3–1000.0) | 588.3 (183.3–975.3) | 513.0 (504.5–1000.0) | 604.8 (0.0–684.3) | 531.7 (517.0–988.7) | 481.0 (132.7–714.0) | 726.3 (402.7–998.7) | 662.3 (276.0–1000.0) | — | 297.7 (0.0–595.3) | 517.0 (0.0–572.3) | 353.0 (0.0–723.3) |
| WS | 0.002 | 720.3 (408.0–1000.0) | 757.7 (531.3–1000.0) | 445.0 (0.0–463.7) | 606.3 (426.0–1000.0) | 662.3 (218.7–1000.0) | 333.7 (0.0–418.7) | 603.0 (203.3–972.7) | 418.3 (0.0–479.3) | 718.3 (389.3–1000.0) | 623.7 (334.7–1000.0) | 664.3 (295.3–1000.0) | 358.3 (0.0–689.3) | 662.3 (206.7–985.3) | 727.7 (280.7–1000.0) | 482.4 (0.0–498.3) | — | 357.0 (0.0–780.0) | 495.7 (115.3–967.3) |
| HZ | 0.001 | 570.3 (555.5–996.7) | 528.3 (139.3–965.3) | 463.6 (0.0–488.3) | 517.7 (154.7–1000.0) | 762.3 (465.3–1000.0) | 547.4 (0.0–564.3) | 507.9 (0.0–554.3) | 635.7 (350.7–991.3) | 274.3 (0.0–614.7) | 459.0 (0.0–472.3) | 353.0 (0.0–490.0) | 745.0 (460.7–1000.0) | 566.3 (203.3–1000.0) | 478.3 (126.7–622.7) | 471.7 (14.7–662.7) | 595.0 (203.0–1000.0) | — | 369.7 (0.0–708.7) |
| JY | 0.002 | 575.7 (323.3–972.0) | 572.3 (155.3–974.7) | 219.0 (0.0–680.0) | 445.0 (41.3–898.7) | 566.0 (0.0–611.7) | 772.3 (362.0–1000.0) | 277.7 (13.3–559.3) | 741.0 (517.3–1000.0) | 411.0 (0.0–1000.0) | 517.0 (475.9–1000.0) | 590.3 (316.0–1000.0) | 262.3 (0.0–721.3) | 652.3 (170.0–995.3) | 501.7 (74.0–890.0) | 441.2 (0.0–454.3) | 639.7 (236.7–10000.0) | 569.7 (300.7–996.7) | — |

Population abbreviations are defined in Table 1. $\theta$, mutation-scaled effective population size. M, mutation-scaled effective immigration rate. 95% highest probability density intervals are shown in parentheses.