

Ecography

ECOG-05334

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Supplementary material

1 **Supplementary material**

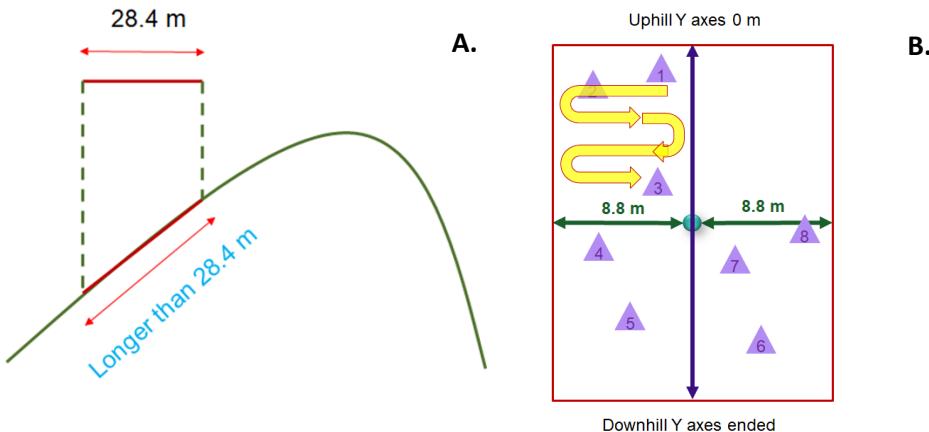


Fig.A1: Representation of double sampling method and plot layout. **A.** Plot Y axes are adjusted according to the slope to ensure a standard plot size in remote sensing imagery. **B.** Plot X axes run horizontally, divided into two sides of 8.8m and Plot Y axes run downslope. Sampling runs from the top left of the plot to the bottom right.

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12 *Table A1: Variable collected in the NFI and their description.*

| Variable | Description |
|---------------------------------|---|
| Office | The district office where the staff who conducted the survey were based (Hsinchu, Pingtung, Chiayi, Hualien, Luodong, Taitung, Nantou or Dongshih). |
| Plot number | Unique number for each inventory plot. |
| Tree number | Unique identification number of each tree within the plot. |
| Record type | A value of 1 or 2 to identify which side of the plot the tree was recorded from. |
| Y axis | Distance (m) along the Y axis of the plot the record was observed. |
| X axis | Distance (m) along the X axis of the plot the record was observed. |
| Chinese name | Chinese name of tree. |
| English name | English name of tree. |
| Scientific name | Scientific name of tree recorded to species or variety level. |
| Diameter at breast height (dbh) | Diameter of tree (cm) at breast height (1.3m high). |
| Height | Height of tree (m). Estimated visually by highly trained surveyors. |

| | |
|------------------|---|
| Branch height | Height (m) of lowest branches of tree. |
| Tree crown level | Size of tree crown (m). Most estimated, but some measured with measuring tape. |
| P.S. | Numbers are a code for a modified method of calculating tree height when dbh and height values seem odd. They are used for trees with multiple stems and are also used to help calculate volume. Some observations have the letter A or B next to them to indicate which side of the plot the observation was recorded. Most values given in Chinese. |
| Volume | Some species specific equations (dominant species), others general equations. Uses dbh and tree height. |
| Tree X | X coordinate of tree |
| Tree Y | Y coordinate of tree |
| Plot X | Longitudinal plot centre coordinate. |
| Plot Y | Latitudinal plot centre coordinate. |
| Slope | Plot slope angle (degrees) |
| Aspect | Plot aspect (degrees) |
| Elevation | Plot elevation (meters a.s.l.). Recorded using GPS. |
| Terrain | Categorisation of terrain class (1=flat, low altitude plain. 2=platform, high elevation, plateau. 3=beach. 4=hill. 5=mountain. 6=valley. 7=ridge). |
| Survey date | Date plot was surveyed in the format yyyyymmdd. |

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15 *Table A2: Results from generalized linear models (glm) run for each species and each life stage using two models. Model 1 is*
 16 *a standard glm and Model 2 is a glm with a quadratic term. Selected models are indicated, *higher pseudo R2 value*
 17 ***lower AIC value. Highlighted results indicate species which did not favour the curved distribution and were therefore not*
 18 *included in further analysis.*

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| Species | Life stage | Model | Pseudo R2 | AIC |
|------------------------------------|------------|-------|-----------|---------|
| <i>Acer albopurpurascens</i> | Adult | 1 | 0.03 | 580.4 |
| | | 2 | 0.08* | 550.4** |
| | Juvenile | 1 | 0.03 | 417.8 |
| | | 2 | 0.05* | 412** |
| <i>Castanopsis cuspidata</i> | Adult | 1 | 0.00 | 838 |
| | | 2 | 0.04* | 807.8** |
| | Juvenile | 1 | 0.01 | 680.4 |
| | | 2 | 0.03* | 668.6** |
| <i>Ardisia sieboldii</i> | Adult | 1 | 0.22 | 705.7 |
| | | 2 | 0.23* | 695.1** |
| | Juvenile | 1 | 0.23 | 607.5 |
| | | 2 | 0.25* | 595.5** |
| <i>Beilschmiedia erythrophloia</i> | Adult | 1 | 0.02 | 920.1 |
| | | 2 | 0.14* | 810** |

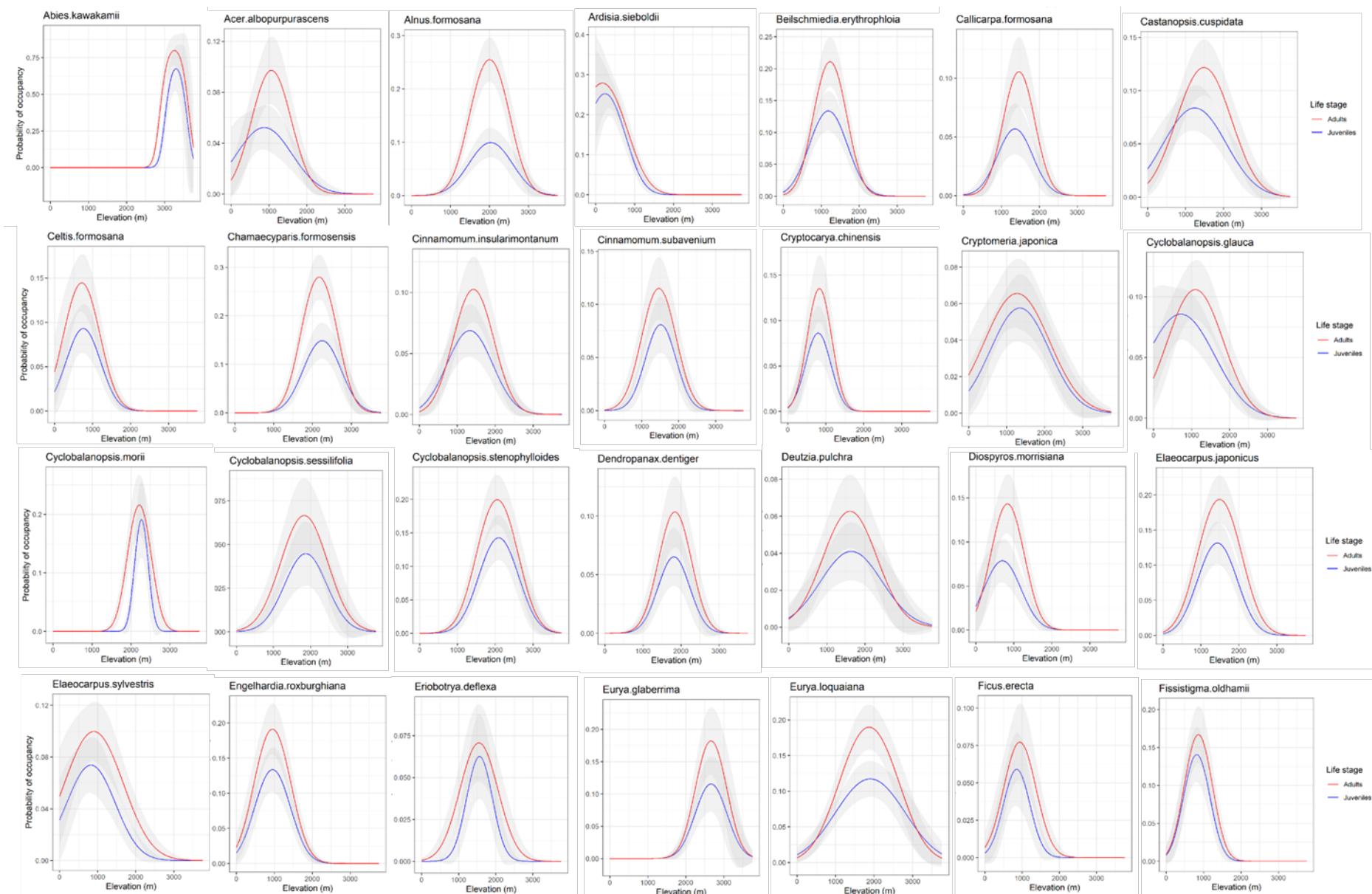
| | | | | |
|-------------------------------------|-----------------|---|-------------|----------------|
| | Juvenile | 1 | 0.02 | 726.7 |
| | | 2 | 0.09* | 673.6** |
| <i>Celtis formosana</i> | Adult | 1 | 0.11 | 632.3 |
| | | 2 | 0.15* | 603.8** |
| | Juvenile | 1 | 0.09 | 461.8 |
| | | 2 | 0.13* | 441.7** |
| <i>Callicarpa formosana</i> | Adult | 1 | 0.00 | 543.3 |
| | | 2 | 0.12* | 482.2** |
| | Juvenile | 1 | 0.00 | 367.1 |
| | | 2 | 0.08* | 340.9** |
| <i>Alnus formosana</i> | Adult | 1 | 0.05 | 974.5 |
| | | 2 | 0.17* | 852.9** |
| | Juvenile | 1 | 0.03 | 536.9 |
| | | 2 | 0.10* | 500.9** |
| <i>Chamaecyparis formosensis</i> | Adult | 1 | 0.09 | 884.7 |
| | | 2 | 0.22* | 760.3** |
| | Juvenile | 1 | 0.08 | 571.5 |
| | | 2 | 0.17* | 518.3** |
| <i>Abies kawakamii</i> | Adult | 1 | 0.65 | 185.4 |
| | | 2 | 0.71* | 157.2** |
| | Juvenile | 1 | 0.61 | 135.8 |
| | | 2 | 0.68* | 113.1** |
| <i>Cyclobalanopsis sessilifolia</i> | Adult | 1 | 0.01 | 467.9 |
| | | 2 | 0.06* | 447.3** |
| | Juvenile | 1 | 0.01 | 319.1 |
| | | 2 | 0.07* | 303.7** |
| <i>Cyclobalanopsis longinu</i> x | Adult | 1 | 0.00 | 1156 |
| | | 2 | -0.13 | 1024** |
| | Juvenile | 1 | 0.00 | 910.7 |
| | | 2 | 0.09* | 832.2** |
| <i>Cleyera japonica</i> | Adult | 1 | 0.01 | 730.3 |
| | | 2 | 0.03* | 721.8** |
| | Juvenile | 1 | 0.01 | 539.3 |
| | | 2 | 0.01 | 537.4** |
| <i>Cinnamomum subavenium</i> | Adult | 1 | 0.00 | 622 |
| | | 2 | 0.10* | 561.9** |
| | Juvenile | 1 | 0.00 | 438.8 |
| | | 2 | 0.11* | 392.1** |
| <i>Cryptomeria japonica</i> | Adult | 1 | 0.00 | 577.5 |
| | | 2 | 0.02* | 569.4** |
| | Juvenile | 1 | 0.00 | 503.7 |
| | | 2 | 0.03* | 494.2** |
| <i>Cyclobalanopsis glauca</i> | Adult | 1 | 0.02 | 746.7 |
| | | 2 | 0.05* | 728** |
| | Juvenile | 1 | 0.04 | 626.1 |
| | | 2 | 0.05* | 620.6** |
| <i>Cryptocarya chinensis</i> | Adult | 1 | 0.09 | 507.1 |
| | | 2 | 0.18* | 456.6** |
| | Juvenile | 1 | 0.09 | 370 |
| | | 2 | 0.16* | 342.3** |
| <i>Cinnamomum insularimontanum</i> | Adult | 1 | 0.00 | 627.3 |
| | | 2 | 0.07* | 584.1** |
| | Juvenile | 1 | 0.00 | 503 |
| | | 2 | 0.05* | 482** |
| <i>Cyclobalanopsis morii</i> | Adult | 1 | 0.10 | 546.4 |
| | | 2 | 0.28* | 439.6** |
| | Juvenile | 1 | 0.10 | 331 |
| | | 2 | 0.36* | 240.5** |
| <i>Daphniphyllum glaucescens</i> | Adult | 1 | 0.01 | 570.7 |
| | | 2 | 0.02* | 566.1** |
| | Juvenile | 1 | 0.02 | 360 |
| | | 2 | 0.03* | 359.9** |
| <i>Elaeocarpus japonicus</i> | Adult | 1 | 0.00 | 1020 |
| | | 2 | 0.08* | 937.4** |
| | Juvenile | 1 | 0.00 | 739.2 |

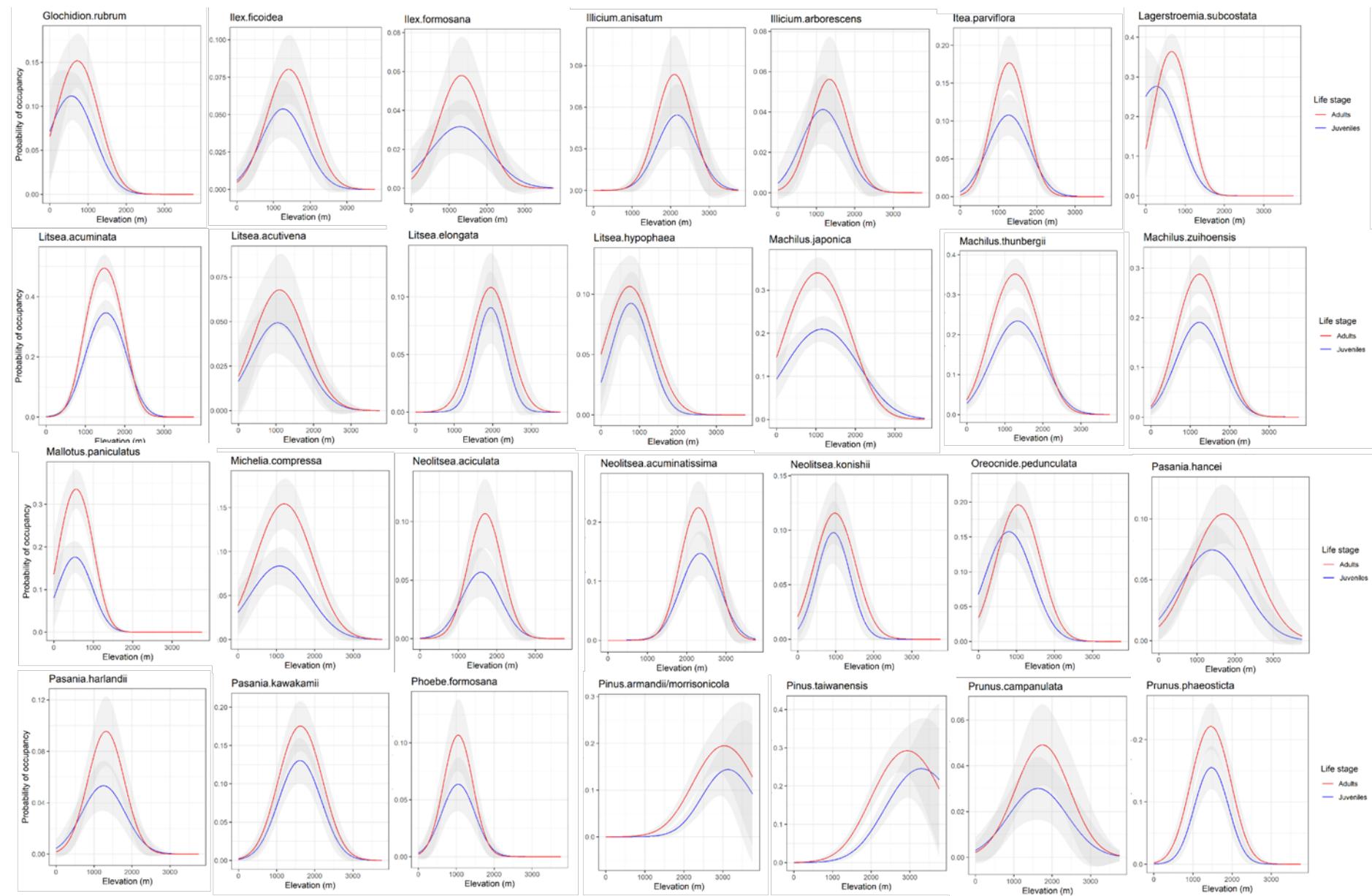
| | | | | |
|--|----------|---|-------|---------|
| | | 2 | 0.08* | 679.4** |
| <i>Dendropanax dentiger</i> | Adult | 1 | 0.02 | 502.6 |
| | | 2 | 0.13* | 446.9** |
| | Juvenile | 1 | 0.01 | 348.6 |
| | | 2 | 0.12* | 313.8** |
| <i>Elaeocarpus sylvestris</i> | Adult | 1 | 0.03 | 693.4 |
| | | 2 | 0.06* | 681** |
| | Juvenile | 1 | 0.05 | 492.3 |
| | | 2 | 0.08* | 481.5** |
| <i>Cyclobalanopsis stenophylloides</i> | Adult | 1 | 0.05 | 848.5 |
| | | 2 | 0.14* | 766.9** |
| | Juvenile | 1 | 0.05 | 646 |
| | | 2 | 0.14* | 590** |
| <i>Deutzia pulchra</i> | Adult | 1 | 0.00 | 505 |
| | | 2 | 0.03* | 490.2** |
| | Juvenile | 1 | 0.00 | 389.6 |
| | | 2 | 0.02* | 383.7** |
| <i>Diospyros eriantha</i> | Adult | 1 | 0.21 | 337.1** |
| | | 2 | 0.21 | 338.9 |
| | Juvenile | 1 | 0.26 | 274.4 |
| | | 2 | 0.30* | 262.6** |
| <i>Diospyros morrisiana</i> | Adult | 1 | 0.08 | 638.5 |
| | | 2 | 0.14* | 599** |
| | Juvenile | 1 | 0.09 | 412.3 |
| | | 2 | 0.12* | 399** |
| <i>Engelhardia roxburghiana</i> | Adult | 1 | 0.06 | 858.7 |
| | | 2 | 0.13* | 797.8** |
| | Juvenile | 1 | 0.05 | 664 |
| | | 2 | 0.12* | 622.1** |
| <i>Ficus fistulosa</i> | Adult | 1 | 0.07 | 840.7** |
| | | 2 | 0.07 | 842.6 |
| | Juvenile | 1 | 0.10 | 692.1** |
| | | 2 | 0.10 | 694 |
| <i>Ficus erecta</i> | Adult | 1 | 0.05 | 423.7 |
| | | 2 | 0.11* | 399.5** |
| | Juvenile | 1 | 0.07 | 295.2 |
| | | 2 | 0.13* | 276.2** |
| <i>Glochidion rubrum</i> | Adult | 1 | 0.09 | 723.3 |
| | | 2 | 0.13* | 698.5** |
| | Juvenile | 1 | 0.10 | 553.2 |
| | | 2 | 0.12* | 541.8** |
| <i>Ficus septica</i> | Adult | 1 | 0.28 | 290.8 |
| | | 2 | 0.30* | 287.9** |
| | Juvenile | 1 | 0.26 | 239.2** |
| | | 2 | 0.27* | 240.3 |
| <i>Eurya loquaiana</i> | Adult | 1 | 0.01 | 1082 |
| | | 2 | 0.06* | 1035** |
| | Juvenile | 1 | 0.01 | 840.9 |
| | | 2 | 0.03* | 824.2** |
| <i>Fissistigma oldhamii</i> | Adult | 1 | 0.09 | 652.3 |
| | | 2 | 0.17* | 593.9** |
| | Juvenile | 1 | 0.09 | 548.8 |
| | | 2 | 0.17* | 501.8** |
| <i>Ilex ficoidea</i> | Adult | 1 | 0.00 | 567.3 |
| | | 2 | 0.05* | 541.3** |
| | Juvenile | 1 | 0.01 | 421.9 |
| | | 2 | 0.05* | 407.6** |
| <i>Eriobotrya deflexa</i> | Adult | 1 | 0.00 | 459.1 |
| | | 2 | 0.07* | 427.8** |
| | Juvenile | 1 | 0.00 | 315.3 |
| | | 2 | 0.14* | 275.1** |
| <i>Eurya glaberrima</i> | Adult | 1 | 0.20 | 396.4 |
| | | 2 | 0.28* | 359.5** |
| | Juvenile | 1 | 0.17 | 293.8 |
| | | 2 | 0.24* | 271.9** |

| | | | | |
|---------------------------------|----------|---|-------|---------|
| <i>Litsea acuminata</i> | Adult | 1 | 0.00 | 1636 |
| | | 2 | 0.21* | 1288** |
| | Juvenile | 1 | 0.00 | 1376 |
| | | 2 | 0.15* | 1174** |
| <i>Lagerstroemia subcostata</i> | Adult | 1 | 0.19 | 1027 |
| | | 2 | 0.25* | 952.7** |
| | Juvenile | 1 | 0.21 | 748.6 |
| | | 2 | 0.23* | 734.1** |
| <i>Illicium anisatum</i> | Adult | 1 | 0.05 | 405.6 |
| | | 2 | 0.13* | 371.7** |
| | Juvenile | 1 | 0.05 | 300.8 |
| | | 2 | 0.11* | 283.1** |
| <i>Litsea hypophaea</i> | Adult | 1 | 0.07 | 605.4 |
| | | 2 | 0.10* | 589.9** |
| | Juvenile | 1 | 0.08 | 496.7 |
| | | 2 | 0.11* | 478.3** |
| <i>Itea parviflora</i> | Adult | 1 | 0.01 | 840 |
| | | 2 | 0.12* | 750.4** |
| | Juvenile | 1 | 0.01 | 661.9 |
| | | 2 | 0.07* | 622.8** |
| <i>Ilex formosana</i> | Adult | 1 | 0.00 | 443.7 |
| | | 2 | 0.05* | 426.7** |
| | Juvenile | 1 | 0.00 | 322 |
| | | 2 | 0.02* | 318.3** |
| <i>Illicium arborescens</i> | Adult | 1 | 0.00 | 381.2 |
| | | 2 | 0.07* | 357.9** |
| | Juvenile | 1 | 0.01 | 326.6 |
| | | 2 | 0.05* | 315.6** |
| <i>Litsea acutivena</i> | Adult | 1 | 0.02 | 527.5 |
| | | 2 | 0.04* | 515.4** |
| | Juvenile | 1 | 0.02 | 417.1 |
| | | 2 | 0.04* | 409.9** |
| <i>Litsea elongata</i> | Adult | 1 | 0.03 | 540 |
| | | 2 | 0.12* | 490.6** |
| | Juvenile | 1 | 0.03 | 398.8 |
| | | 2 | 0.15* | 350.3** |
| <i>Michelia compressa</i> | Adult | 1 | 0.01 | 989.5 |
| | | 2 | 0.05* | 957.9** |
| | Juvenile | 1 | 0.02 | 645.7 |
| | | 2 | 0.04* | 633.6** |
| <i>Machilus thunbergii</i> | Adult | 1 | 0.02 | 1551 |
| | | 2 | 0.10* | 1427** |
| | Juvenile | 1 | 0.01 | 1261 |
| | | 2 | 0.06* | 1191** |
| <i>Mallotus japonicus</i> | Adult | 1 | 0.12 | 429.4** |
| | | 2 | 0.12 | 431.4 |
| | Juvenile | 1 | 0.14 | 335.6** |
| | | 2 | 0.14 | 337 |
| <i>Machilus zuihoensis</i> | Adult | 1 | 0.02 | 1311 |
| | | 2 | 0.10* | 1200** |
| | Juvenile | 1 | 0.01 | 1022 |
| | | 2 | 0.08* | 956.5** |
| <i>Neolitsea aciculata</i> | Adult | 1 | 0.01 | 546.4 |
| | | 2 | 0.12* | 486.6** |
| | Juvenile | 1 | 0.00 | 382.3 |
| | | 2 | 0.07* | 357.2** |
| <i>Neolitsea acuminatissima</i> | Adult | 1 | 0.11 | 701.3 |
| | | 2 | 0.22* | 618.9** |
| | Juvenile | 1 | 0.10 | 545.2 |
| | | 2 | 0.18* | 500.7** |
| <i>Machilus japonica</i> | Adult | 1 | 0.04 | 1588 |
| | | 2 | 0.08* | 1528** |
| | Juvenile | 1 | 0.01 | 1301 |
| | | 2 | 0.03* | 1275** |

| | | | | |
|-------------------------------------|----------|---|-------|---------|
| <i>Mallotus paniculatus</i> | Adult | 1 | 0.22 | 886.7 |
| | | 2 | 0.27* | 831.6** |
| | Juvenile | 1 | 0.17 | 599.3 |
| | | 2 | 0.20* | 574.9** |
| <i>Mallotus philippensis</i> | Adult | 1 | 0.17 | 420.3 |
| | | 2 | 0.17 | 419.6** |
| | Juvenile | 1 | 0.19 | 285.9 |
| | | 2 | 0.21* | 281.7** |
| <i>Pasania harlandii</i> | Adult | 1 | 0.01 | 558.9 |
| | | 2 | 0.09* | 515.6** |
| | Juvenile | 1 | 0.01 | 400.6 |
| | | 2 | 0.05* | 384.6** |
| <i>Oreocnide pedunculata</i> | Adult | 1 | 0.04 | 996.4 |
| | | 2 | 0.10* | 940.1** |
| | Juvenile | 1 | 0.07 | 819.5 |
| | | 2 | 0.10* | 793** |
| <i>Polyspora axillaris</i> | Adult | 1 | 0.00 | 649.2 |
| | | 2 | 0.02* | 639.1** |
| | Juvenile | 1 | 0.00 | 485.5 |
| | | 2 | 0.01* | 483.6** |
| <i>Pasania kawakamii</i> | Adult | 1 | 0.00 | 937.4 |
| | | 2 | 0.08* | 862.1** |
| | Juvenile | 1 | 0.00 | 749.6 |
| | | 2 | 0.08* | 693.6** |
| <i>Neolitsea konishii</i> | Adult | 1 | 0.04 | 655.1 |
| | | 2 | 0.09* | 624.3** |
| | Juvenile | 1 | 0.05 | 508.9 |
| | | 2 | 0.11* | 477.8** |
| <i>Phoebe formosana</i> | Adult | 1 | 0.04 | 512 |
| | | 2 | 0.13* | 465.6** |
| | Juvenile | 1 | 0.03 | 378.2 |
| | | 2 | 0.09* | 355.2** |
| <i>Pasania hancei</i> | Adult | 1 | 0.00 | 780.8 |
| | | 2 | 0.03* | 762.6** |
| | Juvenile | 1 | 0.00 | 632.9 |
| | | 2 | 0.02* | 622** |
| <i>Pinus taiwanensis</i> | Adult | 1 | 0.16 | 851.1 |
| | | 2 | 0.18* | 830.9** |
| | Juvenile | 1 | 0.19 | 556.4 |
| | | 2 | 0.20* | 548.2** |
| <i>Pinus armandii/morrisonicola</i> | Adult | 1 | 0.17 | 524.8 |
| | | 2 | 0.19* | 513.1** |
| | Juvenile | 1 | 0.21 | 310.4 |
| | | 2 | 0.23* | 303.6** |
| <i>Prunus campanulata</i> | Adult | 1 | 0.00 | 409.6 |
| | | 2 | 0.04* | 398.6** |
| | Juvenile | 1 | 0.00 | 299.9 |
| | | 2 | 0.02* | 295.4** |
| <i>Schima superba</i> | Adult | 1 | 0.00 | 661.7 |
| | | 2 | 0.04* | 635.5** |
| | Juvenile | 1 | 0.00 | 498.3 |
| | | 2 | 0.02* | 493** |
| <i>Rhododendron leptosanthum</i> | Adult | 1 | 0.04 | 785.3 |
| | | 2 | 0.12* | 721.8** |
| | Juvenile | 1 | 0.03 | 655.3 |
| | | 2 | 0.07* | 628.3** |
| <i>Rhododendron formosanum</i> | Adult | 1 | 0.06 | 451 |
| | | 2 | 0.11* | 428.5** |
| | Juvenile | 1 | 0.05 | 376.4 |
| | | 2 | 0.09* | 363.1** |
| <i>Schefflera octophylla</i> | Adult | 1 | 0.19 | 1201 |
| | | 2 | 0.25* | 1111** |
| | Juvenile | 1 | 0.14 | 981.8 |
| | | 2 | 0.18* | 937.8** |
| <i>Prunus phaeosticta</i> | Adult | 1 | 0.00 | 1041 |

| | | | | |
|---------------------------------|----------|---|-------|---------|
| | | 2 | 0.11* | 927.1** |
| | Juvenile | 1 | 0.00 | 734.5 |
| | | 2 | 0.13* | 643.3** |
| <i>Sloanea formosana</i> | Adult | 1 | 0.04 | 551 |
| | | 2 | 0.09* | 523** |
| | Juvenile | 1 | 0.06 | 368.4 |
| | | 2 | 0.07* | 363.3** |
| <i>Sapindus mukorossi</i> | Adult | 1 | 0.21 | 450.9 |
| | | 2 | 0.23* | 441** |
| | Juvenile | 1 | 0.17 | 300.6 |
| | | 2 | 0.18* | 298.5** |
| <i>Sinoadina racemosa</i> | Adult | 1 | 0.12 | 350.3 |
| | | 2 | 0.14* | 345.1** |
| | Juvenile | 1 | 0.13 | 283.1 |
| | | 2 | 0.14* | 279.3** |
| <i>Tsuga chinensis</i> | Adult | 1 | 0.37 | 675.7 |
| | | 2 | 0.41* | 634.9** |
| | Juvenile | 1 | 0.36 | 446.8 |
| | | 2 | 0.43* | 399.9** |
| <i>Trochodendron aralioides</i> | Adult | 1 | 0.08 | 715.5 |
| | | 2 | 0.16* | 651.8** |
| | Juvenile | 1 | 0.03 | 384.9 |
| | | 2 | 0.08* | 365.6** |
| <i>Symplocos morrisonicola</i> | Adult | 1 | 0.07 | 431.3 |
| | | 2 | 0.17* | 388.4** |
| | Juvenile | 1 | 0.07 | 299.9 |
| | | 2 | 0.11* | 289** |
| <i>Tetradium glabrifolium</i> | Adult | 1 | 0.01 | 635.3 |
| | | 2 | 0.07* | 598.1** |
| | Juvenile | 1 | 0.03 | 307.4 |
| | | 2 | 0.05* | 301.5** |
| <i>Turpinia formosana</i> | Adult | 1 | 0.06 | 1030 |
| | | 2 | 0.13* | 959.8** |
| | Juvenile | 1 | 0.05 | 859 |
| | | 2 | 0.11* | 801.1** |
| <i>Styrax suberifolia</i> | Adult | 1 | 0.14 | 497.3 |
| | | 2 | 0.16* | 485.9** |
| | Juvenile | 1 | 0.12 | 388.2 |
| | | 2 | 0.13* | 382.3** |
| <i>Styrax formosana</i> | Adult | 1 | 0.01 | 479.1 |
| | | 2 | 0.06* | 458.6** |
| | Juvenile | 1 | 0.02 | 348.1 |
| | | 2 | 0.04* | 342.7** |
| <i>Trema orientalis</i> | Adult | 1 | 0.15 | 484.8 |
| | | 2 | 0.21* | 453** |
| | Juvenile | 1 | 0.12 | 290.3 |
| | | 2 | 0.16* | 282.1** |
| <i>Tricalysia dubia</i> | Adult | 1 | 0.02 | 532.8 |
| | | 2 | 0.11* | 485.1** |
| | Juvenile | 1 | 0.03 | 377.6 |
| | | 2 | 0.09* | 357.7** |
| <i>Wendlandia formosana</i> | Adult | 1 | 0.17 | 392.2 |
| | | 2 | 0.23* | 366.2** |
| | Juvenile | 1 | 0.17 | 299.5 |
| | | 2 | 0.25* | 275.2** |
| <i>Turpinia ternata</i> | Adult | 1 | 0.09 | 691.9 |
| | | 2 | 0.13* | 662.9** |
| | Juvenile | 1 | 0.11 | 504 |
| | | 2 | 0.15* | 486.1** |
| <i>Zelkova serrata</i> | Adult | 1 | 0.03 | 612.2 |
| | | 2 | 0.10* | 573.5** |
| | Juvenile | 1 | 0.04 | 389.3 |
| | | 2 | 0.06* | 383.8** |





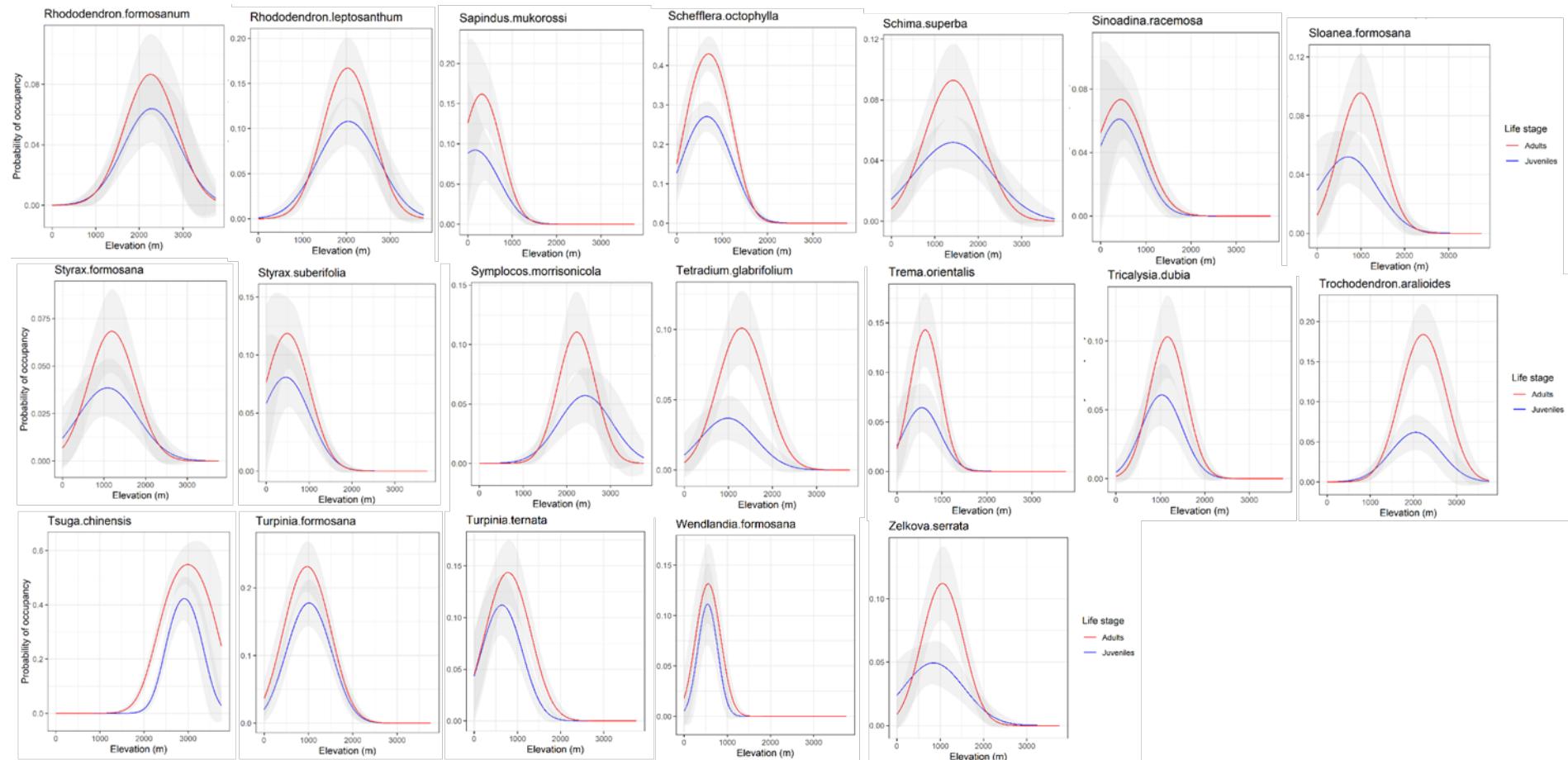


Fig.A2: Probability of occupancy of 75 subtropical montane tree species over an elevation gradient in Taiwan. Red lines refer to the adult life stage and blue lines refer to the juvenile life stage. Grey shaded areas represent confidence intervals of estimates (1.96 standard deviations of the mean).