**Supplementary Material**

**Comparison of forest canopy height profiles in a mountainous region of Taiwan derived from airborne lidar and unmanned aerial vehicle imagery**

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**Figure S1.** Mean monthly precipitation (the bars, the left y-axis) and air temperature (the line, the secondary y-axis) during the observation period.

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**Figure S2.** The relationships (*p* > 0.05) between the model residuals of the airborne mean tree height estimations (Fig. 4) and the plot scale mean slope and a Terrain Ruggedness Index, and the standard deviation of elevation.

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**Figure S3.** The Pearson’s correlation coefficient (correlation, *r*) between the plot scale mean canopy height (MCH, m) derived from lidar (black-colored numbers) or unmanned aerial vehicle imagery (UAV, gray-colored numbers) and the salient structural variables: Tree age (year), stand density (# ha-1), standard deviation of mean tree height (MTHsd, m), Q0 (m) and Q100 (m) for MCH estimation. In addition, correlations among these structural variables are also reported. Numbers without an asterisk indicate statistical insignificance (*p* > 0.05). Asterisks indicate statistical significance (\*, *p* ≤ 0.05; \*\*, *p* ≤ 0.01).

**Table S1.** Tree species inventory of the study site measured from 33 0.05-ha plots (Fig. 1).

|  |  |  |  |
| --- | --- | --- | --- |
| Type | Scientific name | Tree numbers(n) | Percent(%) |
| Total | 2011 | 2014 | 2011 | 2014 |
| Conifer species | *Cunninghamia lanceolata* | 1253 | 631 | 652 | 24.2 | 25.0 |
|  | *Calocedrus macrolepis* var. *formosana* | 332 | 151 | 181 | 5.8 | 6.9 |
|  | *Araucaria cunninghamii* | 60 | 0 | 60 | 0.0 | 2.3 |
|  | *Podocarpus nakaii* | 4 | 2 | 2 | 0.1 | 0.1 |
| Broadleaf species | *Schefflera octophylla* | 118 | 52 | 66 | 2.0 | 2.5 |
|  | *Michelia compressa* | 79 | 20 | 59 | 0.8 | 2.3 |
|  | *Cinnamomum kotoense* | 31 | 0 | 31 | 0.0 | 1.2 |
|  | *Machilus zuihoensis* | 44 | 25 | 19 | 1.0 | 0.7 |
|  | *Diospyros morrisiana* | 96 | 79 | 17 | 3.0 | 0.7 |
|  | *Mallotus paniculatus* | 34 | 17 | 17 | 0.7 | 0.7 |
|  | *Elaeocarpus sylvestris* | 39 | 23 | 16 | 0.9 | 0.6 |
|  | *Wendlandia formosana* | 18 | 4 | 14 | 0.2 | 0.5 |
|  | *Bischofia javanica* | 14 | 0 | 14 | 0.0 | 0.5 |
|  | *Aleurites fordii* | 30 | 18 | 12 | 0.7 | 0.5 |
|  | *Cyclobalanopsis glauca* | 11 | 0 | 11 | 0.0 | 0.4 |
|  | *Nothaphoebe konishii* | 10 | 0 | 10 | 0.0 | 0.4 |
|  | *Phoebe faberi* | 12 | 3 | 9 | 0.1 | 0.3 |
|  | *Quercus gilva* | 9 | 0 | 9 | 0.0 | 0.3 |
|  | *Myristi caceylanica* | 9 | 0 | 9 | 0.0 | 0.3 |
|  | *Sapium discolor* | 24 | 17 | 7 | 0.7 | 0.3 |
|  | *Engelhardtia roxburghiana* | 12 | 5 | 7 | 0.2 | 0.3 |
|  | *Mallotus japonicus* | 8 | 1 | 7 | 0.0 | 0.3 |
|  | *Machilus thunbergii* | 30 | 24 | 6 | 0.9 | 0.2 |
|  | *Rhus succedanea* | 26 | 20 | 6 | 0.8 | 0.2 |
|  | *Styrax formosana* | 9 | 3 | 6 | 0.1 | 0.2 |
|  | *Melicope pteleifolia* | 10 | 5 | 5 | 0.2 | 0.2 |
|  | *Tricalysia dubia* | 10 | 5 | 5 | 0.2 | 0.2 |
|  | *Castanopsis cuspidata* var. *carlesii* | 6 | 1 | 5 | 0.0 | 0.2 |
|  | *Glochidion acuminatum* | 6 | 1 | 5 | 0.0 | 0.2 |
|  | *Neolitsea konishii* | 5 | 0 | 5 | 0.0 | 0.2 |
|  | *Quercus uraiana* | 5 | 0 | 5 | 0.0 | 0.2 |
|  | *Castanopsis carlesii* | 5 | 0 | 5 | 0.0 | 0.2 |
|  | *Pasania harlandii* | 6 | 2 | 4 | 0.1 | 0.2 |
|  | *Castanopsis fargesii* | 5 | 1 | 4 | 0.0 | 0.2 |
|  | *Elaeocarpus japonicus* | 5 | 1 | 4 | 0.0 | 0.2 |
|  | *Prunus campanulata* | 4 | 0 | 4 | 0.0 | 0.2 |
|  | *Zelkova serrata* | 4 | 0 | 4 | 0.0 | 0.2 |
|  | *Illicium arborescens* | 4 | 0 | 4 | 0.0 | 0.2 |
|  | *Prunus phaeosticta* | 24 | 21 | 3 | 0.8 | 0.1 |
|  | *Pasania kawakamii* | 13 | 10 | 3 | 0.4 | 0.1 |
|  | *Cinnamomum subavenium* | 7 | 4 | 3 | 0.2 | 0.1 |
|  | *Randia cochinchinensis* | 5 | 2 | 3 | 0.1 | 0.1 |
|  | *Ilex ficoidea* | 4 | 1 | 3 | 0.0 | 0.1 |
|  | *Cinnamomum camphora* | 4 | 1 | 3 | 0.0 | 0.1 |
|  | *Neolitsea aciculata* var. *variabillima* | 4 | 1 | 3 | 0.0 | 0.1 |
|  | *Schima superba* | 3 | 0 | 3 | 0.0 | 0.1 |
|  | *Adinandra  formosana* | 3 | 0 | 3 | 0.0 | 0.1 |
|  | *Antidesma japonicum* | 3 | 0 | 3 | 0.0 | 0.1 |
|  | *Cryptocarya chinensis* | 3 | 0 | 3 | 0.0 | 0.1 |
|  | *Toona sinensis* | 3 | 0 | 3 | 0.0 | 0.1 |
|  | *Pyrenaria shinkoensis* | 3 | 0 | 3 | 0.0 | 0.1 |
|  | *Machilus zuihoensis* var. *mushaensis* | 3 | 0 | 3 | 0.0 | 0.1 |
|  | *Styrax suberifolia* | 20 | 18 | 2 | 0.7 | 0.1 |
|  | *Camellia oleifera* | 19 | 17 | 2 | 0.7 | 0.1 |
|  | *Eustigma oblongifolium* | 12 | 10 | 2 | 0.4 | 0.1 |
|  | *Pasania konishii* | 11 | 9 | 2 | 0.3 | 0.1 |
|  | *Litsea cubeba* | 11 | 9 | 2 | 0.3 | 0.1 |
|  | *Cinnamomum osmophloeum* | 11 | 9 | 2 | 0.3 | 0.1 |
|  | *Acacia confusa* | 10 | 8 | 2 | 0.3 | 0.1 |
|  | *Syzygium buxifolium* | 6 | 4 | 2 | 0.2 | 0.1 |
|  | *Crateva adansonii* subsp. *formosensis* | 6 | 4 | 2 | 0.2 | 0.1 |
|  | *Archideneron lucidum* | 6 | 4 | 2 | 0.2 | 0.1 |
|  | *Lagerstoemia subcostata* | 4 | 2 | 2 | 0.1 | 0.1 |
|  | *Ormosia formosana* | 4 | 2 | 2 | 0.1 | 0.1 |
|  | *Eucalyptus robusta* | 3 | 1 | 2 | 0.0 | 0.1 |
|  | *Helicia formosana* | 3 | 1 | 2 | 0.0 | 0.1 |
|  | *Prunus campanulata* | 3 | 1 | 2 | 0.0 | 0.1 |
|  | *Castanopsis cuspidata* var. *carlesii* | 3 | 1 | 2 | 0.0 | 0.1 |
|  | *Microtropis japonica* | 3 | 1 | 2 | 0.0 | 0.1 |
|  | *Tetradium glabrifolium* | 3 | 1 | 2 | 0.0 | 0.1 |
|  | *Corymbia citriodora* | 3 | 1 | 2 | 0.0 | 0.1 |