SUPPLEMENTARY MATERIALS

Appendix 1. DNA Extraction and quantification

To analyze the proximity and relationship between samples of the putative *Cedrela angusticarpa* and samples from closely related species using genetic data, leaves from 9 individuals of *C. angusticarpa* and 34 individuals of *C. odorata* were collected in the field (Table 1). All leaf samples were then transported to the Plant Biotechnology Laboratory at USFQ for DNA extraction. DNA was extracted following the protocol described by Rezadoost et al. (2016) with modifications as described below.

20 mg of leaf tissue were macerated in a mortar with liquid nitrogen and transferred to a 1.5-ml tube. 400 µl of Buffer 1 [200mM Tris–HCl, 1.4M NaCl, 0.5 % (v/v) Triton X-100, 3 % (w/v) CTAB] and 0.1 % (w/v) PVP (added before use) were then incorporated. The solution was placed in a vortex for 20s and transferred to a heat sink at 60°C for 30 min. 400 µl of chloroform:isoamyl alcohol (24:1, v/v) were added and vigorously shaken for 2 min. The tube was centrifuged for 15 min at 10,000 rpm. Subsequently, 300 µl of supernatant were transferred to a fresh 1.5-ml tube and 1/2 volume of Buffer 2 [50mM Tris–HCl, 2M guanidinethiocyanate, 0.2% (v/v)β-mercaptoethanol (added before use), 0.2 mg/ml Proteinase K (added before use)] was added before transferring the tube to a heat sink at 40°C for 15 min. ½ volume of 4M NaCl was added, stirred and placed on ice for 5 min before adding 2 volumes of ice cold isopropanol. The solution was then placed at -20°C for 1 hour. The tube was centrifuged at 12,000 rpm for 20 min, the supernatant discarded, and the pellet rinsed twice with 75% ethanol. The solution was then centrifuged at 10,000 rpm for 5 min. The obtained pellet was dried and dissolved in 30 µl of UltraPure PCR water and then transferred to a heat sink at 70°C for 10 min (Rezadoost et al., 2016).

The quality, quantity and integrity of the extracted DNA was evaluated using a NanoDrop 2000 (Thermo Fisher Scientific) and an agarose gel (1%) electrophoresis. Samples were then stored at -20º C.

Appendix 2. Microsatellite amplification for *Cedrela* species

To analyze if samples of *C. angusticarpa* are genetically distinct from samples of *C. odorata*, nine microsatellite loci developed for *C. odorata* (Hernández et al., 2008) were selected for Polymerase Chain Reaction (PCR) amplification (details including allele size and sequences are presented in Table S1). The nine SSR regions were amplified with fluorophore-labeled forward primers (Table S1). The amplification protocol was first standardized using samples with high DNA concentration and quality, based on the parameters presented by Hernández et al. (2008).

The PCR master mix (30 µl) used for each reaction included: 21.02 µl of UltraPure PCR water, 3 µl of 10X PCR buffer (1X final concentration), 1.5 µl of 50 mM MgCl2 (2.5 mM final concentration), 0.6 µl of 10 mM dNTPs (0.2 µM final concentration), 0.6 µl of 10 µM forward primer and 0.6 µl of 10 µM reverse primer ( 0.2 µM final concentration), 0.48 µl of 1 mg/ml BSA (0.016 mg/ml final concentration), 0.2 µl of Taq Platinum DNA Polymerase (5U/µl, Invitrogen) and 2 µl of template DNA (100ng/µl) For loci Ced18 and Ced61a, BSA concentration was increased to 1 mg/ml (3 µl). PCR amplifications were performed following the thermocycling program reported by Hernández et al. (2008) with an initial denaturation of 1 min at 94°C, followed by 30 cycles of denaturation for 1 min at 94°C, annealing for 1 min at 55°C, extension for 1 min at 72°C and a final extension of 5 min at 72°C. For loci Ced18, Ced95 and Ced61a, 35 cycles were run.

PCR products were visualized in a 1.5% agarose gel electrophoresis and preserved at 4ºC.

Appendix 3. SSR Genotyping and Principal Coordinate Analysis

PCR products (40 µl) were transferred to MicroAmp Optical 96-Well Reaction Plates and sent to Macrogen for genotyping (Seoul, South Korea).

Resulting files were interpreted using GeneMarker Software (Softgenetics, State College, PA, USA). Fluorescence peaks were identified to produce an allelic matrix for all sampled individuals and species. To analyze how genetically distinct samples of *C. angusticarpa* are to other *Cedrela* species, a Principal Coordinate Analysis was performed in R Studio v. 4.0.3 with the *pcoa* function of the ape v. 5.4-1 package (Paradis et al., 2020). Euclidean distances were calculated with the *dist* function of the stats package and the graph was plotted with the *ggplot* function of the ggplot2 v. 3.3.3 package (Wickham et al., 2020) (Figure 4).

Appendix 4. Maxent modelling details and considerations.

In order to avoid the use of autocorrelated variables and thus, to improve the accuracy of modelling outputs, we performed a pre-selection assessment for the bioclimatic variables used here (Elith 2011, Guisan & Zimmermann 2000). For both target species, a correlation matrix with the 19 bioclimatic variables (from BIOCLIM) and built-in MaxEnt platform was constructed. In order to choose variables used in models, we performed a Spearman's rank correlation, because the data did not present a normal distribution according to Shapiro-Wilk test (Razali & Wah 2011). Analyses described before were carried out using PAST software (Hammer *et al.* 2001).

For model evaluation, data was partitioned in training and testing clusters, in order to use several replicates of all the known presence records to assess the model. For this specific assessment, we also applied bootstrap approaches to deal with the low sample issue (Franklin 2009). We choose the resulting model with the highest AUC (Area Under the Receiver Operating Curve) and the lowest test omission value. Subsequently, the logistic output model obtained from Maxent was transformed into a presence-absence grid (binary map) that was obtained using the "Minimum training presence" threshold, as a way to minimize the inclusion of commission errors in model testing (Späth *et al*. 2018). Finally, from resulting model we extracted the not-suitable ecosystems for the species occurrence and the deforested surface using updated in-country data (MAE 2013, 2017).

Table S1. Description of the nine microsatellite loci used in this study

|  |  |  |  |
| --- | --- | --- | --- |
| **Locus\*** | **Primer sequences\*** | **Fluorophore** | **Allele size (pb)** |
| Ced2 | F: TTTGCTTTGAGAAACCTTGTR: AACTTTCGAATTGGTTAAGG | PET | 123-175 |
| Ced18 | F: CAAAGACCAAGATTTGATGCR: ACTATGGGTGGCACAACTAC | VIC | 118-152 |
| Ced131 | F: CTCGTAATAATCCCATTCCAR: GGAGATATTTTTGGGGTTTT | 6-FAM | 76-106 |
| Ced65 | F: GAGTGAGAAGAAGAATCGTGATAGCR: GAGGTTCGATCAGGTCTTGG | NED | 162-188 |
| Ced95 | F: ATTTTCATTCCCTTTTAGCCR: TTATCATCTCCCTCACTCCA | 6-FAM | 172-244 |
| Ced44 | F: ACTCCATTAACTGCCATGAAR: ATTTTCATTCCCTTTTAGCC | PET | 157-211 |
| Ced54 | F: GATCTCACCCACTTGAAAAAR: GCTCATATTTGAGAGGCATT | NED | 181-211 |
| Ced41 | F: TCATTCTTGGATCCTGCTATR: GTGGGAAAGATTGTGAAGAA | VIC | 115-153 |
| Ced61a | F: CAATCAAACCAAAAATGGATR: GCAAATTAACCAGAAAAACG | 6-FAM | 247-285 |

\*Primers obtained from Hernández et al. 2008. Allele sizes may differ –not significantly, with those reported in Hernández et al. 2008.

Table S2. Allelic matrix used for PCoA analysis of *C. odorata* (Coast and Amazon) and *C. angusticarpa* samples

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ID** | **Species** | **Ced131** | **Ced18** | **Ced2** | **Ced65** | **Ced95** | **Ced44** | **Ced41** | **Ced54** | **Ced61** |
| **18333** | *C. odorata* Amazon | 78/98 | 120/120 | 141/141 | 164/172 | 190/190 | 177/177 | 121/121 | 185/187 | 251/251 |
| **18345** | *C. odorata* Amazon | 78/98 | 120/120 | 123/169 | 164/176 | 188/194 | 175/181 | 123/129 | 187/193 | 273/273 |
| **18347** | *C. odorata* Amazon | 82/98 | 120/120 | 123/141 | 164/174 | 188/190 | 175/177 | 121/125 | 187/187 | 273/273 |
| **18348** | *C. odorata* Amazon | 78/78 | 120/120 | 139/141 | 176/180 | 194/200 | 181/187 | 121/133 | 185/197 | NA |
| **18349** | *C. odorata* Amazon | 84/84 | 120/120 | 153/153 | 176/176 | 198/208 | 185/185 | 121/151 | 181/181 | 261/261 |
| **18356** | *C. odorata* Amazon | 94/94 | 120/120 | 123/141 | 162/174 | 192/196 | 179/185 | 121/121 | 185/189 | 257/263 |
| **18359** | *C. odorata* Amazon | 76/78 | 120/120 | 153/155 | 168/178 | 194/200 | 181/189 | 121/123 | 181/185 | 267/277 |
| **18365** | *C. odorata* Amazon | 78/82 | 120/120 | 159/169 | 172/174 | 194/194 | 181/181 | 133/135 | 185/191 | 247/285 |
| **18377** | *C. odorata* Amazon | 80/98 | 120/120 | 123/167 | 164/174 | 190/196 | 177/183 | 121/133 | 187/187 | 251/285 |
| **COT1** | *C. odorata* Amazon | 78/82 | 120/120 | 153/153 | 172/176 | 192/198 | 179/183 | 121/121 | 181/193 | NA |
| **COT2** | *C. odorata* Amazon | 78/82 | 120/120 | 153/153 | 172/176 | 192/198 | 179/183 | 121/121 | 181/193 | 261/261 |
| **COT3** | *C. odorata* Amazon | 78/82 | 120/120 | 153/153 | 172/176 | 192/196 | 179/183 | 121/121 | 181/193 | 269/269 |
| **COT4** | *C. odorata* Amazon | 94/94 | 120/122 | 171/171 | 182/188 | 224/224 | 209/209 | 123/133 | 181/181 | 267/267 |
| **COT5** | *C. odorata* Amazon | 84/94 | 120/120 | 153/171 | 188/188 | 220/244 | 183/205 | 133/153 | 181/181 | 267/267 |
| **COT6** | *C. odorata* Amazon | 90/90 | 120/120 | NA | 180/188 | 224/224 | 185/209 | 119/133 | 181/181 | 267/267 |
| **COT7** | *C. odorata* Amazon | 84/94 | 120/120 | 171/175 | 180/182 | 224/224 | 209/209 | 119/123 | 181/195 | 261/261 |
| **COT8** | *C. odorata* Amazon | 90/106 | 120/120 | 123/123 | 186/186 | 220/220 | 175/209 | 121/123 | 181/185 | 273/273 |
| **18406** | *C. angusticarpa*  | 94/94 | 118/118 | 149/149 | 168/168 | 172/172 | 157/157 | 115/115 | 185/185 | 247/247 |
| **18407** | *C. angusticarpa*  | 96/96 | 118/118 | 149/149 | 170/174 | 172/172 | 157/157 | 115/115 | 187/189 | 247/247 |
| **18408** | *C. angusticarpa*  | 96/96 | 118/118 | 149/149 | 170/170 | 172/172 | 157/157 | 115/115 | 185/185 | 247/247 |
| **18411** | *C. angusticarpa*  | 94/94 | 118/118 | 149/149 | 170/170 | 172/172 | 157/157 | 115/115 | 185/185 | 247/247 |
| **18412** | *C. angusticarpa*  | 90/98 | 118/118 | 149/149 | 170/170 | 172/172 | 157/157 | 115/115 | 185/185 | 247/247 |
| **18413** | *C. angusticarpa*  | 90/96 | 118/118 | 149/149 | 168/170 | 172/172 | 157/157 | 115/115 | 185/185 | 247/247 |
| **18414** | *C. angusticarpa*  | 96/96 | 118/118 | 149/149 | 168/170 | 172/172 | 157/157 | 115/115 | 189/189 | 247/247 |
| **18445** | *C. angusticarpa*  | 104/104 | 118/118 | 147/147 | 172/172 | 170/170 | 157/157 | 115/115 | 173/173 | 243/243 |
| **18745** | *C. angusticarpa*  | 90/94 | 118/118 | 147/147 | 168/168 | 170/170 | 157/157 | 115/115 | 185/191 | 243/243 |
| **18425** | *C. odorata* Coast | 80/80 | 142/142 | 167/167 | 178/178 | 224/224 | 211/211 | 139/149 | 209/211 | 249/263 |
| **18422** | *C. odorata* Coast | 80/80 | 146/152 | 167/169 | 178/180 | 218/220 | 203/205 | 143/149 | 193/193 | 259/261 |
| **CC2** | *C. odorata* Coast | 80/94 | 142/142 | 165/165 | 178/178 | 222/222 | 209/209 | 139/149 | 211/211 | 263/263 |
| **CC3** | *C. odorata* Coast | 80/94 | 138/142 | 165/165 | 178/180 | 216/222 | 203/209 | 139/139 | 193/211 | 259/261 |
| **CC4** | *C. odorata* Coast | 80/94 | 142/142 | 165/165 | 178/178 | 222/222 | 209/209 | 139/149 | 211/211 | 247/263 |
| **CC5** | *C. odorata* Coast | 80/94 | 142/142 | 167/167 | 178/178 | 222/222 | 209/209 | 139/149 | 211/211 | 247/247 |
| **CC6** | *C. odorata* Coast | 80/94 | 142/142 | 165/165 | 178/178 | 222/222 | 209/209 | 149/149 | 211/211 | 247/263 |
| **CC7** | *C. odorata* Coast | 80/94 | 142/142 | 165/165 | 178/178 | 222/222 | 209/209 | 139/139 | 211/211 | 247/263 |
| **CC8** | *C. odorata* Coast | 80/80 | 136/146 | 149/167 | 180/182 | 210/218 | 197/207 | 143/147 | 195/211 | 263/263 |
| **CC9** | *C. odorata* Coast | 80/94 | 140/144 | 157/169 | 178/180 | 218/222 | 207/209 | 143/149 | 177/211 | 259/259 |
| **CC10** | *C. odorata* Coast | 80/94 | 138/146 | 149/171 | 178/180 | 210/220 | 197/209 | 145/145 | 213/213 | 259/267 |

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