

Supplementary file S1

Table S1. List of environmental variables downloaded from different sources

| Environmental Variables | Description | Code | Unit | Resolution(m) | Source |
|------------------------------|---|--------|----------|---|---|
| Bioclimatic | Annual Mean Temperature | Bio1 | °C | 1000 | https://www.worldclim.org/ |
| | Mean Diurnal Range (mean of monthly [max temp.-min temp.] | Bio2 | °C | 1000 | https://www.worldclim.org/ |
| | Isothermality (100) (Bio2/Bio7) | Bio3 | - | 1000 | https://www.worldclim.org/ |
| | Temperature Seasonality (standard deviation _ 100) | Bio4 | °C | 1000 | https://www.worldclim.org/ |
| | Max Temperature of Warmest Month | Bio5 | °C | 1000 | https://www.worldclim.org/ |
| | Min Temperature of Coldest Month | Bio6 | °C | 1000 | https://www.worldclim.org/ |
| | Temperature Annual Range (Bio5-Bio6) | Bio7 | °C | 1000 | https://www.worldclim.org/ |
| | Mean Temperature of Wettest Quarter | Bio8 | °C | 1000 | https://www.worldclim.org/ |
| | Mean Temperature of Driest Quarter | Bio9 | °C | 1000 | https://www.worldclim.org/ |
| | Mean Temperature of Warmest Quarter | Bio10 | °C | 1000 | https://www.worldclim.org/ |
| | Mean Temperature of Coldest Quarter | Bio11 | °C | 1000 | https://www.worldclim.org/ |
| | Annual Precipitation | Bio12 | mm | 1000 | https://www.worldclim.org/ |
| | Precipitation of Wettest Month | Bio13 | mm | 1000 | https://www.worldclim.org/ |
| | Precipitation of Driest Month | Bio14 | mm | 1000 | https://www.worldclim.org/ |
| | Precipitation Seasonality (coefficient of variation) | Bio15 | - | 1000 | https://www.worldclim.org/ |
| | Precipitation of Wettest Quarter | Bio16 | mm | 1000 | https://www.worldclim.org/ |
| | Precipitation of Driest Quarter | Bio17 | mm | 1000 | https://www.worldclim.org/ |
| | Precipitation of Warmest Quarter | Bio18 | mm | 1000 | https://www.worldclim.org/ |
| | Precipitation of Coldest Quarter | Bio19 | mm | 1000 | https://www.worldclim.org/ |
| Potential Evapotranspiration | PET | mm | 1000 | https://www.worldclim.org/ | |
| Terrain | Digital Elevation Model (DEM) | SRTM90 | m | 1000 | https://cgiasi.community/data/srtm-90m-digital-elevation-database-v4-1/ |
| Edaphic/Soil | Cation Exchange Capacity | CEC | cmolc/kg | 250 | https://data.isric.org/geonetwork/srv/eng/catalog_V_1.2 |
| | pH | PHIHOx | - | 250 | https://data.isric.org/geonetwork/srv/eng/catalog_V_1.2 |
| | Sand | SND | g/100g | 250 | https://data.isric.org/geonetwork/srv/eng/catalog_V_1.2 |
| | Clay | CLY | g/100g | 250 | https://data.isric.org/geonetwork/srv/eng/catalog_V_1.2 |
| | Silt | SLT | g/100g | 250 | https://data.isric.org/geonetwork/srv/eng/catalog_V_1.2 |
| | Soil Electrical Conductivity | ELC | uS/cm | 250 | https://data.isric.org/geonetwork/srv/eng/catalog_V_1.2 |
| | Soil Water Holding Capacity | WHC | mm | 250 | https://data.isric.org/geonetwork/srv/eng/catalog_V_1.2 |
| | Soil Organic Carbon | SOC | g/kg | 250 | https://data.isric.org/geonetwork/srv/eng/catalog_V_1.2 |
| | Soil texture | TXT | mm | 250 | https://data.isric.org/geonetwork/srv/eng/catalog_V_1.2 |

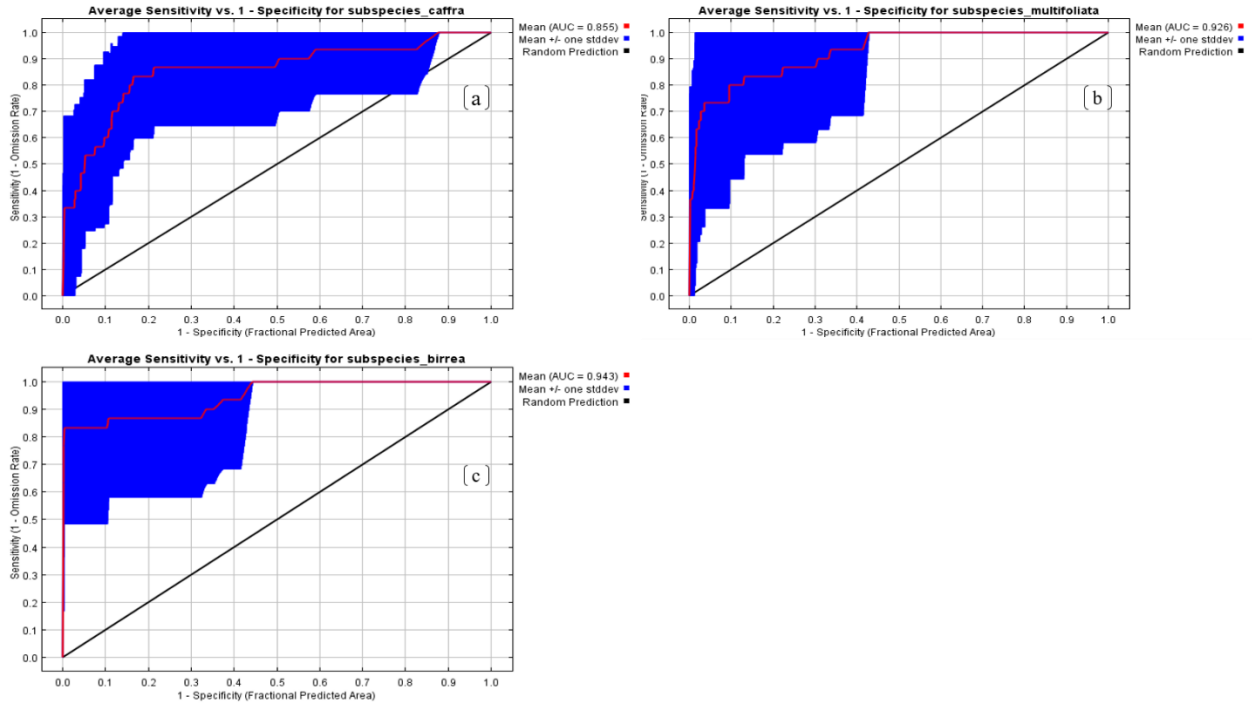


Figure S1. The mean areas under the curves for Marula tree (*Sclerocarya birrea*) subspecies (a) subsp. *birrea*, (b) subsp. *caffra* and (c) subsp. *multifoliata* ecological niche models (ENMs) for Tanzania

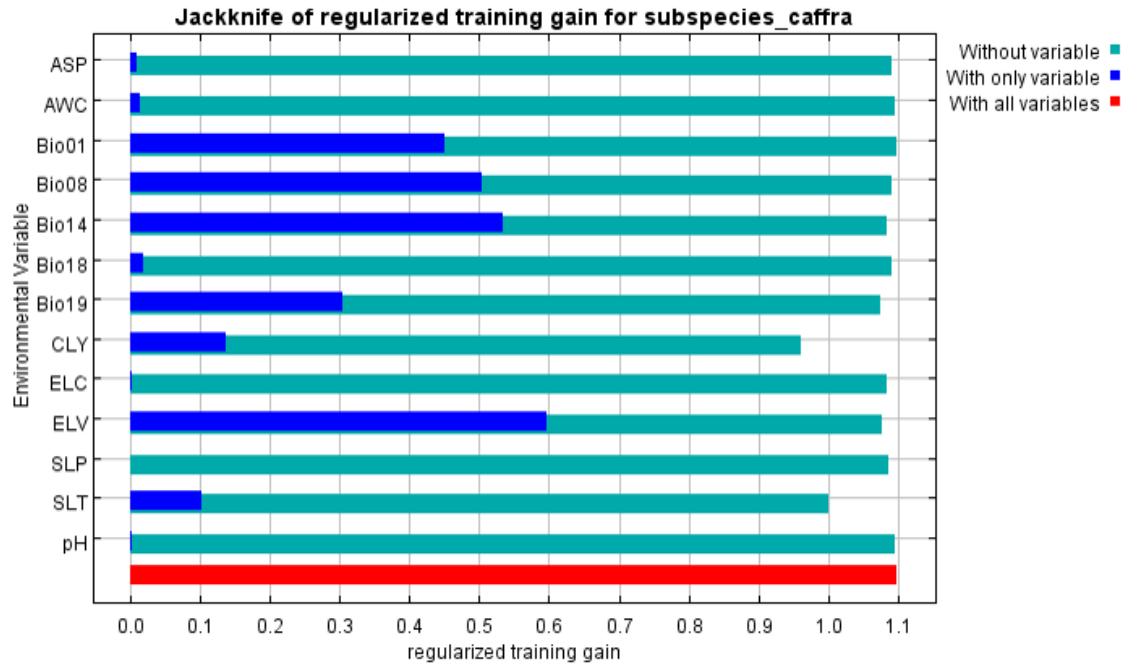


Figure S2. Jackknife test result showing environmental variables that define the ecological niche of Marula tree (*Sclerocarya birrea*) subsp. *caffra* in Tanzania under the current environmental conditions. Note: “ASP” is an aspect; “AWC” is available water holding capacity; “Bio01” is the annual mean temperature; “Bio08” is the mean temperature of the wettest quarter; “Bio14” is the precipitation of the driest month; “Bio18” is the precipitation of warmest quarter; “Bio19” is the precipitation of coldest quarter; “CLY” is clayey soil; “ELC” is soil electrical conductivity; “ELV” is elevation; “SLP” is slope; “SLT” is silt soil and “pH” is soil pH.

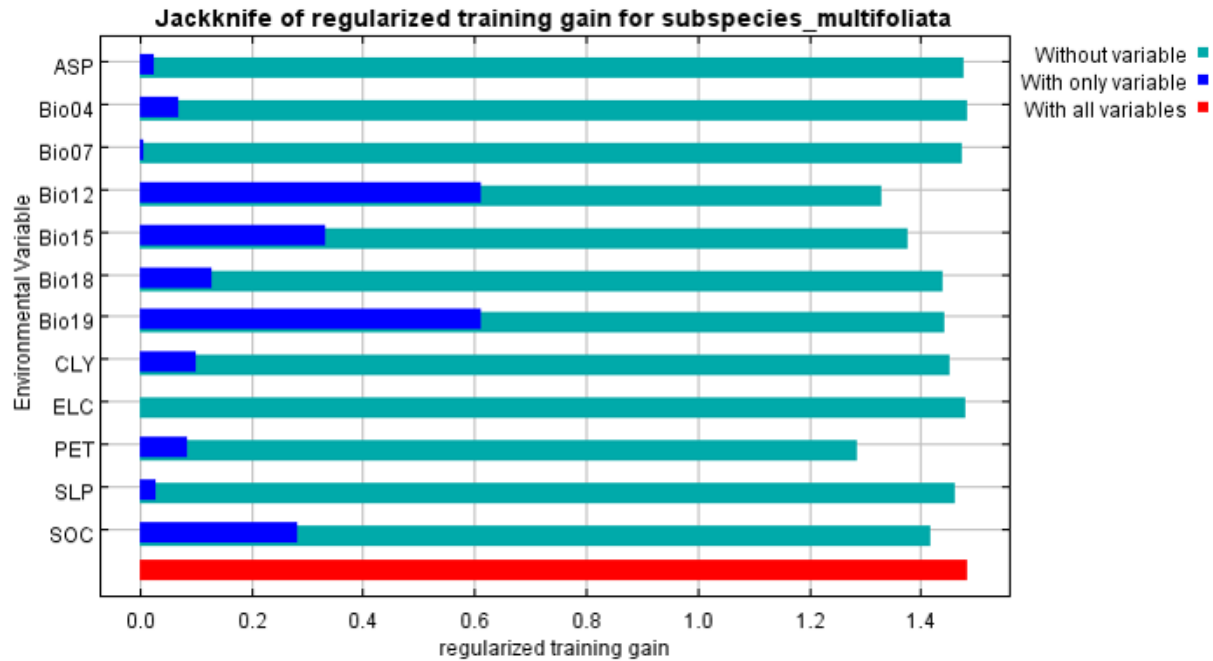


Figure S3. Jackknife test result showing environmental variables that define ecological niche of Marula tree (*Sclerocarya birrea*) subsp. *multifoliata* in Tanzania under the current environmental conditions. Note: “ASP” is aspect; “Bio04” is temperature seasonality; “Bio07” is temperature annual range; “Bio12” is annual precipitation; “Bio15” is precipitation seasonality; “Bio18” is precipitation of warmest quarter; “Bio19” is precipitation of coldest quarter; “CLY” is clayey soil; “ELC” is soil electrical conductivity; “PET” is potential evapotranspiration; “SLP” is slope and “SOC” is soil organic carbon.

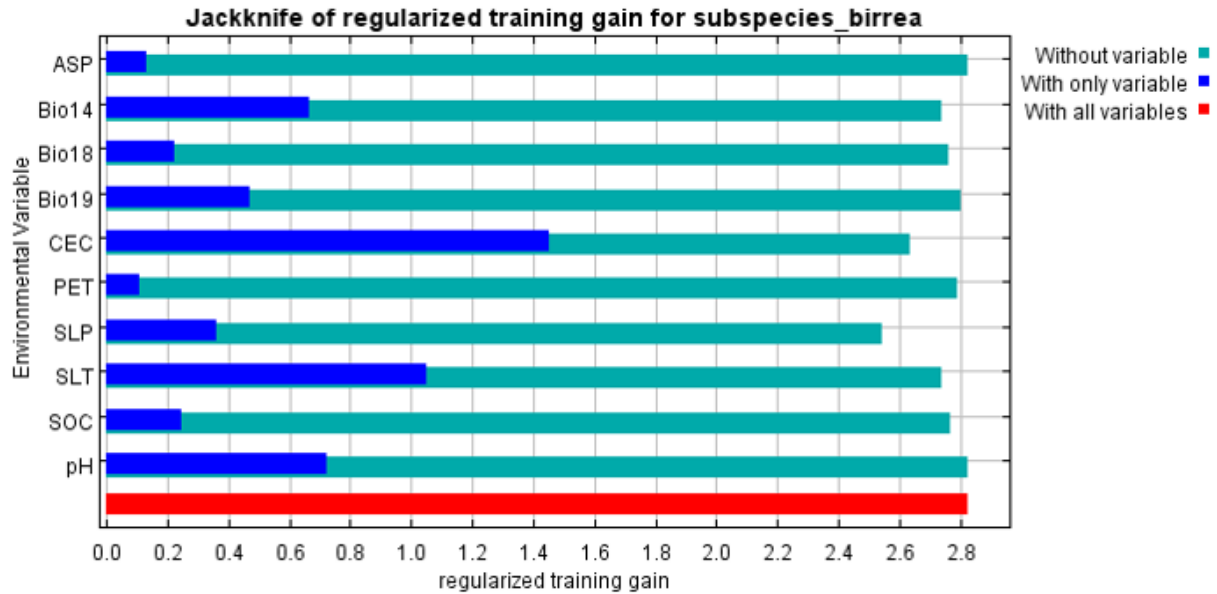


Figure S4. Jackknife test result showing environmental variables that define ecological niche of Marula tree (*Sclerocarya birrea*) subsp. *birrea* in Tanzania under the current environmental conditions. Note: “ASP” is aspect; “Bio14” is precipitation of driest month; “Bio18” is precipitation of warmest quarter; “Bio19” is precipitation of coldest quarter; “CEC” is soil cation exchange capacity; “PET” is potential evapotranspiration; “SLP” is slope; “SLT” is silt soil; “SOC” is soil organic carbon; and “pH” is soil pH.