

Supplementary Materials

Table S1. List of 145 present records of *L. chinense*.

| ID | Longitude (°) | Latitude (°) | ID | Longitude (°) | Latitude (°) | ID | Longitude (°) | Latitude (°) |
|----|---------------|--------------|----|---------------|--------------|-----|---------------|--------------|
| 1 | 119.43 | 30.4 | 50 | 114.602 | 29.384 | 99 | 103.2 | 22.8 |
| 2 | 119.6 | 28.5 | 51 | 115.987 | 29.548 | 100 | 108.8 | 28.82 |
| 3 | 118.83 | 30.12 | 52 | 114.414 | 28.475 | 101 | 105.5 | 28.2 |
| 4 | 116.7 | 30.17 | 53 | 104.702829 | 23.125462 | 102 | 114.2 | 29.8 |
| 5 | 117.66 | 29.55 | 54 | 109.02111 | 28.471455 | 103 | 109 | 30.3 |
| 6 | 116 | 29.53 | 55 | 115.989221 | 29.671778 | 104 | 110.2 | 29.15 |
| 7 | 117.76 | 27.84 | 56 | 115.998105 | 29.61015 | 105 | 110.2 | 26.33 |
| 8 | 114.2 | 29.8 | 57 | 110.340757 | 31.042327 | 106 | 116 | 29.53 |
| 9 | 109 | 30.3 | 58 | 110.350732 | 31.021345 | 107 | 116.1 | 30.17 |
| 10 | 110.2 | 26.33 | 59 | 115.998105 | 29.61015 | 108 | 119.6 | 28.5 |
| 11 | 106.3 | 24.84 | 60 | 109.726617 | 30.601932 | 109 | 119.9 | 29.13 |
| 12 | 110.4 | 25.87 | 61 | 108.936347 | 30.290996 | 110 | 109.5 | 26.8 |
| 13 | 110.37 | 25.88 | 62 | 107.099276 | 29.157849 | 111 | 117.8 | 27.92 |
| 14 | 108.61 | 27.89 | 63 | 109.021111 | 28.471455 | 112 | 103.217 | 22.783 |
| 15 | 109.32 | 28.16 | 64 | 103.848611 | 22.393056 | 113 | 109.13 | 26.23 |
| 16 | 105.89 | 28.24 | 65 | 120.159265 | 29.310962 | 114 | 115.98 | 29.68 |
| 17 | 109.19 | 26.34 | 66 | 110.585686 | 25.60168 | 115 | 110.31 | 26.37 |
| 18 | 105.5 | 28.2 | 67 | 110.585616 | 25.37285 | 116 | 119.9 | 27.4 |
| 19 | 108.8 | 28.82 | 68 | 110.599945 | 26.00537 | 117 | 117.62 | 27.45 |
| 20 | 104.47 | 23.3 | 69 | 115.989221 | 29.671778 | 118 | 108.93 | 30.3 |
| 21 | 104.19 | 23.02 | 70 | 110.543672 | 29.671765 | 119 | 110.03 | 29.9 |
| 22 | 103.23 | 22.78 | 71 | 110.57845 | 26.39326 | 120 | 119.68 | 30.63 |
| 23 | 103.07 | 23.03 | 72 | 111.03045 | 25.465207 | 121 | 119.48 | 28.45 |
| 24 | 103.257 | 22.812 | 73 | 110.564893 | 25.543782 | 122 | 119.92 | 28.45 |
| 25 | 104.754 | 23.137 | 74 | 110.050532 | 25.255089 | 123 | 107.03 | 33.08 |
| 26 | 106.133 | 25.407 | 75 | 110.599945 | 26.00537 | 124 | 118.02 | 30.2 |
| 27 | 107.868 | 25.226 | 76 | 111.600795 | 25.526439 | 125 | 110.53 | 25.85 |
| 28 | 107.364 | 26.27 | 77 | 104.010884 | 28.672732 | 126 | 106.22 | 24.9 |
| 29 | 108.69 | 26.497 | 78 | 107.890946 | 30.317053 | 127 | 110.62 | 25.88 |
| 30 | 106.623 | 27.119 | 79 | 102.700013 | 25.012526 | 128 | 108.62 | 25.2 |
| 31 | 105.023 | 26.095 | 80 | 106.259272 | 29.290189 | 129 | 109.02 | 25.65 |
| 32 | 104.135 | 28.067 | 81 | 104.580735 | 28.114752 | 130 | 109.25 | 25.57 |
| 33 | 105.492 | 28.197 | 82 | 105.467548 | 28.088025 | 131 | 119.68 | 30.63 |
| 34 | 107.038 | 28.5 | 83 | 104.250727 | 23.363 | 132 | 117.4 | 27.53 |
| 35 | 107.198 | 29.049 | 84 | 104.702829 | 23.125462 | 133 | 118.03 | 27.92 |
| 36 | 108.628 | 32.03 | 85 | 103.954021 | 28.53963 | 134 | 102.22 | 22.43 |
| 37 | 110.405 | 31.401 | 86 | 103.388085 | 23.36561 | 135 | 103.63 | 23.06 |
| 38 | 109.68 | 30.713 | 87 | 111.316667 | 26.466667 | 136 | 108.52 | 25.68 |
| 39 | 108.656 | 28.968 | 88 | 114.66805 | 27.81111 | 137 | 109.52 | 26.52 |
| 40 | 109.067 | 29.067 | 89 | 112.683333 | 27.25 | 138 | 110.67 | 25.5 |
| 41 | 109.319 | 28.157 | 90 | 114.4 | 28.5 | 139 | 109.97 | 25.97 |

| | | | | | | | | |
|----|---------|--------|----|-------|-------|-----|--------|-------|
| 42 | 110.363 | 25.85 | 91 | 116 | 29.5 | 140 | 110.62 | 26.7 |
| 43 | 117.774 | 27.841 | 92 | 119 | 27.6 | 141 | 118.32 | 29.82 |
| 44 | 118.858 | 28.361 | 93 | 119.6 | 30.6 | 142 | 115.87 | 29.43 |
| 45 | 119.198 | 27.787 | 94 | 115 | 31.5 | 143 | 118.13 | 29.68 |
| 46 | 119.997 | 27.197 | 95 | 110.7 | 26 | 144 | 108.33 | 29.7 |
| 47 | 119.433 | 30.412 | 96 | 109.4 | 29.5 | 145 | 108.3 | 30.65 |
| 48 | 118.835 | 30.11 | 97 | 108.8 | 28.82 | | | |
| 49 | 116.548 | 31.059 | 98 | 109.1 | 28.1 | | | |

Table S2. List of 21 environment variables used in this study.

| Category | Variable | Description | Unit |
|------------|-----------|---|------|
| Climate | Bio1 | Annual Mean Temperature | ° C |
| | Bio2 | Mean Diurnal Range (Mean of monthly) (max. temp-min. temp)) | ° C |
| | Bio3 | Isothermality (Bio2/Bio7) (*100) | - |
| | Bio4 | Temperature Seasonality (standard deviation * 100) | ° C |
| | Bio5 | Maximum Temperature of Warmest Month | ° C |
| | Bio6 | Minimum Temperature of Coldest Month | ° C |
| | Bio7 | Temperature Annual Range (Bio5-Bio6) | ° C |
| | Bio8 | Mean Temperature of Wettest Quarter | ° C |
| | Bio9 | Mean Temperature of Driest Quarter | ° C |
| | Bio10 | Mean Temperature of Warmest Quarter | ° C |
| | Bio11 | Mean Temperature of Coldest Quarter | ° C |
| | Bio12 | Annual Precipitation | mm |
| | Bio13 | Precipitation of Wettest Month | mm |
| | Bio14 | Precipitation of Driest Month | mm |
| | Bio15 | Precipitation Seasonality (Coefficient of Variation) | - |
| | Bio16 | Precipitation of Wettest Quarter | mm |
| | Bio17 | Precipitation of Driest Quarter | mm |
| | Bio18 | Precipitation of Warmest Quarter | mm |
| | Bio19 | Precipitation of Coldest Quarter | mm |
| Topography | Elevation | - | m |
| | Slope | - | ° |

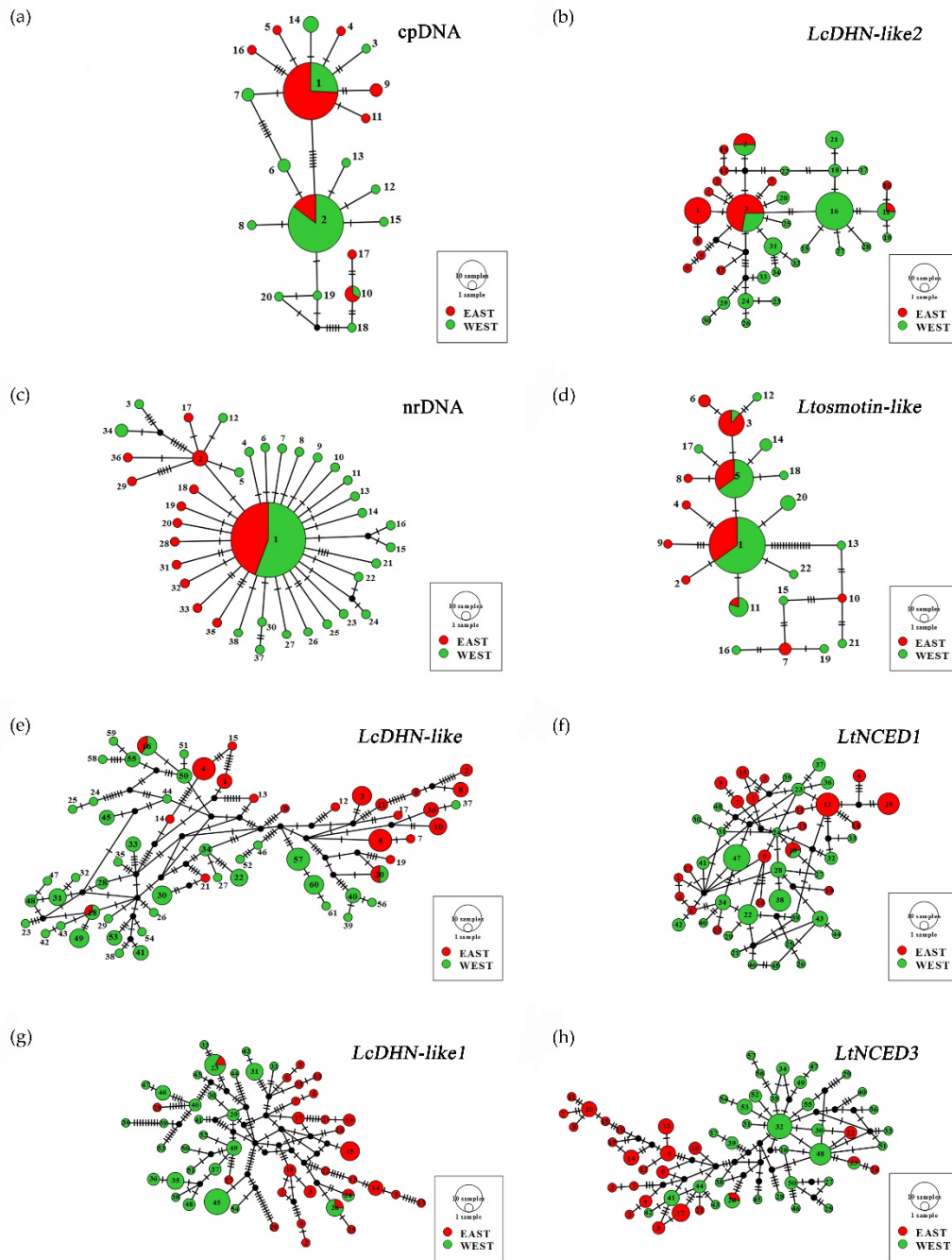


Figure S1. Haplotype networks of cpDNA, nrDNA, and six nuclear genes (*LcDHN-like*, *LcDHN-like1*, *LcDHN-like2*, *LtNCED1*, *LtNCED3* and *Ltosmotin-like*) in *L. chinense* (a-h). Red circles represent eastern populations, green circles represent western populations, and circle size is proportional to the frequency of a haplotype across all populations. Black dots represent unsampled haplotypes or extinct ancestral haplotypes, and black short lines between the nodes represent mutational steps.