**Online supplementary materials for: Urban spandrels: the roles of genetic drift, gene flow and selection in the formation of parallel clines.**

**Contents of online supplementary materials:**

* Supplementary text:
  + **Effects of initial allele frequency variation on cyanogenesis cline formation**
    - *Drift scenario 1:* *Gradient in carrying capacity across the matrix*
    - *Drift scenario 2:* *Colonization and founder events*
  + Effects of selection on linkage between *CYP79D15* and *Li*
* Supplementary tables SX – SX
* Supplementary figures SX – SX

**Effects of initial allele frequency variation on cyanogenesis cline formation**

*Drift scenario 1:* *Gradient in carrying capacity across the matrix*

The initial frequency of both dominant alleles influenced the formation and strength of phenotypic clines in HCN. The strongest clines occurred when the frequency of both dominant alleles (i.e. *CYP79D15* and Li) was 0.5 (Figure SXA). The weakest clines occurred when the frequency of one or both dominant alleles was low (i.e. 0.1) whereas clines of intermediate strength occurred when either or both alleles were at high frequency (i.e. 0.9, Figure SXA). These results hold regardless of migration rate; increasing migration reduced the strength of clines, regardless of initial allele frequencies (Figure SXA).

The proportion of significantly positive clines was always greater than the proportion of negative clines, independent of initial allele frequencies. The greatest proportion of significantly positive clines occurred when the frequency of both dominant alleles was 0.5, followed by cases when one or both alleles were at low frequency (i.e. 0.1) and finally by cases where one or both alleles were at high frequency (i.e. 0.9, Figure SXB). Significantly negative clines were rare and only arose when the frequency of one or both dominant alleles was high (Figure SXB).

*Drift scenario 2:* *Colonization and founder events*

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**Figure SX:** Effects of initial frequency of both dominant alleles (*CYP79D15* and *Li*) on (A) the mean strength of clines across 1000 simulations and (B) the proportion of significantly positive (open squares) and negative (black diamonds) clines. Simulations were run under a strong gradient in drift, manipulated by imposing a gradient in the maximum size of populations: rural populations were large (*N =* 1000) while urban population were small (*N =* 10). In (A), we examined the mean slope of clines under no (open circles), low (grey square), and (high (black diamonds) migration. In (B), positive clines reflect significantly (*P <* 0.05) less HCN in urban populations relative to rural populations while negative clines reflect the opposite. All points represent means or proportions ± 95% confidence intervals.