Review of: "Signals of Human Polygenic Adaptation: Moving Beyond Single-Gene Methods and Controlling for Population-Specific Linkage Disequilibrium"

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Potential competing interests: No potential competing interests to declare.

Careful analysis of the mechanisms behind genetic and phenotypic differentiation are useful, and this paper points out some useful avenues for thought.

The researcher's heavy emphasis on Fst is perhaps understandable given that so many others use it, but Fst-based scans for regions of the genome under selection have very high false-discovery rates, which are drastically reduced when complemented with tests based on alternative measures of genetic differentiation (Sherwin 2022). Therefore I recommend that other approaches be used in conjunction.

There was a lack of definitions. In particular, LD decay is nowhere defined as far as I can see. Does it mean decay with distance along the genome, or for a given genomic region, the decay with time or decay with geographic distance? Given the importance of LD decay in this article, we need to know for sure what is being analysed, otherwise it is difficult to evaluate the article. Other definitions are also lacking, such as EA3 and EA4.

There need to be many more citations, eg for

- " Studies have demonstrated that allelic covariance can help explain the observed population differences in these traits, emphasizing the importance of accounting for allelic covariance when investigating the genetics of polygenic traits under divergent selection."

- "Selection can lead to the accumulation of intergenic disequilibrium, a phenomenon that can cause differentiation at the gene level to become uncoupled from differentiation at the trait level or in the polygenic score, which represents the cumulative effect of multiple genetic variants on a trait."

"...Fst enrichment … relies on randomly matched sets of SNPs." Randomly matched to what? Do you mean randomly selected? Also this entire paragraph needs support by citations and/or algebraic demonstration.

- Need citation for "Cronbach's Alpha, "

REFERENCE: Sherwin, WB. 2022. Bray-Curtis (AFD) Differentiation in Molecular Ecology: Forecasting, an Adjustment (AA), and Comparative Performance in Selection Detection Ecology and Evolution 12:e9176. http://dx.doi.org/10.1002/ece3.9176