Supplemental Information

# R scripts to generate Figure 1

#install and load the package

install.packages("https://github.com/YingZhou001/POPdemog/raw/master/POPdemog\_1.0.3.tar.gz", repos=NULL)

library(POPdemog)

#save the simulation command to a file named “model-Tennessen.cmd”

cat("macs 2025 15000000 -i 10 -r 3.0e-04 -t 0.00069 -T -I 4 10 1006 1008 1 0 -n 4 0.205 -n 1 58.00274 -n 2 70.041 -n 3 187.55 -eg 0.9e-10 1 482.46 -eg 1.0e-10 2 570.18 -eg 1.1e-10 3 720.23 -em 1.2e-10 1 2 0.731 -em 1.3e-10 2 1 0.731 -em 1.4e-10 3 1 0.2281 -em 1.5e-10 1 3 0.2281 -em 1.6e-10 2 3 0.9094 -em 1.7e-10 3 2 0.9094 -eg 0.007 1 0 -en 0.007001 1 1.98 -eg 0.007002 2 89.7668 -eg 0.007003 3 113.3896 -eG 0.031456 0 -en 0.031457 2 0.1412 -en 0.031458 3 0.07579 -eM 0.031459 0 -ej 0.03146 3 2 -en 0.0314601 2 0.2546 -em 0.0314602 2 1 4.386 -em 0.0314603 1 2 4.386 -eM 0.0697669 0 -ej 0.069767 2 1 -en 0.0697671 1 1.98 -en 0.2025 1 1 -ej 0.9575923 4 1 -em 0.06765 2 4 32 -em 0.06840 2 4 0", file="model-Tennessen.cmd")

#plot the demographic graph

png("fig\_new.png", width=1400, height=1200, res=200)

par(mfrow=c(2,2), mar=c(1.1, 4.6, 2.1, 2.1), xpd=T, las=1); cex.lab=1.2;cex.axis=1.1

col.pop=c("brown", "blue", "gold3", "forestgreen")

lab.pop=c("AFR", "EUR", "ASI", "ARC")

#figure 1A

PlotMS(input.file="std-model-Tennessen.cmd", type="macs", N4=30000, size.scale="log", log.base=50, inpos = c(1,4,7,9), time.scale = "kyear", col.pop=col.pop, pops=lab.pop, cex.lab=cex.lab, cex.axis=cex.axis, xlab="", length.arrow=0.05)

text(-3.7, 1000, label="A", cex=2.5)

#figure 1B

PlotMS(input.file="std-model-Tennessen.cmd", type="macs", N4=30000, size.scale="log", log.base =50, inpos = c(1,4,7,9), time.scale= "log10year", col.pop=col.pop, pops=lab.pop, cex.lab=cex.lab, cex.axis = cex.axis, xlab="", length.arrow=0.05)

#add the population size ruler to the plot

NRuler(x=6, y=7, Nsize=c(1e5, 1e6, 1e7), Nlab=c("1e5", "1e6", "1e7"), N4=30000, size.scale="log",log.base=50, lwd=1, cex=0.8)

text(-3.7, 8, label="B", cex=2.5)

#figure 1C

PlotMS(input.file="std-model-Tennessen.cmd", type="macs", N4=30000, size.scale="topology", inpos = c(1,3,5,7), col.pop=col.pop, pops=lab.pop, cex.lab=cex.lab, cex.axis = cex.axis, xlab="", length.arrow=0.1, m.adjust=0.001)

text(-1.4, 41, label="C", cex=2.5)

#figure 1D

PlotMS(input.file="std-model-Tennessen.cmd", type="macs", N4=30000, time.scale="log10year", plot.out=F, demo.out=T)->out;

PlotMig(time\_pt=1000, time.scale="year", demograph\_out=out$demograph\_out, mig\_par=out$mig\_par, col.pop=col.pop, size.scale="linear", linear.scale=0.000005, length.arrow=0.1, xlim=c(0,20), ylim=c(0,24));

N<-NOut(time\_pt=1000, time.scale="year", demograph\_out=out$demograph\_out)

legend("topleft", legend=paste(lab.pop, ":", N), col=col.pop, pch=20, bty="n")

text(-6.5, 26.2, label="D", cex=2.5)

dev.off()