Expected genotype counts

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After dispersal

$$\begin{aligned}
\mathrm{E}[\mathrm{n'}_{AA}(x, t=0)] &= \frac{m e^{\frac{-x^2}{4D}}}{\sqrt{4\pi D}} \\
\mathrm{E}[\mathrm{n'}_{Aa}(x, t=0)] &= 0 \\
\mathrm{E}[\mathrm{n'}_{aa}(x, t=0)] &= \rho
\end{aligned}$$

After dispersal and reproduction (but before viability selection)

$$\begin{aligned}
\mathrm{E}[\mathrm{n''}_{AA}(x, t=1)] &= \frac{\left[m e^{\frac{-x^2}{4D}} + \rho\sqrt{4\pi D}\right]\left[m^2 e^{\frac{-x^2}{2D}}\right]}{\sqrt{4\pi D}\left[m e^{\frac{-x^2}{4D}} + \rho\sqrt{4\pi D}\right]^2} \\
\mathrm{E}[\mathrm{n''}_{Aa}(x, t=1)] &= \frac{\left[m e^{\frac{-x^2}{4D}} + \rho\sqrt{4\pi D}\right]\left[2m\rho e^{\frac{-x^2}{4D}}\sqrt{4\pi D}\right]}{\sqrt{4\pi D}\left[m e^{\frac{-x^2}{4D}} + \rho\sqrt{4\pi D}\right]^2} \\
\mathrm{E}[\mathrm{n''}_{aa}(x, t=1)] &= \frac{\left[m e^{\frac{-x^2}{4D}} + \rho\sqrt{4\pi D}\right]\left[4\pi D\rho^2\right]}{\sqrt{4\pi D}\left[m e^{\frac{-x^2}{4D}} + \rho\sqrt{4\pi D}\right]^2}
\end{aligned}$$

After dispersal, reproduction, and viability selection

$$\mathrm{E}[\mathrm{n}_{AA}(x,t=1)] = \frac{[1+2\alpha k]\left[m^2 e^{\frac{-x^2}{2D}}\right]\left[m e^{\frac{-x^2}{4D}} + \rho\sqrt{4\pi D}\right]}{\left[\sqrt{4\pi D}\right][1+2\alpha k]\left[m^2 e^{\frac{-x^2}{2D}}\right] + [1+(\alpha-1)k]\left[8\pi D m\rho e^{\frac{-x^2}{4D}}\right] + \left[4\pi D\rho^2\sqrt{4\pi D}\right]}$$

$$\mathrm{E}[\mathrm{n}_{Aa}(x,t=1)] = \frac{[1+(\alpha-1)k]\left[m e^{\frac{-x^2}{4D}} + \rho\sqrt{4\pi D}\right]\left[2m\rho e^{\frac{-x^2}{4D}}\right]}{[1+2\alpha k]\left[m^2 e^{\frac{-x^2}{2D}}\right] + [1+(\alpha-1)k]\left[2m\rho e^{\frac{-x^2}{4D}}\right]\left[\sqrt{4\pi D}\right] + [4\pi D\rho^2]}$$

$$\mathrm{E}[\mathrm{n}_{aa}(x,t=1)] = \frac{\left[4\pi D\rho^2\right]\left[m e^{\frac{-x^2}{4D}} + \rho\sqrt{4\pi D}\right]}{\left[\sqrt{4\pi D}\right][1+2\alpha k]\left[m^2 e^{\frac{-x^2}{2D}}\right] + [1+(\alpha-1)k]\left[8\pi D m\rho e^{\frac{-x^2}{4D}}\right] + \left[4\pi D\rho^2\sqrt{4\pi D}\right]}$$