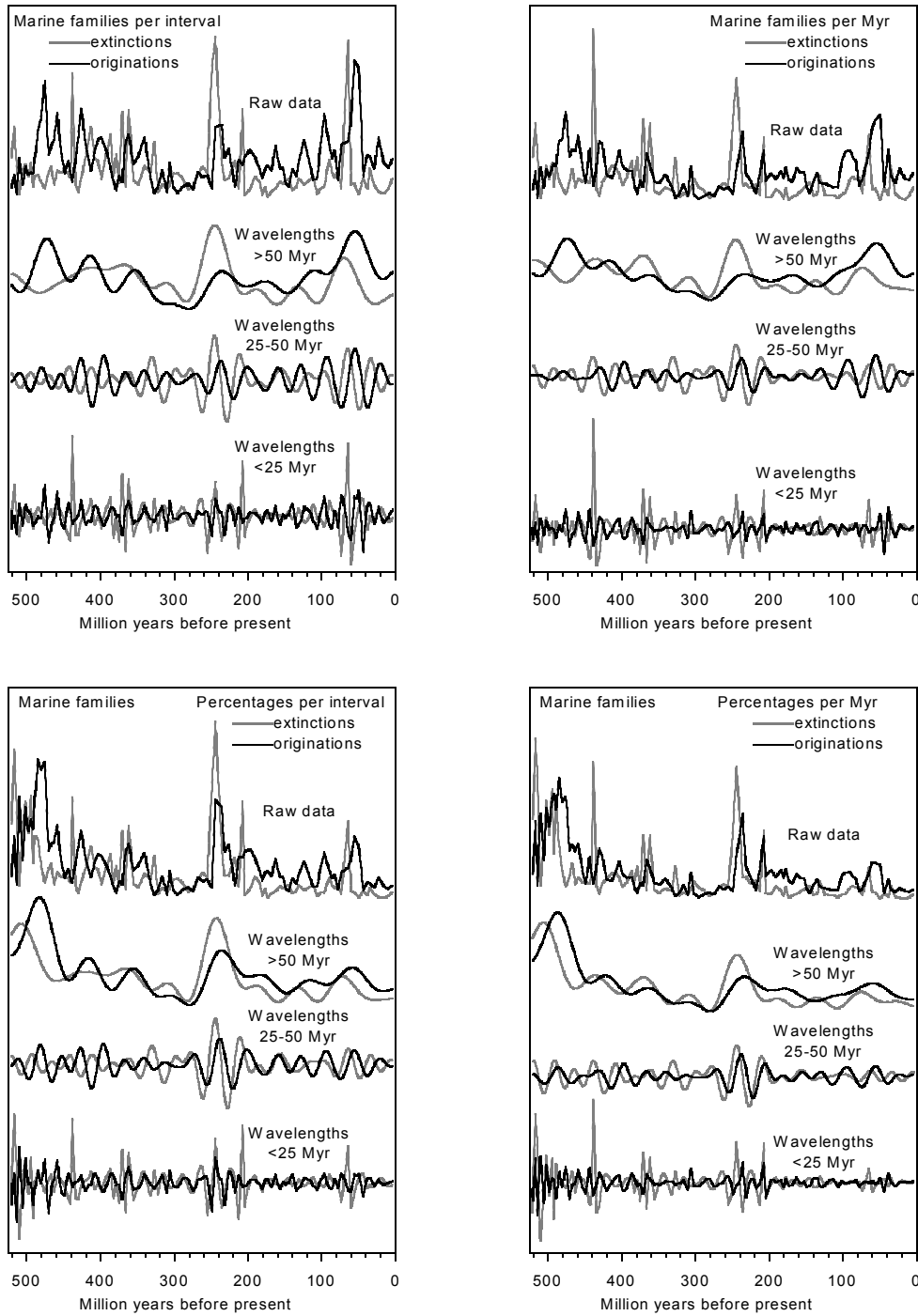
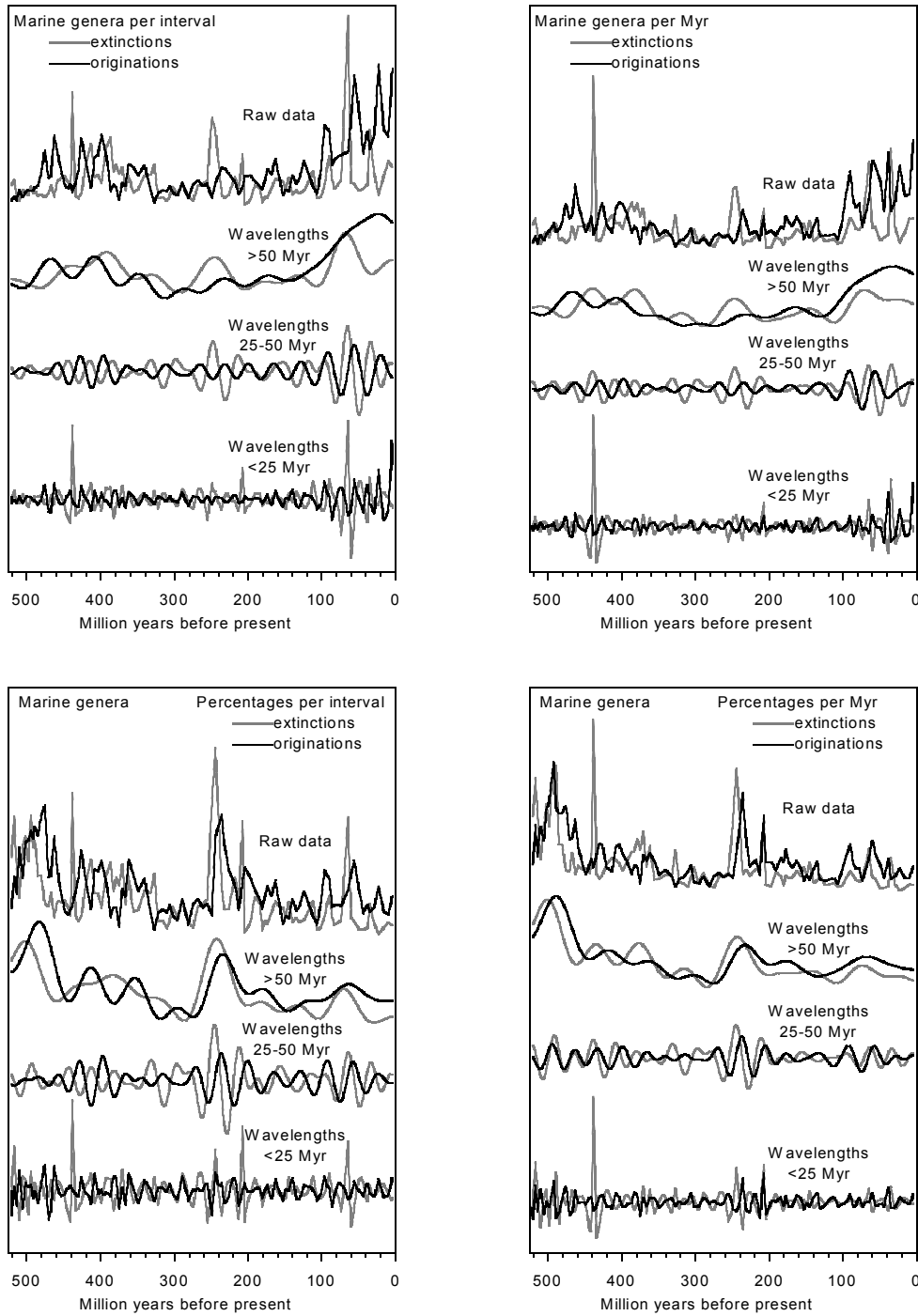


Supplementary Figure 1. Fourier power spectra for extinction and origination rates (grey and black lines, respectively) of fossil genera, as measured by four metrics: genera per stratigraphic interval (a) and per million years (b), and percentages of total diversity per stratigraphic interval (c) and per million years (d). Insets show the raw time series. Spectra are smoothed over a window spanning 5% of the width the plot. Fine lines are the median and 90% confidence limits for spectral power of random white noise at each wavelength, estimated by repeating the same analysis on 10^4 random re-shuffles of the original extinction data. Origination rates have markedly lower spectral power than extinction rates at wavelengths less than 30 Myr, indicating that they are much less variable over short time scales.



Supplementary Figure 2, part 1. Extinction and origination rates (gray and black lines, respectively), of marine fossil families, separated into long-wavelength (>50 Myr), intermediate-wavelength (25-50 Myr) and short-wavelength (<25 Myr) components by Fourier filtering.



Supplementary Figure 2, part 2. Extinction and origination rates (gray and black lines, respectively), of marine fossil genera, separated into long-wavelength (>50 Myr), intermediate-wavelength (25-50 Myr) and short-wavelength (<25 Myr) components by Fourier filtering.