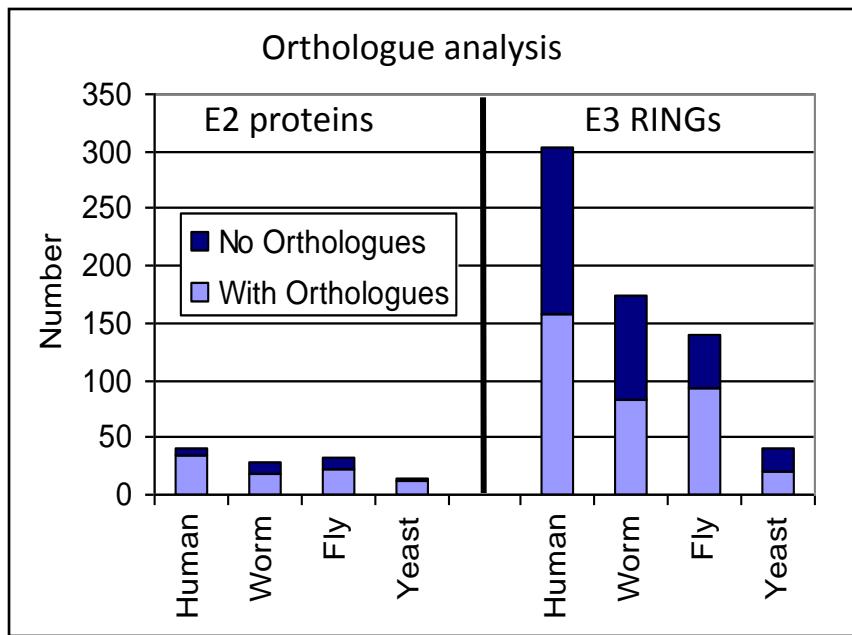


## Supplementary File 1: Evolutionary expansion within E2 and E3 RING protein families



Throughout evolution there has been a significant increase in the number of E2 and E3-RING proteins encoded within different eukaryotic genomes. Consequently several human E2 proteins and many E3-RING proteins have no direct orthologue in fly, worm or yeast (dark blue areas in chart).