



Fig. 13. Enzymatic production of FDCA from renewable HMF. **A.** Scheme for a cosubstrate-free cascade including: **i)** HMF oxidation by AAO to DFF, whose hydrated (*gem*-diol) form undergoes a second AAO oxidation yielding FFCA that is not substrate of AAO due to its low hydration degree; and **ii)** Conversion of unhydrated FFCA into FDCA by UPO at expenses of the H_2O_2 previously formed by AAO, with H_2O as the only by-product. **B.** Time course of HMF products by the above cascade (GC-MS analysis) with AAO and UPO additions at times 0 and 4 h, respectively (DFF was not detected due to its rapid conversion by AAO). Adapted from Carro et al. (2015).