

Electronic supplementary information

Harnessing inherently hierarchical microstructures of biomass to in situ construct three-dimensional nanoporous nitrogen-doped carbons as efficient and durable oxygen reduction electrocatalysts

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Fig. S1 Photograph of living *E. tirucalli*.

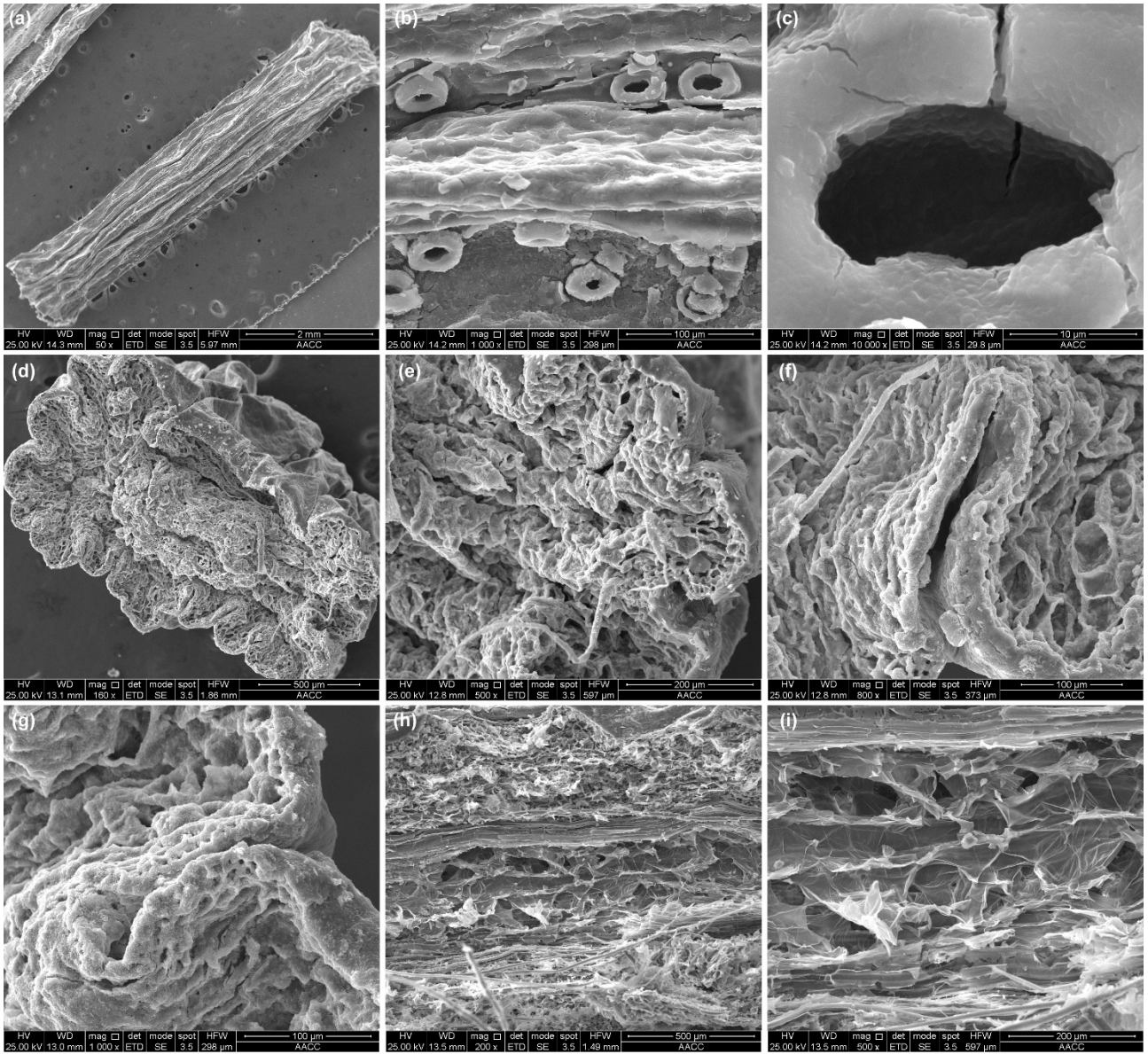


Fig. S2 SEM images of the external surface (a–c), the cross-section (d–g) and the internal part (h and i) of fresh *E. tirucalli*.

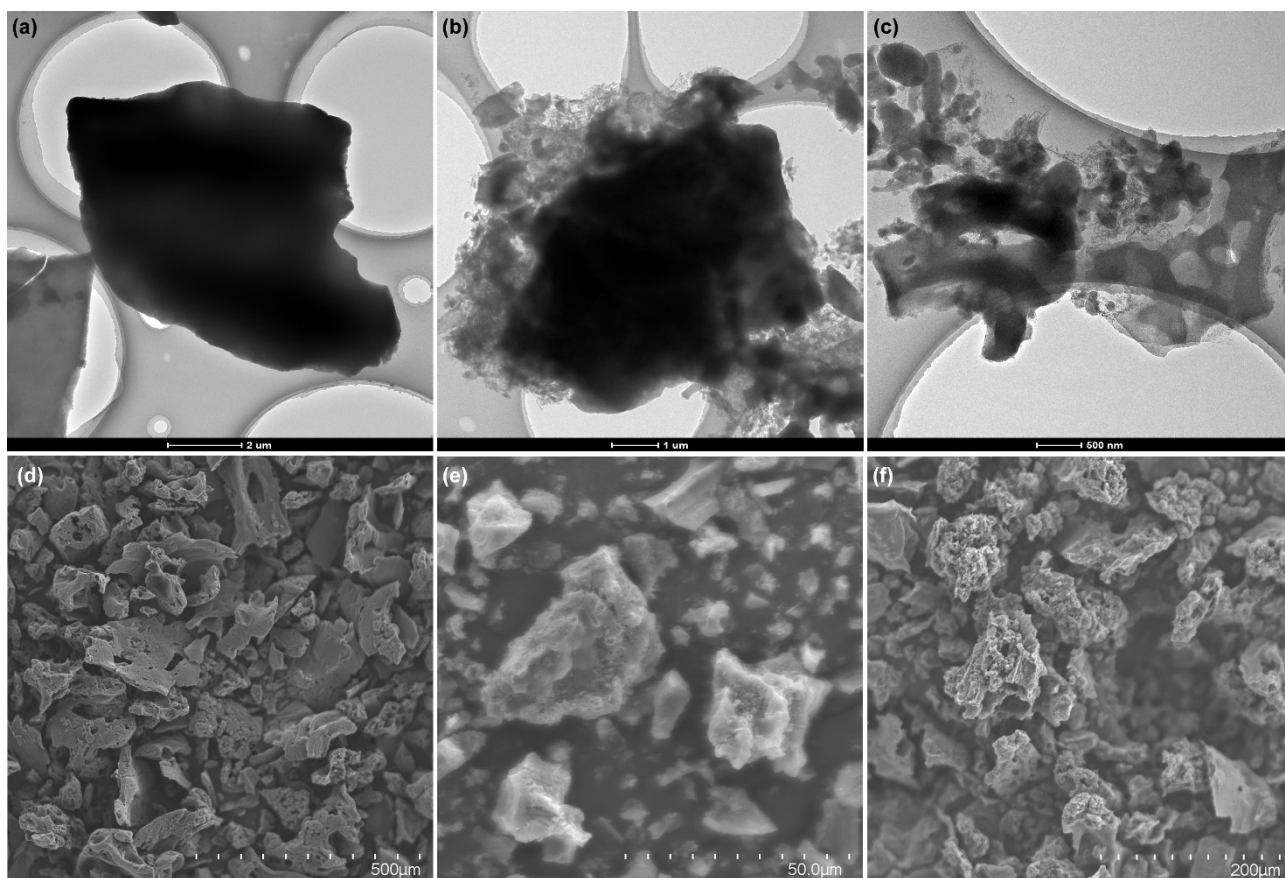


Fig. S3 TEM images of NA (a), NE (b) and EA (c); SEM images of NA (d), NE (e) and EA (f).

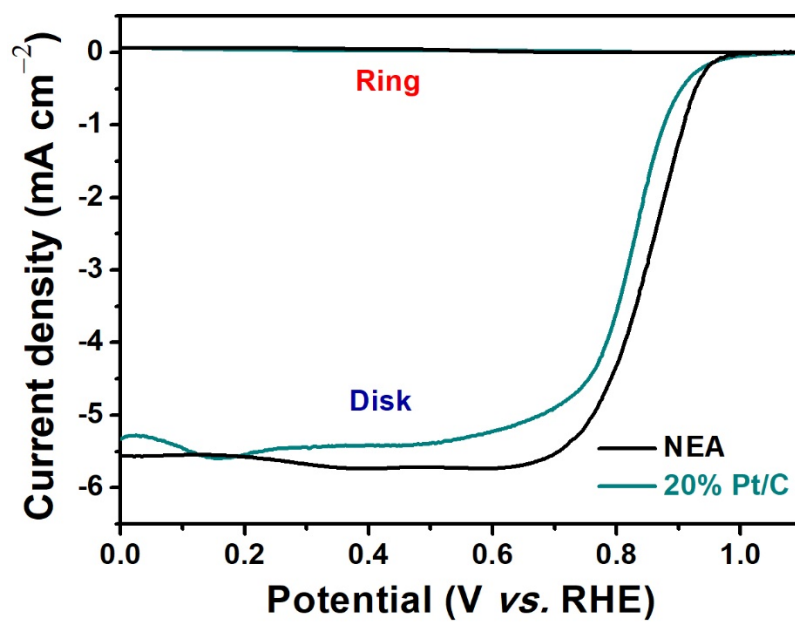


Fig. S4 RRDE measurements in the O₂-saturated 0.1 M KOH with a scan rate of 10 mV s⁻¹ at a rotating rate of 1600 rpm at 25 °C: showing the disk and ring current densities of NEA and 20% Pt/C.