

Table S1. Descriptions of pollen zone and dominant charcoal fragment along three sediment cores from Unguja Ukuu.

Core	Pollen zone	Pollen zone description	Charcoal description
AUU1	AUU-1 ~ Prior CE 635-1265 -1.25 -(-0.74) m a.m.s.l. Depth 135-84 cm	Mangroves have the highest concentration (79-95%) followed by terrestrial herbaceous (4-26%) non-mangrove arboreal (0-12%) and unknown pollen (0-1%). Mangroves are characterised by <i>Rhizophora mucronata</i> (30-71%), <i>Bruguiera/Ceriops</i> (15-34%), <i>Avicennia marina</i> (1-13%), and <i>Sonneratia alba</i> (0-24%). Terrestrial herbaceous taxa are present and dominated by Asteraceae, Poaceae and Cyperaceae. Non-mangrove arboreal namely Anacardiaceae, <i>Casuarina</i> , <i>Cocos nucifera</i> and Sapindaceae represents in low percentage.	Charcoal fragments in all size classes are present with the peak of all sizes class at around 105 cm. The sample at 104 cm depth had the lowest representation in all size classes. The total charcoal content is relatively high, ranging between 29 and 219 fragments/mm ² .
	AUU-2a CE 1265-1720 -0.74 -(-0.38) m a.m.s.l Depth 84-48 cm	Mangroves (4-79%), especially <i>R. mucronata</i> (4-47%) and <i>Bruguiera/Ceriops</i> (0-27%) slightly decrease. Non-mangrove arboreal (8-75%) fluctuated and increased at the base of the zone with the highest representation of <i>Cocos nucifera</i> (12-74%). Poaceae (5-25%) has the greatest abundance among terrestrial herbaceous taxa.	The size classes of charcoal fragments in 3-10 µm, 11-25 µm, 26-50 µm, 51-75 µm, and 76-100 µm are gradually reduced from the AUU-1 zone. However, the proportion of charcoal fragments larger than 100 µm increased slowly, with a peak at 60 cm. The total charcoal content varies between 26 and 156 fragments/mm ² .
	AUU-2b CE 1720-1940 -0.38-(-0.02) m a.m.s.l. Depth 48-12 cm	Mangroves dominate this zone (2-78%), particularly <i>S. alba</i> (0-37%) with <i>Bruguiera/Ceriops</i> (0-20%) having the lowest percentage across the AUU-2b. Non-mangrove arboreal increases are dominated by <i>Cocos nucifera</i> (0-76%) and <i>Arecaceae</i> (0-24%).	
	AUU-3 ~ CE 1940 to the present -0.02-0.10 m a.m.s.l. Depth 12-0 cm	Mangroves (69-88%) increased, particularly <i>S. alba</i> (6-59%) followed by <i>R. mucronata</i> (15-38%), <i>Bruguiera/Ceriops</i> (9-34%) and <i>A. marina</i> (3-5%). Non-mangrove arboreal have dropped to minimum levels, with only a few <i>Buddleja</i> sp. (0-9%) remaining, while <i>Cocos nucifera</i> disappeared. Terrestrial herbaceous taxa (9-22%) are represented mainly by Poaceae (9-13%)	Charcoal fragments in the 3-10 µm, 11-25 µm, and 51-75 µm size classes decreased sharply from the AUU-2 zone to the middle of this zone. The total charcoal content ranges from 84 to 150 fragments/mm ² .

Core	Pollen zone	Pollen zone description	Charcoal description
BUU1	BUU-1 ~Prior CE 502-671 -1.33-(-1.07) m a.m.s.l. Depth 150-124 cm	Mangroves (90-97%) dominate by <i>R. mucronata</i> (24-59%), <i>Bruguiera/Ceriops</i> (17-51%), <i>S. alba</i> (6-14%) and <i>A. marina</i> (0-10%). Back mangroves represented by <i>Lumnitzera</i> (0-4%) and <i>Acrostichum</i> (0-3%). Non-mangrove arboreal record low percentages (0-6%). Poaceae (0-5%) are represent terrestrial herbaceous taxa.	The highest representation of charcoal fragments is observed in classes 3-10 μm and 11-25 μm . The charcoal fragments larger than 100 μm disappear at the bottom of the zone but continue to rise at around 140 cm. Total charcoal contents are low, ranging from 16 to 27 fragments/mm ² .
	BUU-2 ~ CE 671-1578 -1.07-(-0.19) m a.m.s.l. Depth 124-36 cm	Mangrove are the primary group (89-100%) dominated by <i>R. mucronata</i> (27-70%) and <i>Bruguiera/Ceriops</i> (22-70%) whereas <i>S. alba</i> slightly decreases from the previous zone. Back mangrove (0-5%) increased with the presence of <i>Lumnitzera</i> (0-4%) and <i>Acrostichum</i> (0-1%). Non- mangrove arboreal (0-2%) was lower than in other zones. Terrestrial herbaceous taxa (0-11%) is increasing in this zone.	Charcoal fragments of all sizes have a high appearance, with some variation from the base to the middle of the BUU-2 zone. Then they dropped dramatically to the top of this zone. Furthermore, charcoal fragments in classes 76-100 μm and >100 μm are disappearing from around 68 cm to the top of the BUU1 core. Total charcoal content varies between 4-41 fragments/mm ² .
	BUU-3 ~ CE 1578 to the present -0.19-0.17 m a.m.s.l. Depth 36-0 cm	Mangroves (76-100%) remained extremely high in this zone. <i>S. alba</i> (2-18%) and <i>A. marina</i> (0-6%) increase towards the top of this zone. Back mangroves (0-2%) reach their minimum values, with slight decrease in <i>Acrostichum</i> (0-2%). Non-mangrove arboreal (0-2%) are rare with only Convolvulaceae (0-2%) and <i>Casuarina</i> (0-1%) present. Terrestrial herbaceous taxa (0-23%) significantly increases, with Poaceae (0-23%) and Poaceae with pollen size larger than 40 μm (0-4%).	Charcoal fragments in 3-10 μm , 11-25 μm and 26-50 μm remain demonstrate low representation until at the depth of 16 cm. Whereas other classes does not present from the basal of this zone. After at the depth of 16 cm, charcoal fragments in 3-10 μm , 11-25 μm , 26-50 μm and 51-75 μm sharply increased toward to the surface sediment. Total charcoal contents are relatively low ranging from 5-14 fragments/mm ² .
CUU1	CUU-1 ~Prior to BCE 3225-2733 0.48-0.64 m a.m.s.l. Depth 90-74 cm	Non-mangrove arboreal (45-73%) dominates with the majority of <i>Cocos</i> sp. (45-73%). Terrestrial herbaceous taxa are present (17-42%) including Poaceae (16-46%) and <i>Casuarina</i> (0-1%). Mangroves (7-23%) characterised by <i>S. alba</i> (4-12%), <i>R. mucronata</i> (3-6%) and <i>Bruguiera/Ceriops</i> (0-6%). Back mangroves are rare with only <i>Lumnitzera</i> (0-2%) present.	Charcoal fragment which greater than 100 μm have the highest representation while charcoal fragments in class 3-10 μm have the lowest in this zone. Total charcoal contents are relatively low ranging from 13-38 fragments/mm ² .

Core	Pollen zone	Pollen zone description	Charcoal description
	CUU-2 ~ BCE 2733-1069 0.64-0.9 m a.m.s.l. Depth 74-48 cm	Non-mangrove arboreal remained extremely high in this zone with the fluctuation of <i>Cocos</i> sp. (20-58%). Terrestrial herbaceous taxa (20-30%) slightly increase from the previous zone with Poaceae (10-28%). Mangrove increase with <i>Avicennia</i> (14-50%), <i>S. alba</i> (5-37%), <i>R. mucronata</i> (5-10%) and <i>Bruguiera/Ceriops</i> (1.4-6%). Back mangroves increase with <i>Lumnitzera</i> (0-6%).	All size classes fluctuated before reaching a peak at the uppermost part of the zone at varying depths from 48 to 52 cm. Except for the largest size classes, which have a maximum of 68 cm. Total charcoal content varies between 13 and 45 fragments/mm ² .
	CUU-3 ~BCE 1069 - CE 559 0.9-1.01 m a.m.s.l. Depth 48-37 cm	Mangroves (50-83%) increase towards the top of this zone with the highest representation of <i>S. alba</i> (35-70%). Non-mangrove arboreal (4-27%) slightly decreased including <i>Cocos nucifera</i> (0-27%), which mostly disappears at the end of the zone. The percentages of Poaceae (11-28%) in terrestrial herbaceous taxa remain steady. Back mangroves characterised by <i>Lumnitzera</i> (0-3%) declined slightly from the previous zone.	This zone has a high representation of charcoal fragments in size classes 3-10 μm , 11-25 μm , and 26-50 μm . While the other three classes, 51-76 μm , 76-100 μm , and > 100 μm , decreased gradually from the previous zone. When compared to other zones, total charcoal contents are relatively high, ranging from 40 to 59 fragments/mm ² .
	CUU-4 ~ CE 559 to the present 1.01-1.38 m a.m.s.l. Depth 37-0 cm	Mangroves have risen sharply once again, which is characterised by <i>Bruguiera/Ceriops</i> (8-57%), <i>R. mucronata</i> (18-50%), <i>S. alba</i> (2-40%) and <i>A. marina</i> (5-16%). Non-mangrove arboreal sharply decreased with <i>Cocos nucifera</i> (0-4%). Terrestrial herbaceous taxa (3-24%) decreased with Poaceae (3-19%). Back mangroves dominated by <i>Lumnitzera</i> (0-3%).	All size classes of charcoal fragments in this zone are significantly smaller than in the previous zone, especially classes 76-100 μm and > 100 μm . Total charcoal contents are low, ranging from 4 to 24 fragments/mm ² .