

Identification and definition of stock units of the commercially important demersal resources off Angola and Namibia

BCC Project -LMR/DEM/09/09

Partipation:

INIP-Angola

NatMIRC-Namibia

UNAM-Namibia

Principal investigator: Kumbi Kilongo

OBJECTIVES

- **Describe the distribution of adults of commercially important demersal resources off Angola & Namibia;**
- **Identify the nursery areas,**
- **Define and delineate stock units these demersal species,**

OBJECTIVES

- **Examine how current management measures based on spatial limits, such as distance from the coast and closed areas & relate to the distribution of the resources.**
- **Assess how the information on distribution can be used to improve management of Angola's demersal fisheries.**

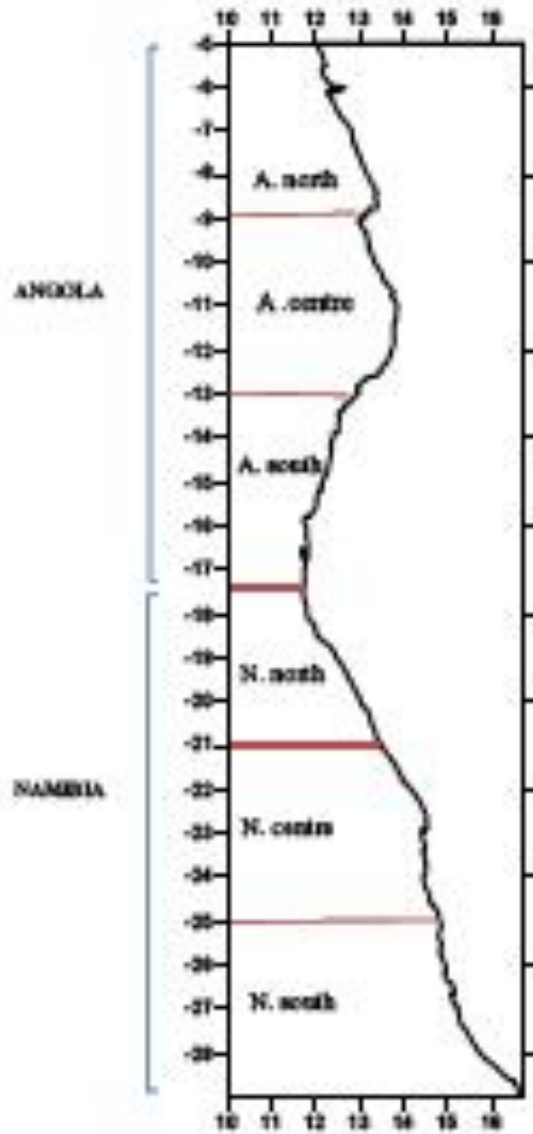
THE SELECTED COMMERCIALY IMPORTANT DEMERSAL RESOURCES

Family	Species	Common name
Sparidae	<i>Dentex angolensis</i>	Angola dentex
	<i>Dentex banardi</i>	Barnard dentex
	<i>Dentex canariensis</i>	Canary dentex
	<i>Dentex congoensis</i>	Congo dentex
	<i>Dentex gibbosus</i>	Pink dentex
	<i>Dentex macrophthalmus</i>	Large eye dentex
	<i>Pagellus bellottii</i>	Red pandora
	<i>Pagrus caeruleostictus</i>	
Sciaenidae	<i>Argyrosomus hololepidotus</i>	Southern meagre
	<i>Atractoscion aequidens</i>	African weakfish
	<i>Pentheroscion mbizi</i>	Blackmouth croaker
	<i>Pseudotolithus senegalensis</i>	Cassava croaker
	<i>Pseudotolithus typus</i>	Longneck croaker
	<i>Pteroscion peli</i>	Boe drum
	<i>Umbrina canariensis</i>	Canary drum
Merluccidae	<i>Merluccius capensis</i>	Cape hake
	<i>Merluccius polli</i>	Benguela hake
Haemulidae	<i>Pomadasyus incisus</i>	Bastard grunt
	<i>Pomadasyus jubelini</i>	Sompat grunt
Polynemidae	<i>Galeoides decadactylus</i>	Royal threadfin
	<i>Pentanemus quinquarius</i>	Royal threadfin
Ariidae	<i>Arius heudeloti</i>	Smoothmout sea catfish
	<i>Arius latiscutatus</i>	Rough-head sea catfish
	<i>Arius parkii</i>	Guineansea catfish
Myctophidae	Myctophidae	
Aristeidae	<i>Aristeus varidens</i>	Striped red shrimp
Penaeidae	<i>Parapenaeus longirostris</i>	Deepwater rose shrimp

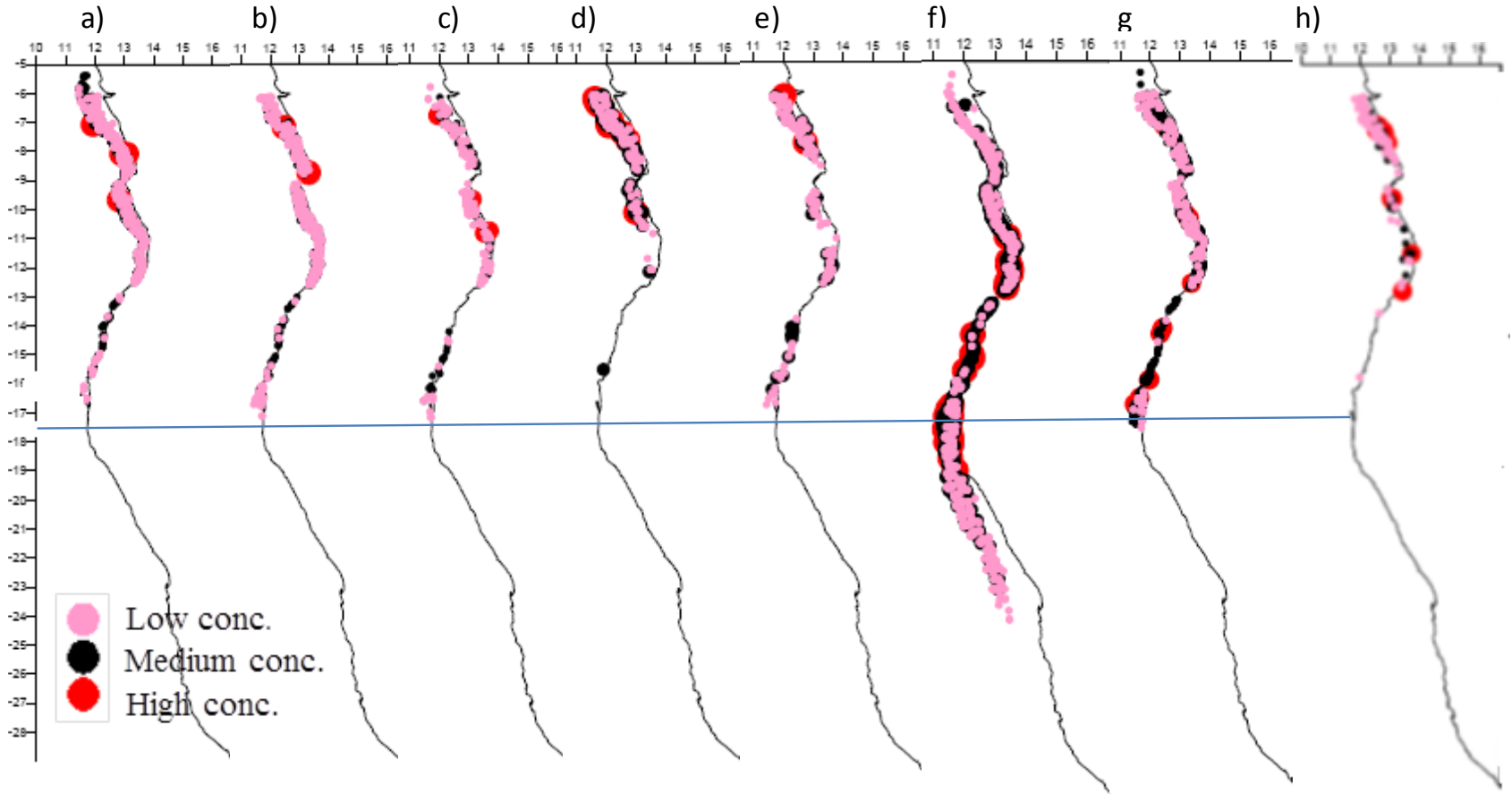
SOURCE OF DATA

- **Survey catch data -Angola: 1994-2011**
- **Coastal survey catch data -Angola: 2006-2009**
- **Demersal survey catch data –Namibia: 2000-2011**

STUDY AREA

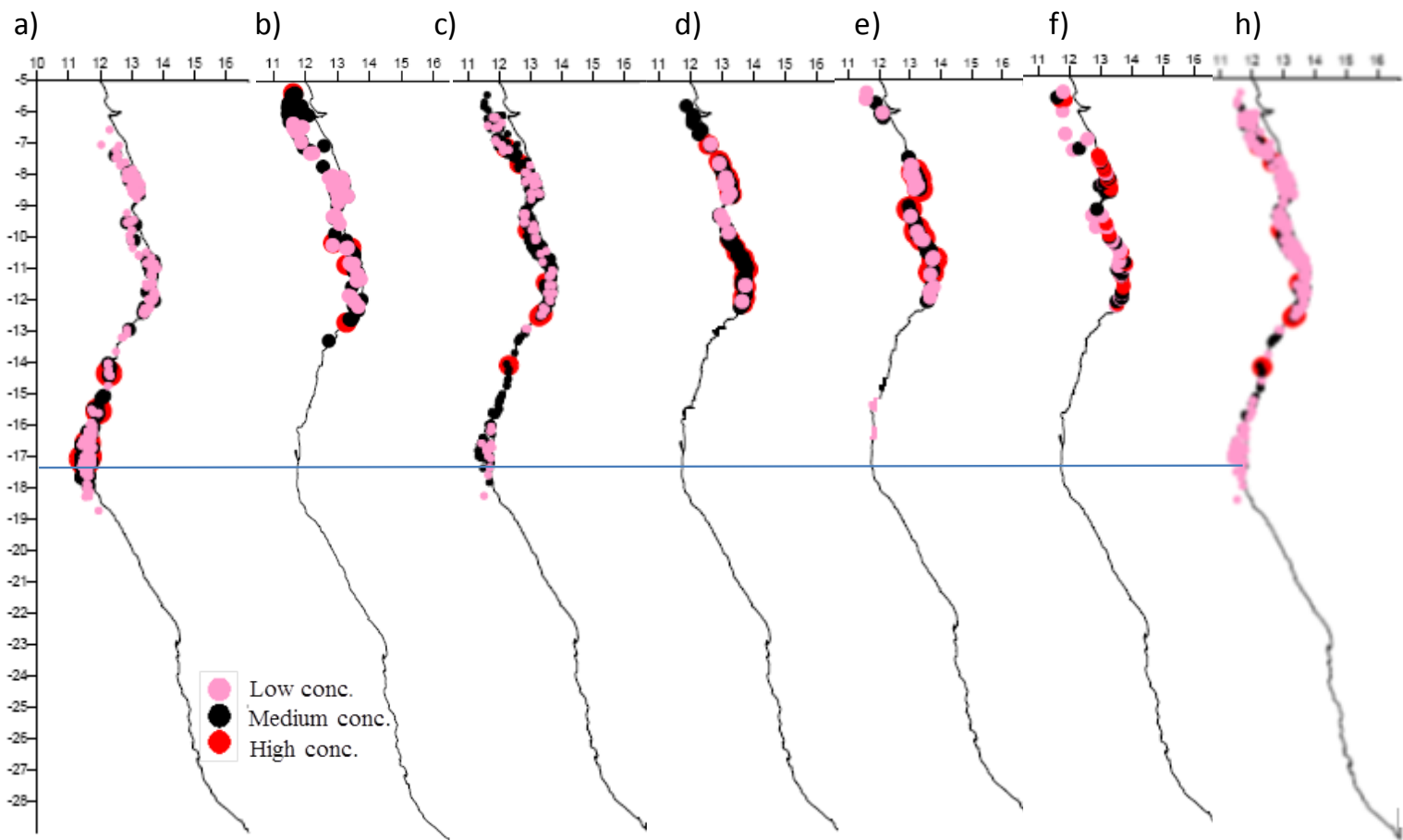


DISTRIBUTION OF SPARIDAE SPECIES: a) *D. Angolensis*, b) *D. banardi*, c) *D. canariensis*, d) *D. Congoensis*, e) *D. Gibbosus*, f) *D. Macrophthalmus*, g) *P. Bellottii*, h) *P. caeruleostictus*



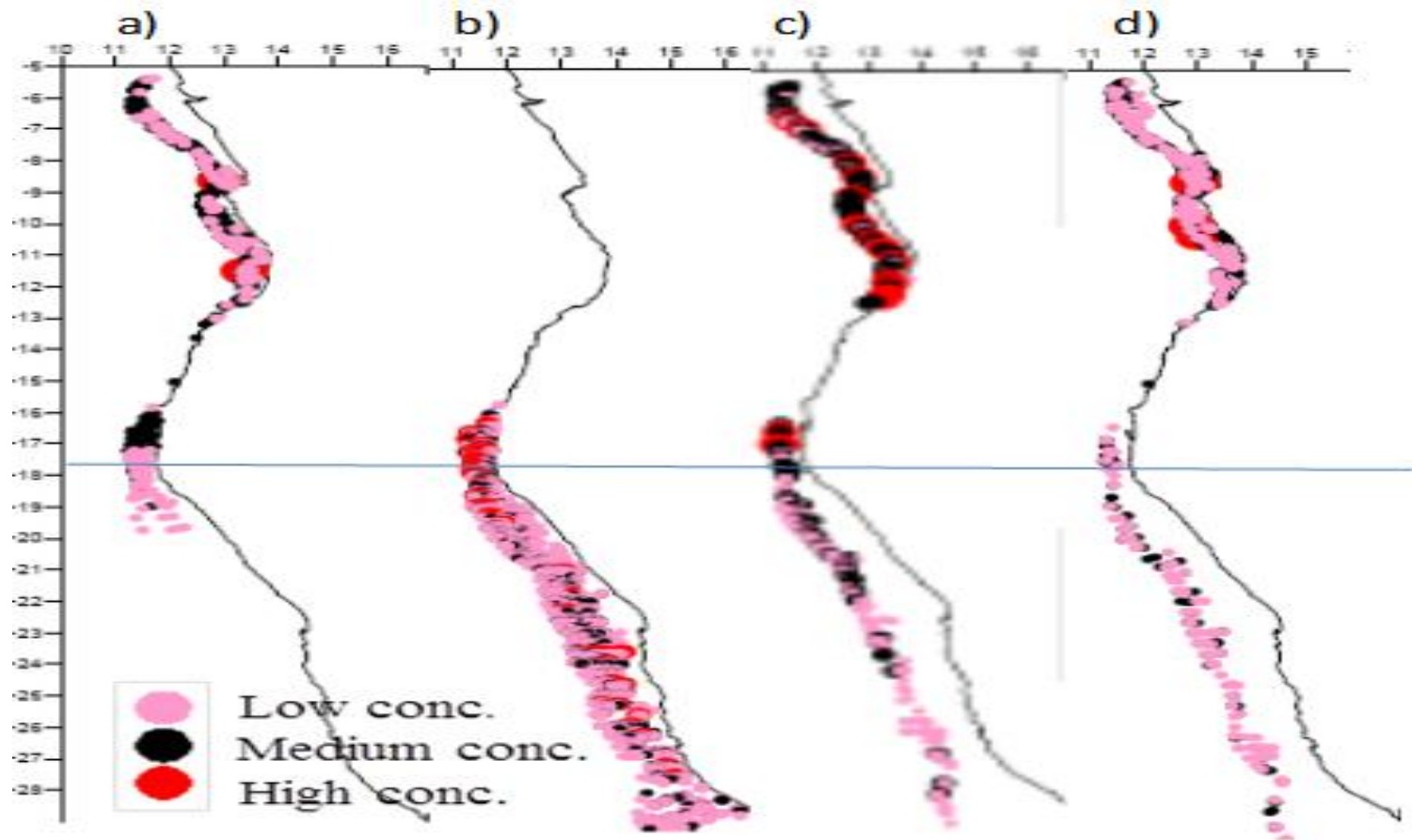
Only *D. Macrophthalmus* is distributed to central Namibia

DISTRIBUTION OF SCIAENIDAE SPECIES: *a) A. Aequidens, b) P. Mbizi, c) U. canariensis, d) P. Typus, e) P. Senegalensis, f) P. Peli, g) A. hololepidotus*



Only some few species around the border with Namibia

DISTRIBUTION OF MERLUCCIDAE SPECIES: a) *M. polli*, b) *M. capensis*, SHRIMPS: c) *A. varidens*, d) *P. longirostris*



***M. capensis* is replaced by *M. polli* northward**

SIMILARITIES BETWEEN ZONES

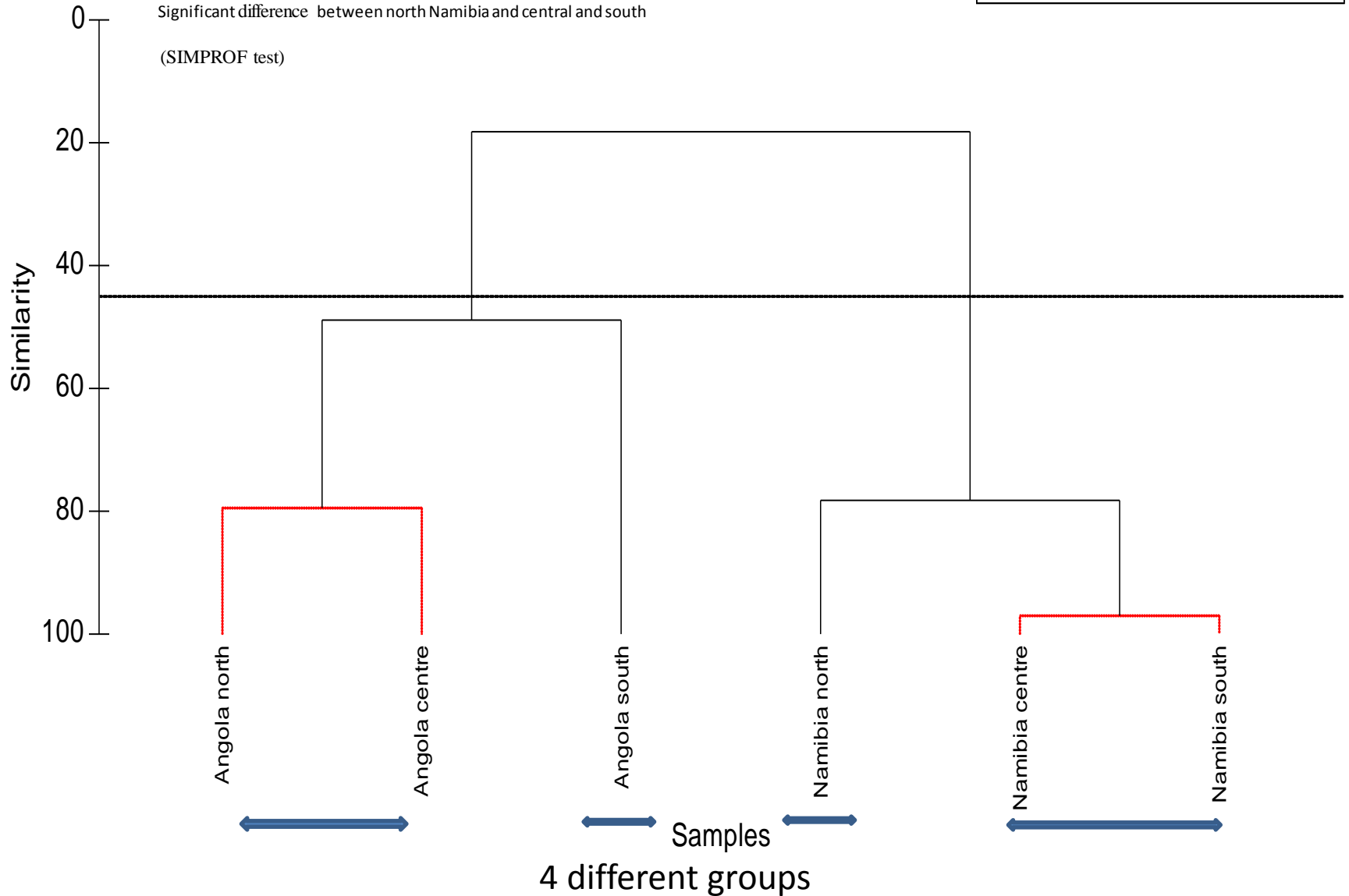
Group average

Transform: Fourth root
Resemblance: S17 Bray Curtis similarity

Significant difference between south Angola and and both central and north

Significant difference between north Namibia and central and south

(SIMPROF test)



DISTRIBUTION TABLE BY REGION & SPECIES CONTRIBUTION

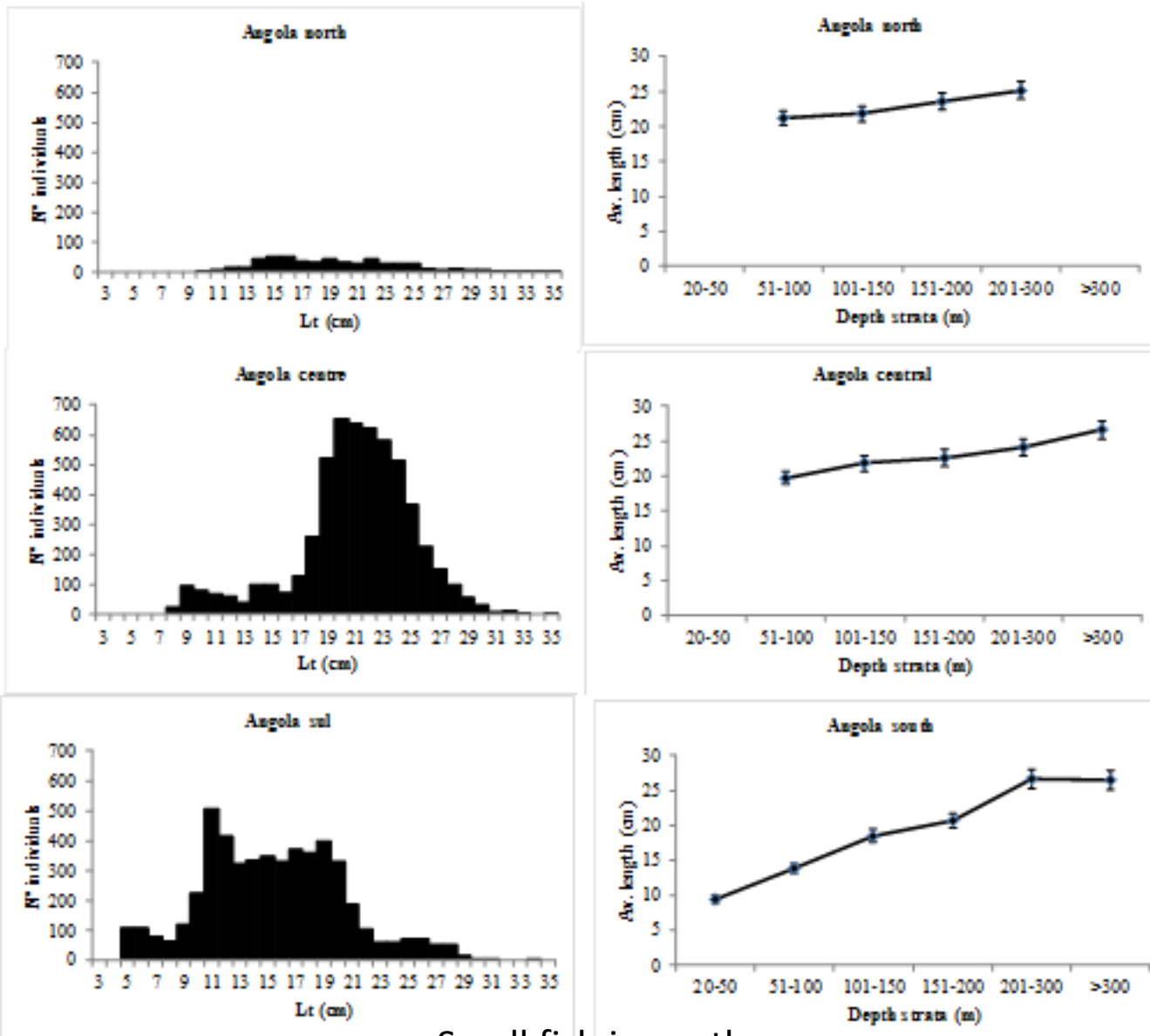
Species	A. north	A. centre	A. south	N. north	N. centre	Na. south
<i>Pentheroscion mbizi</i>	55.92	153.08				
<i>Pentacnemus quinquearius</i>	10.17	6.59				
<i>Dentex bancrofti</i>	17.12	16.52		36.34		
<i>Dentex gibbosus</i>	15.58	8.89		27.49		
<i>Pagellus bellottii</i>	26.44	45.15		75.83		
<i>Pagrus caeruleostictus</i>	17.69	13.93		4.02		
<i>Dentex cancriensis</i>	21.88	15.78		18.89		
<i>Galeoides decadactylus</i>	72.02	143.30		16.90		
<i>Dentex congoensis</i>	36.50	22.21		33.17		
<i>Arius heudeloti</i>	6.61	12.99		18.02		
<i>Arius latiscutatus</i>	5.69	10.15		37.38		
<i>Arius parkii</i>	22.08	17.09		27.66		
<i>Pomadasys incisus</i>	16.23	64.67		81.89		
<i>Pomadasys jubelini</i>	89.66	72.33		24.17		
<i>Pseudolithus senegalensis</i>	39.16	23.18		33.78		
<i>Pseudolithus typus</i>	57.85	49.68		16.00		
<i>Pteroscion pelti</i>	64.14	35.81		16.40		
<i>Umbrina cancriensis</i>	45.82	56.91		42.78	0.22	
<i>Argyrosomus hololepidotus</i>	40.40	16.65		116.67	0.59	
<i>Atractoscion aequidens</i>	11.22	16.66		41.19	22.65	
<i>Dentex congolensis</i>	34.47	21.82		34.69	0.52	
<i>Merluccius polli</i>	74.14	137.83		150.81	9.55	
<i>Dentex macrophthalmus</i>	26.66	210.87		372.31	136.87	7.20
<i>Merluccius capensis</i>				218.32	88.91	89.82
Myctophidae	36.25	86.58		43.05	3.83	4.77
<i>Parapenaeus longirostris</i>	9.64	11.97		4.19	2.74	1.84
<i>Aristeus varidens</i>	4.80	7.61		16.88	2.36	1.57

Summary table: few species found along the Namibian coast

DISTRIBUTION TABLE BY DEPTH WITH SPECIES CONTRIBUTION

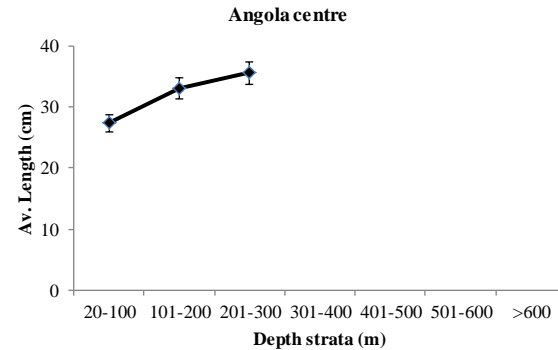
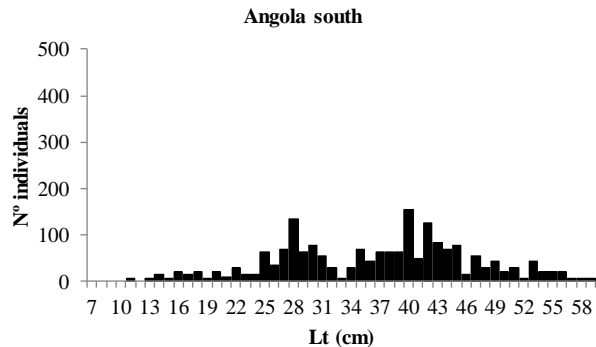
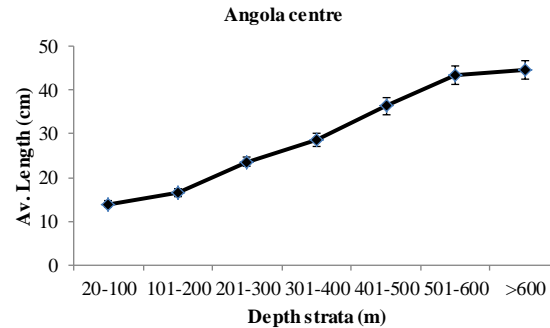
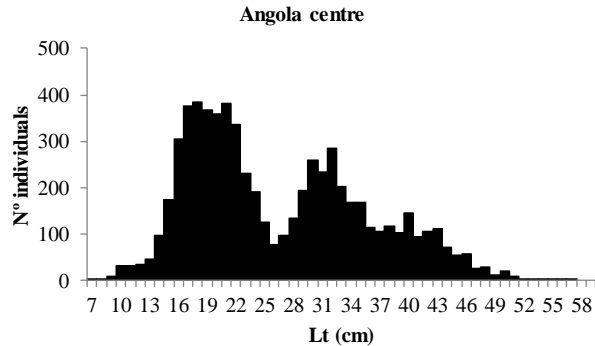
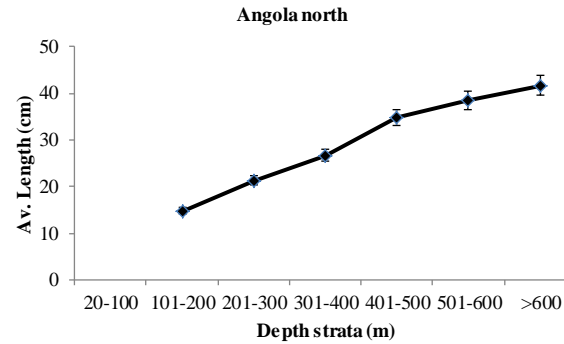
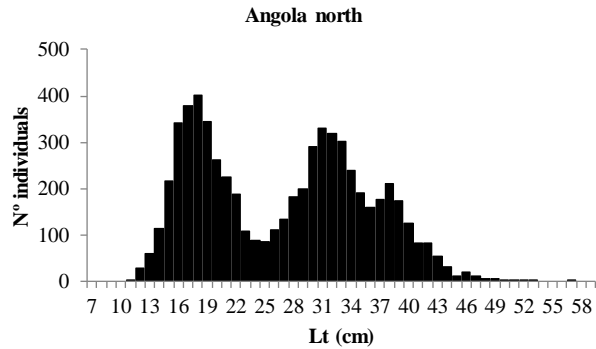
Species	0-50	50-100	100-200	200-300	300-400	400-500	>500
<i>Pentanemus quinquarius</i>	9.48						
<i>Galeoides decadactylus</i>	121.84	44.43					
<i>Pseudotolithus typus</i>	56.06	40.08					
<i>Argyrosomus hololepidotus</i>	31.63	23.92	141.18				
<i>Arius heudeloti</i>	21.91	8.11	10.70				
<i>Arius latiscutatus</i>	48.70	4.40	0.64				
<i>Dentex canariensis</i>	26.58	17.09	15.36				
<i>Dentex gibbosus</i>	29.77	10.33	15.11				
<i>Pagrus caeruleostictus</i>	25.40	7.29	9.44				
<i>Pomadasys jubelini</i>	58.93	129.58	19.93				
<i>Umbrina canariensis</i>	11.20	50.49	62.79	14.99			
<i>Pseudotolithus senegalensis</i>	40.49	14.00	34.66	1.97			
<i>Pomadasys incisus</i>	28.75	76.68	3.02	2.39			
<i>Dentex congoensis</i>	1.60	30.15	39.83	6.20			
<i>Dentex banardi</i>	21.57	19.80	11.84	15.10			
<i>Atractoscion aequidens</i>	16.60	25.52	31.55	22.19			
<i>Pagellus bellottii</i>	35.04	51.94	18.41	2.10	0.42		
<i>Dentex angolensis</i>	2.30	19.26	36.74	39.49	32.04		
<i>Arius parkii</i>	20.75	34.06	11.80	3.86	26.67		
<i>Pentheroscion mbizi</i>	36.69	39.39	128.53	125.89	12.85		
<i>Pteroscion peli</i>	63.58	17.13	5.95	25.92	2.20		
<i>Dentex macrophthalmus</i>	26.41	174.75	271.13	103.18	30.13	0.41	
<i>Parapenaeus longirostris</i>	3.84	2.82	8.17	15.21	6.53	5.14	
<i>Merluccius capensis</i>	16.20	138.09	76.89	118.29	78.41	40.30	42.73
<i>Merluccius polli</i>	9.86	37.53	77.69	80.32	203.73	113.00	18.31
Myctophidae	143.86	52.54	68.52	58.55	13.35	7.21	2.90
<i>Aristeus varidens</i>			1.25791	3.29496	5.32981	5.82119	4.85138
	GROUP I		GROUP II			GROUP III	

DISTRIBUTION BY SIZE AND DEPTH: *D. macrophthalmus*



DISTRIBUTION BY SIZE AND DEPTH:

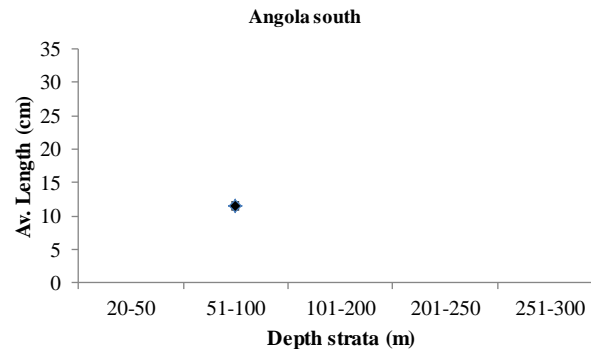
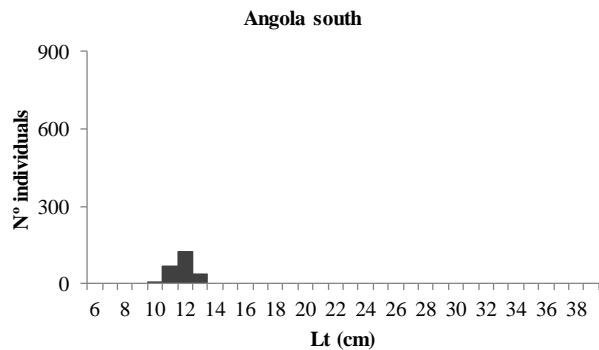
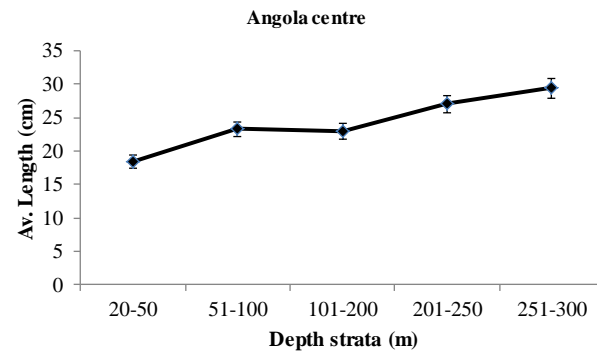
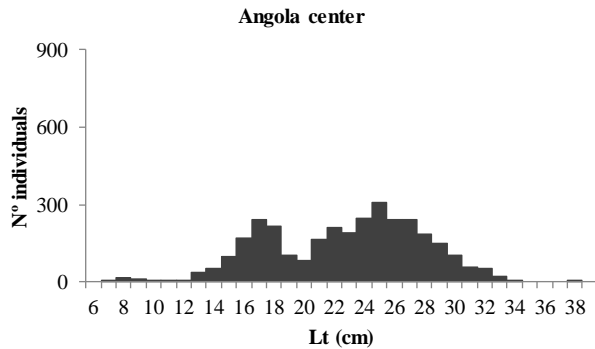
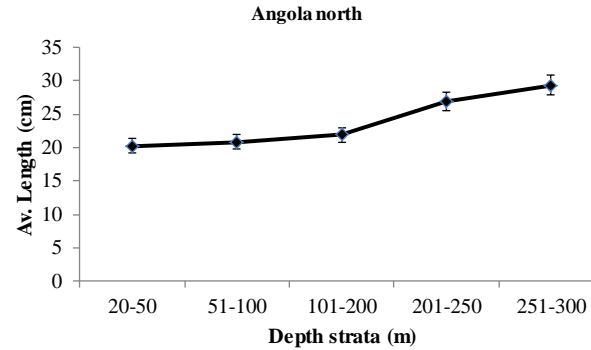
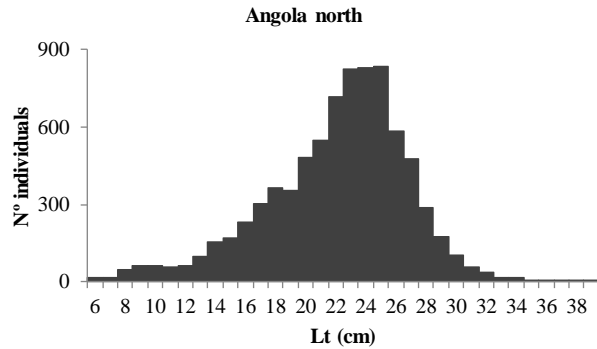
M. polli



Small fish in central and north areas

DISTRIBUTION BY SIZE AND ZONE AND DEPTH:

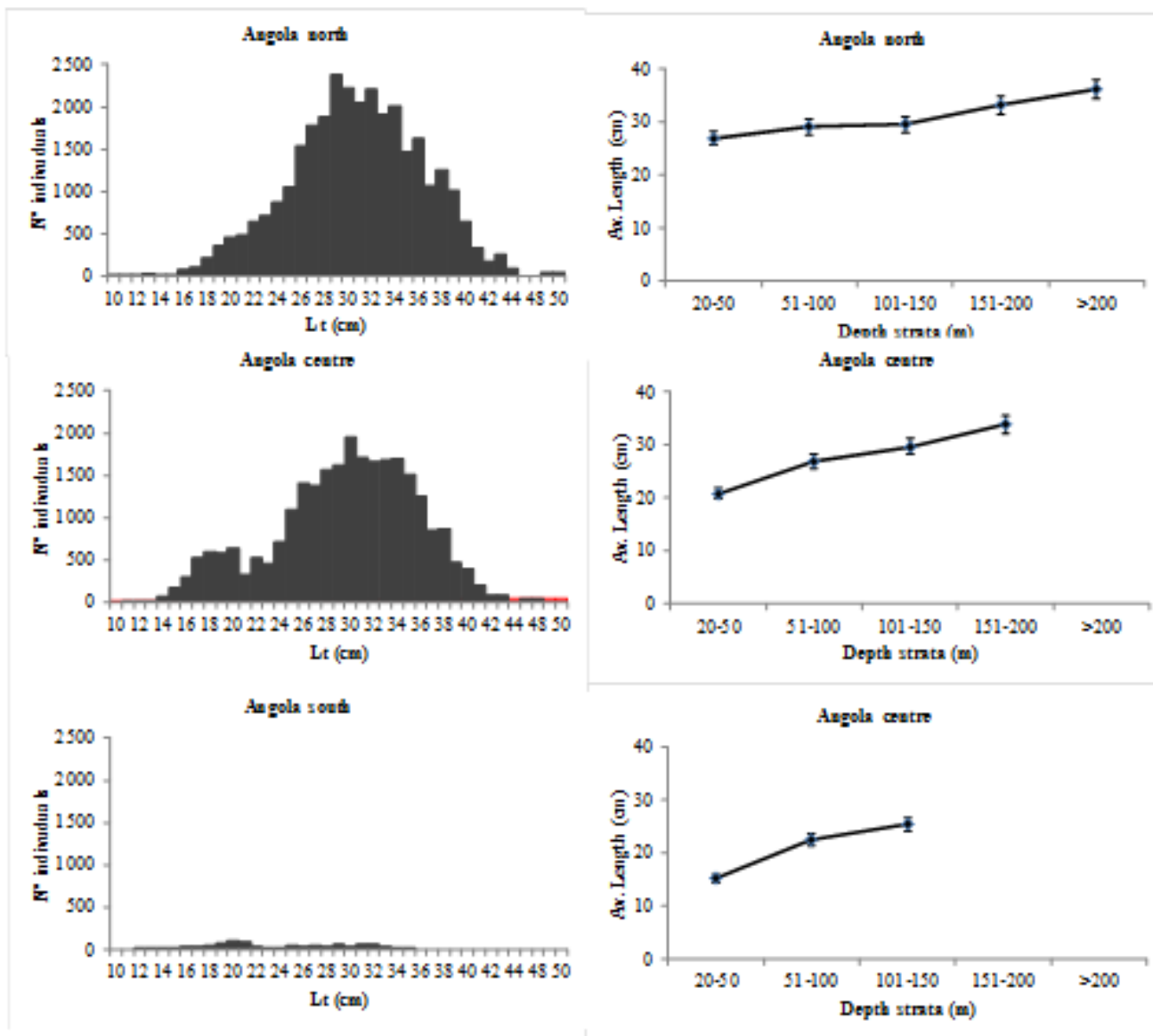
D. angolensis



Small fish in north and center

DISTRIBUTION BY SIZE AND DEPTH:

U. canariensis



Few fish in south

THE WAY FORWARD

ANALYSIS

WRITING

THANK YOU