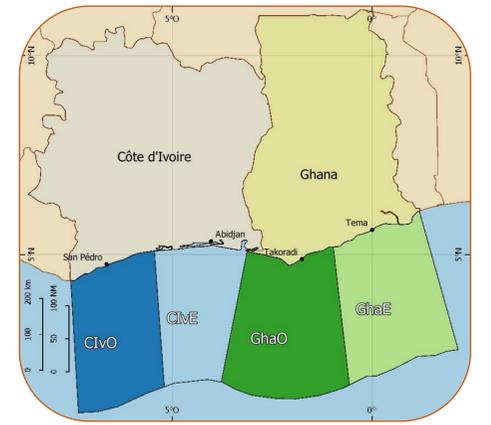


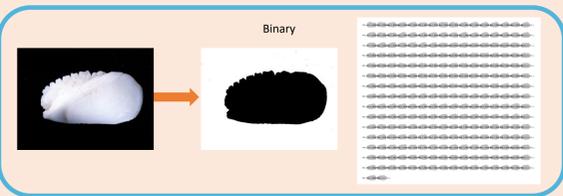
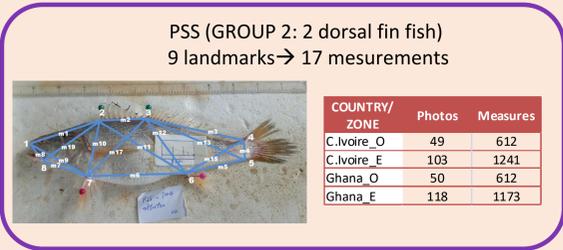
1 Introduction

The Cassava croaker *P. senegalensis* is assessed by CECAF within one single stock of croakers (*Pseudotolithus* spp.), for Côte d'Ivoire, Ghana, Togo and Benin. Taking into account the mix of three species, the consideration of one single stock for these four countries follows practical reasons and has no any biological basis.



2 Methods

Specimens pictures & otoliths (bi-annual)



Classification and multivariate analysis:

- Principal Component Analysis (PCA)
- Linear Discriminant Analysis (LDA)

Morphometry

Analysis based on morphometric measurements of the species (pictures) → TRUSS NETWORK

Analysis based on the otolith shape → FOURIER

Statistical analysis by country-zone

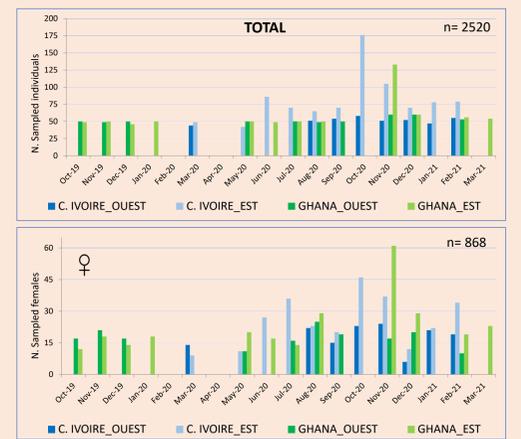
Life History Traits

Weight parameters

Reproduction parameters and features

Biological samplings (monthly)

- Length
- Sex
- Weight
- Gutted weight
- Gonad weight
- Maturity stage (1-5)
- Otoliths



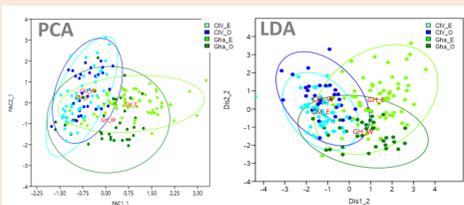
Parameters comparison by:

- ANCOVA (Kruskall- Wallys)
- ANOVA (Mahn-Whitney)/ (Kruskall- Wallys)

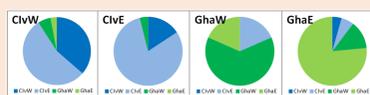
3 Results

Morphometry

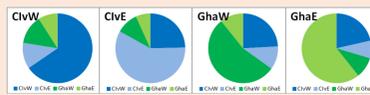
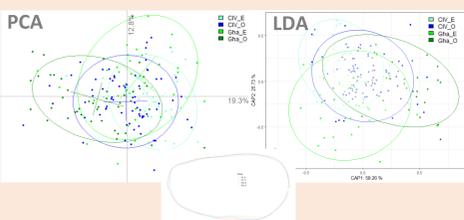
SPECIMEN SHAPE (TRUSS NETWORK)



Correct classification from LDA



OTOLITH SHAPE (FOURIER ANALYSIS)



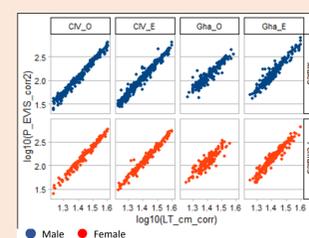
Similarity of the results of both methods, although the correct classification of individuals using specimen shape is slight higher than by otolith shape. Based on the morphometry analysis, individuals from Côte d'Ivoire could be differentiated from those from Ghana.

Life History Traits

WEIGHT PARAMETERS

Length- Gutted weight relationship

Contry-Zone	Length- Gutted weight relationship		Le Cren's condition factor (k)		
	Slope (b)	SE	median	mean	sd
C.IVOIRE_O	3.32	0.04	1.01	1.00	0.09
C.IVOIRE_E	3.19	0.05	0.98	0.99	0.10
GHANA_O	2.84	0.05	1.02	1.00	0.16
GHANA_E	3.21	0.05	1.11	1.13	0.14



No significant differences are observed in weight parameters among the four zones.

REPRODUCTION

	FEMALES	CIV_O	CIV_E	GHA_O	GHA_E
Spawning period		7 of 8 sampled months	All year	2 of 8 sampled months	8 of 10 sampled months
Spawning peaks		Ago/ Dec-Feb	Mar-May/ Oct-Dec	Ago/ Dec	May-Ago/ Nov-Jan
L50		31.3	27.6	33.1	32.6
cv		0.05	0.02	0.03	0.03
N		67	115	61	220

Spatial and temporal sampling limitations hamper the interpretation of conclusive results on the species reproduction. In general, the species seems to spawn in two main periods, linked to the two main upwelling seasons in the area. Length at first maturity (L50) of females are close in three of the four studied zones.

4 Conclusions (preliminary)

While data from life history traits do not show conclusive results, the two morphometric techniques (body shape-truss network and otolith shape) show more reliable information for stock identification. Following these techniques, at least two independent stocks of *Pseudotolithus senegalensis* can be distinguished for Côte d'Ivoire and Ghana. A more in-depth analysis of this information is being carried out and the results may be useful for fisheries assessment and management of this species.

The extension of this study to longer periods and areas, especially to those that are considered by CECAF as sharing the same stock that C.Ivoire-Ghana (Togo and Benin) is highly recommended. In addition, improving the landing reporting at species level is a must to produce reliable assessments of the stocks.



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