ABSTRACTS

PRODUCTION OF XY FEMALES AND YY MALES ASSISTED BY SEX CHROMOSOMIC MARKERS IN A NILE TILAPIA *Oreochromis niloticus* WILD POPULATION FROM BURKINA FASO

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Nile tilapia, *Oreochromis niloticus,* is a major farmed fish in which the farming of all-male offspring is the best way to avoid unwanted reproduction during the grow-out period and to optimize the production since males grow faster than females. Currently, the most sustainable method for producing all-male offspring is based on the use of YY males. However, the classic procedure to produce YY males is tedious because XY females and YY males cannot be identified before sexual maturity, and consequently YY males have been produced in very few strains. The recent identified sex markers could optimize this process. Nevertheless studies have shown that sex is linked to at least 2 linkage groups LG1 and LG23, depending on the strains as well as the wild populations. Therefore, it is necessary to develop a specific protocol for YY-males' production assisted by these markers for each farmed strain. The aim of the present study was to analyse and apply these sex markers to produce YY males in a wild population from Burkina Faso (Bama, Lake Kou) during its domestication process.

In our study, we used the *amh* genes (located on LG23) identified in a Japanese *Oreochromis niloticus* strain containing several insertions and deletions located in the promoter, exon VI and exon VII. Ninety one *O. niloticus* wild caught breeders from Lake Kou were genotyped using these *amh* genes' markers. According to progeny testing results, *amh* markers correctly assigned the genotype for 82% of the G0 XY males. This suggests that in the remaining males, sex was not linked to LG23. The markers formally identified all G0 females including XX and XY genotypes which were also confirmed by progeny testing.

To obtain G1 XY females, 34 progenies were treated with ethynyl-estradiol during the sex differentiating period. We subsequently identified precociously with the *amh* markers 58 XY females sampled amongst these progenies. The genotypes of three of the XY females out of 58 were confirmed by progeny testing (XY males crossed with XY females). We obtained 68 to 83% male proportions which were not significantly different from the theoretical expected proportion. However, the markers failed to clearly indicate the absence of an X chromosome in the possible YY males. Nevertheless, these *amh* markers allowed us to develop a rapid procedure to obtain functional XY-females. This is a major step of the ongoing YY-males' production assisted by chromosomic markers for the domestication of the Kou *O. niloticus* population. Additional sex-linked markers need to be searched with others approaches such as RAD sequencing and allelic variations including the analyses of both LG1 and LG23 sex-linked markers.

Table1. Validation of *amh* markers by progeny testing

	***amh* markers**						**Progeny testing**	
Males	*amh*	Y^+	$amhY^+$	$amhX^+$	XY	31	XY	38
	amh	Y^-	$amhY^-$	$amhX^+$	XX	8	XX	1
Females	*amh*	Y^-	$amhY^-$	$amhX^+$	XX	44	XX	44
	amh	Y^-	$amhY^+$	$amhX^+$	XY	1	XY	1