International Journal of Research Studies in Biosciences (IJRSB)
Volume 2, Issue 1, February 2014, PP 46-50
www.arcjournals.org

Influence of the Temperature on the Performence of Growth of Tilapia (Oreochromis Niloticus) at the Level of the Station of Fish Farming of Deroua (Blessed Mellal / Morocco)

S. Adam Adey

Laboratory of Biodiversity,
Forest School of the Engineers, Salé Morocco
abbaelhassan@hotmail.com
Abbaelhassangmail.com

H. Abba

Sciences Faculty,
Ibn Tofail University
Kénitra, Morocco.

M. Benabid

National Center of Hydrobiology and Pisciculture (NCHP)
Azrou Morocco.

M. Droussi

Station of Fish Farming of Deroua. (CNHP)
Beni Mellal Morocco

Abstract: *To estimate the growth of Tilapia (Oreochromis niloticus, L, 1758) at the level of the station of Déroua (Blessed Mellal / Morocco) and the influence of the environmental factors, an experimental study was led in 2007 on alevins raised at the level of two ponds (C_1 and C_2) the average depth of which is of 1,5m and a surface of 1500 m2. Ponds in question were empoisoned by alevins of 4g on average, with a density of 5individus / m ². The obtained results(profits) show that the growth is positively influenced by the temperature, and has increase 1 %, every time we pass of a range of temperature to another superior among the following ranges (16 - 20°C), (21 - 24°C) and (25 - 28°C). The obtained average immediate growth was 1 %. Models of weight growth (Y= 77, 97 e0, 012t) and shelf space (Y= 62, 49 t0, 288) according to time and the relation size / weight (P = 0, 0392 L 2,763) were determined from the data of the essays made in 2005 and 2006 in the station of Deroua.*

Keywords: *tilapia of the Nile, the fish farming, the temperature, the weight growth, the growth shelf space, Deroua.*

1. INTRODUCTION

The fish farming is the production which progresses most at the world level. The production affected 148 million tons of fishes in 2010 and the preliminary data show that the production increased in 2011, affecting 154 million tons (FAO, on 2012). The continental fish farming in Africa is the most late in the world, in spite of its favorable conditions for the development of this production. Of African origin, the Tilapia, can play an important role in the economy of many countries of this continent, so improving the especially protein food self-sufficiency. The Tilapia, the foundation of the African fish farming, train from now on, with some endemic species in Africa, the base of the fish farming of fresh water of the intertropical belt of the globe (Arrignon, 1998).

Morocco following the example of the other countries of Africa does not escape this rule as regards the development of the continental fish farming in spite of this speculation was introduced since 1924 by the creation of the fish station of Azrou (Chaker, 2004) then that of Deroua en1990 .These two units are managed by the National Center of Hydrobiology and Fish farming of Azrou being of the High Commission in Waters and Forests and Fight Against the Desertification.

The present work handles the influence of the temperature on the growth of tilapia of the Nile (*Oreochromis niloticus*) and consequently the determination of the relations enters the growth size and the weight growth during a ' intensive semi breeding at the level of the station of fish farming of Déroua (Béni Mellal) in Morocco between 2005 and 2007. The knowledge of the variation of the parameters of breeding as the temperature and their optimization will allow a better production.

2. MATERIALS AND METHODS

2.1 Presentation of the Site of Study

The fish station of Deroua, geographical coordinates: Latitude: 32 ° 20 ' the North, Longitude: 6 ° 45 ' the West and of a Height of 428m is situated in 20 km in the Southwest of the city of Beni Mellal (Morocco).La refreshed station of ponds in identical earth(ground) of 2000m2 of surface and of 1,5m of depth and the food(supply) of which is made from The groundwater and the dam(roadblock) Bine El ouidane. (Hasnaoui2002). From geologic point of view, ponds base on a brown ground subtropical isohumique developed on an argilo-calcareous deposit of the average Quaternary (Massoni and Missante, 1967).

2.2 Biological Material

To estimate the growth of alevins at different intervals of temperature (16 - 20°C, 21 - 24°C and 25 - 28°C) an experience was organized at the level of two ponds named C_1 and C_2. These two ponds are empoisoned by 7000 alevins of a middleweight of 4 g is an initial biomass of 21 kg each. Every two weeks we make a fishing of control to follow the growth of alevins according to the temperature. Before poisoning the ponds of experiment, a meticulous sorting was made to obtain a homogeneous population not to bias the experience. . More the dispersal is big more the individual difference plays an important role on the growth. Best is to group together alevins stemming from the same laying or the moved closer laying. The (figure1) shows the structure by size at the beginning of the experience of growth in C_1 and C_2. To estimate the growth according to sex, measures were made on a population of tilapia constituted by 160 females and by 80 males raised at the level of ponds named A_2 and A_3. The determination of a model of weight and linear growth is obtained by the use of the data collected during the partners of breeding of the 2005s and 2006.

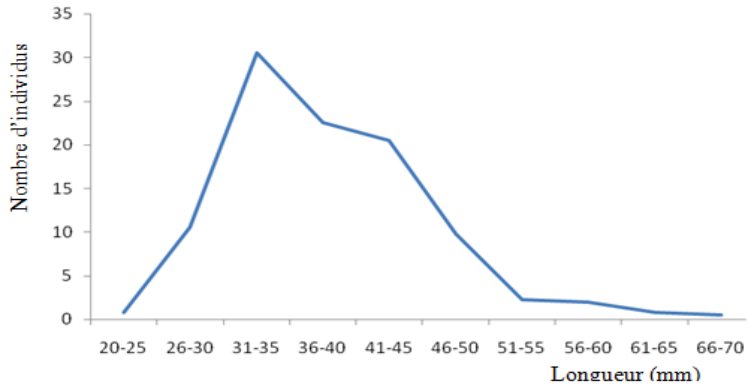

Figure1. *structure by size at the beginning of the experience of growth of C_1 and C_2*

3. RESULTS AND DISCUSSION

The measures made on a sample of 80 males and 160 females show that the Tilapias of the Nile product in the station of Deroua present different growths according to the sexes. Measures made on fishes of different sex and the same age revealed that males grow faster than females (Ballast and *al*.; 1989; Baras and Mélard, 1997). The sizes obtained for both sexes are respectively 32, 5 cm (±2) for males and 26 cm (± 2, 6) for females. The recorded middleweight is 580 g (± 115) for males against 330 g (± 93) only for females. The males of one year have an almost double size of the females of the same age. This difference of growth has for origin the genetic factors. The measures made at the level of the station between 2005 and 2006 allowed to follow the weight growth and the linear growth according to time and to determine the relation between variables (Weight and size). The obtained results show that the weight growth of *Oreochromis .niloticus* takes an exponential speed (Figure 2) whereas the linear growth (Figure) 3) tends to decrease with the age. These experiences took place in ponds of 1500 m ² (C_1, C_2) and of 2000m ² (A_3 and A_4), in a low density. From 150è in the daytime the experience, the middleweight of the individuals (males) was upper to 500 g. As comparison, a weight of 650 g is affected by some individuals in experimental breeding (Melard, 1986) to the 200è days in ponds rich in natural food and in low density.

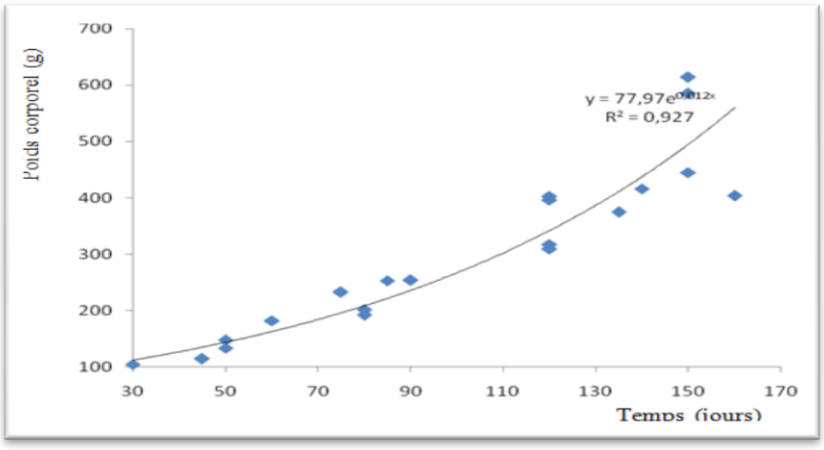

Figure 2. *weight Growth of Tilapia of the Nile in the station of Deroua*

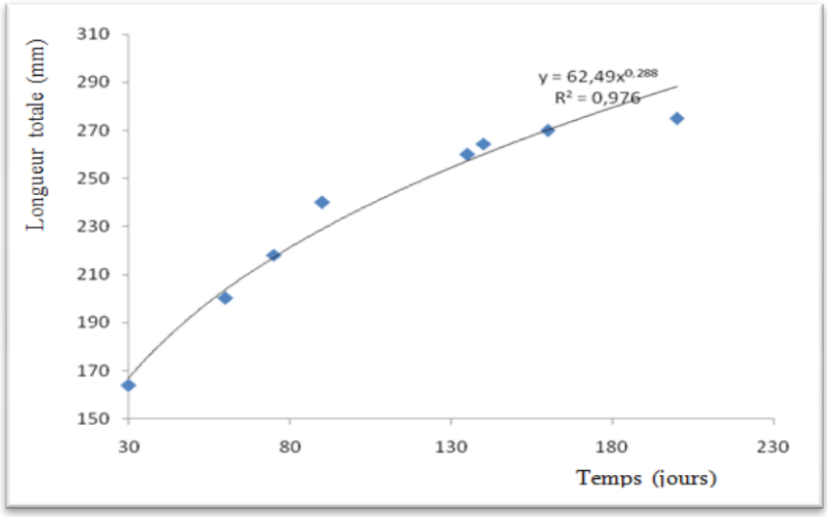

Figure 3. *linear Growth of Tilapia of the Nile*

For the relation weight length ($P = a L^b$), the figure (4) shows the results obtained on a sample of 241 variable-sized specimens between 6, 5 cm and 36 cm. The analysis of the figure shows that the weight increases with the size of fish with a coefficient of correlation of the order of 0, 98 ($p < 0, 01$). The equation connecting the weight with the size is the shape $P=0, 0392\ L^{2,763}$, the coefficient b is lower than 3 (2, 763) this shows that the growth in size is important with regard to the mass growth (ABBA, 2011).

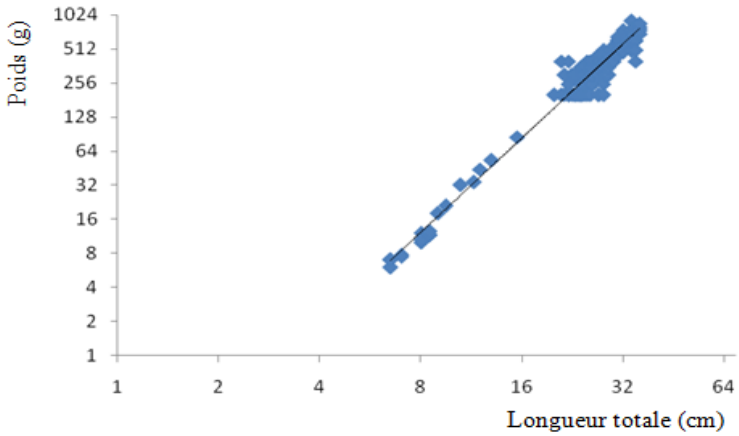

Figure 4. *relation weight-size of tilapia of the station of Deroua (2005-2006) The immediate growth (Gp) for three ranges of temperature followed at the level of ponds C_1 and C_2 are recorded in the table 1 and the figure 5.*

Table 1. *Immediate Growth (Gp) for various ranges of temperature.*

	Estimation of Gp (%/day) in various temperatures		
Pond	16 – 20° C	21 – 24°C	25 – 28°C
C_1	3,04	3,7	4
C_2	4,53	4,7	5,1

The immediate growth (GI) varies according to the pond and the range of temperature. This growth increases with the increase of the temperature, According to Boyd and Tucker (1998), the temperature is a crucial factor for the growth of fishes. Any variation in the diet of this environmental characteristic can pull a difference of growth (Halvorsen and Svenning, 2000). Also, and for the same temperatures, the growth (% a day) alevins is important at the level of the pond C_2; this difference is understandable by an abundance of food due to the important development of phytoplankton because alevins receive the same quantity of complement to food at the level of both ponds. These results confirm that the growth of fishes is influenced by numerous factors of which the food (quality and quantity) and the environmental variables (Boyd and Tucker, 1998; Ouattaran and *al* ., 2005).

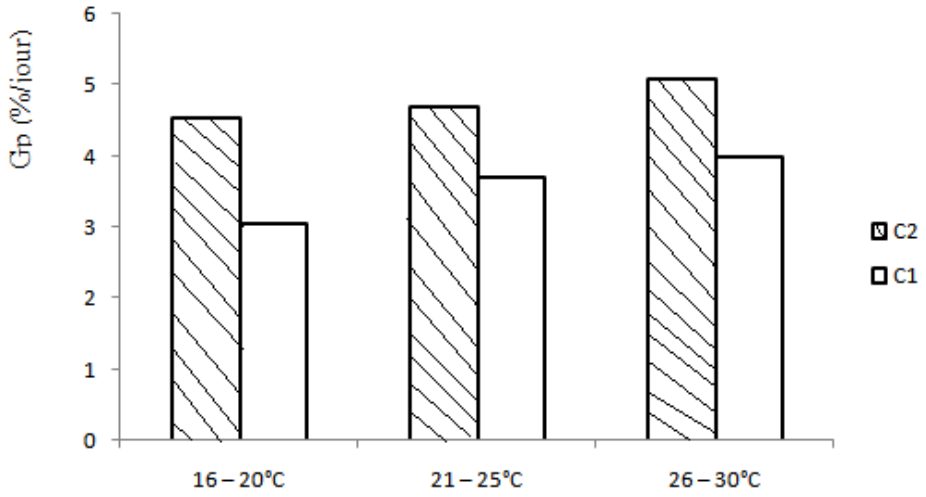

Figure 5. *Immediate Growth (Gp) according to ponds for various ranges of temperature*

4. CONCLUSION

The present study allowed determining the performances of growth of Tilapia in different conditions of temperature. The experience led at the level of the station Déroua showed a fast growth of tilapia at the level of the station with a good rate of conversion of 1. Old males of one year affect weights going from 800 to 900g. The temperature and the conditions of the environment are factors influencing the growth of the Tilapia during its breeding.

REFERENCES

Abba H. 2011 Etude écologique et biologique de la truite commune (Salmo trutta macrostigma, Dumeril, 1858) de l'Oued Sidi Rachid (Ifrane Maroc). Thèse de Doct. Uni. Ibn. Tofail.Fac. Sc.Kenitra Maroc.pp 205.

Arrignon J. 1998 .Aménagement piscicole des eaux douces 589 p.

Baras E and Mélard C .1997. Individual growth patterns of juvenile Nile tilapia Oreochromis niloticus (L.): Emergence and dynamics of sexual growth dimorphism. In: Fitzsimmons K. (Ed.), Tilapia aquaculture. Northeast Regional Agricultural Engineering Service 106:169 177.

Boyd C E and Tucker C.S., 1998. Pond aquaculture water quality management. Boston Dordrecht London: Kluwer Academic Publishers,:700 p.

Chaker Y. 2004. La détermination des indicateurs socio-économiques de la pêche continentale au Maroc). Mémoire de 3ème cycle, ENFI, Salé, 123p.

FAO. 2012. La situation mondiale des pêches et de l'aquaculture.

Halvorsen H. and Svenning M.A., 2000.Growth of Atlantic salmon parr in fluvial and lacustrine habitats. J. Fish Biol., 57: pp.145-160.

Hasnaoui M., Kassila, J., Droussi, M., Loudiki, M. and G. Balvay. 2002 Relation Cyanobactéries - Hypophthalmichthys molitrix dans un étang de polyculture en climat semi-aride. v15 (1) : 137-152.

Lester LJ, Lawson KS, Abella TA and Palada MS .1989 Estimated heritability of sex-ratio and sexual dimorphism in tilapia. Aquaculture and Fisheries Management 20: 369-380.

Lowe-McConnell, R.H., 1982. Tilapias in fish communities. p. 83-113. In R.S.V. Pullin and R. H. Lowe-McConnell (eds.). The biology and culture of tilapias. ICLARM Conf. Proc.7.432 p.

Massoni, C. et Missante, G. 1967. La plaine de Thdla. Les Cahiers de la Recherche Agronomique, 24, r 63- I 94.

Melard Ch., 1986. Les bases biologiques de l'élevage intensif du tilapia du Nil. Cahiers d'Ethologie appliquée, Fasc. 3, Vol. 6, 224p.

Ouattaran N I , N'Doubay V , Kone T, Snoeks J and Phillippart J-C.2005. Performances de croissance d'une souche isolée du Tilapia estuarien Sarotherodon melanotheron (Perciformes, Cichlidae) en bassins en béton, en étangs, en terre et en cages flottantes.