THE INTERRELATION BETWEEN BODY GROWTH AND GROWTH HORMONE, INSULIN-LIKE GROWTH FACTOR AND PROLACTIN LEVELS IN TILAPIA (Oreochromis aureus)

Isabel Guillén,[1] Mario P. Estrada,[1] Reynold Morales,[1] Philipa Melamed[2] and José de la Fuente[1]

Mammalian Cell Genetics Division. Center for Genetic Engineering and Biotechnology. P.O. Box. 6162, Havana, Cuba. [2]Tel Aviv University, Department of Zoology, Tel Aviv 69978, Israel.

Introduction

The growth hormone(GH)and prolactin (PRL) are polypeptide hormones synthesised mainly by somatotrophos and lactotrophos respectively in the anterior pituitary gland of all vertebrates (1), whereas the insulin like growth factors(IGFs) are peptides whose synthesis and secretion in various tissues and particularly in hepatocytes is possible after the stimulation with GH (2).It has been observed that IGFs can mediate the stimulatory action of GH in the longitudinal growth during the early development.

The combined effect of GH and IGFs is responsible for the maintenance of appropriate body composition, cell regeneration and organ function (2). On the other hand PRL is involved in the regulation of reproduction, osmoregulation, growth and development in teleost fishes as in other vertebrates (3). In this study we examined the relationship between different factors such as GH, IGFs and PRL in tilapia grown from hatching to juvenile stages in natural conditions as well as their influence on growth and development.

Materials and Methods

The study was carried during a period of 8 months (June to January).This period of time matches with the stages of development from hatching to juveniles. Body weight in grams and the length in centimeters were measured monthly in 100 to 200 tilapias in natural culture conditions. Pituitaries, liver and blood were extracted monthly and pooled from various animals in order to determine the levels of GH, IGFand PRL in these stages of development. A radioimmunoassay (RIA) for recombinant tilapia GH was used to detect the levels of GH in serum as reported (4) and plasma PRL was determined by ELISA using a polyclonal antibody against tilapia PRL (kindly given by Dr J. A. Martial, Liege University, Belgium) and developed with Horse-radish-peroxidase (Sigma).

We used Northern blot analysis to measure IGF mRNA levels.The RNA was purified from isolated livers as described (5),transferred to nylon filters (Hybond N, Amersham International plc) and hybridized with a tilapia IGFI cDNA probe, and subsequently rehybridized to gliceraldehyde 3 phosphate dehydrogenase to normalize the signals.

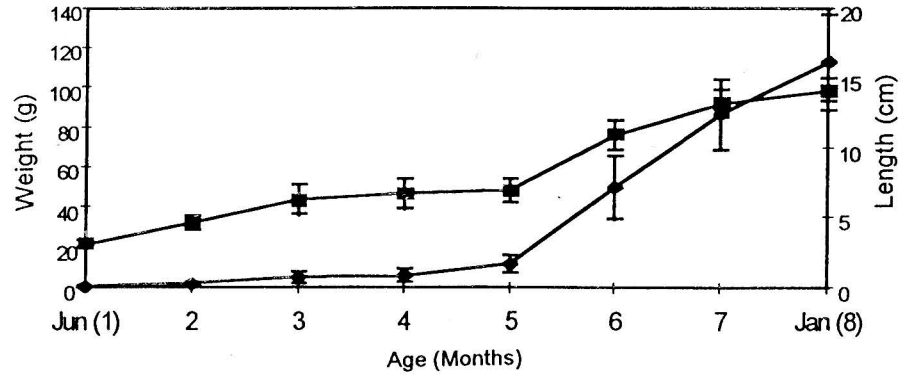

Figure 1.

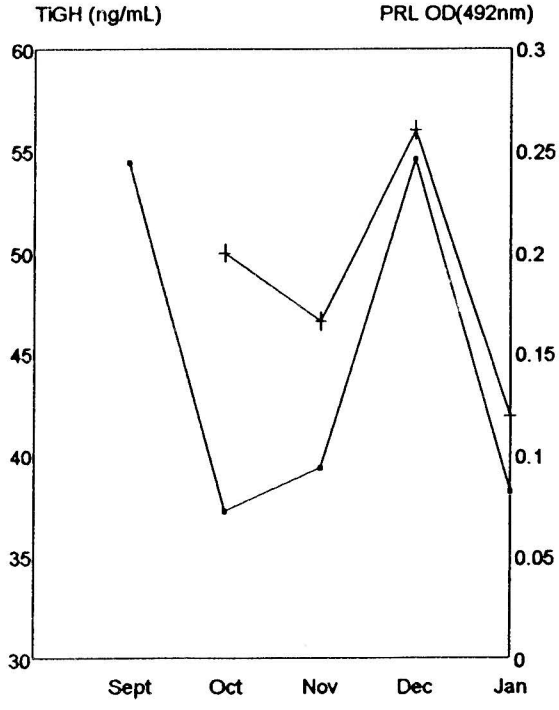

Figura 2.

Results and Discussion

Figure 1 shows the growth characteristics of tilapia during the period from hatching to juveniles (8 months of development) under natural conditions of photoperiod,

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