



## Comparative study of $\alpha$ -amylase activity in three Cyprinid species of different feeding habits from Southern Iraq

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### Abstract

This work provides a comparative data of  $\alpha$ -amylase activity in the gut extract of three Cyprinid species inhabiting Garma River (Basrah Governorate, Southern Iraq). Those species are bunny *Barbus sharpeyi* (herbivorous), common carp *Cyprinus carpio* (omnivorous), and shilik *Aspius vorax* (carnivorous). The study also investigate the discrepancy between the activity of the enzyme in common carp collected from Garma river with those reared in ponds. The specific activity of  $\alpha$ -amylase has apparently been influenced by feeding habits of the three studied species. Values of  $\alpha$ -amylase activity averaged 1.84 U mg<sup>-1</sup> protein in the herbivorous bunny. It showed a significant (P<0.01) superiority to that of the omnivorous common carp (1.33 U mg<sup>-1</sup> protein) which, in turn, showed a significant (P<0.01) superiority to that of the carnivorous shilik (0.76 U mg<sup>-1</sup> protein). Omnivorous common carp which was collected from fish ponds showed a significantly (P<0.01) higher value of  $\alpha$ -amylase specific activity which reached 1.92 U mg<sup>-1</sup> protein when compared with the value recorded in common carp collected from Garma River which reached 1.33 U mg<sup>-1</sup> protein.

**Keywords:** Cyprinid fish, feeding habits,  $\alpha$ -amylase activity.

### Güney Irak'ta Farklı Beslenme Alışkanlıkları Olan Üç Sazangil Türünde $\alpha$ -amilaz Aktivitesi Üzerine Karşılaştırmalı Çalışma

#### Özet

Bu çalışma, Garma Nehrinde (Basrah, Güney Irak) yaşayan üç Sazangil türünün ait mide özütündeki  $\alpha$ -amilaz aktivitesine ait karşılaştırmalı verileri göstermektedir. Bu türler, Bunni *Barbus sharpeyi* (otobur), pullu sazan *Cyprinus carpio* (etobur) ve shilik *Aspius vorax* (etobur). Çalışma aynı zamanda Garma Nehrinden toplanan ile havuzda yetiştirilmiş pullu sazanların enzim aktivitesi arasındaki farklılığı da araştırmaktadır. Özgül  $\alpha$ -amilaz aktivitesi, araştırılan üç türün beslenme alışkanlıklarından belirgin bir şekilde etkilenmiştir.  $\alpha$ -amilaz aktivitesine ait değerler, otobur bunni'de ortalama protein 1,84 U mg<sup>-1</sup> olmuştur. Etobur pullu sazanınkiyle karşılaştırıldığında anlamlı bir üstünlük (P<0,01) göstermiştir. Buna karşılık pullu sazan ise etobur shilik'inden (0,76 U mg<sup>-1</sup> protein) daha anlamlı bir üstünlük (P<0,01) göstermiştir. Garma Nehrin'den toplanan ve 1,33 U mg<sup>-1</sup> protein seviyesine ulaşmış pullu sazanda kaydedilen değer ile karşılaştırıldığında, balık havuzundan toplanan etobur pullu sazan, 1,92 U mg<sup>-1</sup> protein seviyesine ulaşarak anlamlı derecede (P<0,01) yüksek bir özgül  $\alpha$ -amilaz aktivitesi göstermiştir.

**Anahtar Kelimeler:** Sazangil balıklar, beslenme habitatu,  $\alpha$ -amylase aktivitesi.

#### Introduction

The study of digestive enzymes in fish has a wide range of potential interest. Study of digestive enzymes is an essential step towards understanding the mechanism of digestion and how the organism adapts to changes in the nutritional environment (Sunde *et al.*, 2004). On the other hand, the assessment of the activity of digestive enzymes in

cultured species may be helpful in the selection of feed ingredients (Lan and Pan, 1993). Recent investigations on digestive processes have focused on evaluating the ability of organisms to hydrolyze, absorb and assimilate the principal dietary nutrients, these processes can be initially examined by analyzing the activity of digestive enzymes (total proteinases, trypsin, chymotrypsin  $\alpha$ -amylase and lipase) (Guzman *et al.*, 2005).