

RINGKASAN

Channa asiatica merupakan ikan gabus hias berasal dari China yang hidup di air tawar dan termasuk ikan karnivora. Makanan yang dikonsumsi oleh *C. asiatica* didigesti di sepanjang saluran pencernaan yang melibatkan aktivitas enzim, yaitu protease dan amilase. Aktivitas protease dan amilase dipengaruhi oleh beberapa faktor diantaranya ukuran tubuh dan organ digesti yang berbeda. Selama ini belum ada kajian mengenai aktivitas enzim protease dan amilase pada ikan *C. asiatica* dengan perbedaan ukuran tubuh dan organ digesti sehingga penting untuk dilakukan penelitian. Tujuan dari penelitian ini adalah untuk mengetahui adanya perbedaan aktivitas protease dan amilase ikan *C. asiatica* antar ukuran tubuh, antar organ digesti dan interaksi antara ukuran tubuh dengan organ digesti dan mengetahui aktivitas protease dan amilase yang lebih tinggi di antara ukuran tubuh dan organ digesti berbeda pada ikan *C. asiatica*.

Penelitian ini dilakukan menggunakan metode eksperimental dengan rancangan percobaan Rancangan Acak Lengkap pola faktorial 3x4. Faktor pertama adalah ukuran tubuh, faktor kedua organ digesti. Pengambilan sampel dilakukan dengan cara *purposive sampling* yang diulang sebanyak 3 kali. Variabel bebas yang diamati adalah ukuran tubuh (2,5 g; 24 g; dan 100 g) dan organ digesti (hepatopankreas, lambung, pilorik kaeka, dan usus). Variabel terikat yang diamati adalah aktivitas protease dan amilase. Parameter yang diukur yaitu jumlah μg tirosin. $\text{menit}^{-1}.\text{mg}^{-1}$ protein dan jumlah μmol maltosa. $\text{menit}^{-1}.\text{mg}^{-1}$ protein. Data dianalisis dengan *two-ways* ANOVA dan analisis lanjut Duncan.

Hasil penelitian aktivitas protease *C. asiatica* menunjukkan perbedaan antar ukuran tubuh, organ digesti, maupun interaksi keduanya ($P < 0,05$). Semakin besar ukuran tubuh ikan, maka akan semakin tinggi aktivitas proteasenya. Aktivitas protease di pilorik kaeka dan usus lebih tinggi daripada di hepatopankreas dan lambung. Hasil interaksi ukuran tubuh dan organ digesti juga menunjukkan bahwa pilorik kaeka dan usus ikan ukuran 100 g memiliki aktivitas protease tertinggi. Sebaliknya, aktivitas amilase tidak berbeda secara signifikan antar ukuran tubuh ($P > 0,05$), namun antar organ digesti maupun interaksi keduanya ada perbedaan ($P < 0,05$). Aktivitas amilase di lambung dan usus lebih tinggi daripada organ digesti lainnya. Namun berbeda dengan hasil interaksi ukuran tubuh dan organ digesti yang menunjukkan bahwa lambung ikan berukuran 2,5 g memiliki aktivitas amilase tertinggi. Kesimpulannya, aktivitas protease ikan *Channa asiatica* mengalami perubahan antar ukuran tubuh, antar organ digesti, dan antar interaksi ukuran tubuh dengan organ digesti, sedangkan aktivitas amilasanya hanya mengalami perubahan antar organ digesti dan antar interaksi ukuran tubuh dengan organ digesti. Aktivitas protease tertinggi terdapat pada pilorik kaeka dan usus ikan *Channa asiatica* yang berukuran 100 g, sedangkan aktivitas amilase tertinggi terdapat pada lambung ikan yang berukuran 2,5 g.

Kata kunci: *amilase, channa asiatica, organ digesti, protease, ukuran tubuh,*

SUMMARY

Channa asiatica is an ornamental snakehead fish native to China that inhabits freshwater and is classified as a carnivorous species. The food consumed by *C. asiatica* is digested along the digestive tract, involving the activity of enzymes such as protease and amylase. Protease and amylase activities are influenced by several factors, including body size and different digestive organs. So far, there has been no study on the protease and amylase activities in *C. asiatica* with varying body sizes and digestive organs, making it important to conduct this research. The objective of this study was to determine the differences in protease and amylase activities of *C. asiatica* across body sizes, digestive organs, and the interaction between body size and digestive organs, and to identify which body size and digestive organ exhibit the highest protease and amylase activities in *C. asiatica*.

This research was conducted using an experimental method with a Completely Randomized Design (CRD) in a 3x4 factorial pattern. The first factor was body size, and the second factor was digestive organs. Samples were taken using purposive sampling, repeated three times. The independent variables observed were body size (2.5 g, 24 g, and 100 g) and digestive organs (hepatopancreas, stomach, pyloric caeca, and intestines). The dependent variables observed were protease and amylase activities. The parameters measured were the amount of tyrosine ($\mu\text{g}\cdot\text{min}^{-1}\cdot\text{mg}^{-1}$ protein) and the amount of maltose ($\mu\text{mol}\cdot\text{min}^{-1}\cdot\text{mg}^{-1}$ protein). Data were analyzed using two-way ANOVA followed by Duncan's multiple range test.

The results of protease activity in *C. asiatica* showed significant differences among body sizes, digestive organs, and their interactions ($P < 0.05$). The larger the body size of the fish, the higher its protease activity. Protease activity in the pyloric caeca and intestines was higher than in the hepatopancreas and stomach. The interaction between body size and digestive organs also indicated that the pyloric caeca and intestines of 100 g fish exhibited the highest protease activity. Conversely, amylase activity did not differ significantly across body sizes ($P > 0.05$), but there were significant differences across digestive organs and their interactions ($P < 0.05$). Amylase activity in the stomach and intestines was higher than in other digestive organs. However, the interaction between body size and digestive organs showed that the stomach of 2.5 g fish exhibited the highest amylase activity. In conclusion, protease activity in *Channa asiatica* varies across body sizes, digestive organs, and the interaction between body size and digestive organs, while amylase activity only varies across digestive organs and their interaction with body size. The highest protease activity was found in the pyloric caeca and intestines of 100 g *Channa asiatica*, while the highest amylase activity was found in the stomach of 2.5 g fish.

Keywords: *amylase*, *Channa asiatica*, *digestive organs*, *protease*, *body size*