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6 I. Introduction

7 II. Protein degradation of black carp (*Mylopharyngodon piceus*) muscle during cold
8 storage

9 III. The relationship between degradation of myofibrillar structural proteins and
0 texture of superchilled grass carp (*Ctenopharyngodon idella*) fillet

1 IV. Conclusion

During the low-temperature storage after the death of fish, the muscles will experience rigor mortis, and then endogenous enzymes will act to tenderize the meat and change the physicochemical properties of the fish. Therefore, this study aims to understand the changes in black carp (*Mylopharyngodon piceus*) and grass carp (*Ctenopharyngodon idella*) at low temperature. The results showed the formation of gaps between myofibrils and myofibrils, the fragmentation of myofibrils and myofibrils, and the degradation of the sarcoplasmic reticulum at -0.5 and 4°C. Gel-based proteomic analysis revealed that these structural changes were accompanied by the degradation of a range of MPs, followed by bands of gelatinolytic and caseinolytic proteases observed at 4, -0.5, and -3°C upon storage up to 12 days or 21 days nearly disappear. The results showed that low-molecular-weight MPs such as Desmin and Troponin-T caused structural degradation, resulting in weakened Z-discs and loose actin. In contrast, high-molecular-weight MPs such as Titin and Nebulin were more degraded in the anaphase, resulting in disintegration of Z-disc and M-band and blurring light and dark regions (I and A-bands). That is, the role of Desmin and Tinin in softening is more important. To sum up, the physical and chemical characteristics of fish stored at low temperature, including the texture, microstructure, or the decrease of endogenous enzyme activity, are related to muscle protein degradation.

1 **References**

- 2 Bao, Y., Wang, K., Yang, H., Regenstein, J. M., Ertbjerg, P., & Zhou, P. (2020). Protein
3 degradation of black carp (*Mylopharyngodon piceus*) muscle during cold
4 storage. *Food chemistry*, 308, 125576.
- 5 Yang, F., Jia, S., Liu, J., Gao, P., Yu, D., Jiang, Q., Xu, Y., Yu, P., Xia, W., & Zhan, X.
6 (2019). The relationship between degradation of myofibrillar structural proteins
7 and texture of superchilled grass carp (*Ctenopharyngodon idella*) fillet. *Food*
8 *chemistry*, 301, 125278.