Conference Abstract

The composition of fish species shows little seasonal variation in eDNA based survey at urban streams

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Abstract

Biodiversity in the city is becoming important as cities are expanded. Thus, the cost-efficient and accurate methodology for the investigation of biota has been consistently demanded. Environmental DNA (eDNA) is one of the emerging tools to supplement traditional survey methods and improve the efficiency of the survey. Summer (from July to August) is the monsoon period in South Korea, so it is excluded from the survey period because of the unstable aquatic environment, the safety of investigators, and accessibility to study sites. On the other hand, spring and autumn (from March to October), excluding the flooding season, are considered suitable times for the survey. This study compared fish composition and distribution by season in summer and autumn using eDNA to identify the change of fish composition and determine the suitability of the eDNA survey for seasonal fish investigation at urban streams. The number of eDNA reads, fish composition, and their community structures was changed according to the season. The total eDNA read was 2.3 times more in October (1,419,062) than in July (3,202,626). In addition, compared to the summer when 13 families and 33 species were detected, 13 families and 35 species were detected in fall. A total of 13 families and 32 species were detected in common. Three species (*Acheilognathus rhombeus, Tachysurus fulvidraco, Pungtungia herzi*) more were identified, and one (*Hemiculter leucisculus*) was not detected in October. The result

described that the distribution rate of fish species has changed in the study area. Especially, the appearance of invasive species increased from 14 to 20 sites and the habitat range of invasive species was extended in October than July. However, there was no significant difference in richness and diversity except for abundance among fish community structures. This result revealed that eDNA survey methods can identify changes in the composition and distribution of fish by season. Furthermore, based on the little fluctuation in the species appearing according to the season, the study suggested that eDNA can be used to complement traditional survey methods by conducting fish surveys regardless of the survey period.

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