

Pengembangan metode environmental DNA eDNA dari sampel air untuk mendeteksi spesies asing alligator gar *Atractosteus spatula* = Developing environmental DNA eDNA method to detect alligator gar *Atractosteus spatula* using water sample

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Abstrak

ABSTRAK

Introduksi spesies asing merupakan ancaman bagi banyak organisme perairan. Deteksi dini dapat meningkatkan keberhasilan usaha pengendalian spesies asing, namun saat ini belum ada metode konvensional yang mampu melakukan hal tersebut. Pendekatan terbaru menggunakan environmental DNA eDNA mulai digunakan sebagai pendukung metode survey konvensional, terutama di daerah beriklim sedang temperate. Suhu yang lebih rendah diperkirakan dapat mempertahankan keberadaan DNA di dalam air. Penelitian ini dilakukan untuk menguji metode eDNA di daerah beriklim tropis untuk mendeteksi spesies asing alligator gar *Atractosteus spatula* dilakukan di Depok, Indonesia. Sebanyak 200 ml sampel air diambil dari kolam artifisial setiap tujuh hari selama satu bulan, lalu difiltrasi melalui kertas filter nitrat selulosa berdiameter 0,45. Sampel diekstraksi berdasarkan protokol kit FastDNA Spin Kit for Soil. Sampel kemudian diamplifikasi dengan primer ecoPrimer yang memiliki gen target 12S rRNA, lalu dikuantifikasi dan dilakukan sekuensing. Hasil penelitian menunjukkan bahwa eDNA terdeteksi di tiga dari empat sampel air dan mengindikasikan bahwa metode eDNA dapat dipertimbangkan sebagai metode pendukung bagi metode survey konvensional. Meskipun demikian, penelitian lebih lanjut diperlukan sebelum mengaplikasikan metode tersebut di lapangan.

ABSTRACT

Introduction of non native species threatens the life of many aquatic organisms. Successful eradication requires early detection, but currently no traditional monitoring technique offer the quality to do so. New approach using environmental DNA eDNA begins to be used to complement the more traditional monitoring methods. Most of eDNA studies were carried out in temperate areas, as the cooler temperature preserve the DNA better. This study aims to test the applicability of eDNA method in detecting alligator gar *Atractosteus spatula* from an artificial pond in Depok, Indonesia. 200 mL water samples was taken every seven days in a month before being filtered through 0,45 nitrate cellulose filter. DNA was isolated using FastDNA Spin Kit for Soil for the subsequent PCR process. Samples were then amplified using ecoPrimer which targeted 12S rRNA gene and quantified using spectrophotometer and electrophoresis, and sequenced. The study showed that eDNA was detected in three out of four samples, and therefore should be considered to complement the more traditional monitoring methods. However, further study is still needed before this method can be widely applied in the field.