

Pengembangan metode environmental DNA eDNA dari sampel sedimen untuk deteksi spesies asing alligator gar (*Atractosteus spatula*) =
Development of environmental DNA eDNA method from sediment sample for detection alien species alligator gar (*Atractosteus spatula*)

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Abstrak

ABSTRAK

Pemantauan spesies asing invasif berperan penting dalam mempelajari konservasi dan pengendalian ekosistem perairan. Alligator gar merupakan salah satu spesies asing yang masuk ke dalam perairan Indonesia dan berpotensi invasif. Sifatnya yang kriptik menyebabkan spesies ini sulit diamati secara visual. Metode eDNA hadir sebagai alternatif untuk deteksi spesies. Namun penelitian eDNA umumnya dilakukan di daerah beriklim subtropis. Pengembangan metode eDNA di daerah tropis dilakukan dengan menggunakan sedimen kolam artifisial untuk deteksi alligator gar. Sedimen diharapkan mampu melindungi eDNA dari degradasi akibat faktor lingkungan. Pengambilan sampel dilakukan empat kali dalam sebulan dengan mengeruk langsung lapisan sedimen sebanyak 500 mg dan diisolasi menggunakan Fast DNA Spin Kit for Soil. Hasil spektrofotometri menunjukkan konsentrasi terbesar yaitu 204,37 ng/L pada sampel 1. Suhu annealing telah dioptimasi yaitu 53,4 C menggunakan ecoPrimer dengan gen target 12SrRNA, pita paling jelas ditunjukkan oleh sampel 4 dengan ukuran amplicon 115 bp. Hasil blastn menunjukkan kekerabatan tertinggi pada dua spesies yaitu *A. tropicus* dan *A. spatula*, mengindikasikan bahwa sampel sedi mendapat digunakan untuk deteksi alligator gar *A. spatula*.

ABSTRACT

Monitoring of alien invasive species plays an important role in management and preservation of natural ecosystem. Alligator gar is an alien species in Indonesia swater and potentially invasive. Its cryptic and solitary nature makes visual detection difficult, there fore can not be monitored using traditional method. Recent advances studies have produced technology called eDNA, which allows species detection by using environmental samples such as water, sediment or soil. However, this study often carried out in subtropical area. Development of eDNA in tropical aquatic was performed by using sediment to detect alligator gar. In sediment, the persistance of eDNA can be much longer due to slow rate of degradation. Sample collection was done four times in artificial pond by dredging 500 mg of sediment for each sample. Samples were processed directly using FastDNA Spin Kit for soil. Electrophoresis and spectrophotometry results show edall samples positive containing eDNA, the largest concentration 204,37 ng/L belong to sample 1. Annealing temperature was optimized at 53.4 C by using ecoPrimer with target region 12 SrRNA, the clearest band shown by sample 4, with the size 115 bp. Blastn result showed the highest similarity with two species *A. tropicus* and *A. spatula*. The result was indicating that eDNA contained in sediment samples allows for detection of alligator gar *A. spatula*.