

**Identifikasi Keanekaragaman Jenis Ular
Menggunakan Metode eDNA di Bagian Hulu Sungai Opak
Daerah Istimewa Yogyakarta**

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INTISARI

Kegiatan monitoring ular banyak dilakukan dengan cara konvensional yang memakan banyak waktu, tenaga, dan sumberdaya. Maka dari itu, perlu dilakukan penelitian mengenai metode alternatif penelitian secara konvensional, yakni menggunakan metode *environmental* DNA (eDNA). Penelitian ini dilakukan untuk mengetahui keanekaragaman ular yang ada di Sungai Opak menggunakan metode eDNA dan mengetahui tingkat presisi hasil keanekaragaman jenis ular menggunakan metode eDNA dibandingkan dengan metode sampling manual *Visual Encountered Survey* (VES) 2016. Penelitian ini menggunakan sampel air hulu Sungai Opak yang difiltrasi kemudian dipreservasi di Laboratorium Sistematika Hewan UGM. Pengambilan sampel akan dilakukan pada Juli 2022 di hulu Sungai Opak, Dusun Salem, Desa Wukirsari. Sampel berisi DNA selanjutnya diekstraksi, kemudian diamplifikasi menggunakan PCR, dilakukan visualisasi menggunakan sinar ultraviolet, dan *disequencing* menggunakan MiSeq Illumina. Data diolah menggunakan perangkat lunak Geneious 2020.1.2, dan diidentifikasi taksonomi dan tingkat klasifikasinya menggunakan *clasifier* Kraken 2 dengan *database* Kraken2. Pengolahan sampel dan analisa dilakukan selama bulan Desember 2022 – Agustus 2023. Hasil dari penelitian ini adalah identifikasi 33 jenis ular dari 11 familia berbeda. Dua spesies terkonfirmasi keberadaanya melalui penelitian sebelumnya menggunakan metode konvensional dan wawancara dengan narasumber. Tiga spesies diprediksi merupakan spesies introduksi, dan 27 spesies tidak tersebar di Indonesia. Metode eDNA disimpulkan memiliki hasil yang presisi untuk digunakan sebagai alternatif metode konvensional, namun memiliki beberapa kendala yang menyebabkan hasil yang didapat kurang akurat sehingga membutuhkan evaluasi dan perbaikan lebih lanjut.

Kata kunci : *Environmental* DNA, Keanekaragaman, Reptil, Serpentes, Sungai Opak

**Identification of Snakes Diversity using eDNA
along Upstream Part of The Opak River
Special Region of Yogyakarta**

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ABSTRACT

Snake monitoring activities is often carried out using conventional methods that consume a lot of time, effort, and resources. Therefore, research regarding alternative methods to conventional research is needed, that is using environmental DNA (eDNA) methods. This study is conducted to understand the diversity of snakes that present in the Opak River using the eDNA method and to determine the precision level of snake diversity results obtained using the eDNA method compared to the Visual Encountered Survey (VES) 2016 manual sampling method. This research utilized water samples from the upper reaches of the Opak River, which were then filtered and preserved at the UGM Animal Systematics Laboratory. Sample collection will take place in July 2022 in the upper reaches of the Opak River, Salem Hamlet, Wukirsari Village. The samples containing DNA were subsequently extracted, amplified using PCR, visualized using ultraviolet light, and sequenced using MiSeq Illumina. The data were processed using Geneious 2020.1.2 software and taxonomically identified and classified using the Kraken 2 classifier with the Kraken2 database. Sample processing and analysis were conducted from December 2022 to August 2023. The results of this study identified 33 snake species from 11 different families. Two species' presence was confirmed through previous research using conventional methods and interviews with informants. Three species were predicted to be introduced species, and 27 species were not distributed in Indonesia. The eDNA method was concluded to yield precise results to be used as an alternative to conventional methods, but it had some limitations that led to less accurate outcomes, thus requiring further evaluation and improvement.

Key word : Diversity, *Environmental* DNA, Opak River, Reptile, Serpentes