

ABSTRAK

Rahmawati, Alvindi. 2026. *Penyusunan E-Ensiklopedia Berbasis Analisis Perbandingan Keanekaragaman Larva Insekta Akuatik di Sungai Wisata Brumbun dan Grape Madiun sebagai Bioindikator Kualitas Perairan*. Skripsi. Program Studi Pendidikan Biologi, Fakultas Keguruan dan Ilmu Pendidikan, Universitas PGRI Madiun. Pembimbing (I) Prof. Dr. Marheny Lukitasari, M.Pd. Pembimbing (II) Nurul Kusuma Dewi, S.Si., M.Sc

Penelitian ini bertujuan untuk menyusun e-ensiklopedia berbasis keanekaragaman larva insekta akuatik, mengidentifikasi famili larva insekta akuatik, menganalisis struktur komunitas sebagai bioindikator kualitas perairan, serta membandingkan kondisi perairan di Sungai Wisata Brumbun dan Sungai Grape Kabupaten Madiun. Penelitian menggunakan metode deskriptif kuantitatif dengan pendekatan eksploratif. Pengambilan sampel dilakukan secara *purposive sampling* pada sepuluh stasiun menggunakan *kick net*. Data dianalisis menggunakan indeks keanekaragaman Shannon-Wiener (H'), keseragaman (E), dominansi (C), kelimpahan relatif, dan *Family Biotic Index* (FBI). Hasil penelitian menunjukkan bahwa e-ensiklopedia memperoleh persentase validasi ahli media sebesar 93,7% (sangat layak) dan validasi ahli materi sebesar 80,2% serta 80,4% (baik), sehingga layak digunakan sebagai media pembelajaran. Sebanyak 20 famili larva insekta akuatik dari 6 ordo berhasil diidentifikasi. Nilai keanekaragaman pada Sungai Brumbun ($H' = 2,28$) dan Sungai Grape ($H' = 2,25$) termasuk kategori sedang, nilai keseragaman tergolong tinggi ($E = 0,94$), sedangkan dominansi tergolong rendah ($C = 0,13$ dan $0,12$). Nilai FBI Sungai Brumbun sebesar 5,26 menunjukkan kualitas perairan cukup dengan pencemaran organik sedang, sedangkan Sungai Grape sebesar 5,13 menunjukkan kualitas perairan baik dengan pencemaran organik ringan. Hasil penelitian menunjukkan bahwa larva insekta akuatik efektif digunakan sebagai bioindikator kualitas perairan, dan e-ensiklopedia yang dikembangkan layak dimanfaatkan sebagai sumber belajar biologi.

Kata kunci: E-ensiklopedia, larva insekta akuatik, bioindikator, kualitas perairan, *Family Biotic Index*.

ABSTRACT

Rahmawati, Alvindi. 2026. Development of an E-Encyclopedia Based on a Comparative Analysis of Aquatic Insect Larval Diversity in the Brumbun and Grape Tourism Rivers, Madiun, as Bioindicators of Water Quality. Undergraduate Thesis. Biology Education Study Program, Faculty of Teacher Training and Education, Universitas PGRI Madiun. Supervisor (I) Prof. Dr. Marheny Lukitasari, M.Pd. Supervisor (II) Nurul Kusuma Dewi, S.Si., M.Sc.

This study aimed to develop an e-encyclopedia based on aquatic insect larva diversity, identify aquatic insect larva families, analyze community structure as a bioindicator of water quality, and compare water conditions between the Brumbun and Grape Rivers in Madiun Regency. A quantitative descriptive method with an exploratory approach was employed. Samples were collected using purposive sampling at ten stations with a kick net. Data were analyzed using the Shannon-Wiener diversity index (H'), evenness (E), dominance (C), relative abundance, and the Family Biotic Index (FBI). The results showed that the e-encyclopedia achieved a media expert validation score of 93.7% (highly feasible) and content expert validation scores of 80.2% and 80.4% (good), making it suitable for use as a learning medium. A total of 20 aquatic insect larva families across 6 orders were identified. Diversity values for the Brumbun River ($H' = 2.28$) and Grape River ($H' = 2.25$) fell into the moderate category; evenness was high ($E = 0.94$), while dominance was low ($C = 0.13$ and 0.12). The FBI value for the Brumbun River (5.26) indicated fair water quality with moderate organic pollution, whereas the value for the Grape River (5.13) indicated good water quality with slight organic pollution. The findings demonstrate that aquatic insect larvae are effective bioindicators of water quality and that the developed e-encyclopedia is suitable for use as a biology learning resource.

Keywords: E-encyclopedia, aquatic insect larvae, bioindicator, water quality, *Family Biotic Index*.