# ABSTRAK

Azolla merupakan tanaman paku air yang mampu mengikat nitrogen bebas ($N_2$) udara melalui simbiosis dengan *Cyanobacteria* (*Anabaena azollae*). Salah satu spesies tanaman Azolla yang sering dibudidayakan adalah *Azolla microphylla*. Spesies ini memiliki keunggulan dibandingkan dengan spesies tanaman Azolla lainnya, diantaranya adalah kandungan proteinnya yang tinggi dan pertumbuhannya yang sangat cepat dengan waktu penggandaan 3-7 hari sehingga dapat dipanen setiap hari untuk dijadikan pakan ternak alternatif. Potensi *A. micropylla* sangat baik, namun pengembangannya di kalangan petani menemui beberapa kendala, diantaranya adalah pemupukan. Pemupukan pada *A. microphylla* yang harus dilakukan secara berkala seringkali memberatkan petani. Oleh karena itu, penambahan beberapa populasi ikan lele pada kolam budidaya *A. microphylla* diharapkan dapat mengurangi intensitas pemupukan atau bahkan menghilangkan pemupukan tambahan pada *A. microphylla*. Penelitian ini bertujuan untuk: 1) Mengetahui pengaruh populasi ikan lele terhadap pertumbuhan dan hasil tanaman *A. microphylla*, 2) Mencari populasi ikan lele terbaik bagi pertumbuhan dan hasil tanaman *A. microphylla*.

Penelitian dilaksanakan pada bulan Oktober 2018 sampai Januari 2019 di Desa Susukan, Kecamatan Sumbang, Kabupaten Banyumas. Penelitian menggunakan Rancangan Acak Kelompok Lengkap (RAKL) yang terdiri dari satu faktor dan tiga ulangan. Faktor yang diteliti adalah populasi ikan lele pada kolam Azolla, yang terdiri dari 6 taraf kerapatan yaitu 0 ekor/$m^2$, 15 ekor/$m^2$, 30 ekor/$m^2$, 45 ekor/$m^2$, 60 ekor/$m^2$ dan 75 ekor/$m^2$. Data dianalisis menggunakan uji F, dan apabila berbeda nyata dilanjutkan dengan uji BNT 5%. Variabel yang diamati yaitu kadar N, P, K dan nilai *Electrical Conductivity* **(**EC) air kolam, panjang akar, warna akar, persentase perapatan, *doubling time*, waktu *recovery*, kandungan klorofil, bobot segar panen (20%, 90%, 100%) dan bobot kering. Hasil penelitian menunjukkan bahwa populasi ikan lele mempengaruhi kadar N, P, K air kolam, *Electrical Conductivity* (EC) air kolam pada umur tanaman 42 hst, 49 hst dan 56 hst, panjang akar dan skor warna akar *A. microphylla* serta persentase perapatan *A. microphylla* umur tanaman 57 hst dan 60 hst. Populasi ikan lele dengan kerapatan 75 ekor/$m^2$ merupakan populasi terbaik untuk meningkatkan kadar N, P, K air kolam. Populasi ikan lele sebanyak 60 ekor/$m^2$ kolam merupakan perlakuan terbaik untuk meningkatkan kualitas akar *A. microphylla*, sedangkan populasi ikan lele sebanyak 45 ekor/$m^2$ merupakan perlakuan terbaik untuk meningkatkan EC air kolam dan persentase perapatan *A. microphylla*.



Kata Kunci: *Azolla microphylla*, ikan lele, populasi

## *ABSTRACT*

*Azolla is an aquatic plant that is capable of fixing free nitrogen ($N_2$) from the air through symbiosis with Cyanobacteria (Anabaena azollae). One species of Azolla plant commonly cultivated is Azolla microphylla. This species has more advantages compared to other Azolla plant species, including its high protein content and its rapid growth with the doubling time of 3-7 days, so that it can be harvested daily to be used as an alternative animal feed. Despite its promising advantages, the development of A. microphylla has encountered several obstacles, incuding fertilizer application. This input factor which must be applied regularly on A. microphylla often burdens the farmers. Therefore, the addition of some catfish populations in A. microphylla aquaculture ponds is expected to reduce fertilizer intensity or even eliminate additional fertilizer for A. microphylla. The objectives of this research were to: 1) Determine the effect of catfish population on the growth and yield of Azolla microphylla plant, 2) Find the best population of catfish for the growth and yield of Azolla microphylla plant.*

*The study was conducted in October 2018 until January 2019 in Susukan Village, Sumbang District, Banyumas Regency. The study used a Complete Randomized Block Design (CRBD) consisting of one factor and three replicates. The factor evaluated was catfish population in Azolla pond with 6 density levels, i.e. 0 individual/m2, 15 individuals/m2, 30 individuals/m2, 45 individuals/m2, 60 individuals/m2 and 75 individuals/m2. Data were analyzed using ANOVA test and continued with LSD 5% test if significantly different results found. The variables observed were N, P, K levels and Electrical Conductivity (EC) value of the pond water, root length, root color, surface cover percentage, doubling time, recovery time, chlorophyl content, yield of 20%, 90%, 100% and dry weight. The results showed that the population of catfish gave a very significant effect on the level of N, P, K of pond water. It also significantly affected root length and colour of A. microphylla, Electrical Conductivity (EC) value of pond water at 42, 49, and 56 days after planting, and Surface cover percentage of A. microphylla at 57 and 60 days after planting. It was found that the pond containing catfish with the density of 75 individuals/$m^2$ was the best treatment to increase the level of N, P, K of the pond water. Moreover, the population of 60 catfish/m2 was the best treatment to increase A. microphylla root growth, whereas 45 catfish/m2 was the best treatment to increase the EC value and surface cover percentage of A. microphylla.*



*Keywords : Azolla microphylla, catfish, population*