

Analisis Kadar Particulate Matter (PM) Pada Lumut *Sphagnum cuspidatum* Ehrh. ex Hoffm. dengan Teknik Moss Bag Sebagai Bioindikator Kualitas Udara di Wilayah Urban Beji dan Juanda Depok = Analysis of Particulate Matter (PM) Levels in *Sphagnum cuspidatum* Ehrh. ex Hoffm. with the Moss Bag Technique as an Bioindicator of Air Quality in the Urban Areas of Beji and Juanda Depok

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Abstrak

Emisi atau residu pembakaran kendaraan merupakan sumber utama terjadinya polusi udara di wilayah urban, salah satunya adalah Particulate Matter (PM). Berdasarkan ukurannya, PM terbagi menjadi dua, yaitu PM10 dan PM2,5. Keberadaan polutan tersebut dapat ditangkap oleh tumbuhan, salah satunya adalah lumut *Sphagnum cuspidatum*. Tujuan penelitian adalah mengetahui perbedaan kadar PM pada lumut *S.*

cuspidatum yang ditransplantasikan di beberapa lokasi dengan jumlah volume kendaraan yang berbeda, serta mengetahui adanya korelasi lingkungan abiotik terhadap kadar PM pada lumut *S. cuspidatum* yang ditransplantasikan. Metode biomonitoring yang digunakan, yaitu transplantasi lumut menggunakan moss bag. Lumut *S. cuspidatum* diukur kadar PM sebelum dipaparkan di lokasi paparan dengan jumlah volume kendaraan yang berbeda. Selanjutnya, 0,5 gram lumut *S. cuspidatum* ditimbang dan dimasukkan ke dalam moss bag yang terbuat dari kantong nilon. Lokasi paparan dalam penelitian, yaitu tepi jalan UI, tepi jalan Kabeda, dan tepi jalan Juanda. Ketiga lokasi tersebut merepresentasikan lokasi tepi jalan dengan tingkat volume kendaraan rendah, sedang, dan tinggi. Waktu paparan selama 5 minggu atau 35 hari. Berat PM diperoleh dari selisih berat kertas saring akhir dengan berat kertas saring awal. Kadar PM dihitung dengan membagi berat PM dan berat kering lumut. Analisis statistik yang digunakan adalah uji Kruskal-Wallis dan uji korelasi Pearson. Hasil penelitian menunjukkan bahwa kadar PM10 dan PM2,5 yang tertangkap oleh lumut *S. cuspidatum* yang ditransplantasikan di lokasi urban Juanda memiliki nilai rata-rata tertinggi. Hal tersebut mengindikasikan bahwa lokasi urban Juanda memiliki tingkat polusi udara paling tinggi, sehingga kualitas udara di lokasi tersebut lebih rendah dibanding lokasi urban Beji UI dan Kabeda. Selain itu, parameter lingkungan abiotik seperti suhu udara, kelembapan udara, kecepatan angin, volume kendaraan, AQI level, konsentrasi PM10 dan PM2,5 di udara berkorelasi terhadap kadar PM yang tertangkap pada lumut *S. cuspidatum*.

.....Emissions or residues of vehicle combustion is the main source of air pollution in urban areas, one of which is Particulate Matter (PM). Based on its size, PM is divided into two, namely PM10 and PM2.5. The existence of these pollutants can be captured by plants, one of which is the moss *Sphagnum cuspidatum*. The aim of the study to determine differences in PM levels in *S. cuspidatum* moss transplanted at several locations with different vehicle volumes and to determine whether there was a correlation between abiotic environment and PM levels in transplanted *S. cuspidatum* moss. The biomonitoring method used is moss transplantation using a moss bag. PM levels of *S. cuspidatum* were measured before being exposed at the exposure location with different vehicle volumes. Next, 0.5 grams of *S. cuspidatum* moss was weighed and put into a moss bag made of nylon bags. Locations of exposure in the study, namely the UI roadside, Kabeda roadside, and Juanda roadside. These three locations represent roadside locations with low, medium,

and high vehicle volume levels. Exposure time for 5 weeks or 35 days. The PM weight was obtained from the difference between the final filter paper weight and the initial filter paper weight. The PM content was calculated by dividing the PM weight and the dry weight of the moss. The statistical analysis used was the Kruskal-Wallis test and the Pearson correlation test. The results showed that the levels of PM10 and PM2.5 caught by *S. cuspidatum* moss transplanted at the Juanda urban location had the highest average values. This indicates that the urban location of Juanda has the highest level of air pollution so the air quality in that location is lower than the urban locations of Beji UI and Kabeda. In addition, abiotic environmental parameters such as air temperature, air humidity, wind speed, vehicle volume, AQI level, PM10, and PM2.5 concentrations in the air correlate with PM levels captured in *S. cuspidatum* moss.