BAB V
PENUTUP

5.1 Kesimpulan

1. Variasi waktu ekstraksi pada metode MAE berpengaruh signifikan terhadap jumlah antosianin yang berhasil diekstraksi. Waktu optimum diperoleh pada 210 detik, yang menghasilkan total kandungan antosianin tertinggi sebesar 13,4038. Peningkatan durasi pemaparan gelombang mikro hingga waktu optimum terbukti meningkatkan intensitas serapan pada panjang gelombang maksimum sekitar 533 nm, yang menunjukkan efektivitas proses ekstraksi dalam memperoleh senyawa antosianin dari bunga Sepatu,
2. Variasi waktu ekstraksi pada metode UAE turut memengaruhi efisiensi perolehan antosianin. Peningkatan durasi sonikasi meningkatkan intensitas efek kavitasi yang mampu merusak dinding sel tanaman sehingga memperbesar pelepasan antosianin ke dalam pelarut. Namun, waktu sonikasi yang terlalu lama berpotensi menurunkan stabilitas antosianin akibat terbentuknya panas lokal selama proses ultrasonikasi. Waktu optimum pada metode UAE diperoleh pada durasi 9 menit, dengan kadar antosianin tertinggi sebesar 5,32376 mg/L.
3. Antosianin bunga sepatu yang diimobilisasi ke dalam film indikator berbasis PVA–kitosan mampu menunjukkan perubahan warna yang jelas sebagai respons terhadap perubahan pH selama penyimpanan susu kedelai. Perubahan warna yang terlihat ketika mengalami pembusukan adalah film yang semula berwarna merah menjadi hijau lumut. Perubahan warna tersebut berkorelasi dengan penurunan tingkat kesegaran susu kedelai akibat aktivitas mikroba, sehingga film indikator dapat berfungsi secara efektif sebagai indikator visual kesegaran susu kedelai.

5.2 Saran

Ada beberapa hal yang perlu diperhatikan dalam penelitian ini

1. Validasi dan karakterisasi antosianin bunga sepatu perlu dilakukan untuk memastikan bahwa senyawa aktif yang berperan dalam perubahan warna indikator benar-benar berasal dari golongan antosianin. Penentuan kadar serta identifikasi jenis antosianin juga penting agar dapat diketahui

antosianin spesifik yang paling berkontribusi terhadap sensitivitas dan perubahan warna akibat pergeseran pH.

2. Selain optimasi waktu, pengkajian lebih lanjut terhadap variasi jenis pelarut dan pengaturan pH selama proses ekstraksi juga direkomendasikan. Perbedaan tingkat polaritas pelarut serta kondisi keasaman medium berpotensi memengaruhi efisiensi ekstraksi, stabilitas struktur, dan karakteristik warna antosianin yang dihasilkan. Oleh karena itu, eksplorasi parameter tersebut secara sistematis diperlukan untuk memperoleh kondisi ekstraksi yang benar-benar optimum, sehingga ekstrak antosianin yang dihasilkan memiliki kestabilan dan sensitivitas respons warna yang lebih baik serta lebih efektif diaplikasikan dalam sistem deteksi kesegaran.
3. Pengembangan label indikator kesegaran masih perlu difokuskan pada pengamatan perubahan warna secara bertahap terhadap waktu penyimpanan, sehingga mampu menggambarkan proses kerusakan awal susu kedelai secara lebih realistis. Hal ini penting karena perubahan kesegaran tidak terjadi secara tiba-tiba, melainkan melalui tahapan sebelum mencapai kondisi basa yang ditandai dengan perubahan warna hijau.

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