

SKRIPSI SARJANA FARMASI

**PENGARUH SINAR ULTRAVIOLET TERHADAP
PARAMETER FISIKOKIMIA DISPERSI KOLOIDAL
KOLAGEN KULIT IKAN GABUS (*Channa striata*)**



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ABSTRAK

PENGARUH SINAR ULTRAVIOLET TERHADAP PARAMETER FISIKOKIMIA DISPERSI KOLOIDAL KOLAGEN KULIT IKAN GABUS (*Channa striata*)

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Dispersi koloidal kolagen kulit ikan gabus (*Channa striata*) merupakan sediaan dari sumber kolagen alternatif yang dapat diaplikasikan sebagai bahan sediaan cair. Stabilitas kolagen dari organisme air diketahui rendah, termasuk dari penyinaran ultraviolet. Perubahan pada molekul kolagen akibat penyinaran ultraviolet telah diteliti sebelumnya. Penelitian ini bertujuan untuk menentukan perubahan intensitas serapan panjang gelombang maksimum, konformasi gugus fungsi, viskositas intrinsik, dan sifat alir dispersi koloidal kolagen kulit ikan gabus setelah pengaruh paparan sinar ultraviolet. Pemeriksaan bahan baku kolagen dilakukan dengan parameter rendemen, berat molekul, kandungan air, kadar abu, kadar protein, kadar lemak, kandungan logam berat, nilai pH, sifat termal, gugus fungsi, dan difraksi sinar X. Parameter intensitas serapan panjang gelombang maksimum, konformasi gugus fungsi, viskositas intrinsik, dan sifat alir dispersi diamati perubahannya di bawah penyinaran ultraviolet. Karakteristik tersebut diamati dengan menggunakan spektrofotometer UV-Vis, spektrometer FTIR-ATR, viskometer Ostwald, dan viskometer Brookfield. Penyinaran ultraviolet menyebabkan peningkatan intensitas serapan pada panjang gelombang maksimum di ± 230 nm ($\Delta_{abs} = 0,107$) dan kehilangan puncak serapan pada panjang gelombang maksimum di 250-300 nm ($\Delta_{abs} = 0,170$). Penyinaran ultraviolet menyebabkan penurunan nilai bilangan gelombang pita amida A ($\Delta n = 30,86$ cm⁻¹) dan peningkatan nilai bilangan gelombang pita amida I ($\Delta n = 1,93$ cm⁻¹). Penyinaran ultraviolet menyebabkan penurunan nilai viskositas intrinsik ($\Delta[\eta] = 38,761$ dL/g). Dispersi koloidal kolagen kulit ikan gabus (*Channa striata*) memiliki sifat alir jenis dilatan tiksotropik. Penyinaran ultraviolet pada sediaan menyebabkan perubahan pada sifat alir. Penyinaran ultraviolet berpengaruh terhadap parameter fisikokimia dispersi koloidal kolagen kulit ikan gabus.

Kata kunci: kolagen, kulit ikan gabus, dispersi koloidal, sinar ultraviolet, stabilitas

ABSTRACT

THE EFFECT OF ULTRAVIOLET IRRADIATION ON PHYSICOCHEMICAL PARAMETERS OF COLLAGEN COLLOIDAL DISPERSION FROM SNAKEHEAD FISH (*Channa striata*) SKIN

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Colloidal dispersion of snakehead fish skin collagen (*Channa striata*) is a form of an alternative collagen source that can be applied as a liquid preparation material. It is known that the stability of collagen from marine organisms is low, including from ultraviolet irradiation. Changes in the collagen molecule due to ultraviolet irradiation have been studied previously. The purpose of this study is to determine the changes of absorption intensity at maximum wavelength, conformational of functional groups, intrinsic viscosity, and rheological properties of the colloidal dispersion of snakehead fish skin collagen after ultraviolet irradiation. Collagen raw material was examined with the parameters of yield, molecular weight, water content, ash content, protein content, fat content, heavy metal content, pH value, thermal properties, functional groups, and X-ray diffraction. The changes of absorption intensity at maximum wavelength, functional group conformation, intrinsic viscosity, and rheological properties of dispersion under ultraviolet irradiation were observed. These characteristics were observed using UV-Vis spectrophotometer, FTIR-ATR spectrometer, Ostwald viscometer, and Brookfield viscometer. Ultraviolet irradiation caused an increase in absorption intensity at maximum length of ± 230 nm ($\Delta_{\text{abs}} = 0.107$) and a loss of absorption peak at maximum wavelength of 250-300 nm ($\Delta_{\text{abs}} = 0.170$). Ultraviolet irradiation caused a decrease in the value of the wavenumber of the amide A band ($\Delta n = 30.86 \text{ cm}^{-1}$) and an increase in the value of the wavenumber of the amide I band ($\Delta n = 1.93 \text{ cm}^{-1}$). Ultraviolet irradiation caused a decrease in the value of intrinsic viscosity ($\Delta[\eta] = 38.761 \text{ dL/g}$). Colloidal dispersion of snakehead fish skin collagen had shear thickening thixotropic flow. Ultraviolet irradiation caused changes in the flow properties of dispersion. Ultraviolet irradiation affects the physicochemical parameters of the colloidal dispersion of snakehead fish skin collagen.

Keywords: collagen, snakehead fish skin, colloidal dispersion, ultraviolet light, stability