

## **STRUKTUR ANATOMIS DAN KAJIAN HISTOKIMIA BUAH ANDALIMAN (*Zanthoxylum acanthopodium* DC.) PADA TIGA FASE KEMATANGAN**

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### **INTISARI**

Buah Andaliman (*Zanthoxylum acanthopodium* DC.) merupakan buah endemik Sumatera Utara yang memiliki nilai ekonomi tinggi. Buah andaliman diketahui mengandung senyawa metabolit sekunder yang memiliki aktivitas biologi tertentu sehingga dapat dijadikan bahan obat. Secara tradisional andaliman digunakan mengatasi penyakit asma, batuk dan reumatik. Andaliman diketahui memiliki aktivitas biologis sebagai antioksidan, antimikrobia, dan efek immunostimulant. Pemanfaatan andaliman sebagai bumbu masak dan obat diduga berhubungan dengan senyawa bioaktif metabolit sekunder. Pada penelitian ini dilihat stuktur anatomi dan histokimia dari buah andaliman pada saat perikarp berwarna hijau, merah dan hitam. Sampel diambil dari Kecamatan Raya, Kabupaten Simalungun, Sumatera Utara dan diteliti di Laboratorium Struktur dan Perkembangan Tumbuhan Fakultas Biologi Universitas Gadjah Mada. Pengamatan struktur anatomi dilakukan dengan pembuatan preparat dengan metode penyelubungan yang dioptimasi, sedangkan uji histokimia dilakukan dengan pembuatan preparat segar yang diuji dengan reagen tertentu. Struktur anatomi buah andaliman pada tiga fase kematangan meliputi bagian perikarp dan biji. Perikarpnya tersusun atas epikarp, mesokarp yang terdapat ruang sekretori, dan endokarp. Struktur biji tersusun atas kulit biji yang terdiri epidermis biji, makrosklereid, osteosklereid, dan endosperm. Jaringan penyusun kulit biji mengalami diferensiasi pada fase 2 dan fase 3 andaliman. Pada fase 3 andaliman mengalami penipisan jaringan mesokarp dan makrosklereid. Jaringan sekretori yang dimiliki buah andaliman adalah jaringan sekretori internal dan ruang sekretori. Berdasarkan uji histokimia senyawa terpenoid, fenolik, alkaloid, flavonoid, dan saponin terdistribusi pada bagian perikarp dan biji buah andaliman pada tiga fase kematangan.

**Kata kunci** : andaliman; anatomi, histokimia, metabolit sekunder, *Zanthoxylum acanthopodium*

## ANATOMICAL STRUCTURE AND HISTOCHEMICAL STUDY OF ANDALIMAN FRUIT (*Zanthoxylum acanthopodium* DC.) AT THREE PHASES OF MATURITY

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### ABSTRACT

Andaliman fruit (*Zanthoxylum acanthopodium* DC.) is a fruit endemic to North Sumatra which has high economic value. Andaliman fruit is known to contain secondary metabolites that have certain biological activities so that they can be used as medicinal ingredients. Traditionally, Andaliman is used to treat asthma, cough and rheumatism. Andaliman is known to have biological activity as an antioxidant, antimicrobial, and immunostimulant effect. The use of andaliman as a cooking spice and medicine is thought to be related to bioactive secondary metabolite compounds. In this study, the anatomical and histochemical structures of Andaliman fruit were examined when the pericarp was green, red and black. Samples were taken from Raya District, Simalungun Regency, North Sumatra and studied at the Laboratory of Plant Structure and Development, Faculty of Biology, Gadjah Mada University. Observation of the anatomical structure was carried out by making preparations using an optimized coating method, while histochemical tests were carried out by making fresh preparations which were tested with certain reagents. The anatomical structure of Andaliman fruit in three stages of maturity includes the pericarp and seeds. The pericarp is composed of the epicarp, mesocarp which contains a secretory ducts, and endocarp. The structure of the seed is composed of the seed coat which consists of the seed epidermis, macrosclereid, osteosclereid, and endosperm. The tissue making up the seed coat undergoes differentiation in phase 2 and phase 3 of andaliman. In phase 3, andaliman undergoes thinning of the mesocarp and macrosclereid tissue. The secretory system of Andaliman fruit is the internal secretory tissue and secretory ducts. Based on histochemical tests, the terpenoids, phenolics, alkaloids, flavonoids, and saponins were distributed in the pericarp and seeds of Andaliman fruit in three stages of maturity.

**Key words** : andaliman, anatomy, histochemistry, secondary metabolites  
*Zanthoxylum acanthopodium*