

## Kristal Apatit Karbonat dalam Kutikula Udang Galah

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### Abstrak

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Sampel kutikula dibuat dari udang galah yang dipelihara dalam akuarium, dengan umur bervariasi dari saat setelah molting sampai dengan molting berikutnya.

Spektra infra merah kutikula yang dipanaskan dengan suhu 600°C dan 900°C selama 6 jam, dan diukur dengan jangkauan frekuensi 4000 - 400 cm<sup>-1</sup>, memberikan informasi bahwa pertumbuhan kristal apatit berlangsung dalam 2 tahap. Mula-mula kristal apatit tumbuh cepat, dalam waktu pendek, kemudian diikuti oleh pertumbuhan yang lebih lambat dalam waktu yang lebih lama, sampai akhirnya berhenti.

Hasil difraksi sinar X memperkuat hasil spektrometer infra merah. Diperoleh pula informasi bahwa kandungan kalsium fosfat dalam kutikula didominasi oleh ACP, termasuk dalam kutikula molting.

Spektrometer RSE (Resonansi Spin Elektron) digunakan khusus untuk mengamati apatit karbonat. Pertumbuhan apatit karbonat dalam kutikula sejalan dengan pertumbuhan kristal apatit. Meskipun kutikula mengandung banyak ACP, apatit karbonat, khususnya tipe A ikut dicerna dan dikeluarkan dari kutikula pada saat persiapan molting.

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The samples of giant prawns cuticle were made with the prawn age variations during one molting cycle.

Infrared spectra of the cuticle after heating with temperature 600°C and 900°C for 6 hours, and measured with the frequency range of 4000 - 400 cm<sup>-1</sup>, showed that the growth of crystals proceeded into two steps. In the first period, the crystals were produced with high rate, within a few days [4-5 days], then followed by lower rate production for longer period, and finally it stopped.

The X-ray diffraction investigation supported the results of infrared spectroscopy. The X-ray diffraction patterns also informed that the calcium phosphate in the cuticle was dominated by ACP, including in the molting cuticle.

The carbonate apatite was studied by using Electron Spin Resonance spectrometer. The growth of the carbonate apatite crystals followed the same way as the crystals growth. Although the cuticle contains high amount of ACP, however, the carbonate apatite especially type A, was also digested and some of them was reabsorbed out of the cuticle during the molting preparation.