

Imaging Spectrometry on Mangrove Species Identification and Mapping in Malaysia

ABSTRACT

This study was conducted in Tok Bali, Kelantan and Setiu, Terengganu, Malaysia with the objectives to determine the spectral properties and to identify the significant wavelength in discriminating five mangrove species at different locations. The five mangrove species selected were *Rhizophora apiculata*, *Bruguiera cylindrica*, *Avicennia alba*, *Heritiera littoralis* and *Hibiscus tiliaceus*. In the Near Infra Red (NIR) region, the mean spectral reflectance of five mangrove species at Tok Bali showed that the highest reflectance was recorded by *R. apiculata* with 84% and the lowest was recorded by *A. alba* with 69% spectral reflectance, respectively. Meanwhile at Setiu, the highest reflectance was represented by *H. littoralis* with 81% and the lowest was *B. cylindrica* with 73%. Spectral reflectance of five selected mangrove species were statistically tested using canonical stepwise discriminant analysis of SPSS program. Fifteen wavelengths were produced in discriminating among five selected mangrove species at both locations. Student t-test showed that there were no significant differences between spectral reflectance of mangrove species at Tok Bali and Setiu ($P=0.345$, $P=0.778$, $P=0.753$ and $P=0.513$ greater than 0.05). These spectral signatures were also influenced by several factors such as cloud cover changes, atmospheric condition, leaf internal structure and chlorophyll content. This study therefore implies that individual mangrove species have a unique spectral reflectance and can be easily identified and mapped with a narrow contiguous wavelength bands in the NIR region.

Keyword: Mangrove, Spectral, Reflectance, Spectroradiometer, Wavelength, Stepwise analysis, Hyperspectral