

LAYMAN'S ABSTRACTS

A Hybrid CFD-BEM Analysis of the Aerodynamic Performance of a Cut-Out Hollow Pipe Horizontal Axis Wind Turbine Blade

Neil Richard P. Tanguilig and Louis Angelo M. Danao

This study investigated the performance of a cut-out hollow-pipe blade profile in small horizontal axis wind turbines (HAWT). Although this type of blade was expected to have losses in efficiency, such blade profile can be easily manufactured locally, and could potentially have a lower cost compared to conventional blades with aerofoil profiles. Computational Fluid Dynamics (CFD) was used to derive the aerodynamic characteristics of the cut-out hollow-pipe sections. The Blade Element Momentum (BEM) method was then used to investigate the performance of the HAWT's rotor. CFD results show that cut-out hollow-pipe sections have poor aerodynamic characteristics due to their simple geometry and crude design. BEM results demonstrate that rotor with cut-out hollow-pipe blades can still work but only at low tip speed ratios. Other relevant analyses show that the performance can be improved by altering the pitch of the blades and by adding additional blades to the rotor.

Genetic Comparison of *Oncomelania hupensis quadrasi* (Möllendorf, 1895) (Gastropoda: Pomatiopsidae), the Intermediate Host of *Schistosoma japonicum* in the Philippines, Based on 16S Ribosomal RNA Sequence

James Christopher C. Chua, Ian Kim B. Tabios, Pebbles Grayle P. Tamayo, Lydia R. Leonardo, Ian Kendrick C. Fontanilla, Raffy C. Fornillos, Emmanuel Ryan C. De Chavez, Takeshi Agatsuma, Mihoko Kikuchi, Naoko Kato-Hayashi and Yuichi Chigusa

Schistosoma japonicum is a parasitic fluke that makes use of humans and other vertebrates as hosts. Its infective stage is the water-borne cercaria that burrows through skin. One of its intermediate hosts that release cercariae is the freshwater snail *Oncomelania hupensis*. There are many

subspecies of *O. hupensis* in Asia; in the Philippines, the subspecies present is *O. hupensis quadrasi*. The genetic diversity of the snail intermediate host may also reflect the genetic diversity of the parasite, which in turn, may have implications on the susceptibility of a snail to the parasite as both may co-evolve with each other. This study aimed to assess the genetic diversity of *O. h. quadrasi* isolates based on the 16S rRNA gene from nine provinces known to have *S. japonicum* in the Philippines, namely Cagayan Valley, Bohol, Negros Occidental, Leyte, Davao, Davao del Sur, Mindoro Oriental, Samar, and Sorsogon. *O. h. hupensis* and *O. h. nosophora* subspecies were also collected from China and Japan, respectively. The results reveal that the Philippine *O. h. quadrasi* had four distinct sequences, but these were not correlated with their geographical location. Furthermore, the Philippine isolates formed a distinct group from the other subspecies, confirming its taxonomic designation.

Morphological Characterization, Evaluation and Selection of Hibiscus (*Hibiscus rosasinensis* L) Hybrids

**Elena May N. Cabarrubias, Pablito M. Magdalita,
Antonio G. Lalusin and Norma G. Medina**

Fifty-seven hibiscus siblings derived from the cross-breeding of different parents were assessed for various characteristics to select plants with good flower color and form. Out of 57, 14 hybrids were selected. The characteristics of the siblings were subjected to principal component analysis (PCA) and cluster analysis. PCA revealed three major PCs with eigenvalue >1 contributing 78% of the total accumulated differences among the siblings. For instance, in PC-I, the contribution of flower size, leaf size, and style length to variation in flower traits was the highest. Using the three major PCs, the 57 siblings were grouped into five different clusters. Cluster-I had 16 yellow-orange and purple members. Cluster-II had 15 white and red-purple members. Cluster-III comprised five yellow members. Cluster-IV was composed of 13 yellow and yellow-orange members. Cluster-V had 8 members with red and red-purple flowers. The mean size of the flowers of all siblings was 130.21 mm. PCA revealed that the siblings with large flowers and longer petioles tend to have wider leaves, which agrees with the dendrogram groupings of the 57 hibiscus hybrids. Correlation based on PCA revealed a

significant positive association between flower size and leaf size, and between petiole length and leaf size.

Determination of Cr, Cd, Sn and Pb in Selected Herbal Products Available in Philippine Markets

Joan S. De Vera, Leni B. Quirit and Irene B. Rodriguez

Many Filipinos rely on herbal products despite the lack of studies validating their safety. One concern in the use of herbal supplements is metal contamination, which may be introduced from the environment where the plants are grown, as well as during manufacturing. When ingested, metals, such as lead and cadmium, can accumulate in the body and cause various health problems like liver and kidney damage. Some forms of tin and chromium are also known to be toxic to humans. In light of this, we conducted a study to analyze the amount of these trace metals in selected herbal products with various plant ingredients. Most of the products tested had measurable trace metal concentrations, which were below the suggested maximum limits for cadmium and lead in herbal products. However, one product derived from mangosteen exceeded the limit for cadmium. The variability of metal concentrations in herbal products underlines the fact that plants are susceptible to contamination, and quality control during processing must be improved to minimize possibility of contamination. The results of this study suggest that vigilant monitoring of herbal products is imperative to avoid exposure to trace metal contaminants.

Angiotensin-Converting Enzyme Inhibitory Action of Selected Plants

Dionisio Bong B. Singson and Christine L. Chichioco-Hernandez

Hypertension is a leading cause of morbidity in the Philippines affecting 20% of Filipino adults. Untreated hypertension may lead to stroke, blindness, heart attack, and kidney and heart failure. One way to lower blood pressure is through the use of angiotensin-converting enzyme (ACE) inhibitors like captopril. However, the use of such drugs is associated with unwanted side effects. Plants are good sources of potential effective anti-hypertensive compounds with minimal side effects.