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Vanda Sp

The orchid genus Vanda belongs to the largest family of flowering plants -the Orchidaceae, many of them endemic to the Philippines. There are over 900 species of orchids in the country representing almost 10 % of the entire flora. Orchids grow in the wild as terrestrial plants or epiphytes, and are collected or cultivated by enthusiasts and growers. It is economically important as part of the cut flower industry. Although orchids have been studied since a very long time, the taxonomy of orchids is in a constant flux since it is currently based generally on morphological characters. Partly due to the strong heterozygosity displayed by them, large variations occur among species, creating confusion regarding taxonomical status based on morphological descriptions of some species. The situation gets complicated because the orchids can breed easily with other species within the same genus or with those of closely related genera giving rise to hybrids. Such hybrids often show habit and growth behavior similar to other species, thus adding to the confusion. This has led to different versions of classifications and relationships among the orchids.

Recent advances using molecular techniques like isozyme analysis, Restricted Fragment Length Polymorphism (RFLP) and Random Amplified Polymorphic DNA (RAPD) have contributed to understanding phylogenetic relationships among the orchid groups. Since these techniques rely on genomic information rather than the morphologic, they are seen to be more useful in studying relationships. With the available resources, this study focused on selected members of the Philippine Vanda and related species, as well as one "new" as yet unidentified vandaceous species collected from Cotabato, in order to study genetic relationships using the RAPD technique. The main objective was to obtaining preliminary genomic data to be able to asses the relationships among the different species of the Philippine Vanda and its related species [namely -V. lamellata, V. merillii, V. luzonica, V. ustii, V. roeblingiana, V. javierae, V. sanderiana syn. Euanthe and related species like Trichoglottis, Ascocentrum, Euanthe and Renanthera].

The genomic DNA was extracted from leaf samples using the modified CTAB method and RAPD was performed using PCR Core System I kit (Invitrogen) in a thermocycler (MJ Research PTC100) using fourteen different Operon primers. The optimized reaction conditions were: 50 µl reaction volume, containing 1x PCR buffer, 4 mC-0.06bsM04 T493r,

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[Ru(dppe)Cp*C$_6$I(CN)$_4$·½(C$_6$H$_6$)], [Ru(dppe)Cp*C$_6$I(CN)$_4$·½(C$_2$H$_5$OC$_2$H$_5$)], and [Ru(dppe)Cp*C$_4$(CN)$_4$]

The crystal structures of *[Ru(dppe)Cp*C$_6$I(CN)$_4$·½(C$_6$H$_6$)]*, **I**; *[Ru(dppe)Cp*C$_6$I(CN)$_4$·½(C$_2$H$_5$OC$_2$H$_5$)]*, **II**; and *[Ru(dppe)Cp*C$_4$(CN)$_4$]*, **III**, were solved by single crystal x-ray diffraction at 150(2) K using a Bruker SMART CCD diffractometer.

I and **II** are isomorphous crystallizing in space group ***P***$\bar{1}$ with 2 molecules per asymmetric unit. The cell parameters for **I**: a = 15.706(2) Å, b = 16.891(2) Å, c = 17.669(2) Å; α = 100.360(2)°, β = 102.755(2)°, γ = 98.698(2)°, V = 4407.3(9) Å^{-3}, Z = 4; for **II**: a = 15.786(3) Å, b = 16.885(3) Å, c = 17.620(3) Å, α= 100.30(3)°, β = 102.62(3)°, γ = 99.80(3)°, V = 4400.8(18) Å^{-3}, Z = 4. Residual benzene solvent molecules are found in **I** while residual diethylether solvent molecules are found in **II**. Crystal **III** crystallized in the space group $P2_1/n$ with cell parameters : a = 13.362(3) Å, b = 17.193(3) Å, c = 16.114(3) Å; β= 98.96(3)°, V= 3656.7(13) Å^{-3}, Z = 4. All non-hydrogen atoms were refined anisotropically. Hydrogen atoms were located at geometrically calculated positions. Final cycles of full-matrix least squares refinement converged at R and wR values of: **I**, 0.047, 0.066; **II**, 0.054, 0.069; **III** 0.059, 0.073, respectively. All structures exhibit distorted octahedral geometry about the Ru center. The P atoms of dppe are coordinated to Ru at a distance ranging from 2.27 Å to 2.30 Å. The distance of Ru to the C of the acetylenic chain is about 1.9 Å. The Cp* ring sits atop the Ru at a distance about 1.9 Å away as defined by the plane of Cp*. Bond lengths and angles of the dppe, Cp*, and the acetylenic carbon chain as well as those of the cyano groups are normal.

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Allocation

Prior work has demonstrated the applicability of Zimmermann's symmetric fuzzy linear programming (SFLP) as a robust method for designing near-optimal reuse networks for

By using real classroom evaluations, in two studies, the effects of metacognitive ability (high vs. low) and test type (multiple-choice vs. short-answer) on students' performances and monitoring processes in individual and in collaborative tests were investigated. Moreover, it was also assessed whether those effects would change over the duration of one academic term. Results revealed that 1) compared to their counterparts, high-metacognitive students presented more effective test preparation practices and attributional and regulatory processes. As a result, they presented better test performances and online monitoring; 2) over time, students' performances and monitoring processes varied in specific patterns according to the type of test being taken; and 3) collaborative testing had particular positive effects on groups of low-metacognitive students. Only the accuracy scores of groups composed of two low-metacognitive students showed a significant improvement from the first to the second short-answer tests. Consequently, their performances also improved. Results are discussed focusing on the educational implications of the interaction of those factors and how it might determine how much students can learn from test-taking experiences.

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