

INITIAL BIOLOGICAL VALIDATION OF HERBAL DRUGS FROM VIETNAMESE TRADITIONAL MEDICINE

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Introduction: In Vietnam, two types of traditional medicine (TM) are practiced: *thuoc nam*, medicine of the South, and *tuoc bac*, medicine of the North, both of which are largely based on herbal drugs used by different Vietnamese ethnic groups. The main problem of Vietnamese herbal pharmacology is the biological validation of the traditional uses of medicinal plants and pure compounds isolated from them. To this purpose, we have performed initial validation studies on two plants of Vietnamese medical tradition: *Dacrycarpus imbricatus*, and *Pinus dalatensis* Ferrè.

Materials and methods: Analysis of cell viability and cell cycle progression. Cell viability and cell cycle progression were analyzed by flow cytometry to determine DNA content of cell nuclei after staining with propidium iodide (PI). Briefly, cells were collected by centrifugation and washed in PBS. DNA was stained by incubating the cells in PBS containing 50 µg/mL PI and incubated for 30 min at 4°C. Fluorescence was measured and analyzed using a Becton Dickinson FACScan and Cell Fit software.

Results: *Dacrycarpus imbricatus* (Blume) de Laub: A new diterpene, cassiopouryl hexadecanoate (2), in addition to cassiopourol (1) and four terpenes were isolated from the twigs and leaves of the plant. The two monocyclic diterpenes (1 and 2) were tested for their anti-proliferative activity on acute myeloid leukemia (OCI-AML) cells. The results showed that 1 had significantly anti-proliferative activity whereas 2 was weakly active. *Pinus dalatensis* Ferrè is an endemic species in Vietnam that has never been investigated. Fifteen compounds were isolated from its wood including two diterpenoids (1, 2), five flavonoids (3, 4, 5, 6, 7), five stilbenoids (8, 9, 10, 11, 12), two lignans (13, 14) and one phenol (15). Compounds 2, 3 and 9 had inhibitory effects on the growth of OCI-AML.

Discussion and conclusion: In conclusion, the contribution of Vietnamese TM in establishing improved medical standards via the biological validation of the traditional remedies *Dacrycarpus imbricatus*, and *Pinus dalatensis* Ferrè has been analyzed. Specifically, several compounds isolated from different parts of the two medicinal plants were able to inhibit cell cycle progression and to increase apoptosis. Additional studies will clarify mechanisms, toxicity and therapeutic importance of these substances. Thus, biological validation of traditional medicines, particularly characterization of their active components, will hopefully prompt development of novel drugs, reveal new drug targets, and uncover pathogenic mechanisms of various diseases. Additionally, because many TM therapies have been used for a long time, ideal compounds have already been selected based on their efficacy and low toxicity profile and could be utilized in Western medicine after appropriate validation. The successful integration of Western and Oriental pharmacology can improve health perceptions and available medical treatments to cultures around the world.