

A Diterpene γ -Lactone Derivative from *Pterodon polygalaeflorus* Benth. as a Photosystem II Inhibitor and Uncoupler of Photosynthesis

Beatriz King-Díaz^a, Flávio J. L. dos Santos^b, Mayura M. M. Rubinger^c,
Dorila Piló-Veloso^b, and Blas Lotina-Hennsen^{a,*}

^a Departamento de Bioquímica, Facultad de Química, Universidad Nacional Autónoma de México, Ciudad Universitaria, México, D. F., 04510, México. Fax: (55) 56225329.

E-mail: blas@servidor.unam.mx

^b Departamento de Química, Instituto de Ciências Exatas, Universidade Federal de Minas Gerais, Belo Horizonte, MG, 31270-901, Brazil

^c Departamento de Química, Centro de Ciências Exatas e Tecnológicas, Universidade Federal de Viçosa, Viçosa, MG, 36571.000, Brazil

* Author for correspondence and reprint requests

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6 α ,7 β -Dihydroxyvouacapan-17 β -oic acid (**1**) was isolated from *Pterodon polygalaeflorus* Benth. Modification of **1** yielded 6 α -hydroxyvouacapan-7 β ,17 β -lactone (**2**) and then 6-oxovouacapan-7 β ,17 β -lactone (**3**). Photosynthesis inhibition by **3** was evaluated in spinach chloroplasts. The uncoupled non-cyclic electron transport rate and ATP synthesis were inhibited by **3**, which behaved as a Hill reaction inhibitor. Furthermore, **3** acted as an uncoupler because it enhanced the basal and phosphorylating electron transport rate on thylakoids. This last property of **3** was corroborated when it was observed that it enhances the Mg²⁺-ATPase activity. In contrast, **3** did not affect photosystem I (PSI) activity. Analysis of the partial photosystem II (PSII) reactions from water to DCPIP_{ox} and water to silicomolybdate allowed to locate the inhibition sites at the redox components of PSII. The OJIP test of the chlorophyll *a* fluorescence transient confirmed that the inhibition sites were 1.) the oxygen-evolving complex (OEC) and 2.) by the formation of silent centers in the non-Q_A reducing centers.

Key words: PSII Inhibitor, *Pterodon polygalaeflorus* Benth., 6-Oxovouacapan-7 β ,17 β -lactone