

INHIBITION BY FLAVONE OF ALTERNATIVE DEHYDROGENASES IN  
MITOCHONDRIA OF *A. ANGUSTIFOLIA*

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Alternative NAD(P)H-dehydrogenases are specialized mitochondrial proteins that are non-proton pumping unlike complex I, and probably related to stress. Their activities were found in *A. angustifolia* mitochondria. It has been suggested that flavone inhibits alternative NADH-dehydrogenases in plants, fungi and protozoa. Considering the great differences between angiosperms and gymnosperms, our main interest was to investigate the effect of flavone on NADH-dehydrogenases in araucaria. Here we demonstrate its inhibitory action on uncoupled mitochondria respiring by oxidation either of NADH, malate/glutamate or succinate. This effect was detected by the decreases in oxygen consumption and  $\Delta\psi$ . Analysis of the inhibitions promoted by 500 $\mu$ M flavone on respiration induced by the individual substrates, in the presence or absence of rotenone, showed that it affected similarly the alternative NADH-dehydrogenases (60%). It also presented 10% inhibition on complex I and 20% on complex II. Membrane potential measured fluorometrically was partially depolarized by addition of flavone to mitochondria respiring on NADH or malate/glutamate. Further addition of FCCP totally collapsed  $\Delta\psi$ . These results confirm that the internal and external NADH-dehydrogenases of *A. angustifolia* mitochondria are highly sensitive to flavone. Our data may contribute to the understanding of NADH-dehydrogenases and of other mitochondrial functions in this gymnosperm.  
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