Berberina: Diminui o potencial de membrana mitocondrial (Delta-Psimt), Inibe microorganismos tumorigênicos: bactérias, fungos e vírus, Interage com DNA e RNA formando complexos, Ativa AMPK, Ativa p53, Inibe HIF-1, Inibe NAT – N-acetiltransferase, Inibe a telomerase, Inibe a topoisomerase I, Inibe COOX-2, Inibe NOi (óxido nítrico induzível), Inibe a 5 alfa-reduutase tipo 2, Ativa p21, p27 e Wee1 e inibe Cdk1, Cdk2, Cdk4/6 e Ciclinas A, E, D1 e D2, Aumenta expressão do Fas/FasL, Inibe fator nuclear NF-kappaB,Inibe metaloproteinases: MMP-1, MMP-2 e MMP-9, Inibe vários fatores de crescimento, Reduz resistência à insulina, Diminui a resistência do câncer MDR, Inibe a glicólise por inibir extrusão do lactato (inibe CD147/Basigin - MCT1/4) . José de Felippe Junior

**Inhibition of CYP450 1A and 3A by berberine in crucian carp Carassius auratus gibelio.**


**Source**

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**Abstract**

Berberine has long been considered as an antibiotic candidate in aquaculture. However, studies regarding its effects on drug-metabolizing enzymes in fish are still limited. In the present study, the effects of berberine on cytochrome P4501A (CYP1A) and CYP3A in crucian carp were investigated. Injection of different concentrations of berberine (0, 5, 25, 50, and 100mg/kg) inhibited the CYP1A mRNA expression, thereby inhibiting further the catalytic activity of CYP1A-related ethoxyresorufin-O-deethylase (EROD). Furthermore, both CYP1A expression and EROD activity were further inhibited with increasing berberine concentrations. In addition, the CYP3A expressions at both the mRNA and the protein levels were downregulated by higher berberine concentrations. The catalytic activity of CYP3A-related erythromycin N-demethylase (ERND) was also inhibited by berberine at a dose of no less than 25mg/kg. Moreover, at the berberine concentration exceeding 25mg/kg, the inhibition of CYP3A expression
and ERND activity increased with increasing berberine concentrations. In vitro experiments were also performed. When berberine was pre-incubated with the crucian carp liver microsomes, it competitively inhibited the corresponding EROD activity with the IC(50) of 11.7 μM. However, the ERND activity was slightly inhibited by berberine with the IC(50) of 206.4 μM. These results suggest that, in crucian carp, berberine may be a potent inhibitor to CYP1A, whereas the CYP3A inhibition needs a higher concentration of berberine.

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