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Hypoxic and aerobic culture systems influence activity of selected flavonoids in eukaryotic parasitic organism *in vitro*: An interesting model for pharmacological research

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Larval stage of flatworm, tetrathyridium, has ability of survival and asexual multiplication in a wide range of vertebrate hosts what indicates a high biochemical and physiological potential for adaptation. We recently developed axenic long-term *in vitro* cultivation systems of larvae under both hypoxic and aerobic conditions, representing the unique eukaryotic model for pharmacological and molecular studies. This *in vitro* system allowed us to study the dose- and time-dependent effects of various natural compounds on multiple biochemical and molecular pathways in larvae. We have focussed on flavonolignans (silybin, dehydrosilybin and silychristin) prepared from silymarin, the main component of herb *Silybum marrianum* and two other flavonoids: bergenin and arbutin. Activity of individual compounds on metabolic activity of larvae, which reflects activity of enzymes of complex I and II in mitochondria, was dependent on oxygen tension in culture. Flavonolignans also modulated activity of other enzymes like GST, SOD, enzymes involved in glucose transport, in lipogenesis, cell death and motility, indicating their complex activity on multiple targets in larvae.

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