

不同质量浓度苦草对铜绿微囊藻生长及抗氧化酶系统的影响

Effects of different concentrations of *Vallisneria spiralis* Linn. on growth and antioxidant system of *Microcystis aeruginosa*

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中文摘要:

采用苦草(*Vallisneria spiralis* Linn.)和铜绿微囊藻(*Microcystis aeruginosa*)共生培养的实验方法,通过追踪测定铜绿微囊藻的生物量、叶绿素a含量、丙二醛(MDA)含量、超氧化物歧化酶(SOD)和过氧化物酶(POD)活性,研究了不同质量浓度苦草对铜绿微囊藻生长及抗氧化酶系统的影响。结果表明,质量浓度大于10 g/L时,苦草对铜绿微囊藻有明显的抑制作用,表现为苦草质量浓度为10、20和40 g/L时,第15天对铜绿微囊藻的抑制率分别为63.3%、94.7%和99.8%,培养过程中,铜绿微囊藻的叶绿素a含量逐渐减少,而SOD、POD活性及MDA含量呈现先增加后逐渐降低的趋势,表明苦草释放的化感物质在经过一定时间积累后能够明显抑制铜绿微囊藻SOD和POD的活性,引起细胞的氧化损伤,促进叶绿素的分解,从而导致藻类死亡,这是苦草抑制铜绿微囊藻生长的原因之一。

英文摘要:

The evaluation of different concentrations of *Vallisneria spiralis* Linn. on *Microcystis aeruginosa*'s growth and antioxidant system was carried out through co-cultivation of *Vallisneria spiralis* Linn. and a by monitoring the alga density, chlorophyll-a content, MDA content, SOD and POD activities. Results showed there was significant inhibition on a' s growth when the co-cultivated *Vallisneria spiralis* Linn.' s concentration was over 10 g/L. After 15 days incubation, the inhibition rates of a' s growth were 63.3%,94.7% and 99.8% versus the concentration of *Vallisneria spiralis* Linn. at 10, 20 and 40 g/L, respectively. During the incubation period, chlorophyll-a content of a decreased gradually, whereas MDA content, SOD and POD activities increased initially and decreased gradually thereafter. The study indicated that one of the mechanisms which led the inhibition of *Microcystis aeruginos*' s growth by co-cultivation with *Vallisneria spiralis* Linn. demonstrated that the accumulated allelopathical substance which released from *Vallisneria spiralis* Linn. effectively inhibited SOD and POD activities of *Microcystis aeruginos*, induced the oxidative damage to cells and eventually facilitated chlorophyll degradation of *Microcystis aeruginos*.

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