不同培养条件对堆肥中降解纤维素林丹复合菌系分解能力的影响

Effects of cultural conditions on the capability of complex microbial system to degrade cellulose and lindane in composting

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中文摘要：

该论文作者对一组高效降解纤维素林丹的复合微生物菌系在不同培养条件下的降解能力进行了研究，结果表明，该复合菌系对滤纸、脱脂棉、稻秸粉和锯末等不同纤维素材料均有较强的降解能力，但相比之下对天然纤维素含量高的碳源（如滤纸、脱脂棉）降解效果更好。最佳的碳源浓度为0.5%和1%。有机复合氮源对降解效果的影响明显优于无机氮源，氮源浓度以0.25%和0.5%为宜。它能在较大的pH值范围内均保持高的纤维素降解活性，但在中性及偏碱环境中活性最强。在纤维素降解最佳的pH值7～9范围内，也同样有利于林丹的降解，而在纤维素降解较少的pH值为10的条件下，林丹的降解率仍高达49.6%。培养复合菌系的溶解氧范围以0.07～0.13 mg/L为宜，最适生长和降解纤维素林丹的温度为50～60℃。

英文摘要：

The degrading capability of a high-efficient complex microbial system to degrade cellulose and lindane was tested under different cultivating conditions. The results show that the complex microbial system can decompose filter paper, absorbent cotton, rice straw powder and sawdust effectively, especially has high degrading activity for the materials with higher native cellulose such as filter paper and absorbent cotton. The more cellulose was decomposed, the more lindane was degraded. The optimum concentrations of carbon were 0.5% and 1%. The organic nitrogen source was much better than inorganic nitrogen source on the degrading effect. The demand of nitrogen concentration for the microbial system was stricter for that of carbon, and the optimum concentrations were 0.25% and 0.5%. The complex microbial system can also keep a higher degrading capability in a wider range of pH value. Filter paper and lindane can be degraded effectively by the complex microbial system during pH 7～9 which also was the optimum condition of cellulose degrading, and in the condition of pH 10, the degradation ratio of lindane reached 49.62%, much more than that of cellulose. The optimum oxygen concentration was 0.07～0.13 mg/L, and the most adaptable temperature was 50～60℃.

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