Periphyton communities in carp culture ponds treated with cow manure and biogas slurry

The mean periphyton counts in the surface and subsurface waters of the fish ponds with applications of cow manure at 10 t/ha/yr; urea at 100 kg N/ha/yr and single super phosphate at 50 kg P/ha/yr in the first treatment; biogas slurry at 15 t/ha/yr and inorganic fertilizers as in the previous treatment in the second treatment; biogas slurry at 30 t/ha/yr in the third and biogas slurry at 30 t/ha/yr with supplementary feed were 333, 365, 433/cm²/day and 230, 284, 348, 377/cm²/day, respectively. Higher counts were observed in treatment 4, followed by treatments 3, 2 and 1 showing significant differences with higher counts in the surface waters. The species diversity indices were more in the third and fourth treatments with higher diversity at the surface levels. The dominance of Bacillariophyceae in the surface waters was distinct (45.9–60.6%) attributing to the higher nutrient availability on mineralization of the easily decomposable substrate. Water quality parameters in all the four treatments were in the normal ranges. The representations of both Bacillariophyceae and Chlorophyceae were similar in the subsurface waters (36.6–50.8% and 28.2–36.4%). There was an increase in the percentage composition of protozoans in the surface waters in the slurry-applied ponds (0.6–3.3%). Variations in rotifers were moderate, the respective representation ranges being 0.9–3.4%, 2.2–5.3% in the two levels and cladocerans in subsurface waters were higher with means of 10.7, 4.3, 4.9 and 4.7. Copepods were the dominant group in the animal assemblages at the surface level with the means of 3.0%, 2.3%, 4.0% and 5.0%. The variations in the different groups presented a vertical distribution pattern in the colonization of the periphytic communities.

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