# 5. SUMMARY

1. The isolates obtained showed very less activity and were heterotrophs. Highest nitrification was observed with D330 which corresponded to 2.198µg/ml of nitrite.

2. D3 consortia showed the maximum nitrite production and hence was selected for the further studies and had 1000 times more nitrifying activity as compared to pure isolates.

3. Bacteria growing under the anaerobic conditions were not anammox as they did not show considerable decrease in the ammonia and nitrite.

4. Ammonium sulphate supported maximum nitrifying activity with D3 consortia amongst the ammonium salts tested.

5. $K_2HPO_4$ and $NaH_2PO_4$ supported maximum nitrifying activity with D3 consortia amongst the phosphate salts.

6. Bicarbonate and carbonate showed almost similar results in the nitrifying activity.

7. D3 consortia showed greater Nitrifying activity as compared to the standard strain *Nitrosomonas europaea.*

8. Maximum growth and nitrifying activity for D3 consortia was obtained at pH 8.

9. In the statistical optimization of the media, in the Plackett Burman design $MgSO_4$ and $CuSO_4$ had significant effect on the removal of ammonia, whereas $(NH_4)_2SO_4$, $CaCl_2$, and $CuSO_4$ had significant effect on the production of nitrite.

10. When the concentration of $CuSO_4$ was increased in the medium it showed maximum activity at 0.75ppm concentration.

11. Amplification of *amoA* gene could be obtained with D3 consortia, *Nitrosomonas europaea* acting as +ve control and *E. coli* as –ve control. This confirmed that D3 consortia contain ammonia oxidizing bacteria.

12. Vanadium increased the nitrifying activity in D3 consortia, whereas it decreased the nitrifying activity in *Nitrosomonas europaea*.

13. In the presence of Nickel and Cobalt the nitrifying activity of D3 consortia and *Nitrosomonas europaea* decreased immediately.

14. Nitrifying activity of D3 consortia showed resistance to Chromium at a low concentration, while *Nitrosomonas europaea* was sensitive to the metal.