Discussion

The growth of phytoplankton was observed to be highest when combination of mustard cake and NPK was applied. This was true for all classes of phytoplankton found. However the growth of phytoplankton was found to be higher on application of NPK than mustard cake when these were applied alone. Mustard cake contains 4.8% of Nitrogen, 2% phosphorous (as P_2O_5) and 1.3% potassium (as K_2O) (Solvent Extractor's Association of India, 2011, *Indian Oilmeals Fertilzer From Nature*). The presence of NPK in mustard cake helps in the growth of phytoplankton. Though application of NPK results in higher growth of phytoplankton, it may be advisable to go for organic fertiliser rather than opting for inorganic fertiliser as the growth of phytoplankton with mustard cake is sufficient for fish growth. When inorganic fertiliser is used, fish becomes entirely dependent on phytoplankton as it can not feed on inorganic fertiliser. But in case of organic fertiliser like mustard cake, fishes can feed on mustard cake also besides feeding on phytoplankton. Thus growth of fish is not affected by the lower phytoplankton growth on application of organic fertiliser (Effect of Organic and Inorganic Fertilizers on Plankton Production and Bluegill Bream Carrying Capacity of Ponds by E. V. Smith &H. S. Swingle , Pages 257-262, Published online: 09 Jan 2011). The chlorophyll a was also found to be highest in the pots fertilised by mix of NPK and mustard cake followed by NPK and mustard cake. This is lowest in the pots fertilised by mustard cake alone. The chlorophyll a content of phytoplankton was also

measured to estimate the growth of phytoplankton. As the chlorophyll a content is proportional to the phytoplankton present, the chlorophyll a content estimate has also been used for estimation of phytoplankton growth in our study. Chlorophyll a estimation also indicate that the phytoplankton growth is maximum on application of combination of NPK and mustard cake followed by NPK and mustard cake alone. Thus the results obtained from counting of phytoplankton cells and chlorophyll a growth have been found to be similar.

pH level was around 7 which is suitable for growth of phytoplankton. The variation was observed through the day due to CO_2 by phytoplankton during daytime by photosynthesis. The turbidity and transparency was also varied depending on the growth of phytoplankton.

Though the growth of phytoplankton has been found to be highest on application of NPK+mustard cake, it may not be the best method of fertilisation for fish growth. The fish survival rate is higher in ponds treated with organic fertiliser (Advantage of Organic Supplementation of Inorganic Fertilizer in Walleye (*Sander vitreus*) Hatchery Ponds at Minor Clark Fish Hatchery, *KY* Brian C. Reeder and Roderick J. Middleton). Further excessive use of inorganic fertiliser may lead to deterioration of soil quality in the pond as Inorganic fertiliser like NPK do not decompose. It may result in reduction in fish production in long run. As mustard cakes can get decomposed by oxygen no long term adverse impact take place in pond soil due to application of mustard cake.