

Table 4 Shows the water quality parameters of culture medium

	T°C	pH	DO (mg/L)
SC1	32.38 ^a	6.10 ^a	5.30 ^a
SC2	31.28 ^a	5.90 ^a	5.61 ^a
SC3	31.74 ^a	5.78 ^a	5.45 ^a
SC4	29.71 ^a	5.70 ^a	5.85 ^a
SC5	29.55 ^a	6.16 ^a	4.99 ^a
Pr>F(Model)	0.51	0.86	0.35

Mean with the same superscript across the same row we're not significantly different (P>0.05)

Table notes: SC= *Saccharomyces cerevisiae*, T= Temperature, DO= Dissolved oxygen

3 Discussion

The growth performance of *Clarias gariepinus* fed diets containing *Saccharomyces cerevisiae* was evaluated in this study. The results showed that dietary inclusion of *S. cerevisiae* significantly improved growth performance, nutrient utilization, and carcass composition of *C. gariepinus*, particularly at the 0.5% supplementation level. The mean weight gain (MWG) recorded in this study ranged from 37.66 g to 68.65 g, with the highest value obtained in the 0.5% inclusion level of *S. cerevisiae*. This result is similar to the findings of Kela et al. (2022), who recorded a MWG of 71.60 g/fish in *C. gariepinus* fed diets containing 100% black cumin (*Nigella sativa*). However, the MWG recorded in this study is lower than the value reported by Abdullahi et al. (2024), who recorded a MWG of 120.33 g in *C. gariepinus* fed diets containing 2.5% *Nigella sativa* meal as a growth promoter. The percentage weight gain (PWG) recorded in this study ranged from 92.23% to 95.67%, with the highest value obtained in the 0.5% inclusion level of *S. cerevisiae*. This result is similar to the findings of Abdullahi et al. (2024), who recorded a PWG of 94.12% in *C. gariepinus* fed diets containing 2.5% *N. sativa* meal. The specific growth rate (SGR) recorded in this study ranged from 1.82 to 2.45, with the highest value obtained in the 0.5% inclusion level of *Saccharomyces cerevisiae*. This result is similar to the findings of Kela et al. (2022), who recorded an SGR of 1.33%/day in *C. gariepinus* fed diets containing 100% black cumin. The lowest FCR value of 0.52 in fish fed the 0.5% *S. cerevisiae* diet indicates better feed utilization, whereas the higher FCR value of 1.51 in the 1.5% group suggests lower feed efficiency.

The carcass composition of *C. gariepinus* fed diets containing *Saccharomyces cerevisiae* was evaluated in this study. The results showed that the inclusion of *Saccharomyces cerevisiae* in the diet had a significant effect on the dry matter, moisture, crude protein, ether extract, and crude fibre contents of the carcass. The highest crude protein content recorded was 44.07% in the 1.5% inclusion level of *Saccharomyces cerevisiae*, which is lower than the value reported by Abdullahi et al. (2024), who recorded crude protein contents of 61.33%, in *Clarias gariepinus* fed diets containing black seed. The ether extract content recorded in this study ranged from 10.00% to 19.50%, which is similar to the range reported by Abdullahi et al., (2024) who recorded ether extract contents ranging from 10.66% to 16.56%. The moisture content recorded in this study ranged from 25.33% to 44.50%, which is higher than the range reported by Abdullahi et al., (2024) and who recorded moisture contents ranging from 6.45% to 8.06%. The ash content recorded in this study ranged from 1.00% to 1.50%, which is similar to the range reported by Abdullahi et al., (2024), who recorded ash contents ranging from 3.38% to 7.04%.

Saccharomyces cerevisiae in the diet of *Clarias gariepinus* significantly improved growth performance and nutrient utilization. The optimal inclusion level of *Saccharomyces cerevisiae* was 0.5%, which resulted in the highest mean weight gain, percentage weight gain, specific growth rate, condition factor, protein efficiency ratio, and lowest feed conversion ratio. This study revealed that the fish fed 0.5% *Saccharomyces cerevisiae* had the best growth performance, unveiling the positive effect of *S. cerevisiae* on the growth of *Clarias gariepinus*. The improved growth and feed utilization observed with 0.5% *S. cerevisiae* supplementation could be attributed to enhanced nutrient absorption, beneficial yeast components such as β -glucans and mannan oligosaccharides, and better feed efficiency. Therefore, under the conditions of this study, 0.5% dietary *S. cerevisiae* may be considered a promising natural feed additives for improving growth performance and nutrient utilization in African catfish.