

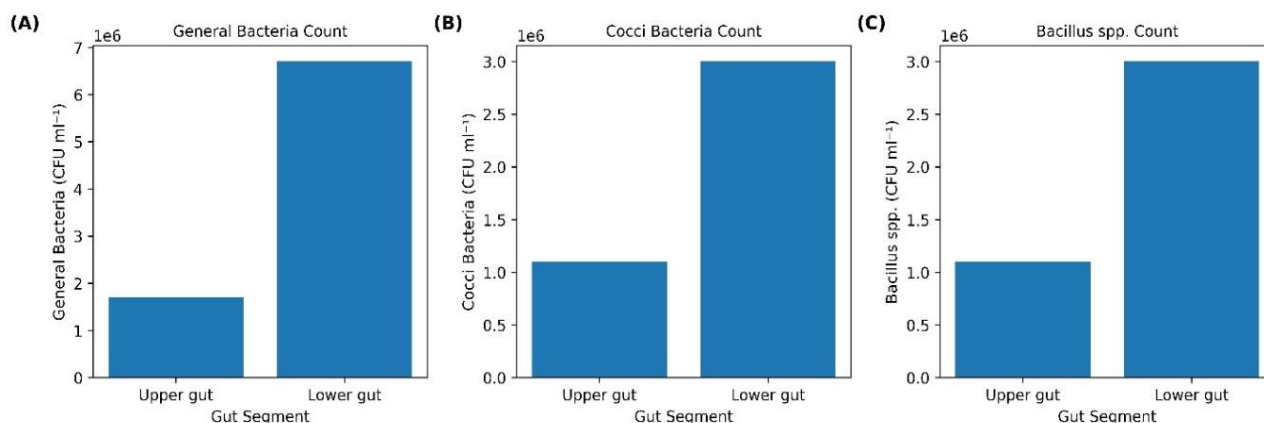


Figure 1 Comparative bacterial load in the intestinal tract of *Oreochromis niloticus*

Image caption: (A) Total heterotrophic bacteria, (B) cocci bacteria, and (C) *Bacillus* spp. counts in the upper and lower gut segments. Bacterial abundance is expressed as colony-forming units per millilitre (CFU mL⁻¹). The lower gut consistently exhibited higher bacterial populations than the upper gut.

Table 2 Gram staining results

Isolate	Morphology	Gram Reaction
<i>Bacillus</i> spp.	Rod-shaped cells	Gram positive
<i>Cocci</i> bacteria	Spherical cells	Gram positive
<i>Helicobacter</i> spp.	Spiral rods	Gram negative
<i>Fusobacterium</i> spp.	Spindle rods	Gram negative

Table 3 Spore staining

Isolate	Spore Formation
<i>Bacillus</i> spp.	Positive
<i>Cocci</i> bacteria	Negative
<i>Helicobacter</i> spp.	Negative
<i>Fusobacterium</i> spp.	Negative

3.2.3 Catalase and hemolysis test

The result of production of catalase and hemolytic test by the Isolates is presented in Table 4. Gas production from the isolates comes out positive for both *Cocci* and *Bacillus* spp., while both isolates were negative to hemolysis which is a good sign of potential probiotics

Table 4 Catalase and Hemolysis Test

Isolate	Catalase	Hemolysis
<i>Bacillus</i> spp.	Positive	Negative
<i>Cocci</i> bacteria	Positive	Negative

The absence of hemolytic activity suggests the isolates are non-pathogenic and safe for probiotic application.

3.3 Acid and bile salt tolerance

The results of acid tolerance and bile salt tolerance are presented in Tables 5 and 6, respectively. The results shows that selected isolates survived bile salt at all concentration, however, the tolerance of *Bacillus* spp. is greater than *Cocci* bacteria at all level of bile salt concentration. Also, isolates survived pH tolerance at all concentration, meanwhile, the tolerance level of *Bacillus* spp. at all pH concentration is higher in value than the value recorded for *Cocci* bacteria.