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Comparative study of three predominant gut Bacillus strains and a commercial *B. amyloliquefaciens* as probiotics on the performance of *Clarias gariepinus*

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The present study was conducted to evaluate the supplementation of three	11
autochthonous Bacillus strains (B. subtilis, B. amyloliquefaciens and B. cereus)	12
and a commercial B. amyloliquefaciens in doses of 1X10 ¹⁰ CFU/kg on the growth	13
performance, hematology, antioxidant activities, digestive enzyme levels, immune	14
status and disease resistance of <i>Clarias gariepinus</i> . A total of 300 fish (75.23±1.6	15
g) were randomly divided into 5 groups (each group was subdivided into 2	16

subgroups, 30 fish/each). The control group was fed basal diet (D₀). Diets D₁, D₂, 17 D₃and D₄were supplemented with B. subtilis, B. amyloliquefaciens, B. cereus and 18 a commercial B. amyloliquefaciens, respectively. During the course of the 19 experiment, D₃ showed the best body weight, weight gain, specific growth rate 20 and food conversion ratio. The measured hemogram blood parameters had the 21 highest significant increase in D₃. WBCs and monocyte counts had no significant 22 differences among the experimental groups. The serum antioxidant and digestive 23 enzymes were the highest in D₃ and were the lowest in D₀. After 15 d, the non-24 specific immune parameters were markedly increased in fish fed probiotic-25 containing diet compared with the control. After 30 d, the highest significant 26 immune parameters were observed in D₃; D₁ and D₂ had no significant differences 27 in serum lysozyme activity, nitric oxide and IgM compared with D₀.Myostatin 28 cDNA levels were adversely affected by probiotic supplements compare with the 29 control. The PACAP expression showed the highest significant value in D₃ 30 followed by D₁and D₄then D₂. The relative survival percentages of the Aeromonas 31 sobria challenged C. gariepinus were the highest in D₃, D₂, D₄ and then D₁. 32 Among the three isolated *Bacillus* species, dietary supplementation with the *B*. 33

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