

Study on Hybridization between *Clarias gariepinus* (Burchell 1822) and *Heterobranchus bidorsalis* (Geoffroy Saint Hilaire, 1809)

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Abstract : Hybridization has been of importance in both research and commercial aquaculture due to its benefits such as increased growth rate, sex ratio manipulation, production of sterile species and many other desirable economic traits. In this study, we successfully produced hybrids between crosses of Clariid catfish species of *Clarias gariepinus* and *Heterobranchus bidorsalis* for stock improvement. Milt and eggs from parent broodstock of *C. gariepinus* and *H. bidorsalis* were collected for both intrageneric and interspecific hybridization, viz: same parent species crosses (♀*C. gariepinus* × ♂*C. gariepinus*; ♀*H. bidorsalis* × ♂*H. bidorsalis*) and inter-specific crosses (♀*H. bidorsalis* × ♂*C. gariepinus*; ♀*C. gariepinus* × ♂*H. bidorsalis*). These crosses were made in triplicates whereby the data on latency period, fertility, hatchability, deformity, and survival were recorded. A phenotypic form of distinction was registered in the hybrid ♀*C. gariepinus* × ♂*H. bidorsalis* that was smooth-greyled while its reciprocal cross was marpatic. The parent species *C. gariepinus* had greyed-marpatic color while the *H. bidorsalis* was yellowish-brown. Fertility data revealed the significant difference ($p < 0.05$) between the hybrid cross ♀*C. gariepinus* × ♂*H. bidorsalis* ($88.00 \pm 1.00\%$) compared to its reciprocal ♀*H. bidorsalis* × ♂*C. gariepinus* ($71.67 \pm 10.41\%$) which further had carried over effects to hatchability. The reciprocal ♀*H. bidorsalis* × ♂*C. gariepinus* recorded the highest deformity ($11.67 \pm 3.06\%$) that was significantly different ($p < 0.05$) from the rest of the crosses. Also, an outcome of equal sex ratio in the hybrids compared with the two parent species was shown. Specific growth rate (SGR) data revealed highest significant difference ($p < 0.05$) in the hybrid ♀*C. gariepinus* × ♂*H. bidorsalis* ($2.64 \pm 0.09\%$), followed by the cross of ♀*C. gariepinus* × ♂*C. gariepinus* ($1.91 \pm 0.02\%$) while there were no significant differences ($p > 0.05$) between the reciprocal hybrid ♀*H. bidorsalis* × ♂*C. gariepinus* ($2.20 \pm 0.57\%$) and ♀*H. bidorsalis* × ♂*H. bidorsalis* ($2.19 \pm 0.19\%$). The SGR analysis proved that the crosses ♀*C. gariepinus* × ♂*C. gariepinus* had slow growth performance compared to its hybrid ♀*C. gariepinus* × ♂*H. bidorsalis*. Critical evaluation based on survival and specific growth performance showed the superiority of the hybrid ♀*C. gariepinus* × ♂*H. bidorsalis*. The least survival in reciprocal hybrid ♀*H. bidorsalis* × ♂*C. gariepinus* (27.33%) can be explained by significant deformity (11.67%) recorded due to maternal effects. Hence, the survival of hybrid ♀*C. gariepinus* × ♂*H. bidorsalis* was better.

Keywords : aquaculture, hybridization, *Clarias gariepinus*, *Heterobranchus bidorsalis*

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