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 (QC. gariepinus × dC. gariepinus; QH. bidorsalis × ♂H. bidorsalis) and inter-specific crosses (QH. bidorsalis × ♂C. gariepinus; QC. 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 QC. gariepinus × o^{*}H. bidorsalis that was smoothgreyed 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 QC. qariepinus $\times \sigma^2$ H. bidorsalis (88.00 ± 1.00%) compared to its reciprocal QH. bidorsalis $\times \sigma^2$ C. qariepinus (71.67 ± 10.41%) which further had carried over effects to hatchability. The reciprocal QH. bidorsalis \times σ^2C . 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 QC. gariepinus $\times \sigma$ H. bidorsalis (2.64 ± 0.09%), followed by the cross of QC. gariepinus $\times \sigma$ C. gariepinus (1.91 ± 0.02%) while there were no significant differences (p > 0.05) between the reciprocal hybrid QH. bidorsalis × σ C. gariepinus (2.20 ± 0.57%) and QH. bidorsalis × σ H. bidorsalis (2.19 ± 0.19%). The SGR analysis proved that the crosses QC. gariepinus × o^{*}C. gariepinus had slow growth performance compared to its hybrid QC. gariepinus × o^{*}H. bidorsalis. Critical evaluation based on survival and specific growth performance showed the superiority of the hybrid QC. gariepinus × o^{*}H. bidorsalis. The least survival in reciprocal hybrid QH. bidorsalis × o^{*}C. gariepinus (27.33%) can be explained by significant deformity (11.67%) recorded due to maternal effects. Hence, the survival of hybrid QC. gariepinus × o'H. bidorsalis was better.

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