



**APPLICATION OF SAGO (METROXYLON SAGU) STARCH IN
THE DIET OF NILE TILAPIA, OREOCHROMIS NILOTICUS
(LINNAEUS, 1758) JUVENILES ON NUTRIENT
DIGESTIBILITY AND DIGESTIVE ENZYMES**

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5 **NILE TILAPIA, *OREOCHROMIS NILOTICUS* (LINNAEUS, 1758) JUVENILES ON**
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11 **Abstract:** Omnivorous fish utilize dietary carbohydrates better due to the efficiency of
12 nutrient digestibility and enzymes in the digestive tracts. However, the effectiveness of
13 nutrient digestibility and digestive enzymes can be affected by different levels of dietary
14 carbohydrates in the diet. Very limited information is known about the effect on nutrient
15 digestibility and digestive enzymes by different levels of sago starch utilization. A 12-week
16 feeding trial was conducted to identify the effects of sago (*Metroxylon sagu*) starch in the diet
17 of Nile tilapia, *Oreochromis niloticus* juveniles on nutrient digestibility and digestive enzyme
18 activities. Six isoenergetic (20.25 ± 1.35 kJ/g) semi-purified experimental diets were
19 formulated which consisted of dietary protein levels (P22 %; P26 %; P30 %) incorporated
20 with C38 % and C44 % of sago starch as the carbohydrates source. All the diets were
21 designated as D1 (P:22 %, C:38 %); D2 (P:26 %, C:38 %); D3 (P:30 %, C:38 %); D4 (P:22
22 %, C:44 %); D5 (P:26 %, C:44 %) and D6 (P:30 %, C:44 %), respectively. A control diet
23 used was formulated from corn starch and labelled as D0 (P30 %: C40 %). The result showed
24 fish fed on treatment D3 (80.12 %) had higher nutrients digestibility followed by D2 (77.54
25 %), D1 (74.72 %), D0 (69.83 %), D6 (65.67 %), D5 (57.40 %) and D4 (50.29 %). Digestive
26 enzymes (amylase, lipase and protease) activities were significantly affected among all diets.
27 Fish fed on diet, D3 showed high amylase (6.54 Umg^{-1}), lipase (5.68 Umg^{-1}) and protease
28 (0.77 Umg^{-1}) activities compared to fish from other diet treatments. Two-way ANOVA result
29 confirmed that the incorporation of different levels of protein and carbohydrate had
30 significantly influenced nutrient digestibility and digestive enzyme activities of *O. niloticus*
31 juveniles. Overall, fish fed on C38 % sago starch-based diets showed positive result and
32 performed better than those fed with C44% diets. The study revealed the ability of *O.*
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