

Abstract of Animal Research International (2007) Volume 4 Number 1

Animal Research International (2007) 4(1): 587 – 590

HISTOPATHOLOGICAL CHANGES INDUCED BY STAPHYLOCOCCAL ENTEROTOXIN PRODUCED IN YOGHURT

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ABSTRACT

In this study, six Staphylococcus aureus strains isolated from contaminated yoghurt were evaluated for enterotoxigenicity. Two of the strains were enterotoxigenic and caused fluid accumulation in rabbit ileal loops. Fluid aspirated from the loops was bloody and histopathological changes in sections collected from rabbit ileum, inoculated with crude enterotoxin, were characterized by circulatory disturbances, degenerative/ necrotic and inflammatory changes, including hyperaemia, fibrinous exudation and necrosis of villi epithelial cells. These findings showed that although SE are typically associated with vomiting and diarrhoea, which often abate within 24 hours, there was potential for more serious disturbances such as inflammation, tissue damage and toxic shock. Moreover, the production of potent SE by strains isolated from commonly consumed products such as yoghurt emphasizes the need for complete elimination of staphylococcal contaminants from foods in order to protect consumers.

Keywords: *Staphylococcus aureus*, Enterotoxins, Hyperaemia, Histopathological changes, Necrosis of villi

Animal Research International (2007) 4(1): 591 – 596

IMPACT OF LAMDA CYHALOTHRIN PYRETHROID INSECTICIDE ON THE UPTAKE OF CATIONS AND ANIONS BY THE GILLS OF FRESHWATER CATFISH HYBRID JUVENILE

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ABSTRACT

The impact of acute exposure of karate (Lambda cyhalothrin pyrethroid) insecticide was evaluated in a 4 – day exposure period at 20, 40, 60 and 80 ppm to Heterobranchus bidorsalis (♀) X Clarias gariepinus (♂) fingerlings showed the 96-hlc 50 as 25.11 ppm. The threshold value was 25.11 ppm. The gills of the exposed fish analyzed showed a

significant decrease in all major cations and anions (Cl^- , Ca^{2+} , Na^+ , K^+ , Mg^{2+}) at $P < 0.05$). There was no inhibition of uptake of the cations and anions (Cl^- , Ca^{2+} , Na^+ , K^+ , Mg^{2+}). Their uptake increased rapidly during the 24 hr period and dropped at 48hr and 72 hr and gradually increased at the end of 96 hr showing that it was time dependent. During the exposure period the fish stood in upright position with their snouts above the water surface gasping for air. Other behavioral characteristics of the exposed fish were peeling of the skin, initial increase in opercula movement, curvature of the body, loss of balance, erratic swimming and quietness. Based the outcome of this research and under similar experimental condition it is the recommendation of this research that this pyrethroid will affect the uptake of the major cations and anions. It further advises environmental officers, crop farmers and insecticides habitual users to be cautious on the use of this insecticide because of the resultant consequences of the misuse.

Keywords: Karate, Uptake, Cations, Anions, Gills, Catfish, Toxicity

Animal Research International (2007) 4(1): 597 – 600

EXOGENOUS TESTOSTERONE STIMULATES GLUCONEOGENESIS IN HYPOPROTEINEMIC ALBINO RAT

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ABSTRACT

Changes in plasma glucose and protein concentrations in two experimental groups of albino rats, weighing 250 - 300g, were evaluated after 7 days of acclimatization to laboratory conditions and another 14 days of feeding the rats with low protein diets. Frank hypoproteinemia was evident by the low plasma protein levels and some clear physical manifestations, such as hair loss, changes in skin colour and edema. Edema was caused by lowered plasma protein concentrations. Daily intraperitoneal (i.p.) injections of 0.2 ml of testosterone for a period of 7 days produced a statistically significant increase in plasma glucose concentrations ($P < 0.01$) when compared with the saline-treated controls. There was a statistically significant decrease ($P < 0.05$) in total protein concentrations in testosterone injected hypoproteinemic rats when compared with the control rats. These findings suggest that testosterone, in addition to its anabolic function of protein build up in muscles, may also be involved in gluconeogenesis, the formation of plasma glucose from non-carbohydrate substrates. Apparently, the hypoproteinemic rats require enough glucose to survive since glucose is the only source of energy for the mammalian brain. The mechanism of action of steroid hormones on target organ cells, and the role of testosterone as a performance enhancing drug are discussed.

Keywords: Exogenous testosterone, Protein, Glucose, Gluconeogenesis, Hypoproteinemic rat

Animal Research International (2007) 4(1): 601 – 607

A NEW POLYSACCHARIDE, *Detarium microcarpum* FROM TRADITIONAL NIGERIAN PLANT FOOD: ITS PHYSIOLOGICAL EFFECTS ON RATS

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ABSTRACT

Detarium microcarpium is a leguminous plant food used traditionally among the Ibos in the South-Eastern part of Nigeria as a thickening agent in vegetable soups. *Detarium* is largely uncharacterised and under exploited. There is a dearth of information in the literature on this plant food. The aim of the study is to process, analyze and characterise *detarium* flour; screen *detarium* using rats to investigate its physiological effect on the general metabolism of rats, compare *detarium* to guar gum (GG) as a positive control, to determine the effects of the two foods on the plasma cholesterol level of rats. The result of the analysis showed that powdered *detarium* has a mean particle size of 464µm. The SNSP content per 100 g food sample was 59.8 g. The viscosity of 1% aqueous dispersion of the powdered *detarium* food sample obtained using the U tube capillary viscometer was 4000 – 24000 cp. The main SNSP fraction of *detarium* was found to be a high molecular weight xyloglucan. In the rat study, the experimental diet contained *detarium* or guar gum, as positive control, at a level providing 80g soluble NSP/kg diet. Food intake, faecal output, weight gain, digestibility, food efficiency ratio and plasma cholesterol (after overnight fasting) were measured. The result showed that the cholesterol levels of rats fed *detarium* and guar gum diets were significantly lower than the control ($P < 0.05$) using the analysis of variance. *Detarium* and guar gum covariates such as weight gain, food intake and faecal output. The results obtained indicate that *detarium* may possess properties as guar gum which maybe useful in the management of diabetes and disorders of lipid metabolism in humans.

Keywords: *Detarium*, Guar Gum, Soluble Non starch polysaccharides, General rat metabolism

Animal Research International (2007) 4(1): 608 – 610

VARIATION IN RELATIVE PALATABILITY OF DIFFERENT FORAGES FED TO RABBITS

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ABSTRACT

Twenty four 10-week old crosses of (New Zealand White X Chinchila) rabbits was used to determine relative palatability differences in leaves of *Calopogonium mucunoides* (Calopo), *Elaeis guineensis* (Oil palm), *Musa sapientum* (Banana) and *Andropogon gayanus* (Gamba). *Centrosema pubescens* (Centro) was included as control. Significant differences ($P < 0.01$) in relative palatability index (RPI) were detected among the different forages offered. Based on their RPI rabbits preferred in descending order of magnitude *Centrosema pubescens*, *Calopogonium mucunoides* and *Elaeis guineensis* (RPI > 95 %) to *Musa sapientum* (RPI > 70 %) and *Andropogon gayanus* (RPI > 40 %). The preference of Oil palm leaves to Banana leaves according to the RPI ranking in this study is an interesting observation from the study.

Keywords: Forage plants, Relative palatability, Rabbit

Animal Research International (2007) 4(1): 611 – 616

MACROINVERTEBRATE FAUNA OF A NIGERIAN FRESHWATER ECOSYSTEM

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ABSTRACT

A survey of macro invertebrate fauna of Anambra River was carried out for 22 months at Otuocha, Ogurugu and Nsugbe. The macro invertebrates were sampled using kick sampling techniques and scoop nets. Sampled specimens were identified to generic level. During the study a total of 21 genera of macroinvertebrates belonging to 13 families were identified. The fauna was composed of Gyrinus sp. (29.2%), Macrobranchium sp. (19.6%), Ranatra sp. (13.2%), and Agabus sp. (3.5%). The margalef's index of fauna richness showed that Otuocha station had the highest species richness (12.70), followed by Nsugbe (7.01), and Ogurugu (6.80) stations. The least fauna diversity of 0.21 was registered at Nsugbe as against 3.15 at Otuocha and 0.86 at Ogurugu. The McNaughton community dominance index was more pronounced at Nsugbe (53.1) than at Otuocha (49.69) and Ogurugu (47.04). Jackson's fauna similarity index showed that the fauna at Otuocha and Ogurugu were more closely related (0.64) than the fauna at Nsugbe.

Keywords: Macroinvertebrates, Anambra River, Nigeria

Animal Research International (2007) 4(1): 617 – 620

LENGTH-WEIGHT RELATIONSHIP AND CONDITION FACTOR OF THE ELEPHANT FISH, *Mormyrus rume* (Valenciennes, 1846) IN RIVER OSE, SOUTHWESTERN NIGERIA

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ABSTRACT

*A total of 791 elephant fish, *Mormyrus rume* specimens of various sizes were sampled from River Ose, south-western Nigeria. Length-weight relationship and condition factor of the *M rume* specimens were studied. Their standard lengths ranged from 15.0 to 45.0 cm. Mean standard length for males, females and combined sex were 27.86 cm, 30.08 cm and 28.97 cm, respectively. The body weight ranged from 75.5 to 610.0 g. Mean body weight for males, females and combined sex were 167.57 g, 237.38 g and 202.48 g respectively. Length-weight relationship for males, females and combined sex were 1.699, 2.134 and 1.990, respectively. The fish exhibited allometric growth in the river. The predictive equation was $\log W = -0.636 + 1.99 \log L$. The mean condition factor varied between seasons. The mean condition for males, females and combined sex were 0.787, 0.859 and 0.823, respectively. The condition factor decreased with increase in individual sizes.*

Keywords: Length-weight relationship, Condition factor, *Mormyrus rume*, River Ose, Nigeria

AFZELIA AFRICANA, A NOVEL NON STARCH POLYSACCHARIDE, RAISED FASTING PLASMA CHOLESTEROL AND TRIGLYCERIDE LEVELS OF RAT

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ABSTRACT

The effects of vegetable flour prepared from indigenous plant Afzelia africana, a legume, on the fasting plasma cholesterol and triglyceride levels of rats were investigated. Chemical analysis indicated that Afzelia flour contained significant amount of non-starch polysaccharides (NSP). The flour of Afzelia was incorporated into semi-synthetic diet to provide 10 g of dietary fibre which is 300g/kg Afzelia flour. This replaced some of the casein, oil and starch in the control diet. The test and control diets were fed to young Sprague-Dawley rats for 14 days ad-libitum. Food intake, weight gain, crude digestibility, faecal fat excretion, fasting plasma cholesterol and triglyceride were evaluated. The result showed a statistically significant difference ($p > 0.05$) between the control diet and the test diet in food intake, weight gain and energy digestibility. Afzelia fed rats had a significant higher fasting plasma cholesterol and triglyceride levels than rats fed the control diet.

Keywords: Afzelia africana, Plasma cholesterol, Triglyceride levels, rat

DIPTERAN FAUNA OF AN ABATTOIR AND ITS CONTIGUOUS FALLOW PLOT IN A GUINEA SAVANNA ECOSYSTEM

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ABSTRACT

The pitfall trap was used in the study of the dipteran populations of an abattoir and a contiguous fallow plot, in relation to their relative abundance and distribution. A total number of 140 adult species of Synydas and Stomorhina cribrata, and 400 dipteran larvae were captured at the abattoir using pitfall techniques, with correspondingly fewer species of similar dipterans trapped at the contiguous fallow plot. Significant difference existed in the trapping of the Diptera larvae with more trapped at the abattoir than the fallow plot using Student t-test. There was also a preponderance of calliphorid species at the abattoir when the sweep net was used, with these species implicated as being potential pests of medical and forensic importance. The presence of Sarcophaga sp. and Fannia canicularis in the sweep net collection at the abattoir was also traced to the presence of decaying fall-offs from carcass. Other possible implications of the collected dipteran species at the abattoir and its vicinity were also discussed.

Keywords: Dipteran fauna, Abattoir, Contiguous fallow plots, Guinea savanna

THE USE OF BANANA FLAVOUR ESSENCE, FORMALIN AND ORDINARY WATER IN PITFALL TRAPS IN THE STUDY OF THE DIEL ACTIVITIES OF INSECTS FROM A FALLOW PLOT IN AWKA, NIGERIA

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ABSTRACT

A study was carried out to access the insect fauna of a fallow plot in Awka, Nigeria, in relation to their diel activities and to report any differences in the pitfall catches as a result of differences in the fluid used. The fluid used in the three sets of six traps installed bimonthly at the sites for 12 hours in each case were 5% formalin, water with 0.01% banana flavour essence and ordinary water. Using Student t-test, statistical differences existed in the diurnal and nocturnal activities of the Sminthurididae, Poduromorpha, Diptera, Acantholepsis, Paratrechina sp. and Camponotus, at probability level $P < 0.05$ with more nocturnal catches obtained in all cases for water with banana flavour essence. Similarly statistical differences also existed in the trapping of Poduromorpha, Entomobryomorpha, Acantholepsis and Camponotus sp., for pitfall traps containing water. For pitfall traps with 5% formalin statistical differences, existed in the trapping of Sminthurididae, Poduromorpha, Diptera, Acheta lefevrei, Acantholepsis sp., Hymenoptera (other than formicids) and orthopteran larvae, with more nocturnal catches recorded for the pitfall traps with banana flavour essence, possibly indicating the attractive properties of this particular flavour essence. The Analysis of Variance (ANOVA) test also showed that statistical differences existed in the diurnal and nocturnal catches of insects obtained using the three killing agents. The Fisher's Probability Least Significance Difference (F-LSD) also established statistical differences in the catches made using banana flavour essence and water and also with ordinary water and formalin, with the nocturnal catches being higher than the diurnal catches. The F-LSD also confirmed that the total nocturnal catches were significantly higher than the total diurnal catches obtained using all the three killing agents. An approximate ratio of 12 was also obtained in the catches in relation to diurnal and nocturnal activities respectively.

Keywords: Pitfall traps, Diel activities, Insects, Fallow plot, Killing agents, Awka

LENGTH-WEIGHT RELATIONSHIP AND CONDITION FACTOR OF *Clarias gariepinus* AND *Tilapia zilli* IN LAKE ALAU AND MONGUNO HATCHERY, BORNO STATE, NIGERIA

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ABSTRACT

*Length-Weight relationship and condition factor of *Clarias gariepinus* and *Tilapia Zilli* were studied in lake Alau and Monguno hatchery, both in Borno State of Nigeria, for a period of two weeks. A total of 98 *C. gariepinus* and 140 *T. zilli* were measured. The*

length-weight regression coefficients (*b*) for both fishes in lake Alau were not significantly different from the hypothesized value 3, but for both fishes in Monguno hatchery (*b*) differed significantly from the hypothesized value. Isometric growth of both fishes was recorded in lake Alau while a comparative decline in weight in relation to specific length of fishes was recorded in Monguno hatchery. Furthermore, condition of *C. gariepinus* in lake Alau revealed that all size groups of the fish grew better than those in Monguno hatchery, while the condition of *T. zilli* in Monguno hatchery was better than that in lake Alau. Although our results suggest that *C. gariepinus* in lake Alau grew faster than that cultured in Monguno hatchery, the study is not conclusive as abiotic, biotic, and sampling error might have interplayed. The reverse is also true for the growth potentials of *T. zilli* in Monguno hatchery when compared to that in lake Alau.

Keywords: *Clarias gariepinus*, *Tilapia zilli*, lake, Hatchery pond

Animal Research International (2007) 4(1): 639 – 642

EFFECT OF pH ON THE GROWTH PERFORMANCE OF *Heterobranchus bidorsalis* (♂) X *Clarias gariepinus* (♀) HYBRID JUVENILES

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ABSTRACT

Twelve plastic basins each filled with 6 litres of dechlorinated tap water at pH 6, 7 (control), 7.5 and 8 such that each pH treatment was replicated three times in a Latin square design were used for the study. The tanks were randomly stocked with 10 four-week-old *Clarias gariepinus* (♀) x *Heterobranchus bidorsalis* (♂) hybrid juveniles (mean weight 3.32 ± 0.05 g) and fed 30.25% crude protein diets for five weeks. Fish growth was measured by weighing the juveniles every week and the weight differences, specific growth rate (SGR) and food conversion ratio (FCR) determined. Fish raised at pH treatment 7.0 recorded significantly higher weight gain ($P < 0.05$) than other pH treatments. Weight gain of fish raised at pH 6.0 was however not different ($P > 0.05$) from that of fish raised on pH 8.0 treatment. There was significant difference ($P < 0.05$) in the SGR of the juveniles raised at pH 6 and pH 8. There was no significant difference ($P > 0.05$) between the SGR of fish raised at pH 7 and pH 7.5 but there was significant difference between the SGR of fish raised at pH 7 and fish raised at other treatments. Fish showed reduced growth when raised at pH 6 and pH 8 and positive growth when raised at pH 7 and 7.5 though there was no significant difference ($P > 0.05$) in FCR of fish cultured at all pH treatments. Our results showed that the optimal pH range for raising the hybrid catfish juveniles was between 7.0 – 7.5 pH.

Keywords: *Heterobranchus bidorsalis* x *Clarias gariepinus* hybrid, Optimal pH range