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INFLUENCE OF DIETARY PROTEIN CONTENT ON GROSS EFFICIENCY OF FOOD CONVERSION AND NET PROTEIN UTILIZATION OF AFRICAN CATFISH (*Clarias gariepinus* BURCHELL, 1822) FRY

¹MGBENKA, Bernard Obialo, ²ASOGWA, Maureen Obioma and ²UGWU, Lawrence Linus Chukwuma

¹Department of Zoology, Fish Nutrition and Aquaculture Unit, University of Nigeria, Nsukka, Nigeria.

²Department of Animal Production Technology and Fisheries Management, Ebonyi State University, P.M.B. 053, Abakaliki, Nigeria.

Correspondence Author: Mgbenka, B. O. Department of Zoology, Fish Nutrition and Aquaculture Unit, University of Nigeria, Nsukka, Nigeria. Email: bo_mgbenka@yahoo.co.uk

ABSTRACT

The influence of dietary protein content on some nutritional parameters of Clarias gariepinus fry was studied. Seven diets were formulated to yield 28, 31, 34, 37, 40, 43, and 46% crude protein (CP) while the 8th 48.8% CP diet was prepared from microencapsulated whole egg and preserved in a refrigerator at 7° C. The diets were fed to advanced fry of C. gariepinus (mean initial weight, 1.6 ± 0.24 g) in triplicate 25 L plastic baths per treatment at 5% body weight per day in three portions for 56 days. The mean weight gain (MWG), daily rate of growth (DRG) increased as the dietary protein level increased up to 40% but gradually declined as CP level increased while increase in CP did not significantly affect daily rate of feeding (P > 0.05). The best response of fish to gross efficiency of food conversion was within 37 - 40% dietary CP and thus reflected the best mean weight gain (0.86 - 1.93g), DRG (0.17 - 20 g), and nitrogen metabolism (12.62 - 13.43 mg/100g) respectively. There was a relatively high metabolizable energy: protein ratio for the 48.80% CP diet (9.88 KJ/mg) compared to 40% CP diet (7.60 mg/kg). Similarly, the low net protein utilization (NPU) value recorded with diets of between 31% to 40% CP compared to the NPU value of higher CP level (43% to 48.8%) suggests that despite the apparently better utility of protein by fish fed the higher CP diets, much of the ingested protein might have been affected by endogenous nitrogen losses resulting in its unavailability for productive use by the fish.

Keywords: *Clarias gariepinus*, Dietary protein, Growth, Feeding rates, Net protein utilization.

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THE EFFECTS OF SEASON AND DISTANCE ON THE PREVALENCE AND INTENSITY RATES OF URINARY SCHISTOSOMIASIS IN AGULU-LAKE AREA OF ANAMBRA STATE, NIGERIA

EKWUNIFE, Chinyelu Angela

Department of Biology, P.M.B 1734, Nwafor Orizu College of Education Nsugbe, Anambra State, Nigeria

ABSTRACT

A survey of the effects of season, and distance to water source on the prevalence and intensity rates of Schistosoma haematobium infection in Agulu community of Anambra State was conducted using the primary schools in the town, using parasitological screening approach. Prevalence was similar in both the dry and rainy season months. Seven out of the 15 Primary schools surveyed had pupils with infection. Prevalence in schools with infection ranged from 4.1- 55.2 % during the dry season to 3.3-55.6 %

during the rainy season. Prevalence and geometric mean egg count were highest in the 10-14 years age group in all the schools and in both dry and rainy seasons. Geometric mean of egg count / 10ml urine (intensity) decreased from 22.5 egg/10 ml in dry season to 10.7 egg/10 ml in wet season. Prevalence rates and intensity showed significant decrease with increase in the distance from the village to the lake. The implications of these are discussed.

Keywords: Urinary schistosomiasis, Season, Distance, Prevalence rate, Intensity, Geometric mean

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THE EFFECT OF TRANSPORTATION STRESS ON HAEMATOCRIT LEVEL OF *Oreochromis niloticus* LINNAEUS

ORJI, Raphael Christopher Agamadodaigwe

Department of Fisheries, Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria

ABSTRACT

Transportation stress was investigated in Oreochromis niloticus (Linnaeus) by transporting samples in open rectangular iron tanks from Panyam fish farm, Plateau State of Nigeria to University of Jos, Nigeria. All fish appeared more stressed with higher densities and increasing media salt employed in transportation. There was a significant difference between mean haematocrit values of control (before transportation) and those of low, medium and high densities ($p < 0.05$). Transportation under different saline concentrations showed significant difference between means haematocrit value of control and varying media saline levels ($p < 0.05$) except 1% saline. There were immediate and delayed mortalities, lasting up to three days after transportation except in aerated samples.

Keywords: Transportation stress, Haematocrit, *Oreochromis niloticus*, Salinity, Oxygen

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EFFECTS OF PALM OIL ON SOME OXIDATIVE INDICES OF ALLOXAN INDUCED DIABETIC RABBITS

OGUGUA Victor Nwadiogbu and IKEJIAKU Chukwuemeka Afam

Department of Biochemistry, University of Nigeria, Nsukka Nigeria

Corresponding Author: Ogugua V. N. Department of Biochemistry, University of Nigeria, Nsukka Nigeria

ABSTRACT

The effects of palm oil on oxidative indices of alloxan induced diabetic rabbits were investigated. The result obtained showed that palm oil significantly decreased ($P < 0.05$), lipid peroxidation in diabetic treated animals. The vitamin C (antioxidant vitamin) level increased significantly ($P < 0.05$) in the supplemented group but decreased significantly ($P < 0.05$) in non supplemented group. The glucose levels in both the diabetic supplemented group and non supplemented group were not significantly different ($P > 0.05$). The results indicate that palm oil supplementation decreased the level of lipid peroxidation but increased the level of vitamin C, an indication that palm oil can attenuate oxidative stress generated in diabetic condition. This result may suggest that supplementation of palm oil may be effective in the management of diabetes mellitus.

Keywords: Red palm oil, Diabetes mellitus, Antioxidant, Oxidative stress, Lipid peroxidation

EFFECT OF EXPOSURE TO SUBLETHAL CONCENTRATIONS OF GAMMALIN 20 AND ACTELIC 25 EC ON THE LIVER AND SERUM LACTATE DEHYDROGENASE ACTIVITY IN THE FISH *Clarias albopunctatus*

OLUAH, Ndubuisi Stanley, EZIGBO, Joseph Chukwura and ANYA, Nnenna Catherine
Fisheries and Hydrobiology Research Unit, Department of Zoology, University of Nigeria, Nsukka

Corresponding Author: Oluah, N. S. Fisheries and Hydrobiology Research Unit, Department of Zoology, University of Nigeria, Nsukka

ABSTRACT

One hundred and eighty adult Clarias albopunctatus (mean weight 160±2.7g) were subjected to sublethal concentrations of Gammalin 20 and Actellic 25 EC (0, 0.3; and 1.0 µg/l) in a static bioassay renewal system for 18 days. The changes in the activities of the liver and serum lactate dehydrogenase (LDH) during the period of exposure were studied. The exposure of C. albopunctatus to these pesticides evoked significant increase (P < 0.05) in both the liver and serum LDH activities. There was a progressive increase in both the liver and serum LDH activities following exposure to the pesticides. When compared with the control, the LDH activities were significantly higher (p < 0.05) in the treatment groups. The LDH activities in both the liver and the serum were higher in the fish exposed to Gammalin 20 than in the fish treated with similar concentrations of Actellic 25 EC. The serum LDH activity in the group exposed to a mixture of 0.3µg/l of Gammalin 20 and Actellic 25 EC was significantly higher than the activities in the fish exposed to either 0.3 µg/l Gammalin 20 or Actellic 25 EC. These observations suggest that these pesticides affect the energy metabolism of the fish.

Keywords: *Clarias*, Liver, Serum, Lactate dehydrogenase, Gammalin 20, Actellic 25 EC

EFFECT OF EFFLUENT FROM A VEGETABLE OIL FACTORY IN SOUTHEASTERN NIGERIA ON THE MMIRIELE STREAM

ATAMA, Chinedu and MGBENKA, Bernard Obialo

Fish Nutrition, Aquaculture and Hydrobiology Unit, Department of Zoology, University of Nigeria Nsukka.

Corresponding Author: Mgbenka, B. O. Fish Nutrition, Aquaculture and Hydrobiology Unit, Department of Zoology, University of Nigeria Nsukka. Email: bo_mgbenka@yahoo.co.uk.

ABSTRACT

Environmental monitoring of effluent discharged from a vegetable oil factory and route to receiving Mmiriele stream, Nnewi Anambra State, Nigeria was conducted bi-weekly for 12 months. The physicochemical parameters examined in the effluent assessment were dissolved oxygen (DO), biochemical oxygen demand (BOD), chemical oxygen demand (COD), total hardness, hydrogen ion concentration (pH), and ammonia-nitrogen. Others were copper (Cu), zinc (Zn), lead (Pb) and arsenic (As). Concentration of each of the parameters at the various sampled points indicated significant variation among the points (P < 0.05). Comparing the results to international effluent quality standards for municipal and industrial effluents discharged into surface inland waters and the Federal Ministry of Environment (FMENV) standards for such effluents showed that the mean values of each of the parameters was within acceptable limits except for very high

distribution of lead recorded in all samples. Arsenic was notably not detected. The significance of the results is discussed.

Keywords: Vegetable oil factory effluent, Physicochemical parameters, Dissolved metal pollutants

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BAOBAB (*Adansonia digitata* L.) SEED PROTEIN UTILIZATION IN YOUNG ALBINO RATS I: BIOCHEMICAL INGREDIENTS AND PERFORMANCE CHARACTERISTICS

EZEAGU, Ikechukwu Edwin

Nutrition Unit, Department of Medical Biochemistry, University of Nigeria, Enugu Campus, P. O. Box 15676, Enugu, Nigeria. Email: ikezeagu@yahoo.co.uk

ABSTRACT

*Raw, cooked and HCl-extracted baobab, *Adansonia digitata* seed meals were used for biological and nutritional evaluation studies. The seed is low in protein (16.60g/100g DM) but could be a good source of oil (17.50g/100g) and minerals, particularly sodium, potassium and phosphorus, which contained 228.0, 1429.0 and 924.5 mg/100gDM respectively. Low levels of antinutritional factors such as tannin, phytate, cyanide, oxalate, nitrate/nitrite and absence of trypsin inhibitors were observed. Seed protein is high in sulfur-amino acid, with a chemical score (CS) of 126.80, but marginally limiting in lysine and threonine, with CS of 64.31 and 85.59 respectively based on the preschool age (2-5yrs) reference protein requirement. The seed oil contain appreciable level of unsaturated fatty acids with oleic and linoleic acids making up 66.32% of total fatty acids. The raw diet was similar to the casein diet in weight gain, feed intake, net protein retention (NPR) and true digestibility (TD) but significantly inferior in protein efficiency ratio (PER). Cooking did not have any significant effect on feed intake but significantly lowered the weight gain relative to the raw and casein diets. HCl-extracted meal exerted significantly lower weight gain compared to the raw, cooked and casein diets. It is concluded that the raw seed showed promise as a source of food supplement and is likely to be satisfactory in supporting growth and maintenance in livestock feeding.*

Keywords: *Adansonia digitata*, Baobab seed protein, Biochemical ingredients, Performance, Rats

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EFFECT of *Dermestes maculatus* INFESTATION ON SOME NUTRITIONAL COMPOSITION OF SMOKED AFRICAN CATFISH, *Clarias gariepinus* BURCHELL, 1822

¹UGWU, Lawrence Linus Chukwuma, ²NWAMBA, Helen Ogochukwu and ²KANNO, Linda Uchenna

¹Department of Animal Production and Fisheries Management, Ebonyi State University, Abakaliki, Nigeria

²Department of Applied Biology, Enugu State University of Science and Technology, Enugu, Enugu State, Nigeria

Corresponding author: Ugwu, L. L. C., Department of Animal Production and Fisheries Management, Ebonyi State University, P.M.B.053, Abakaliki, Ebonyi State. Nigeria

ABSTRACT

*Studies on pest infestation of some nutritional composition of smoked-dried *Clarias gariepinus* were carried out, to assess the effect of exposing preserved fish products to different levels of infestation by *Dermestes maculatus* and the resultant effect on pH, crude protein (CP), free fatty acid (FFA) and tissue contents. Graded levels (5, 10 and 15) of larval and adult *D. maculatus* were used to infest pieces of *C. gariepinus* placed in 7 groups of 3 bottles per group. The experiment lasted 8 weeks (56days). There were*

consistent decreases in the pH and CP as well as the tissue contents of fish with storage time, although the CP content of the samples with the larval pests did not differ significantly from those without larval pests ($P > 0.05$). Fish samples exposed to adult pests showed significant variation ($P < 0.05$) in their pH and CP contents while the FFA content increased with storage time but was not significant ($P > 0.05$). The longer the storage periods of the infested smoked fish the more the tissue was degraded.

Keywords: *Dermestes maculatus*, *Clarias gariepinus* infestation

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THE EFFECT OF SALINITY STRESS ON BUCCAL VENTILATORY RATE IN THE AFRICAN LUNGFISH, *Protopterus annectens* OWEN

¹OKAFOR, Anthony Ikechukwu and ²CHUKWU, Lucian Obinnaya

¹Department of Zoology, University of Lagos, Lagos, Nigeria

²Department of Marine Sciences, University of Lagos, Lagos, Nigeria

Corresponding Author: Okafor, A. I., Department of Zoology, University of Lagos, Lagos, Nigeria

ABSTRACT

*The buccal ventilatory rate of the African lungfish, *Protopterus annectens* (Owen) following acclimation to diluted seawater was investigated under laboratory conditions for six days. Healthy adult specimens of African lungfish, *Protopterus annectens* (Owen) (mean weight 299.4g and mean length 38.9 cm) procured from Anambra river at Otuocho were subjected to the following concentrations of dilute seawater: 0%, 5% ($s = 1.8‰$), 10% ($s = 3.5‰$), 15% ($s = 5.3‰$), 20% ($s = 7.0‰$), 30% ($s = 10.5‰$) and 40% ($s = 14.0‰$) respectively. The results revealed that increase in salinity had a significant positive correlation ($r = 0.92$, $p < 0.05$) with increase in buccal ventilatory rate. The mean least and highest buccal ventilatory rates were 5.32 and 12.26 times per hour at 1.8‰ and 14.0‰ salinities respectively. The implications of the findings for the culture of this fish species in estuarine ecosystems are discussed.*

Keywords: Salinity Stress, Buccal Ventilation, *Protopterus annectens*

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PARASITIC DISEASES AND SEXUAL DISABILITY: A CRITICAL REVIEW OF SOME PARASITIC DISEASES WITH SERIOUS SEXUAL REPERCUSSIONS

¹OKAFOR, Fabian Chukwuemenam and ²OMUDU, Edward Agbo

¹Department of Zoology, University of Nigeria, Nsukka

²Department of Biological Sciences, Benue State University, Makurdi

Corresponding Author: Omudu, E. A. Department of Biological Sciences, Benue State University, Makurdi

ABSTRACT

A wide range of parasitic diseases even though not sexually transmitted, invade male and female reproductive organs causing direct pathological damages leading to impaired fertility and sexual dysfunction. This paper provides a framework for thinking about the psychological impact and burden of these parasitic infections. It begins by providing the etiology of these diseases and a brief overview of the socio-cultural and psychological implications of infected and affected individuals. The article concludes with reflections as to how interactions of parasitological and anthropological factors produce multi-

dimensional reproductive health problems requiring urgent multi-disciplinary investigation and intervention.

Keywords: Parasitic infection, Sexual repercussion

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SUPEROXIDE DISMUTASE (SOD) ACTIVITY AND SERUM CALCIUM LEVEL IN RATS EXPOSED TO A LOCALLY PRODUCED INSECTICIDE "RAMBO INSECT POWDER"

OTITOJU Olawale and ONWURAH Ikechukwu Noel Emmanuel
Pollution Control and Biotechnology Unit, Department of Biochemistry University of Nigeria, Nsukka, Enugu State, Nigeria

Corresponding Author: Onwurah I. N. E. Pollution Control and Biotechnology Unit, Department of Biochemistry University of Nigeria, Nsukka, Enugu State, Nigeria. Email: iyknuelo@yahoo.com

ABSTRACT

Studies of superoxide dismutase (SOD) induction in rats exposed to locally produced insecticide; "Rambo" of which the active chemical compound is permethrin (0.6% w/w) was performed. The calcium levels in the blood plasma of the exposed rats were also evaluated. The rats were divided into three groups of five rats per cage. Each group of rats was fed with 1 %, 5 % or 10 % of the insecticide in their diets. The control group was fed normal diet. The effect of insecticide at various concentrations on superoxide dismutase (SOD) activity in the blood plasma was not significantly different ($P > 0.05$) in the newly weaned rats (NWR). However, in the middle-aged rats (MAR) and aged rats (AR) groups, the results were significantly different ($P < 0.05$) against the parallel controls. Comparison of the effect of the insecticide on SOD induction at various concentrations among the groups based on age difference showed significantly different result ($P < 0.05$), especially among the groups fed with 10 % (w/w) of the insecticide in the diet. Serum Ca^{2+} level ($0.51 \pm 0.22\text{mg/ml}$) increased from newly weaned rats groups to ($0.66 \pm 0.24\text{mg/ml}$) in the middle-aged rats and ($0.63 \pm 0.04\text{mg/ml}$) for the aged rats. The observed Ca^{2+} increase was significantly high for rats fed 10 % (w/w) concentration of the insecticide in the diet ($P < 0.05$). This increase tends to suggest a concentration-dependent effect. The no-observed-effect-concentration (NOEC) was found to be 0.006 g permethrin per 100 g of the diet, which is equivalent to 1% of the "Rambo" insecticide per 100g of the feed. Results of this study show that in non-target organisms "Rambo" insect powder may induce superoxide dismutase activity, thus, suggesting, oxidative-stress related toxicity. The observed increase in calcium ion especially at 10 % (w/w) of the insecticide showed that permethrin may induce toxic effects associated with cell death via mitochondria uncoupling and loss in ATP metabolism.

Keywords: Superoxide dismutase, Calcium ion, Permethrin insecticide, Rambo insect powder

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ANIMAL WASTE MANAGEMENT STRATEGIES, A REVIEW

¹UCHEWA, Emmanuel Nwafoagu, ¹OTUMA, Michael Oria and ²BROOKS, Peter

¹Department of Animal production and Fisheries Management, Ebonyi State University, PMB 053, Abakaliki, Ebonyi State, Nigeria

²Faculty of Food, Land and Leisure, University of Plymouth, Seale Hayne, Newton Abbot. TQ12 6NQ, United Kingdom

Corresponding Author: Uchewa, E. N. Department of Animal production and Fisheries Management, Ebonyi State University, PMB 053, Abakaliki, Ebonyi State, Nigeria

ABSTRACT

The issue of pollution and environmental protection now command widespread interest and political attention. Increased concern over environmental destruction has led to the introduction of new anti pollution laws and regulations in many countries throughout the world. Some such regulations focus on curbing pollution caused by industrial and agricultural activities. Animals produce enormous quantities of waste per day. In areas supporting intensive livestock production, accumulation of such waste can pose a serious environmental hazard. A single animal pen of a moderate size will produce quantities of waste equal to that produced by a small town annually. Waste produced from these pens usually lead to soil, water and the atmosphere pollutions. Several nutritional advances have been reported which serve to reduce the excretion and pollutive effect of animal waste.

Keywords: Environmental pollution, Animal, Nutrition, Animal waste

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CYTOGENETIC VARIATIONS IN *Clarias* species (CLARIIDAE: SURULIFROMIS) OF THE ANAMBRA RIVER USING LEUCOCYTES CULTURE TECHNIQUES

EYO, Joseph Effiong

Department of Zoology, University of Nigeria, Nsukka, Nigeria. Email: divinelove@yahoo.com

ABSTRACT

*Cytogenetic variations among four Clarias species from Anambra river, Nigeria were studied using leucocytes culture techniques. Heterogeneity in chromosome number ($2n = 48$ in *Clarias ebriensis* and *C. albopunctatus* to $2n = 56$ in *C. anguillaris* and *C. gariepinus*) and Karyotype morphologies occurred among the clariids. The chromosomes were characterized by a high proportion of meta-submetacentric chromosomes and low proportion of acrocentric chromosomes. The females karyotype morphologies exhibited a heteromorphic pair suspected to be the sex chromosome complex. The following formulae were established for the male clariids; *C. ebriensis* $6m + 22sm + 20a$ FN = 76; *C. albopunctatus* $4m \pm 22sm + 22a$ FN = 74; *C. gariepinus* $8m + 24a$ FN = 88; and *C. anguillaris* $8m + 26m + 22a$ FN = 90. The female karyotype morphologies were *C. ebriensis* $6m + 23sm + 19a$ FN = 77, *C. albopunctatus* $4m \pm 23sm + 21a$ FN = 75, *C. gariepinus* $8m + 25sm + 23a$ FN = 89 and *C. anguillaris* $8m + 27sm + 21a$ FN = 91. A generic chromosomal number of $2n = 54 \pm 4$ for the clariids was suggested. The almost uniform karyotype morphologies and the closeness of the chromosome numbers around the generic chromosome number may suggest success with which the clariids may hybridize in nature.*

Keywords: Cytogenetics, Chromosomes, Karyotype, Idiogram, Clarias, Clariidae, Leucocyte culture