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EFFECT OF AGE ON IMMUNE RESPONSE OF TRYPANOSOME-INFECTED RATS (*Rattus rattus*) FED DIETARY VITAMIN E AND SELENIUM

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ABSTRACT

This study was done to determine the combined effects of dietary supplementation of vitamin E and selenium on age-dependent immune response of Trypanosoma congolense-infected white rats (Rattus rattus, whiskers breed). Sixty rats were used in the study, 30 20-day old (newly weaned) rats and 30 90-day old (adult) rats. Four groups of rats with five rats of identical age per group were kept in wire-rat-cages. The cages were labeled G to J. Cage G contained adult rats (Control 1), while cage H contained newly weaned rats (Control 2). Cage I contained adult rats fed diet containing selenium and vitamin E (nutrient), while cage J contained newly weaned rats also fed diets containing selenium and vitamin E. Each treatment was replicated three times. Longevity (days of survival) and differential leucocyte counts which are functions of immune response of the rats upon infection with T. congolense were determined. At the end of the study, the longevity and differential leucocyte counts were analysed for significant differences using analysis of variance (ANOVA) and any differences were partitioned with the least significant difference (LSD) and the Duncan's Multiple Range Test (DMRT). The results revealed that there was no significant difference in longevity ($P > 0.05$) between the two control groups (newly weaned and adult rats) but there were significant differences between the longevity of each control group and the longevities of the rats given combined dietary supplementation of the nutrients. Longevity of newly weaned and adult rats given dietary supplementation of selenium and vitamin E were not different ($P < 0.05$). These results implied that age of the rats was not a contributory factor in improved immune response of the trypanosome-infected rats fed the combined dietary supplementation of selenium and vitamin E.

Keywords: Immune response, Newly weaned rats, Longevity, *Trypanosoma congolense*, *Rattus rattus*

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PREVALENCE OF URINARY SCHISTOSOMIASIS IN OZUITEM, BENDE LOCAL GOVERNMENT AREA OF ABIA STATE, NIGERIA

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ABSTRACT

Studies on the prevalence of urinary Schistosomiasis were carried out in Ozuitem, Bende LGA between May and September, 1998. Urine collections from villagers were examined using centrifuge and filtration technique. A total of 1173 urine samples were collected and examined, of which 496 (42.3%) were positive for Schistosomiasis. Visible haematuria was

their predominant presenting symptom. Of the total, 370 (74.6 %) were excreting under 100 eggs per 10 ml urine sample with 250 (75.0 %) males and 120 (72.6 %) females, while 3(0.6 %) were excreting more than 500 eggs in 10 ml of urine samples with 2(0.6 %) males and 1(0.6 %) females. A chi square analysis showed that intensity of infection and frequency of water contact were significantly higher in persons under 20 years of age than in persons 20 years and above ($P < 0.05$). Of the 496 infected persons, 333 (67.1 %) were males, while 163 (32.9 %) were females. Overall peak infection (59.4 %) occurred in the 11-20 years age group. Infection varied significantly among different villages, ages and sex in the study area ($P < 0.01$). *Schistosoma intermedium* host snails collected in routine malacological survey include *Bulinus globosus*, *B. forskalii*, *B. truncatus*, *Lymnaea natalensis* and *Melanoides tuberculata*. Only *B. globosus* was found to shed furcocercous cercariae believed to be human schistosomes.

Keywords: *Schistosoma haematobium*, Urinary schistosomiasis, Urine, Bende

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EMBRYONIC DEVELOPMENT IN *Clarias gariepinus* (BUHELL, 1822) UNDER LABORATORY CONDITIONS

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ABSTRACT

The embryonic development in Clarias gariepinus was studied under laboratory conditions. The development stages of eggs starting from first cleavage to hatching were examined microscopically. The accurate timing and detailed description of each stage were recorded. Photomicrograph of important stages, segmentation, blastulation, differentiation of embryo and hatching, was taken. The result shows that the blastodisc (polar cap) appeared 35 ± 1 minutes after fertilization. The first cleavage dividing the blastodisc into two blastomeres occurred 15 ± 0.5 minutes after the polar cap formation. The larva emerged from the egg case 22 hours after fertilization at a water temperature of 25.1 ± 1.5 °C. This result will assist in better management of C. gariepinus, enhance their survival to fry and increase the supply of fingerlings in Nigeria.

Keywords: Embryonic development, *Clarias gariepinus*

**THE EFFECT OF ACTELLIC 25 EC ON MINERAL COMPOSITION ON CURED FRESH WATER FISH:
*Heterobranchus longifilis, Heterotis niloticus AND Chrysichthys nigrodigitatus***

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ABSTRACT

A study to evaluate the effects of the preservative, Actellic 25 EC solution, on the mineral composition of the three freshwater fish species was carried out. Pieces of fish (samples) were analysed for mineral composition before and after traditional smoke drying and smoke drying after Actellic treatment. The investigations were carried out using fresh water fish, Heterobranchus longifilis, Heterotis niloticus and Chrysichthys nigrodigitatus. The result showed that Actellic 0.03 % solution greatly reduced the sodium content of the smoked dried fish species. Furthermore, Actellic 25 EC eroded the magnesium (Mg) content of C. nigrodigitatus and also reduced slightly the naturally high iron content of H. longifilis, H. niloticus and C. nigrodigitatus. The implications of these results are discussed.

Keywords: Actellic, Mineral, Freshwater fish

EFFECTS OF AQUEOUS LEAF EXTRACT OF *VERNONIA AMYGDALINA* ON BLOOD GLUCOSE AND TRIGLYCERIDE LEVELS OF ALLOXAN-INDUCED DIABETIC RATS (*Rattus rattus*)

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ABSTRACT

The effect of Vernonia amygdalina aqueous leaf extract on serum glucose and triglyceride level of diabetic rats were investigated. The aqueous extract was administered to alloxan – diabetic rats. The blood glucose and serum triglyceride levels were estimated at time intervals post oral administration of the extract (80 mg/kg). The extract caused significant ($P < 0.05$) and progressive time dependent reduction of blood glucose and serum triglyceride levels in both normoglycaemic and alloxan-induced diabetic rats, with similar time course of action. In conclusion, the significant reduction in blood glucose and serum triglyceride level observed in this study may help in alleviating some of the complications associated with diabetic conditions.

Keywords: *Vernonia amygdalina*, Leaf extract, Blood glucose, Serum triglyceride, Diabetic rats

CYTOTOXICITY OF FRACTIONS OF *Pistia stratiotes* L. ON LARVAE OF *Culex* MOSQUITO AND *A. salina*

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ABSTRACT

Crude chloroform and aqueous extracts of the duckweed, Pistia stratiotes L., were bioassayed at various concentrations for larvicidal activities against larvae of Culex mosquito and Artemia salina (brine shrimp). The crude (LC50 = 159.50 μ g/ml) and chloroform extracts (LC50 = 0.0909 μ g/ml) exerted mortality at 40 μ g/ml of 16.67 % and 90.0 % respectively on Culex mosquito larvae, while the aqueous extract (LC50 = >1000 μ g/ml) at 200 μ g/ml, resulted in 3.33 % mortality. The crude (LC50 = 2524.22 μ g/ml) was moderately toxic on A. salina larvae at 1000 μ g/ml which killed 30.00 % of the test organisms. Whereas the chloroform extract showed lower activity on brine shrimp larvae (3.3 % mortality, LC50 > 1000 μ g/ml). The aqueous extract demonstrated no activity on brine shrimp at all concentrations tested. The study showed that the chloroform extract of P. stratiotes selectively exerts cytotoxic effect on Culex mosquito larvae resulting in high mortality with LC50 = 0.0909 μ g/ml than on the brine shrimp larvae at LC50 >1000 μ g/ml. It is therefore recommended that these extracts of P. stratiotes L. should be tested for adulticidal and/or mosquitocidal activity as well as toxicity in higher animals up to man. This may yield a more base line data valuable for use in the development of a microbially active chloroform fraction of the plant for possible use in modern medicine.

Keywords: Toxicity, *Pistia stratiotes*, Chloroform fractions, Aqueous fractions, *Artemia salina*, *Culex* mosquito

THE EFFECTS OF PRESERVATION METHODS ON PROXIMATE COMPOSITION, INSECT INFESTATION AND ORGANOLEPTIC PROPERTIES OF *Heterobranchus longifilis*, *Heterotis niloticus* AND *Chrysichthys nigrodigitatus*

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ABSTRACT

A study to evaluate the effects of insecticide, Actellic 25 EC and salt solutions on proximate composition, preservation of organoleptic properties and reduction of insect infestation on traditionally smoked dried fish samples was carried out using three freshwater fishes, Heterobranchus longifilis, Heterotis niloticus and Chrysichthys nigrodigitatus. The various dehydration and smoking treatments had effect on the proximate composition. The highest

moisture contents were recorded in the batch I (fresh) fish pieces, while the lowest moisture content occurred amongst the Actellic dehydrated and smoked dried fish pieces. The fat content of fish pieces dehydrated and smoked dried showed that the non dehydrated and non smoked dried fish pieces (fresh fish) had the highest fat content. The highest fibre content was recorded in the batch I (fresh fish) fish species and the lowest was recorded among the fish pieces dehydrated in salt solution before smoke drying. The protein content of fish pieces variously dehydrated and smoked dried revealed that the Actellic 25 EC dehydrated smoked dried fish pieces had the highest protein content while the lowest protein contents were recorded among the fresh fish pieces not dehydrated either in salt and/or Actellic 25 EC solutions. The highest carbohydrate content was recorded in the batch I (fresh fish) while the lowest occurred among Actellic 25 EC dehydrated smoked dried fish pieces. Two insects, *Dermestes sp* and *Necrobia sp* were identified to attack dehydrated and smoked dried fishes. The smoked dried fishes had comparatively higher insect attack than the salted and / or Actellic dehydrated smoked dried fish pieces. Fish pieces preserved with Actellic had the overall best organoleptic properties while acceptability of the dried fish was best for salted smoked dried fish pieces. The relevance of this study to humanity is discussed.

Keywords: Deltamethrin, Freshwater Fish, Fish salting, Fish Smoking, Fish Storage, Chemical Properties, Organoleptic Properties

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GROWTH PERFORMANCE OF MONO-SEX AND MIXED SEX POPULATION OF *Oreochromis niloticus* FED SIMILAR DIET

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ABSTRACT

*The growth performance of all-male, all-female and mixed sex population of *Oreochromis niloticus* fed similar diet was carried out. The fingerlings used in the study were of relatively similar weight ranges (24.8 g – 26.6 g) with initial mean weight of 25.7 ± 1.3 g and initial mean total length of 3.8 ± 1.5 cm. The mean increase in weight for the all-male *Oreochromis* was significantly higher than the values for the all-female *Oreochromis* and the control ($P < 0.05$). The food conversion ratio (FCR) was best in the all-male *Oreochromis*, while that of all-female was better than that of the mixed population. There was no significant difference between the food conversion ratio of all-male *Oreochromis* and those of all-female and mixed population ($P > 0.05$). The percentage survival of all-male *O. niloticus* was 94 % and that of all-female was 88 %, while that of the mixed population was 74 %. All-male *O. niloticus* grew better than the all-female under the same experimental conditions. It is therefore recommended that the culture of all-male *O. niloticus* species by fish farmers should be encouraged for increased fish production in Nigeria.*

Keywords: Mono-sex culture, All-male, All-female, *Oreochromis niloticus*

EFFECT OF PERMETHRIN ON SURVIVAL AND REPRODUCTION OF *Bulinus globosus* MORELET 1868 AND *Bulinus truncatus* AUDOUIN 1827

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ABSTRACT

*The effects of permethrin on reproduction and survival of *Bulinus globosus* and *Bulinus truncatus* are reported. Serial dilutions of the chemical were used in 96 h exposure tests on the molluscs, followed by postexposure maintenance in the laboratory for 8 weeks. There was significant decrease in oviposition with increase in pesticide concentration. There were significant differences between treatment-means for both egg mass and embryo counts for both species of molluscs. The F-LSD values at 5% alpha level for egg mass counts were 2.81 and 2.97 respectively for *B. globosus* and *B. truncatus*; 49.60 and 55.72 for the embryo counts in that order. The chemical did not produce an appreciable adverse effect on snail survival and longevity.*

Keywords: Permethrin, Fecundity, Survival, *Bulinus globosus*, *Bulinus truncatus*

THE PHYSICO-CHEMICAL PARAMETERS OF AN AFRICAN ARID ZONE MAN MADE LAKE

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ABSTRACT

Physico-chemical studies were conducted in lake Alau, a large reservoir in the northeast arid zone of Nigeria, between October, 2001 and September, 2002. Five stations were selected to determine the physico-chemical characteristics. The results showed that water temperature values ranged from 23 °C to 27 °C, depth varied from 2.85 m to 7.23 m, water current was between 19.62 cm/sec and 26.71 cm/sec, Secchi disc transparency ranged from 0.26 m to 0.42 m, pH varied from 6.59 to 7.29, conductivity was between 118.41 $\mu\text{mhos/cm}$ and 131.45 $\mu\text{mhos/cm}$, free CO₂ ranged from 2.55 mg/l to 3.06 mg/l, Biochemical oxygen demand (BOD) was between 4.30 mg/l and 5.31 mg/l and nitrate-nitrogen concentration was between 30.30 mg/l and 47.0 mg/l. There were significant differences ($P < 0.05$) between these parameters in relation to stations. Generally, the physico-chemical characteristics of lake Alau fall within the productive values for aquatic systems, and strongly indicate that the lake is unpolluted.

Keywords: Arid zone, Physico-chemical, Aquatic systems, Lake Alau, Transparency

FRESHWATER SNAILS OF NIGER-CEM, NKALAGU EASTERN NIGERIA: OBSERVATIONS ON SOME DEMOGRAPHIC ASPECTS OF THE SCHISTOSOME-TRANSMITTING BULINIDS

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ABSTRACT

*The results of snail collections carried out in the freshwater habitats of Niger-Cem in Nkalagu from August to November 2002 are reported. Also reported are findings on abundance, diversity and age structure of the snails. A total of 3491 pulmonate snails were collected, belonging to 3 families: Planorbidae (3133); Lymnaeidae (199) and Ampullariidae (159). *Bulinus globosus* was most abundant, with mean abundance (MA = 627.66) followed by *B. truncatus* (MA = 294) and *Biomphalaria pfeifferi*, the least abundant (MA = 6.33). Analysis of the collected snails gave the following: Shannon's index of diversity, $H = 1.2889$; Simpson's index of dominance, $D = 0.3642$ and the number of snails per man-hour = 174.6. Age structure findings demonstrated a 'lag' phase in the period of peak abundance between *B. globosus* and *B. truncatus*. Findings on the reproductive to pre-reproductive (R/P) ratios, suggest similar demographic strategies for the two buliniid mollusc species.*

Keywords: Abundance, Diversity, Demographic Strategy, *Bulinus globosus*, *Bulinus truncatus*

THE HAEMATOLOGICAL PROFILE OF THE SPRAGUE-DAWLEY OUTBRED ALBINO RAT IN NSUKKA, NIGERIA

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ABSTRACT

This study determined the haematological profiles of Sprague-Dawley (SD) outbred albino rats of both sexes and different age sets bred and maintained at the Faculty of Veterinary Medicine Laboratory Animal Unit, University of Nigeria, Nsukka, Nigeria. Erythrocyte counts (EC), packed cell volume (PCV), haemoglobin concentration (Hb), erythrocyte sedimentation rate (ESR), total leukocyte counts (TLC), and differential leukocyte counts (DLC), were carried out following standard procedures on blood samples collected from 543 rats (267 males and 276 unbred females) during a 14-month study period. Results of the determinations for each of the haematological characteristics were compared with standard reference values generated in temperate countries for specific age sets and sexes of the rats. Findings from our study showed that there were significant differences in the normal values of some of the indices between the sexes and age sets of rats studied; also there were significant differences

for some indices in some age sets and sexes between the results obtained in Nsukka Nigeria and the ones generated in temperate climatic conditions - means of the PCV, Hb, mean corpuscular volume, mean corpuscular haemoglobin and absolute numbers of the different leukocytic cellular elements of the rats studied were found to significantly differ from comparable standard reference values generated in temperate locations for specific age sets and sexes, but the means of the EC and TLC were not found to significantly differ from the temperate values. The results of the study were discussed in relation to climatic and geographical locational factors (especially temperature) as they affect the normal reference haematological values, and the relevance of haematology in model animal experimentation and biomedical research.

Keywords: Haematology, Rat, Sprague-Dawley strain, Nsukka, Nigeria