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### EFFECT OF FOOD SUPPLEMENTATION ON THE WHITE BLOOD CELLS COUNT AND DIFFERENTIAL LEUCOCYTES COUNT OF TRYPANOSOME-INFECTED PREGNANT RATS

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#### ABSTRACT

*Trypanosomiasis is an important livestock disease in sub-Saharan Africa. Improvement on host's nutrition is important in moderating the severity of pathophysiological effect of trypanosomiasis and it also influences the rate of recovery. Earlier researchers demonstrated that dietary supplement of selenium and vitamin E enhanced immune response in white rats. It has also been reported that during pregnancy, immune response is depressed. Leucocytes count has been recognized as a measure of immune response. This research was therefore conducted using chicks' mash fortified with 80 mg of vitamin E and 0.3 mg of selenium as control (Diet 1) to determine the effect of dietary supplementation of moderate protein (combination of 250 g of corn meal, 240 g soyabean meal and 10 g of crayfish) in the chicks' mash (Diet 2), high dietary protein (combination of 400 g of caseinogen and 300 g of soyabean meal) (Diet 3), and high dietary carbohydrate (combination of 400 g dextrose and 300 g cornmeal) (Diet 4) in the chicks' mash on the white blood cells count and differential leucocytes count of trypanosome-infected pregnant rats. Dies 1 – 4 were given to rats in Cage A – D, respectively. The rats were infected with trypanosomes within 10<sup>th</sup> to 14<sup>th</sup> day of pregnancy. Each experimental set up was replicated three times. On comparing the total white blood cell counts of all the rats fed different diets, there was no significant difference ( $P > 0.05$ ) between the rats in Cage A (fed Diet 1) and rats in Cage B (fed Diet 2), and similarly between rats in Cage C (fed Diet 3) and rats in Cage D (fed Diet 4). There was, however, significant difference ( $P < 0.05$ ) between rats in Cage A and rats in Cages C and D, and also between rats in Cage B and those in Cages C and D. Diet 2 with a moderate (20.01%) protein level and a balance of other nutrients produced the highest leucocytes count. Diet 2 therefore produced the highest immune response in the pregnant trypanosome-infected rats.*

**Keywords:** Trypanosomiasis, Nutrition, Leucocytes count, Immune response

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### COLEOPTERAN FAUNA OF AGROECOSYSTEMS IN AWKA, NIGERIA

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#### ABSTRACT

*A study was carried out to investigate the coleopteran fauna of two agroecosystems (cultivated farmland and fallow plot at the Permanent Site of Nnamdi Azikiwe University, Awka) for a twelve-month period using the pitfall technique. Eight pitfall traps made up of plastic containers with mouth diameters of 9.80 cm and 6.20 cm deep were set monthly at random in the two sampling sites. The traps, which were filled to one-third with 5 % formalin, serving a preservative, were inspected every twenty-four hours and the insects caught sorted and counted under a dissecting microscope. Species of Coleoptera obtained from the cultivated plot were Macrocheilus labrosus, Hyarpalus sp., Carpophilus fumatus, Podagrica uniforma, Tetragonothorax sp., Chlaenius sp., Pheropsophus parallus, Silidas apicalis, Tenebroides mauritanicus, Heteroderes sp., and Heterorynchus licas while only Hyarpalus sp., and Mylabris sp., were obtained from the fallow plot. The result of Fisher's Least Significance Difference (F-LSD) test shows that the pitfall catches of Coleopterans from the two sampling sites were significantly different at p-value of 0.0053 and mean difference of 2.500. The heterogeneity of the coleopteran species at the cultivated plot was traced to cultivation. The role of certain coleopteran families as faunal indicators was highlighted. Other factors, which influenced the Coleopteran species at the farmlands were also discussed.*

**Keywords:** Coleoptera, Fauna, Agroecosystems, Pitfall traps

**Animal Research International (2007) 4(2): 650 – 652**

#### PROPERTIES OF LIPASE (EC 3.1.1.3) FROM DIFFERENT VARIETIES OF MAIZE

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#### ABSTRACT

*Lipase activity was studied in four varieties of Corn (Zea mays) namely: Local yellow (LY), Western yellow (WY), Western white (WW) and Pop corn (POP). Using emulsified olive oil as substrate, lipase was found to be present in the dry seeds of maize. Lipase activity increased with germination and reached it's peak on the first day of germination for WY and LY, third day for POP and sixth day for WW. Lipase activity was tested for its ability to hydrolyze different emulsified oils such as groundnut oil, palm kernel oil, and soybean oil. The highest activity was with soybean oil. This high activity was correlated with high specificity of corn lipase on linoleic acid. Thermal inactivation studies showed that the enzyme was stable up to 50°C and showed rapid inactivation above this temperature. Its optimum temperature was 50°C and the optimum pH, 8.0.*

**Keywords:** Lipase, Enzymes, Maize, Thermal stability, Substrate specificities

**Animal Research International (2007) 4(2): 653 – 661**

#### A COPROLOGICAL SURVEY OF GEOHELMINTH INFECTIONS AMONG SCHOOL CHILDREN IN RURAL EBONYI STATE, NIGERIA

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## ABSTRACT

*A cross-sectional coprological survey involving 420 primary school pupils of both sexes aged 6-14 years, was conducted in 8 primary schools at different locations in Ishielu Local Government Area (L.G.A.) of Ebonyi State, Nigeria, to determine the prevalence and intensity of infection of the geohelminth (soil-transmitted helminth) parasites. The dominant geohelminth parasites identified were Ascaris lumbricoides (32.9%), Trichuris trichiura (20.5%), and hookworms (3.8%). Altogether 240 respondents composed of 124 (29.4%) males and 116 (27.6%) females were infected with one or more of the parasites thus establishing an overall prevalence of 57.1%. In 7/8 (87.5%) of the study primary schools, over 50% of the children harboured the ova of the parasites. The distribution of the infections was not gender-dependent, and the between-sex prevalence was not statistically significant ( $p > 0.05$ ). The prevalence of the infections appeared to be generally age-dependent but not over-dispersed as there was a marked association between age of the pupil and the infectious process. Concomitant infection involving 13.3% of all the infected pupils was recorded. Generally, the intensity of the geohelminthiasis was of the light category for *A. lumbricoides* ( $\leq 4999$  eggs per gram faecal matter(epg); *T. trichiura* ( $\leq 999$  epg); and hookworm ( $\leq 999$  epg). Moderate infections (1000 – 9999 epg) of trichiuriasis was recorded in all the study schools. A deworming programme of the infected schools and the at-risk population is recommended.*

**Keywords:** Coprological survey, Geohelminth, Prevalence, Intensity of infection, Concomitant infection

## Animal Research International (2007) 4(2): 662 – 665

### EFFECT OF DIFFERENT DIETARY ITEMS ON THE GROWTH OF AFRICAN CATFISH HYBRID *Heterobranchus bidorsalis* (♂) X *Clarias gariepinus* (♀)

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## ABSTRACT

*This paper describes the growth response of the developmental stages of hybrid cattish resulting from the crossing of *Heterobranchus bidorsalis* (male) and *Clarias gariepinus* (female), fed with different feed rations. Hatchlings of the hybrid catfish were cultured in plastic aquaria set up at the fish hatchery complex, Nnamdi Azikiwe University, Awka. The hatchlings were fed and observed for 91 days. Different food items such as artificially compounded feed, zooplankton / live organisms *Moina* sp and *Brachionus* sp, and a mixture of zooplankton (*Moina* sp and *Brachionus* sp) and artificially compounded feed were administered. The mixture gave the best result with a mean weight of 792g  $\pm$  2.73g followed by those fed *Moina* sp (1.93g  $\pm$  0.27) and *Brachionus* sp (1.80g  $\pm$  0.32) respectively. Hatchlings fed only artificially compounded feed exhibited the poorest growth. A mixture of live food organisms and artificially compounded feed is thus recommended for better growth response of catfish hybrid, (*H. bidorsalis* ♂ x *C. gariepinus* ♀).*

**Keywords:** Catfish hybrid, Hatchlings, Juveniles, Diet, Growth

**Animal Research International (2007) 4(2): 666 – 672**

**FORMICID FAUNA OF CONTRASTING TROPICAL RAINFOREST AGRO-ECOSYSTEM AND THEIR ENVIRONMENTAL IMPLICATIONS**

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**ABSTRACT**

*The pitfall technique was used to study ants in a secondary re-growth forest and a fallow plot at the Permanent Site of Nnamdi Azikiwe Awka from January to December, 1998. The selected environmental variables including mean soil temperature, mean relative humidity and rainfall. Species of ant obtained from the two sampling sites were *Acantholepsis* sp. *Camponotus acvapimensis*, *C. perrisi*, *Myrmecaria striata*, *C. maculatus*, *Dorylus affinis* *Paratrechina* sp., *Megaponera foetans*, *Pheidole* sp., *Crematogaster* sp. and *Oecophylla longinoda*. Statistical differences existed only in the distribution of *Camponotus acvapimensis* and *C. perrisi* with less catches recorded at the forest than the fallow plot. There was positive correlation coefficient between the density of *Dorylus affinis* and mean soil temperature ( $r = 0.84$ ) at the forest while at the fallow plot negative correlation value ( $r = -0.61$ ) was obtained between the population density of *Acantholepsis* sp. Populations of *Acantholepsis* also recorded a positive correlation ( $r = 0.54$ ) with monthly mean soil temperature and mean relative humidity. These results do not only suggest a reflection of response of these ant species to these environmental variables during their foraging activities but their implications during the exploratory activities of these ants carried out in relation to temporal organization of the foraging systems, with these ants species exhibiting centrifugal polytheism associated with ant societies. The environmental implications of the trapping of these formicid species in the habitats studied were also discussed.*

**Keywords:** Formicid fauna, Tropical rainforest, Agro-ecosystem, Environmental variables

**Animal Research International (2007) 4(2): 673 – 676**

**QUALITATIVE STUDY OF ANOPHELES SPECIES IN KONDUGA LAKE AREA OF BORNO STATE, NIGERIA**

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**ABSTRACT**

*The investigation on Anopheles species in Konduga lake area, Borno State of Nigeria, was carried out to identify various Anopheles species prevalent in the area and to determine their relative population densities. Six Anopheles species were recorded, namely, *A. gambiae*, *A. funestus*, *A. ziemanni*, *A. squamosus*, *A. pharoensis*, and *A. maculipalpis*. The relative population densities of various species were higher during rainy season than during the dry season. The population densities of female Anopheles were higher than those of the males. With the exemption of *A. maculipalpis*, all the other Anopheles*

*species recorded during the study are known transmitters of human malaria. A. gambiae of the A. gambiae complex was dominant in the study area. The periodic occurrence of Anopheles explains periodicity of malaria epidemiology in the study area. The high population of the female Anopheles predisposes inhabitants of the study area to incessant contact with the malaria vectors. Lake Konduga and its environments seem to satisfy the basic requirements of Anopheles mosquitoes growth and survival.*

**Keywords:** Tropical lake, Anopheles species, Malaria vectors

**Animal Research International (2007) 4(2): 677 – 679**

**MACROBENTHIC FAUNA OF A HUMID TROPICAL WATER RESERVOIR, ABIA STATE, NIGERIA**

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**ABSTRACT**

*The macrobenthic fauna of a humid tropical zone water reservoir was investigated from January to December 2002. Benthos was obtained using an improvised Surber Stream Bottom Sampler. Three phyla of macrobenthos (Arthropoda, Mollusca and Annelida) prevail in the reservoir, with quantitative variations. A total of 1,279 macrobenthic animals were recorded. The Arthropoda was represented by larvae of five genera of insects, with a total of 644 (50.4 %), while Mollusca was represented by two genera with a total of 165 (12.9 %), and Annelida by three genera, with a total of 470 (36.7 %) of the benthos. There was significant difference ( $P < 0.05$ ) among the phyla populations of the benthos.*

**Keywords:** Macrobenthic, fauna, Humid, Tropics, Water reservoir

**Animal Research International (2007) 4(2): 680 – 684**

**MOLLUSCAN POPULATION OF AN AFRICAN ARID ZONE LAKE**

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**ABSTRACT**

*The species composition, abundance and distribution of molluscs population together with some physico-chemical variables from five different stations in the littoral region of lake Alau, Maiduguri; Borno state, were studied from October 2001 to September 2002. Three patterns of seasonal abundance were found, maximal abundance during the rainy season (July -September), moderate abundance during the harmattan season (November – February) and minimal abundance in the dry hot season (March - June). Significant*

*differences in species composition and abundance of the molluscs were found between stations studied. The total number of organisms recorded was 3368 comprising of 1924 Bivalves and 1544 Gastropoda. Nine families were recorded which includes Bithyniidae, Hydrobiidae, Lymnaeidae, Physidae, Valvatidae, Vivipariidae, Sphaeridae and Unionidae while 15 species were observed in this study. The predominant families in terms of total number collected from all stations Sphaeridae and Unionidae recording 1006 and 933 organisms with the percentage compositions of 29.86% and 27.7%. The least was from the families Lymnaciidae with total number of 116 and 3.44% as the percentage composition. The abundance of the molluscs was positively and significantly correlated at 5% confidence with temperature ( $r = 0.675$ ), dissolved oxygen ( $r = 0.832$ ), phosphate ( $r = 0.528$ ).*

**Keywords:** Molluscs, Littoral Region, Abundance, Unionidae

**Animal Research International (2007) 4(2): 685 – 690**

**EVALUATION OF SNAIL MUCIN DISPERSED IN *Brachystegia* GUM GEL AS A WOUND HEALING AGENT**

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**ABSTRACT**

*Snail mucin was obtained from the mucilage of Archachatina marginata (Family Arionidae). The wound healing effect of the snail mucin was evaluated with special attention to the effect when combined with honey in Brachystegia eurychoma gel preparation. Brachystegia eurychoma gum, snail mucin and honey were combined in different concentrations in the treatment of wound made by excision model in rats. It was observed that mucin when combined with honey and in the Brachystegia eurychoma gel heals faster than when used alone. Brachystegia eurychoma gum was also observed to effect fast healing of the wounds when used alone. Complete healing was observed in 15 days post treatment. Honey in combination with mucin as well as the Brachystegia eurychoma gel should be harnessed in pharmaceutical formulations for the treatment of wounds. Brachystegia eurychoma gum in right combinations with mucin and honey for wound healing, prevents bacteria infection, scar formation and promotes regeneration of hair follicles.*

**Keywords:** Snail mucin, Honey, *Brachystegia eurychoma* gum, Gel, Wound healing

**Animal Research International (2007) 4(2): 691 – 697**

**BLOOD ERYTHROCYTIC AND LEUCOCYTIC COMPONENTS OF *Heterobranchus bidorsalis* JUVENILES STOCKED IN WATER POLLUTED WITH CRUDE OIL FRACTIONS**

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#### ABSTRACT

*The blood erythrocytic (RBC) and leucocytic (WBC) components of Heterobranchus bidorsalis juveniles exposed to different concentration of crude oil fractions were studied. Two study periods namely the toxicity and recovery periods were adopted. Lubricating engine oil (LBO), Bonny-light crude oil (BLCO), Kerosene (DPK) and premium motor spirit (PMS) were respectively applied at four concentrations 1.00, 2.00, 4.00 and 8.00 ml L<sup>-1</sup>. Lower numbers of RBCs were recorded in fish samples exposed to the crude oil fractions than in the control fish. The comparatively high RBCs in fish during the 4 days toxicity period than during 42 days recovery periods is attributed to the greater destruction of RBCs during the toxicity period. The 4.00 ml L<sup>-1</sup> LBO and BLCO concentration were apparently preferred by the fish to maintain a higher number of RBCs than with 1.00, 2.00, and 8.00 ml L<sup>-1</sup> concentrations. Similarly, the 8.00 ml L<sup>-1</sup> concentrations of DPK and PMS gave better values of RBCs than the 1.00, 2.00 and 4.00 ml L<sup>-1</sup> concentrations. Reduced number WBCs in the fish blood during the toxicity period at concentrations of 1.00, 4.00 and 8.00 ml L<sup>-1</sup> LBO; was recorded likely the phagocytic action of the WBCs.*

**Keywords:** *Heterobranchus bidorsalis*, Erythrocyte, Leucocyte, Toxicity, Crude oil fractions

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#### ANTIDIABETIC EFFECT OF *Sarcocephalus latifolus* AQUEOUS ROOT EXTRACT IN EXPERIMENTAL RAT MODEL

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#### ABSTRACT

*Investigations were carried out to evaluate the blood sugar lowering activity of the aqueous extract of Sarcocephalus latifolus roots (SLA) in normal and streptozotocin-diabetic rats. The extract (250 mg/kg body weight; p.o) caused 76 % reduction in blood glucose within 6h in fasted diabetic rats. However, the extract at the same dose showed no effect in normoglycaemic rats. Acute toxicity studies of the extract in mice gave an oral LD<sub>50</sub> value greater than 5000 mg/kg. Phytochemical tests revealed that SLA tested positive for alkaloids, tannins, saponins, terpenoids, reducing sugars, carbohydrates, sterols and glycosides. The results show that the aqueous root extract of S latifolus has blood glucose lowering effect, which is consistent with the use of the root in folklore diabetes management.*

**Keywords:** *Sarcocephalus latifolus* roots, Streptozotocin, Antidiabetic

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#### PARASITIC INCIDENCE IN CULTURED *Clarias gariepinus*

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#### ABSTRACT

*A sample of 27 fish was collected from the fish breeding centre of the Ministry of Agriculture and Natural Resources. Agodi, Ibadan. This sample was examined for parasitic incidence and the results showed 77.7 % parasitic prevalence while infection was not sex dependent ( $P > 0.05$ ). Parasitic prevalence within the sample increases as length of fish increases. The prevalence of parasites encountered were *Henneguya* (3.7%), *Dactylogyrus* sp (11.1 %), *Capillaria* sp (7.4 %), unidentified larvae (7.4 %), unidentified cysts (40.7%), *Dibothriocephalu* sp (3.7 %), *Argulus* 7.4 %), *Ichthophthirius* (3.7 %) and *Tricodina* (3.7 %).*

**Keywords:** Parasites, Prevalence, *Clarias gariepinus*, Infection

Animal Research International (2007) 4(2): 705– 712

### HARNESSING AQUATIC PHYSICOCHEMICAL PARAMETERS INFLUENCING MACROINVERTEBRATE FAUNA IN ANAMBRA RIVER BASIN FOR SUSTAINABLE FISH PRODUCTIVITY

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#### ABSTRACT

*The management-oriented background for harnessing aquatic physicochemical parameters influencing macro invertebrate fauna of Anambra River basin for sustainable fish productivity was studied. The intra seasonal variability in the water quality of the river revealed mean transparency of 1.79 cm, Conductivity of 28.81  $\mu\text{scm}^{-1}$ , nitrate-nitrogen of 3.23  $\text{mg l}^{-1}$ , total hardness of 6.43  $\text{mg CaCO}_3\text{L}^{-1}$ , biological Oxygen Demand (BOD) of 3.62  $\text{mg l}^{-1}$ ,  $\text{NO}_3\text{-N}/\text{PO}_4\text{-P}$  0.54 ratio and  $\text{CO}_2/\text{DO}$  of 0.81 were significantly higher in the dry season than all other parameters which were significantly higher in the wet season. A total of 1808 individuals (mostly adults) belonging to 97 species of macro-invertebrate fauna were collected. The overall composition of the fauna in the river basin was dominated by coleopterans and the hemipterans. The estimated annual fish yield of the river basin was 72.91 kg/ha based on a morphoedaphic index. The water quality of the River can be harnessed by controlling and/or prohibiting the discharge of municipal effluents and domestic garbage into the river as well as the continuous use of the riparian zone for agronomy. The maintenance of peripheral 50/60 m of thick riparian vegetation can act as buffer strip to check bank erosion is suggested.*

**Keywords:** Macro invertebrates, Physicochemical Parameters, Harnessing, Fish yield