IV. LOCK HAVEN UNIVERSITY OF PA. (1986)

(ABSTRACTS 86-1 to 86-24)

ABSTRACT 86-1

ACTIVATION OF PROTEIN KINASE-C BY METHYLPHENIDATE. Sharon I. Davidgeiser and Susan M. Beatty, Kutztown University of PA.

Thrombin initiation of phosphatidylinositol (PI) turnover causes platelet activation through the action of phospholipid and calcium-dependent protein kinase (PKC). Neurotransmitters also initiate PI turnover and we propose that PKC is on the pathway of their action as well. Attention Deficit Disorder (ADD) is a syndrome characterized by short attention span, learning disabilities, and hyperactive behavior, which is treated with methylphenidate, a stimulant drug, whose structure is similar to inhibitors of PKC. We predicted that methylphenidate would activate PKC. In vitro, using partially purified protein isolated from rat brain, we demonstrated protein activation by methylphenidate, thus supporting our hypothesis.

ABSTRACT 86-2

INDUCTION OF ASPARAGINE SYNTHETASE ACTIVITY IN AN ASPARAGINE DEPENDENT FROG CELL LINE. Laura L. Bockhoefer and Carol Ely Hepfer, Millersville University of PA.

The haploid frog cell line ICR2A requires exogenous asparagine due to negligible asparagine synthetase activity. Asparagine independent variants expressing elevated levels of this enzyme arise spontaneously in ICR2A cell populations. Preliminary results show that the frequency of asparagine independent variants is increased significantly by treatment with L-ethionine. Previously, we reported a similar increase with 5-azacytidine treatment. Both agents have been shown to decrease levels of DNA methylation and, thus, to modulate gene activity in a number of mammalian cells. The combined findings implicate a role for DNA methylation in the regulation of the asparagine synthetase gene in ICR2A frog cells.

ABSTRACT 86-3

EFFECTS OF LOW LEVELS OF PARAQUAT ON MICE. Stephen M. Popula and Earl Nollenberger, Shippensburg University of PA.

Paraquat, a nonselective herbicide, has been used in general and no-till agricultural applications since the late 1950's. The general effects of paraquat on nontarget species are impairment of the nervous and respiratory systems. This study involves the observation of tissue responses and determination of tissue levels to a single sub-lethal dosage.
14 days post-intoxication. After exposure, sections of liver, lung, and kidney were processed for histological examination. Levels of paraquat were determined by gas chromatography. Initial findings include increased eosinophilia in 1 hour post-toxication hepatocytes with eosinophilia decreasing by 7 days. Enlargement of the sinusoids was also observed beginning at 4 hours. In the lungs, fibrosis and thickening of alveolar walls were visible. Renal tubule damage was minimal, limited to local loss of tubular cells.

ABSTRACT 86-4

PLASMID CHARACTERIZATION FOR USE IN THE EPIDEMIOLOGY OF LEGIONELLOSIS. Thomas D. Johnson and Frank Baker, Indiana University of PA.

Plasmid analysis was used to investigate the source of Legionnaires' disease in a heart transplant patient located at Presbyterian Hospital in Pittsburgh, PA. Clinical and hospital environmental isolates of Legionella pneumophila were compared on the basis of plasmid profiles. These profiles involved the enumeration and size of the plasmids, as well as fragment patterns from restriction enzyme digestion. The presence of similar plasmid profiles between the environmental and clinical isolates provided evidence that the strains were the same and, therefore, support the concept of acquiring Legionnaires' disease from the immediate environment.

ABSTRACT 86-5

THE ISOLATION AND CHARACTERIZATION OF PLASMID DNA FROM THE BACTERIUM, Thiobacillus ferroxidans. Linda L. Jacobs and Foster Billheimer, California University of PA.

Thiobacillus ferroxidans is a bacterium distinguished by its ability to obtain energy through the oxidation of ferrous iron and reduced inorganic sulfur compounds, a facultative saprotroph. Thiobacillus ferroxidans can, however, be induced to utilize glucose as its sole energy source. Research is being conducted to determine how this organism makes this trophic transition. One possibility may be due to the presence of plasmid DNA. Both forms can be screened for plasmids using agarose gel electrophoresis. Differences between the forms would infer that the ability to undergo this transition is related to plasmid content. The main objectives are to isolate the plasmids from Thiobacillus ferroxidans, to discover in which trophic form they occur, and to characterize the plasmids which are found.

ABSTRACT 86-6

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IN VIVO EFFECTS OF GOSSYPOL ON PREGNANCY IN RATS. Chriis Van Horn, Barry Perry, and Neil O. Anderson, East Stroudsburg University of PA.

Gossypol, a compound extracted from cotton plants, has been reported to have birth control effects on males, but little information has been reported about its effect on females. Our research indicates high doses of gossypol prevents pregnancy in female rats. Females subcutaneously injected with 10 mg/kg gossypol for 20 consecutive days did not get pregnant for at least 30-40 days following the cessation of the gossypol. Conversely, low doses of gossypol (1 mg/kg) administered for 20 days increased the pregnancy rate with the rats apparently getting pregnant immediately following cessation of gossypol treatment. Perplexedly, control animals receiving only carrier (corn oil) did not get pregnant following the cessation of the injections.

ABSTRACT 86-7

IN VITRO EFFECTS OF GOSSYPOL ON THE ENZYME ACTIVITY OF LDH-X. Bobby Lucas and Neil O. Anderson, East Stroudsburg University of PA.

LDH-X is an enzyme found in testis and sperm. Gossypol, a compound extracted from cotton plants, has been reported to have a competitive inhibitory effect on LDH-X. Our research, using rat testis cytosol containing LDH-X, confirms the inhibitory effect but shows the inhibition is mixed, i.e., neither completely competitive nor non-competitive. It was shown that when gossypol was stored for more than 24 hours in ethanol, it had increased inhibitory effects on LDH-X. Also when LDH-X in rat testis cytosol was stored for longer than 6-8 hours at 4 degrees C, the LDH-X became more sensitive to the inhibitory effects of gossypol.

ABSTRACT 86-8

THE EFFECTS OF SHELL AVAILABILITY ON THE TERRESTRIAL HERMIT CRAB, Coenobita clypeatus. Richard Daniels, Slippery Rock University of PA.

This study involved the terrestrial hermit crab, Coenobita clypeatus; and its responses to the availability of gastropod shells in its environment. The gastropod shell is important to the protection of the hermit crab; since it cannot secrete a shell for protection, the crab must seek out new shells to grow into, or else vital areas are exposed. The experiment was performed in 3 separate but identical environments in which only the availability of the shells differed. In an environment where no shells are available, the crabs displayed limited activity and food intake. In an environment where the crabs were free to choose from a large selection and the control (limited selection), the crabs were more active and had increased
food intake. The crabs also had frequent shell changes in
the environment were a large selection was available.

ABSTRACT 86-9

WATER QUALITY IN THE TANNERSVILLE CRANBERRY BOG. K. L.
Kissinger, K. M. Marquart, M. L. Klusaritz, R. G. Milewski,
and P. Keim, East Stroudsburg University of PA.

The cranberry watershed includes the Tannersville
Cranberry Bog, an ecosystem adapted to nitrogen limitations.
Recently, substantial resort and residential development has
occurred within the watershed. We are acquiring baseline
data for water quality, so that any degradation in water
quality can be correlated with changes in this black spruce
bog ecosystem. More than 25 undergraduates are collecting
replicate field samples to be analyzed for pH, total
alkalinity, conductivity, aluminum nitrate and sulfate ions,
biochemical oxygen demand and dissolved oxygen, turbidity
and color, ammonia and total and fecal coliform. These
results are analyzed statistically and correlated with
atmospheric precipitation levels and acidity, as well as
water flow rate and height. This will provide us with a
scientific overview of this natural, national landmark.

ABSTRACT 86-10

THE EFFECT OF SALINITY ON THE ACUTE TOXICITY OF UN-IONIZED
AMMONIA TO LAKE TROUT, Salvelinus namaycush. William E.
Yaracz and Richard W. Soderberg, Mansfield University of PA.
and James M. Meade, U.S. Fish and Wildlife Service.

The accumulation of ionized ammonia is an important
limiting parameter in intensive fish culture. Reported
levels of HN3 cause a reduction in salmonid growth range
from 0.017 mg/L (Smith and Piler 1975) to 0.13 mg/L
(Schulze-Wiehenbrauck 1976). Recent literature (SECL 1983;
Bradley and Rourke 1985; Meade, 1985) indicates that sodium
and chloride in solution may affect the toxicity of NH3 to
fish. We conducted acute bioassays on NH3 to lake trout at
salinities of 0, 1.3, 10.2 0/00 and found that NaCl3
significantly decreased the toxicity of HN3. Unionized
ammonia maxima for hatcheries should be assigned with
respect to salinity and NaCl could probably be used to
relieve fish from NH3 exposure.

ABSTRACT 86-11

EVALUATION OF ELECTROFISHING FOR THE ESTIMATION OF
PROPORTIONAL STOCK DENSITY, A FISH POPULATION STRUCTURE
INDEX. Kirk D. Fox and Richard W. Soderberg, Mansfield
University of PA.

Proportional Stock Density (PSD) of largemouth bass and
bluegills were estimated from electrofishing samples 3 times
in each of 6 north central Pennsylvania farm ponds from
September 16 to October 30, 1985. Coefficients of variation
(CV) ranged from 0-89 percent, and 0-48 percent, for the bass and bluegill PSD estimates, respectively. Seventy-six percent of the variability in bass PSD estimates was accounted for by water temperature, total alkalinity, conductivity, and secchi disc visibility. These parameters explained 98 percent of the variability in bluegill PSD estimates. We conclude that PSD is too variable to be a useful index for assessing fish population structures, but suggest that methods be explored to correct PSD estimates for environmental variables.

**ABSTRACT 86-12**

**ALGAL PERiphyton COMMUNITIES IN LAKE LACAWAC, PENNSYLVANIA.** Alan Everett, West Chester University of PA.

Effects of nutrient addition upon algal periphyton growth was investigated in Lake Lacawac, Pennsylvania. Thirty-two nutrient-diffusing flower pot substrates were filled with combinations of nitrogen, phosphorus, and carbon and placed in the lake for 35-38 days. Periphyton standing crop on the substrates was then measured as chlorophyll-a and ash-free dry mass. Gross production, net production, and community respiration were assessed as oxygen change in light-dark chambers affixed to the pots. Algal communities which developed on pots releasing both nitrogen and carbon exhibited significantly greater standing crops and photosynthetic rates than communities given other nutrient treatments.

**ABSTRACT 86-13**

**THE ALLELOPATHIC EFFECT OF JUGLONE ON FRESHWATER ALGAL GROWTH.** Carl T. Kessler, Bloomsburg University of PA.

A reduction of growth of various freshwater algae species was observed upon the addition of juglone to the culture medium under laboratory conditions. Juglone (5-hydroxy-1, 4-naphthoquinone) is a chemical compound common to most plant parts at concentrations of 10 -3M and 10 -4M. Concentrations of 10 -5M juglone were not inhibitory to any algaes tested.

**ABSTRACT 86-14**

**SOME PLANT PROTOPLAST PREPARATIONS.** Robert A. Barr and Richard A. Barr, Shippensburg University of PA.

An enzymatic digestion technique has been devised for the preparation of leaf protoplasts, from lily, rose, and geranium plants. Combinations of commercial hydrolytic enzymes from fungi of the genera *Aspergillus*, *Rhizopus*, and *Trichoderma* have proven to be most effective for the digestion of cell walls. The digestions are carried out in a refrigerator (8 degrees C) for 3 to 5 days. Spherical...
protoplasts obtained by this procedure are being used in cell fusions, cell cultures, and regeneration experiments.

**ABSTRACT 86-15**

EFFECTS OF INSECT PREDATION BY *Hyphantria cunea* ON NUTRITIONAL QUALITY OF *Prunus serotina* BUDS. Leslie Deem and William Barnes, Clarion University of PA.

Some plants produce naturally-occurring secondary metabolites such as tannins, phenols, alkaloids, etc., that discourage insect predation. This research investigated the chemical mechanism of differential infestation of *Prunus serotina* by *Hyphantria cunea* (fall web worm). Tannin content, which inhibits larval digestive enzymes, and possible toxic effects of bud extracts on eukaryotic organisms were measured. Statistical analysis of the data from infested and non-infested trees revealed no differences in tannin content of the buds. Bud extracts contained no compounds which were toxic to yeast. Therefore, it is unlikely that this plant insect interaction affects the herbivores that browse on the buds in the winter.

**ABSTRACT 86-16**

AN INVESTIGATION OF REACTION RATES OF STUDENTS IN A FUNCTIONAL HUMAN ANATOMY CLASS. Sherry Sundy and Alex Henderson, Millersville University of PA.

The reaction rates of students were investigated. The effect of stimulants, sedatives, and distraction on reaction rates were statistically determined using analysis of variance and a randomized block design. The stimulants produced a small increase in the reaction rate, but showed no statistically significant difference from the normal reaction rate. The sedatives and distractions produced a decrease in the reaction rate, but also did not show a statistically significant difference from the normal reaction rate.

**ABSTRACT 86-17**

THE EFFECT OF TREADMILL PROTOCOL UPON LACTATE, VENTILATORY, AND TEMPERATURE THRESHOLDS IN MAN. John A. Pellegrino and Andrew C. Browe, Indiana University of PA.

The effects of varying the treadmill protocol were studied in several subjects. Each subject performed three graded exercise tests (GXT) to exhaustion. During each GXT ventilation (Ve), oxygen consumption (VO2), rectal temperature (Tr), blood lactate, and blood pH were recorded each minute. Ventilatory and temperature thresholds were obtained using the initial point of non-linearity from a multiple linear regression of the Ve vs. VO2 and Tr vs. VO2. Lactate thresholds were determined as the VO2 at a blood lactate of 2 mM. Using the blocked ANOVA, there was no significant difference between Ventilatory, Temperature, and
Lactate thresholds between each protocol. It is concluded that varying the protocol had no significant effect upon the thresholds when the exercise increment is fixed at 3 minutes.

**ABSTRACT 86-18**

EFFECT OF BODY POSITION ON CONTRACTILITY OF THE UPPER URINARY TRACT IN SYRIAN HAMSTERS. Patricia A. Johansen, Millersville University of PA.

Evidence suggests that contractions of the upper urinary tract alter renal function. This study examined the effect of body position on upper urinary tract contractions in anesthetized (Inactin, 150 mg/kg body wt.; intraperitoneal) female hamsters (80-160g). Contractions of the upper urinary tract were monitored using a fiber optic light system. Animals served as their own controls; data were collected and compared during initial horizontal, head down (7 degree tilt), and horizontal recovery periods (approximately 30 min/period). Preliminary results indicate that head down tilt increases the variability of contractions, but does not alter the contraction rate.

**ABSTRACT 86-19**


Two eye size mutations (lobe and eyeless) in *Drosophila melanogaster*, differ from wild type in that both of the mutations are darker in eye color. A rapid and effective chromatographic technique for the separation of pteridines (red pigments) was used to compare the mutations with wild type flies. The most noticeable difference in the pteridines between the 2 mutations and wild type was that wild type contained more of the blue fluorescence 2-amino-4 hydroxypteridines, with lobe and eyeless having the same reduced amount. This relationship was also true for the greenish-blue fluorescence xanthopterin while all 3 differed in the blue fluorescence biopterin. Biopterin was present in wild type, very faint in lobe, and absent in eyeless. Extraction of the red and brown pigments from the eyes, along with photometric measurements, revealed considerable more red pigment in wild type than in either of the mutations. The same was true of the brown pigment, but to a lesser extent. The difference in observed eye color between wild type and lobe and eyeless can be explained by the ratio of red to brown pigment in each of the eye types.

**ABSTRACT 86-20**

A STUDY OF HANDEDNESS AND REGENERATION IN FIDDLER CRABS, *Uga Pugilator*. Michael J. Harman, Edinboro University of PA.
The following research is in progress and, therefore, without conclusive results. Presented are the questions, experiments, and preliminary results. A few studies have concluded that the handedness in permanent after a certain period of growth. Preliminary results of this investigation contradict this.

ABSTRACT 86-21

BROOD DESERTION IN THE BIPARENTAL SPECIES, Cichlasoma nigrofasciatum (Pisces: Cichlidae). Karen J. Bird and Allan Miller, California University of PA.

Trivers’ parental investment theory predicts that brood desertion in biparental species would be more likely in males because of their lower cumulative parental investment. Brood size and past investment are 2 factors that would affect brood desertion. The aquarium tanks contained either 3 males and 1 female or 3 females and 1 male. One parent was removed 3 days or 7 days after spawning. The paternal parent was removed in the 3-male tank and the maternal parent in the 3-female tank. The maternal parent remained with the brood significantly longer than the paternal parent (P<0.05). A female would abort the brood only after being displaced by a larger dominant male. The displaced females did not form a pair bond with the dominant male. The paternal parent always spawned with the dominant female within 3 days after brood desertion. It took the paternal parent significantly longer to desert the brood when the maternal parent was removed 7 days after spawning than at 3 days (P<0.05). Thus, past investment was a significant factor.

ABSTRACT 86-22

SPAWNING SITE SELECTION IN Cichlasoma nigrofasciatum (Pisces: Cichlidae). Michael E. Bennett and Allan Miller, California University of PA.

The results from a previous experiment on mate choice in C. nigrofasciatum showed intrasexual competition between females. We hypothesized that female-female competition evolved because females compete in order to gain access to high quality spawning sites. Three individuals of the same sex were introduced into an aquarium at the same time. Once dominance was established, a member of the opposite sex was introduced. Dominant females had a significantly greater frequency of occurrence in the ideal spawning microhabitat than the subordinate females (P=0.05). Similar results were found for the dominant males. Dominant males had a significantly greater frequency of occurrence in the ideal spawning site after the female was introduced (P<0.05). Conversely, the subordinate males occurred significantly less frequently in the ideal site after the female was introduced (P<0.05). It appears that both sexes are involved in choosing and defending the spawning site.
ABSTRACT 86-23

AN IMPROVED SELECTIVE MEDIUM FOR THE ISOLATION OF SPECIES OF CYLINDROCLADIUM. Vicki L. Raffle and Barry B. Hunter, California University of PA.

Pathenogenic species of Cylindrocladium are soil-borne fungi that produce disease in a variety of economic plants. Their primary propagules are resistant structures called microsclerotia. These fungi can be identified qualitatively utilizing a geranium leaf-baiting technique developed by Hunter and associates. A quantitative procedure, wet sieving extraction and a selective medium, has been developed to determine soil densities of Cylindrocladium. The major problem of the procedure is that other fungi are commonly recovered. The objectives were (1) to determine the genera of fungi found in association with Cylindrocladium and (2) to develop a selective medium which has few contaminating fungi, yet doesn’t inhibit Cylindrocladium, especially C. scoparium. The media consisted of a control and a treatment. The control was a glucose-lima-bean-rose bengal agar (GLRBA) (100:23:0.5) and the treatment was GLRBA amended with 20, 40, 60, or 100 ppm cycloheximide. Results at present indicate the control medium is superior.

ABSTRACT 86-24

EVALUATION OF THE AEROBIC CAPACITY OF STUDENTS ENROLLED IN A COLLEGE FITNESS AND WELLNESS COURSE. Karen Hoffman, William Sproule, and Cynthia Surmacz, Bloomsburg University of PA.

The changes in aerobic capacity of 19 students enrolled in a fitness and wellness course at Bloomsburg University were evaluated before and after an 8 week exercise program. Maximal oxygen consumption (VO2 max) was measured using the Astrand bicycle ergometer test. These results were correlated with information from a student activity questionnaire and a log of resting heart rates. The mean VO2 max of the entire class improved 8 percent as predicted by the American College of Sports Medicine. A statistically significant decline in resting heart rate was achieved (x = 64, pre-test; x = 55, post-test; p<0.05).