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WHEN NUT BURIAL AREAS
GRAY SQUIRRELS. D.
Univ., Al.
by in a 3.24 hectare
vealed a stable resident
adult gray squirrels,
males with a 2:3 ratio of
. During breeding sea-
t males entered the
he ratio to 1:1. These
een shown to defend nut
A) which occupy <25% of
home range. This study
persal of young individ-
ism of population regu-
f aggressive encounters
ounters, within and
subgroups, were
fall seasons. Under
ion densities, the
ive encounters was
her within NBA as
remainder of the home
essive individuals were
subgroups as a result
rs. Thus, increased
ctions centering on NBA
to dispersal of
ting in a stable
Financial assistance
Zoology-Wildlife,
is greatly

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CHANGES IN FORCE ASSOCIATED WITH WEB
REDUCTION IN THE SPIDER FAMILY ULOBORIDAE.
B.P. Opell. Virginia Tech, Blacksburg.
The purpose of this study is to
determine if changes in strength
accompany the altered monitoring tactics
required by reduced webs. It compares
the resting and maximum forces expressed
by spiders as they hung from a thread
spun between a glass needle and fixed
support of a strain gauge. Regression
analyses of carapace length and spider
weight against the force expressed by a
developmental series of each species show
that the triangle-web spider Hyptiotes
cavatus exerts more force than the
orb-weaver Uloborus glomosus which, in
turn, exerts more force than members of
the single-line-web genus Miagrammopes.
These results are consistent with the
behaviors these spiders use to monitor
and operate each web type. Orb-weavers
hang beneath the hubs of their horizontal
webs, whereas Hyptiotes cavatus monitors
and tenses the four radii of its vertical
web via a single apex thread. Miagrammopes
species spin a still more reduced web
consisting of only a few threads and
operate this web by jerking forcefully
only the sticky thread that has caught a
prey. National Science Foundation grant
BSR-8407979 supported this research.

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GROWTH AND MOLTING OF GRASS SHRIMP,
PALAEMONETES FUGIO, AS AFFECTED BY THE
PARASITIC ISOPOD, PROBOPYRUS PANDALICOLA.
M. Moore and G. Anderson. Univ. of
Southern Mississippi, Hattiesburg.
Total lengths, growth rates and molt
periods of laboratory reared Palaemonetes
fugio experimentally infested with one or
two parasites, Probopyrus pandalicola,
were compared with values for uninfested
shrimp. Preliminary analyses of results
of comparisons made between uniform age
classes indicate that although molt peri-
ods of singly infested shrimp were longer
than for both doubly infested and control
shrimp, growth rates and sizes of singly
infested hosts were generally greater
than for shrimp in the other two groups.
Following parasite reproduction, (ca. day
50), molt period of hosts infested with
two parasites (a sexually mature pair),
lengthens dramatically, from 5.55 ± 0.63
days to 7.55 ± 0.69 days.

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COMMUNITY STRUCTURE IN
A STREAM. T.M. SHORT and
of Kentucky, Lexington.
anges in structural and
characteristics of macroinver-
s were investigated in
oil-well brine in
Salinity concentrations
of stream ranged
100-1000 mg/l. Lotic regions
with salinity greater than 400 mg/l
were colonized exclusively by larvae of
Ephedra sp. and
other rare
fauna were rare
with salt concentra-
tions >1000 mg/l; whereas, at concen-
trations <1000 mg/l species
density increased linearly with decreasing
salinity. However, at
salinities of 15-30 mg/l, density
of benthic faunas remained depressed,
density patterns were similar to undis-
turbed streams. Preliminary studies sug-
gested that the composition of benthic fauna
was related to high salinity
regions of osmoregulatory
regions of low salin-
ity and density patterns
were influenced by increased
salinized drift.

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COMMON FLOUR BEETLE CONTROL BY AN OXIDIZ-
ING AGENT. William E. Oakley, Jr.* and
Gerhard W. Kelms, East Carolina Univer-
sity, Greenville, N.C.
Tribolium confusum, the confused flour
beetle, was used as a model to test the
insecticidal potential of benzoyl perox-
ide, an oxidizing agent used to bleach
flour. A known chitin synthesis inhibitor
diflubenzuron, which has a chemical struc-
ture similar to benzoyl peroxide, was
used as a control. Flour was treated with
each benzoyl derivative ranging from 0.01
to 100 ppm and progressive developmental
stages of T. confusum were exposed to the
treated flour for a thirty day period at
27°C and 60% relative humidity. Results
indicated that egg laying decreased, num-
ber of larval stages decreased but the
time within each larval stage increased,
larval weight decreased, and larval and
adult mortality rates increased. Measure-
ments of chitin dry weight showed a drop
in overall chitin deposition. Polyacryla-
mide gel electrophoresis indicated a drop
in total protein concentration in benzoyl
peroxide treated beetles. Both treatments
had similar effects. Thus, this prelimin-
ary data suggests a possible common
action in controlling T. confusum by in-
terfering with chitin synthesis.

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GRABABILITY OR GRIPABILITY: SELECTION OF
A MODE OF GLOCHIDIAL ATTACHMENT. M.A.
Hoggarth* and A.S. Gaunt. The Ohio State
Univ., Columbus.

Glochidia are the minute parasitic
larvae of the Unionidae. Although their
size and shape vary considerably, they all
possess the singular function of securing
attachment to a host. In effect these
larvae act as third-class levers in which
the valves form the lever arms and the
single adductor muscle produces the force.
We determined that a majority of the
glochidia examined have a mode of
attachment that emphasized area of sweep
during valve adduction. These glochidia
possessed long resistance arms, short
force arms and small diameter adductor
muscles. Other glochidia were found to
possess a mode of attachment that
emphasized strength of valve adduction.
These larvae had short resistance arms,
long force arms and large diameter
adductor muscles. This study suggests
that the mode of attachment, whether for
grabability or gripability involves a
number of trade-offs (valve gape, speed
of valve closure, strength of valve
adduction and amount of host tissue
caught) and that the solution to the
problem of grabability or gripability
has produced convergence in valve shape
and in the size and shape of the muscle.

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SYMBIOTIC MITES BEHAVIORALLY DISCRIMINATE HOST FROM NON-HOST MUSSELS. R.V. Dimock, Jr. Wake Forest Univ., Winston-Salem, NC.

The water mite *Unionicola formosa*, a common symbiont of eastern North American anodontine mussels, occurs primarily with *Anodonta cataraeta* at high latitudes and with *A. imbecillis* in the southeast. However, even sympatric populations of these congeneric mussels often harbor vastly different symbiont populations, with 0-80 mites/mussel. Furthermore, the mites exhibit population-specific behavioral responses to mussels. Adults preferentially aggregate on tissues isolated only from their respective host species; whereas larval mites fail to discriminate in a behavioral assay. Adult mites become negatively phototactic in effluent from the mantle cavity of only their respective host species. While 'conditioning' during ontogeny may be reflected in the behavior of adult mites, adults readily leave the mantle cavity of non-host mussels upon transferral thereto.

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EVIDENCE OF SPERM CAPACITATION IN *LITTORINA* J.A. Buckland-Nicks and F.S. Chia. University of Alberta, Edmonton, Canada.

The phenomenon of sperm capacitation in Mollusca remains unexplained. In most gastropods sperm are stored prior to fertilization in a storage organ. Previous attempts to achieve fertilization of ripe eggs taken from the ovary, using stored sperm, have failed. During spawning in *Littorina sitkana*, sperm are expelled from the seminal receptacle through a small duct that connects with the oviduct. We have discovered a tiny gland that surrounds this duct and empties complex secretions into it. Viable sperm must swim through these secretions in order to reach and fertilize the eggs. In preliminary experiments we achieved *in vitro* fertilization of unspawned ripe eggs, only by premixing sperm from the seminal receptacle with the homogenate of this gland, here termed the "capacitating gland". Some of these sperm were mixed with Hoechst's 33342 dye and examined under UV light. They had undergone a change in nuclear morphology in which the DNA had become spiralled at the anterior end. In these experiments virtually all eggs released two polar bodies, but fertilization was confirmed by the occurrence of polar lobe extrusion followed by cleavage. We suggest that secretions from the "capacitating gland" prepare sperm for fertilization during their passage from the seminal receptacle. (Supported by an NSERC of Canada grant to F.S.C.)

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SETTLEMENT OF MARINE MACROINVERTEBRATE LARVAE ON CHEMICALLY DEFINED SURFACES. D. Pletschhof, I. Hooper,* and A. Schmidt*. Duke University Marine Laboratory, Beaufort.

We studied the relationship between surface chemistry and settlement of larvae of barnacles, *Balanus amphitrite* and bryozoans, *Bugula neritina*. Previous studies demonstrate barnacle larvae settle in high percentage on glass surfaces where bryozoan larvae do not. Surface modifications were via silanization technology on muffled glass vials. Surfaces tested were hydrophobic to hydrophilic, highly positive to highly negative, and include amino acids, proteins, and sugars. Both types of larvae show marked responses to surface chemistry. Barnacle larvae settled in highest percentage on hydrophilic surfaces and in lowest on hydrophobic surfaces. Bryozoan larvae settled in highest percentage on hydrophobic surfaces and in lowest on hydrophilic surfaces. Surface charge was not a determining factor with either larval organism. The only surface both larval types settled in high percentage was cytochrome c, a positively-charged hydrophilic protein. Tests will be done in field conditions to see if this level of surface chemistry plays a role in settlement in the environment. Supported by ONR contract N00014-86-K-0261.

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SALINITY EFFECTS ON THE SURVIVAL AND DEVELOPMENTAL RATE OF THE SEA URCHINS, *STRONGYLOCENTROTUS DROEBACHIENSIS* AND *S. PALLIDUS*. R.A. Roller and W.E. Stickle. Louisiana State University, Baton Rouge.

Tolerance and developmental rates of the larvae of *Strongylocentrotus droebachiensis* and *S. pallidus* were determined after acclimation of adult urchins to eight salinity treatments. Adult urchins were stepwise acclimated (5°/oos per day) to 30, 27.5, 25, 22.5, 20, 15, 12.5, & 10°/oos and held for one week before spawning. Developmental rates varied directly with salinity for both species. Low salinity acclimation of adults did not enhance the survival of embryos or larvae (ANOVA). Embryonic survival decreased with decreasing salinity. Coelomic cavity lactic acid levels varied indirectly with salinity for adult urchins. *S. pallidus* larvae are stenohaline when compared to larvae of *S. droebachiensis*. (Supported by grants from Sigma Xi and the Petroleum Refiners Environmental Council of Louisiana).