ZATION OF
CAN IC MATRICES
NIAN LEPTOGORGIA
. Kinglsey, T.
Univ. of South
niv. of North

luble organic
rom calcareous
n Leptogorgia
es are considered
s in spicule
ntibodies were
uble matrix, and
prepared against
mice. Indirect
showed that
f the matrices
ule vacuoles of
ing immunogold
he ultrastructural
ionship between
e matrix
for the first
rix was present
ron dense fibrous
matrix was
ral regions of

806

PLASTICITY IN NET CONSTRUCTION BY HYDROPSYCHID CADDISFLIES. C. Loudon and D.N. Alstad*. U. of Minnesota, Minneapolis.

Aquatic larvae of the caddisfly family Hydropsychidae spin silken nets with which they capture particles from the stream water. Characterization of phenotypic plasticity in net construction is critical to any model linking net function with caddisfly biogeography. Nets were collected from larvae (Hydropsyche and Cheumatopsyche species) in the laboratory to determine the plasticity of net architecture in response to ambient flow conditions. The mesh sizes spun by the same individual in different flow conditions in a flowtank were measured by projecting the net image onto a digitizer.

Net morphology was invariant. Individual larvae spun the same mesh sizes over a flow range of 5 cm/s to 50 cm/s. Therefore, the general field pattern of a correlation between mesh size and local flow conditions is not due to variation at the individual level.

807

INFLUENCE OF BODY SIZE, POPULATION DENSITY AND AMBIENT TEMPERATURE IN THE MATING PATTERNS OF A SOLITARY BEE. F. K. Larsson, Uppsala Univ., Sweden.

The mating patterns of the ground-nesting bee Colletes cunicularius L. (Colletidae) was studied during spring-time 1985 and 1986 in southern Sweden. Mean body size of mating males and females was different between years, as was population density. Degree of homogamy in mating pairs correlated positively with the number of interacting males in the population. In 1986 body size of emerging females and mating males was negatively correlated to ground temperatures. Heavy males were more successful to mate in cold weather, when large females were more abundant. In this way ambient temperature significantly affected mating success of differently sized and shaped males. Thus, individual variation in thermoregulatory capacity is supposed to be an important aspect of male mating success in this early spring species.

The study was performed together with J. Tengö, Ecological Research Station of Uppsala Univ., Ölands Skogsby, Sweden.

808

COMPARISON OF EMBRYO PACKING INTO GILL BROOD CHAMBERS BY TWO UNIONID SPECIES. P.E. Richard*, and H. Silverman. Louisiana State Univ., Baton Rouge.

Anodonta grandis and Ligumia subrostrata both use lateral gills for brooding embryos, the latter using only the posterior portion. In both species ^{45}Ca labeling studies indicate that brood chambers filled with embryos are isolated from mantle cavity water flow. In A. grandis the original water channel is split into a brood chamber and two secondary water channels isolating water flow. Individual chambers are packed with paired rows of embryos which occupy the entire width of the chamber. Septal wall epithelium contacts each embryo. L. subrostrata does not develop secondary water channels during brooding. Brood chamber isolation is confirmed by allowing methylene-blue containing pondwater to be circulated into the gill for 24 hr. Non-brooding water channels are stained while embryo-filled brood chambers are unstained. Blockage of circulation is by basal swelling of the septa. Also while water canals lead to these chambers, the ostia of these canals are likely closed. Embryos are packed in multiple rows across the width of single chambers; each embryo is not in contact with a septal wall.

Supported by NSF 8518221 and 8701504.

809

MORPHOLOGY OF THE PHYLLOBRANCHIATE GILLS OF A EURYHALINE CRAB. M. J. Cavey and G. M. Curtis*. Univ. of Calgary, Alberta, Canada.

The gills of Carcinus maenas have been examined by light microscopy and transmission and scanning electron microscopy. Each gill plate is bounded by a multilayered, chitinous cuticle and served by afferent and efferent blood vessels. A continuous epithelium, consisting exclusively of pillar cells, lines the interior of the plate. The apical surfaces of the pillar cells contact the cuticular matrix, and slender cellular stalks project across the vascular space. The only marker of the boundary of the vascular space is the basal lamina along the undersurfaces and around the stalks of the pillar cells. An electron-dense epicuticle rests on the cuticular matrix and forms the external surface of the gill plate. Relatively little surface area of the epicuticle is, however, directly exposed to the environment. The epicuticle is largely obscured by two populations of adherent bacteria. The bacterial distributions have been analyzed with respect to the proximal and distal surfaces of adjoining gill plates. Distributional similarities are apparent, and they may relate to the arrangement of the pillar cells on the internal surface of the cuticle.

S MEDIATED BY
. Baron.
a, Berkeley.
orms of selected
les were modelled
ing conditions
alysis. Among
s modelled were
es, self weight,
rated by adhesive
ea urchins
l pressure bear
ces on their
positively
of growth in
me loads generate
on the oral
ures; these
reas of
rvature in living
regimes in
ernal pressure,
distributions.
of the finite
suggests that
luences how a
ributed over an
. Thus, if the
een stress
h patterns are
the shape of a
ld predictably
ges of form.