

TCS Student Winners Chili 2007

The Crustacean Society (TCS) is pleased to announce the winners of the Best Student Paper and Poster Competition held during the Mid-Year Meeting of TCS, October 14-17, 2007, in La Serena-Coquimbo, Chile. There were 33 competitors and the quality of entries was very good.

The Best Student Oral Presentation Award was presented to **Paula J. Rodgers** (University of Maryland, USA) for her talk entitled, “A comparison of sperm storage and mating strategies in brachyurans”.

The Best Student Poster Awards were presented to **Romina B. Ituarte** (Universidad del Mar del Plata, Argentina) for her poster entitled, “Activity of Na^+ - K^+ -ATPase in a “freshwater shrimp”, *Palaemonetes argentinus* (Caridea, Palaemonidae): ontogenetic changes and effects of salinity” (with co-authors A. López-Mañanes, E. D. Spivak & K. Anger) and **Alba Marina Cobo-Viveros** (Universidad del Valle, Cali, Colombia) for her poster entitled “Bioeroding crustaceans in a rocky cliff in the Colombian Pacific” (with co-authors J. R. Cantera-Kintz & J. F. Lazarus-Agudelo).

Each award consists of a certificate, US\$100 cash, and a one-year membership in The Crustacean Society, including subscription to *The Journal of Crustacean Biology*. TCS thanks those members who served as judges and all student participants.

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A comparison of sperm storage and mating strategies in brachyurans

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The ability for females to store sperm across broods should drastically alter optimal male mating strategies. Males likely increase the amount of sperm allocated to a female at mating if she can store sperm across broods. These patterns of sperm storage and allocation can be constrained by phylogeny, and likely correspond with variation in mating strategies. Brachyuran crabs can have one of three mating strategies, female centered (males compete directly for access to females), resource centered (males defend valuable resources used by females), or encounter rate competition (males defend neither females nor resources). Sperm storage and increased male sperm allocation are predicted for a female centered strategy. Mating experiments are currently being conducted on six species of crabs from three superfamilies and with varying mating strategies to determine the average amount of sperm allocated per species, and across superfamilies. One side of the male gonopod is clipped, to prevent sperm transfer from one side of their reproductive tract, and male sperm allocation calculated for each species by counting the number of sperm in the clipped versus the non-clipped recipient spermathecae of the

female after mating. Additionally, mating pairs of two species of fiddler crabs will be collected from the field in Panama during the summer of 2007 and the percent sperm allocated will be calculated. Preliminary data indicate there is a large degree of variation across species in copulation duration and the amount of sperm allocated. Additionally, from a survey of reproductive traits of ten brachyuran species, there is a large degree of variation at the species level in male sperm number and in sperm-egg ratios. This variation is likely explained by differences in their mating strategies and ecologies.

Activity of Na⁺-K⁺-ATPase in a “freshwater shrimp”, *Palaemonetes argentinus* (Caridea, Palaemonidae): ontogenetic changes and effects of salinity

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Embryos, larvae and adults of the shrimp *Palaemonetes argentinus* tolerate a wide range of salinities, but osmoregulatory capacities have been demonstrated only in post-embryonic stages. Like in many other crustaceans, little is known about osmoregulation during the embryonic phase. In the present investigation, ontogenetic changes in the activity of one of the key enzymes involved in the osmoregulation of crustaceans, Na⁺-K⁺-ATPase, were studied in the following life-history stages: (1) in embryos at an early (soon after egg laying; SI), an intermediate (SII), and a late stage of embryonic development (near larval hatching, SIII); (2) after hatching (Zoea-I stage, ZI); (3) in adult shrimps; (4) in isolated gill tissues from adults. All stages were abruptly transferred to 1, 15 and 25 PSU, and Na⁺-K⁺-ATPase activity was determined after 24 (embryos, larvae) or 48 hs (adults, gill tissues). Na⁺-K⁺-ATPase activity was lowest in SI and SII, maximum in SIII, and intermediate values were measured in the ZI and in adults. Increasing Na⁺-K⁺-ATPase activity during late embryonic development, with highest levels just prior to hatching (SIII), suggest that the osmoregulatory functions of *P. argentinus* are expressed during a late embryonic stage. Comparing different salinity treatments, late embryonic Na⁺-K⁺-ATPase activity (in SIII) was always higher at 15 PSU than at 1 and 25 PSU. By contrast, the enzyme activity in isolated gill tissues was higher at both 15 and 25 PSU than at 1 PSU. Changes in Na⁺-K⁺-ATPase activity under hyperosmotic conditions indicate that gill tissue are involved in the osmoregulation of adult shrimps. As these tissues are absent in embryonic and early larval stages, ion-transporting cells must be located elsewhere during these early ontogenetic phases.

Bioeroding crustaceans in a rocky cliff in the Colombian Pacific

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Abundance and distribution of bioeroding crustaceans (grazers and borers) was studied in a rocky cliff in the Colombian Pacific. Six species of grazers and four of borers were found. In the grazer group, belonging to the order Decapoda, *Pachygrapsus transversus*

was the most numerous (46%), followed by *Ligia baudiniana* (30%) and *Eurypanopeus transversus* (19%). *P. transversus* was found in all the heights of the cliff, differing from *Goniopsis pulchra*, *Panopeus purpureus* and *Eurytium affine*, which were less numerous and restricted to low heights. *E. transversus* was found until medium heights and *L. baudiniana* was only collected in the splash zone. The borer group was conformed by the orders Amphipoda (2 species) and Decapoda (2 species). The decapods *Alpheus bouvieri* and *Upogebia tenuipollex* were numerous (52% and 45% respectively), the amphipods *Hyale* sp. and Corophiidae sp.1 were rare. These species were restricted to the lower heights of the cliff, which remain more time submerged. The importance of the bioerosion process lies in that, along with others like waves, wind, sand abrasion, chemical wear down due to terrestrial lixiviates or water nutrients, causes a continuous retraction of the rocks in the lower parts of the cliffs. Bivalves and sipunculids have been recognized as important organisms in the process, weakening the rocks by chemical and mechanical means. In this work the crustacean role as bioeroders is highlighted; they weaken the rock by “chemical glands” (some *Upogebia* species), and by mechanical means using their chelae (alpheids and upogebids).