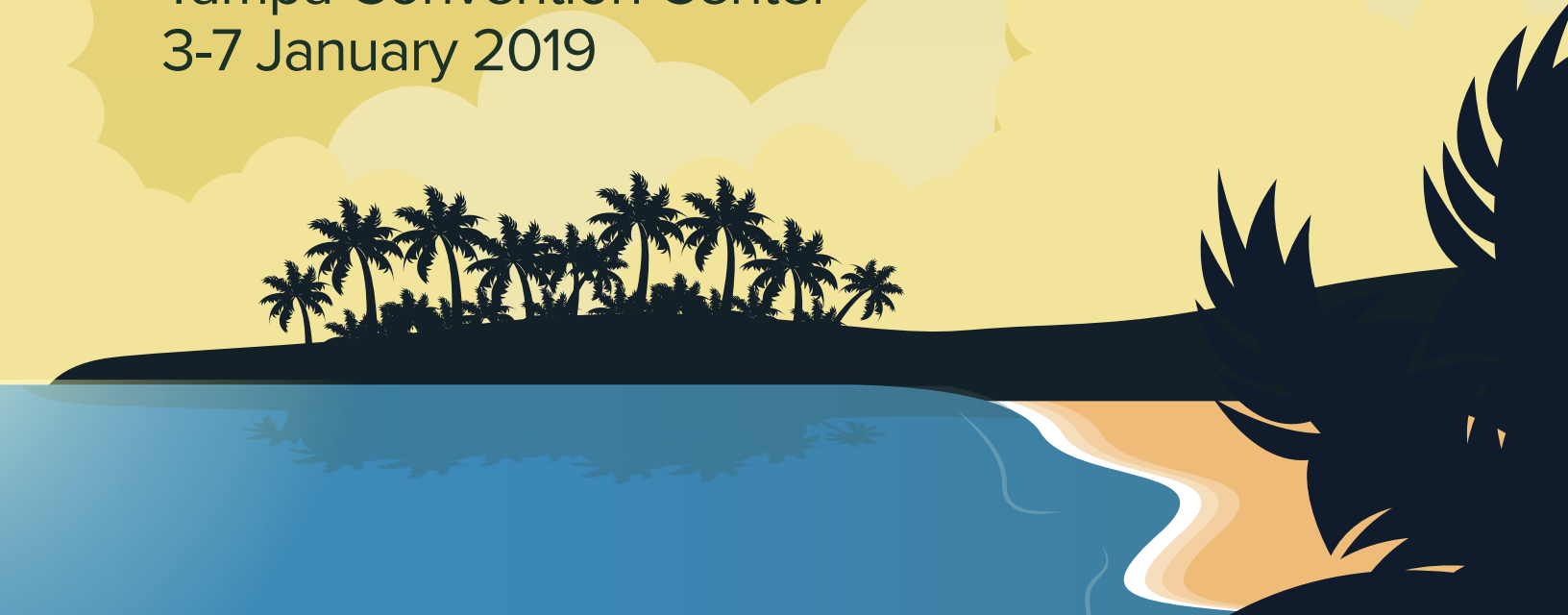
The Society for Integrative and Comparative Biology

with the
American Microscopical Society
Animal Behavior Society
The Crustacean Society

FINAL PROGRAM

Tampa Marriott Waterside and
Tampa Convention Center
3-7 January 2019



8:15 am	**38-2**	*Taverne M, Fabre AC, Dutel H, Tadic Z, Fagan M, Herrel A; Muséum National d'Histoire Naturelle, Natural History Museum, School of Engineering, Hull, Zagreb*	Phenotypic diversification in insular populations of *Podarcis* lizards: how do diet and bite force drive variation in skull morphology?
8:30 am	**38-3**	*Gusmão LC, Grajales A, Rodríguez E; American Museum of Natural History, Universidade de los Andes*	Sea Anemones Through X-rays: Utility of Micro-computed Tomography (Micro-CT) for the taxonomy and systematics of the group
8:45 am	**38-4**	*Herrel A, Orpel J, Padilla P, Courant J, Rebelo R; UMR719 CNRS/MNHN, Faculdade de Ciências da Universidade de Lisboa*	Do invasive populations of Xenopus laevis living in different environments differ in morphology?
9:00 am	**38-5**	*Perez-Guerra D, Garduño-Paz MV, Mendez-Sanchez JF, Adams CE; Midwestern State University, Universidad Autónoma del Estado de México, Glasgow University*	Morphological plasticity in *Girardinichthys multiradiatus*: a high-altitude fish endemic to Upper Lerma, Mexico
9:15 am	**38-6**	*Conith AJ, Lam DT, Albertson RC; Univ of Massachusetts Amherst*	Muscle-Induced Loading as a Major Source of Variation in Craniofacial Skeletal Shape
9:30 am	**38-7**	*Zelditch ML, Li J, Swiderski DL; Univ of Michigan, Univ of Colorado*	Stasis of Functionally Versatile Specialists
9:45 am		**Coffee Break**	**Exhibit Hall**

8:00 AM – 9:15 AM Session 39 — Room 5 & 6

Host Pathogen Interactions

Chair: Laura Zimmerman

8:00 am	**39-1**	*Clissold FJ, Woodman JD, Wilson K, Simpson SJ; The University of Sydney, Department of Agriculture and Water Resources, Lancaster University*	The interactive impact of temperature and nutrition on disease resistance
8:15 am	**39-2**	*Fassbinder-Orth C, Hughes S, Sabotin R, Push G, Tran T; Creighton University*	Honey Bees in Peril: An Investigation of Honey Bee Viral Infection Dynamics
8:30 am	**39-3**	*Gajewski ZJ, Stevenson LA, Pike D, Roznik EA, Johnson L; Virginia Tech, Northern Australia Quarantine Strategy, Rhodes College, Memphis Zoo*	Varying temperature effects on the growth of the amphibian chytrid fungus
8:45 am	**39-5**	*Balenger SL; Univ of Mississippi*	Costs associated with *Mycoplasma gallisepticum* infection of Eastern Bluebirds (*Sialia sialis*)
9:00 am	**39-6**	*Gray WA, Sunnucks E, Huber T, Zimmerman LM*; Millikin University, Towson University*	Natural Antibody Abundance But Not Avidity Predicts *Salmonella* Infection in a Reptile
9:15 am		**Coffee Break**	**Exhibit Hall**

8:00 AM – 10:00 AM Session 40 — Room 13

Social Behavior and Predator-Prey Interactions

Chair: Roslyn Dakin

8:00 am	**40-1**	*Dakin R, Ryder TB; Smithsonian Institution*	Dynamic Network Partnerships and Social Contagion Drive Cooperation
8:15 am	**40-2**	*Philson CS, Foltz SL, Davis JE; Radford University*	Plasticity in Songbird's Environment-Behavior Interactions at a Supplemental Feeder
8:30 am	**40-3**	*Hill GM, Trager M, Lucky A, Daniels JC; University of Florida, Gainesville, US Forest Service, National Forests*	Uncovering the benefits of an ant-butterfly mutualism in the Florida Keys
8:45 am	**40-4**	*Ferguson SM, Barr JI, Bateman PW; Kalamazoo College, Curtin University*	Silver gull flight initiation distance varies with human predictability, not habituation
9:00 am	**40-5**	*Rogers DC; University of Kansas*	Predatory Anostracans Alter Growth of Prey Anostracans (Crustacea: Branchiopoda)
9:15 am	**40-6**	*McKee AA, McHenry MJ; Univ of California, Irvine*	How zebrafish use visual cues to evade predation
9:30 am	**40-7**	*Peterson AN, McHenry MJ; Univ of California, Irvine*	The Coupled Strategies of Lionfish and Prey Fish

P3-177 TASSIA, MG*; HALANYCH, KM; Auburn University, Auburn, AL; *mgt0007@auburn.edu*

Evolution of pattern-recognition receptor pathways and the identification of novel domain architectures in Deuterostomia

Immunity fundamentally relies on the host's capacity to distinguish unwanted, potentially pathogenic microbes from a slurry of endogenous biological materials and other functionally inert molecules saturating the environment. To combat this colossal task, animals utilize various pattern-recognition receptors (PRRs) to identify and initiate immune responses against individual groups of pathogens. The patterns PRRs recognize, such as lipopolysaccharide (found in Gram-positive bacteria) or dsRNA (found in viruses), are often essential to the structure/biology of the potentially pathogenic agent on/in which they are found, and thus remain consistent/present over evolutionary time. Moreover, individual PRR proteins often only recognize a single classification of molecular pattern, like Gram-positive cell wall components or viral nucleotide polymers, suggesting an increase in the number of PRRs encoded in a single genome may represent increased immune capacity against a larger breadth of pathogens. In this study, we investigate the molecular conservation of the Nod-like receptors, Rig-1-like receptors, and Toll-like receptor PRR pathways among deuterostomes - a clade encompassing Echinodermata (e.g., sea stars, urchins, and sea cucumbers), Hemichordata (e.g., acorn worms and pterobranchs), and Chordata (e.g., sea squirts, lancelets, and vertebrates). In addition to findings on the ancestral repertoire of these pathways in the context of Deuterostomia and its composite clades, we will discuss novel domain architectures in close association with these core PRR pathways, and their potential role in immunity.

38-2 TAVERNE, M*; FABRE, AC; DUTEL, H; TADIC, Z; FAGAN, M; HERREL, A; Muséum National d'Histoire Naturelle, Paris, Natural History Museum, London, School of Engineering, Hull, Department of Biology, Zagreb, School of Engineering, Hull; *maxime.taverne@mnhn.fr*

Phenotypic diversification in insular populations of Podarcis lizards: how do diet and bite force drive variation in skull morphology?

Changes in the environment drive diversification in morphology as survival is intricately related to the constraints associated with the new habitats. Islands are strong selective environments since they provide only a limited amount and diversity of resources, thus increasing the intensity of competition compared to mainland populations. Previous studies have highlighted that changes in diet are associated with changes in skull geometry and bite force in insular lizards. However, little is known about the functional consequences of skull shape differences in association with access to food resources on islands. The present study explores whether insular lizards have converged on similar morphologies in relation to diet and variation in bite force. The heads of 140 individuals across two closely related species of *Podarcis* lizards from 16 islands across the Adriatic were CT-scanned, 3D surfaces of both skull and mandible were extracted and compared using 3D geometric morphometrics. Maximal bite force was measured for each individual and food items were identified after stomach flushing. We tested whether changes in diet were correlated with bite force, and whether changes in bite force were associated with variation in skull shape. We predict that higher bite forces will allow the inclusion of more plant matter and/or harder prey in the diet. Moreover, we predict changes in skull shape associated with higher bite forces. The present study will provide new insights on how insular environments select for different phenotypes and whether these differences are related to diet and biting performance.

P2-257 TAYLOR, ED*; SEGRE, PS; University of Florida, Stanford University; *ebonytaylornew@gmail.com*

Maximal Load Carrying Performance of Leaf-cutter Ants

Leaf-cutter ants play an important role in maintaining the biodiversity of neotropical forests by cutting and transporting leaf fragments from the canopy to their underground colonies. After cutting the leaves, ants lift the fragments overhead and carry them for long distances over well-established foraging trails. Previous studies have demonstrated that larger ants carry heavier leaves and that larger loads decrease walking speed. However, little is known about the maximum limits of load carrying ability in leaf-cutter ants, particularly in relation to the size of the self-selected fragments they carry and the excess power reserves they maintain to overcome obstacles. By incrementally adding weights to leaf fragments carried by foraging ants, we examined the relationship between body mass and maximum lifting power. As the ants reached maximum load carrying ability, their stepping pattern changed: walking speed slowed, leg stance widened, and staggering increased. Maximum load carrying ability scaled isometrically with body size and leaf-cutter ants were able to carry 7.8 times their body weight. However, larger ants chose to carry leaf fragments that represented a lower proportion of their body mass compared to smaller ants. This suggests that larger ants have the capacity to carry heavier leaves than they normally select and that the mechanism by which leaf-cutter ants choose leaf fragments to transport is not optimized for maximum foraging efficiency.

89-1 TAYLOR, HA*; PARK, NR; KAVAZIS, AN; HOOD, WR; Auburn University; *hat0008@auburn.edu*

Variation in Mitochondrial Complex Activity, Oxidative Stress, and the Unfolded Protein Response in the Brain of Mice with Region and Parity

Reproduction is associated with a significant increase in energetic demand, particularly among small female mammals. When these demands are particularly high, or the animal is under stress, the cost of reproduction can reduce future reproductive performance and longevity. An increase in reactive oxygen species (ROS) levels has been proposed to underlie this relationship. While empirical tests of this theory have been equivocal, relatively few studies have evaluated change within the brain. Prolonged exposure to excessive levels of ROS has been shown to impair cognitive ability. Further, correlations have also been found between the number of reproductive bouts a female has and the risk of developing neurological disorders. These correlations suggest there is a link between relative parity and brain damage over a lifetime. With this investigation, we compare mitochondrial complex activity, oxidative damage, antioxidants and the linked, unfolded protein response in the forebrain, midbrain, and the cerebellum of 3 groups of the of ICR lab mice. These age-matched mice include 1) a group of non-reproductive mice, 2) a group of mice that had 1 reproductive event, and 3) a group of mice that had 4 reproductive events. Preliminary data suggests that antioxidant levels vary between forebrain, midbrain, and the cerebellum, but damage and antioxidants did not vary with parity. The impact of treatment on mitochondrial function via complex activity and the unfolded protein response will be discussed.