Abstracts of talks in alphabetical order by first author

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Lacertid lizards as bioindicators of pesticide exposure and toxicity in agricultural areas

Lizards are among the least studied groups in ecotoxicology, and despite a recent increase in the number of studies, there is still a lack of knowledge regarding their response to environmental contamination. In Europe, lacertid lizards have been identified as potential model species for reptile ecotoxicology. The main question of our project was to assess if highly abundant lacertid lizards belonging to the genus *Podarcis*, could be used as bioindicator of pesticide exposure and toxicity in agricultural areas. To achieve this end, we used a three-stage tiered approach. The first tier took the form of a field survey to document both exposure and population endpoints of lacertids occurring in areas of intensive pesticide and usage and areas of negligible pesticide usage. The second tier was a mesocosm study in which naïve lizards were exposed to pesticides in a controlled experiment. Finally, the third tier included a laboratorial approach to the effects of one of the most common insecticides used worldwide, chlorpyrifos. We assessed pesticide impact using a comprehensive set of endpoints applied at different levels of biological organization, including behavioral, physiological, biochemical and histological biomarkers. The field work confirmed the difficulty of differentiation between the effect of contaminants and other (local) factors at the population level but our results suggest a difference in the metabolic activity between animals from reference and exposed locations. Animals from exposed fields seem to be in worst body conditions and in a deficitary energy balance when compared to animals from the reference locations. The results of the mesocosm study validated the correlative data obtained in the field survey. While the laboratory approach showed that environmentally relevant dosages of chlorpyrifos can affect *P. bocagei*. According to our data, P. bocagei seems to be a suitable indicator of sub-lethal exposure to pesticides.

M. Arakelyan & F. Danielyan

Syntopic populations of *Darevskia* biparental species in Armenia and Nagrono-Karabakh

Range overlap between species even at local scales is a defining trait in the biogeography of the Caucasian rock lizards of the genus *Darevskia*. Syntopy between populations of two biparental species is remarkable, especially when they are parental contributors of parthenogenetic species. The detailed analyses of such contact zones revealed that when biparental species *D. valentini* and *D. nairensis* are in syntopy, no hybrid forms arise. This is likely due to their different

reproductive periods. In contrast, the biparental *D. raddei* and *D. portschinskii* often produce hybrids, and the parthenogenetic species *D. rostombekovi* is also found in low numbers in the same sites which suggests that they are an occasional result of hybridization. Three sympatric zones between *D. raddei* and *D. portschinskii* are known for Armenia, Nagorno-Karabakh Republic (NKR) and Azerbaijan. Likely, the reproductive isolation between *D. raddei* and *D. portschinskii* is not complete which is contributing to reticular evolution. The hybridization events between syntopic *D. raddei* and *D. portschinskii* produce lizards with intermediate scalation and coloration characters when compared to allopatric populations. Among 207 lizards from Northern Armenia 59 (28.5%) *D. raddei* and 53 (25.5%) of *D. portschinskii* displayed intermediate morphology, 6 (2.86%) were parthenogenetic *D. rostombekovi* and 4 (1.93%) triploid hybrid females *D. raddei* × *D. rostombekovi*. Of 20 lizards with intermediate morphology 53 eggs and 35 young were obtained; 12 of young were similar to *D. rostombekovi* according to their external morphology. Among 143 lizards collected in another syntopic locality with *D. raddei* and *D. portschinskii* in NKR, 24 were hybrid females of uncertain morphological ascription. Among 66 *D. portschinskii* 18 individuals displayed modified morphological characters similar to *D. raddei* while among 43 *D. raddei* 14 individuals show morphologies close to *D. portschinskii*. Therefore, the successful combination of parental species with low reproductive isolation may be considered as the main factor explaining the origin of parthenogenetic species. For next steps of reticulate evolution, the combination of biparental and parthenogenetic species is required. Namely, in the sympatric zone of biparental *D. raddei* (40% of lizards) and parthenogenetic *D. rostombekovi* (35%), *D. armeniaca* (20%) and *D. dahli* (5%), triploid hybrids arise only between *D. raddei* and *D. rostombekovi* (18 hybrid males and 6 intersexes with both hemipenises and oviducts found). *D. raddei* from this locality showed pholidosis and coloration approaching *D. rostombekovi*.

E. Argaña & N. Sillero

GIS and GPS application for the study of home ranges of sympatric Iberian lizards

Few studies have analyzed spatially the home ranges of small lizards, namely in the Iberian Peninsula. We studied the home ranges of two Iberian lacertids (*Podarcis bocagei* and *P. hispanica*) in a sympatric situation. Fieldwork was performed in a small area (Moledo beach, 0.8 ha) in the North-West of Portugal, situated within an urban area, limited by buildings, stone walls and small fields of traditional agriculture. The study area is characterized by four stones walls, and a small beach area with rocks and vegetation. Both species are in strict sympatry and present high densities. We captured 76 lizards of both species, and the exact position was geo-referenced with a professional Trimble GPS (horizontal error lower than 50 cm). We collected morphological measures, as well as tissue and blood samples; we marked the lizards with colored inks and release them in the same place of capture. We followed marked and unmarked lizards during seven days, making random paths around the stone walls and the beach. By visual contact and without recapture them, we recorded lizards' positions with the GPS and collected other information such as species, sex, age, social interactions, environmental temperature, humidity, and substrate temperature. We calculated the home ranges of marked individuals with minimum convex polygons (MCP), within a Geographical Information System. We analyzed