Differences in Locomotor Activity in Two Syntopic Spadefoot Toad Species (Genus Pelobates)
Diana Székely¹, Mathieu Denoël², Paul Székely¹, Dan Cogălnicencau¹

Introduction
Stable coexistence requires competitor species to differ in their niches, and species that are too ecologically similar cannot coexist.
The spadefoot toads from Dobrudja provide a very interesting study-case: the ranges of two species of the genus overlap at the limit of their distribution ranges - southern limit for Pelobates fuscus and northern limit for P. syriacus (Cogălnicencau et al., 2013b).
Both spadefoot toad species are nocturnal, fossorial, and exploit a similar ecological niche (Cogălnicencau et al., 2013a). They both have similar size at metamorphosis, reach sexual maturity at a similar age but P. syriacus becomes significantly larger than P. fuscus.
We focused on the analysis of locomotor behaviour of the two species in search for species-specific adaptations.
Any movement carries potential costs, including energetic costs, exposure to predation and exposure to drought or other unfavorable climatic conditions. On the other hand, increased locomotor activity may be the only way to maximize access to food.

Materials and methods
The nocturnal activity of 6 adult P. fuscus and 6 P. syriacus (3 females and 3 males for each species) was monitored in a laboratory setting for a period of 30 days. The individuals were collected from Grindul Chituc, an area where the two species live in sympatry.
We used webcams to capture time-lapse photographs of the toads’ movement, which were then processed to obtain tracks for each individual (a total of 48 tracks and over 260 hours of activity), using ImageJ 1.46r software.
A measure of overall locomotor activity was derived by summing the magnitude of the displacements between pairs of consecutive images for each individual on each night of recording. These individual sums are subsequently expressed as the average distance moved in cm per minute. Independent Samples T-Test was performed using the SPSS 18 computer software package.

Results and discussion
The analysis of the tracks showed that P. fuscus individuals moved an average distance of 419.85 cm per night, at an average speed of 1.33 cm/min, while for P. syriacus individuals the average distance covered was 1070.64 cm at an average speed of 3.42 cm/min. The average activity time, considered as the time an animal spends outside the burrow every night, was 324 min for P. fuscus, compared to 339 min for P. syriacus.

Our preliminary results showed that P. syriacus was significantly more active than P. fuscus with almost 2.5 overall distance covered (t0.05 = 5.133, P < 0.001, r = 0.86 ) and more than twice the speed achieved (t0.05 = 3.274, P < 0.01, r = 0.74), but with approximately the same time spent outside burrows (t0.05 = 0.305, P > 0.5, r = 0.1).
These results suggest that the closely related Pelobates species from Dobrudja differ in patterns of foraging behaviour. P. fuscus being relatively sedentary (sit-and-wait) whereas P. syriacus is more an active (‘wildenly-foraging’) predator. We consider that the higher levels of activity in the case of P. syriacus are correlated with their larger body size compared to P. fuscus. We suggest that P. syriacus might be more adapted to the dry and unpredictable environment in Dobrudja, which might allow them to forage more actively.

Literature Cited

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