



PROGRAMME & ABSTRACTS



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Tortoise's shell—a blessing and a curse. How tortoises cope with various obstacles

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During 200 million years of evolutionary history, all chelonians are characterized by a well developed, protective shell. Conserved during major evolutionary transitions (e.g. return to the sea), shell likely provides substantial selective advantages. Conversely, heavy and rigid shell poses a set of serious motion limitations, especially in terrestrial species during displacements in rugged and complex environments. We examined how terrestrial tortoises overcome various obstacles in their natural habitat. We compared several Balkan populations of Hermann's tortoises by placing individuals (app. 1100) in three types of challenging positions to measure their performances.

Righting ability: males were more successful in righting themselves than females. Body size influenced righting abilities only in females: smaller ones were more efficient. Individuals with markedly domed carapace (increased instability) and shorter bridges (enlarging space for leg movements) were more successful to right themselves.

Boldness to cross a steep step: animals from rugged environment were more prone to jump from 50 cm high obstacle than ones from the flat habitat. Genders had similar success, but adults showed more boldness to leap off the hedge than juveniles.

Disentangling themselves from thick vegetation: residents of Mediterranean macchia displayed moderate pulling force and released themselves quickly by backwards movements. Tortoises living in herbaceous habitats moved forward, deployed strong pulling force, ripping on the substrate and were far less successful.

Individuals from different habitats, sex and age classes exhibited divergent and apparently appropriate traits and strategies to overcome each locomotory challenge. We further speculate that behavioural responses, as a response to morphological constraints, are shaped by experience. These results may have conservation value and assist in improving translocation strategies for endangered tortoise populations.