



CROATIA DISSERTATION/THESIS PROJECT

CR02 Community structure and ecology of crickets and grasshoppers in Krka National Park

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The mixed Mediterranean scrublands and forests of Krka National Park are hypothesized to support both a rich diversity and high abundance of Orthoptera (crickets and grasshoppers). The community here is already known to include some iconic and/or threatened species, such as the predatory Spiked Magician (*Saga pedo*) which is listed as globally Vulnerable by the IUCN. However, all current descriptions of Krka's Orthoptera community are based on opportunistic record-making only, and this year will be the first in which a monitoring programme will be implemented from which formal data will be gathered to determine precisely which species occur in the Park, assessments of Orthopteran community structure, and species-specific habitat associations.

Students taking this option will join an experienced entomologist and complete a series of surveys aiming to investigate the community structure and ecology of crickets and grasshoppers in the Krka National Park. Surveys will involve walking set transects at mid-morning (when intermediate temperatures coincide with peak Orthoptera activity times) in the grassland and scrub habitat surrounding the edge of the Park and completing sweep-transects with nets, during which all Orthoptera encountered will be trapped, counted, and identified to as fine a taxonomic level as possible. Captured Orthoptera will then be marked with a semi-permanent marker to allow for mark-release-recapture analysis, and then released.

Each transect completed during survey work will also be characterised via the completion of a detailed habitat survey along its length, examining factors such as height of grass swards, percentage of bush cover, slope angle, dominant plant species, and other biotic and abiotic variables. Students will then combine both their dataset on the abundance, diversity, and density of Orthoptera at each transect with habitat data to complete a robust analysis of which broad habitat types support the highest Orthoptera diversity, and which individual habitat variables exert the strongest overall influence on the community structure of Crickets and Grasshoppers. The results of these analyses can then be used to suggest managerial recommendations for the grassland and scrub habitats of Krka National Park.

Recommended Reading

- Baldi, A. & Kisbenedek, T. (1997) Orthopteran assemblages as indicators of grassland naturalness in Hungary. *Agriculture, Ecosystems, and the Environment* **66**: 121–129.
- Gardiner, T. & Hill, J. (2006) A comparison of three sampling techniques used to estimate population density and assemblage diversity of Orthoptera. *Journal of Orthoptera Research* **15**: 45–51.
- Gardiner, T., Hill, J. & Chesmore D (2005) Review of the methods frequently used to estimate the abundance of Orthoptera in grassland ecosystems. *Journal of Insect Conservation* **9**: 151–173.

- Isern-Vallverdu, J., Pedrocchi, C. & Voisin, J.F. (1993) A comparison of methods for estimating density of grasshoppers (Insecta: Orthoptera) on Alpine pasturelands. *Revue Ecology Alpine* **2**: 73–80.
- Kruess, A. & Tschardtke, T. (2002) Grazing intensity and the diversity of grasshoppers, butterflies, and trap-nesting bees and wasps. *Conservation Biology* **16**: 1570–1580.
- Siemann, E., Tilman, D. & Haarstad, J. (1999) Abundance, diversity and body size: patterns from a grassland arthropod community. *Journal of Animal Ecology* **68**: 824–835.