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## Reptile diversity associated to archaeological sites: the significance of ancient ruins for reptile conservation

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**RESUMEN:** Un hecho bien conocido es la selección de las ruinas de origen antropogénico, como por ejemplo antiguas murallas, como hábitat por los reptiles. En el presente trabajo se ha revisado la información disponible acerca de los yacimientos arqueológicos como lugares de interés para la conservación y protección de los reptiles. Sin embargo, a pesar de los múltiples ejemplos que señalan la importancia de los yacimientos arqueológicos para la conservación de los reptiles, hay pocos estudios científicos orientados a esta cuestión. Por este motivo, se propone incrementar el número de estudios sobre diversidad herpetológica centrados en los sitios arqueológicos. Por otra parte, sería conveniente implementar medidas de conservación destinadas a mantener la diversidad herpetológica dentro de los sitios arqueológicos, lo que podría tener otros efectos positivos al ser un incentivo adicional para aumentar las visitas y los ingresos de estos lugares.

It is well known that the selection of the ruins of anthropogenic origin, as ancient walls, by reptiles (Scali *et al.*, 2013). The epithet of the scientific name of wall lizard *Podarcis muralis* (Laurenti, 1768), alludes to this fact. Thus, many researchers perform reptile surveys around anthropogenic ruins (Castilla & Ali, 1997; Calderón-Mandujano *et al.*, 2008). The value of anthropogenic ruins for the conservation of biodiversity is highlighted in websites of some archaeological localities. For example, the official web site of Angkor Center for Conservation of biodiversity at the ruins of the Angkor complex (Cambodia) states “Various animals use the area as a safe haven, and several species that are usually very shy and secretive due to human persecution can be observed at close range... There is also a great diversity of reptiles and during the rainy season the ponds are teeming with frogs” (<<http://www.ac-cb-cambodia.org/en/wildguests.php>> [accessed: 15 August 2015]).

However, there are few studies analyzing the diversity of reptiles in archeological sites in relation to its environment. After an intensive bibliographic search on different sources like Web of Science and Scopus (key words: reptiles+ archeological sites, ruins or ancient buildings), we have found few papers studying the herpetofauna diversity living associated with archaeological sites (N = 5). Nevertheless, we found a large number of papers reporting archaeological records trace in fossils and bones of ancient reptiles (N = 50).

Within the few papers dealing with reptile diversity in archeological sites, Somaweera *et al.* (2001) found 47 species of reptiles at the site of Menikdena (Dambulla, Sri Lanka), an ancient monastery of 555-573 b.c. with the remains of several stone-buildings in an area of 0.16 km<sup>2</sup>. The diversity found in this archaeological site represents 31.5% of reptiles described in Sri Lanka. Márquez-Rodríguez (2014) describes the impor-

tance of the Roman archaeological site of Baelo Claudia (II B.C.) in the Natural Park of the Strait, Tarifa, Spain, for the ocellated lizard (*Timon lepidus*), and the Maya site of Tulum (VI B.C.) (Tulum, Mexico) for the common iguana (*Ctenosaura acanthura*). In summer 1977, an observation of a big individual of *T. lepidus* was recorded on the roof of the Cathedral of Málaga (ancient building, XVI century) within Malaga town (J. Mario Vargas, personal communication).

The ancient city of Kaunos modern-day Dalyan city (Muğla, Turkey) (X B.C.-XV A.D.; coordinates: 36°49'35"N / 28°37'17"E) currently represents another important archeological site. Amphibian and reptile species are distributed in the Protected Area around Köycegiz-Dalyan (Turkey), a natural area including the Mediterranean Sea shore, lakes, channels, swamp, farming land and natural biotope (Baran *et al.*, 1994). In this area, most studies concentrate on sea turtles as consequence of the importance of the Dalyan beach, a sandy beach southwestern Turkey, one of the most important nesting areas for the loggerhead turtle (*Caretta caretta*) in the Mediterranean Sea (Türkozan & Ymaz, 2008). In 2015, during a purposive sampling field survey (documented and available from the website: <<http://datab.us/kUgTasFrrVE#Field>> [accessed: 15 May 2015]) in the archaeological site of Kaunos and surrounding wet and coastal area in Dalyan, 19 reptile species were recorded, representing about 13% of the diversity of non-marine reptiles of Turkey (<<http://www.reptile-database.org/>> [accessed: 15 May 2015]).

According to Márquez-Rodríguez (2014), the availability of shelters is an important factor that can explain the richness of reptiles in archaeological sites. Moreover archaeological sites, as a tourist places, are frequently visited by hundreds of tourists and avoided for other animals such as mammals and birds, which could be potential reptile

predators. We want to foreground the importance of archaeological sites as refuges for herpetofauna. However, we highlighted there is few scientific publications and information on the diversity of reptiles species in the archaeological sites. Considering this situation, it should be necessary to increase herpetological diversity studies focused on archaeological sites. Moreover, it would be convenient to implement conservation measures aimed at maintaining herpetological diversity within archaeological sites. These conservation measures could include different actions such as banning the use of external materials in the works

for ruins restoration, avoiding seal cracks and holes in the walls by adding cement or other unneeded materials (Márquez-Rodríguez, 2014), reducing the interferences during certain periods of the life cycle (reproduction, hibernation, etc.), to preserve the natural environment of the sites. Moreover, it could be advisable the development of herpetological studies, complementary to the archaeological ones, and promoting the natural use and conservation within the archeological sites, which could positively contribute as an additional incentive to increase visits and incomes to the sustainability of the archeological sites with herpetofauna.

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## Evidencias reproductivas de *Trachemys scripta* en el suroeste de León

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El galápago de Florida (*Trachemys scripta*) es un galápago originario del sureste de Norteamérica que se distribuye también por Centroamérica hasta Colombia, Venezuela y Brasil (Pleguezuelos, 2004). Ha llegado a Europa desde allí con

la exportación masiva resultante de la reorientación de su comercio, después de ser prohibida en 1975 la venta de quelonios como animales de compañía en los EEUU (Cadi & Joly, 2004). Se estima que desde entonces y hasta 1997, cuando