Revista Ibérica de Aracnología, nº **40** (30/06/2022): 222–224.
Grupo Ibérico de Aracnología (S.E.A.). ISSN: 1576 - 9518.

First record of scorpion in the diet of the common skink *Scincus scincus* (Linnaeus, 1758) in the northern Sahara of Algeria (Squamata: Scincidae)

Aicha Mouane [1], Hayat Laoufi [1], Souad Aouimeur[2], Abdelkrim Harrouchi[1] Chaima Bekkar [1] & Salah Eddine Sadine[3*]

[1] Department of Biology, Faculty of Nature and Life Sciences, University of El Oued, 39000 El-Oued, Algeria.
[2] Department of Agronomic Sciences, Faculty of Nature and Life Sciences, University of Kasdi-Merbah, 30000 Ouargla, Algeria.
[3] Faculty of Nature and Life Sciences and Earth Sciences, University of Ghardaïa, 47000, Ghardaïa, Algeria.
* Corresponding e-mail address: sse.scorpion@yahoo.fr

Abstract: This study reports a first case of predation on scorpions by the common skink *Scincus scincus* (Linnaeus, 1758) (Squamata: Scincidae) in the northern part of the Algerian Sahara, based on analyses of the stomach contents of 28 specimens (15 males and 13 females). Among the important results is reporting the presence of scorpion fragments in the diet of common skink females at a rate above 23%. Scorpion matter is energetically rewarding for females of these reptiles in order to put on weight in preparation for the mating season.
Key words: Scorpiones, Squamata, common skink, predation, Sahara, Algeria.

Primer registro de escorpiones en la dieta del escinco común *Scincus scincus* (Linnaeus, 1758) en el norte del Sahara argelino (Squamata: Scincidae)
Resumen: Se comenta un primer caso de depredación de escorpiones a cargo del escinco común *Scincus scincus* (Linnaeus, 1758) (Squamata: Scincidae) en el norte del Sahara argelino, en base al análisis de contenidos estomacales de 28 especímenes (15 machos y 13 hembras). Entre los resultados destacados está el hallazgo de la presencia de fragmentos de escorpión en hembras de escinco común en proporción superior al 23%. El consumo de escorpiones es energéticamente beneficioso para las hembras de estos reptiles con vistas a poner peso para la época de reproducción.
Palabras clave: Scorpiones, Squamata, escinco común, depredación, Sahara, Argelia.

Introduction

Scorpions are potentially important food sources for many predators (Polis *et al*., 1981). Nearly 312 species can be considered as scorpion predators, more than 80% of them are vertebrates: Birds, Mammalia and Reptiles (Williams, 1987; Lourenço & Cloudsley-Thompson, 2008; Dupré, 2015; Chedad *et al*., 2021).

The predation of scorpions by lizards in the wild is well documented in the literature (Simmonds, 1958; Polis *et al*., 1981; Dupré, 2008; Žagar *et al*., 2011; Shehab *et al*., 2011; Rodríguez-Cabrera *et al*., 2020; Gabriel *et al*., 2021). However, the natural history of skinks (Scincidae) diet has been little explored except some contribution (Pianka, 1969; Huey *et al*., 1974; Read, 1998; Mesquita *et al*., 2006; Paray *et al*., 2018).

In this note, we report a first case of predation on scorpions by common skink *Scincus scincus* (Linnaeus, 1758) (Squamata: Scincidae) from Northern Algerian Sahara, based on observations of scorpion fragments in their stomach content.

Material and Methods

The field work was carried out in the sand dune of Belghit region Oued Souf (Fig.1), located at 6°30'E., 33°33'N., with an average altitude of 80 m. Between Mai and Jun 2016, we have sampled 28 specimens of *S. scincus* composed of 15 males and 13 females.

In Laboratory of Zoology (University of El-Oued, Algeria), the stomach contents were analyzed using stomach flushing follows Legler & Sullivan (1979).

The fragments of scorpions found in stomach contents of this species were identified under a stereo-microscope according to the keys presented by Vachon (1952) and Hjelle (1990).

Results and Discussion

The genus *Scincus* Laurenti, 1768 includes four species distributed all in northern Africa and the Middle-East (Sindaco and Jeremčenko 2008). In Algeria, *S. scincus* is the most abundant and widespread species (Le Berre, 1989; Schleich *et al*., 1996; Mouane, 2010). Which ranked as psammophilous species, spends most of its time under the sand searching for small Arthropods principally insects and arachnids (Schleich *et al*., 1996; Trape *et al*., 2012).

The stomach contents analysis of 28 specimens of common skink revealed the presence of scorpion fragments in the diet of 3 adult females which represents a rate higher than 23%.

In the Southwest Saudi Arabia, the stomach content analysis of the Arabian skink (*Scincus hemprichii* Wiegmann, 1837) showed the presence of 76% arthropods (beetles), 12% plant remains, 6% sand and 6% unidentified item, with a total absence of the scorpion fragments. (Paray *et al*. 2018).

The identification of the scorpion fragments revealed the presence of two scorpion genera belonging to the Buthidae family: *Androctonus* Ehrenberg, 1828 and *Buthacus* Birula, 1908 (Fig. 2).

The presence of scorpions only in diet of females can be justified that this period of Mai to Jun can coincide with ovarian development, which is an important phase of female reproductive cycle (Al-Johany *et al*., 1997). Moreover, the animal matter (scorpions and other terrestrial arthropods) is energetically rewarding for reptiles (Mebarki *et al*., 2021). All the Scincidae family, accumulates the weight preparing for the mating season, which can start over a period of 2 to 3 months from May to July (Le Berre, 1989; Al-Johany *et al*., 1997).

Because, seasonality has a pronounced effect on the diet composition of a lizard (Wapstra & Swain, 1996), these two scorpion species consumed by common skink are very abundant in this moment (Mai to July) in our the study area: Androctonus species are the most abundant species in Souf region and Buthacus species are mentionned as psammophilous scopions found in restricted habitat with common skink (Sadine *et al*., 2011; Sadine, 2018).

Acknowledgments

We thank Mouane F., Mouane S., Mouane T., Makkaoui M. and Benhenich I. for their assistance in the field. We also acknowledge the laboratory engineers at University of El Oued for their help during the laboratory work.

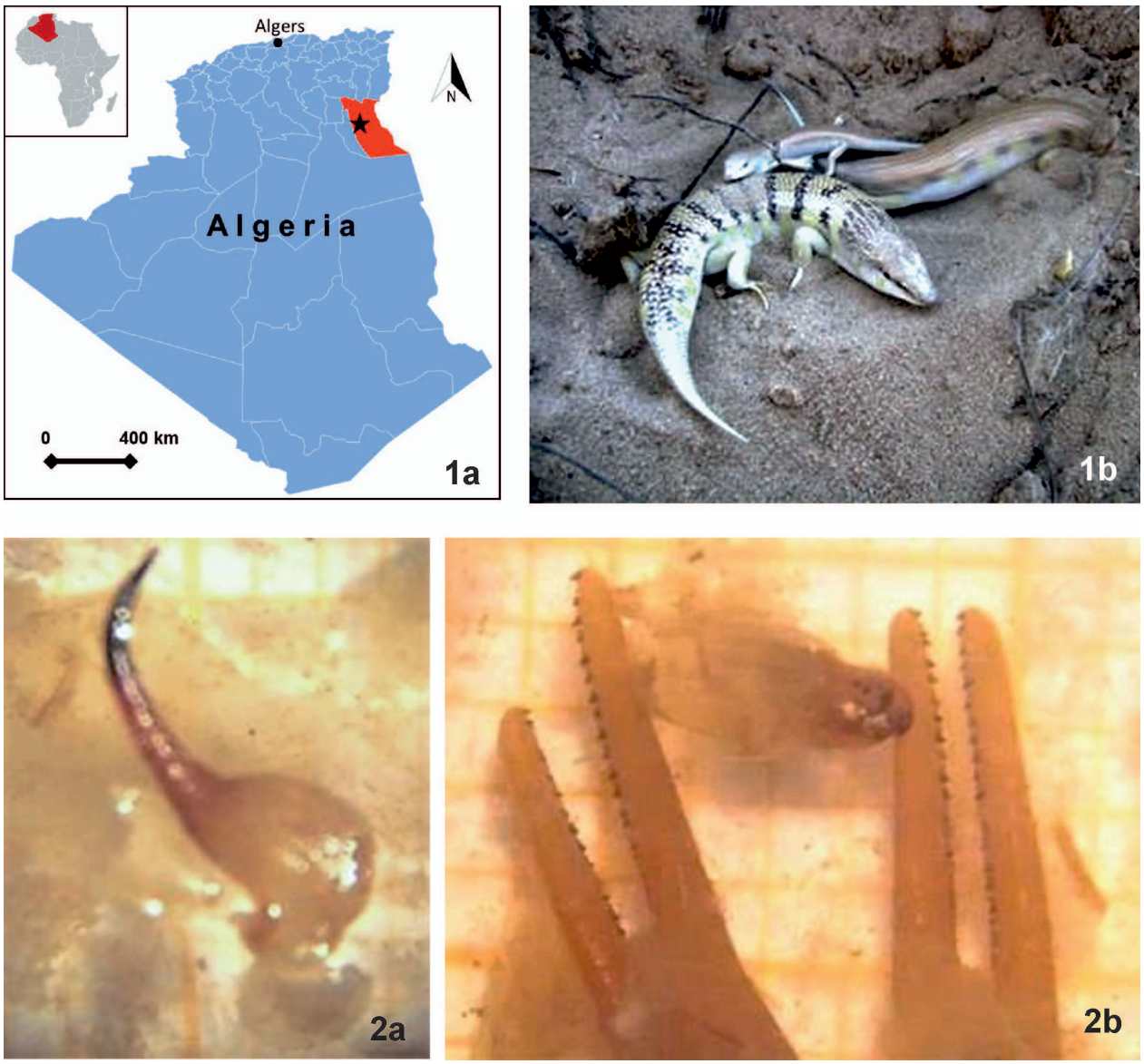


Fig.1. Material of work: **A**. Map of Algeria, showing our study region (black star). **B**. *Scincus scincus* specimens alive in Laboratory.
Fig.2. Scorpion fragments in stomach contents of common skink. **A**. Telson of *Buthacus* sp. **B**. Chelicera and two chela of *Androctonus* sp.

Reference

AL-JOHANY, A., M. AL-SADOON & S. AL-FARRAJ 1997. Reproductive biology of the skink *Scincus mitranus* (Anderson, 1871) in the central region of Saudi Arabia. *Journal of Arid Environments*, **36**: 319-326.

CHEDAD, A., M. AIT HAMMOU & S.E. SADINE 2021. The wild boar Sus scrofa Linnaeus, 1758 as a predator of scorpions (Scorpiones) in north-western Algeria (Mammalia, Suidae). *Revista Ibérica de Aracnología*, **39**: 137-138.*

DUPRÉ, G. 2008. Les prédateurs des Scorpions (Arachnida: Scorpiones). *Arachnides*, **54**: 9-23.

DUPRÉ, G. 2015. Les prédateurs des scorpions (Arachnida: Scorpiones). *Arachnides*, **76**:1-31.

GABRIEL, R., B. BURUM & D. SHERWOOD 2021. Predation of *Tityus ocelote* (Scorpiones: Buthidae) by the lizard *Norops polylepis* (Sauria: Dactyloidae) in Costa Rica. *Revista Ibérica de Aracnología*, **38**: 187-188.*

HJELLE, J. T., 1990. Anatomy and morphology (p. 9-63). *In* : Polis G. A. (ed.), *The Biology of Scorpions*. Stanford: Stanford University Press, 587 p.

HUEY, R., PIANKA, E., M. EGAN & L. COONS 1974. Ecological shifts in sympatry: Kalahari fossarial lizards (*Typhlosaurus*). *Ecology*, **55**: 304-316.

LE BERRE, M. 1989. *La faune du Sahara I*, Poissons, Amphibiens, Reptiles. Ed Raymond chanbaud le chevalier. Paris. Coll. (Terre Africaine).

LEGLER, J.M. & L.J. SULLIVAN 1979. The application of stomach-flushing to lizards and anurans. *Herpetologica*, **35**: 107-110.

LOURENÇO, W. R. & J. L. CLOUDSLEY-THOMPSON 2008. A new case of predation on Scorpions by the little owl *Athene noctua* in the southeast Anatolia region. *Turk. J. Arach.*, **1**(1): 54-58.

MEBARKI, M.T., GUEROUL O., SOUTOU, K., MARNICHE, F., A. BOUZID & S.E. SADINE 2021. Report of camel spiders (Solifugae: Galeodidae) predation by Saharan horned viper *Cerastes cerastes* (Linnaeus, 1758) in Northern Algerian Sahara. *Serket*, **18**(1): 22-26.

MESQUITA, D.O., G.C. COSTA & G.R. COLLI 2006. Ecology of an Amazonian savanna lizard assemblage in Monte Alegre, Parà State, Brazil. *South American Journal of Herpetology*, **1** (1): 61-71.

MOUANE, A. 2010. *Contribution à la connaissance des amphibiens et des reptiles de la région de l'erg Oriental (Souf, Taibet et Touggourt)*. Magister Dissertation, Univ. Biskra, Algeria, 164 pp.

PARAY, B.A., A. R. AL-MFARIJ & M. K. AL-SADOON 2018. Food habits of the Arabian skink, *Scincus hemprichii* Wiegmann, 1837, (Sau-

ria: Scincidae), in the Southwest Saudi Arabia. *Saudi Journal of Biological Sciences*, **25**: 90-93.

PIANKA, E.R. 1969. Sympatry of desert lizards (*Ctenotus*) in Western Australia. *Ecology*, **50**: 1012-1030.

POLIS G.A., W.D. SISSOM & S.J. MCCORMICK 1981. Predators of scorpions: field data and a review. *Journal of Arid Environments*, **4**(4): 309-326.

READ, J.L. 1998. The ecology of sympatric scincid lizards (*Ctenotus*) in arid South Australia. Australian. *Journal of Zoology*, **46**: 617-629.

RODRÍGUEZ-CABRERA, T. M., R. TERUEL & E. MORELL SAVALL 2020. Scorpion predation in Cuba: new cases and a review. *Euscorpius*, **306**: 1–7.

SADINE, S.E. 2018. *La faune scorpionique du Sahara septentrional algérien: Diversité et Ecologie*. Thèse de Doctorat ès sciences. Université Kasdi Merbah-Ouargla. Algérie. 112 pp.

SADINE, S.E., S. BISSATI & M.D. OULD EL-HADJ 2011. Premières données sur la diversité scorpionique dans la région du Souf (Algérie). *Arachnides*, **61**: 2-10.

SCHLEICH, H. H., W. KÄSTLE & K. KABISCH 1996. *Amphibians and Reptiles of North Africa*. Koletz Scintific Books, Koeningstein. 630 pp.

SHEHAB, A. H., Z. S. AMR & J. A. LINDSELL 2011. Ecology and biology of scorpions in Palmyra, Syria. *Turkish Journal of Zoology*, **35**(3): 333-341.

SIMMONDS, F. 1958. The effect of lizards on the biological control of scale insects in Bermuda. *Bull. Entomol. Res*., **49**: 601-12.

SINDACO, R. & V.K. JEREMČENKO 2008. *The Reptiles of the Western Palearctic*. 1. Annotated checklist and distributional atlas of the turtles, crocodiles, amphisbaenians and lizards of Europe, North Africa, Middle East and Central Asia. Monografie della Societas Herpetologica Italica I - Edizioni Belvedere: Latina, Italy. 579 pp.

TRAPE, J.F., S. TRAPE & L. CHIRIO 2012. *Lézards, crocodiles et tortues d'Afrique occidentale et du Sahara*. Ed. IRD.

VACHON, M., 1952. *Études sur les scorpions. Alger*: Publications de l'Institut Pasteur d'Algérie, 482 pp.

WAPSTRA, E. & R. SWAIN 1996. Feeding ecology of the Tasmanian spotted skink, *Niveoscincus ocellatus* (Squamata: Scincidae). *Aust. J. Zool*., **44**: 205-213.

Williams, S.C. 1987. Scorpion bionomics. *Ann. Rev. Entomol*., 32: 275-95.

ŽAGAR, A., T. TRILAR & M. A. CARRETERO 2011. Horvath's rock lizard, *Iberolacerta horvathi* (Méhely, 1904), feeding on a scorpion in Slovenia. *Herpetology Notes*, **4**: 307-309.

*Available at www.sea-entomologia.org