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Body Size and Diet of *Tarentola Deserti* (Sauria: Phylloadctylidae) in the Sahara Desert of Algeria

***Bahia Bacha*[1], *Aicha Mouane*[2], *Adel A. Ibrahim*[3,6], *Abdallah Aouadi*[4], *Souad Aouimeur*[5], and *Hayat Laoufi*[2]**

[1]*Department of Natural and Life Sciences, Faculty of Exact Sciences Natural and Life Sciences, University Mohamed Khider, 07000 Biskra, Algeria*
[2]*Faculty of Natural and Life Sciences, University of El Oued, 39000 El Oued, Algeria*
[3]*Department of Zoology, Faculty of Science, Suez University, 43522 Suez, Egypt*
[4]*Laboratory of Conservation of Humid Zones (LCHZ), University of May 8, 1945, Guelma, Algeria, and Department of Biology, Faculty of Nature and Life Sciences, Chadli Benjedid University, El Tarf, Algeria*
[5]*Department of Agronomic Sciences, Faculty of Life and Natural Sciences, University of Kasdi–Merbah, 30000 Ouargla, Algeria*
[6]*Corresponding author, e–mail: dolaibrahim@yahoo.com*

***Abstract*.—We investigated the body size and diet composition of the Desert Wall Gecko (*Tarentola deserti*) in the Sahara Desert of Algeria from October 2019 to May 2024. *Tarentola deserti* exhibited sexual differences in body size with males significantly larger than females. The snout-vent length of males and ranged from 53.8–115 mm and for females from 50.2–87 mm. This gecko exhibited opportunistic feeding behavior, consuming a wide array of prey across 11 arthropod orders. Insects represented the largest portion and highest relative abundance of prey items, followed by Arachnida (spiders) and Collembola (Springtails). Diptera (flies) represented the most important prey items, followed by Coleoptera (beetles) and Hymenoptera (bees and wasps). Although Coleoptera was the primary prey item in males, Diptera dominated the diet of females. Despite these differences, there was no significant divergence in overall diet composition between sexes. We found seasonal variations in diet, with the highest prey diversity and abundance recorded in spring and the lowest in winter. *Tarentola deserti* primarily employed a sit-and-wait predation strategy, with occasional bouts of active foraging. Co-inertia analysis identified a significant relationship between gecko morphological traits and prey composition, suggesting that morphological differences influenced the feeding patterns of *T. deserti*, and reflected an adaptive trophic strategy where morphological variation supports resource partitioning and ecological specialization among individuals, which could reduce intersexual feeding overlap.**

Key Words.— Food; geckos; predator-prey relationships; morphometrics; North Africa

Introduction

Lizards have contributed significantly to life-history theory (Huey et al. 1983; Vitt and Pianka 1994; Pianka and Vitt 2003), and they have usually been used as models for uncovering patterns in life-history strategies (Pianka 1986) because they are relatively abundant, easily collected, and provide for simple dietary analysis through the examination of their prey. The genus *Tarentola* is widespread in the Algerian Sahara and is represented by five species: the Desert Wall Gecko (*T. deserti*), the White-spotted Wall Gecko (*T. annularis*), the African Wall Gecko (*T. hoggarensis*), the Moorish Gecko (*T. mauritanica*), and the Algerian Wall Gecko (*T. neglecta*: Gauthier 1967; Le Berre 1989; Schleich et al. 1996; Mouane 2020). The ecology and natural history of geckos inhabiting the Algerian Sahara remains poorly known, however.

Tarentola deserti (Fig. 1) is an endemic species in the northern Sahara of Morocco, Algeria, Tunisia, and Libya (Le Berre 1989; Schleich et al. 1996; Trape et al. 2012; Bauer et al. 2017; Martinez del Marmol et al. 2019). It is found in rocky areas, deserts with firm ground (regs), on building walls and ceilings, drains under roads, palm oases, ruins, abandoned buildings, and close to sandy deserts (ergs; Schleich et al. 1996; Mouane et al. 2013). Its elevational distribution ranges from 39–120 m. This species is a medium-sized gecko; the largest individual reached a snout-vent length (SVL) of 95.0 mm, but the average is 68.2 mm (Mouane 2020). Juveniles show lighter or more translucent skin than adults. Males can be identified by the presence of hemipenal bulges at the base of tail, while females had slimmer tail base (Schleich et al. 1996; Mouane 2020).

Studying the diet of a given predatory reptile species provides useful information about the type and the relative importance of consumed prey, which helps

Figure 1. The Wall Desert Gecko (*Tarentola deserti*) from Oued Righ, Algeria. (Photographed by Aicha Mouane).

elucidate inter- and intra-specific relationships and feeding strategies (Klawinski et al. 1994; Saenz 1996; Bonfiglio et al. 2006) of species. Despite several studies on the ecology of lizards in Algeria, including dietary analysis (Rouag et al. 2006; Mamou et al. 2016; Saoudi et al. 2017), the diet of *T. deserti* in the field has not previously been studied. We studied dietary habits in *T. deserti* in urban sites (settlements) in the Algerian Sahara as a contribution to learning more about gecko life in general and in North Africa in particular, and to pave the way for future studies related to reproduction, behavior, and conservation. We analyzed the diet of *T. deserti* and compared its food habit and components with those of other gecko species to improve our understanding of the natural history of gekkonid lizards in Algeria.

Materials and Methods

Study site.—Our study occurred in the northern Sahara Desert, encompassing the areas of Oueds (locally called Wadis) Souf, Righ, and Biskra (Fig. 2). This region, situated in southeast Algeria, extends from the northern limit (Laghouat - Biskra) up to 1,000 km inland (Toutain 1979). The northern Sahara climate is characterized by low and irregular rainfall, with an average annual precipitation of < 100 mm, high temperatures, intense sunlight, and strong evaporation rates (Chehma and Youcef 2009). Daily air temperatures approximately range from 7° to 11° C in January, and

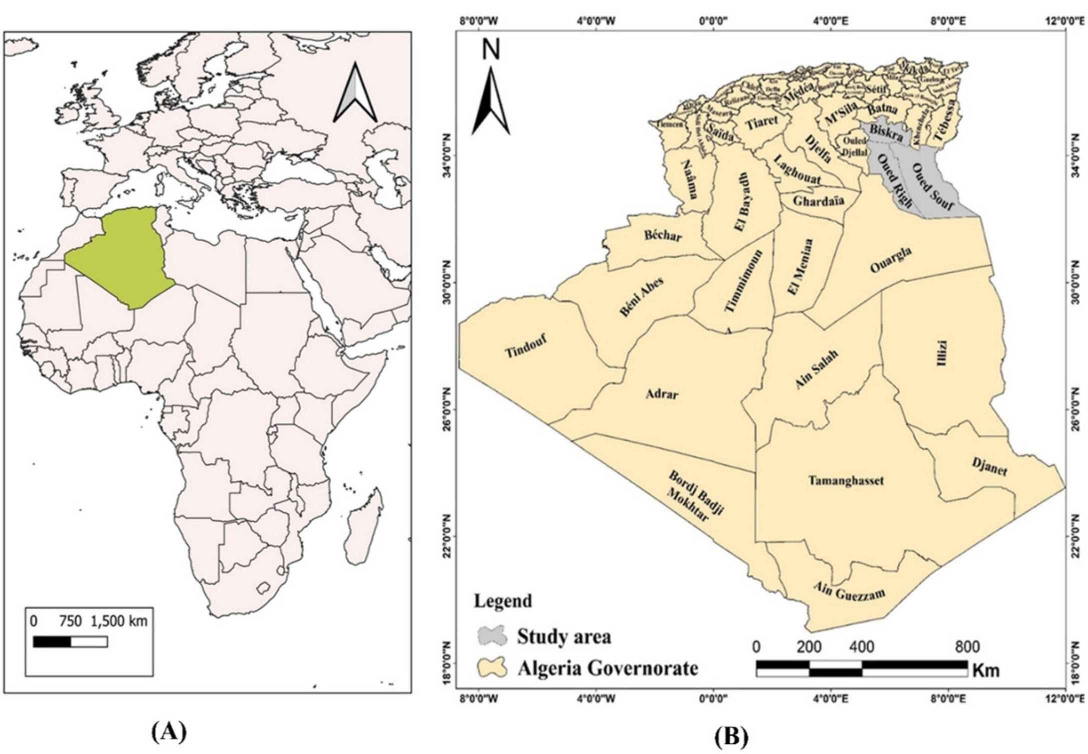

Figure 2. Map of Algeria showing (A) the location of Algeria in northern Africa and (B) location of the study sites (grey) in the Oued Righ region of the northeastern Sahara Desert.

from 34° to 40° C in July. The highest levels of rainfall generally occur between January and April (Voisin 2004; Office National de la Météorologie 2023). The flora of the northern Sahara is relatively homogeneous, with strong Mediterranean influences contributing to it being one of the richest botanical regions in the Sahara. A total of 480 plant species have been recorded in the area, of which 162 are considered endemic (Quezel 1978). The region also supports a diverse invertebrate fauna with 244 species of arthropods recorded in the Oued Souf area, of which insects represented 92.7% of the total (Aouimeur et al. 2017). In the Oued Righ region, 99 species of arthropods have been identified (Hadjoudj et al. 2018), while in Biskra, 125 species have been reported (Larkem et al. 2017).

Fieldwork and sampling.—We conducted fieldwork (250 field trips, more than 800 h, 14.5–21.7 h/mo) on a monthly basis in urban and residential areas of Biskra, Oued Souf, and Oued Righ from October 2019 to June 2024. We made observations from 1630 to 2230 (4–5 h/d) in winter (December through February), spring (March through May), summer (June through August), and autumn (September through November). During each field trip, two observers searched for geckos on the walls and ceilings of inhabited houses and abandoned buildings, as well as beneath debris and ruins.

We captured geckos by hand and by using rubber bands and brought them to the laboratory for morphological measurements and diet analysis. We measured total body length (TBL) from the tip of the rostral to the end of the tail; snout-vent length (SVL) from the tip of the rostral to the vent, and tail length (TL) from the vent to the end of the tail (broken and damaged tails were not included). We used Mann-Whitney *U* Tests ($\alpha = 0.05$) to compare the above measures of body size between sexes, as the assumption of variance homogeneity was not met. Within 24 h, we returned geckos to the field and released them at the site of capture.

Diet composition and data analysis.—We removed the stomach contents of 84 adult geckos (41 males and 43 females) using a stomach-flushing method (Legler and Sullivan 1979; Luiselli and Amori 2016). In this method, a flexible tube supplied with water is inserted into the esophagus of the lizard and water is pumped in, which causes the lizard to regurgitate most of the stomach contents. We used plastic rings to keep the mouth open during the flushing.

We examined stomach contents under a binocular dissecting microscope equipped with a micrometer eyepiece, which allowed us to identify most contents to species or order, using standard morphological keys for Algeria (Chopard 1943; Balachowsky 1962; Bouragba 2010). We used the following measures in food analysis: Total Richness, Average Richness, Frequency of Occurrence, and Index of Relative Importance (IRI) of prey. We counted the number of individuals for each prey category. We estimated the volume of each prey item (mm^3) using the spheroid volume formula (Bonfiglio et al. 2006):

$$\text{Volume (V)} = 4/3\ \pi \times (L/2) \times (W/2)^2$$

where L is length of prey and W is width of prey. We used the Index of Relative Importance (IRI) to determine the importance of food items from the numerical, volumetric and frequency data. The IRI (Medin 1970) is calculated as:

$$\text{IRI} = (N + V)\ F$$

where N = Numerical percentage, V = Volumetric percentage, and F = Frequency percentage. Numerical percentage (frequency of prey occurrence: PF) is the number of individuals of a particular food item expressed as a percentage of all food items. Volumetric percentage is the volume of a particular food item expressed as a percentage of the total volume of all food items. Frequency of Occurrence is the number of stomachs in which a particular food item occurs expressed as a percentage of total number of stomachs examined. Total Richness (S) is the total number of prey species identified (Magurran 2004). Average Richness (SM) is the average number of prey species observed in all stomachs (Ramade 1984).

We assessed trophic niche using Food Niche Breadth, the Shannon Diversity Index, and Evenness. We calculated Niche Breadth (Levins 1968) as:

$$B = 1/\Sigma P_i^2$$

where P_i is the proportion of prey species (i) in the diet ($P_i = n_i/N$), n_i is the number of individuals of prey species and N is the total number of prey individuals. We determined the Shannon Diversity Index (Shannon and Weaver 1949) as:

$$H' = -\Sigma\ (P_i \times \log_2 P_i)$$

where Hmax = $\log_2$ mean specific richness (SR), and Evenness (Legendre and Legendre 1998) as:

$$E = H'/\text{Hmax}$$

Table 1. Range and mean (± standard deviation) of total body length (TBL), tail length (TL), and snout-vent length (SVL) of 41 male and 43 female Desert Wall Geckos (*Tarentola deserti*) from the Sahara Desert of Algeria.

	Males		Females		Total (n = 84)	
Variables	Mean (mm)	Range (mm)	Mean (mm)	Range (mm)	Mean (mm)	Range (mm)
TBL	149.3 ± 23.1	115.4–192.7	127.4 ± 14.7	96.1–165.1	138.1 ± 22.1	96.1–192.7
TL	72.0 ± 13.1	50.3–95.2	63.6 ± 8.6	42.2–84.2	67.7 ± 11.8	42.2–95.2
SVL	77.1 ± 14.0	53.8–115.0	63.9 ± 10.2	50.2–87.0	70.3 ± 13.8	50.2–115.0

The Evenness Index (E) shows how the prey species are distributed in the diet. Values of Evenness range from zero (representing the diet of a specialist species) to 1 (indicating the diet of a generalist species). To explore the common and exclusive prey taxa between the two sexes, we generated a Venn diagram from the R package Venn Diagram (Chen and Boutros 2011) to understand potential differences in feeding behavior or resource partitioning between the sexes. We also applied a Kruskal–Wallis Test to assess seasonal differences in prey ecological indices. When significant effects were detected, we performed pairwise comparisons using the Wilcoxon Rank-sum Test with Holm-adjusted *P*-values to control for multiple testing. Indices included total abundance, species richness, Shannon Diversity Index, Simpson Index, and Evenness. To test differences between sexes and seasons, we used A Permutational Multivariate Analysis of Variance (PERMANOVA) test. For all tests, $\alpha = 0.05$.

Results

Adult males had a mean TBL = 149.3 mm, mean SVL = 77.1 mm, and mean TL = 72.0 mm (Table 1). Adult female mean TBL = 127.4 mm, mean SVL = 63.9 mm, and mean TL = 63.6 mm (Table 1). Males were significantly larger than females in mean TBL ($U = 348$, df = 1, $P < 0.001$), mean SVL ($U = 371.5$, df = 1, $P < 0.001$), and mean TL ($U = 371.5$, $P < 0.001$), Lizards were usually active after sunset, in full dark, and around electric lamps. We found some individuals active on several occasions during the day, very close to wall holes and crevices, and under debris of logs on the soil and ruins of buildings. Once the observer approached their hiding places, they ran quickly to hide. When first sighted, lizards were most often observed motionless, showing a sit-and-wait feeding strategy. They were seen ambushing the prey, especially in artificial lit places on ceilings and walls. During the day, we occasionally saw lizards around hiding places in walls, but they were never observed hunting prey.

Diet composition.—We examined 84 *T. deserti* stomachs (41 males and 43 females) with 13 stomachs from winter captures (seven males and six females), 25 from spring captures (10 males and 15 females), 25 from summer (14 males and 11 females), and 21 from autumn (10 males and 11 females). Geckos fed upon a wide spectrum of food, comprising eight orders of insects and three other orders of invertebrates. We found 482 prey items (226 from males; 256 from females) that we identified and classified into 61 species, representing four classes, 11 orders, 33 families, and 48 genera (Table 2).

Insects represented the largest percentage of the diet with highest relative abundance (430 prey items, PF = 89.2%), followed by Arachnida (PF = 8.9%), and Collembola (PF = 1.5%). Insects were classified into 52 prey species, including 13 species for Coleoptera, 10 species each for Diptera and Hymenoptera, eight species for Orthoptera, and two for Blattodea. The other classes of invertebrates were each represented by a single order, with seven species for Arachnida and only one each for Malacostraca and Collembola (Appendix Table).

Although Coleoptera attained the largest volume of prey items, Diptera was the most important category in terms of prey number, frequency of occurrence, and consequently, the IRI, followed by Coleoptera and Hymenoptera (Appendix Table). The House Fly (*Musca domestica*) was the most important and frequent member of Diptera in the diet of males and females in all seasons, with maximum occurrence in autumn, followed by the Common House Mosquito (*Culex pipiens*). Neuroptera were noted as least important. The most important food item in the diet of males were members of Coleoptera, followed by Diptera, while in the diet of females, Diptera were most important followed by Coleoptera (Appendix Table).

Seasonal variation in diet.—The diet composition varied significantly by seasons ($F_{3,77} = 3.804$, $P = 0.001$). In winter, the most abundant prey items were members of Hymenoptera and Arachnida (PF = 32.3% and 25.8%, respectively). During spring, Hymenoptera were the most frequent (PF = 33.3%), followed by Diptera (PF = 22.7%). In summer, the most significant food items were Coleoptera (PF= 33.3%), followed by Hymenoptera (PF = 28.4%). In autumn, members of

Diptera were most frequent (PF = 52.7%; Appendix Table). In winter, lizards took only seven food prey categories (lowest seasonal value); in spring, they took 11 items (highest seasonal value; Appendix Table). The mean number of prey individuals per stomach in winter was 2.4 ± (standard deviation) 1.39. This increased to the maximum during spring (7.2 ± 2.21), decreased to some extent in summer (5.6 ± 2.93), and slightly increased during autumn (6.1 ± 5.28; Table 2). Yet, we recorded the highest number of prey species (51) in spring (Sm = 5.3 ± 1.67), followed by summer (42; Sm = 4.04 ± 1.67) and autumn (40, Sm = 4.5 ± 1.16; Table 2).

There were significant seasonal differences (Fig. 3) in prey richness (H = 28.499, df = 3, $P < 0.001$), total abundance (H = 30.775, df = 3, $P < 0.001$), Shannon diversity (H = 24.533, df = 3, $P < 0.001$), and Simpson diversity (H = 23.782, df = 3, $P < 0.001$). In contrast, Evenness did not vary significantly among seasons (H = 7.263, df = 3, P = 0.064). *Post-hoc* pairwise comparisons indicated that most significant differences were mainly associated with winter, particularly in comparisons involving autumn versus winter; spring vs. winter, and summer versus winter, while significant differences were also detected between spring and summer for all indices. The prey diversity was highest in spring (Niche Breadth = 5.04), followed by winter (4.56) and summer (4.48), whereas the lowest value was recorded in autumn (3.10).

Sexual variation in prey selection.—Dipterans, hymenopterans and coleopterans were the most prevalent food items for both males and females (Appendix Table). Diet composition in males did not differ significantly from females ($F_{1,77}$ = 0. 301, df = 1, P = 0.891). Of the 61 prey species, 44 (72.1%) were common between both sexes (Fig. 3). Five species of prey were only found in male stomachs, and 12 species were exclusive to females. These exclusive prey species for both males and females, however, showed the lowest rates of relative abundance. Prey representation in the stomach was slightly more evenly distributed in winter and summer (E = 0.89) than in autumn (E = 0.82; Table 2).

Discussion

In many lizard species, males often have comparatively larger body sizes than females (Cox et al. 2003; Mouane et al. 2020; Liang et al. 2021; Laoufi et al. 2023). Both TBL and SVL of males were significantly larger than those of females, which could be explained by larger male size conferring an advantage in intra-sexual competition due to sexual selection pressures (Cox et al. 2003). Zuffi et al. (2011) pointed out that male *T. mauritanica* are typically larger, longer, and heavier than females. Increased body size among males can provide an evolutionary advantage during territorial fights and mate acquisition, considering that sexual size dimorphism is characteristic of the territorial nature of lizards, where male size is related to successful territory defense and mating (Cox et al. 2003; Moore et al. 2009). Moreover, females can reach their maximal body size earlier than males, which keep growing until they achieve increased body size and

Table 2. Number of stomachs flushed, frequency of prey items (PF), and richness of prey species in stomachs of Desert Wall Geckos (*Tarentola deserti*) from the Sahara Desert in Algeria by sex and season. The Mean number of prey per stomach and Mean SR per sample include ± one standard deviation. The symbol H’ is the Shannon Diversity Index.

	Sex		Season				
Diet characteristics	Males	Females	Spring	Summer	Autumn	Winter	Total
Number of stomach flushes	41	43	25	25	21	13	84
Number of prey items found	226	256	181	141	129	31	482
Prey frequency (PF)	46.88	53.11	37.55	29.25	26.76	6.43	100
Mean number prey per stomach (Nm)	5.5 ± 2.72	5.9 ± 2.70	7.2 ± 2.21	5.6 ± 2.93	6.1 ± 5.28	2.4 ± 1.39	5.7 ± 2.70
Prey species richness (SR)	49	56	51	42	40	14	61
Mean SR per sample	4.1 ± 1.90	4.3 ± 1.72	5.3 ± 1.67	4.04 ± 1.67	4.5 ± 1.16	2.07 ± 1.25	4.2 ± 1.78
H’	4.90	5.03	4.90	4.80	4.40	3.50	5.10
H_{max}	5.61	5.80	5.67	5.39	5.32	3.80	5.93
Evennes	0.87	0.86	0.86	0.89	0.82	0.91	0.85
Niche breadth	4.97	5.08	5.04	4.48	3.10	4.56	5.04
Levin’s measure	0.45	0.40	0.40	0.39	0.23	0.59	0.42

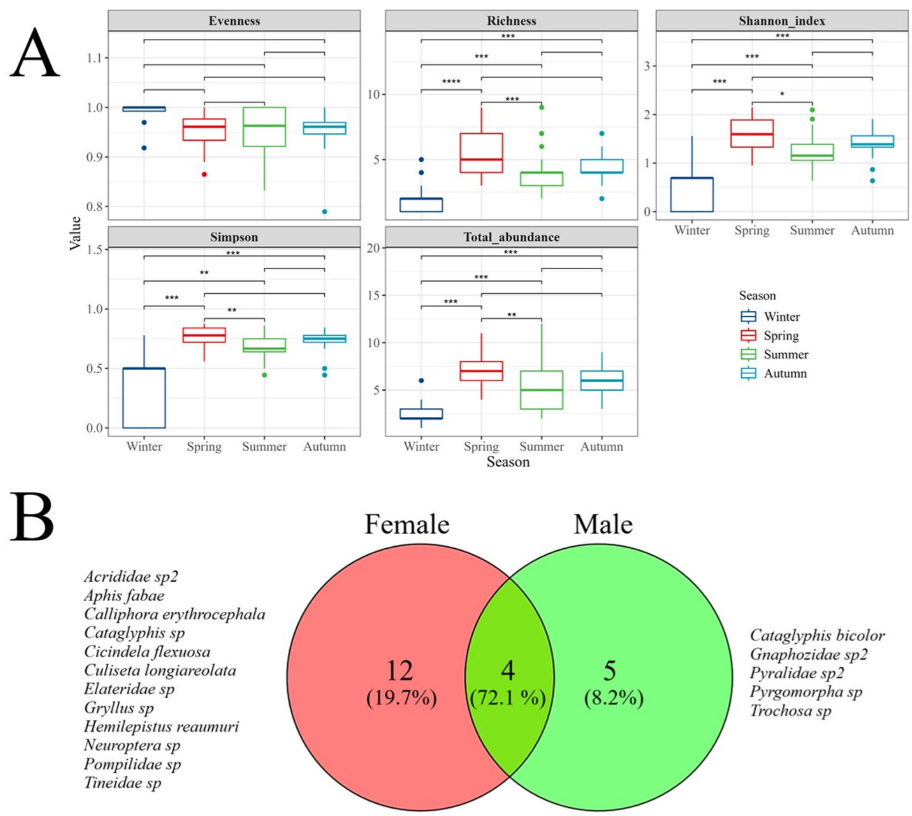

Figure 3. Sexual and seasonal variation in the feeding ecology of Desert Wall Geckos (*Tarentola deserti*) in Oued Righ, Algeria. (A) Boxplots illustrating seasonal variations in ecological prey indices with horizontal lines are median values, boxes are 1st to 3rd quartile values, and vertical lines are ranges of values. Asterisks (*) indicate significant differences: * = $P < 0.05$, ** = $P < 0.01$, *** = $P < 0.001$. (B) Venn diagram displaying shared and unique prey species richness in males and females.

head dimensions. Increased body size in females, however, is typically associated with reproductive benefits, such as carrying more or bigger eggs or offspring (Cox et al. 2003; Pincheira and Hunt 2017).

The degree of sexual dimorphism in geckos differs greatly among species (Zuffi et al. 2011). Ibrahim (2007, 2013) observed no difference in body size between males and females of relatively small geckos of the Mediterranean House Gecko (*Hemidactylus turcicus*) and the Rough Bent-toed Gecko (*Cyrtopodion scabrum*) but there is sexual dimorphism in body size in larger geckos including the Yellow-belly Gecko (*Hemidactylus flaviviridis*; Ibrahim 2003), White-spotted Wall Gecko (*Tarentola annularis*; Ibrahim 2004), Moorish Gecko (*Tarentola mauritanica*; Ibrahim 2008), and the Yellow Fan-fingered Gecko (*Ptyodactylus hasselquistii*; Ibrahim and Busais 2016). Zuffi et al. (2011) pointed out that in most small-sized geckos, sexual dimorphism is limited to only very slight subtle differences in head size, such as in the Whistling Gecko (*Ptenopus garrulus*; Hibbits et al. 2005), or in the shape of the cloacal region and in toe morphology (i.e., *Tarentola*; Rieppel 1981). In a small sphaerodactylid gecko, the European Leaf-toed Gecko (*Euleptes europaea*), however, sexual dimorphism is more pronounced (Salvidio and Delaugerre 2003).

The foraging modes of geckos are varied and complex (Werner et al. 1997) and depend on many factors (Werner et al. 2006). The prevalence of invertebrates, insects in particular, is well known in the diet of lizards (e.g., Znari et al. 2000; Arab and Doumandji 2003; Rouag 2016; Mouane et al. 2023). The prey items taken by *T. deserti* throughout the years of our study suggest opportunistic feeding. The presence of eight of 11 orders of insect taxa in the diet confirms that this species is mainly insectivorous and suggests that insects in the Algerian desert and inhabited zones are highly diverse. The variety of habitats and the artificially lit places around which lizards aggregate in our study sites may have attracted insects, such as house flies and beetles. This is consistent with previous studies of *T. mauritanica* (Ibrahim 2008; Ouldaissa and Doumandji 2025), as well as other geckos (e.g., Capula and Luiselli 1994; Ibrahim 2003; 2013; Ibrahim and Busais 2016). We suspect that in more uninhabited areas, the diet of species would be different and include less light attracted arthropods.

Dipterans, particularly *M. domestica,* were the most important food item for *T. deserti*. The high number of flies in the diet during autumn reflects their higher incidence in this season. Also, in both Oued Souf and Oued Righ, agricultural fields are supplied with a large amount of chicken droppings as an organic fertilizer, which attracts a huge number of flies, especially in autumn. Additionally, there are artificially lit places in dwelling areas around which a large number of geckos congregate. During autumn, the air temperature is quite suitable for the activity and breeding of flies and affects feeding during the suitable feeding days (Avery 1971). Ibrahim (2003, 2013) reported similar reasons for the highest incidence of the house flies in the diet of *Hemidactylus flaviviridis* and *Cyrtopodion scabrum*, in urban and rural areas, respectively. Based on the relative abundance in stomach samples, Mouane et al. (2023) pointed out that *M. domestica* was the most frequently consumed prey item by *Cyrtopodion scabrum* in southeastern Algeria. Our findings, however, confirm that *T. deserti* is not a house fly specialist, and the dominance of house flies in the stomachs of this gecko reflects its richness in the study area.

The wide spectrum of food items consumed by *T. deserti* suggests that this gecko is essentially a sit-and-wait forager. The incidence of a large number of moving insects in the diet such as dipterans, beetles, orthopterans, and cockroaches characterizes an ambush predator diet (Huey and Pianka 1981). Meanwhile, the occurrence of sedentary insect prey such as homopterans, even in low numbers, shows an occasional assumption of active foraging strategy (Huey and Pianka 1981). Both foraging modes have previously been documented for *T. mauritanica* (Gil et al. 1994; Ibrahim 2008) and *T. annularis* (Ibrahim 2004), as well as for other geckos (e.g., Werner et al. 1997; Ibrahim 2003, 2013; Ibrahim and Busais 2016).

Tarentola deserti was mainly nocturnal, an assumption supported by the presence of insects that aggregate around artificial lights at night, such as flies and mosquitoes. Simultaneously, the presence of other insects in the diet of this gecko, such as some members of Coleoptera and Hymenoptera (Driche et al. 2022), may indicate occasional diurnal feeding and suggests that *T. deserti* is also crepuscular. These latter insects are generally considered to be the main prey taxa of lizards in desert ecosystems (Pianka 1986). Ibrahim et al. (2000) reported that the main food items for the diurnal lacertid Nidua Fringe-toed Lizard (*Acanthodactylus scutellatus*) were Coleoptera and Hymenoptera, likely because of their high energetic return (Schoener 1971).

The maximum number of prey items per stomach that we recorded in spring may be attributed to the need of lizards of both sexes to devote energy for reproduction. The higher diversity of dietary items in summer than in spring reflects the richness of insects during summer and may also show the efforts of lizards to make up the resources devoted for reproductive processes in spring (Durtsche 1992). These reasons were postulated similarly for *H. flaviviridis* (Ibrahim 2003), *Cyrtopodion scabrum* (Ibrahim 2013), and *Ptyodactylus hasselquistii* (Ibrahim and Busais 2016). The minimum number of prey items per stomach recorded in winter likely reflects the paucity of prey in cooler weather. Most species are known to reduce their feeding during cooler months (Wapstra and Swain 1996) when they have lower energy needs. *Tarentola deserti*, however, does consume a large number of ants and spiders in winter and selection of such smaller, more abundant prey shows the relatively high occurrence of this prey in winter (Schoener and Janzen 1968).

Consumption of large insects by adult *T. deserti* during the spring and summer confirms trophic partitioning and is possibly a mechanism to maximize their energy intake, especially in the reproductive season (Stephens and Krebs 1986; Schoener 1971). If males catch larger prey, they can spend more time searching for females. Likewise, the incidence of smaller taxa, such as flies and ants, in large quantities in the diet may reflect the abundance of these taxa in spring and summer, which also could be associated with energy intake. By these tactics, lizards can use energy for reproductive activities in a shorter time (Schoener and Janzen 1968).

Male *T. deserti* did not differ from females in terms of the number and size of consumed prey. This supports the assumption of opportunism irrespective of sex. Similar findings were reported for other geckos (e.g., Gil et al. 1994; Ibrahim 2003, 2004; Mouane et al. 2023). The inclusion of certain food types in the stomachs of males not found in females is attributed to accidental ingestion of these items. Ibrahim (2004) stated that some prey taxa in the stomachs of male *T. annularis* were found in the stomach of female *H. flaviviridis* (Ibrahim 2003), which supports the suggestion that food types are not exclusively for one sex, and ingestion of such food taxa is not necessarily due to preference.

The low number of stomachs that we examined was because of a low incidence of *T. deserti* in the area. Recently, this gecko entirely disappeared in some habitats in its range, while in others, it greatly decreased in number and was replaced by the invasive gecko, *C. scabrum* in 2009 (Mouane et al. 2021). Therefore, *T. deserti* was so infrequent that we only found two or three individuals at most per field trip in recent trips.

The increase in number of invasive gecko species and the decline of native geckos is a global concern (see Rödder et al. 2008; Buckland et al. 2014; Lamb et al. 2021). The apparent extinction of the native *T. deserti* in some areas may be attributed to human alterations to the environment, which often reduce structural complexity, and may have facilitated the invasion and dispersal of the smaller gecko, *C. scabrum*, which is a competitor for food. Also, local inhabitants are used to killing geckos as soon as they see them because they frightening and disgusting to these people. *Tarentola deserti* is large and intimidating to people compared to the invasive gecko, so, the former is more likely to be killed, while the latter is smaller, less intimidating, and can escape or hide quickly, and in more hiding places. Additional natural history research such as trophic ecology and reproduction of *T. deserti* may contribute to better conservation of this species. The possibility of breeding these geckos and transferring a large number of them to natural habitat away from towns and villages may be an important conservation action (See Barts 1992).

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Literature Cited

Aouimeur, S., O. Guezoul, L. Ababsa, and M. Sekour. 2017. Aperçu sur la faune arthropodologique du Souf (Sahara septentrional - est, Algérie). Revue ElWahat pour les Recherches et les Etudes 7:85–94.

Arab, K., and S. Doumandji. 2003. Étude du régime alimentaire de la Tarente de Mauritanie *Tarentola mauritanica* (Linné. 1758) (Gekkonidae) et le Psammodrome algire *Psammodromus algirus* (Linné. 1758) (Lacertidae) dans un milieu suburbain près d'Alger. Bulletin de la Société Herpétologique de France 106:10–16.

Avery, R.A. 1971. Estimates of food consumption by the lizard *Lacerta vivipara* Jacquin. Journal of Animal Ecology 40:351–365.

Balachowsky, A.S. 1962. Entomologie Appliquée à l'agriculture. Tome I, Coléoptères. Masson et Cie, Paris, France.

Barts, M. 1992. Zur Haltung und Zucht von *Tarentola deserti* (Boulenger, 1891). Sauria 14:23–26.

Bauer, A.M., J.C. Deboer, and D.J. Taylor. 2017. Atlas of the Reptiles of Libya. Proceedings of the California Academy of Sciences 64:155–318.

Bonfiglio, F., R.L. Balestrin, and L.H. Cappellari. 2006. Diet of *Hemidactylus mabouia* (Sauria, Gekkonidae) in urban area of southern Brazil. Biociências 14:107–111.

Bouragba, B. 2010. Guides de Quelques Arthropodes en Région Semi-aride. Institut National de Recherche Forestière (INRF), Djelfa, Algeria.

Buckland, S., N.C. Cole, J. Aguirre–Gutierrez, L.E. Gallagher, S.M. Henshaw, A. Besnard, R.M. Tucker, V. Bachraz, K. Ruhomaun, and S. Harris. 2014. Ecological effects of the invasive Giant Madagascar Day Gecko on endemic Mauritian geckos: applications of binomial-mixture and species distribution models PLoS ONE 9 (4): e88798. https://doi.org/10.1371/journal.pone.0088798.

Capula, M., and L. Luisell. 1994. Trophic niche overlap in sympatric *Tarentola mauritanica* and *Hemidactylus turcicus*: a preliminary study. Herpetological Journal 4:24–25.

Chehma, A., and F. Youcef. 2009. Variations saisonnières des caractéristiques floristiques et de la composition chimique des parcours sahariens du Sud-Est algérien. Science et Changements Planétaires - Sécheresse 20:373–381.

Chen, H., and P.C. Boutros. 2011. VennDiagram: a package for the generation of highly-customizable Venn and Euler diagrams in R. BMC Bioinformatics 12: 35. https://doi.org/10.1186/1471-2105-12-35.

Chopard, L. 1943. Orthoptéroïdes de l'Afrique du Nord. Ed. Libraire Larose, Coll. Faune de L'empire Français, Tome I, Paris, France.

Cox, R.M., S.L. Skelly, and H.B. John-Alder. 2003. A comparative test of adaptive hypotheses for sexual size dimorphism in lizards. Evolution 57:1653–1669.

Driche, N., O.K. Louafi, A. Dridi, and A. Zahani. 2022. Variation du régime alimentaire du *Cyrtopodion scabrum* Heyden, 1827 (Rough Bent-toed Gecko) et *Tarentola deserti* Boulenger, 1891 (Tarente du Désert) dans la région d'Oued. Master Académique en Sciences Biologiques, Université Echahid Hamma Lakhdar d'El-Oued, Algeria. 92 p.

Durtsche, R.D. 1992. Feeding time strategies of the Fringe–toed Lizard, *Uma inornata*, during breeding and non–breeding seasons. Oecologia 89:85–89.

Gauthier, R. 1967. La faune herpétologique du Sahara nord-ouest Algérien. Addition et mise à jour. Bulletin du Muséum national d'Histoire Naturelle 5:819–828.

Gil, M., F. Guerrero, and V. Perez–Mellado. 1994. Seasonal variation in diet composition and prey selection in the Mediterranean Gecko, *Tarentola mauritanica*. Israel Journal of Zoology 40:61–74.

Hadjoudj, M., K. Souttou, and S. Doumandji. 2018. The diversity of arthropods community in dunes and a palm grove (*Phoenix dactylifera*) in the Touggourt region (Septentrional Sahara). International Journal of Tropical Insect Science 38:283–293.

Hibbits, T.J., E.R. Pianka, R.B. Huey, and M.J. Whiting. 2005. Ecology of the Common Barking Gecko (*Ptenopus garrulus*) in southern Africa. Journal of Herpetology 39:509–515.

Huey, R.B., and E.R. Pianka. 1981. Ecological consequences of foraging mode. Ecology 62:991–999.

Huey, R.B., E.R. Pianka, and T.W. Schoener. 1983. Lizard Ecology: Studies of a Model Organism. Harvard University Press, Cambridge, Massachusetts, USA.

Ibrahim, A. 2003. Diet and reproduction of the Indian-leaf Gecko, *Hemidactylus flaviviridis* (Sauria: Gekkonidae) in Ismailia Governorate, with consideration to its distribution in the Suez Canal area, Egypt. Union of Arab Biologist 19:125– 151.

Ibrahim, A. 2004. Behavioural ecology of the White-spotted Gecko *Tarentola a*. *annularis* (Reptilia: Gekkonidae) in Ismailia City, Egypt. Zoology in the Middle East 31:23–38.

Ibrahim, A. 2007. Ecology of the Fan-toed Gecko, *Hemidactylus turcicus* in Al–Arish City, North Sinai, Egypt. Zoology in the Middle East 41:41–54.

Ibrahim, A. 2008. Ecology of the Moorish Gecko, *Tarentola mauritanica* in Northern Sinai, Egypt, with some comparisons to populations in northwest Libya. Egyptian German Society Union of Life Sciences 55:59–81.

Ibrahim, A. 2013. Ecology of the Rough-tailed Gecko, *Cyrtopodion scabrum* (Sauria: Gekkonidae) in the Suez Canal Zone, Egypt. Journal of Herpetology 47:148–155.

Ibrahim, A., and S. Busais. 2016. Ecological study of the fan-toed gecko, *Ptyodactylus hasselquistii* in the Ha'il region, Saudi Arabia. Egyptian Journal of Zoology 8(1), 1–9. https://doi.org/10.12816/0027815.

Ibrahim, A.A., M.A. Saleh, J.R. Dixon, and I.M. Abdel Nabi. 2000. On the ecology of the Fringe-toed Lizard, *Acanthodactylus scutellatus scutellatus* (Sauria: Lacertidae) in northern Sinai, Egypt. Journal of the Egyptian German Society 32:335–355.

Klawinski, P.D., R.K Vaughan, D. Saenz, and W. Godwin. 1994. Comparison of dietary overlap between allopatric and sympatric geckos. Journal of Herpetology 28:225–230.

Lamb, A.D., C.A. Lippi, G.J. Watkins-Colwell, A. Jones, D.L. Warren, T.I. Iglesias, C. Matthew, M.C. Brandley, and A. Dornburg. 2021. Comparing the dietary niche overlap and ecomorphological differences between invasive *Hemidactylus mabouia* geckos and a native gecko competitor. Ecology and Evolution 11:18719–18732.

Laoufi, H., A. Mouane, S. Aouimeur, B. Merabti, and M.S. Mehaoua. 2023. Sexual dimorphism and dietary composition of the Sandfish Lizard, *Scincus scincus* (Linnaeus, 1758) of southeastern Algeria. Acta Fytotechnica et Zootechnica 26:263–272.

Larkem, I., N. Benchikha, S. Domandji, and M.B. Domandji. 2017. Inventory of arthropods on *Sesbania aculeata* in the Algerian Sahara and quantification of phenolic compounds by HPLC. Journal of Fundamental and Applied Sciences 9:1569–1584.

Le Berre, M. 1989. La faune du Sahara: I, Poissons, Amphibiens, Reptiles. Raymond Chabaud Chevalier, Coll (Terre Africaine), Paris, France.

Legendre, L., and P. Legendre. 1998. Numerical Ecology. 2nd Edition. Elsevier, New York, New York, USA.

Legler, J.M., and L.J. Sullivan. 1979. The application of stomach-flushing to lizards and anurans. Herpetologica 35:107–110.

Levins, R. 1968. Evolution in Changing Environments: Some Theoretical Explorations. Princeton University Press. Princeton, New Jersey, USA.

Liang, T., S. Meiri, and L. Shi. 2021. Sexual size dimorphism in lizards: Rensch's rule, reproductive mode, clutch size, and line fitting method effects. Integrative Zoology 2021:1–17. https://doi.org/10.1111/1749-4877.12569.

Luiselli, L., and G. Amori. 2016. Diet. Pp. 100–111 *In* Reptile Ecology and Conservation: A Handbook of Techniques. Dodd, C.K., Jr. (Ed.). Oxford University Press, Oxford, UK.

Magurran, A.E. 2004. Measuring Biological Diversity. Wiley-Blackwell, New York, New York, USA.

Mamou, R., F. Marniche, M. Amroun, and A. Herrel. 2016. Trophic ecology of two sympatric lizard species: the Algerian Sand Lizard and the Wall Lizard in Djurdjura, northern Algeria. Zoology and Ecology 26:256–264.

Martinez del Marmol, G., J.D. Harris, P. Geniez, P. de Pous, and D. Salvi. 2019. Amphibians and Reptiles of Morocco. Edition Chimaira, Frankfurt am Main, Germany.

Medin, D.E. 1970. Stomach content analyses: collections from wild herbivores and birds. Pp. 133–145 *In*: Range and Wildlife Habitat Evaluation - A Research Symposium. Miscellaneous Publication No. 1147, U.S. Forest Service, Flagstaff and Tempe, Arizona, USA.

Moore, J. A., C. H. Daugherty, and N. J. Nelson. 2009. Large male advantage: phenotypic and genetic correlates of territoriality in Tuatara. Journal of Herpetology 43:570–578.

Mouane, A. 2020. Contribution à l'étude de l'écologie de l'herpétofaune du Sahara septentrional. Ph.D. Dissertation, University of Biskra, Algeria. 155 p.

Mouane, A., D. Bourougaa, M. Hamdi, and S. Aouimeur. 2023. Diet of invasive Rough Bent-toed Gecko, *Cyrtopodion scabrum* (Heyden, 1827), in southeastern Algeria. Archives of Pathology and Laboratory Medicine 57:315–324.

Mouane, A., D. Bourougaa, M. Hamdi, K. Boudjerada, A. Harrouchi, I. Ghennoum, M. Sekkour, and H. Chenchouni. 2021. The Rough Bent-toed Gecko *Cyrtopodion scabrum* (Heyden, 1827) (Squamata: Gekkonidae): first records in Algeria and NW Africa with morphometric and meristic description of population. African Journal of Ecology 59:312–319.

Mouane, A., M. Sekour, A. Harrouchi, I. Ghennoum, and S. Aouimeur. 2020. Diversity and morphometric of Sauria (reptile) in the Algerian northern Sahara. International Journal of Sciences and Research 76:162–184.

Mouane, A., A. Si Bachir, I. Ghennoum, and A. Harrouchi. 2013. Premières données sur la diversité de l'herpétofaune de l'Erg oriental (Région du Souf - Algérie). Bulletin de la Société Herpétologique de France 148:491–502.

Office National de la Météorologie. 2023. Climatological bulletin of the Oued station. Office National de la Météorologie, Archive Service, Algeria. 22 p.

Ouldaissa, F. and S. Doumandji. 2025. Overview on the trophic ecology of the Moorish Gecko, *Tarentola mauritanica* (Linnaeus 1758) (Reptilia: Phyllodactylidae) in a suburban ecosystem in Algiers. Ecologia Mediterranea 50:3–14.

Pianka, E.R. 1986. Ecology and Natural History of the Desert Lizards: Analysis of the Ecological Niche and Community Structure. Princeton University Press, Princeton, New Jersey, USA.

Pianka, E.R., and L. Vitt. 2003. Lizards: Windows to the Evolution of Diversity. University of California Press, Berkeley, California. USA.

Pincheira, D., and J. Hunt. 2017. Fecundity selection theory: concepts and evidence. Biological Reviews 92:341–356.

Quezel, P. 1978. Analyses of the flora Mediterranean and Saharan Africa. Annals of the Missouri Botanical Garden 65:479–535.

Ramade, F. 1984. Eléments d'Écologie: Éologie Fondamentale. McGraw Hill, Paris, France.

Rieppel, O. 1981. *Tarentola mauritanica* (Linnaeus 1758) - Mauergecko. Pp. 119–133 *In* Handbuch der Reptilien und Amphibien Europas. Band 1: Echsen (Sauria). I. (Gekkonidae, Agamidae, Chamaeleonidae, Anguidae, Amphisbaenidae, Scincidae, Lacertidae). Böhme, W. (Ed.). Verlag, Wiesbaden, Germany.

Rödder, D., M. Solé, and W. Böhme. 2008. Predicting the potential distributions of two alien invasive house geckos (Gekkonidae: *Hemidactylus frenatus*, and *Hemidactylus mabouia*). North-Western Journal of Zoology 4:236–246.

Rouag, R. 2016. Approche fonctionnelle de l'écologie de deux espèces de Reptiles Lacertidés insectivores (*Psammodromus algirus* et *Acanthodactylus erythrurus*) et d'un reptile chélonien phytophage (*Testudo graca graeca)*, dans un maquis dunaire du parc national d'El-Kala (Wilaya d'El-Tarf). Ph.D. Dissertation. University Badji Mokhtar - Annaba, Algeria. 169 p.

Rouag, R., I. Berrahma, and L. Luiselli. 2006. Food habits and daily activity patterns of the North African

Ocellated Lizard *Timon pater* from northeastern Algeria, Journal of Natural History 40:1369–1379.

Saenz, D. 1996. Dietary overview of *Hemidactylus turcicus* with possible implications of food partitioning. Journal of Herpetology 30:461–466.

Shannon, C.E., and W. Weaver. 1949. The Mathematical Theory of Communication. University of Illinois Press, Urbana, Illinois, USA.

Salvidio, S., and M. Delaugerre. 2003. Population dynamics of the European Leaf-toed Gecko (*Euleptes europaea*) in NW Italy: implications for conservation. Herpetological Journal 13:81–88.

Saoudi, M., A. Necer, I. Bouam, F. Khelfaoui, and O. Saadi. 2017. Daily activity, biometry and diet of the North African Ocellated Lizard *Timon pater* in Mount Chélia, north-eastern Algeria. African Journal of Herpetology 66(1):1–11. https://doi.org/10.1080/21564574.2016.1271834.

Schleich, H.H., W. Kästle, and K. Kabisch. 1996. Amphibians and Reptiles of North Africa. Koletz Scientific Books, Koeningstein, Germany.

Schoener, T.W. 1971. Theory of feeding strategies. Annual Review of Ecology and Systematics 2:369–404.

Schoener, T.W., and D.H. Janzen. 1968. Notes on environmental determinants of tropical versus temperate size patterns. American Naturalist 102:207–224.

Stephens, D.W., and J.R. Krebs. 1986. Foraging Theory. Princeton University Press. Princeton, New Jersey, USA.

Toutain, G. 1979. Elément d'Agronomies Sahariennes. De la Recherche au Développement. Éditions Institut National de la Recherche Agronomique (INRA), Paris, France.

Trape, J.F., S. Trape, and L. Chirio. 2012. Lézards, crocodiles et tortues d'Afrique occidentale et du Sahara. IRD Éditions - Institut de Recherche pour le Développement, Marseille, France.

Vitt, L.J., and E.R. Pianka. 1994. Lizard Ecology. 1st Edition. Princeton University Press, Princeton. New Jersey, USA.

Voisin, P. 2004. Le Souf Monographie. El-Walid publishers, Algeria.

Wapstra, E., and R. Swain. 1996. Feeding ecology of the Tasmanian Spotted Skink, *Niveoscincus ocellatus* (Squamata: Scincidae). Australian Journal of Zoology 44:205–213.

Werner, Y.L., A. Bouskila, S.J. Davis, and N. Werner. 1997. Observations and comments on active foraging in geckos. Russian Journal of Herpetology 4:34–39.

Werner, Y.L., H. Takahashi, Y. Yasukawa, and H. Ota. 2006. Factors affecting foraging behaviour, as seen in a nocturnal ground lizard, *Goniurosaurus kuroiwae kuroiwae*. Journal of Natural History 40:439–459.

Znari, M.E., E. El Mouden, H. Benfaidah, and A. Boumezzough. 2000. Spatial and trophic resource partitioning among an insectivorous lizard community in the central Jbilet Mountains (Western Morocco). Revue d'Écologie (La Terre et La Vie) 55:141–160.

Zuffi, M., R. Sacchi, F. Pupin, and T. Cencetti. 2011. Sexual size and shape dimorphism in the Moorish Gecko (*Tarentola mauritanica*, Gekkota, Phyllodactylidae). North-Western Journal of Zoology 7:189–197.

Bahia Bacha is an Ecologist involved in wetland biodiversity since 2004. She received her Engineering state degree in Plant Ecology and Environment from Hadj Lakhdar University of Batna (Algeria), and a Magister Degree in Animal Ecology from Mohammed Khider University of Biskra (Algeria). Currently, Bahia works as Assistant Professor and is doctoral student at Mohamed Khider University of Biskra (Algeria). Her primary research goal is on the diversity of squamates in Saharan regions (inventory, morphometric variation, diet, protection status). (Photographed by Mouane Aicha).

Aicha Mouane is a Researcher and Lecturer in Biological Sciences at the University of El Oued, Algeria. She obtained her Master's and Ph.D. degrees from Mohamed Khider University of Biskra, Algeria, where her research focused on the diversity, ecology, and conservation of Saharan reptiles. Her research interests primarily include zoology, biodiversity conservation, wildlife ecology, and animal biology, with particular emphasis on reptiles and their ecological importance. Aicha has contributed to several scientific studies on reptile diversity, ecology, and conservation, as well as broader topics related to vertebrate fauna and environmental sustainability. Her work aims to enhance knowledge of animal biodiversity and support conservation efforts through scientific research and interdisciplinary approaches. (Photographed by Mouane Salah).

Adel A. Ibrahim is a Professor Emeritus at the Faculty of Science, Suez University, Egypt. In 1990, he submitted the first Master's thesis on reptiles in Sinai. He received his Ph.D. in Herpetology on the reptile community in Sinai, Egypt, and on the free-ranging snakes in Texas, USA, through a joint channel system supervision with Texas A&M University, College Station, USA. Adel has done extensive fieldwork during the past decades in Egypt, Libya, and Saudi Arabia to study the ecology, behavior, and conservation of amphibians and reptiles. His work in the Suez Canal zone, Egypt, for more than 10 y revealed several new species records and documented how irrigation canals and urbanization facilitated species migration from the River Nile into the canal zone and how environmental changes affect herpetofaunal distribution. His research filled gaps in poorly studied regions in the Suez Canal area, Egypt, southern Libya, Saudi Arabia, and Algeria. Adel also has an interest in molecular phylogeny and has worked on the Diademed Sand Snake (*Lytorhynchus diadema*) populations in Saudi Arabia. (Photographed by Salem Busais).

Abdallah Aouadi is a Lecturer at the University of Chadli Bendjedid El Tarf, Algeria, since 2022 and a Ph.D. Researcher in Ecology, with research interests focused on freshwater ecosystems, wetlands, waterbirds, macroinvertebrates, biodiversity conservation, species distribution modeling, the impacts of climate change on species and habitats, as well as the study of environmental perception, attitudes, awareness, and public engagement in biodiversity conservation. His work combines field ecology, spatial analysis, ecological modeling, and socio-ecological approaches to support the conservation of aquatic biodiversity and promote sustainable environmental management. (Photographed by Faycel selmi).

Souad Aouimeur, earned her Ph.D. in Agricultural Sciences with a specialization in Plant Protection from Kasdi Merbah University of Ouargla, Algeria, in 2025. She previously obtained a Master's degree in Agricultural Sciences, specializing in Applied Entomology and Natural Environment Conservation, in 2016, and an Engineering degree in Agricultural Sciences with a specialization in Plant Protection (Entomology) in 2012. Souad also holds a Baccalaureate in Mathematics obtained in 2005. Her research interests include entomology, arthropods, date palm pests, and agricultural crop pests. She has conducted several scientific studies on the bioecology of insect pests affecting date palms in southeastern Algeria, contributing to a better understanding of their ecology and impact on agricultural ecosystems. (Photographed by Touahir Zakaria).

Hayat Laoufi is a Researcher and Lecturer in Biological Sciences at the University of El Oued, Algeria. She obtained her Master's and Ph.D. degrees from Mohamed Khider University of Biskra, Algeria. Her research interests focus on herpetology, reptile ecology, biodiversity assessment, and species conservation in desert and semi-desert ecosystems. Hayat has participated in several scientific studies addressing reptile distribution, habitat use, ecological adaptations, and biodiversity conservation. Through her research and academic activities, she contributes to improving scientific knowledge of reptile ecology and supporting conservation strategies for wildlife in arid environments. (Photographed by Emma Guemari).

Appendix

Appendix Table. Number percent (PF), Volume percent (V%), frequency of occurrence (Occ%), and Index of Importance of food items found in the stomachs of Desert Wall Geckos (*Tarentola deserti*) ranked according to Index of Relative Importance.

	Sex												Seasons			
	Total				Males				Females				Spring	Summer	**Autumn**	**Winter**
Food Item	PF	V (%)	Occ %	IRI	PF	V (%)	Occ %	IRI	PF	V (%)	Occ %	IRI	PF	PF	PF	PF
Diptera	27.6	23.1	57.1	2895.9	26.1	24.0	53.7	2685.1	28.9	25.6	60.5	3295.6	22.7	14.2	52.7	12.9
Coleoptera	19.5	26.2	60.7	2771.4	21.2	27.1	65.9	3184.5	18.0	29.0	55.8	2621.4	13.8	33.3	13.2	16.1
Hymenoptera	26.4	7.9	60.7	2077.5	27.0	6.2	63.4	2102.7	25.8	6.8	58.1	1896.0	33.2	28.4	13.2	32.3
Arachnida: Aranea	8.9	6.8	38.1	597.8	9.3	8.0	39.0	674.7	8.6	3.3	37.2	442.8	9.4	7.8	5.4	25.8
Orthoptera	4.2	20.9	22.6	566.4	4.4	18.5	22.0	503.8	3.9	20.5	23.3	567.3	3.9	4.3	4.7	3.2
Lepidoptera	2.7	8.6	14.3	160.8	2.7	9.2	12.2	144.3	2.7	7.4	16.3	164.6	3.3	2.1	2.3	3.2
Homoptera	5.8	0.4	20.2	125.5	5.8	0.4	17.1	105.5	5.9	0.4	23.3	146.3	6.6	4.3	6.2	6.5
Blattodea	2.7	5.7	14.3	119.6	2.7	6.7	12.2	114.2	2.7	6.3	16.3	146.9	4.4	2.8	0.8	–
Collembola: Entomobryomorpha	1.5	0.01	7.1	10.4	0.9	0.01	4.9	4.3	2.0	0.01	9.3	18.2	1.7	2.1	0.8	–
Malacostraca: Isopoda	0.4	0.5	2.4	2.2	–	–	–	–	0.8	0.6	4.7	6.2	0.6	0.7	–	–
Neuroptera	0.4	0.1	2.4	1.2	–	–	–	–	0.8	0.1	4.7	4.2	0.6	–	0.8	–