



Bird diversity and annotated checklist of Afrotropical species in extreme south of Algeria

Diversidad de aves y lista comentada de especies afrotropicales en el extremo sur de Argelia

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ABSTRACT

The effort to uncover avifauna in the extreme south of Algeria has been concentrated within the Timiaouine region. This region is an understudied area in the extreme south of Algeria and the northern part of Adrar of Ifoghas. 67 species were recorded, belonging to 32 families and 12 orders. The African Collared Dove (*Streptopelia roseogrisea*) was recorded for the first time in Algeria, additionally, there is a noteworthy mention of eleven Afrotropical bird species (*Clamator jacobinus*, *Pterocles exustus*, *Oena capensis*, *Urocolius macrourus*, *Merops albicollis*, *Dendropicos elachus*, *Eremopterix nigriceps*, *Eremalauda dunni*, *Spiloptila clamans*, *Lamprotornis pulcher*, *Cercotrichas podobe*, *Passer griseus* and *Corvus albus*) that were either newly observed or rarely documented in the extreme southern region of Algeria.

Keywords — Birds, New record, Checklist, Afrotropical, Algeria.

► Ref. bibliográfica: Boulaouad, B. A.; Djetti, T.; Belkacem, M.; Ailam, O.; Harzallah, B.; Missoum, M.; Ayyache, K.; Telailia, S. 2024. "Bird diversity and annotated checklist of Afrotropical species in extreme south of Algeria". *Acta zoológica lilloana* 68 (1): 17-27. DOI: <https://doi.org/10.30550/j.azl/1849>

► Recibido: 9 de septiembre 2023 – Aceptado: 1 de noviembre 2023.



► URL de la revista: <http://actazoologica.lillo.org.ar>

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RESUMEN

Los esfuerzos realizados para descubrir la avifauna en el extremo sur de Argelia se han concentrado dentro la región de Timiaouine. Esta región es un área poco estudiada en el extremo sur de Argelia y la parte norte del Adrar de los Iforas. Se registraron 67 especies pertenecientes a 32 familias y 12 órdenes. La paloma de collar africana (*Streptopelia roseogrisea*) fue registrada por primera vez en Argelia, además de once especies de aves afrotropicales (*Clamator jacobinus*, *Pterocles exustus*, *Oena capensis*, *Urocolius macrourus*, *Merops albicollis*, *Dendropicos elachus*, *Eremopterix nigriceps*, *Eremalauda dunni*, *Spiloptila clamans*, *Lamprolornis pulcher*, *Cercotrichas podobe*, *Passer griseus* and *Corvus albus*) que fueron recientemente observadas o raramente documentadas en la región del extremo sur de Argelia.

Palabras clave — Aves, Nuevo registro, lista de chequeo, Afrotropical, Argelia.

INTRODUCTION

The Badji Mokhtar region, and more particularly the area of Timiaouine in the extreme south of Algeria near the Malian border, is an ecoregion situated between the Palearctic and tropical zones. The main types of habitats include predominantly rocky mountainous regions, riverbeds, flat sandy or rocky “regs,” and wet depressions resulting from sporadic rainfall.

The limited information regarding avifaunal biodiversity and the phenological status of birds species in the region dates back to the last century (Heim de Balsac and Mayaud, 1962; Ledant et al., 1981; Isenmann and Moali, 2000; Brito et al., 2014). The emergence of national amateur naturalists organized within non-governmental organisations (NGOs) has motivated them to conduct more comprehensive field surveys in these geographically challenging and difficult-to-reach areas.

These efforts have resulted in the observation of bird species that were previously undocumented in Timiaouine. As an example, new bird species recorded for Algeria include the Rüppell’s Warbler (*Sylvia ruppeli*) (Haddad and Afoutni, 2019). Other recently observed species include the Dunn’s Lark (*Eremalauda dunni*) (Harzallah, Ayyach, Benmokhtar, Telailia, 2021), and the Jacobin Cuckoo (*Clamator jacobinus*) (Haddad and Aftouni, 2020). Furthermore, the White-throated Bee-eater (*Merops albicollis*), Cut-throat Finch (*Amadina fasciata*), and Village Indigobird (*Vidua chalybeata*) have been recorded (Boulaouad et al., 2022). The Goertan Woodpecker (*Dendropicos goertae*) (Haddad and Aftouni, 2022), and the Namaqua Dove (*Oena capensis*) have also been observed in the region.

Our understanding of the avian diversity in the southernmost region of Algeria is currently limited. This study aims to fill this knowledge gap by providing the initial findings regarding bird species in this extreme southern area of Algeria and discussing the presence of afrotropical species in this region.

MATERIALS AND METHODS

Study Area

The study area, Timiaouine, is situated in the southwestern region of Algeria, spanning between longitudes $1^{\circ} 20'$ and $2^{\circ} 30'$ East, and latitudes 20° and 22° North, near the border with Mali. It covers a distance of 950 km southeast of Adrar, 150 km southeast of Bordj Badji Mokhtar, 465 km southwest of Tamanrasset, and 1820 km south of Algiers (Fig. 1). The area's elevation is 582 meters (1,909 ft), located in the northern part of the Adrar des Ifoghas, a vast massif within the Sahara Desert that extends further south to Kidal, Mali.

The climate within the study area is classified as a hot desert type (Köppen climate classification BWh). Summers are extremely hot, while winters are more moderate. The region experiences very low summer precipitation, with an average of 47.7 mm per year. The majority of precipitation falls between July and August, whereas the rest of the year sees minimal to no rainfall. The annual average temperature is 27.7°C (Nasri, Benatallah, Kaloum, Soulimani, 2017).

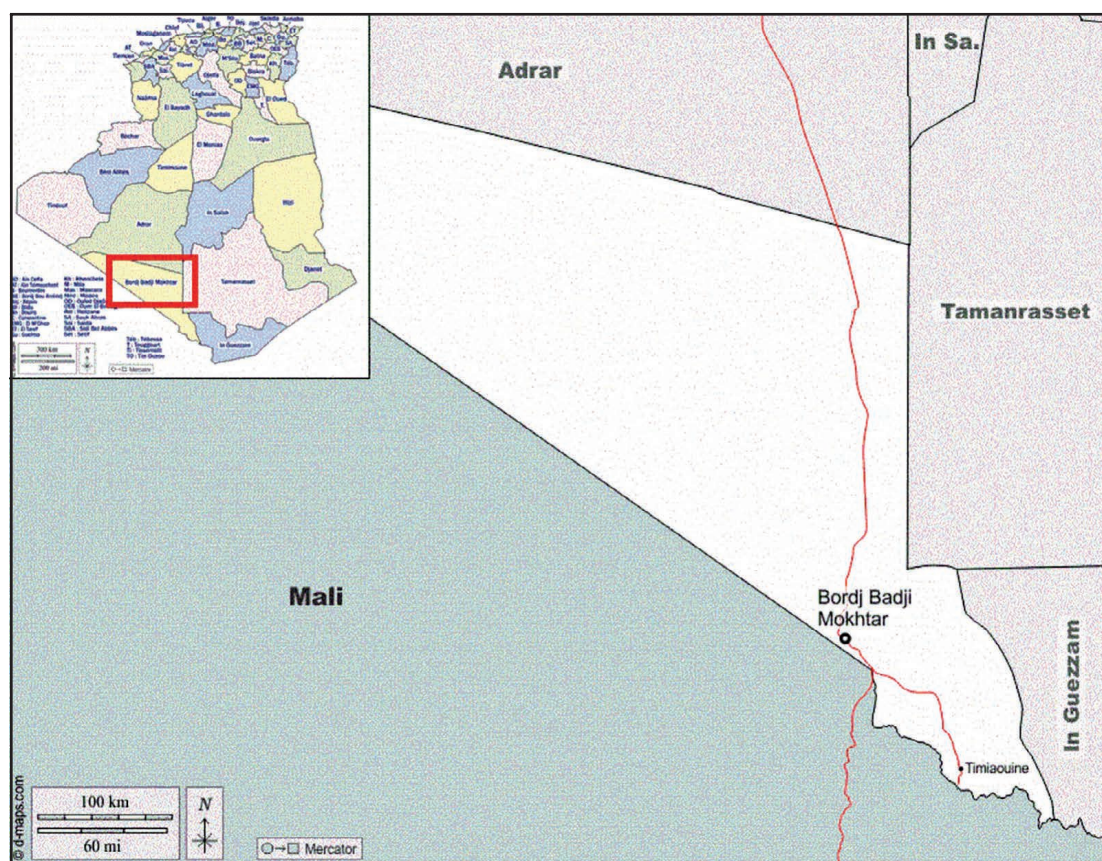


Figure 1. Location of Timiaouine region, Algeria.

Figura 1. Ubicación de la región de Timiaouine, Argelia.

Data Collection

Bird surveys were carried out between October and November 2022 in the Timiaouine region. These inventories employed direct observation, utilizing camera equipment including a Nikon P900 camera (with an $\times 83$ zoom) and a Canon 7D II with a 150-600 mm lens. Additionally, the line transect method has been used in this study. This technique consists of walk in the study locality, a well-defined route several times, while advancing at a steady speed (1 to 2 km/h), marking a stop every 20 meters, and noting and photographing all birds seen and heard by locating them in the course (Bibby, Burgess, Hill, Mustoe, 2000; Boulaouad et al., 2021, 2022). Identification of bird species was conducted using standard field guides (Svensson, 2012). We utilised information from Isenmann and Moali (2000) regarding the geographic distribution and phenological status of birds in Algeria.

RESULTS

During the course of this study, a comprehensive inventory of bird species in the Timiaouine area was conducted, resulting in the identification of 66 species (Table 1). These species were classified into 15 orders and 32 families. The dominant bird families observed were Muscicapidae and Alaudidae, each comprising seven species, followed by Columbidae with six species.

In this region, the distribution of bird species based on their origins is as follows: Palearctic species (PA) constitute the predominant category, representing approximately 42.42% of the total 66 observed species. saharo-sindien (SS) species account for around 15.15%, while Afro-Tropical (AT) species make up about 16.67%. The species with origin Saharan/Sahelian (SA/SL) make up roughly 4.55% of the total, followed by Palearctic/Afro-Tropical (PA/AT) species at approximately 7.58%. Palearctic/Sahelian (PA/SL) species are less represented, accounting for only about 1.51%. Lastly, Sahelian species (SL) represent approximately 10.61% of the total. This distribution of species provides insights into the avian diversity in the region based on their respective origins.

Among the 66 species observed, insectivores constitute the majority, accounting for more than 54% (36 insectivorous species), followed by granivorous species (23 species; 34%). Additionally, five carnivorous species are primarily represented by diurnal raptors. It's worth noting that in this particular region, only the Brown-necked Raven and the Egyptian Vulture are considered scavenger birds.

BRIEF REMARKS ON THE AFROTROPICAL SPECIES OBSERVED IN THE EXTREME SOUTH OF ALGERIA

Jacobin or Pied Cuckoo

Clamator jacobinus

The Jacobin or Pied Cuckoo (*Clamator jacobinus*) was observed by Haddad and Afoutni in 2020 in Tamanrasset. A second observation of a juvenile bird took place in

Table 1. Checklist of birds observed in the extreme south of Algeria.

Tabla 1. Lista de aves observadas en el extremo sur de Argelia.

Ordre	Famille	Latin	Anglais	Origine	R.A.
Caprimulgiformes	Caprimulgidae	<i>Caprimulgus europaeus</i>	European Nightjar	PA	In
		<i>Caprimulgus aegyptius</i>	Egyptian Nightjar	SS	In
Apodiformes	Apodidae	<i>Apus apus</i>	Common Swift	PA	In
Cuculiformes	Cuculidae	<i>Clamator glandarius</i>	Great Spotted Cuckoo	PA/AT	In
		<i>Clamator jacobinus</i>	Jacobin Cuckoo	AT	In
Pterocliiformes	Pteroclididae	<i>Pterocles exustus</i>	Chestnut-bellied Sandgrouse	SS	G
		<i>Pterocles senegallus</i>	Spotted Sandgrouse	SS	G
Columbiformes	Columbidae	<i>Columba livia</i>	Rock Dove	PA	G
		<i>Streptopelia turtur hoggara</i>	European Turtle Dove	PA	G
		<i>Streptopelia decaocto</i>	Eurasian Collared Dove	PA	G
		<i>Spilopelia senegalensis</i>	Laughing Dove	AT	G
		<i>Streptopelia roseogrisea</i>	African Collared Dove	SL	G
		<i>Oena capensis</i>	Namaqua Dove	AT	G
Charadriiformes	Recurvirostridae	<i>Himantopus himantopus</i>	Black-winged Stilt	PA	In
		<i>Recurvirostra avosetta</i>	Pied Avocet	PA	In
	Charadriidae	<i>Charadrius dubius</i>	Little Ringed Plover	PA	In
		<i>Calidris alpina</i>	Dunlin	PA	In
		<i>Tringa stagnatilis</i>	Marsh Sandpiper	PA	In
		<i>Tringa glareola</i>	Wood Sandpiper	PA	In
	Glareolidae	<i>Cursorius cursor</i>	Cream-colored Courser	PA/SL	In
Ciconiiformes	Ciconiidae	<i>Ciconia ciconia</i>	White Stork	PA	In
Pelecaniformes	Threskiornithidae	<i>Platalea leucorodia</i>	Eurasian Spoonbill	PA	In
		<i>Bubulcus ibis</i>	Western Cattle Egret	AT	In
	Ardeidae	<i>Ardea cinerea</i>	Grey Heron	PA/AT	In
		<i>Egretta garzetta</i>	Little Egret	PA/AT	In
Accipitriformes	Accipitridae	<i>Neophron percnopterus</i>	Egyptian Vulture	PA	Cr
		<i>Circus aeruginosus</i>	Western Marsh Harrier	PA	Cv
		<i>Circus pygargus</i>	Montagu's Harrier	PA	Cv
		<i>Buteo buteo</i>	Common Buzzard	PA	Cv
Coliiformes	Coliidae	<i>Urocolius macrourus</i>	Blue-naped Mousebird	AT	
Bucerotiformes	Upupidae	<i>Upupa epops</i>	Eurasian Hoopoe	AT	In
Coraciiformes	Meropidae	<i>Merops albicollis</i>	White-throated Bee-eater	AT	In
Piciformes	Picidae	<i>Dendropicos elachus</i>	Little Grey Woodpecker	SL	In
Falconiformes	Falconidae	<i>Falco tinnunculus</i>	Common Kestrel	PA/AT	Cv
		<i>Falco biarmicus</i>	Lanner Falcon	AT	Cv
Passeriformes	Laniidae	<i>Lanius excubitor meridionalis</i>	Great Grey Shrike	SA/SL	In
	Corvidae	<i>Corvus ruficollis</i>	Brown-necked Raven	SA/SL	Cr
	Alaudidae	<i>Alaemon alaudipes</i>	Greater Hoopoe-Lark	SS	G
		<i>Ammomanes deserti</i>	Desert Lark	SS	G
		<i>Eremopterix nigriceps</i>	Black-crowned Sparrow-Lark	AT	G
		<i>Galerida cristata</i>	Crested Lark	PA/AT	G
		<i>Calandrella brachydactyla</i>	Greater Short-toed Lark	PA	G
		<i>Melanocorypha calandra</i>	Calandra Lark	PA	G
		<i>Eremalauda dunni</i>	Dunn's Lark	SL	G
		<i>Ptyonoprogne obsoleta</i>	Pale Crag Martin	SS	In
	Hirundinidae	<i>Hirundo rustica</i>	Barn Swallow	PA	In
		<i>Phylloscopus collybita</i>	Common Chiffchaff	PA	In
	Cisticolidae	<i>Spiloptila clamans</i>	Crickit Warbler	SL	In
	Sylviidae	<i>Curruca melanocephala</i>	Sardinian Warbler	PA	In
	Leiothrichidae	<i>Argya fulva</i>	Fulvous Babbler	SS	In
	Sturnidae	<i>Lamprotornis pulcher</i>	Chestnut-bellied Starling	SL	G
	Muscicapidae	<i>Cercotrichas podobe</i>	Black Scrub Robin	SL	In
		<i>Cercotrichas galactotes</i>	Rufous-tailed Scrub Robin	AT	In
		<i>Muscicapa striata</i>	Spotted Flycatcher	PA	In
		<i>Oenanthe oenanthe</i>	Northern Wheatear	PA	In
		<i>Oenanthe deserti</i>	Desert Wheatear	PA	In
		<i>Oenanthe hispanica</i>	Western Black-eared Wheatear	PA	In
		<i>Oenanthe leucopyga</i>	White-crowned Wheatear	SS	In
		<i>Passer simplex</i>	Desert Sparrow	SS	G
		<i>Passer luteus</i>	Sudan Golden Sparrow	SL	G
		<i>Passer griseus</i>	Northern Grey-headed Sparrow	AT	G
	Estrildidae	<i>Euodice cantans</i>	African Silverbill	AT	G
	Motacillidae	<i>Motacilla flava</i>	Western Yellow Wagtail	PA	In
		<i>Motacilla alba</i>	White Wagtail	PA	In
	Fringillidae	<i>Bucanetes githagineus</i>	Trumpeter Finch	SS	G
	Emberizidae	<i>Emberiza sahari</i>	House Bunting	SA/SL	G

Tawandert in October 2022, followed by a third observation in the same area by Soukkou, Hadoun and Seddiki in November 2022.

Chestnut-bellied Sandgrouse

Pterocles exustus

The Chestnut-bellied Sandgrouse was recorded for the second time in May 2019 within the Tinzwatine region, situated 450 km southwest of Tamanrasset city (Boulaouad et al., 2021). According to Isenmann and Moali (2000), the initial observation of this species occurred on May 23th 1987, between Gara Ekar and Asamakka along the Algerian-Niger border.

The African Collared Dove

Streptopelia roseogrisea

It was observed for the first time in Algeria in the valley of Tawandart on October 16th, 2022. This sighting included a group of companion species: *Streptopelia turtur hoggara*, *Streptopelia decaocto*, *Spilopelia senegalensis*, *Streptopelia roseogrisea*, and *Oena capensis*.

Namaqua dove

Oena capensis

The first observation involved two collected birds in April 1952 at Tamanrasset. This species was reported exclusively between 1950 and 1980 in a limited number of Algerian villages, specifically Tinzwatine, Timiaouine, and Bordj Moktar, all situated in the Adrar des Iforas region, an area bordering Algeria and Mali. A notable observation occurred in October 2022 and was followed by another in November 2022, during which multiple individuals including adults and juveniles of this species were sighted along the route from Timiaouine to Tawandert.

Blue-naped Mousebird

Urocolius macrourus

The Blue-naped Mousebird (*Urocolius macrourus*) was initially observed by Haddad and Bekkouche in 2018 in Tawandert. This marked the first recorded sighting of several individuals (Haddad and Bekkouche, 2021; Boulaouad et al., 2021). A second observation occurred in October 2022, followed by a third sighting in November of the same year, all within the same region. These observations lead us to believe that this species resides in the southernmost part of Algeria.

White-throated Bee-eater

Merops albicollis

It was initially observed with a single individual in Tamanrasset by Boulaouad et al., in 2022. A second observation revealed the presence of multiple individuals of this species in the southern region of Timiaouine during October 2022.

Little Grey Woodpecker
Dendropicos elachus

The Little Grey Woodpecker (*Dendropicos elachus*) was first observed by Haddad and Afoutni in 2022. Later, three individuals were observed in Tawandert in October 2022, the third observation in the same region in November 2022.

Black-crowned sparrow-lark
Eremopterix nigriceps

The first record of this sub-Saharan species was collected or sighted 150 km west of Tamanrasset/Ahaggar in January 1954. Initially identified as Dunn's Lark (*Eremalauda dunni*), it was later determined to be Black-crowned Sparrow-lark. The second observation and confirmation of breeding took place in October 2022, with the presence of both parents and juveniles observed in the Timiaouine region (Boulaouad et al., 2022).

Dunn's Lark
Eremalauda dunni

The fourth observation of Dunn's Lark occurred in the Timiaouine region, marking the first breeding record for Algeria, with the presence of both parents and juveniles observed in October 2022. This follows the initial record on Chegga Hamada (Algeria/Mauritania) on February 28, 1930. The second record of Dunn's Lark was documented to the west of Tamanrasset (Ahaggar) in January 1954, and the third observation took place in Djanet (Harzallah, Ayyache, Benmokhtar, Telailia, 2021).

Cricket Warbler
Spiloptila clamans

This Afrotropical Sahelian species was discovered in October 2022 along the route from Timiaouine to Tawandert, covering a distance of approximately 80 km (Boulaouad, Harzallah, Ayyache, Missoum, Ailam, 2023). It was observed within well-vegetated steppes, often within the dry riverbeds, dominated by substantial clumps of grasses and a varying density of acacia shrubs.

Chestnut-bellied Starling
Lamprotornis pulcher

Originates from the Afrotropical region and belongs to the Sturnidae family. The first observation of this species in Algeria and the Maghreb took place in November 2022 within the Tawandert region. The habitat features vegetation characterized by the presence of a few shrubs such as *Balanites aegyptiaca*, *Salvadora persica*, and *Acacia* (Soukkou, Hadoun, Seddiki, Boulaouad, Ailame, 2023)

Black Scrub Robin

Cercotrichas podobe

The fourth and fifth observations of the Black Scrub Robin in the Tawendert region occurred in October and November 2022. This Sahelian species was initially spotted on February 8, 1968, in Tamanrasset and possibly again on February 12th, 1968, in the Central Hoggar (Isenmann and Moali, 2000).

Northern Grey-headed Sparrow

Passer griseus

The Northern Grey-headed Sparrow, a Sahelian species, is increasingly being noted and is a potential breeder in the Timiaouine region. The first recorded observation in Algeria was in the town of Timiaouine, located in the far south of the country, on October 16th, 2022. The second locality was within the Tawendart region (Boulaouad et al., 2023).

Pied Crow

Corvus albus

This Sahel species occasionally reaches the southernmost part of Algeria. There was one recorded instance in 1961, and another in December 1964 near in Azaoua. The species has also been reported in the Algerian sector of the Adrar des Iforas region, situated near Mali. Furthermore, a second observation occurred in December 2021, this time near the city of Ain Guezzam.

DISCUSSION

A total of 67 species were observed in the study area. The observed bird species represent (67/350) of the avifauna mentioned by Ledant et al., (1981) and (67/406) documented by Isenmann and Moali (2000). A similar number of species (56) and (62) were observed in Tamanrasset and In Guezzam (Boulaouad et al., 2021, 2022). The species richness, and the number of birds confined to deserts and semi-deserts are low compared to more mesic areas (Dean, 2004).

The timing of our surveys did not allow us to observe all the Palearctic migrants that could potentially stop in the region after crossing the Sahara. Instead, only a few species during their migration were observed the case of (*Hirundo rustica*, *Muscicapa striata*, *Oenanthe oenanthe* and *Motacilla flava*).

We were able to observe the breeding of many encountered species, including those that nest during the rainy season, such as the *Emberiza sahari*, *Argya fulva*, *Cercotrichas galactotes*. This is the first mention of autumnal nesting in the south of Algeria (Ledant et al., 1981; Isenmann and Moali, 2000).

The onset and duration of reproduction depend on the timing and intensity of rainfall, occurring between October and early July in different years. Reproduction does not take place during extended periods of drought, which hinders the growth of herbaceous vegetation that provides the seeds on which the species feeds (Bergi-

er and Thevenot, 2019; Clouet, 2008). Moreover, our findings emphasize the close relationship between rainfall patterns and avian reproduction, reinforcing the importance of environmental factors in shaping avian populations. The richness of the Sahel region's avifauna, as documented by Dean (2004), underscores the significance of our observations in this context.

Furthermore, there is potential for additional Sahelian bird species from this mountainous region to be considered as prospective newcomers to the species list in the southernmost part of Algeria in the future, including, for example *Gyps africanus*, *Cypsiurus parvus*, *Melierax metabates*, *Lybius vieilloti*, *Trachyphonus margaritatus*, *Pogoniulus chrysoconus*, *Corvus rhipidurus*, *Oenanthe melanura*, *Lonchura malabarica*, *Hedydipna platura*, *Falco alopex*, *phoeniculus purpureus* underscores the dynamic nature of this ecosystem (Lamarche, 1980; Newby, Grettenberger, Watkins, 1987; Clouet and Goar 2003; Clouet and Joachim 2013; Borrow and Demey 2014).

Our research not only contributes to the ornithological understanding of this region but also provides a platform for continued exploration and inquiry. The co-existence of Palearctic migrants, Afrotropical species, and resident birds in this area offers a rich tapestry for future studies, focusing on the interplay of environmental factors and avian diversity.

In the grander scheme, our work highlights the importance of conservation efforts in protecting the habitats and migratory pathways of these remarkable birds. With this understanding, we hope to contribute to the preservation of avian biodiversity in the face of changing environmental conditions and evolving populations.

ACKNOWLEDGMENTS

We express our gratitude to the residents of the region for their invaluable assistance and extend our appreciation to reviewers for their thorough corrections and insightful comments.

FINANCIAL SUPPORT

This research was conducted without external funding.

CONTRIBUTIONS

BAB was involved in all stages of the research. TD, MB, and OA contributed to the writing of the article and the analysis of the results. BH, MM, and KA participated in the fieldwork, data collection, and species identification. ST was actively involved in species identification.

CONFLICT OF INTEREST

The authors declare no potential conflicts of interest.

CITED LITERATURE

- Bergier, P., Thevenot, M. (2019). Afrotropical species in the southwestern Palearctic: Recent changes in the Atlantic Sahara (Morocco). *Alauda* 87, 25-39.
- Bibby, C. J., Burgess, N. D., Hill, D. A., Mustoe, S. H., (2000). Bird census techniques. 2nd edition, Elsevier.
- Borrow, N., Demey, R. (2014). Field guide to birds of Western Africa. Christopher Helm, London.
- Boulaouad, B. A., Ailam, O., Telailia, S., Harzallah, B., Ayyach, K., Missoum, M., Bekkouch, A., and Lamia, B. (2021). Preliminary checklist of avifauna of Tammanrasset (South of Algeria) with two new records in Algeria. *Journal of Bioresource Management*, 8, 01-10. doi: 10.35691/JBM.1202.0199
- Boulaouad, B. A., Harzallah, B., Ayyach, K., Attouche, K., Soukkou, W., Aissa, D. H., Faïdi, H., and Missoum, M. (2022). A new species for Algeria, White-throated Bee-eater (*Merops albicollis*), observations of probably escaped individuals of Cut-throat Finch (*Amadina fasciata*) and Village Indigobird (*Vidua chalybeata*) and a checklist of southern Sahara birds. *Ornis Hungarica*, 30, 195-207. doi: 10.2478/orhu-2022-0030.
- Boulaouad, B. A., Ayyach, K., Harzallah, B., Missoum, M., Ailam, O., & Telailia, S. (2023). Northern Grey-headed Sparrows in southern Algeria in October 2022. *Dutch Birding*, 45, 187-189.
- Boulaouad, B. A., Harzallah, B., Ayyach, K., Missoum, M., & Ailam, O. (2023). First Records of the Cricket Warbler *Spiloptila clamans* (Cretzschmar, 1826) (Passeriformes: Cisticolidae) in Algeria. *Acta Zoologica Bulgarica*, 75, 1-3.
- Brito, J. C., Godinho, R., Martínez-Freiría, F., Pleguezuelos, J. M., Rebelo, H., Santos, X., Vale, C. G., Velo-Anton, G., Boratynski, Z., Carvalho, S. B., Ferreira, S., Goncalves, D. V., Silva, T. L., Tarroso, P., Campos, J. C., Leite, J. V., Nogueira, J., Alvares, F., Sillero, N., Sow, A. S., Fahd, S., Crochet, P. A., Carranza, S. (2014). Unravelling biodiversity, evolution and threats to conservation in the Sahara-Sahel. *Biological Reviews*, 89, 215-231.
- Clouet, M. (2008). Sur l'avifaune de l'Adrar des Ifoghas (Mali). *Alauda* (Dijon), 76, 65-69.
- Clouet, M., Goar, J. L. (2003). L'avifaune de l'Adrar Tirharhar/Adrar des Iforas (Mali). *Alauda* (Dijon), 71, 469-474.
- Clouet, M., Joachim, J. (2013). Variations in bird communities of the Saharan mountains. *Ostrich*, 84, 205-211. doi: 10.2989/00306525.2013.867550.
- Dean, W. R. J. (2004). *Nomadic Desert Birds: With 32 Tables*. Springer Science and Business Media.
- Haddad, K., Afoutni, L. (2019). Première observation documentée d'une Fauvette de Rüppell *Sylvia ruppeli* en Algérie. *Alauda*, 87.
- Haddad, K., Aftouni, L. (2020). Première observation du Coucou Jacobin *Clamator jacobinus* en Afrique du Nord. *Alauda*, 88, 71-72.
- Haddad, K., Afoutni, L. (2022). Premier signalement du Pic Goertan *Dendropicos goertae* en Afrique du Nord. [First record of African grey woodpecker *Dendropicos goertae* in North Africa]. *Alauda*, 90, 73-76.

- Haddad, K., Bekkouche, S. (2021). Blue-naped Mousebird and Black Scrub Robin at Tamanrasset, Algeria, in 2018-19. *Dutch Birding*, 43, 147-149.
- Harzallah, B., Ayyach, K., Benmokhtar, A., Telailia, S. (2021). Première observation de l'Alouette de Dunn *Eremalaudadunni* en Algérie [First observation of Dunn's Lark in Algeria]. *Alauda*, 89, 293-294.
- Heim de Balsac, H. Mayaud, N. (1962). *Les oiseaux du Nord-Ouest de l'Afrique*. Ed. Lechevalier, Paris. 488 p.
- Isenmann, P., Moali, A. (2000). Oiseaux d'Algérie [Birds of Algeria]. Société d'études ornithologiques de France, Paris (in French).
- Lamarche, B. (1980). Liste commentée des oiseaux du Mali: passereaux. *Malimbus*, 2, 121-158.
- Ledant, J. P., Jacob, J. P., Jacobs, P., Malher, F., Ochando, B., Roche, J. (1981). Mise à jour de l'avifaune Algérienne [Update of the Algerian avifauna]. *Gerfaut*, 71, 295-394. (in French).
- Nasri, B., Benatallah, A., Kaloum, S., Soulimani, S. (2017). Nitrate Impact on the Groundwater Quality Degradation in Arid Areas (Timiaouine Region South of Algeria), in: *Euro-Mediterr. Conf. Environ. Integr.*, Springer, 2017, 669-672. doi: 10.1007/978-3-319-70548-4_198.
- Newby, J., Grettenberger, J., and Watkins, J. (1987). The birds of the Northern Air, Niger. *Malimbus*, 9, 4-16.
- Soukkou, W., Seddiki, F., Hadoun, A., Boulaouad, A. B., Aillam, O. (2023). First sighting of the Chestnut-bellied Starling *Lamprotornis pulcher* in Algeria. *Alauda*, 91, 209-210
- Svensson, L. (2012). *Le guide ornitho* [The Ornitho Guide]. Delachaux et Niestlé (in French).