

A first record of *Hypolimnias misippus* (Linnaeus, 1764) from northwest Africa (Lepidoptera: Nymphalidae)

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Abstract

The Lepidoptera fauna of Algeria is well documented in Mediterranean regions but remains poorly known across the country's Saharan expanse. We report the first confirmed record of *Hypolimnias misippus* (Linnaeus, 1764) in northwestern Africa, based on a solitary male observed and photographed in the Ikenouine wetland in Illizi Province, southeastern Algeria. A notable migrant, the status of this species at the edges of its range remains fluid. The Ikenouine specimen is plausibly a naturally dispersed stray from sub-Saharan Africa. Several host plants associated with *H. misippus* are documented in the broader region. The presence of *H. misippus* at Ikenouine suggests that Saharan wetlands, including those in the Ahaggar and Tassili n'Ajjer massifs, may represent ecological refuges and dispersal stepping-stones along a northward route from sub-Saharan Africa. This record underlines the importance of continued field investigations in remote desert areas of Algeria to better understand Lepidoptera distributions and biogeographic patterns in the region.

Keywords: Lepidoptera, Nymphalidae, *Hypolimnias misippus*, geographic distribution, migration, Sahara, Algeria.

Premier signalement d'*Hypolimnias misippus* (Linnaeus, 1764) en Afrique du Nord-Ouest (Lepidoptera: Nymphalidae)

Résumé

La faune des Lepidoptera de l'Algérie est bien documentée dans les régions méditerranéennes, mais demeure largement méconnue dans l'étendue saharienne du pays. Nous rapportons le premier signalement confirmé d'*Hypolimnias misippus* (Linnaeus, 1764) en Afrique du Nord-Ouest, représenté par un spécimen unique mâle observé et photographié dans la zone humide d'Ikenouine, dans la wilaya d'Illizi, au sud-est de l'Algérie. Espèce migratrice remarquable, son statut aux marges de son aire de répartition demeure incertain. L'exemplaire d'Ikenouine semble être un erratique ayant atteint la région par dispersion naturelle depuis l'Afrique subsaharienne. Plusieurs plantes-hôtes associées à *H. misippus* sont recensées dans la région au sens large. La présence de *H. misippus* à Ikenouine suggère que les zones humides sahariennes, notamment celles des massifs de l'Ahaggar et du Tassili n'Ajjer, pourraient constituer à la fois des refuges écologiques et des relais de dispersion le long d'un axe de migration vers le nord depuis l'Afrique subsaharienne. Ce signalement souligne l'importance de poursuivre les prospections de terrain dans les régions désertiques reculées de l'Algérie, afin de mieux comprendre la répartition et les schémas biogéographiques des Lepidoptera dans la région.

Mots-clés: Lepidoptera, Nymphalidae, *Hypolimnias misippus*, distribution géographique, migration, Sahara, Algérie.

Primer registro de *Hypolimnas misippus* (Linnaeus, 1764) en el noroeste de África (Lepidoptera: Nymphalidae)

Resumen

La fauna de Lepidoptera de Argelia está bien documentada en las regiones mediterráneas, pero sigue siendo poco conocida en la extensión sahariana del país. Presentamos el primer registro confirmado de *Hypolimnas misippus* (Linnaeus, 1764) en el noroeste de África, basado en un macho solitario observado y fotografiado en el humedal de Ikenouine, en la provincia de Illizi, al sureste de Argelia. Esta especie, notable por su migración, tiene un estatus incierto en los límites de su área de distribución. El espécimen de Ikenouine es probablemente un ejemplar disperso de forma natural desde el África subsahariana. En la región se han documentado varias plantas hospedadoras asociadas a *H. misippus*. La presencia de *H. misippus* en Ikenouine sugiere que los humedales del Sáhara, incluidos los de los macizos de Ahaggar y Tassili n'Ajjer, pueden representar refugios ecológicos y puntos de dispersión a lo largo de una ruta hacia el norte desde el África subsahariana. Este registro subraya la importancia de continuar las investigaciones de campo en zonas desérticas remotas de Argelia para comprender mejor la distribución de los Lepidoptera y los patrones biogeográficos de la región.

Palabras clave: Lepidoptera, Nymphalidae, *Hypolimnas misippus*, distribución geográfica, migración, Sáhara, Argelia.

Introduction

The Lepidoptera fauna of Algeria is relatively well-documented, with the earliest data on its diversity provided by Linnaeus, who described several widespread Lepidoptera from Algeria in the mid-18th century (Honey & Scoble, 2001) as a direct result of specimens sent to him by Erik Brander, Swedish Consul in Algiers from 1753 to 1765 (Tennent, 1996). This was followed by several notable contributions, including those of Charles Oberthür (1845-1924) between 1909 and 1912, and Seurat's (1930) synthesis of existing literature, culminating in Tennent's (1996) monograph. In the past decade, there has been a renewed focus on Algerian Lepidoptera, with several studies expanding our knowledge of species diversity, particularly within the country's northern Mediterranean regions (Aissat & Belmihoub, 2024; Berkane et al. 2019; Bouam et al. 2024; Bougaham et al. 2023; Frahtia et al. 2022; Kacha et al. 2020; Laref et al. 2022; Remini & Moulai, 2015; Saouli et al. 2022).

In contrast, the Sahara, which covers the majority of Algeria's territory, remains comparatively underexplored, largely due to the country's vast geographical expanse and the remoteness of many regions (Weiss et al. 2018), both of which make collection of comprehensive data challenging. Most available records are confined to the Ahaggar and Tassili n'Ajjer massifs (Nazari et al. 2025; Speidel & Hassler, 1989; Tennent, 1996). However, recent investigations in previously overlooked areas of the Algerian Sahara have begun to address this gap, enhancing our understanding of Lepidoptera diversity in the region and documenting taxa previously unrecorded in both Algeria and North Africa (Bougaham et al. 2024; Boulaouad et al. 2024).

Hypolimnas misippus (Linnaeus, 1764), commonly known as the Diadem, Danaid Eggfly, or False Plain Tiger, is a medium-sized nymphalid renowned as a strong migrant, having been recorded as far as 322 km out in the ocean (Scott, 1986). The species has a wide pantropical distribution with limited extension into temperate zones, occurring across sub-Saharan Africa, the eastern Mediterranean, the Arabian Peninsula, Indomalaya, Oceania (including the D'Entrecasteaux, the Louisiades and Vanuatu: historical and unpublished data), the Americas (Coetzer & Westrip, 2021), numerous islands, such as Macaronesia including the Cape Verde Islands (Tennent et al. 2013; Tennent & Russell, 2015), the Antilles (Scott, 1986), and Mauritius (Davis & Barnes, 1991). *H. misippus* is notable for its pronounced sexual dimorphism and is a classic example of sex-linked Batesian mimicry. Males are fundamentally black on the upperside, with a violet sheen and prominent white spots, while the various forms of the polymorphic females include striking mimicry of the toxic *Danaus chrysippus* (Linnaeus, 1758) (Orteu et al. 2024).

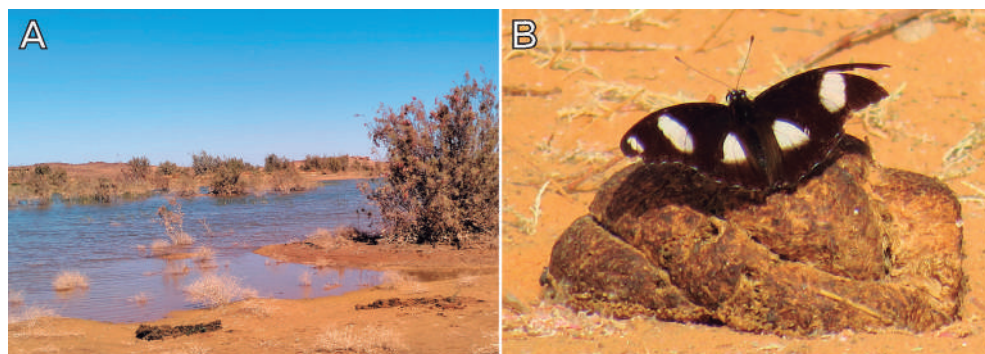
Herein, we document the first reported occurrence of *Hypolimnas misippus* in northwest Africa, specifically in southeastern Algeria.

Materials and Methods

STUDY AREA

Field observations were made during a wildlife photography expedition by the third and fourth authors in the Ikenouine wetland (27.0103°N, 8.7581°E; elevation: 505 m; Figure 1A), located in Illizi Province, southeastern Algeria. This wetland, covering approximately 60 hectares, forms part of a complex of three interconnected wetlands and lies within the North Saharan Xeric Steppe and Woodland ecoregion (Naia & Brito, 2021). Collectively, these sites provide habitat for a variety of taxa, including numerous migratory bird species. Climatic data extracted from the WorldClim database (~1 km² resolution; Fick & Hijmans, 2017), combined with Emberger's pluviothermic quotient as applied by Daget (1977), classify the area within the inferior Saharan bioclimatic zone, characterized by mild winters and extremely low annual precipitation, averaging 21 mm.

Figure 1. (A) View of the Ikenouine wetland, Illizi Province, southeastern Algeria, where the butterfly was observed. **(B)** ♂ *Hypolimnias misippus* (Linnaeus, 1764) photographed at the site on 28-XII- 2024, settled on dung near the water margin. Photographs by Fouad Bederrar.



DATA COLLECTION

To map the global records of *Hypolimnias misippus*, occurrence data were retrieved from the Global Biodiversity Information Facility (GBIF, 2025). While GBIF provides a broad and valuable repository of biodiversity data, its records are subject to various sources of error and spatial bias (Maldonado et al. 2015). To mitigate these limitations, data cleaning procedures were implemented using the “*CoordinateCleaner*” R package (Zizka et al. 2019). Records were excluded if they contained missing or invalid geographic coordinates, coordinate uncertainties exceeding 10 km, or precision values of less than one decimal degree. Additional filtering removed duplicate entries, occurrences located in marine environments, and records falling on country, province, or capital centroids, as well as biodiversity institution coordinates. Further manual validation was performed to ensure data integrity. We also manually added four reliable occurrence points from Turkey, Lebanon, Malta, and Cyprus based on published literature (Hesselbarth et al. 1995; John et al. 2023; Mérit & Mérit, 2007; Sciberras & Sciberras, 2011). The final curated dataset comprised 4,182 occurrence records, which were visualised using ArcGIS v. 10.8.

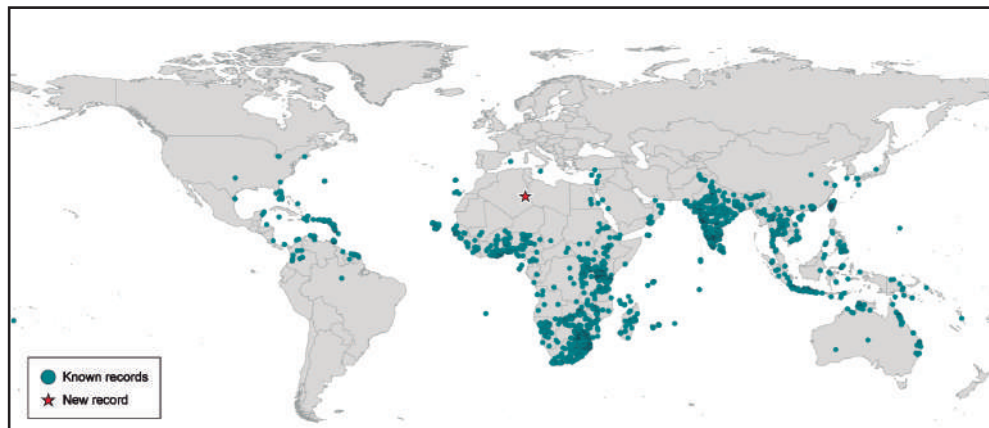
Results and Discussion

On 28-XII-2024, a solitary male *Hypolimnias misippus* (Figure 1B) was observed in active flight and subsequently photographed at the Ikenouine wetland. The individual, which was not collected, had moderate wing damage on the right forewing but appeared otherwise in good condition. This constitutes the first documented record of *H. misippus* in northwestern Africa (Figure 2).

The nearest known *misippus* locality to our observation is Malta, approximately 1,120 km to the north-east, where the species has been reported and speculated to result from anthropogenic introduction, although

no definitive evidence supports this claim (Sciberras & Sciberras, 2011). Similar uncertainties surround its occurrence in other regions, such as North America and the West Indies, where introductions have been proposed but remain unconfirmed (Scott, 1986). Notably, *H. misippus* has also been recorded on isolated oceanic islands, including numerous south Pacific islands (Tennent, 2006) and Saint Helena, over 2,000 km from the nearest mainland (GBIF, 2025), further underscoring the species' capacity for long-distance dispersal, whether natural or human-assisted.

Figure 2. Global records of *Hypolimnias misippus* (Linnaeus, 1764) based on curated occurrence data from GBIF (2025) and literature sources (Hesselbarth et al. 1995; Mérit & Mérit, 2007; Sciberras & Sciberras, 2011; John et al. 2023), shown as blue circles. The red star marks the new record documented in this study from the Ikenouine wetland, Illizi Province, southeastern Algeria.



The biogeographic status of *H. misippus* at the margins of its range is unstable and remains largely unresolved. In the Levant, Larsen (1975) interpreted its rare appearances as accidental or the result of sporadic incursions from Egypt, rather than evidence of regular migratory movements, a scenario which may equally account for our observation. While the provenance of the Ikenouine specimen remains uncertain, it is plausibly a naturally dispersed stray originating from sub-Saharan Africa. We note the recent detection of *Chilades eleusis* (Demaision, 1888), a Lycaenidae of Afrotropical origin, in the Algerian Sahara (Boulaouad et al. 2024).

H. misippus is strongly polyphagous, with host plants reported from numerous genera across at least ten plant families (John & Makris, 2022; Scott, 1986; Vane-Wright et al. 1977). Several of these families and genera, such as *Amaranthaceae*, *Ficus* (*Moraceae*), *Portulaca* (*Portulacaceae*), *Abutilon* and *Hibiscus* (*Malvaceae*), are documented in the Illizi region and in adjacent areas including Djanet, Tamanrasset, and further south near Timiaouine (Hammiche & Maiza, 2006; iNaturalist, 2025; Miara et al. 2019), suggesting that a gravid female would find suitable habitat in the region. The presence of *H. misippus* at Ikenouine suggests that Saharan wetlands, including those scattered across the Ahaggar and Tassili n'Ajjer massifs (GDF, 2016), which are positioned along a potential northward dispersal route from sub-Saharan Africa and where vegetation tends to concentrate in and around bodies of water, may act as temporary ecological refuges for a wide-ranging vagrant species. This interpretation is consistent with experimental findings indicating that even isolated or low-quality habitats can function as effective dispersal corridors, provided they are traversed within a single generation (Haddad & Tewksbury, 2005).

Although based on a single observation, this record contributes valuable data to the known distribution of *H. misippus* and highlights the need for further systematic biodiversity surveys in Saharan areas.

Conflict of Interest

The authors declare that they have no known financial interest or personal relationship that could have influenced the work presented in this article.

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