

Aegocera rectilinea Boisduval, 1836 a new Noctuidae species from Algeria (Lepidoptera: Noctuidae, Agaristinae)

Belkacem Aimene Boulaouad, Mohamed Belkacem, Bachir Harzallah, Mohamed Missoum, Khaled Ayyach & Salvatore Bella

Abstract

Aegocera rectilinea Boisduval, 1836 is reported for the first time from Algeria. Notes on the distribution and habitat of the adult are included. This observation would indicate that the species' range has expanded in North Africa. Some notes on the distribution, food plants and habitats of this species are also given. Illustrations of the adults are included.

Keywords: Lepidoptera, Noctuidae, Agaristinae, *Aegocera rectilinea*, first record, Algeria.

Aegocera rectilinea Boisduval, 1836 una nueva especie de Noctuidae para Argelia
(Lepidoptera: Noctuidae, Agaristinae)

Resumen

Aegocera rectilinea Boisduval, 1836 se cita por primera vez en Argelia. Se incluyen notas sobre la distribución y el hábitat del adulto. Esta observación indicaría que el área de distribución de la especie se ha ampliado en el norte de África. También se presentan algunas notas sobre la distribución, plantas nutricias y los hábitats de esta especie. Se incluyen ilustraciones de los adultos.

Palabras clave: Lepidoptera, Noctuidae, Agaristinae, *Aegocera rectilinea*, primeros registros, Argelia.

Aegocera rectilinea Boisduval, 1836 une nouvelle espèce de Noctuidae en Algérie
(Lepidoptera: Noctuidae, Agaristinae)

Résumé

Aegocera rectilinea Boisduval, 1836 est signalé pour la première fois en Algérie. Des notes sur la distribution et l'habitat de l'adulte sont incluses. Cette observation indiquerait que l'aire de répartition de l'espèce s'est étendue en Afrique du Nord. Quelques notes sur la distribution, les plantes alimentaires et les habitats de cette espèce sont également données. Des illustrations de l'adulte sont incluses.

Mots-clés: Lepidoptera, Noctuidae, Agaristinae, *Aegocera rectilinea*, première observation, Algérie.

Introduction

The Sahara Desert, the largest hot desert on Earth, extends across Northern Africa, stretching from the Atlantic Ocean in the west to the Red Sea in the east. Encompassing more than 10 million square kilometres, it covers a range of countries, such as Morocco, Algeria, Tunisia, Libya, Egypt, Mauritania, Mali, Niger,

Chad, and Sudan (Hereher, 2011). In Algeria, the Saharan regions cover about 80% of the country's total land area, exceeding 2 million square kilometres. This vast territory is predominantly characterized by gravel-covered plains (Regs), expansive sand dune fields (Ergs), and saline lakes. The region experiences drought and irregular rainfall, ranging from 12 to 200 mm from south to north. High temperatures, surpassing 45 °C, are common, with substantial fluctuations between day and night. Additionally, the air's relative humidity is consistently low (Djellouli-Tabet, 2010).

The southern Algerian Sahara belongs to the Afrotropical region, whereas the northern part belongs to the Palearctic region. The biodiversity of North Africa, notably within the Sahara Desert, constitutes a clear example of a region that has been underexplored and largely ignored (Durant et al. 2014).

Knowledge about Lepidoptera species of the Algerian Sahara remains insufficient and fragmented. Studies, such as those by Rothschild (1915, 1916), Riley (1934), Speidel & Hassler (1989), and Yakovlev et al. (2023a, 2023b), provided initial data on the lepidopteran fauna. However, due to the vastness of the area, these studies are to be expanded and deepened.

Globally, the Noctuidae family is the third largest group among Lepidoptera, with more than 12,000 species described, and thousands more awaiting identification (van Nieuwerkerken et al. 2011).

This note provides the first record of *Aegocera rectilinea* Boisduval, 1836 (Noctuidae, Agaristinae) for Algeria and the Maghreb area.

Materials and methods

From October 11 to 16, 2022, an entomological survey was conducted in the extreme southwest of the Algerian Sahara. The adults were collected by attraction to light with a Led lamp on a white sheet. Most of the insects approaching the sheet were collected and photographed using a Nikon 7200 D camera with macro lens.

STUDY AREA

The surveyed location, Tawandert (20°23'16" N, 2°27'28" E) is situated in the Tinzaouatine region, bordering Mali. The climate in this area is classified as a "hot desert type" (Köppen-Geiger climate classification, zone BWh) (Peel et al. 2007). Summers are characterized by extreme heat, while winters tend to be more moderate. The region encounters very little summer precipitation, and a total average rainfall of 47.7 mm per year. Most of the rainfall occurs during July and August, with minimal or no rainfall for the rest of the year. The annual average temperature is 27.7 °C. The light trap method using a lamp on a white sheet was used to attract insects and moths in a natural ecosystem primarily represented by the desert date palm, *Phoenix dactylifera* L. (Arecaceae), *Balanites aegyptiaca* (L.) Delile (Zygophyllaceae), *Acacia* spp. (Fabaceae), and the mustard tree, *Salvadora persica* L. (Salvadoraceae) shrub.

Results and discussion

During a field survey on the night of 15-X-2022, 2 individuals of *Aegocera rectilinea* were observed and photographed in the Tawandert Valley, in the far south-west of the Algerian Sahara.

Aegocera rectilinea Boisduval, 1836 (Figure 1)

Aegocera rectilinea Boisduval, 1836. *Hist. nat. Ins., Spec. gén. Lépid.*, 1, pl. 14, f. 5

TL: SENEGAL

Note on identification: Head white; antennae and sides of the second and extremity of the third pal joint black; collar striped with rufous and black; tegulae edged with blue-black and orange; thorax white with sublateral blue-black and orange stripes; tibiae and tarsi orange, with black-white bands; abdomen orange with dorsal black spots, underside whitish. Forewing dark brown, thickly sprinkled with ochreous; a metallic blue spot below base of costa; a creamy white fascia edged with rusty-red from base along the media and below vein 6, ending in a point just before termen, its upper edge indented by silvery-blue cell and disco-cellular spots, and its lower edge by a spot before the triangular expansion at the cell-extremity; terminal orange-red; cilia blackish tipped with whitish. Hindwings orange; discocellular spot and terminal band rusty-red in 8, black in 9; terminal line orange; cilia dark brown, tipped with whitish. Length of forewing 14-19 mm (adopted from Kiriakoff, 1977).

Figure 1. *Aegocera rectilinea* Boisduval, 1836. Algeria, Tinzaouatine region, 15-X-2022.



Note on distribution: *Aegocera rectilinea* has a widespread distribution in Africa, encompassing a vast area from tropical regions to countries such as the Angola, Benin, Burundi, Cameroon, Central African Republic, Chad, Congo, Democratic Republic of the Congo, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Ivory Coast, Kenya, Mali, Mauritania, Mozambique, Niger, Nigeria, Rwanda, Saudi Arabia, Senegal, Somalia, Sudan, Tanzania, Uganda, Western Sahara, and Yemen (African Moths, 2024; De Prins et al. 2011-2024). In the northernmost part of the continent, it is reported only in Egypt (Kiriakoff, 1977).

Photos relating to the presence of *Aegocera rectilinea* in Algeria were recently posted on the online GBIF platform, with the following data: Adrar province, Bordj Badji Mokhtar, 10-X-2022, photos by Missoum M. (GBIF.org. 2024). Furthermore, the presence of *A. rectilinea* is also reported for Guinea-Bissau, 17-VII-2022, photos by R. Lima (INATURALIST.org. 2024).

The present work confirms the presence of *A. rectilinea* in North Africa, and this finding also significantly expands the known range to the north of the continent (Maghreb area).

Note on biology: According to Abdelfattah (2020), Boireau (2021) and African Moths (2024), caterpillars of *A. rectilinea* have been observed on the following host plants: *Arachis hypogaea* L., *Phaseolus vulgaris* L., *Vigna unguiculata* (L.) Walp. (Fabaceae), *Boerhavia diffusa* L., *B. erecta* L. (Nyctaginaceae), *Brassica oleracea* L. (Brassicaceae), *Lagenaria sicerana* (Molina) Standl. (Cucurbitaceae), *Lycopersicon* sp. (Solanaceae), *Manihot esculenta* Crantz (Euphorbiaceae), and *Zea mays* L. (Poaceae). The species flies in all months of the year.

Conclusion

Although it is considered a pest of cultivated plants in the Democratic Republic of Congo, the *Aegocera rectilinea* larvae are recognized as a viable food source for human consumption. Raising this insect in a controlled environment, along with the advantages of its short development cycle and the wide choice of its host plants, not only guarantees successful breeding but also presents a promising pathway for sustainable animal protein production. In fact, this method has the capacity to satisfy the dietary requirements of the local population in the western part of the country, as indicated by Numbi Muya et al. (2022).

In Algeria, the Sahara Desert covers more than 4/5 of the total land area, with its southernmost region remaining largely unexplored and subject to limited scientific studies in recent years. In this vast and challenging terrain, encompassing a significant portion of the country, there are high possibilities of

discovering further new species records for Algeria, or even entirely new taxa. The difficult pedoclimatic conditions and the vastness of this region have so far limited significant research efforts. Over the past two decades, this underexplored area has revealed potential for significant findings within the fauna of the Sahel like the new species of Lepidoptera found by Yakovlev et al. (2023 a, b) and the new species of scorpion by Ythier et al. (2021), or the study of Eitschberger et al. (2014) on the Sphingidae with several new species records. In addition, several first-time observations of various vertebrate animal species, including birds and reptiles (Boulaouad et al. 2021, 2022, 2023; Soukkou et al. 2023) underlines the need of further and more systematic surveys.

Acknowledgements

We would like to express our gratitude to the anonymous reviewers for their invaluable feedback and insightful comments, which greatly contributed to the improvement of this work.

Conflict of Interest

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

References

- African Moths (2024). *Aegocera rectilinea* Boisduval, 1836. <http://www.africanmoths.com/index.html>.
- Abdelfattah, A. M. (2020). Revision of family Noctuidae of Egypt (3) Subfamilies "Acontinae, Agaristinae, Amphipyriinae and Hadeninae" (Lepidoptera, Noctuidae). *Egyptian Academic Journal of Biological Sciences A, Entomology*, 13(1), 59-88. <https://doi.org/10.21608/eajbsa.2020.72206>
- Boireau, P. (2021). Les Lépidoptères associés à *Boerhavia diffusa* L. (Nyctaginaceae) en basse Côte d'Ivoire. *Bulletin de la Société entomologique de France*, 126(3), 345-350. https://doi.org/10.32475/bsef_2197
- Boulaouad, B. A., Ailam, O., Telailia, S., Harzallah, M., Ayyach, K., Bekkouche, A., Missoum, M., Soukkou, W., & Boutabia, L. (2021). Preliminary Checklist of avifauna of Tamanrasset (South of Algeria) with two new records in Algeria. *Journal of Bioresource Management*, 3(8), 108-113. <https://doi.org/10.35691/JBM.1202.0199>
- Boulaouad, B. A., Bakhouch, B., Benhafid, F., & Escoriza, D. (2023). African Spurred Tortoise *Centrochelys sulcata*: Range extension to Algeria. *Herpetological Bulletin*, 164, 44-45. <https://doi.org/10.33256/hb164.4445>
- Boulaouad, B. A., Harzallah, B., Ayyach, K., Attouche, K., Soukkou, W., Hadj Aissa, D., Faidi, H., & Missoum, M. (2022). A new species for Algeria, White-throated Bee-eater observations of probably escaped individuals of Cutthroat Finch and Village Indigobird and checklist of southern Sahara birds. *Ornis Hungarica*, 30(2), 195-207. <https://doi.org/10.2478/orhu-2022-0030>
- De Prins, J., De Prins, W., & Goff, R. (2011-2024). *Afromoths, online database of Afrotropical moth species (Lepidoptera)*. <http://www.afromoths.net>.
- Djellouli-Tabet, Y. (2010). Common Scarcity, Diverse Responses in the Maghreb Region. In: *Water and Sustainability in Arid Regions* (eds Schneier-Madanes, G. & Courel, M.F.) (pp. 87-102). Springer Science. https://doi.org/10.1007/978-90-481-2776-4_6
- Durant, S. M., Wacher, T., Bashir, S., Woodroffe, R. D., De Ornellas, P., Ransom, C. et al. (2014). Fiddling in biodiversity hotspots while deserts burn? Collapse of the Sahara's megafauna. *Diversity and Distributions*, 20(1), 114-122. <https://doi.org/10.1111/ddi.12157>
- Eitschberger, U., Mooser, J., & Müller, G. (2014). Contribution to the Sphingidae fauna of the Hoggar Mountains in Southern Algeria (Lepidoptera, Sphingidae). *Neue Entomologische Nachrichten*, 70, 201-207 (In german).
- GBIF.org (2024). *Aegocera rectilinea*. <http://www.gbif.org/fr/occurrence/4510414018>.
- Hereher, M. (2011). The Sahara: A desert of change. In: *Sand Dunes: Ecology, Geology and Conservation* (ed. Galvin C.D., pp. 101-114). Nova Science Publishers.
- INATURALIST.org (2024). *Aegocera rectilinea*. <https://www.inaturalist.org/observations/128630753>
- Kiriakoff, S. G. (1977). *Lepidoptera Noctuidiformes. Agaristidae II (Ethiopian and Madagascan Species)*. Walter de Gruyter GmbH & Co. <https://doi.org/10.1515/9783112420980>
- Numbi Muya, G. M., Kambashi, B. M., Bindelle, J., Frédéric, F., & Caparros Megido, R. (2022). Description of the development cycle of *Aegocera rectilinea* (Lepidoptera: Noctuidae), a caterpillar consumed in western Democratic Republic of Congo. *Journal of Insects as Food and Feed*, 8(4), 439-446. <https://doi.org/10.3920/JIFF2021.0093>
- Peel, M. C., Finlayson, B. L., & McMahon, T. A. (2007). Updated world map of the Köppen-Geiger climate classification. *Hydrology and earth system sciences*, 11(5), 1633-1644. <https://doi.org/10.5194/hess-11-1633-2007>

- Riley, N. D. (1934). Report on the Insecta collected by Colonel R. Meinertzhagen in the Ahaggar Mountains. IV. Lepidoptera. *Annals and Magazine of Natural History*, 10(13), 175-181. <https://doi.org/10.1080/00222933408654802>
- Rothschild, W. (1915). On the Lepidoptera collected in 1913-1914 by Herr Geyr von Schweppenburg on a journey to the Hoggar Mountains (Sahara). *Annals and Magazine of Natural History*, 16(94), 247-258. <https://doi.org/10.1080/00222931508693713>
- Rothschild, W. (1916). Some notes of a faunal and other nature on the Lepidoptera collected by Herr Geyr von Schweppenburg in the Hoggar Mountains. *Novitates Zoologicae*, 23, 287-288.
- Soukkou, W., Seddik, F., Hadoun, A., Boulaouad, B. A., & Ailam, O. (2023). First sighting of the Chestnut-bellied Starling *Lamprotornis pulcher* in Algeria. *Alauda*, 91, 209-210.
- Speidel, W., & Hassler, M. (1989). Die Schmetterlingsfauna der südlichen algerischen Sahara und ihrer Hochgebirge Hoggar und Tassili n'Ajjer (Lepidoptera). *Nachrichten des entomologischen Vereins Apollo (Supplement 8)*, 1-156.
- Van Nieuwerkerken, E. J., Kaila, L., Kitching, I. J., Kristensen, N. P., Lees, D. C., ... Zwick, A. (2011). Order Lepidoptera Linnaeus, 1758. *Zootaxa*, 3148, 212-221. <https://doi.org/10.11646/zootaxa.3148.1.41>
- Yakovlev, R. V., Müller, G. C., Prozorov, A. M., Traore, M. M., & Sulak, H. (2023a). *Mahomedella hoggarensis* sp. n. (Lepidoptera, Cossidae, Cossinae) from Southern Algeria. *Ecologica Montenegrina*, 68, 42-47. <https://doi.org/10.37828/em.2023.68.5>
- Yakovlev, R. V., Prozorov, A. M., Traore, M. M., Sulak, H., & Müller, G. C. (2023b). New species of the genus *Afrikanetz* Yakovlev, 2009 (Lepidoptera: Cossidae, Cossinae) from the Hoggar Mountains (Southern Algeria). *Ecologica Montenegrina*, 67, 12-16. <https://doi.org/10.37828/em.2023.67.2>
- Ythier, E., Sadine, S. E., Haddadi, M. L., & Lourenço, W. R. (2021). A new species of *Buthus* Leach, 1815 from Algeria (Scorpiones: Buthidae) and an interesting new case of vicariance. *Faunitaxys*, 9(21), 1-9.

Belkacem Aïmene Boulaouad
Department of Agronomy, SNV-TU Faculty
Mohamed El Bachir El Ibrahimî University
34030 Bordj Bou Arréridj
ARGELIA / ALGERIA
E-mail: belkacemaimene.boulaouad@univ-bba.dz
<https://orcid.org/0000-0002-4573-9031>

*Mohamed Belkacem
Biotechnologies and Protection of Agricultural and Natural Ecosystems Laboratory
Department of Agronomy
Faculty of Natural, Life and Earth Sciences (SNVST)
University of Bouira
10000 Bouira
ARGELIA / ALGERIA
E-mail: m.belkacem@univ-bouira.dz
<https://orcid.org/0000-0001-6151-0758>

Bachir Harzallah
Algerian Wildlife Watchers Association
Cité El-Hay, BT 53, n° 8Hassi-Bahbah 17002, Djelfa
ARGELIA / ALGERIA
E-mail: hrz.mourad@gmail.com
<https://orcid.org/0009-0006-5634-7718>

Mohamed Missoum
Algerian Wildlife Watchers Associatio
Cité El-Hay, BT 53, n° 8Hassi-Bahbah 17002, Djelfa
ARGELIA / ALGERIA
E-mail: rzy.missoum@gmail.com
<https://orcid.org/0009-0009-6896-1290>

Khaled Ayyach
Algerian Wildlife Watchers Association
Cit  El-Hay, BT 53, n  8Hassi-Bahbah 17002, Djelfa
ARGELIA / ALGERIA
E-mail: ayyach_khaled@hotmail.fr
<https://orcid.org/0009-0007-1824-1063>

Salvatore Bella
Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria
Centro di ricerca Olivicoltura, Frutticoltura e Agrumicoltura
Corso Savoia, 190
I-95024 Acireale (CT)
ITALIA / ITALY
E-mail: salvatore.bella@crea.gov.it
<https://orcid.org/0000-0003-3893-6907>

*Autor para la correspondencia / *Corresponding author*

(Recibido para publicaci n / *Received for publication* 2-VII-2024)
(Revisado y aceptado / *Revised and accepted* 30-IX-2024)
(Publicado / *Published* 30-III-2026)

Derechos de autor: El autor(es). Este es un art culo de acceso abierto distribuido bajo los t rminos de la Licencia de Reconocimiento 4.0 Internacional de Creative Commons (CC BY 4.0) que permite el uso, distribuci n y reproducci n sin restricciones en cualquier medio, siempre que se cite al autor original y la fuente. / **Copyright:** The author(s). This is an open access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited