

# On the presence of two tropical butterflies (Lepidoptera Nymphalidae) in the city of Palermo (Italy)

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## ABSTRACT

Two species of showy diurnal butterflies of tropical origin were recently found in the city of Palermo (Italy). These are: *Amauris hecate hecate* (Butler, 1866) (Nymphalidae Danainae) endemic to the Central Africa from Guinea to South Sudan up to Angola, Tanzania and Ethiopia and *Siproeta epaphus* (Latreille, [1813]) (Nymphalinae) native to Central America from Texas to Brazil and Peru. The reporting of these findings and the hypotheses on the presence of these species outside their natural range is the subject of this work.

## KEY WORDS

Nymphalidae; Danainae; Nymphalinae; *Amauris*; *Siproeta*; allochthonous; Sicily.

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## INTRODUCTION

In recent decades there has been an greater increase in animal species that are reported as alien in territories far from their original ranges. This phenomenon is favored by anthropogenic transport which allows the movement of large distances even for species with poor mobility (Hulme, 2009) and by the introduction of alien species that have escaped into farms for food or sporting purposes. The increase in seasonal temperatures positively contribute to the establishment of more delicate species in cold climates (Cannon, 1998; Chown et al., 2007; Mally et al. 2022).

According to Lopez-Vaamonde et al. (2010), in Europe, the number of lepidopteran invasions is increasing; so far, 97 species of non-native Lepidoptera have established themselves in Europe (about 1% of the known fauna), divided into 20 families and 11 superfamilies; of 78 aliens with a known area of origin, Asia contributed first place with the expansion of

these species, followed by Africa, North America, Australasia and the Neotropics. Many of these butterflies established themselves in European territory and are confined to urban and artificial habitats such as parks, gardens and greenhouses.

In this work, two living specimens of tropical butterflies are reported in Palermo (Sicily, Italy) and some hypotheses on their presence are provided.

## RESULTS

*Amauris hecate hecate* (Butler, 1866)

MATERIALS. ITALY • 1 specimen, Sicily, Palermo near Botanical Garden, 9 Oct. 2023, legit R. Viviano; live specimen (Fig. 1).

DISTRIBUTION. The genus *Amauris* Hübner, 1816 (Lepidoptera Nymphalidae Danainae) listed 17 species, all endemic to Africa and is distributed mainly along the tropical belt while fewer species

are present in subtropical and temperate areas; caterpillars of many species are related to plants of the Apocynaceae family (Williams, 2020 and cited references). *Amauris hecate hecate* is endemic to the Central African band that goes from Guinea to South Sudan up to Angola and Tanzania; in Ethiopia is recorded *A. hecate stictica* Rothschild & Jordan, 1903 (Williams, 2020).

**REMARKS.** The family of Nymphalidae listed 12 subfamilies, 40 tribes, 559 genera and approximately 6400 described species distributed worldwide (Wahlberg et al., 2009; Chazot et al., 2021). The subfamily Danainae is widespread almost exclusively in tropical or subtropical regions, only a few species also live in temperate zones (Williams, 2020).

In Sicily there are numerous observations of a well-known species belonging to same subfamily, *Danaus chrysippus* (Linnaeus, 1758) observed several times in nature both in the adult and larval form, which develops on plants of the Asclepiadaceae family (Arnone & Romano, 1991; Grillo, 1999; Pisciotta et al., 2008).

### *Siproeta epaphus* (Latreille, [1813])

**MATERIALS.** ITALY • 1 specimen, Sicily, Palermo, 14 Mar. 2024, live specimen photographed by A. Carapezza (Fig. 2).

**DISTRIBUTION.** The genus *Siproeta* Hübner, 1823 includes three species: *Siproeta epaphus* lives in areas between Mexico and Brazil; *Siproeta stelenes* (Linnaeus, 1758) has a more extensive range that goes from the Antilles to the southern United States and from Brazil to Uruguay; *Siproeta superba* (Bates, 1864) is widespread from southern Mexico to Honduras and also to Costa Rica ([https://www.butterfliesofamerica.com/L/t/Siproeta\\_a.htm](https://www.butterfliesofamerica.com/L/t/Siproeta_a.htm)).

**REMARKS.** The subfamily Nymphalinae (family Nymphalidae) is widespread worldwide with 496 species in 56 genera (Liu et al., 2023).

In Sicily this subfamily is well represented by numerous taxa, such as *Melitaea* Fabricius, 1807, *Aglais io* (Linnaeus, 1758), *Vanessa cardui* (Linnaeus, 1758), *V. atalanta* (Linnaeus, 1758), etc. (<http://www.farfalleitalia.it/>).

In Europe, *Siproeta epaphus* and *S. stelenes*, are reported only from Botanical Garden of Pavol Jozef

Šafárik University in Košice in Victoria greenhouse for exhibition, research and educational reasons (Suvák, 2015). In Palermo, in the 2023 edition of the Butterfly House, *Siproeta stelenes* is officially listed on the illustrative poster, but not *Siproeta epaphus*.

## DISCUSSION AND CONCLUSIONS

The discovery of these two live specimens in Palermo is somewhat unusual and it is possible to formulate some hypotheses.

Regarding *Amauris hecate hecate*, its presence may be attributable to a possible migration, considering that the species belonging to the Danainae subfamily are known for wide-ranging movements (Smithers, 1983; Braby, 1991; Choi et al., 2010; Kanazawa et al., 2015; John et al., 2019; Badon, 2021; James & Kappen, 2021). These movements are facilitated by the strong sirocco winds like those that characterized the month of October 2023 with gusts of 33–74 km/h. Two examples of similar transport in Sicily are those of the butterfly *Vanessa cardui* (Linnaeus, 1758) of the Nymphalidae family (Menchetti et al., 2019) and that of *Campalita olivieri* (Dejean, 1831) (Coleoptera Carabidae) (Sparacio, 2003).

The second factor, the anthropogenic one, is more relevant, as numerous arthropod species are actively and passively transported by human activities (Biscaccianti et al., 2014). Among the possible hypotheses of active transport with which both *Amauris hecate hecate* and *Siproeta epaphus* could have arrived in Palermo, there is the growing request from collectors to keep animals of exotic origin in captivity, including many of which are insects, which could very easily escape from the appropriate terrariums if not carefully sealed, or released intentionally, as reported on the Legambiente Animal Help website (2024). However, within this context, events for scientific educational purposes such as “The Butterfly House” could represent a further hypothesis of introduction, considering the numerous species bred within them of American, Asian and African origin. Despite the accuracy in closing these tents, a possible escape cannot be ruled out; officially, about that, the 2023 edition did not include those belonging to the *Amauris* genus among the species present or even *Siproeta epa-*



Figure 1. *Amauris hecate hecate* from Palermo city, Italy, 8.3 cm wingspan, dorsal and ventral view.





Figure 2. *Siproeta epaphus* from Palermo city, Italy (photo by A. Carapezza).

*phus*. A further intentional introduction is the release of butterflies during weddings and funerals in many continents of the world including Europe; generally the species related to these initiatives are *Vanessa cardui* and *Danaus plexippus* Linnaeus, 1758 (New, 2008), but the release of other species cannot be ruled out. In Colombia, in this regard, *Siproeta epaphus* and other species are released during celebrations (Constantino, 2006).

Another anthropic hypothesis is linked to passive transport via plants and vases of Afrotropical origin. Considering the large number of introduced alien species (Wittenberg, 2005; Cochard et al., 2010), it is potentially attributable to the transport of the caterpillar or chrysalis which, having reached our latitudes, completed their metamorphosis and then flew into the surrounding area.

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#### REFERENCES

- Arnone M. & Romano M., 1991. Nuovi reperti di *Danaus chrysippus* (Linnaeus, 1758) in Sicilia (Lepidoptera, Danaidae). *Il Naturalista siciliano*, 15: 161–166.
- Badon J.A.T., 2021. Notes concerning the migration of *Euploea* (Lepidoptera: Nymphalidae: Danainae) on Palawan Island, Philippines. *Philippines. News of the Lepidopterists' Society*, 63: 190–191.
- Biscaccianti A.B., Zilli A., Antonucci R., Zapparoli M., 2014. Gli Artropodi alloctoni del Lazio. In: Monaco A., 2014 (ed.). *Alieni. La minaccia delle specie alloctone per la biodiversità del Lazio*. Palombi & Partner, Roma, 30–39.
- Braby M.F., 1991. Migration of *Euploea core corinna* (WS Macleay) (Nymphalidae: Danainae) in northern Queensland, Australia. *The Australian Entomologist*, 18: 143–146.
- Cannon R.J.C., 1998. The implications of predicted climate change for insect pests in the UK, with emphasis on non-indigenous species. *Global Change*

- Biology, 4: 785–796.  
<https://doi.org/10.1046/j.1365-2486.1998.00190.x>
- Chazot N., Condamine F., Dudas G., Peña C., Kodandaramaiah U., Matos-Maravi P., Aduse-Poku K., Elias M., Warren A.D., Lohman D., Penz C., DeVries P., Fric Z.F., Nylin S., Müller C., Kawahara A.Y., Silva-Brandao K., Lamas G., Kleckova I., Zubek A., Ortiz-Acevedo E., Vila R., Vane-Wright R.I., Muller S.P., Jiggins C.D., Wheat C.W., Freitas A.V.L. & Wahlberg N., 2021. Conserved ancestral tropical niche but different continental histories explain the latitudinal diversity gradient in brush-footed butterflies. *Nature Communications*, 12: 5717.  
<https://doi.org/10.1038/s41467-021-25906-8>
- Choi W.H., Chae D.Y., Lee C.M., Noshita H. & Hirai N., 2010. First recorded migration of the butterfly, *Parantica sita* (Lepidoptera: Danainae), from Japan to South Korea. *Lepidoptera Science*, 61: 120–122.
- Chown S.L., Slabber S., McGeouch M.A., Janion C. and Leinaas H.P., 2007. Phenotypic plasticity mediates climate change responses among invasive and indigenous arthropods. *Proceedings of the Royal Society B: Biological Sciences*, 274: 2531–2537.  
<https://doi.org/10.1098/rspb.2007.0772>
- Cochard P.-O., Vilisics F. & Sechet E., 2010. Alien terrestrial crustaceans (Isopods and Amphipods). Chapter 7.1. *BioRisk. Biodiversity & Ecosystem Risk Assessment*, 4: 81–96.  
<https://doi.org/10.3897/biorisk.4.54>
- Constantino L., 2006. Biocomercio sostenible de insectos: Estado actual, perspectivas y dificultades del mercado en Colombia con especial referencia en coleoptera y lepidoptera. En *Libro de Memorias. XXXIII Congreso Sociedad Colombiana de Entomología Socolen*, 35–49.  
<https://doi.org/10.13140/RG.2.1.3373.2009>
- Grillo N., 1999. Record of *Danaus chrysippus* (Linnaeus, 1758) in the province of Palermo (Sicily, Italy) (Lepidoptera: Danaidae). *Linneana Belgica* 17: 3–4
- Hulme P.E., 2009. Trade, transport and trouble: managing invasive species pathways in an era of globalization. *Journal of applied ecology*, 46: 10–18.  
<https://doi.org/10.1111/j.1365-2664.2008.01600.x>
- James D.G. & Kappen L., 2021. Further insights on the migration biology of monarch butterflies, *Danaus plexippus* (Lepidoptera: Nymphalidae) from the Pacific Northwest. *Insects*, 12: 161.  
<https://doi.org/10.3390/insects12020161>
- John E., Hardman M. & Smith M., 2019. How important are olfactory cues for host-plant detection by migrating *Danaus chrysippus* (Linnaeus, 1758) (Lepidoptera: Nymphalidae, Danainae) in Cyprus?. *Entomologist's Gazette*, 70: 223–238.  
<https://doi.org/10.31184/g00138894.704.1726>
- Kanazawa I., Cheng W.W.W., Pun H.S.F., Sakiyama Y. & Doi H., 2015. First migration record of Chestnut Tiger Butterfly, *Parantica sita nipponica* (Moore, 1883) (Lepidoptera: Nymphalidae: Danainae) from Japan to Hong Kong and longest recorded movement by the species. *The Pan-Pacific Entomologist*, 91: 91–97.  
<https://doi.org/10.3956/2014-91.1.091>
- James D.G. & Kappen L., 2021. Further insights on the migration biology of monarch butterflies, *Danaus plexippus* (Lepidoptera: Nymphalidae) from the Pacific Northwest. *Insects*, 12: 161 pp.
- Liu N., Wang H., Fang L. & Zhang Y., 2023. Mitogenome of the *Doleschallia bisaltide* and Phylogenetic Analysis of Nymphalinae (Lepidoptera, Nymphalidae). *Diversity*, 15: 558.  
<https://doi.org/10.3390/d15040558>
- Lopez-Vaamonde C., Agassiz D., Augustin S., De Prins J., De Prins W., Gomboc S., Ivinskis P., Karsholt O., Koutroumpas A., Koutroumpa F., Laštůvka Z., Marabuto E., Olivella E., Przybyłowicz L., Roques A., Ryrholm N., Sefrova H., Sima P., Sims I., Sinev S., Skulev B., Tomov R., Zilli A. & Lees D., 2010. Lepidoptera. Chapter 11. *BioRisk*, 4: 603–668.  
<https://doi.org/10.3897/biorisk.4.50>
- Mally R., Turner R., Blake R.E., Fenn-Moltu G., Bertelsmeier C., Brockerhoff E.G., Hoare R., Nahrung H.F., Roques A., Pureswaran D.S., Yamanaka T. & Liebhold A.M., 2022. Moths and butterflies on alien shores: Global biogeography of non-native Lepidoptera. *Journal of Biogeography*, 49: 1455–1468.  
<https://doi.org/10.1111/jbi.14393>
- Menchetti M., Guéguen M. & Talavera G., 2019. Spatio-temporal ecological niche modelling of multigenerational insect migrations. *Proceedings of the Royal Society B*, 286: 20191583.  
<https://doi.org/10.1098/rspb.2019.1583>
- New T.R., 2008. Are butterfly releases at weddings a conservation concern or opportunity? *Journal of Insect Conservation*, 12: 93–95.  
<https://doi.org/10.1007/s10841-007-9124-3>
- Pisciotta S., Zito P. & Sajevo M., 2008. *Danaus chrysippus* (Linnaeus, 1758) (Lepidoptera Nymphalidae) larvae feeding on *Caralluma europaea* (Guss.) N.E.BR. (Asclepiadaceae) in Lampedusa Island. *Il Naturalista siciliano*, 32: 241–251.
- Smithers C.N., 1983. Migration records in Australia. 3. Danainae and Acraeinae (Lepidoptera: Nymphalidae). *The Australian entomologist*, 10: 21–27.
- Sparacio I., 2003. Ritrovamento in Sicilia di *Campalita olivieri* (Dejean, 1831) (Coleoptera Carabidae). *Il Naturalista siciliano*, 27: 209–211.
- Suvák M., 2015. Exotic butterflies and moths (Lepidoptera) in botanical gardens – potential for education and research. *Thaiszia Journal of Botany*, 25, Suppl. 1: 81–147.
- Wahlberg N., Leneveu J., Kodandaramaiah U., Peña C.,

- Nylin S., Freitas A.V. & Brower A.V., 2009. Nymphalid butterflies diversify following near demise at the cretaceous/tertiary boundary. *Proceedings of the Royal Society B: Biological Sciences*, 276: 4295–4302.  
<https://doi.org/10.1098/rspb.2009.1303>
- Williams M.C., 2020. Genus *Amauris* Hübner (1816). Afrotropical butterflies and skippers: a digital encyclopaedia. Updated 27 April 2022. <https://www.metamorphosis.org.za/?p=articles&s=atb>. [Accessed 21 February 2024].
- Wittenberg R., 2005. An inventory of alien species and their threat to biodiversity and economy in Switzerland. CABI Bioscience Switzerland Centre report to the Swiss Agency for Environment, Forests and Landscape. The environment in practice n° 0629. Federal Office for the Environment, Bern, 417 pp.

**Website**

- <https://www.legambienteanimalhelp.it/>  
[https://www.butterfliesofamerica.com/L/t/Siproeta\\_a.htm](https://www.butterfliesofamerica.com/L/t/Siproeta_a.htm)  
<http://www.farfalleitalia.it/>