

First record of an albino lactating female of *Rhinolophus hipposideros* (Bechstein, 1800)

Denise Trombin¹, Alessandra Tomassini¹, Gaetano Fichera²

¹Tutela Pipistrelli APS

²Naturkundemuseum Erfurt, Erfurt, Germany

A - Research concept and design, B - Collection and/or assembly of data, C - Data analysis and interpretation, D - Writing the article, E - Critical revision of the article, F - Final approval of the article

Gaetano Fichera -  [0009-0006-6151-6846](https://orcid.org/0009-0006-6151-6846)

Abstract:

Melanin deficiency is rare among vertebrates, and chromatic disorders in bats are considered exceptional. Among these, albinism is a hereditary condition caused by mutations affecting melanin synthesis, resulting in white fur and red eyes. Although albinism has been documented in several bat families around the world, records for the Lesser horseshoe bat (*Rhinolophus hipposideros*) remain scarce and mostly confined to Central Europe. We report the first documented case of albinism in *R. hipposideros* in Italy, observed in 2025 along the Adriatic coast of the province of Lecce. The albino individual, a lactating female with red eyes and completely white fur, was found within a nursery colony of approximately 172 individuals roosting in an artificial cavity. The bat exhibited normal behaviour and was observed carrying a normally pigmented pup, suggesting possible successful reproduction and apparent social integration based on the available observations. This observation represents one of the southernmost records of albinism in lesser horseshoe bat and provides rare evidence that this condition does not necessarily impair reproductive activity or social behaviour under sheltered roosting conditions. Further studies are needed to assess the potential effects of albinism on fitness and survival in bats.

Keywords: Italy, Chiroptera, albinism, lesser horseshoe bat.

Received: 2025-11-10

Revised: 2026-03-02

Accepted: 2026-03-18

Final review: 2026-02-18

Short title

First record of an albino *Rhinolophus hipposideros*

Corresponding author

Denise Trombin

Tutela Pipistrelli APS; email: denise.trombin91@gmail.com

1 **First record of an albino lactating female of**
2 ***Rhinolophus hipposideros* (Bechstein, 1800)**

3 **Abstract**

4 Melanin deficiency is rare among vertebrates, and chromatic disorders in bats are considered
5 exceptional. Among these, albinism is a hereditary condition caused by mutations affecting melanin
6 synthesis, resulting in white fur and red eyes. Although albinism has been documented in several bat
7 families around the world, records for the Lesser horseshoe bat (*Rhinolophus hipposideros*) remain
8 scarce and mostly confined to Central Europe. We report the first documented case of albinism in *R.*
9 *hipposideros* in Italy, observed in 2025 along the Adriatic coast of the province of Lecce. The albino
10 individual, a lactating female with red eyes and completely white fur, was found within a nursery
11 colony of approximately 172 individuals roosting in an artificial cavity. The bat exhibited normal
12 behaviour and was observed carrying a normally pigmented pup, suggesting possible successful
13 reproduction and apparent social integration based on the available observations. This observation
14 represents one of the southernmost records of albinism in lesser horseshoe bat and provides rare
15 evidence that this condition does not necessarily impair reproductive activity or social behaviour
16 under sheltered roosting conditions. Further studies are needed to assess the potential effects of
17 albinism on fitness and survival in bats.

18 **Keywords:** Chiroptera, albinism, Italy, lesser horseshoe bat

19 Deficiency in melanin production is a rare phenomenon among vertebrates (Bernardi *et al.*, 2019),
20 and atypical pigmentation in bats is considered extremely uncommon (Cichocki *et al.*, 2017; Lucati
21 & López-Baucells, 2017). Consequently, scientific interest in chromatic disorders in bats has
22 increased worldwide, and the number of documented cases continues to grow around the world
23 (Bernardi *et al.*, 2019; Cichocki *et al.*, 2017; Gaisler *et al.*, 2011; Leal *et al.*, 2021; López-Baucells *et*
24 *al.*, 2013; Lucati & López-Baucells, 2017; Murariu & Chisamera, 2006; Smirnov *et al.*, 2014; Zalapa-
25 Hernández *et al.*, 2016; Zortéa & Cristina Silva, 2017). Several forms of abnormal body pigmentation
26 may arise from reduced or altered melanin production, generally classified as true albinism, leucism,
27 piebaldism, melanism and hypomelanism (Lucati & López-Baucells, 2017). All these pigmentation
28 disorders are hereditary and originate from genetic mutations affecting melanin synthesis (Møller *et*
29 *al.*, 2013; Utzeri *et al.*, 2016). It has also been suggested that piebaldism tends to occur more
30 frequently in small or isolated populations (Bensch *et al.*, 2004). Among these conditions, albinism
31 is a well-defined inherited hypopigmentary disorder characterised by a complete lack of melanin. The

33 mutation in genes encoding the enzyme tyrosinase, due to an autosomal recessive trait (van Grouw,
34 2006), leads to pale skin, white fur or feathers, and red eyes (Hofreiter & Schöneberg, 2010; van
35 Grouw, 2006).

36 Albinism has been recorded on all continents where bats occur (Zortéa & Cristina Silva, 2017). The
37 review by Lucati & López-Baucells (2017) showed that chromatic disorders in bats have been
38 observed across a broad diversity of species and ecological contexts. Based on 609 individual bats
39 examined, Lucati and López-Baucells (2017) reported 269 cases of piebaldism, 152 of albinism, 94
40 of melanism, 20 of hypomelanism, 11 of leucism, and three of hypomelanism; while in 60 cases the
41 chromatic disorder remained undetermined. The list of albino bats in the world formulated by Zortéa
42 & Cristina Silva (2017), reported 25 species with the Vespertilionidae family having the largest
43 number of albinism cases. This observation is likely explained by the fact that most research efforts
44 on bats have historically focussed on this taxonomic group. Moreover, the Vespertilionidae family is
45 cosmopolitan and exhibits the highest species richness across several regions, including Europe and
46 the United States. In the Neotropics, where the dominant family is Phyllostomidae, most records of
47 albinism were also found within this group. Therefore, beyond historical differences in research
48 intensity, the higher number of albinism cases reported within a family may also reflect its greater
49 species richness (Zortéa & Cristina Silva, 2017). In the same list of albino bats, as also reported by
50 Uieda (2000), the family Rhinolophidae is also represented. Documented cases include *Rhinolophus*
51 *euryale* from France and *Rhinolophus hipposideros* from Slovakia. Three additional cases involving
52 *Rhinolophus hipposideros* were reported by Gaisler *et al.* (2011) from the Moravian Karst (Czech
53 Republic). With these records, albinism in this species can be regarded as relatively frequent (Uieda,
54 2000). Several occurrences have been documented in the Czech Republic and Slovakia, probably due
55 to the large local populations of this species, whereas *R. hipposideros* is less common in Western
56 Europe and some Mediterranean countries, such as Italy (Crucitti & Cavalletti, 2002). An alternative
57 explanation for the higher frequency of albinism in Central Europe may relate to the low genetic
58 variability of the species in this region (see Gaisler *et al.*, 2011). In Slovakia, a mating pair of albino
59 individuals was documented, while the only reported observation of copulation in Czech territory
60 appears to have been made in northern Moravia (Danko, 1995). Finally, a white-coloured juvenile,
61 probably a leucistic or piebald individual, was observed clinging to its mother in a summer colony
62 located in a church spire in eastern Slovakia (Danko, 1995).

63 The observation of the albino *Rhinolophus hipposideros* (Bechstein, 1800) was made in the province
64 of Lecce, southern Italy, along the Adriatic coast (Fig. 1). The individual was first detected by a local
65 speleologist, who subsequently reported the case to our association. Field observations were carried

67 out on two occasions, on 19 and 29 July 2025, at the same site, an artificial cavity created during a
68 land restoration operation which opens directly to the sea. Inside the cavity, a nursery colony of *R.*
69 *hipposideros* was present, consisting of approximately 172 individuals (Fig. 2).

70 During each visit, the colony was observed for a limited period in order to minimise disturbance to
71 roosting individuals. At first, the individual was roosting near the centre of the colony, displaying no
72 visible behavioural deviations from other individuals. Later, the albino bat moved to a more exposed
73 position, which made it possible to photograph the individual while hanging from the wall. The
74 individual was a lactating female carrying a normally pigmented pup (Fig. 3), indicating that the
75 albino female was actively reproducing within the colony. The bat appeared completely white, with
76 noticeably red eyes, features that are consistent with a case of albinism. However, as no genetic or
77 histological analyses were conducted, alternative pigmentation disorders cannot be definitively
78 excluded.



79 **Figure 1** - Approximate location of the artificial cavity where the albino bat was found, in southern Italy
80 (province of Lecce).



82 **Figure 2** - Nursery colony of *Rhinolophus hipposideros* inside the artificial cavity (left).
83 The enlarged view shows the albino lactating female among the other individuals (right).



84 **Figure 3** - Lactating female carrying a pup attached to her abdomen (left). Close-up view of the
85 same female showing the characteristic features of albinism (right).

87 Other records of albino females carrying pups, as well as observations of juvenile albino bats, have
88 been reported from various parts of the world (Leal *et al.*, 2021; Sánchez-Hernández *et al.*, 2010).
89 Cases of albinism within reproductive colonies have also been documented in Poland for several
90 species, including *Myotis nattereri*, *Myotis myotis*, and *Eptesicus serotinus* (Cichocki *et al.*, 2017), as
91 well as a record of an albino *Rhinolophus hipposideros* within a breeding colony in the same country
92 (Ruprecht, 1965). In Europe, further cases involving *R. hipposideros* have been described in Slovakia
93 and in the Czech Republic where a mating pair was reported (Danko, 1995), although no evidence of
94 successful reproduction was documented. Finally, a white-coloured juvenile of *R. hipposideros*,
95 probably a leucistic or piebald, was observed clinging to its mother in a summer colony located in a
96 church spire in eastern Slovakia (Danko, 1995). In Italy, no previous cases of albinism have been
97 reported for *R. hipposideros*, and to date, this represents the first observation of a lactating albino *R.*
98 *hipposideros* female with a pigmented pup in Italy.

99 Several observations of albino bats have been conducted worldwide to investigate both the behaviour
100 and the responses of conspecifics within the colony. Uieda (2001) discussed these aspects in
101 *Desmodus rotundus* and reported multiple observations from other authors on various species,
102 including *Myotis lucifugus*, *Myotis macrodactylus*, and *Rhamdella minuta*. The results are
103 contrasting: in some cases, other individuals appear to perceive differences in albino bats, while in
104 others, albinism seems to have no significant effect on social dynamics. The influence of albinism on
105 individual fitness in bats needs further evaluation, since lack of pigmentation could represent a
106 potential disadvantage in natural habitats (Uieda, 2000; Acevedo *et al.*, 2009). However, nocturnal
107 behaviour in bats appears to mitigate the effects of pigmentation loss, with minimal impact on
108 survival (Bernardi *et al.*, 2019). Moreover, caves and sheltered roosts provide protection from
109 sunlight, water loss, and visually hunting predators, thus enhancing the likelihood of survival for
110 albino individuals (Uieda, 2001). In our observation, the albino female appeared integrated within the
111 group and showed no abnormal behaviour compared to other individuals, as indicated by her roosting
112 position near the centre of the colony. Moreover, she was also observed carrying a normally
113 pigmented pup, confirming reproductive activity at the time of observation. These findings suggest
114 that, under the sheltered conditions of this roost and within the limits of short-term observations,
115 albinism did not appear to prevent social association or reproductive activity.

116 This represents the first documented case of albinism in *R. hipposideros* in Italy and one of the
117 southernmost records in Europe. The observation confirms that albinism can also occur in
118 Mediterranean populations of this species, and that, in this case, it did not appear to impair the
119 individual's reproductive activity. Nevertheless, further studies are needed to assess the potential
120 effects of albinism on survival, fitness, and social interactions in other colonies and under different

122 environmental conditions. Nevertheless, further research is warranted to evaluate the potential effects
123 of albinism on survival, fitness, and social interactions across additional colonies and under varying
124 environmental conditions. As previously suggested (Danko, 1995), albinism may also be linked to
125 reduced genetic diversity, an aspect that deserves targeted investigation in future studies.

126 Acknowledgements

127 We sincerely thank Francesco Di Natale of the Lecce speleological group Ndrónico for reporting
128 the presence of the albino bat and for his valuable collaboration throughout this observation. We are
129 also grateful to Andrea Scatolini and the editorial staff of Scintilena for mediating between the
130 speleological group and the association Tutela Pipistrelli - APS, without whom this report would not
131 have become known.

132 References

- 133 Acevedo J, Aguayo-Lobo A, Torres D (2009) Albino weddell seal at cape shirreff, Livingston island,
134 Antarctica. *Polar Biology*, 32(8): 1239–1243. <https://doi.org/10.1007/s00300-009-0680-8>
- 135 Bensch, S., Hansson, B., Hasselquist, D., & Nielsen, B. (2004). Partial Albinism in a Semi-Isolated
136 Population of Great Reed Warblers. *Hereditas*, 133(2), 167–170.
137 <https://doi.org/10.1111/j.1601-5223.2000.t01-1-00167.x>
- 138 Bernardi, L. F. D. O., Prous, X., Ribeiro, M. S., Mascarenhas, J., Genelhu, S. M. C., Simões, M. H.,
139 & Bezerra, T. (2019). First record of albinism for the doglike bat, *Peropteryx kappleri* Peters,
140 1867 (Chiroptera, Emballonuridae). *Subterranean Biology*, 30, 33–40.
141 <https://doi.org/10.3897/subtbiol.30.34223>
- 142 Cichocki, J., Lesiński, G., Piksa, K., Ważna, A., Warchałowski, M., Bator, A., Gottfried, I., Gottfried,
143 T., Gubała, W., Jaros, R., Kowalski, M., Postawa, T., Stopczyński, M., & Szkudlarek, R.
144 (2017). Aberrant colouration in bats from Poland. *North-Western Journal of Zoology*, 13(2).
145 <http://biozoojournals.ro/nwjz/index.html>
- 146 Crucitti, P., & Cavalletti, L. (2002). Size, dynamics and structure of the lesser horseshoe bat
147 (*Rhinolophus hipposideros*) winter aggregations in central Italy. *Hystrix, the Italian Journal*
148 *of Mammalogy*, 13(1–2). <https://doi.org/10.4404/hystrix-13.1-2-4183>

- 150 Danko Š. (1995). A finding of conspicuously coloured specimen of the lesser horseshoe bat
151 (*Rhinolophus hipposideros*). *Netopiere* 1: 103-104.
- 152 Gaisler, J., Kovarik, M., & Stefka, L. (2011). Two unusual records of the lesser horseshoe bat
153 (*Rhinolophus hipposideros*) in the Moravian Karst (Czech Republic). *Hystrix, the Italian*
154 *Journal of Mammalogy*, 22(1). <https://doi.org/10.4404/hystrix-22.1-4649>
- 155 Hofreiter, M., & Schöneberg, T. (2010). The genetic and evolutionary basis of colour variation in
156 vertebrates. *Cellular and Molecular Life Sciences*, 67(15), 2591–2603.
157 <https://doi.org/10.1007/s00018-010-0333-7>
- 158 Leal, E. S. B., Lira, T. C., Garcia, A. C. L., & Montes, M. A. (2021). Albinism in *Artibeus planirostris*
159 (Chiroptera, Phyllostomidae) in the Caatinga biome and updated list of albino bats in Brazil.
160 *Anais Da Academia Brasileira de Ciências*, 93(4), e20200582. [https://doi.org/10.1590/0001-](https://doi.org/10.1590/0001-3765202120200582)
161 [3765202120200582](https://doi.org/10.1590/0001-3765202120200582)
- 162 López-Baucells, A., Mas, M., Puig-Montserrat, P., & Flaquer, C. (2013). Hypopigmentation in
163 vespertilionid bats: The first record of a leucistic soprano pipistrelle *Pipistrellus pygmaeus*.
164 *Barbastella*, 6(1). <https://doi.org/10.14709/BarbJ.6.1.2013.09>
- 165 Lucati, F., & López-Baucells, A. (2017). Chromatic disorders in bats: A review of pigmentation
166 anomalies and the misuse of terms to describe them. *Mammal Review*, 47(2), 112–123.
167 <https://doi.org/10.1111/mam.12083>
- 168 Møller, A. P., Bonisoli-Alquati, A., & Mousseau, T. A. (2013). High frequency of albinism and
169 tumours in free-living birds around Chernobyl. *Mutation Research/Genetic Toxicology and*
170 *Environmental Mutagenesis*, 757(1), 52–59. <https://doi.org/10.1016/j.mrgentox.2013.04.019>
- 171 Murariu, D., & Chisamera, G. (2006). Partial albinism in Noctule bat – *Nyctalus noctule* (Schreiber,
172 1774) (Mammalia: Chiroptera) from Romania. *Travaux du Muséum National d'Histoire*
173 *Naturelle « Grigore Antipa »*, vol. XLIX, 353-357.
- 174 Ruprecht, A.L. (1965): A rufous specimen of *Eptesicus serotinus* (Schreber, 1774). *Acta Theriologica*
175 10(17): 239-240.

- 177 Sanchez-Hernandez C., Romero-Almaraz M.L., Taboada-Salgado A., Almazan-Catalan J.A., Schnell
178 G.D., Sanchez-Vazquez L. (2010). Five albino bats from Guerrero and Colima, Mexico.
179 *Chiroptera Neotropical*, 16(1): 522-527
- 180 Smirnov, D. G., Vekhnik, V. P., Kurmaeva, N. M., & Baishev, F. Z. (2014). The Detection of Partial
181 Albinism at Three Species of Bats (Mammalia: Chiroptera) in European Part of Russia. *Open*
182 *Journal of Animal Sciences*, 04(05), 291–296. <https://doi.org/10.4236/ojas.2014.45037>
- 183 Uieda, W. (2000). A review of complete albinism in bats with five new cases from Brazil. 2(1), 97–
184 105.
- 185 Uieda W. (2001) Behavior of an albino vampire bat, *Desmodus rotundus* (E. Geoffroy) (Chiroptera,
186 Phyllostomidae), in captivity. *Revista Brasileira de Zoologia* 18: 641–644. <https://doi.org/10.1590/S0101-81752001000200031>
- 187
- 188 Utzeri, V. J., Bertolini, F., Ribani, A., Schiavo, G., Dall’Olio, S., & Fontanesi, L. (2016). The albinism
189 of the feral Asinara white donkeys (*Equus asinus*) is determined by a missense mutation in a
190 highly conserved position of the tyrosinase (*TYR*) gene deduced protein. *Animal Genetics*,
191 47(1), 120–124. <https://doi.org/10.1111/age.12386>
- 192 van Grouw, H. (2006). Not every white bird is an albino: Sense and nonsense about colour aberrations
193 in birds. 28, 79–89.
- 194 Zalapa-Hernández, S. S., Guerrero, S., Romero-Almaraz, M. D. L., & Sánchez-Hernández, C. (2016).
195 Coloración atípica en murciélagos: Frecuencia y fenotipos en Norte y Centroamérica e islas
196 del Caribe y nuevos casos para México y Costa Rica. *Revista Mexicana de Biodiversidad*,
197 87(2). <https://doi.org/10.1016/j.rmb.2016.04.007>
- 198 Zortéa, M., & Cristina Silva, M. (2017). Albinism in the striped spear-nosed bat *Gardnerycteris*
199 *crenulatum* (Chiroptera: Phyllostomidae) with an updated list of albino bats in the World.
200 *Mammalia*, 82(1), 78–84. <https://doi.org/10.1515/mammalia-2016-0080>



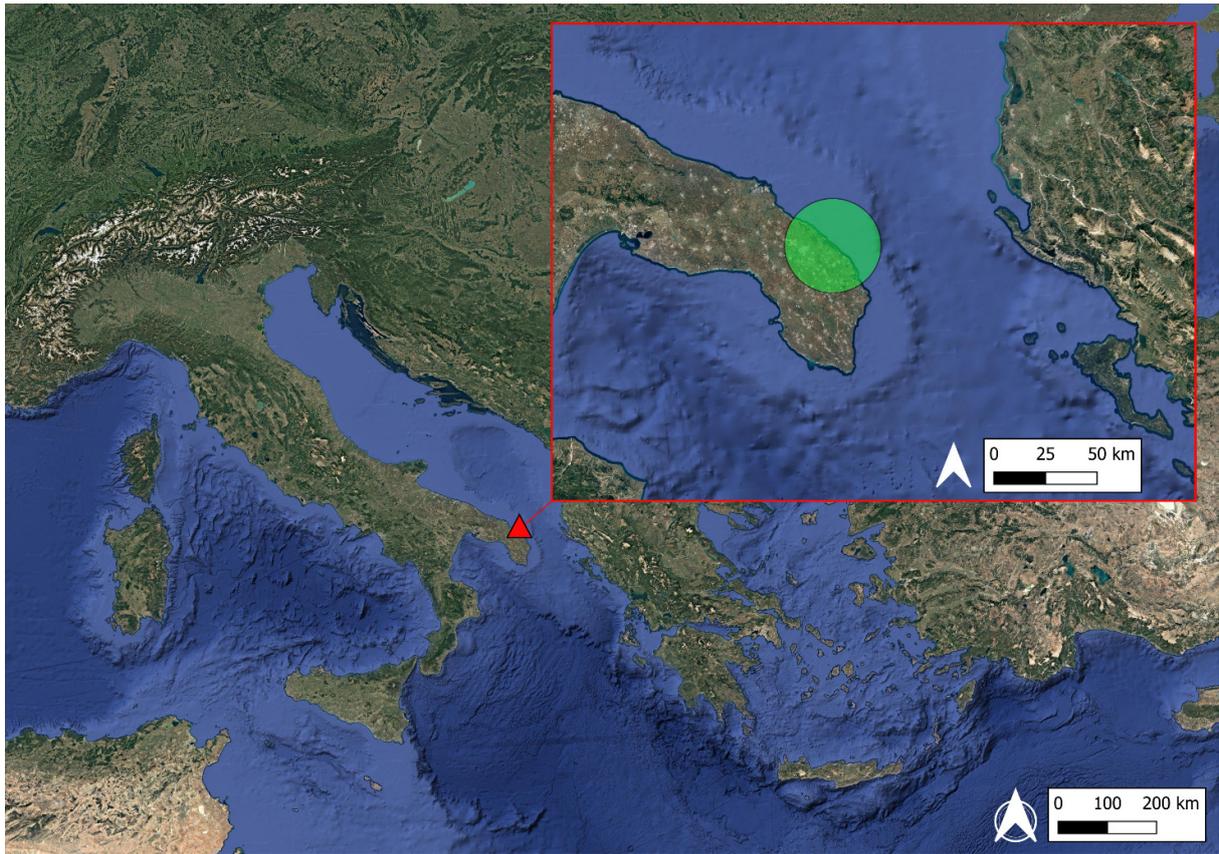


Figure 3

[Download PNG \(383.29 kB\)](#)



Manuscript body

[Download source file \(14.42 MB\)](#)

Figures

Figure 1 - [Download source file \(548.81 kB\)](#)

Figure 2 - [Download source file \(3.82 MB\)](#)

Figure 3 - [Download source file \(383.29 kB\)](#)

Supplementary Online Material

[Download source file \(14.42 MB\)](#)