



**plecotus**

natagora

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Plecotus / Natagora

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David Galens

Vespertilio vzw

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# Identification of bats in hibernation

October 2019

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**English translation:** David Galens – Vespertilio vzw – May 2020 – [www.vespertilio.be](http://www.vespertilio.be).

A special thanks to John Haddow, Stuart Newson and Nils Bouillard for their linguistic input.

All the photographs mentioning Dietz & von Helversen are used with agreement of the author, *Dietz, C. & von Helversen, O. 2004. Identification key to the bats of Europe, 72 pp., version 1.0 - electronical publication* downloadable on the author's website: <http://www.fledermausdietz.de/publications/publications.html>

All the illustrations mentioning of Punt et al. are taken from the book *Punt, A., Van Bree, P. J. H., De Vlas, J. & Wiersema, G.J., 1974. De Nederlandse vleermuizen, Wetenschappelijke mededelingen KNNV 104: 48 pg.*

It is the goal for this guide to evolve. If you have any comments about the proposed identification characteristics or know of other (reliable) methods, feel free to share those with us at [plecotus@natagora.be](mailto:plecotus@natagora.be). This guide is constantly updated following comments and suggestions. You can always download the latest version via [www.chauves-souris.be](http://www.chauves-souris.be): under "Publications" - "Documents à télécharger" or [www.vespertilio.be](http://www.vespertilio.be). This is the May 2020 version.

Any translation, adaptation to a different geographic region, use or reproduction in the context of studies on bats is strongly encouraged. Do not hesitate to contact us regarding the source files ([plecotus@natagora.be](mailto:plecotus@natagora.be)).

**Recommended citation :**

Nyssen, P. & Cors, R., 2019, Mémo pour la détermination des chauves-souris en hiver, Plecotus-Natagora



*Natagora is present throughout the Wallonia and Brussels and has numerous nature reserves spread over 4 800 hectares. The main objective of the association is to stop the decline of biodiversity and to help restore a better balance between people and nature.*



*Vespertilio VZW is an association that focuses on the study of bats in all its facets. Enjoying your hobby is our goal while we aim at conservation through the gathering of data . We like to share that knowledge in the form of education and sensibilisation.*



# Introduction

We can all agree that the identification of bats in hibernation is not always a smooth process. It's often a matter of figuring out which bat species that piece of ear or muzzle in that deep crack belongs to. Or whose blurry silhouette is covered in condensation drops, hanging 5m above ground... And all this, under challenging circumstances as we want to keep our presence in the hibernaculum as short as possible to avoid excessive disturbance, which is a stress factor that should not be underestimated. Even when a bat is visible up close and one can see the whole animal, the identification features to identify the species with high certainty are not always obvious!

The purpose of this document is to summarise all identification features to identify bats that can be observed in hibernation in Belgium. It is not intended for use outside the hibernation period or other geographical regions. Certain species that have never been recorded in Belgium in the winter are therefore not included in this document (this is the case for the *Nyctalus* species, as well as *Eptesicus nilssoni* and *Vespertilio murinus*).

It is also important to mention that the criteria used here are not "absolute". There are indeed exceptions as well as identification features seemingly obvious in high quality photographs but in reality may be far less obvious. It is advisable to never rely on a single characteristic. A good identification is generally based on a number of different characteristics and a critical approach. If you are not sure (because the bat is in a difficult place or too far away, not all features are visible, or simply because of a lack of experience), you should only note what you are sure of. A << *Myotis* sp. >>, or even << *Chiroptera* sp. >> is better than an incorrect identification.

## Data reporting

It is important to report observations through your local/national data portal.

## Limiting disturbance

Hibernation is a critical period. In order to limit the disturbance of bats there are some to guidelines to follow while surveying bats in hibernaculum:

- do not touch hibernating bats under any circumstance
- limit the lighting to a minimum and adjust the light intensity with respect to the distance to the individuals
- limit taking photos as much as possible (photos with flash in particular)
- limit noise as much as possible (whisper, pass only once, ...)
- to stay as short as possible in the vicinity of bats and in the hibernation roost in general
- do not exhale under or in the direction of bats that are nearby
- limit the number of counters depending on the area of the hibernation roost

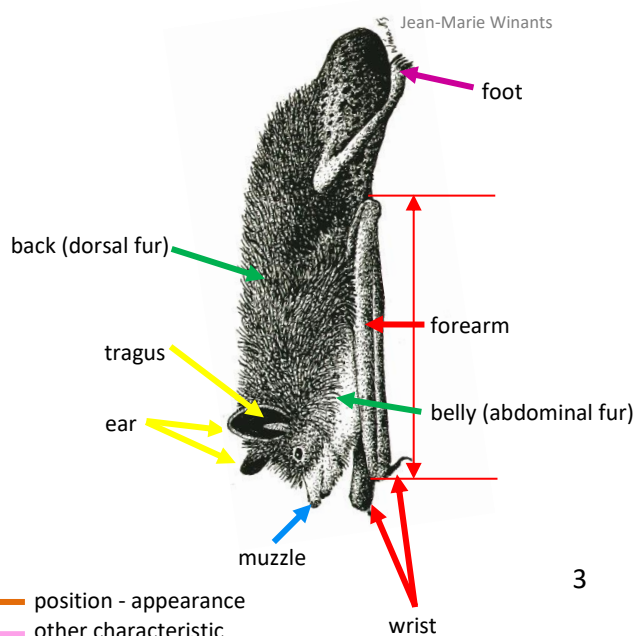
NB: Those guidelines are applicable to Belgium only. In the UK, a number of the actions listed above are subject to strict licensing.

## Morphology, criteria and colour code

The diagram below shows the various body parts of a bat that are used to identify hibernating bats.

The colours of the arrows are consistent throughout this guide. This means that specific identification features can easily be found.

Every species sheet includes important information, at the bottom of the page: body length (top of the skull to the base of the tail), the type of hibernacula used and the preferred roosting locations and temperatures.



# Rhinolophus hipposideros

Lesser horseshoe bat - Rh

The **main distinguishing feature** for the two horseshoe bat species is the **difference in size**.

The Lesser horseshoe bat is really small: its body is **no larger than a thumb or a match box**.

Rhinolophids always **hang freely** and are **wrapped** in their **wing membrane** (contrary to other species).

**Horseshoe bats are extremely sensitive to disturbance: always use caution!**

## Posture - appearance



mostly (as good as) **completely enveloped in its wings** – the body is mostly invisible;  
(as opposed to *R. ferrumequinum* where the wrap-around is looser)

## Nose



- a. comparatively, the **lancet** (upper part of the nose leaf) looks **larger** than *R. ferrumequinum*;
- b. **distinctive muzzle**: a membrane with skin folds, one of which is in the shape of a **horseshoe**.

## Fur



(rarely visible during hibernation)  
**grey-brown back, (light)grey belly, low contrast** with the back.

## Other characteristics



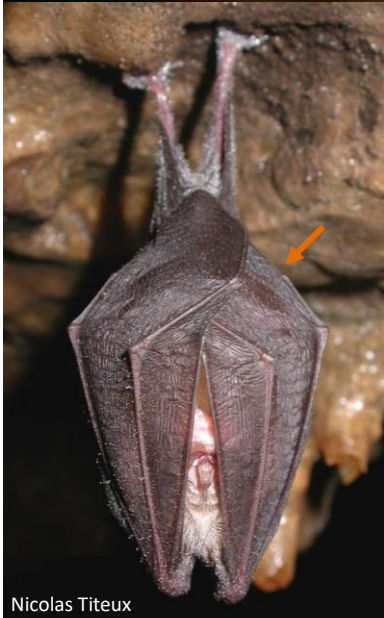
**the eyes are closer to each other than in *R. ferrumequinum*.**

**!!! Be careful not to confuse !!!**

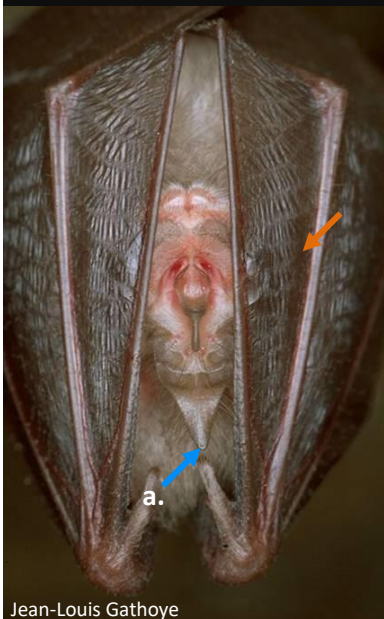
Sometimes, *Plecotus spp.* and even *Myotis spp.* tend to envelop themselves in their wing membrane



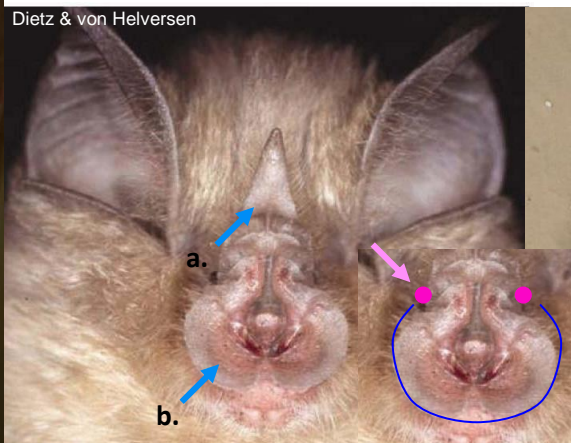
Jean-Louis Gathoye



Nicolas Titeux



Jean-Louis Gathoye



Dietz & von Helversen



Jean-Louis Gathoye



# Rhinolophus ferrumequinum

Greater horseshoe bat - Rf

Jean-Louis Gathoye



The **main distinguishing feature** for the two **horseshoe bat species** is the **difference in size**.

The Greater horseshoe is about the **size of a pear**.

Rhinolophids always **hang freely** and are **wrapped** in their **wing membrane** (something other species very rarely do).

**Horseshoe bats are extremely sensitive to disturbance: always use caution!**

## Posture - appearance

→ **not completely enveloped in its wings** – the muzzle stays visible;  
the wrap-around is 'looser' than *R. hipposideros*

## Nose

- 
- the **lancet** (upper part of the nose leaf) looks **proportionally much smaller** than *R. hipposideros*;
  - distinctive muzzle**: a membrane with skin folds, one of which is in the shape of a horseshoe.

## Ears

→ the ears of both horseshoe bat species are pointed and the extremities are bent outwards. There is **no tragus**.

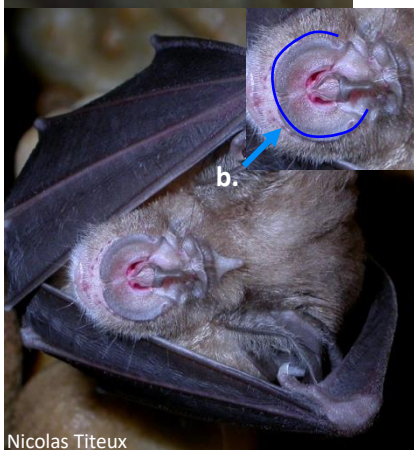
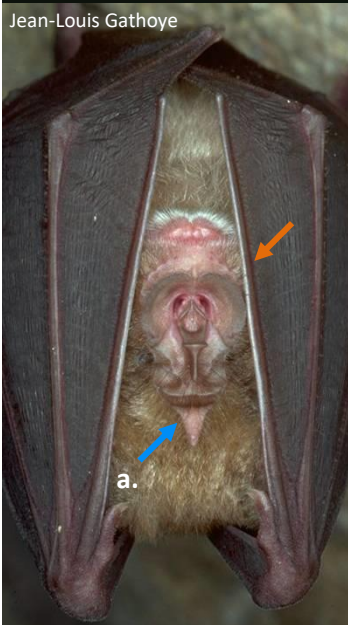
## Fur

→ **reddish dorsal fur, dirty white abdominal fur, low contrast** with the back. (limited visibility during hibernation).

## Other characteristics

→ the tail is folded along the back, a unique characteristic of horseshoes.

Jean-Louis Gathoye

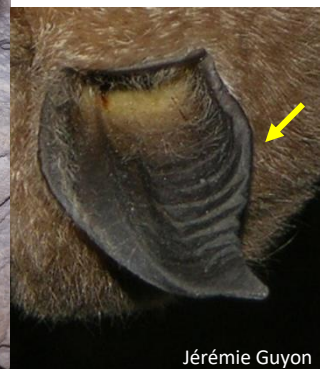


Nicolas Titeux



Serge Motquin

Bernard Urbain



Jérémie Guyon

**!!! Be careful not to confuse !!!**

Sometimes, *Plecotus spp.* and even *Myotis spp.* tend to envelop themselves in their wing membrane

# Plecotus auritus

Brown long-eared bat - Pa

The distinction between both long-eared bats in hibernation is not always possible. When in doubt the taxon *Plecotus spec* (PaA) is used.



Jean-Louis Gathoye

Nicolas Titeux



## Posture - appearance

stubby and oval shaped body.

## Nose

- a. **characteristic muzzle:** light coloured (from pink to light brown) with bloated look and protrusions like two potatoes next to each other;
- b. blunt and rounded, the appearance of a «European truck».

## Ears

- c. **folded back under the wings** during hibernation (a rare exception is possible);
- d. **only the tragi protrude** (and may look like pointed ears!);
- e. long and pointed tragus with an even end, same colour as the ear, often completely pink.

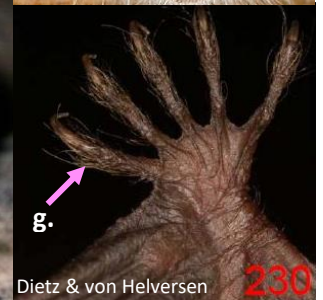
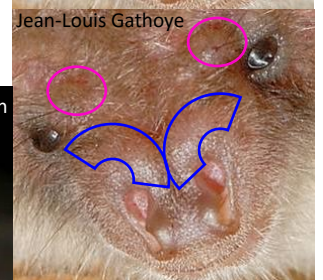
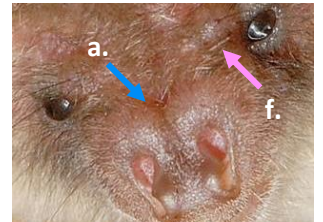
## Fur

reddish brown dorsal fur with long and loose hair.

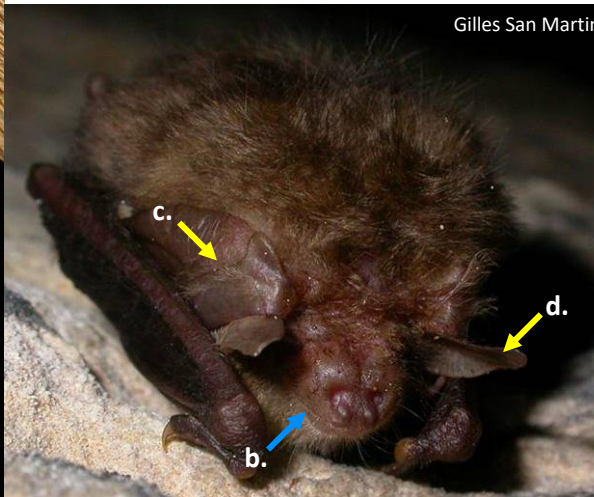
## Other characteristics

- f. presence of **two** clear, **thick 'warts'** with a diameter equal to that of the eye;
- g. **very long hair** on the toes.

*P. austriacus* in contrast, has short hair



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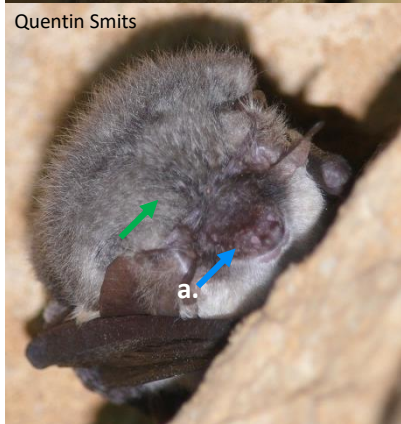
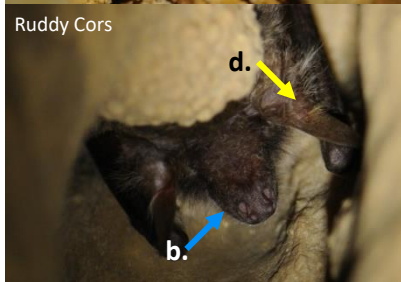
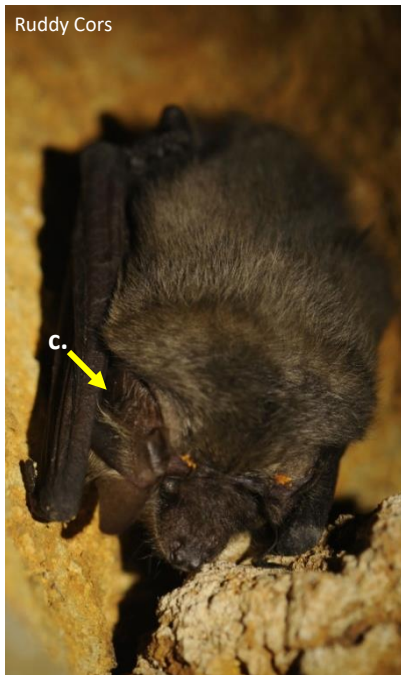
Gilles San Martin

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# Plecotus austriacus

Grey long-eared bat - PA



The distinction between both long-eared bats in hibernation is not always possible. When in doubt the taxon *Plecotus spec* (PaA) is used.

## Posture - appearance

→ stubby and oval shaped body.  
(like *P. auritus*)

## Nose

- a. **distinctive muzzle: dark, less pronounced protrusions** than *P. auritus*;
- b. elongated, looks like a dog's snout or an «American truck»

## Ears

- c. **folded back under the wings** during hibernation (a rare exception is possible);
- d. **only the tragi protrude** (and may look like pointed ears!);
- e. long and pointed tragus with an even end, same colour as the ear, often completely pink.

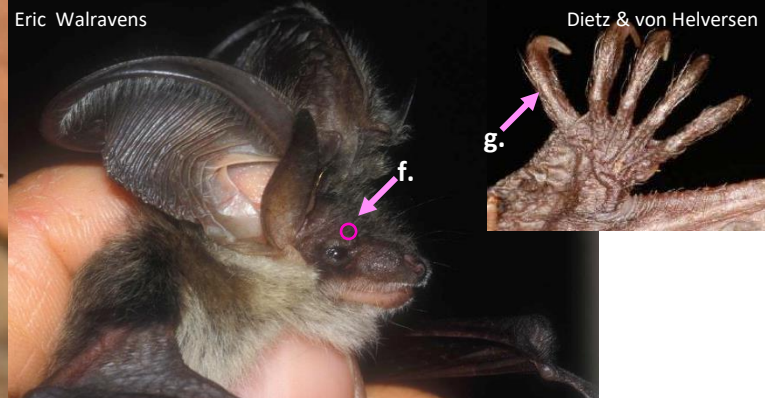
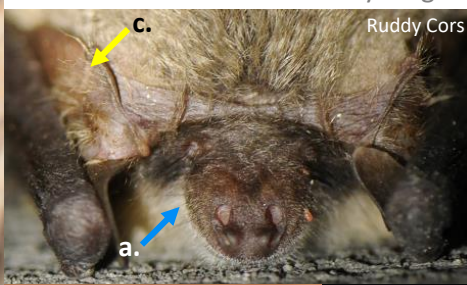
## Fur

→ long and loose dorsal fur, leaning towards grey.

## Other characteristics

- f. presence of two **small** and less pronounced '**warts**' with a diameter smaller than that of the eye;
- g. **short hair** on the toes.

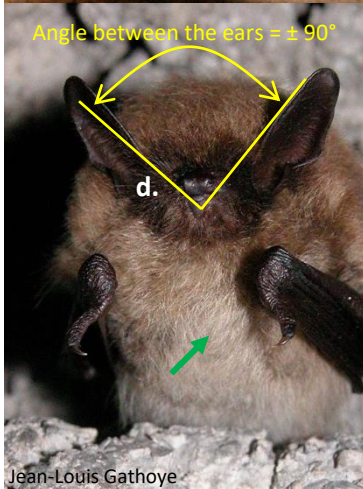
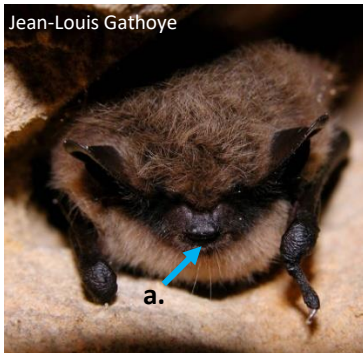
very long with *P. auritus*





# *Myotis mystacinus* / *brandtii* / *alcathoe*

Whiskered bat / Brandt's bat / Alcathoe bat - Mmba



The distinction between these three species is very difficult in hibernation, is usually recorded as *Mystacinus spec* (Mmb) and is further referred to in this manual as *Mystacinus sl.*

It is one of the smallest species that is observed in hibernation but also the most common.

## Forearm

→ forearm and wrist are usually **much thinner and smaller** than *M. daubentonii*.

## Nose

- a. in front view the black mask or **black V** is very characteristic; **!!! Careful, not always obvious !!!**
- b. **small snout**, slightly protruding and dark (dark pink to black). Older animals often have a paler muzzle.

## Ears

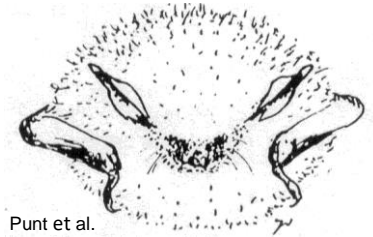
- c. the **tragus** is **pointed**, long and slender and the **notch** is quite **flat**; useful features for the distinction from *M. daubentonii*
- d. **angle between the ears** =  $\pm 90^\circ$ .

## Fur

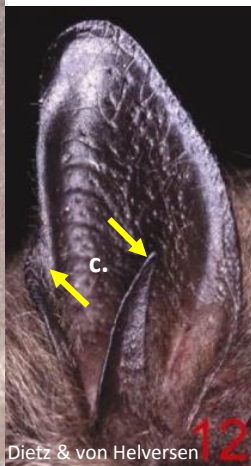
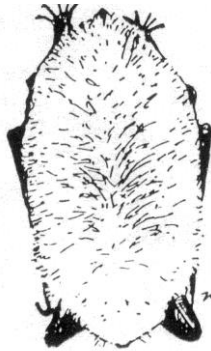
→ **abdominal fur** is **lighter** than the back, rather **beige** (not white). Less «clean» than the other *Myotis* spp.

## Other characteristics

- e. in hibernation, the colour of the skin (ears, muzzle, wings) contrasts strongly with both back and abdominal fur, which gives a **tricolour** look; as opposed to *M. daubentonii* which is 'bicolour'
- f. unlike *M. daubentonii*, the **feet are small** (less than half the tibia), **with no long hairs** on the toes. Uropatagium attached to the toe.



Punt et al.



Frédéric Forget

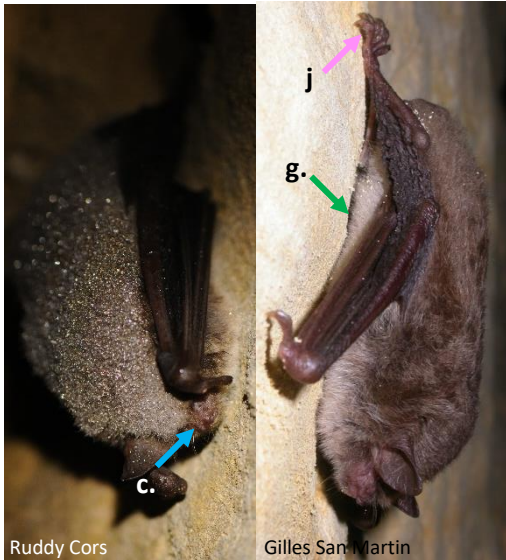


Nicolas Titeux



# Myotis daubentonii

Daubenton's bat - Md



## Forearm



forearms and wrists are **thicker** and **more robust** than in *M. mystacinus s.l.*

## Nose



- a. **pink snout**; much lighter than in *M. mystacinus s.l.*
- b. on the more lightly coloured individuals, a well defined **pink rectangle** can be seen;

!!! Beware, this is not always clear, especially with juveniles that have a more greyish to dark snout !!!

- c. much **shorter** and **stubbier** than *M. nattereri*.

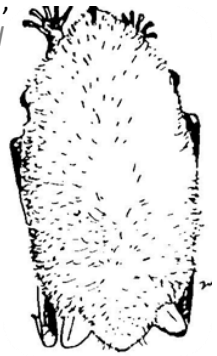


Punt et al.

## Ears



- d. **small** and not prominent, viewed dorsally: do not extend beyond the muzzle when folded forward;
- e. the **short, rounded** and **pale tragus** is **curved forward\***; good characteristics for distinction with *M. mystacinus s.l.* and *M. dasycneme\**
- f. **angle between the ears = ± 120°**.



## Fur



- g. **pale abdominal fur**, rather **greyish** (not white);
- h. area between the ear and muzzle is relatively hairless.

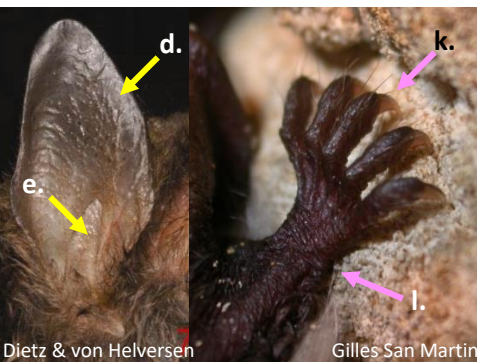
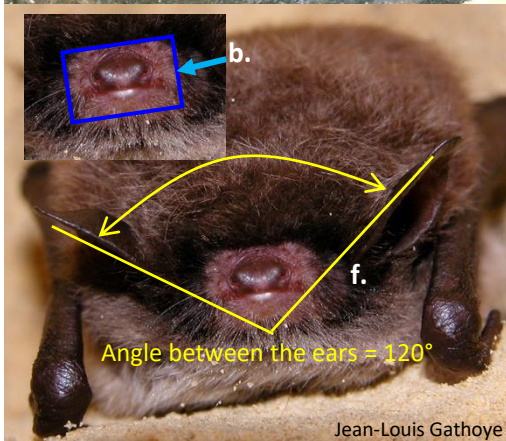
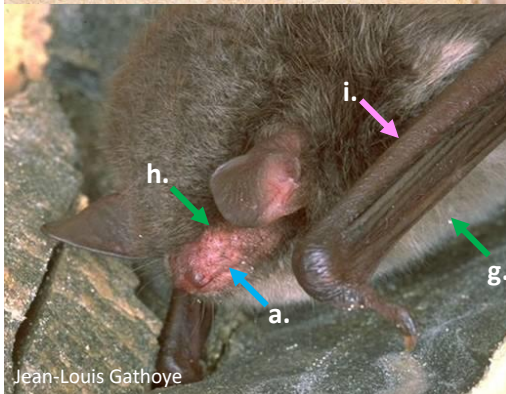
## Other characteristics



- i. in hibernation, the colour of the skin (ears, wings) contrasts only slightly with the brown-grey back, which provides a '**bicoloured**' appearance; in contrast to the 'tricoloured' *M. mystacinus s.l.*
- j. the **feet** are **typically large**, an excellent characteristic for distinguishing *Myotis mystacinus s.l.*; !!! *M. dasycneme* also has big feet !!!
- k. **large hairs on the toes**;
- l. anchor of uropatagium at the ankle. instead of at the toe like *M. mystacinus s.l.*



Along with *M. nattereri*, the only species likely to in its hibernaculum in the winter.

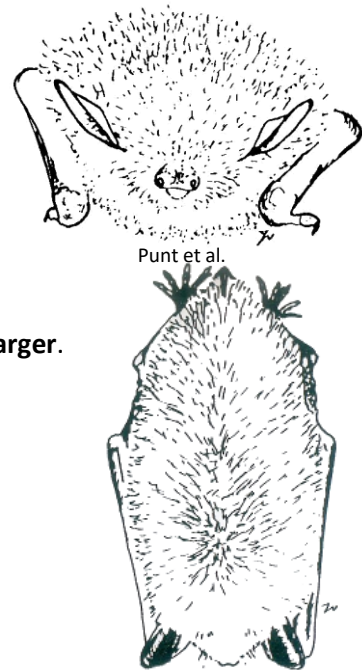


- body length: 40-60 mm, small/average
- hibernaculum: underground sites, crevices in bridges
- position in hibernaculum: mostly hanging freely on the wall but also in cracks, or more rarely, hanging free
- temperature: variable



# Myotis dasycneme

Pond bat - MD



## Posture - appearance



- a. generally an **elongated and rectangular shape**;
- b. *M. dasycneme* resembles *M. daubentonii*, but is **much larger**.

## Forearm



- c. **thick, robust and reddish brown**;
- d. the elbows are often far away from the body.

## Nose



the **snout** consists of 2 separate **lobes** and therefore gives the impression of 2 adjacent lumps.

## Ears



- e. relatively **small** and only project beyond the snout in top view;
- f. **short and rounded tragus**, slightly **curved inwards**.

good characteristic for distinction with *M. daubentonii*

## Fur



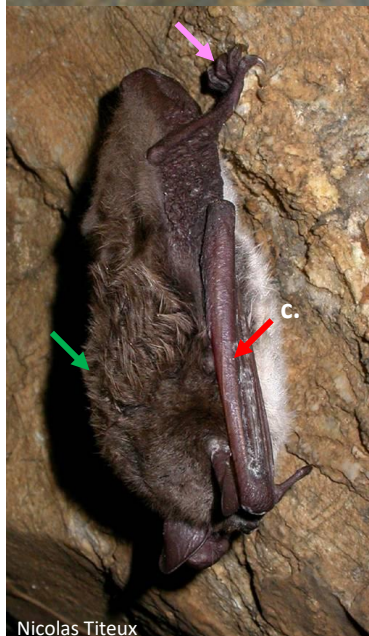
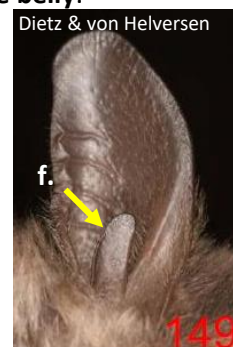
**cocoa-coloured dorsal fur** that **contrasts** strongly with the **white belly**.

## Other characteristics



**big feet** are a distinctive feature: this allows them to grab insects on the water surface (trawling).

!!! *M. daubentonii* also has big feet !!!



Nicolas Titeux



Jean-Louis Gathoye



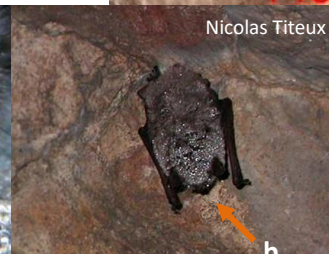
Gilles San Martin



Ruddy Cors



Jean-Louis Gathoye



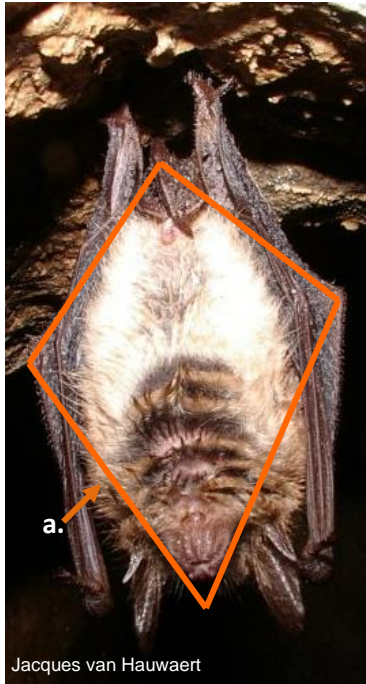
Nicolas Titeux

Size for comparison: an *M. mystacinus* (format similar to *M. daubentonii*) on the left and an *M. dasycneme* on the right.



# Myotis emarginatus

Geoffroy's bat - ME



Jacques van Hauwaert

## Posture - appearance

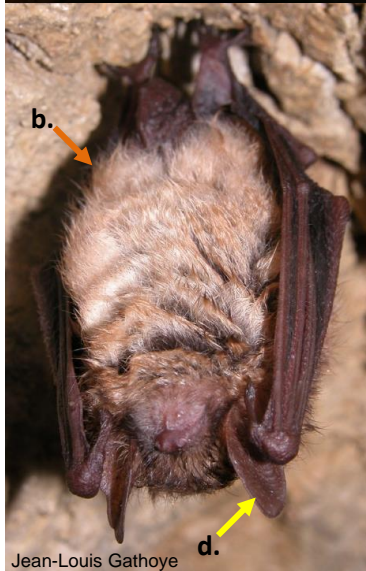
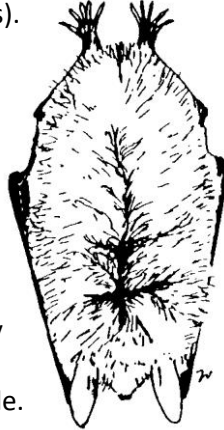
- a. **diamond shaped body** (the elbows are far apart), from the front, the wrists often cover the ears;
- b. most often hanging **freely** in the warmer zones of winter roosts;
- c. often form dense clusters (from two to several dozens of individuals).



Punt et al.

## Ears

- d. **brownish**, relatively **long**, **fine** and **pointed**, aligned with the body towards the ground;
- e. the «notch» in the ear is in fact an earlobe that also occurs in most other myotis species. With *M. emarginatus* however, it is noticeably higher, and if visible, a good ID feature;
- f. from the front the **ears** are more or less **parallel**, or at a limited angle.



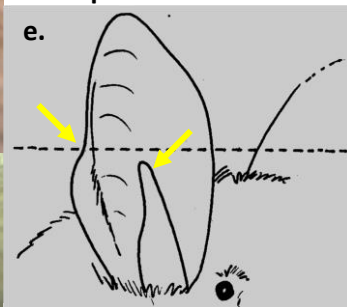
Jean-Louis Gathoye

## Fur

- g. **woolly** and **thick**. In individuals that have been hibernating for a while, the fur shows a characteristic «striped» appearance, like a **wet dog**;
- h. the **back** has a characteristic **reddish colour** and the abdominal fur, lightly contrasting with the back, has an equally characteristic light brown to beige colour;
- i. **5%** of the individuals are **melanistic** (fur and skin are uniformly dark).

**!!! not to be mistaken with other dark species such as Barbastelle !!!**

## The tragus does not extend past the notch



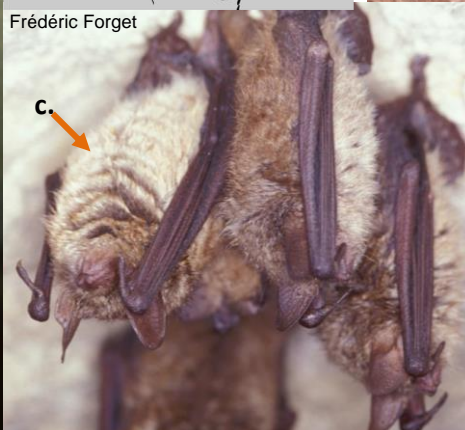
Frédéric Forget



Dietz & von Helversen



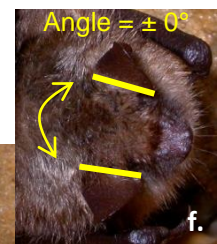
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c.



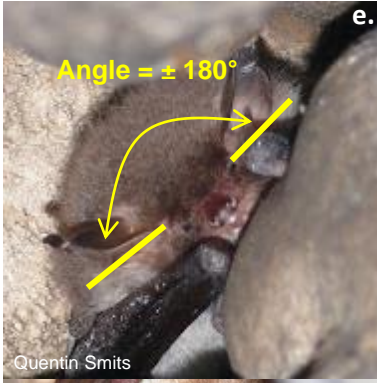
Nicolas Titeux



f.



# Myotis nattereri



## Posture - appearance

- a. **chubby, oval-shaped** body;
- b. *M. nattereri* often crawls deeply in cracks or cavities, or hangs with the belly against the wall.

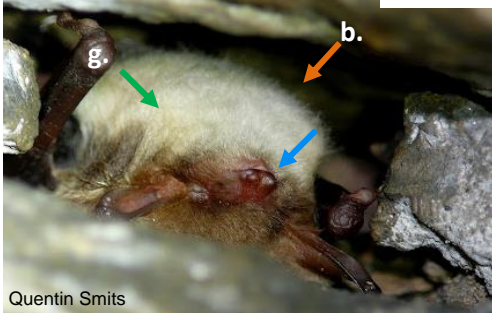
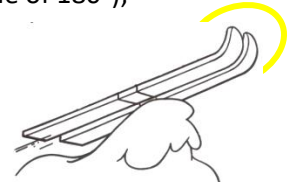
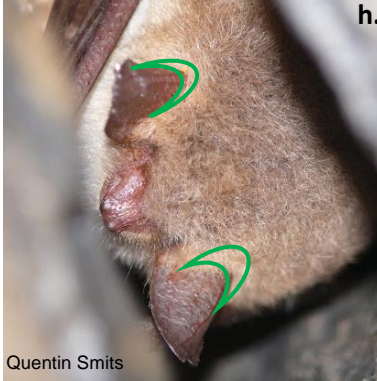
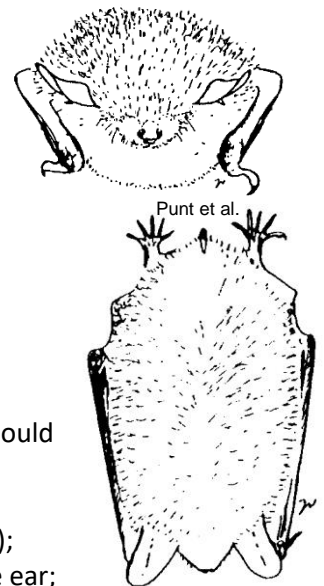
## Nose

- pink **snout**, like *M. daubentonii*, but much finer and more elongated.

## Ears

- c. **rather long** (shorter than *M. bechsteinii*), unfolded, they would protrude beyond the snout (unlike *M. daubentonii* and *M. mystacinus/brandtii*), **light in colour, leathery** and **translucent** (veins are visible!);
- d. very long and fine **tragus**, extending beyond the half of the ear; good feature for distinction with *M. bechsteinii* that has a shorter **tragus**
- e. from the front, the ears appear to be aligned on a plane (angle of 180°);
- f. **curl upwards** like the tips of a ski, with a rounded end.

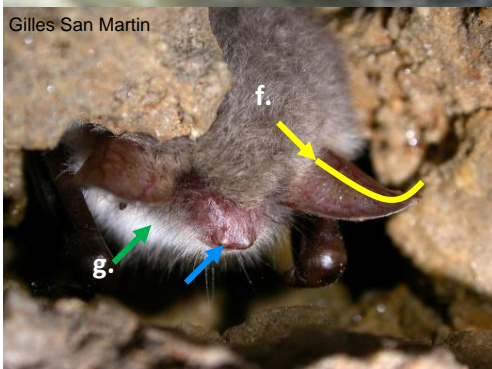
Natterer's bat - Mn



NB. This feature can sometimes be found in other *Myotis* species but the ears do not have the same colour, angle, texture, shape, etc.

## Fur

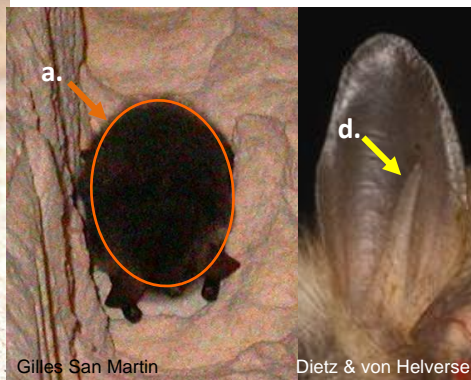
- g. **pure white belly**, spotless (it's the « cleanest» *Myotis*), contrasting strongly with the **grey brown back**;
- h. **light cream 'crescent moons'** clearly visible **behind** the ears.



Even from a distance and/or under poor conditions, the long and raised ears, accentuated by lighter hair, are good ID features. They appear to cover the wrists.

**PARENTAL  
ADVISORY  
EXPLICIT CONTENT**

Along with *M. daubentonii* they are the only species likely to mate during the winter.





# *Myotis bechsteinii*

Bechstein's bat - MB



## Posture - appearance



this species generally hibernates very deeply in cracks and other crevices, making them less frequently observed.

## Nose



pink, little hairy muzzle, similar to *M. myotis*.

## Ear



- a. distinctive: very **long** and **wide**, **U-shaped**, they protrude well beyond the muzzle and measure approximately **1/3 of the body length**;
- b. unlike *Plecotus* the ears are **not connected** to the base and are **never folded** behind the wings;
- c. tragus smaller than half the earcup.

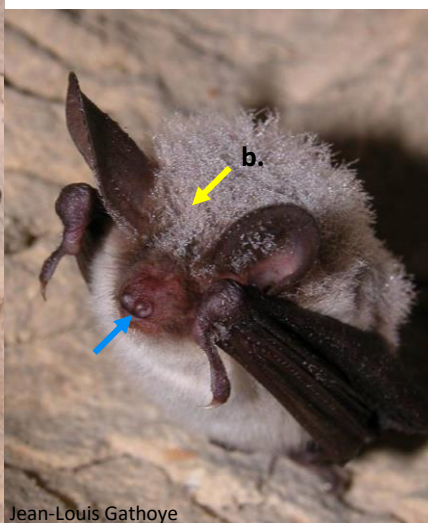
Good characteristic for distinction with *M. nattereri* (longer tragus)

## Fur

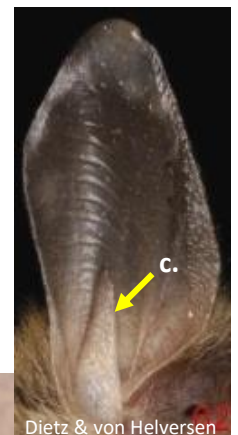


the long **white-pale grey abdominal fur** contrasts well with the back; These long hairs sometimes stick together to form parallel stripes which makes the dark grey base of the fur visible.

!!! not to be mistaken with *M. emarginatus* !!!

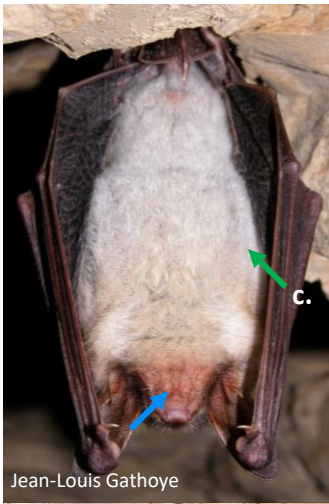


Jean-Louis Gathoye



# Myotis myotis

Greater Mouse-eared bat - MM



Jean-Louis Gathoye

## Posture - appearance

- a. the body generally gives a **bony** impression reminiscent of a '**sack of potatoes**' (due to the numerous bumps) and is rather **diamond-shaped**;
- b. generally **free hanging**, often as high as the ceiling will but sometimes just hanging on the walls.

## Nose

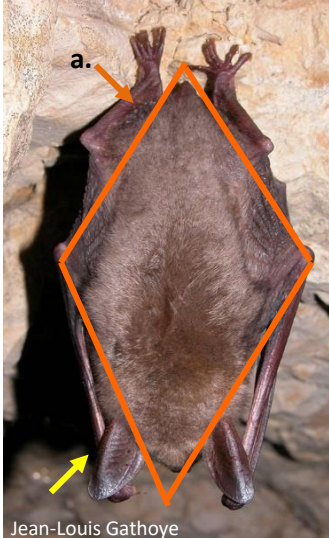
- **protruding**, relatively hairless **snout** (German shepherd-like).

## Ears

- **large, shiny**, come beyond the snout but are only 1/4 to 1/5 of the bodylength.
- Unlike *M. bechsteinii* that has seemingly larger ears. The ears of both species have the same length but *M. myotis* is much larger than *M. bechsteinii*, making the ears of the latter appear relatively larger.

## Fur

- c. very **white belly fur** contrasting strongly with the back;
- d. **typical implantation** of the hair at the level of the forehead (reminiscent of incipient forehead baldness).



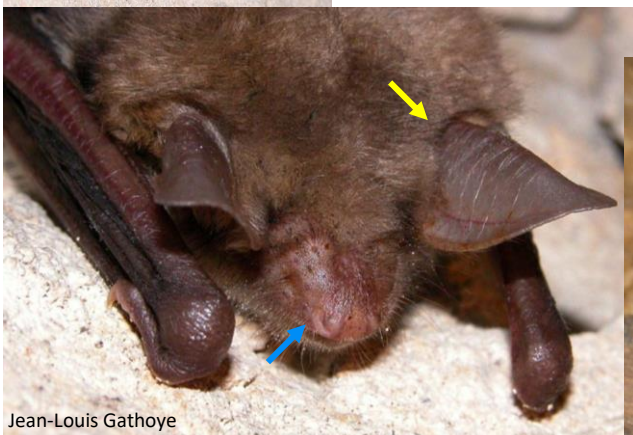
Jean-Louis Gathoye

## Other characteristics

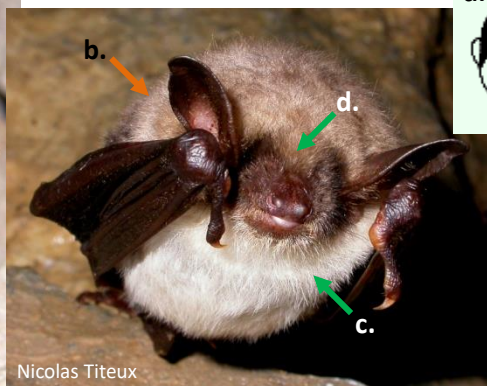
- the «Goliath» among our bats: the very large size is an important feature.



Jean-Louis Gathoye



Jean-Louis Gathoye



Nicolas Titeux



d.



Dietz & von Helversen



Thierry Petit



# Barbastella barbastellus

Barbastelle bat - Bb



## Posture - appearance

this species often looks for winter roosts reminiscent of the loose bark it uses in the summer: **cracks, loose rocks, hanging cloths or panels along walls**. Often free hanging, with the belly against the wall or forming dense clusters.



## Nose

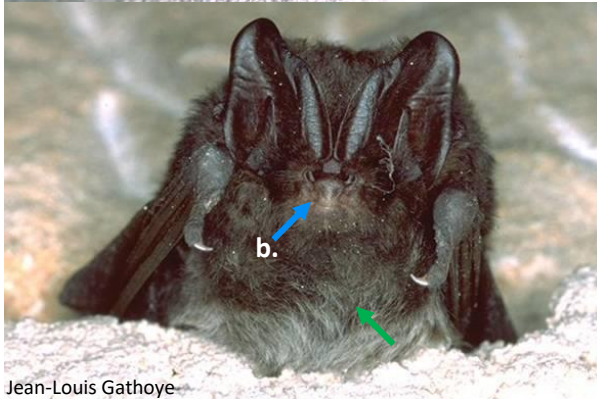
- a. **black** and very characteristic **face**;
- b. **flattened snout ('pug')**, nostrils are pointed upwards.

## Ears

- black, **wide and triangular**, touch each other at the base.

## Fur

- silky** ('like the fur of a mole'), **coal black dorsal fur**, often with greyish hairtips and **dark grey abdominal fur**.





# Pipistrellus sp.

Pipistrelle - 3 species - (Pp, Pn, PP)



Quentin Smits

## Posture - appearance

→ Pipistrelles are **rarely** found in **underground sites**. If so they are located in **cracks**, very often in **tight clusters**. Hibernation often seems to be shallower, the animals responding quickly to light.

## Ears

→ **small, black** and often **rounded**, with a **round** and quite **short tragus**.

unlike *M. mystacinus*

## Fur

→ generally **dark**, with **little contrast** between **abdominal** and **dorsal fur**.

Common and Soprano pipistrelles have a very characteristic red-brown (gingery-brown) fur; the Nathusius's pipistrelle has a browner fur.

## Other characteristics

→ **very dark skin** (wings, ears, muzzle, ...), the pipistrelle's black mask is reminiscent of *Myotis mystacinus s.l.* . Also the low contrast between abdominal and dorsal fur, the triangular shape of ears and rounded tragus are useful identification features.

Pipistrelles are very small: barely larger than a match box.



Quentin Smits



Cyril Schönbacher



M. Daniel



Dietz & von Helversen



Tony Rock



Gilles San Martin

- body length: 32-55 mm, small
- hibernaculum: mainly buildings, rarely in underground sites
- location in hibernaculum: very often in groups in narrow and deep cracks near the entrance
- temperature: tolerates low temperatures - often in very dry conditions



# Eptesicus serotinus

Serotine bat - Es



Vincent Cohez

## Posture - appearance

in winter, serotines are rarely found in underground sites. They are often concealed in crevices in poorly insulated and ventilated areas.

## Forearm

forearms and wrists are **very large** and **dark**, often **greyish** as if covered in dust.

## Nose

rather **elongated** and **protruding snout**, similar to a fox snout. The «thick nose» is a striking feature.

## Ears

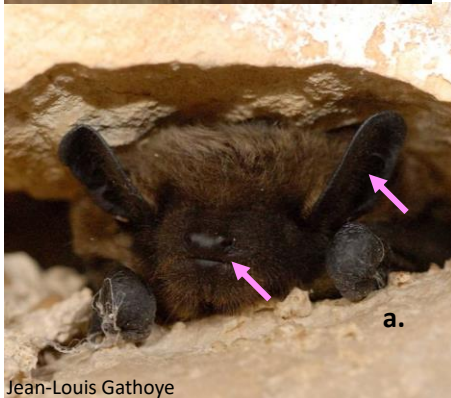
**wide** and **rounded**, very **dark**, with a **wide, short** and **round tragus**.

## Fur

completely **dark coloured**: **brown dorsal fur**, slightly lighter **belly** with a **brown/creamy touch**, slightly contrasting with the back, more pronounced than in pipistrelles.

## Other characteristics

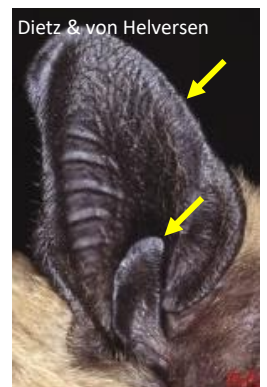
- completely **dark skin**, the **face** is very **dark** (and provides a typical 'black mask');
- large size**, making them easy to distinguish from pipistrelles.



Jean-Louis Gathoye



Vincent Cohez



Dietz & von Helversen



Jean-François Julien



Vincent Cohez



Quentin Smits

- body length: 62-80mm (big !)
- occurrence: common
- hibernaculum: mainly buildings, rarely in underground sites
- location in hibernaculum: in deep cracks or crevasses near the entrances
- temperature: tolerates very low temperatures