Detection and Serological Evidence of EBLV-1 in Belgian Bats between 2016 and 2018

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EBLV-1 in Belgian bats

European Bat Lyssavirus 1 (EBLV-1) is a virus in the same family as Rabies virus and can cause similar symptoms in mammals. EBLV-1 has been detected in Belgian Bats in 2016 and 2017. Blood samples of bats were frequently found to be positive for EBLV-1 neutralising antibodies. Further research has to be done to determine against which lyssavirus from phylogroup I antibodies in Belgian bats are mounted.

Belgium has been free of *Lyssavirus rabies* since 2001. However, other *Lyssavirus* species can also cause encephalitis in mammals and are found in bats in our neighbouring countries. During this research, we have explored the presence antibodies that neutralise *Lyssavirus Hamburg*, better known as European Bat Lyssavirus 1 (EBLV-1), in living bats and have examined bat carcasses for the presence of this virus in different bat species.

Methods

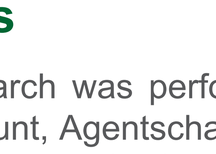
- All research was performed under the guidelines and license from Natuurpunt, Agentschap Natuur en Bos and the Flemish government (reference ANB/BL/FF-V18-00095).
- 120 live animals were captured at five sampling sites in Flanders: Arendonk, Diksmuide, Duffel, Herentals and Liezele. Blood and saliva was collected for antibody testing with RFFIT adapted for EBLV-1 and PCR respectively.
- 133 carcasses were collected during passive surveillance in Belgium. The brains of these carcasses were tested with a PCR that can detect 8 different lyssaviruses.

Results

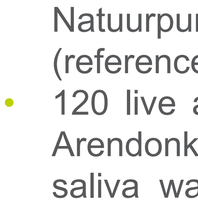
Several species of bats were captured during the active survey. Saliva samples all tested negative for lyssaviruses. EBLV-1 neutralising antibodies were detected in blood of several bat species.

Expected
Unexpected

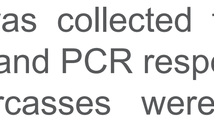
Watervleermuis
Daubenton's bat



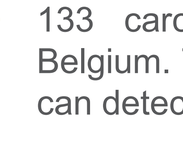
Ingekorven vleermuis
Geoffroy's bat



Baardvleermuis
Whiskered bat



Franjestaart
Natterer's bat



Gewone grootoorvleermuis
Brown long-eared bat

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Bat Species/ Location	Number of Bats Tested	Number of Samples Positive for Antibodies (%)
Myotis daubentonii	**55**	**16 (29%)**
Diksmuide	11	1
Duffel	44	13
Liezele	4	2
Myotis emarginatus	**9**	**2 (22%)**
Arendonk	1	0
Duffel	3	0
Herentals	4	2
Liezele	1	0
Myotis mystacinus	**3**	**2 (67%)**
Diksmuide	1	1
Duffel	1	0
Liezele	1	1
Myotis nattereri	**3**	**0 (0%)**
Arendonk	1	0
Duffel	2	0
Plecotus auritus	**17**	**8 (47%)**
Arendonk	9	3
Duffel	8	5
TOTAL	**87**	**28 (32%)**

Passive surveillance was performed on carcasses from all over Belgium. In 2016, a *Eptesicus serotinus* tested positive for EBLV-1. The bat was severely weakened and immobile, and brought in after a biting incident with a hiker in Bertrix.

In 2017, a weakened *E. serotinus* was found in Étalle 30 km southeast of Bertrix and brought to a bat care centre without human exposure. The bat died and tested positive for EBLV-1.

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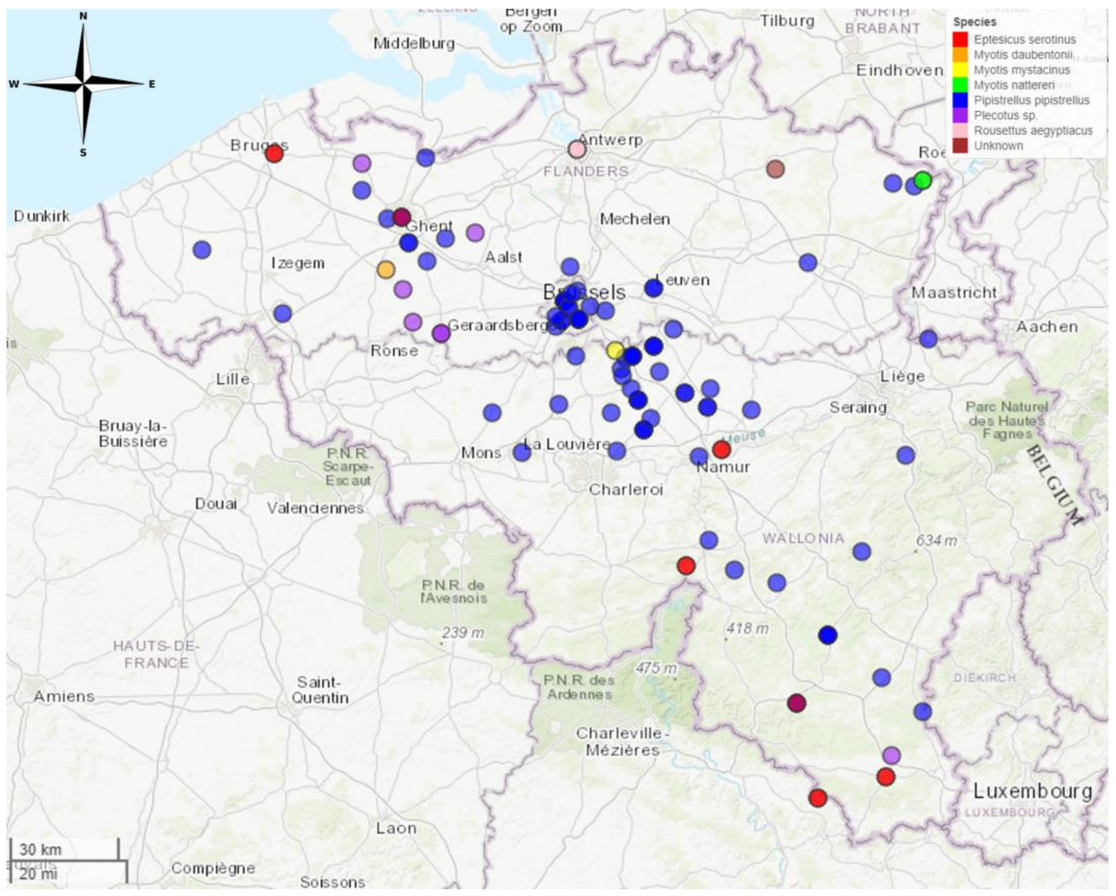

Discussion

- EBLV-1 neutralising antibodies were detected in several bat species. Some of these antibodies might have been mounted against other lyssaviruses of phylogroup I as the virus is not known to circulate in *Myotis daubentonii, M. emarginatus, M. mystacinus and Plecotus auritus*, but EBLV-2 has been detected in *M. daubentonii* and Khujand virus has been found in *M. mystacinus*. Further research has to be done to distinguish cross-protecting antibodies.
- EBLV-1 has been detected for the first time in two *Eptesicus serotinus* bats in southern Belgium. This is consistent with reports from neighbouring countries.

REFERENCES

- Nauwelaers, I.; Van den Eynde, C.; Terryn, S.; Vandendriessche, B.; Willems, W.; Dekeukeleire, D.; Van Gucht, S. Detection and Serological Evidence of European Bat Lyssavirus 1 in Belgian Bats between 2016 and 2018. Trop. Med. Infect. Dis. 2024, 9, 151.

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