

PCR prevalence of rodent-borne Ljungan virus across Europe



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Introduction

The Ljungan (picorna) virus (LV) was identified in 1998, in bank voles (*Myodes glareolus*, Figure 1) close to the Ljungan river, Sweden.



Figure 1: *Myodes glareolus*

Interest in LV has grown as a result of a suggested association of the virus with some human pathologies.

Since LV also causes disease in some wild rodents, it may have a role in small mammal cycles.

This is the first systematic screening of LV across the EU, especially in the bank vole, but also in other small mammals, including shrews and commensal species.

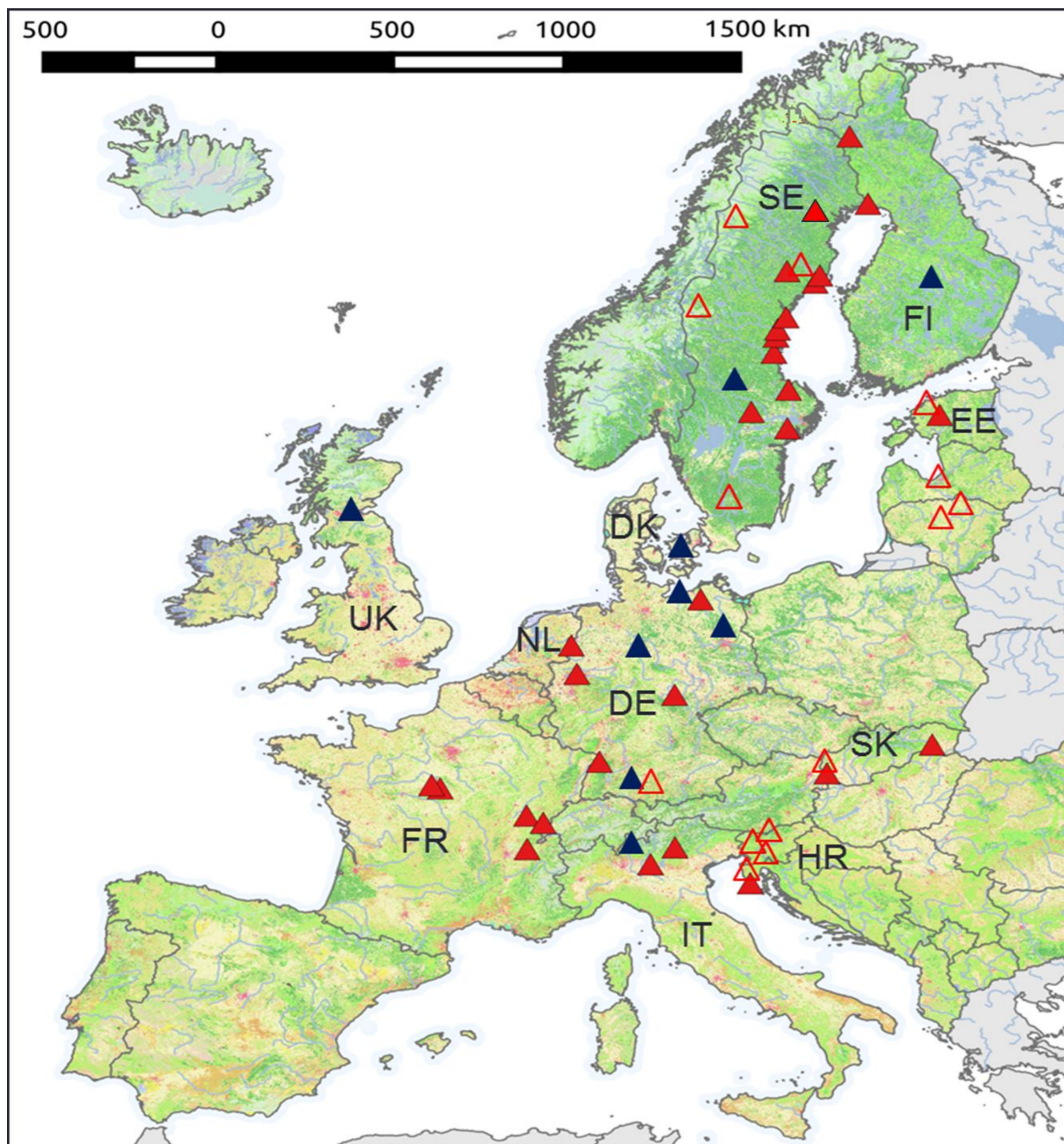


Figure 2: Map of the European countries where LV-positive animal samples were collected.

▲ = sampling sites where LV PCR-positive rodents were found.

▲ = sampling sites where LV has been found in previous studies.

△ = sampling sites where all rodent samples were LV-negative.

The land cover detection was not possible for Greece because it did not join the Corine land cover (CLC) project.

Results

➤ 1602 rodent liver samples screened by RT-PCR, including 24 species from 29 localities in 9 EU countries (14 sample sites did not have at least one LV-positive).

➤ 167 samples were LV PCR-positive (Table 1).

Table 1: List of the EU countries where animals were collected; number of samples screened in each country; number and prevalence of LV-positive samples.

Country	N. screened (n. species)	N. LV-positive (n. species positive)	Prevalence % (prevalence <i>M. glareolus</i>)
Finland	278 (9)	20 (7)	7.19 (23.8)
Sweden	441 (1)*	69	15.65 (15.65)
Estonia	23 (1)	1	4.35 (n/a)
Germany	103 (2)*	13 (1)	12.62 (13.0)
The Netherlands	30 (2)	1 (1)	3.33 (4.8)
Slovakia	80 (1)*	3	3.75 (3.75)
France	100 (1)*	11	11.0 (11.0)
Italy	428 (14)	48 (7)	11.21 (26.2)
Croatia	119 (5)	1 (1)	0.84 (n/a)
Total	1602 (24)	167 (13)	7.77 (10.91)
Mean prevalence			

* indicates that the main or only species screened was the bank vole, *M. glareolus*.

Conclusions

LV-positive samples were found in all countries with significant sample sizes, and in most species, including house mice, but not black rats. Overall PCR-prevalence in bank voles was about 11% (range 0-50% per population). We added eight new species to the list of LV hosts (Fig. 3), including the red squirrel (*Sciurus vulgaris*), and a number of voles and shrews. Our study suggests that LV has a wide geographical and host distribution.

Materials and Methods

As part of the EU FP7 project EDENext, rodent species from nine European countries were sampled. Using an LV-specific RT-PCR method (Donoso-Mantke et al., 2007), 1602 liver samples were screened for LV, including 831 bank voles.

References

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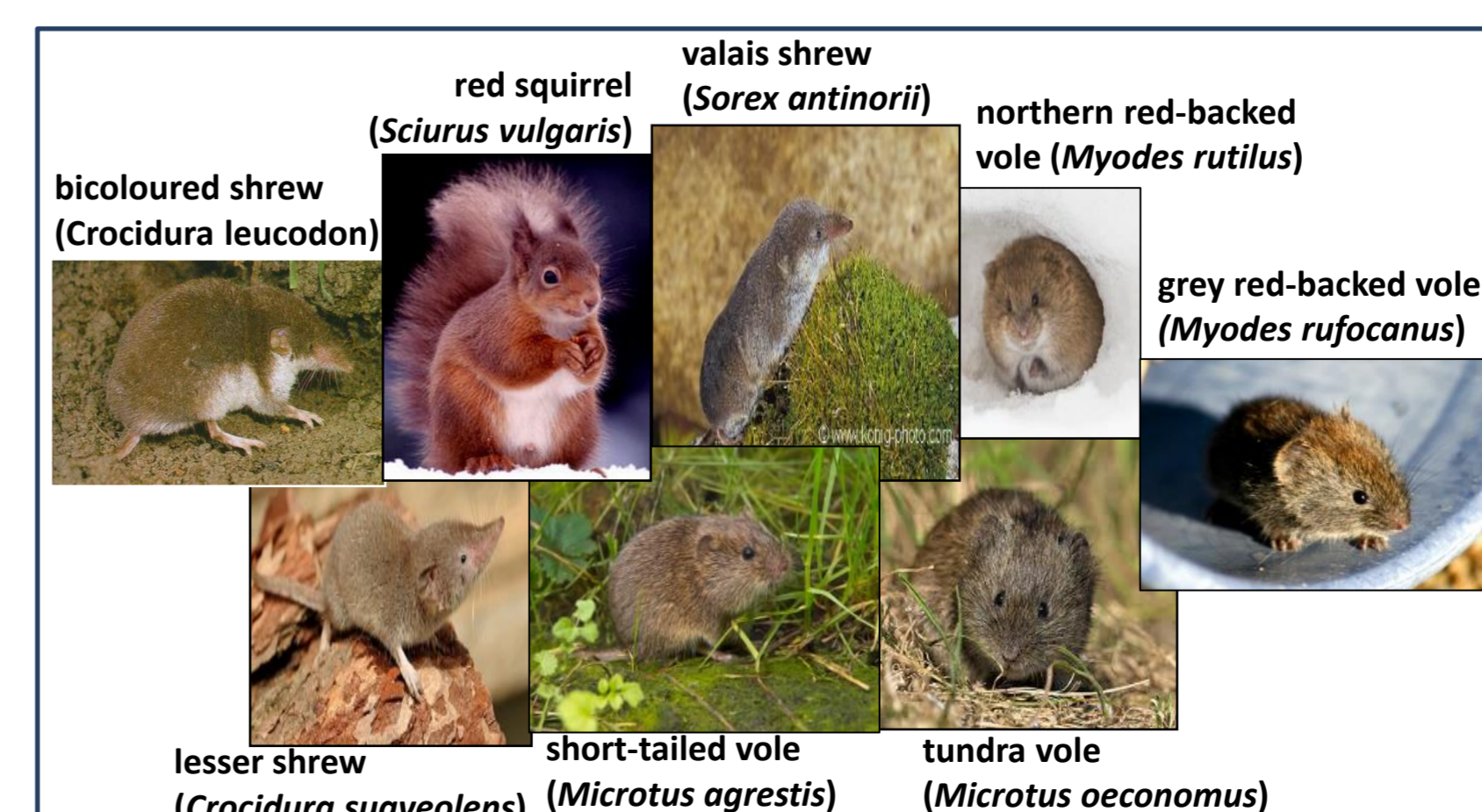


Figure 3: new host species for LV.

