

# Investigating tabanids as potential African swine fever vectors in wild boar habitats in Estonia

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## INTRODUCTION

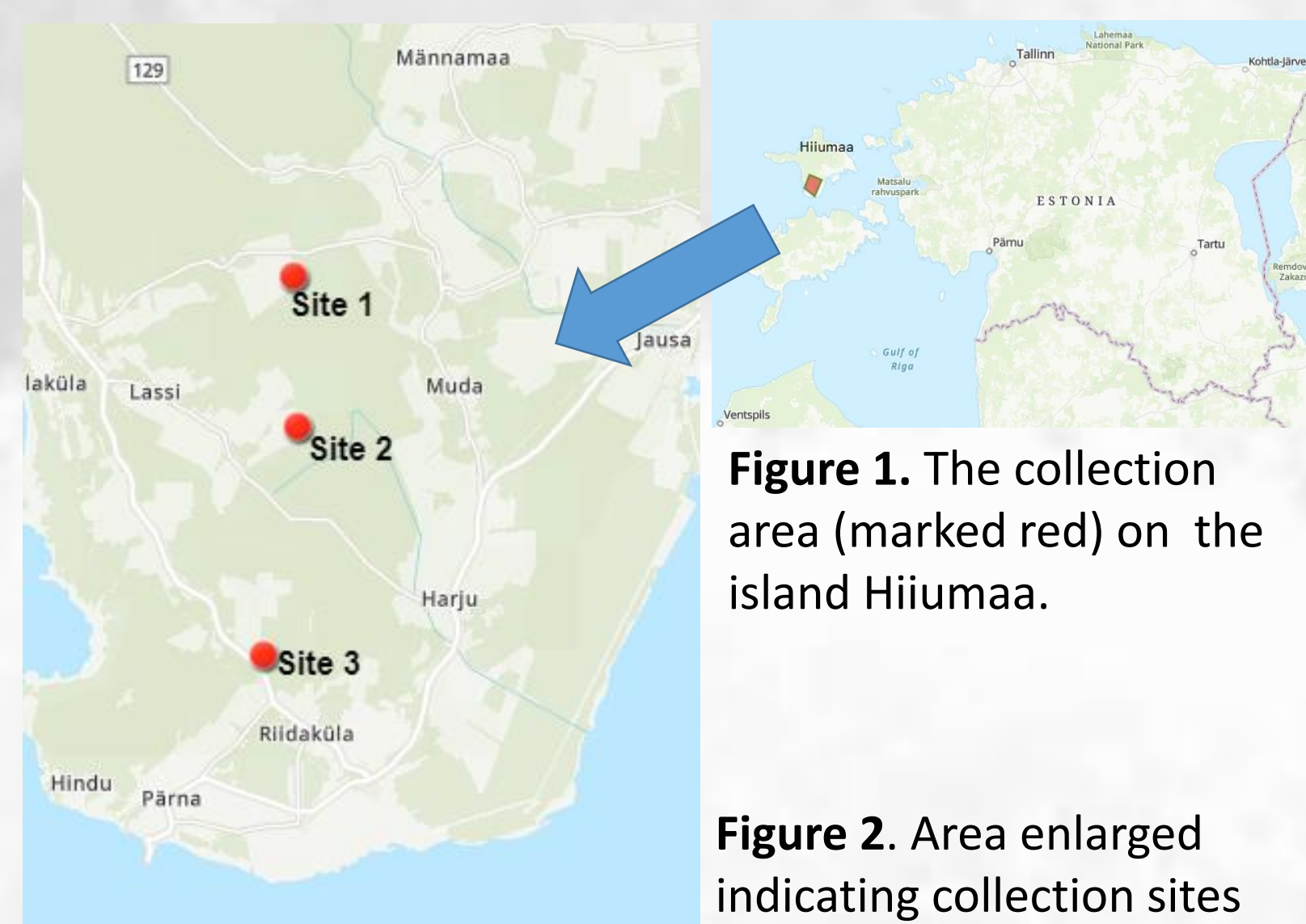
- No Diptera species have been identified as African swine fever virus (ASFV) vectors
- Trace amounts of African swine fever virus DNA has been detected in insects collected from an infected pig farm in Estonia (<sup>1</sup>)
- It has been experimentally demonstrated that stable flies (*Stomoxys calcitrans*) can transmit ASFV in a short period of time (<sup>2</sup>)
- Tabanids are haematophagous flies which feed on a variety of hosts. Being a mechanical vector for many infectious diseases, they should be considered as potential mechanical vectors for ASFV
- The tabanids' host preference is not extensively studied in Europe and has not been studied in Estonia

## AIM

- To determine which tabanid species feed on the wild boar (*Sus scrofa*)

## MATERIAL AND METHODS

- Summer 2019
- Three collection sites on the Estonian island Hiiumaa, near wild boar baiting sites
- Three sampling periods:  
 June 24 – 27  
 July 22 – 27  
 August 16 – 21



- One canopy trap (H-trap) per location
- Baited with aged cow urine
- Oil-covered water tray (liquid trap) placed directly under each trap to enhance tabanid capture and lure in gravid females (<sup>3</sup>)



**Figure 3.** Trap placement in collection site 3. The camera facing the baiting site is seen on the right.

- The presence of wild boar in the area confirmed with motion-triggered infrared cameras, one per site



**Figure 4.** Wild boar at baiting site 2. Infrared camera image, July 2019.

- Tabanids stored in 70% ethanol
- All specimens morphologically identified to species level



**Figure 5.** Female *Haematopota pluvialis*.

## PRELIMINARY RESULTS

- A relatively small overall number (180) of tabanids captured over the study period
- The majority of tabanids captured in July
- 90.9% belonged to genus *Haematopota*
- Liquid traps caught a much smaller number of tabanids (n=28) compared to canopy traps (n=152)
- Two baiting sites visited by wild boar for the majority of the study period; third visited infrequently

**Table 1.** Tabanid species captured from three locations near wild boar baiting sites in Estonia. Water tray and canopy trap catches are shown separately.

Genus	Species	Collection period	Site 1 58.791986; 22.569067		Site 2 58.765896; 22.573636		Site 3 58.726819; 22.560763		Total
			Water tray	Canopy trap	Water tray	Canopy trap	Water tray	Canopy trap	
<i>Atylotus</i>	<i>A. plebeius</i>	June 24-27	0	--	2	--	0	--	2
	<i>A. fulvus</i>	July 22-27	0	--	1	--	0	--	1
<i>Heptatoma</i>	<i>H. pellucens</i>	July 22-27	0	--	1	--	0	--	1
<i>Haematopota</i>	<i>H. pluvialis</i>	June 24-27	0	0	0	0	0	3	3
		July 22-27	1	45	12	23	0	73	154
		August 16-21	0	5	0	2	0	1	8
<i>Hybomitra</i>	<i>H. arpadi</i>	June 24-27	0	0	1	0	0	0	1
		July 22-27	0	--	3	--	0	--	3
		August 16-21	0	--	1	--	0	--	1
		June 24-27	0	--	3	--	1	--	4
	<i>H. bimaculata</i>	June 24-27	0	--	3	--	1	--	4
	<i>H. lundbecki</i>	July 22-27	0	0	1	0	0	0	1
	<i>H. muehlfeldi</i>	June 24-27	0	--	1	--	0	--	1
<b>180</b>									

-- indicates no sampling

## A WORK IN PROGRESS

- Testing the captured tabanids for wild boar contact: Swine specific cytochrome B (*CytB*) gene PCR analysis

## IN 2020

- Wild boar baiting sites: repeat sampling in July 2020 to increase tabanid catch
- Pig farms: collection and identification of tabanids to determine their species diversity and relative abundance
- All captured tabanids to be tested for wild boar/ pig contact

## References

- Herm R, Tummeleht L, Jürison M, Vilem A, Viltrop A. Trace amounts of African swine fever virus DNA detected in insects collected from an infected pig farm in Estonia. *Vet. Med. Sci.* 2019;00:1–5.
- Mellor P.S, Kitching R.P, Wilkinson P.J. Mechanical transmission of capripox virus and African swine fever virus by *Stomoxys calcitrans*. *Res. Vet. Sci.* 1987;43:109–112.
- Egri A, Blahó M, Száz D, et al. A horizontally polarizing liquid trap enhances the tabanid-capturing efficiency of the classic canopy trap. *Bull. Entomol. Res.* 2013;103(6):665–674.

