

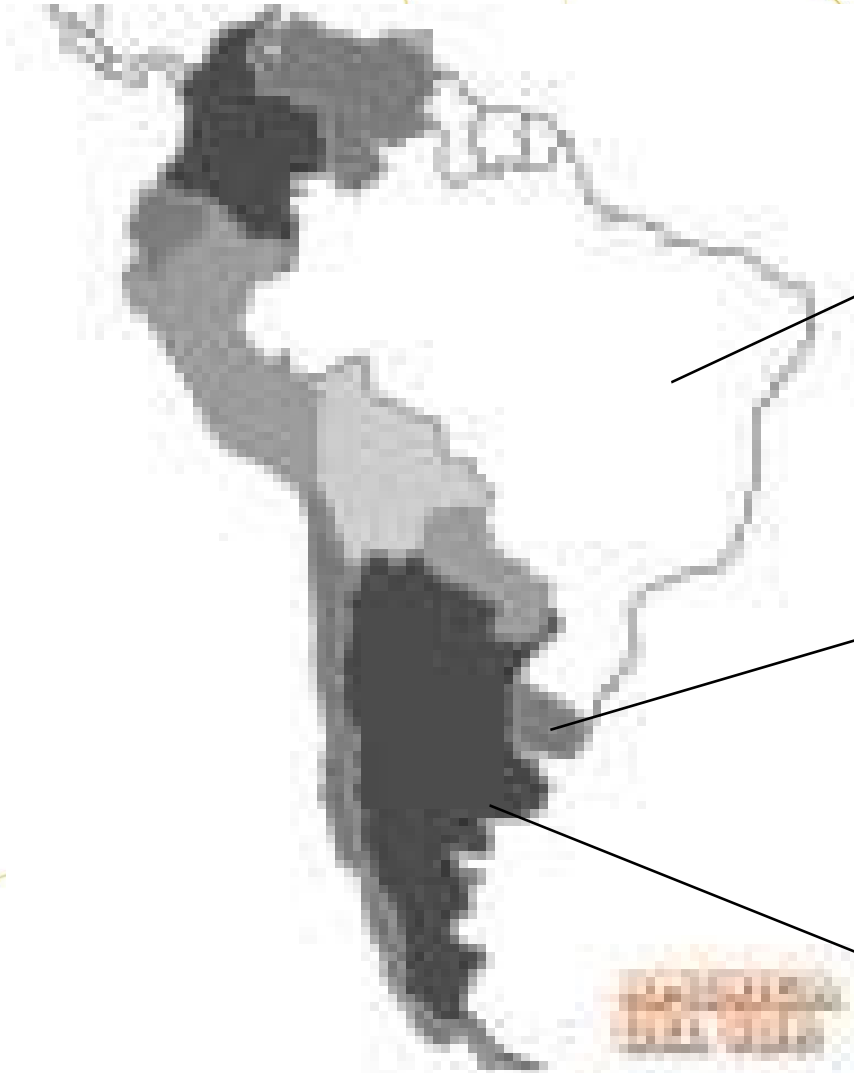
PRESENCE AND PREVALENCE OF VIRUSES IN APIARIES IN ARGENTINA

Fondevila, N; Figini, E; Palacio, M.A; Montenegro, J;
Compaired, D; Bedascarrasbure, E

Instituto de Virología
CICVyA
INTA
Argentina

Virus infections in Argentinian honey bees

The presence of the main virus that infect honey bees was shown spread worldwide and in South America, it was reported in Brazil and Uruguay, but in Argentina until 2008, we didn't know anything about the situation of these viruses.



	Brazil
ABPV	27%
BQCV	37%
DWV	20%

	Uruguay
ABPV	9%
BQCV	91%
DWV	100%
CBPV	47%
SBV	100%

¿?

The aim of this study was to assess the presence of the honeybee viruses in Argentina

- Black queen cell virus (BQCV),
- Sacbrood virus (SBV),
- Deformed wing virus (DWV),
- Acute bee paralysis virus (ABPV),
- Chronic bee paralysis virus (CBPV),
- Israeli Acute Paralysis virus (IAPV).

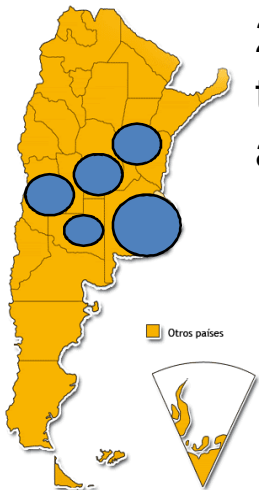
Sampling



23 apiaries located in the main beekeeping areas in Argentina.

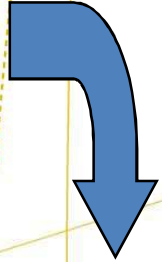
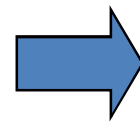
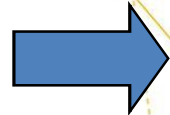
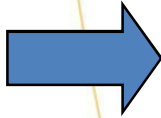
50 bees

10 colonies





Sampling

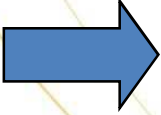


RNA preparation

Reverse transcriptase



PCR



Agar gel electrophoresis

RNA extraction

Primers used in PCR

Primer	Sequence	Product size
BQCV-F	(5'-tggtcagctcccactaccttaaac-3')	700
BQCV-R	(5'-gcaacaagaagaacgtaaaccac-3')	
DWV-F	(5'-cttactctgccgtcgcca-3')	194
DWV-R	(5'-ccgtaggaactcattatcgcg-3')	
SBV-F	(5'-gctgaggtaggatctttgcgt-3')	824
SBV-R	(5'-tcatcatcttcaccatcca-3')	
ABPV-F	5'-TCTGATGATGCTGAAGAGAGAAA-3'	500
ABPV-R	5'-AATCATCATTGCCGGCTCTA-3'	
CBPV-F	(5'-agttgtcatggtaacaggatacgag-3')	455
CBPV-R	(5'-tctaatttaacacgaaagccga-3')	
IAPV-ORF2-F	CCAGCCGTGAAACATGTTCTTACC	225
IAPV-ORF2-R	ACATAGTTGCACGCCAATACGAGAAC	
IAPV F	agacaccaatcacggacctcac	474
IAPV R	agatttgtctgtctcccagtgacat	

Apiaries

	DWV	SBV	BQV	APBV	CPBV	IPVB
N	23	23	23	23	23	23
P	8	2	5	5	0	1
%	35	9	22	22	0	4

•A: colonies

	DWV	SBV	BQV	APBV	CPBV	IPVB
N	174	174	174	174	174	174
P	37	2	6	17	0	1
%	21	1	3	10	0	1

Results in apiaries

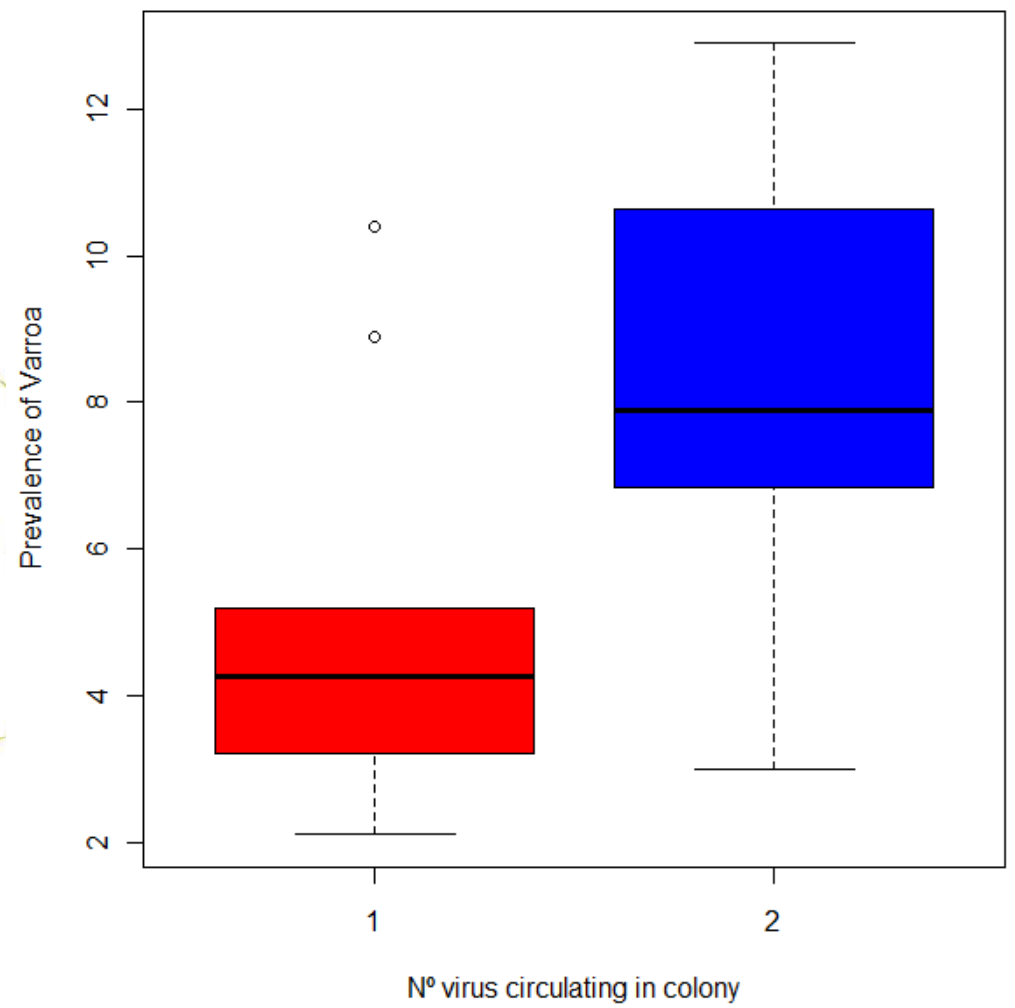
	DWV	SBV	BQCV	APBV	CPBV	IPVB
N	23	23	23	23	23	23
P	8	2	5	5	0	1
%	35	9	22	22	0	4

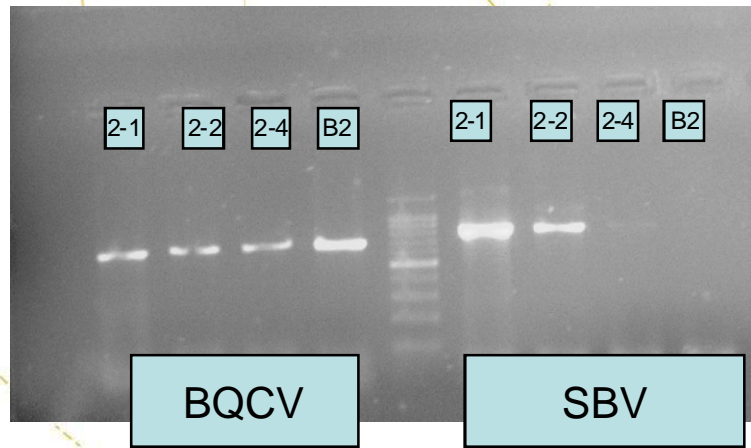
Results in beehives

	DWV	SBV	BQCV	APBV	CPBV	IPVB
N	174	174	174	174	174	174
P	37	2	6	17	0	1
%	21	1	3	10	0	1

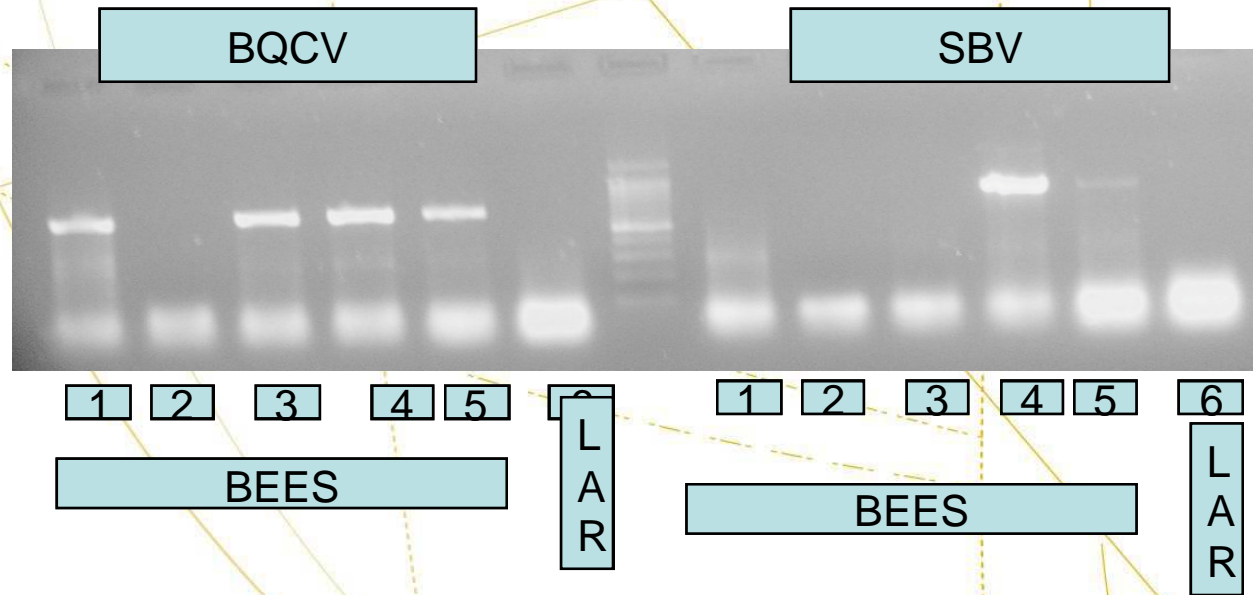
Number of viruses detected in beehives

	N	%
0	127	73
1	32	18
2	14	8
3	1	1



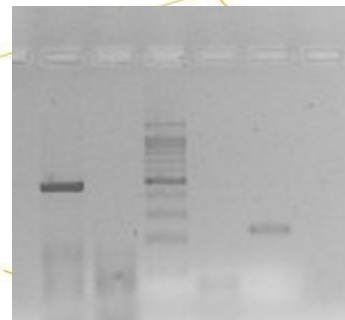
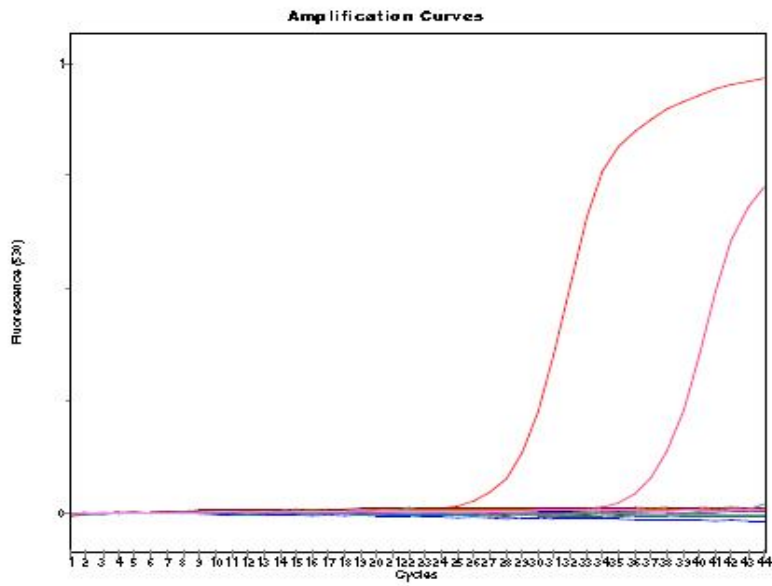


Hive



Bee

Israeli Acute Paralysis virus



3 5 1 2

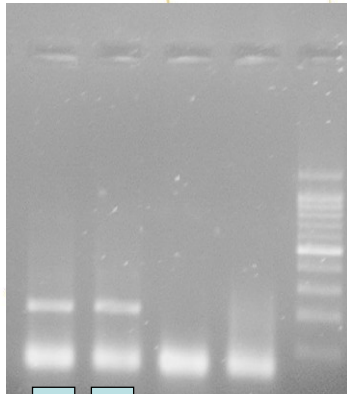
IAPV

RT-pCR

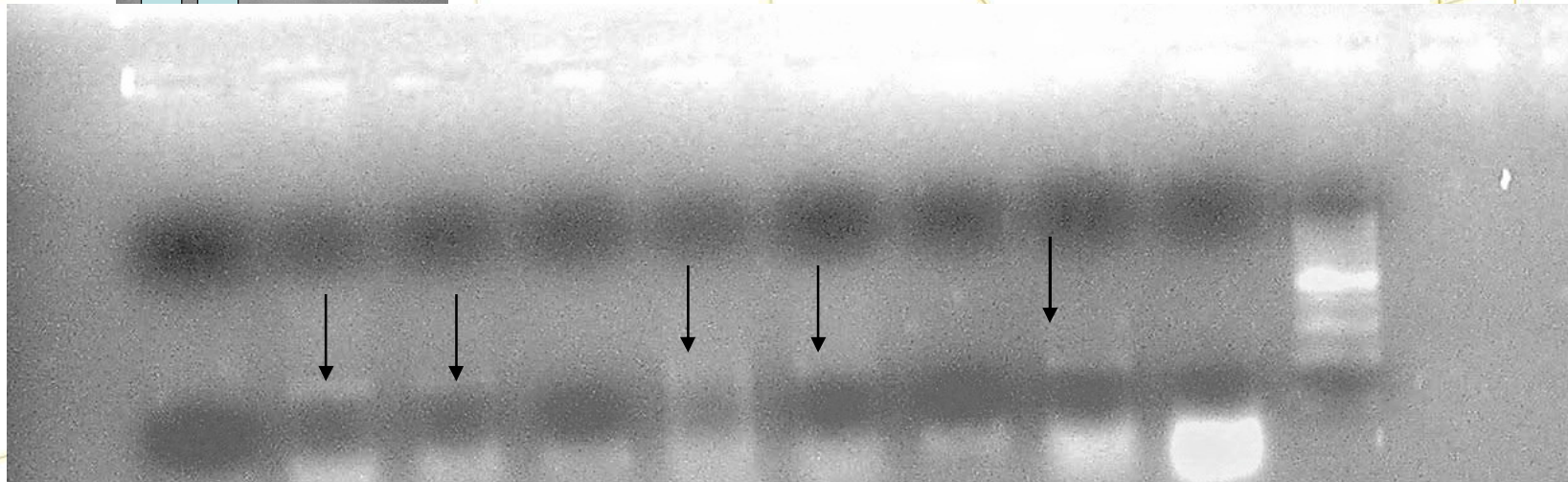
PCRrt



DWV



DWV in Varroa



H TO AB

H TO AB

H TO AB

Bee 1

Bee 2

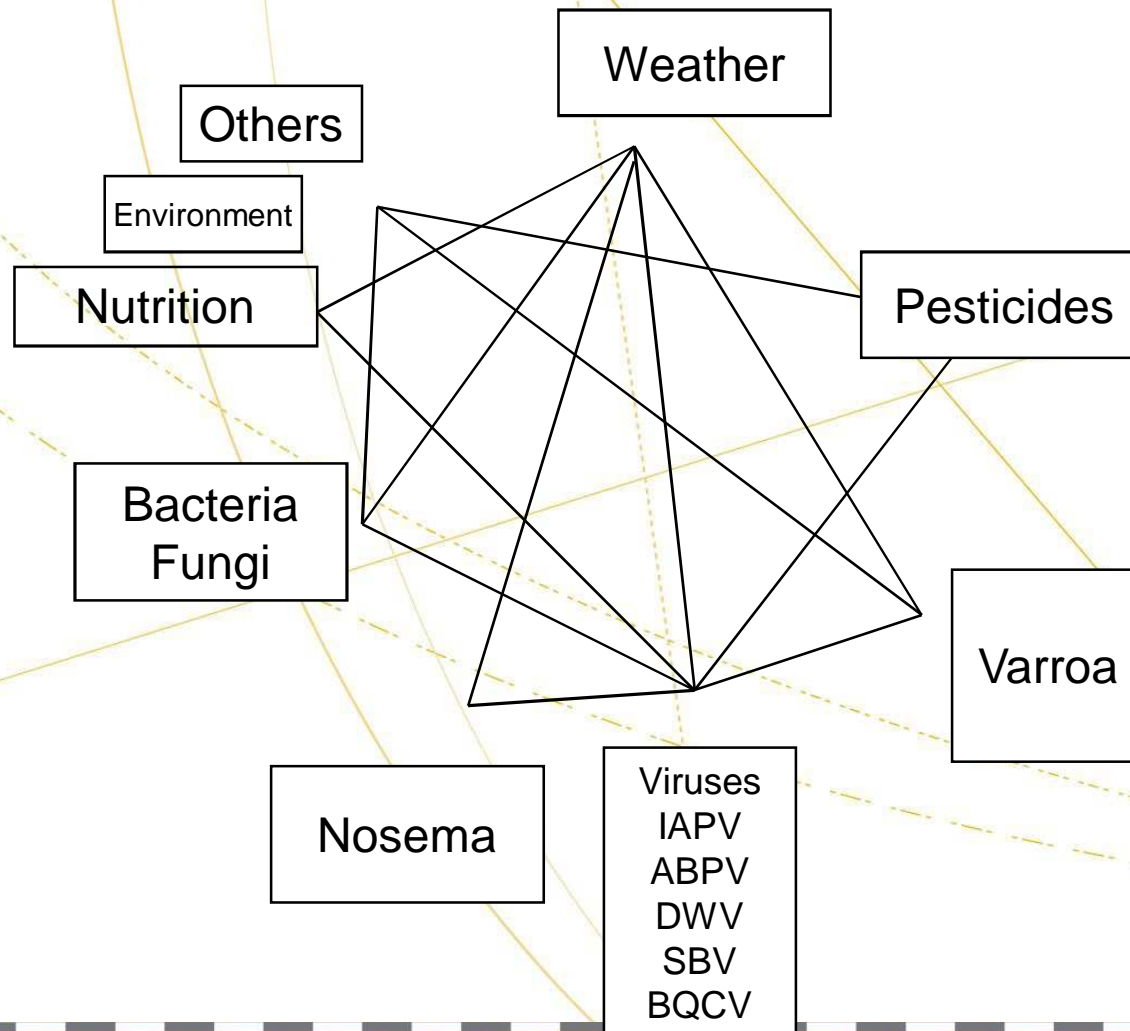
Bee3

Conclusions

- Five viruses were detected: DWV, SBV, BQCV, ABPV, IAPV.
- In the positive apiaries, it was possible to confirm that not all the beehives were infected, and inside these not all the bees were infected.
- Viral co-circulation was detected in some beehives.
- It was possible to detect the presence of more than one virus in some bees.
- No association was found between presence of virus and symptoms with exception of an apiary affected to a queen breeding system where presence of DWV was associated to morphological deformities in wings in bees and high Varroa prevalence levels.

Epidemiological studies

Are they cause necessary? Cause sufficient?
Are Risk factors? Are Risk markers?





Thank you
for your
attention