

INRAE



**Tous les virus ne se ressemblent pas:
la signature dynamique**

Non tutti i virus sono uguali: l'impronta dinamica

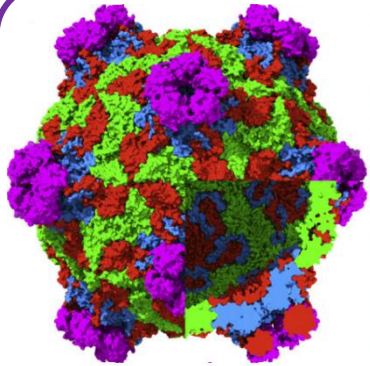


Les virus des abeilles: classification

I virus delle api: classificazione

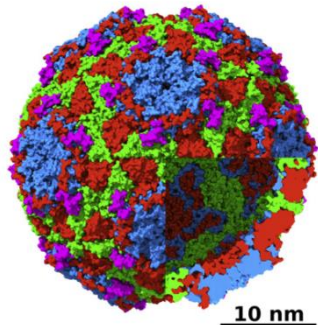
○ ssRNA(+), *Picornavirales*

○ *Iflaviridae*



Virus delle ali deformate

DWV



Virus della covata a sacco

SBV



○ *Dicistroviridae*



Virus della paralisi acuta

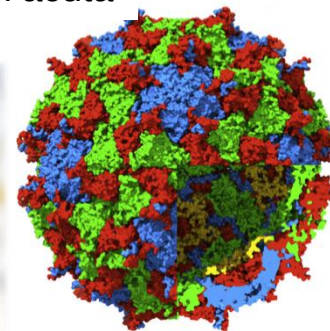
ABPV

IAPV

KBV



BQCV



Virus della cella reale nera

Virus della paralisi cronica

CBPV



Les virus des abeilles: symptômes I virus delle api: sintomi

○ OUVRIÈRES ADULTES / OPERAIE ADULTE



DWV



ABPV

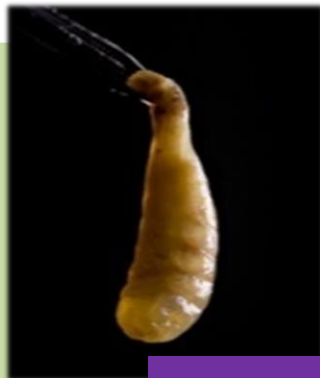
IAPV

KBV



CBPV

○ COUVAIN / COVATA



SBV



BQCV

→ Charge virale / Carica virale

→ Localisation / Localizzazione

→ Transmission / Trasmissione

Modalités de transmission

Modalità di trasmissione



- Qu'est-ce qu'on sait?
Cosa sappiamo?

ORAL-FECAL

VARROA

CONTACT

VERTICAL

ENVIRONMENT



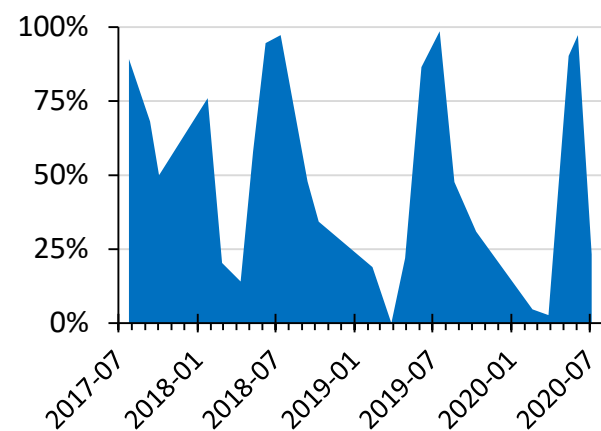
Acute bee paralysis virus	ABPV	+	+	-	+	+
	KBV	+	+	-	+	+
	IAPV	+	+	-	+	+
Chronic bee paralysis virus	CBPV	+	-	+	?	+
Deformed wing virus	DWV	+	+	-	+	+
Sacbrood virus	SBV	+	-	-	?	+
Black queen cell virus	BQCV	+	~	-	+	+

Beaurepaire et al. "Diversity and Global Distribution of Viruses of the Western Honey Bee, *Apis mellifera*" *Insects* 2020, 11, 239

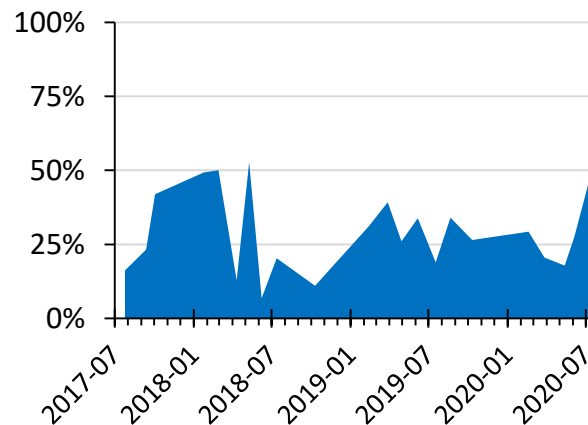
Les résultats du projet I risultati del progetto

○ Différences de prévalence / Differenze di prevalenza

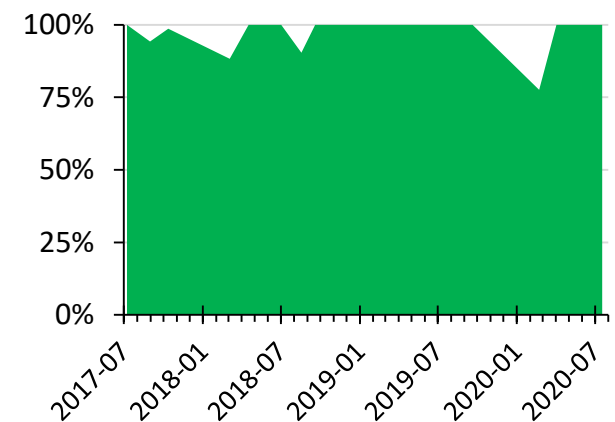
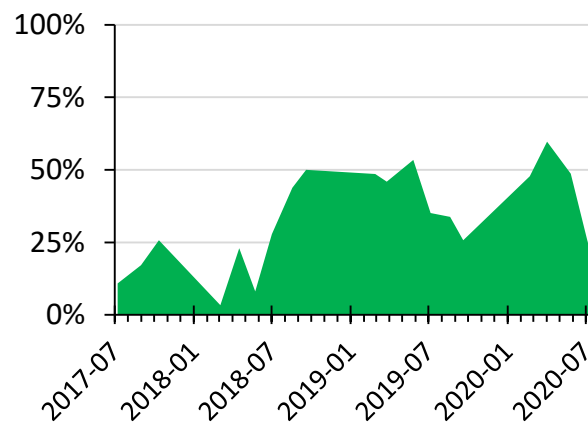
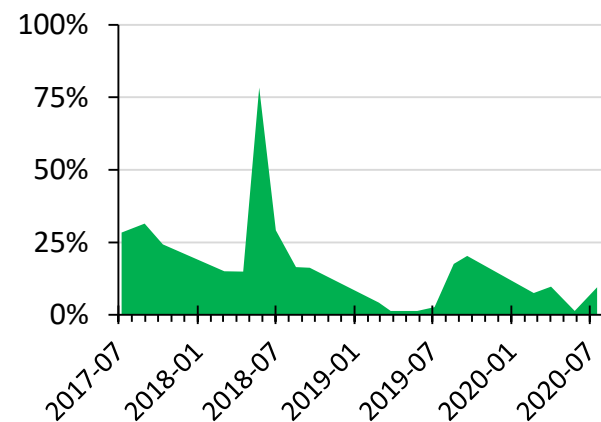
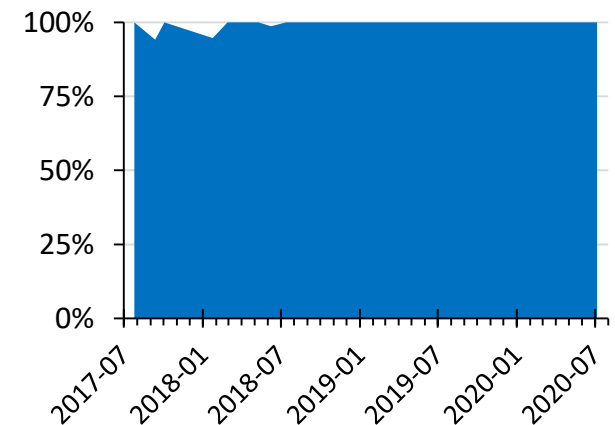
ABPV-IAPV-KBV



CBPV



BQCV

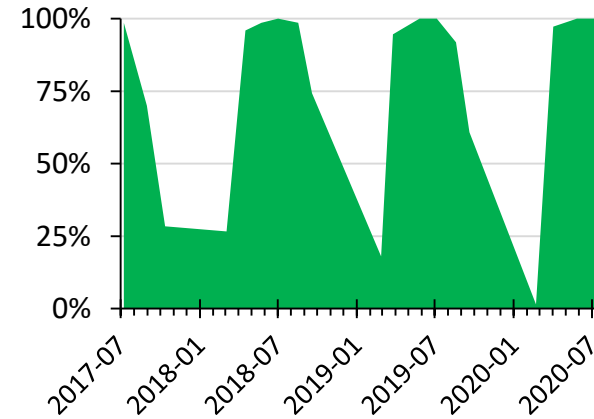
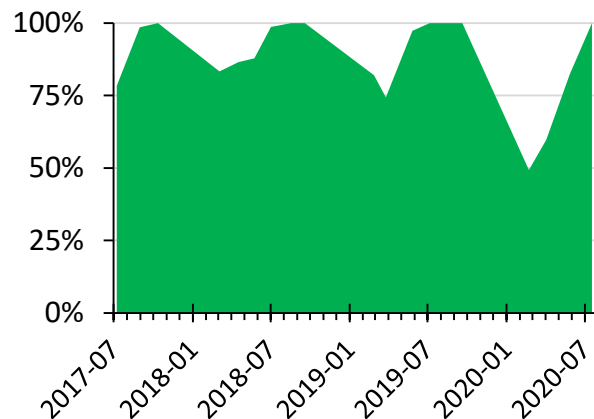
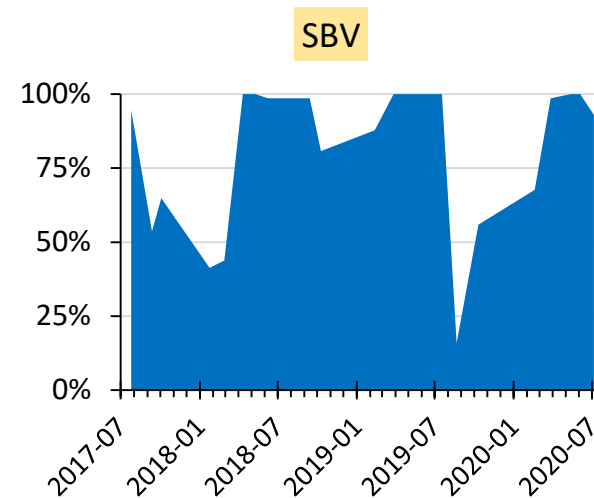
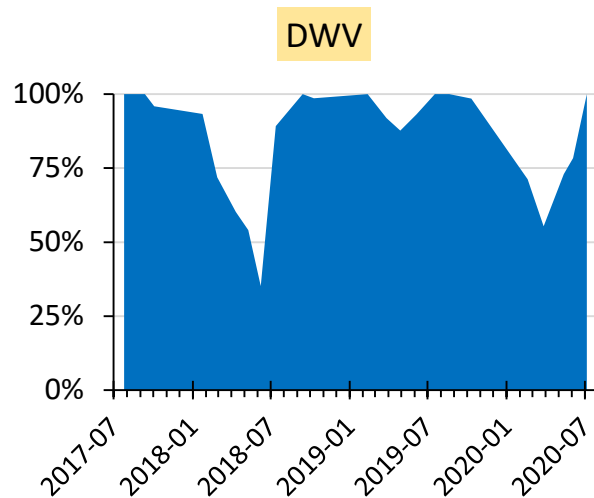


PROVENCE - FR

PIEMONTE - IT

Les résultats du projet I risultati del progetto

○ Différences de prévalence / Differenze di prevalenza



PROVENCE - FR

PIEMONTE - IT

Les virus dans les deux contextes

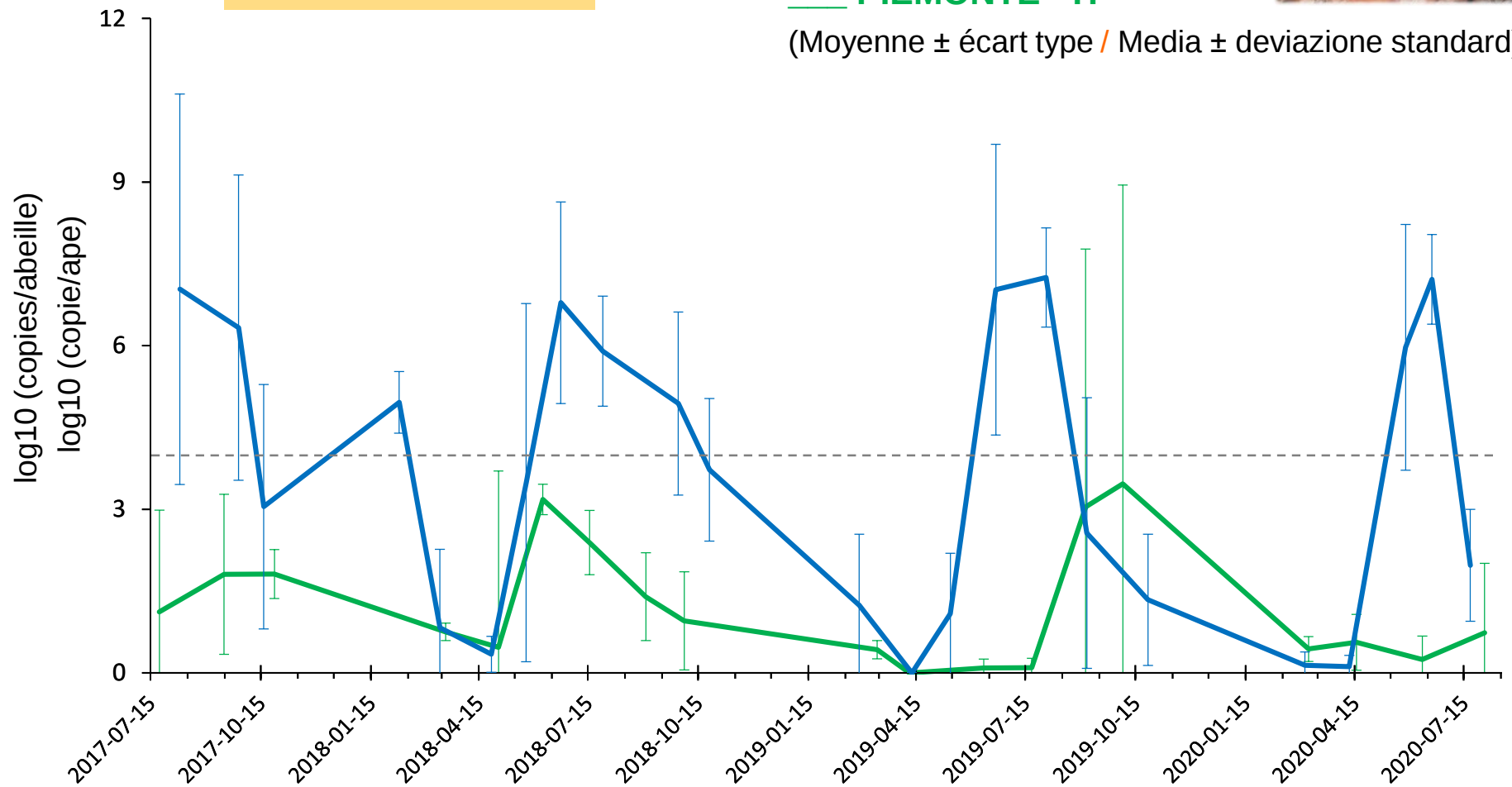
I virus nei due contesti

- Dynamiques des charges virales / Dinamiche delle cariche virali

ABPV-IAPV-KBV

PROVENCE - FR
PIEMONTE - IT

(Moyenne $\pm$ écart type / Media $\pm$ deviazione standard)



Les virus dans les deux contextes

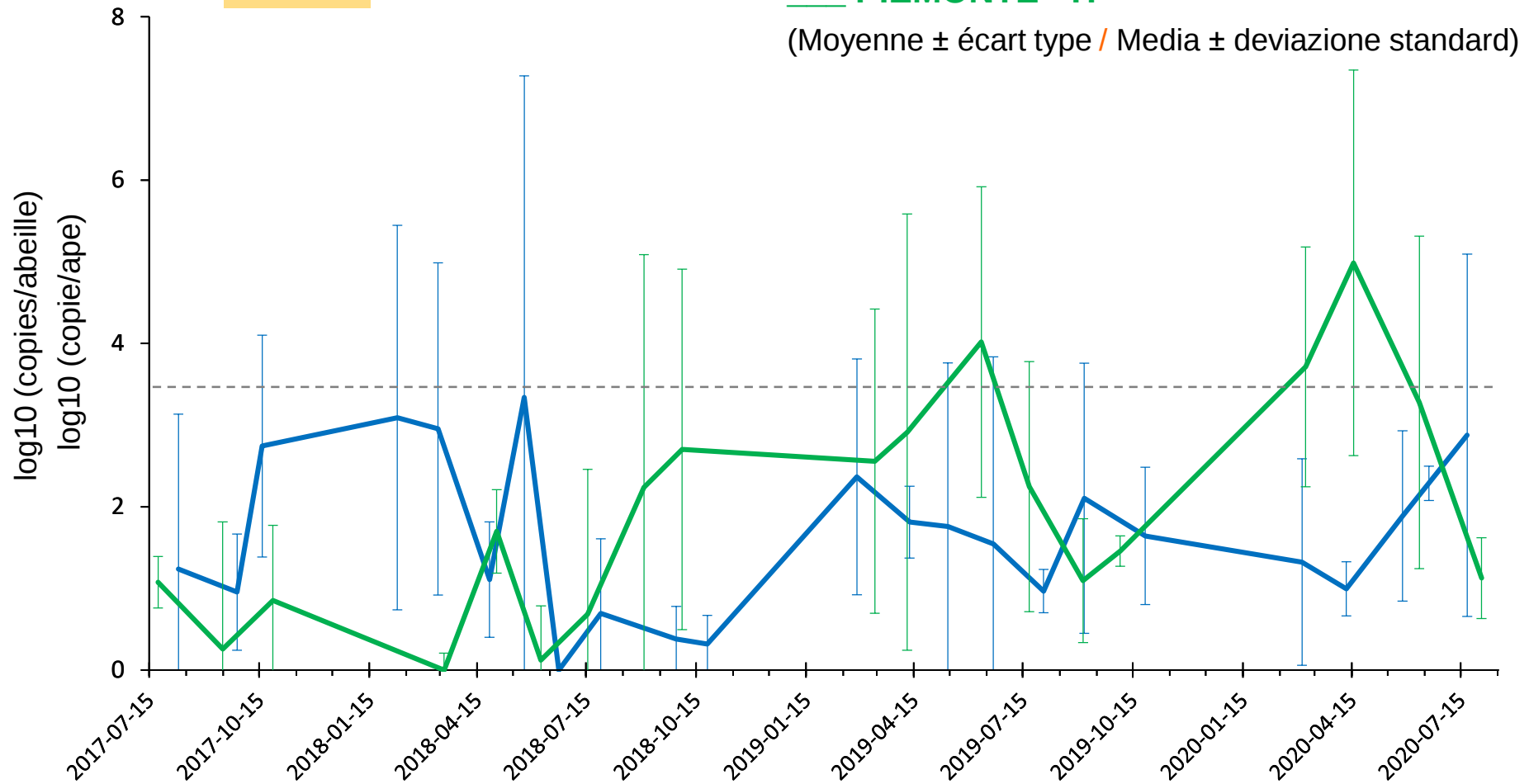
I virus nei due contesti

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CBPV

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PIEMONTE - IT

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Les virus dans les deux contextes

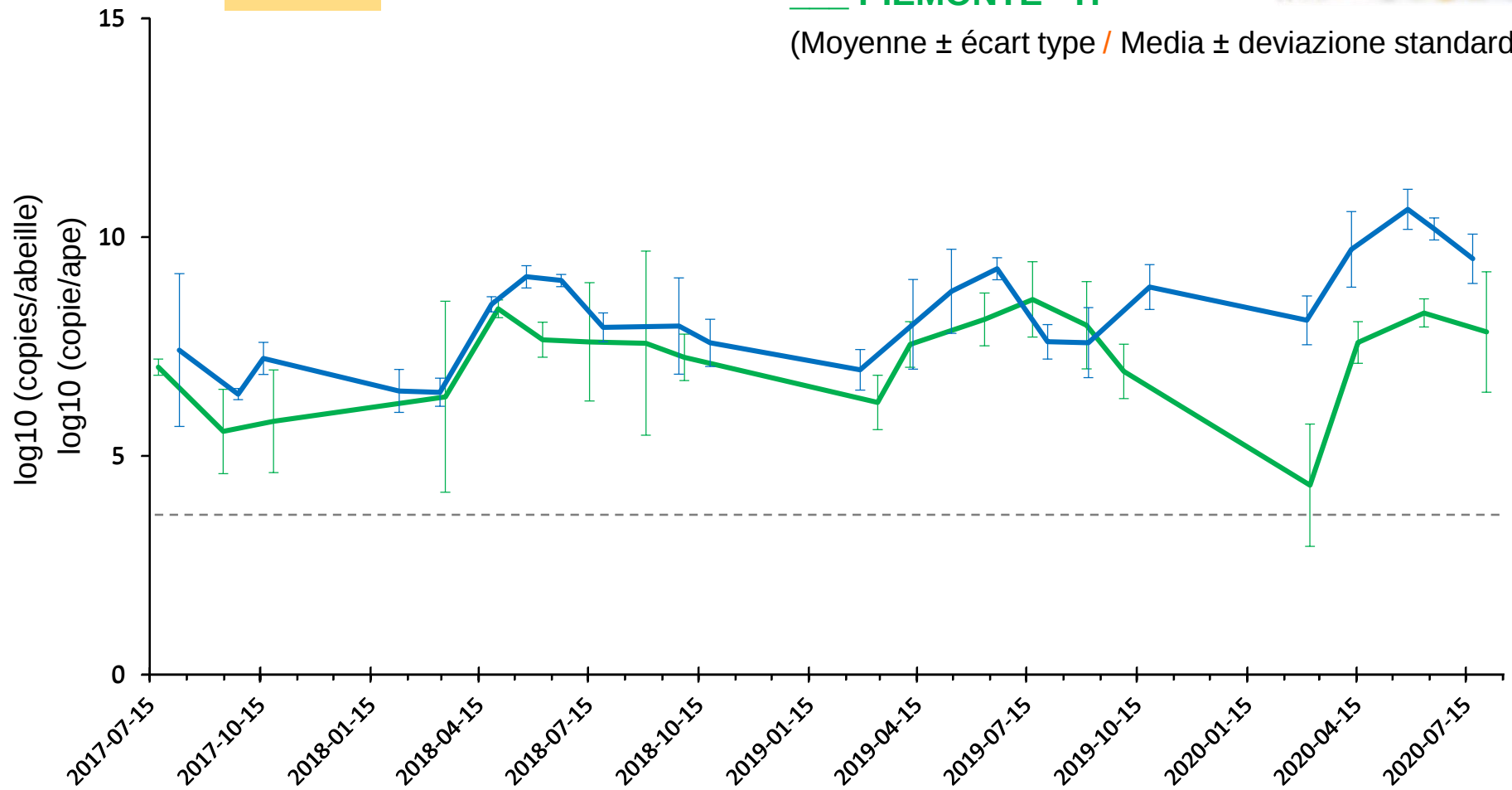
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BQCV

PROVENCE - FR
PIEMONTE - IT

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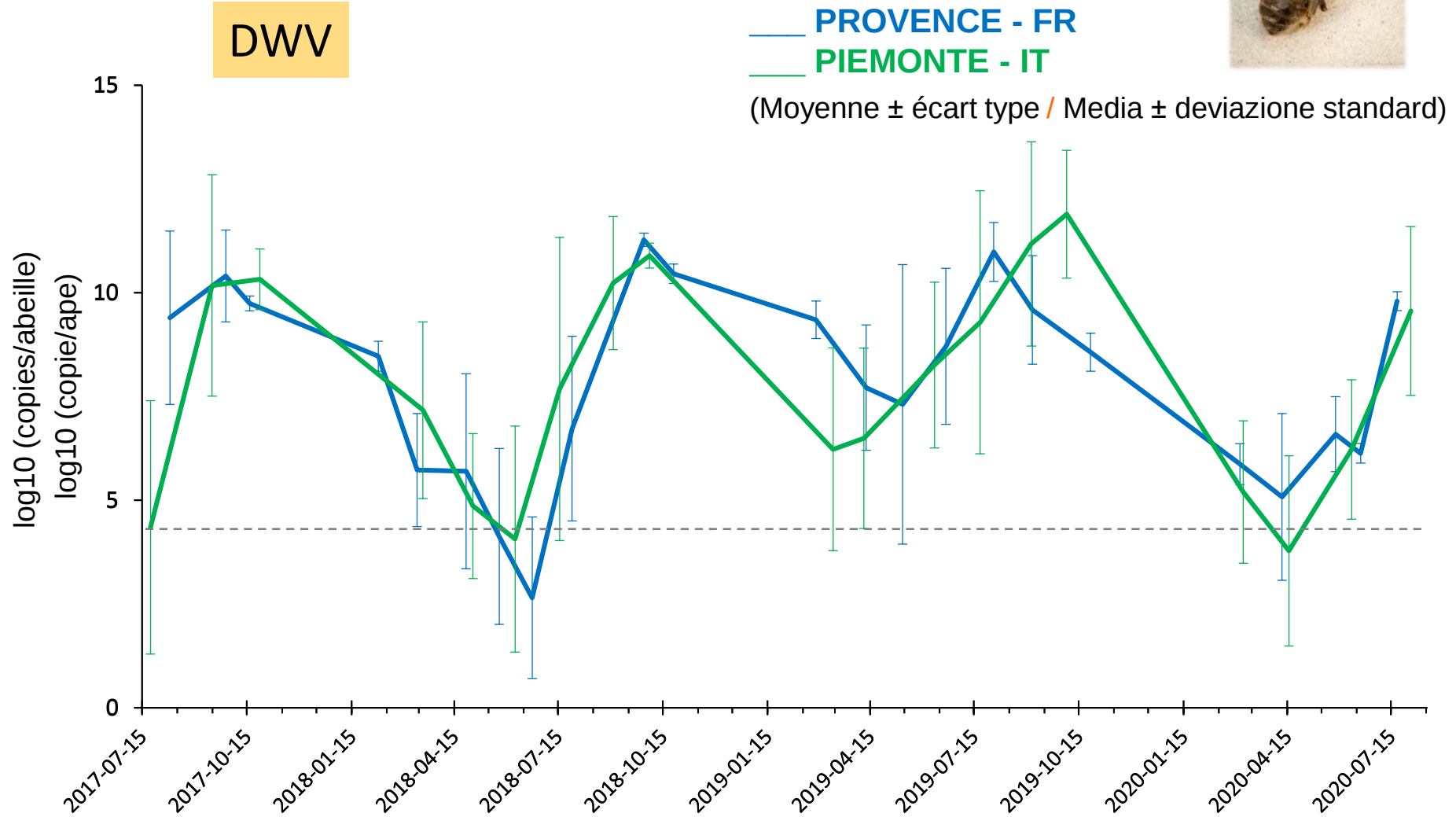


Les virus dans les deux contextes

I virus nei due contesti

- Dynamiques des charges virales / Dinamiche delle cariche virali

DWV



Les virus dans les deux contextes

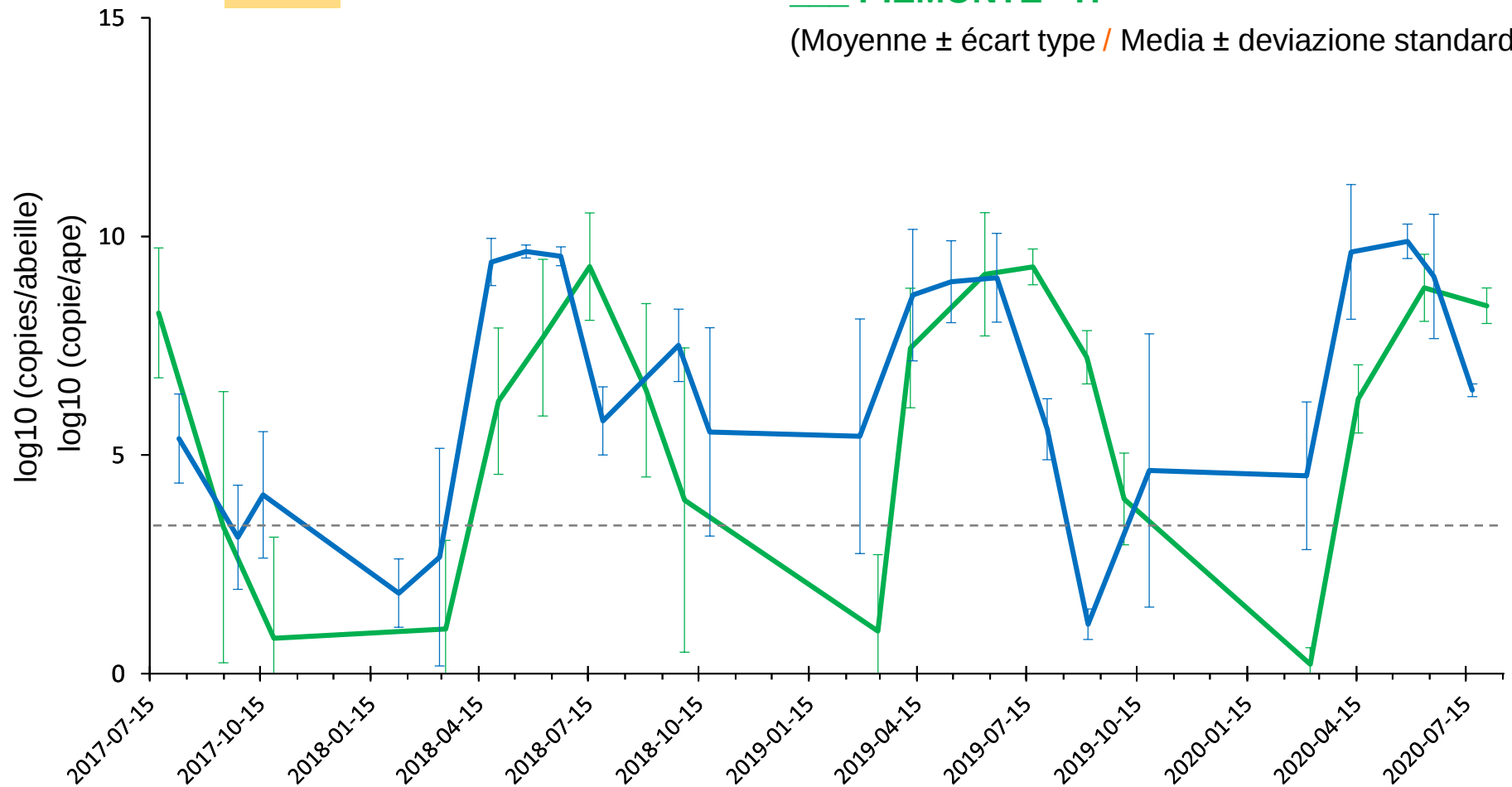
I virus nei due contesti

- Dynamiques des charges virales / Dinamiche delle cariche virali

SBV

PROVENCE - FR
PIEMONTE - IT

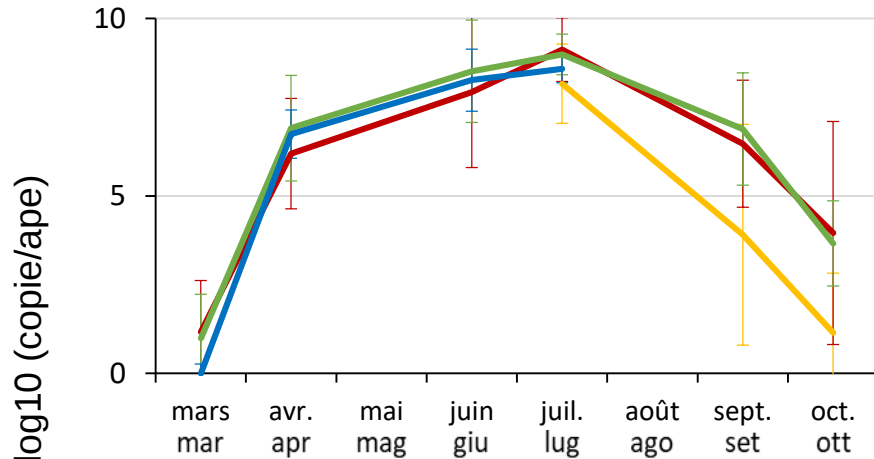
(Moyenne $\pm$ écart type / Media $\pm$ deviazione standard)



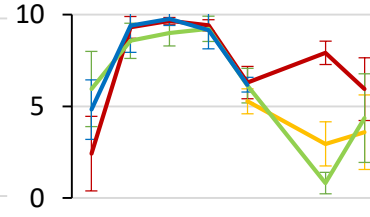
Les variations saisonnières

Le variazioni stagionali

SBV (Piemonte – IT)



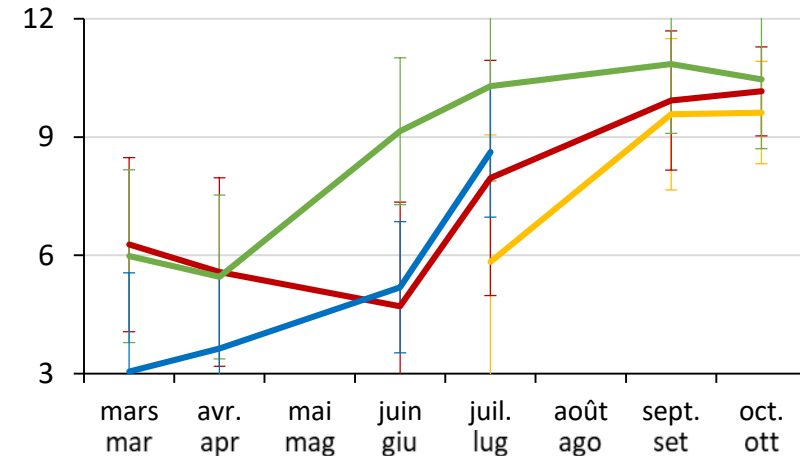
SBV (Provence – FR)



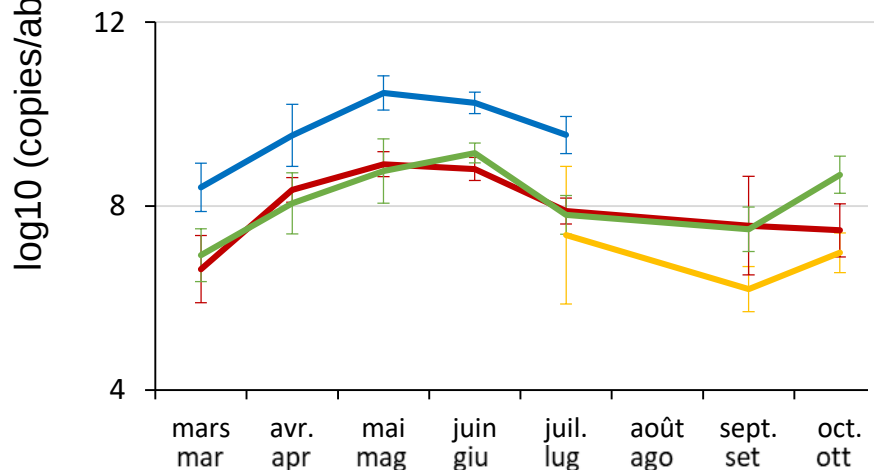
Moyenne $\pm$ é. t. / Media $\pm$ d. s.

2017
 2018
 2019
 2020

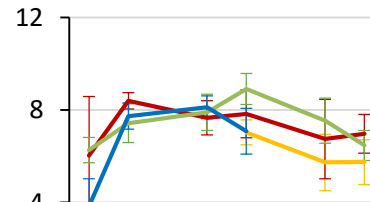
DWV (Piemonte – IT)



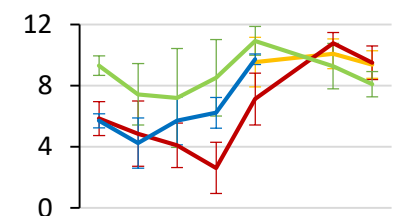
BQCV (Provence – FR)



BQCV (Piemonte – IT)



DWV (Provence – FR)



Conclusions

Conclusioni

- Chaque virus se exprime selon sa propre dynamique à niveau de prévalence et de charge
- Entre les différentes zones géographiques on peut observer des tendances communes, mais aussi des différences par rapport au contexte environnemental
- Certaines variations saisonnières des niveaux d'infection suggèrent que les dynamiques de colonie et la population de varroa ont un impact sur la charge virale
- Ogni virus mostra una propria dinamica a livello di prevalenza e di carica
- Tra aree geografiche diverse si possono osservare degli andamenti comuni e alcune differenze determinate dal contesto ambientale
- Alcune variazioni stagionali dei livelli di infezione suggeriscono che le dinamiche di colonia e della popolazione di varroa influenzano la carica virale

INRAE



Merci pour votre attention !
Grazie per l'attenzione !

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<http://w3.avignon.inra.fr/lavandes/biosp/innovapiFR.html>

<http://w3.avignon.inra.fr/lavandes/biosp/innovapiIT.html>

