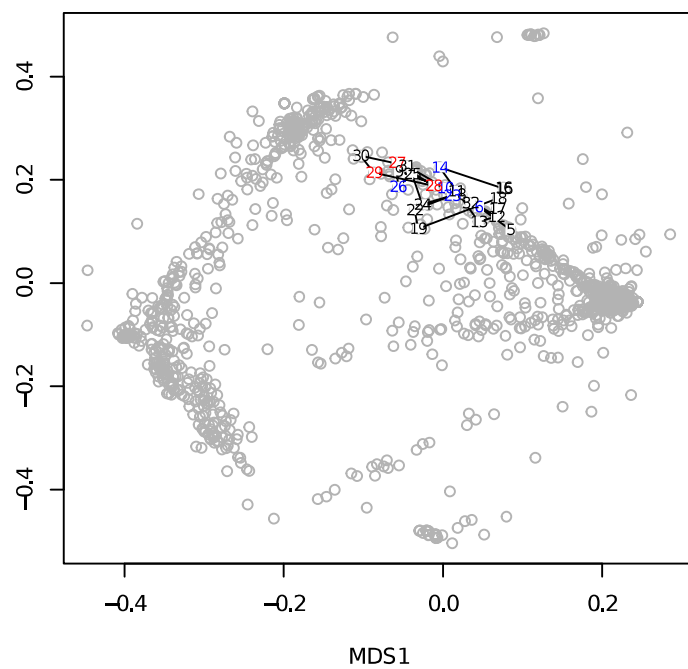
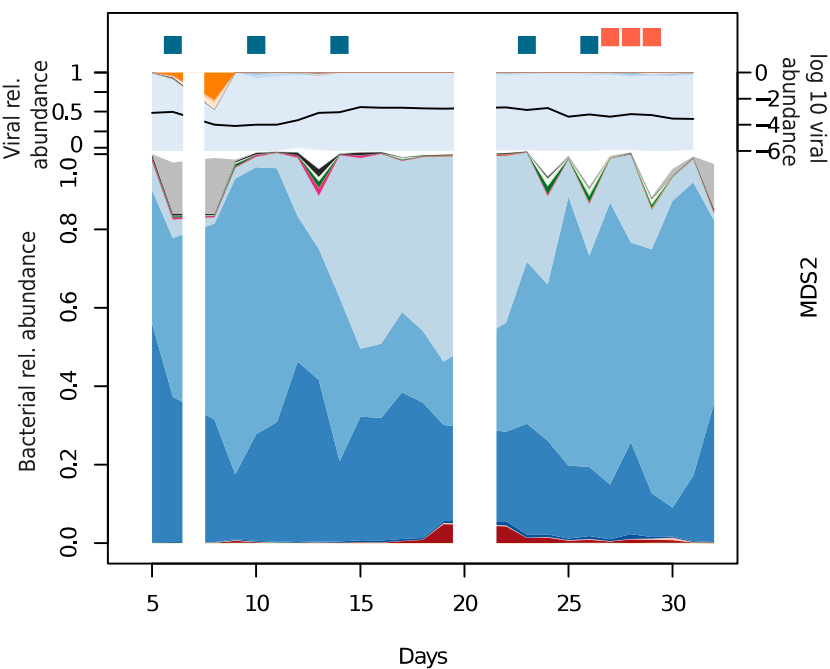


Table of contents

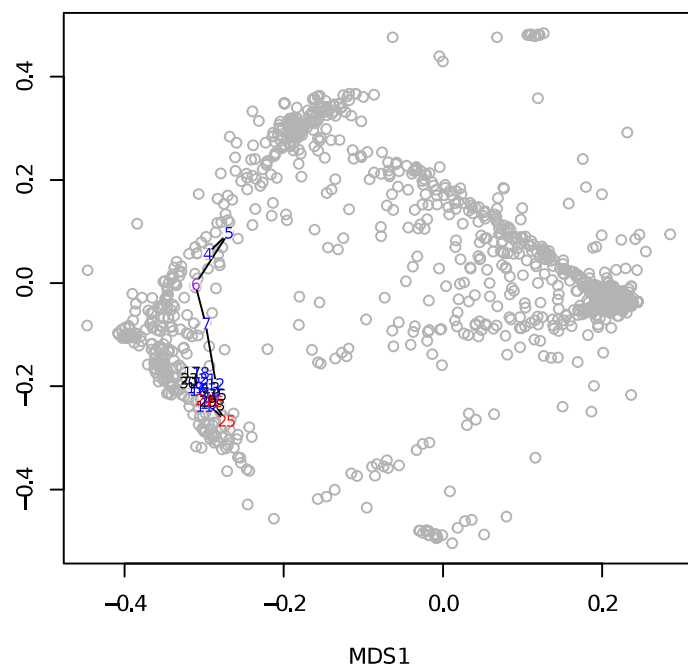
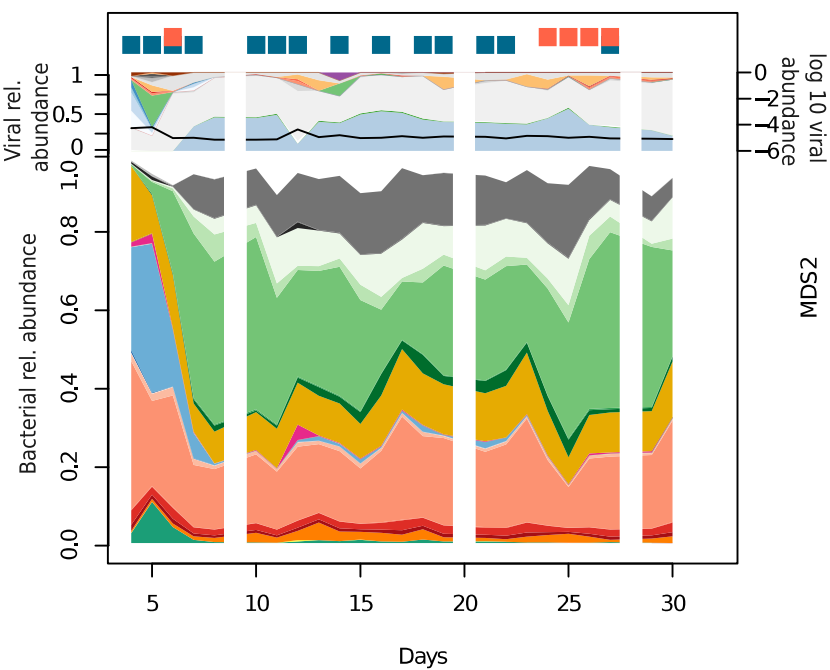
Figure S1.....	p. 2-28
Figure S2.....	p. 29-31
Figure S3.....	p. 32-38
Figure S4.....	p. 39-40
Figure S5.....	p. 41-42
Figure S6.....	p. 43
Figure S7.....	p. 44
Figure S8.....	p. 45
Figure S9.....	p. 46

	<i>Streptococcus</i> spp.		uncultured crAssphage
	<i>Staphylococcus aureus</i>		Temperate phage phiNIH1.1
	<i>Sneathia amnii</i>		<i>Synechococcus</i> virus STIM5
	<i>Sneathia</i> spp.		<i>Streptococcus</i> phage T12
	<i>Pseudomonas aeruginosa</i>		<i>Streptococcus</i> phage SpSL1
	<i>Prevotella timonensis</i>		<i>Streptococcus</i> phage SM1
	<i>Prevotella disiens</i>		<i>Streptococcus</i> phage phiARI0462
	<i>Prevotella bivia</i>		<i>Streptococcus</i> phage phiARI0460-1
	<i>Prevotella amnii</i>		<i>Streptococcus</i> phage phiARI0131-2
	<i>Prevotella</i> spp.		<i>Streptococcus</i> phage phiARI0131-1
	<i>Peptoniphilus lacrimalis</i>		<i>Streptococcus</i> phage phiARI0004
	<i>Neisseria</i> spp.		<i>Streptococcus</i> phage PH10
	<i>Megasphaera</i> sp. UPII 199-6		<i>Streptococcus</i> phage P9
	<i>Massilia timonae</i>		<i>Streptococcus</i> phage K13
	<i>Listeria</i> spp.		<i>Streptococcus</i> phage 20617
	<i>Limosilactobacillus fermentum</i>		<i>Staphylococcus</i> virus St134
	<i>Lactobacillus jensenii</i>		<i>Staphylococcus</i> virus Sextaec
	<i>Lactobacillus iners</i>		<i>Staphylococcus</i> virus SEP9
	<i>Lactobacillus crispatus</i>		<i>Staphylococcus</i> virus PH15
	<i>Lactobacillus</i> spp.		<i>Staphylococcus</i> virus IPLA7
	<i>Gardnerella vaginalis</i> H		<i>Staphylococcus</i> virus IPLA5
	<i>Gardnerella vaginalis</i>		<i>Staphylococcus</i> virus CNPH82
	<i>Gardnerella swidsinskii</i>		<i>Staphylococcus</i> virus Andhra
	<i>Gardnerella piovii</i>		<i>Staphylococcus</i> virus 37
	<i>Gardnerella leopoldii</i>		<i>Staphylococcus</i> phage StB27
	<i>Gardnerella</i> spp.		<i>Staphylococcus</i> phage StB20-like
	<i>Fannyhessea vaginae</i>		<i>Staphylococcus</i> phage StB20
	<i>Escherichia</i> spp.		<i>Staphylococcus</i> phage StB12
	<i>Enterococcus faecalis</i>		<i>Staphylococcus</i> phage SPbeta-like
	<i>Bacillus subtilis</i>		<i>Staphylococcus</i> phage IME-SA4
	<i>Aerococcus</i> spp.		<i>Salmonella</i> virus SPN3US
			<i>Salmonella</i> virus SJ 46
			<i>Pseudomonas</i> virus phiCTX
			<i>Pseudomonas</i> virus phi3
			<i>Pseudomonas</i> virus Pfl
			<i>Pseudomonas</i> virus H66
			<i>Pseudomonas</i> virus Dobby
			<i>Pseudomonas</i> phage PPpW-3
			<i>Propionibacterium</i> virus PHL041M10
			<i>Propionibacterium</i> virus P105
			<i>Propionibacterium</i> virus P1001
			<i>Propionibacterium</i> virus MrAK
			<i>Propionibacterium</i> phage Moyashi
			<i>Propionibacterium</i> phage Enoki
			<i>Mycobacterium</i> virus Giles
			<i>Lactobacillus</i> prophage Lj965
			<i>Lactobacillus</i> prophage Lj928
			<i>Lactobacillus</i> prophage Lj771
			<i>Lactobacillus</i> phage phiAQ113
			<i>Lactobacillus</i> phage phiadh
			<i>Lactobacillus</i> phage phi jlb1
			<i>Lactobacillus</i> phage Lv-1
			<i>Lactobacillus</i> phage KC5a
			<i>Faecalibacterium</i> virus Toutatis
			<i>Faecalibacterium</i> virus Mushu
			<i>Escherichia</i> virus T7
			<i>Escherichia</i> virus M13
			<i>Escherichia</i> virus DE3
			<i>Escherichia</i> phage 500465-1
			<i>Enterococcus</i> virus EEP01
			<i>Enterococcus</i> phage EF62phi
			<i>Enterobacteria</i> phage P4
			<i>Enterobacteria</i> phage HK225
			<i>Clostridium</i> phage C-st
			<i>Bacillus</i> phage vB_BceS-MY192

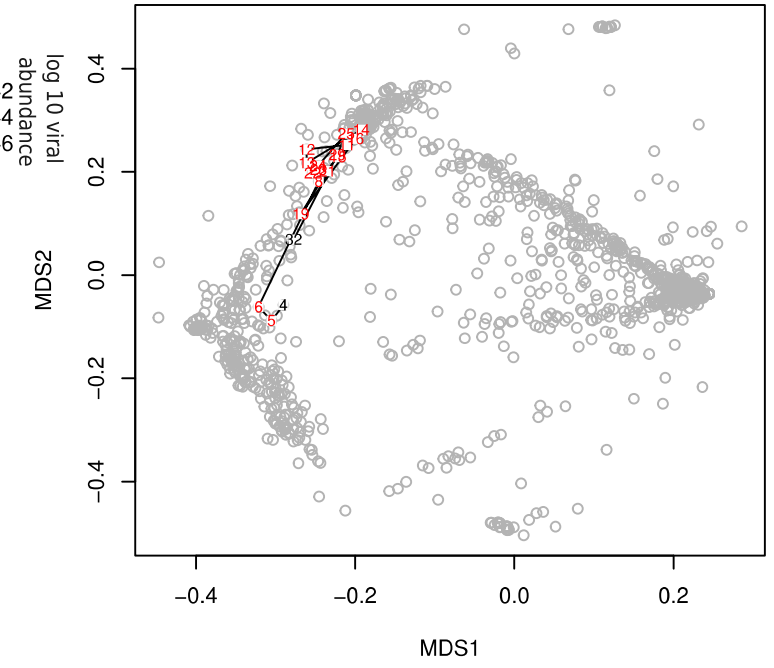
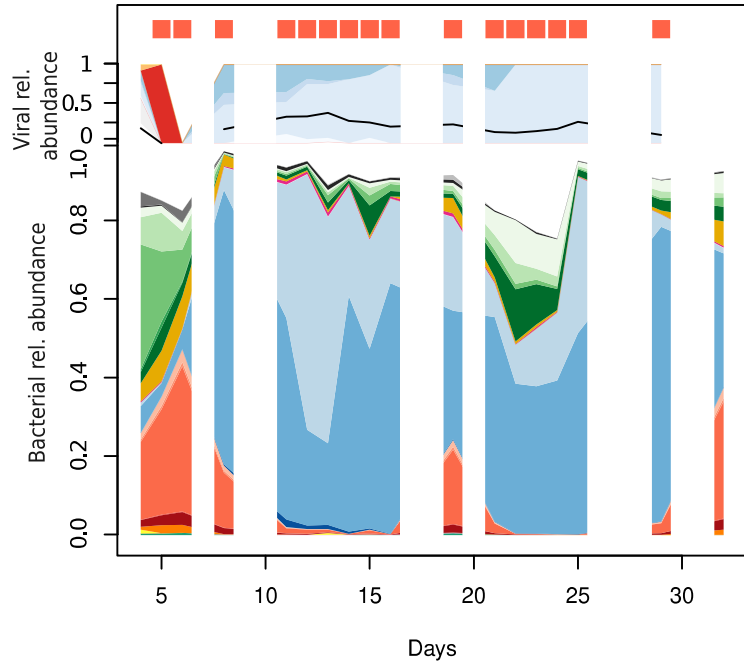
Participant 104



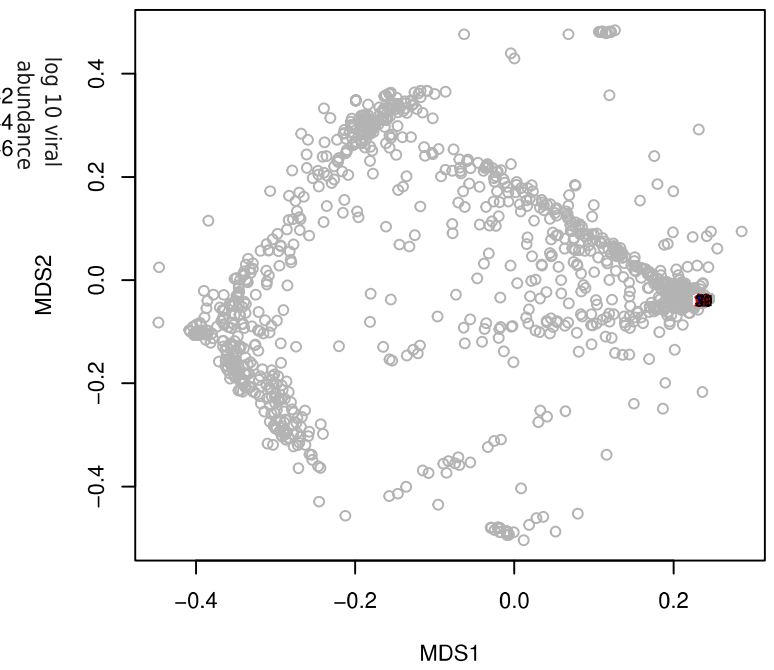
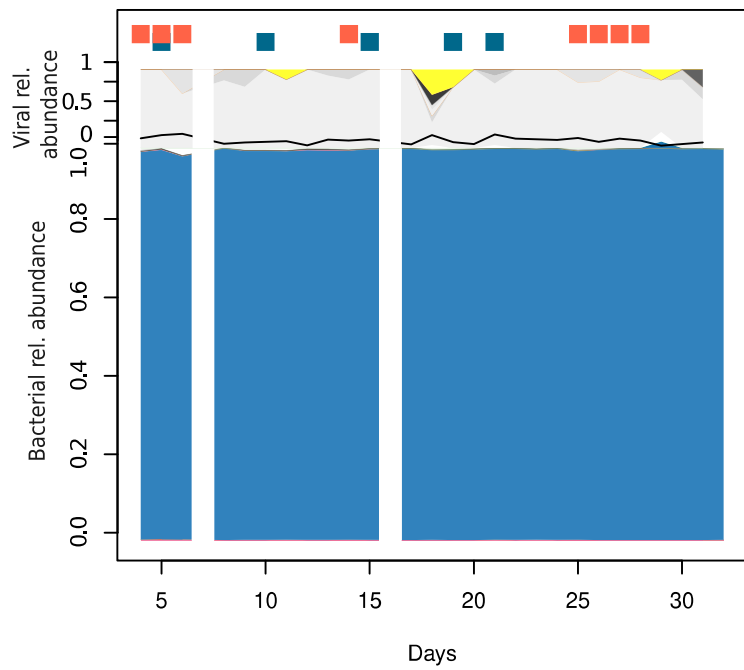
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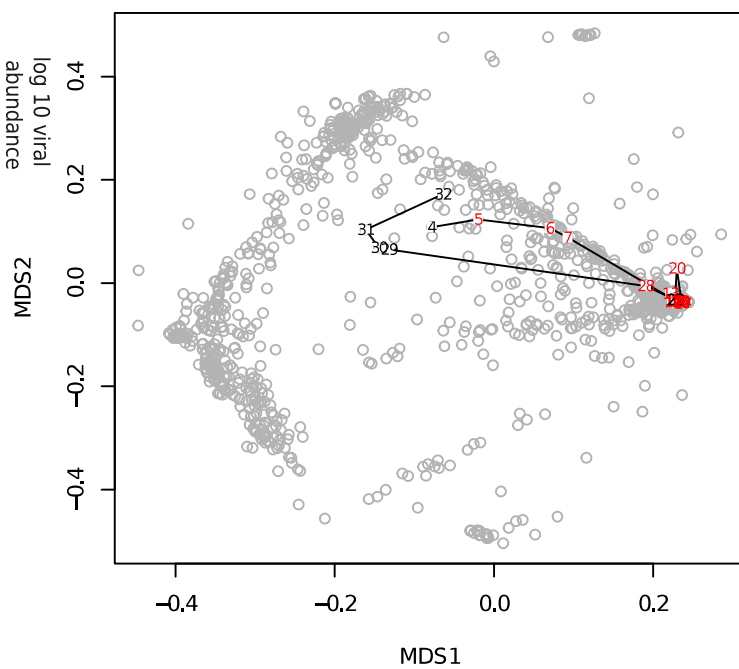
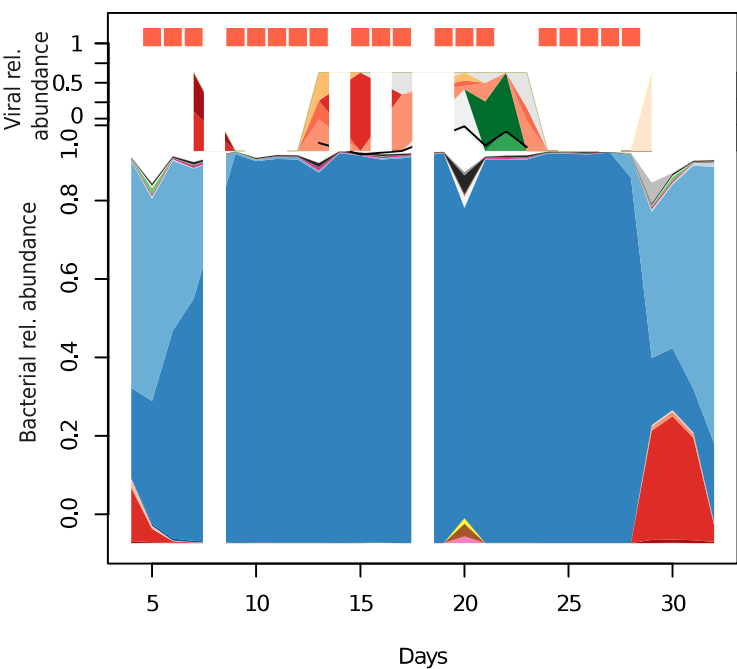
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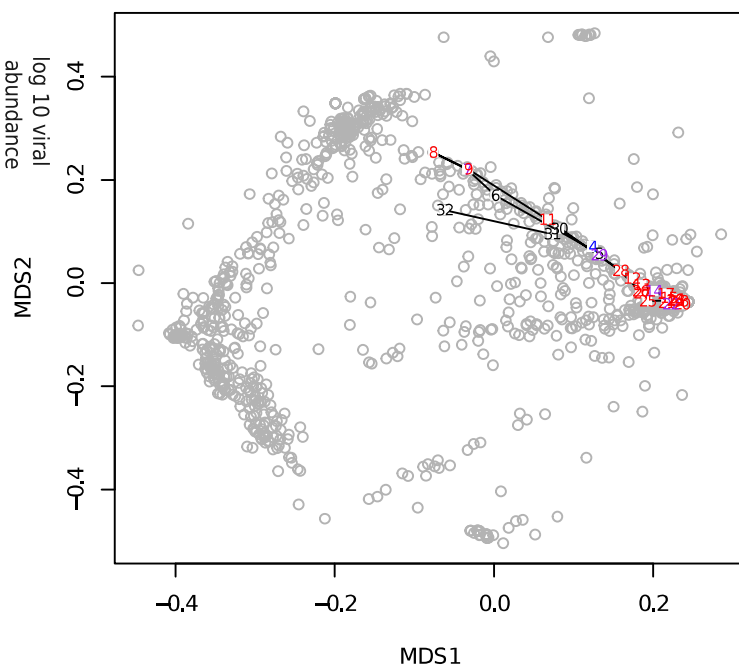
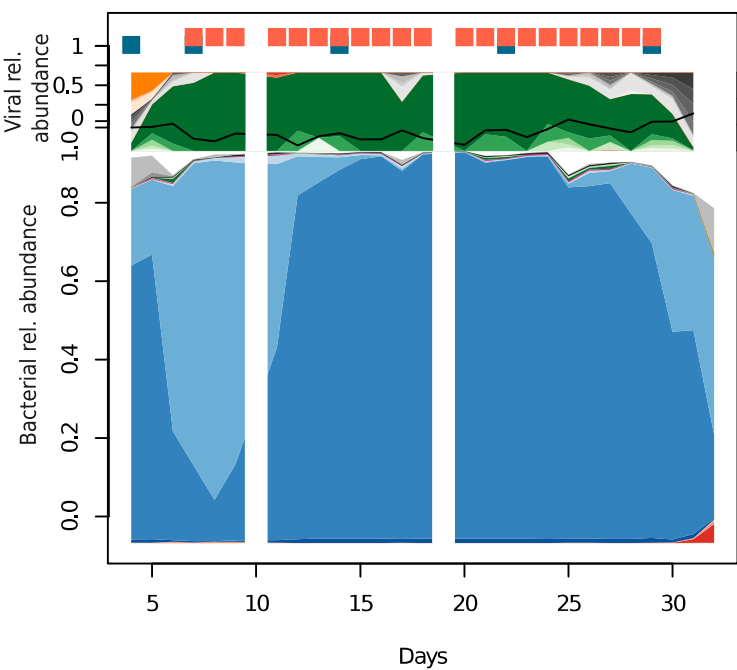
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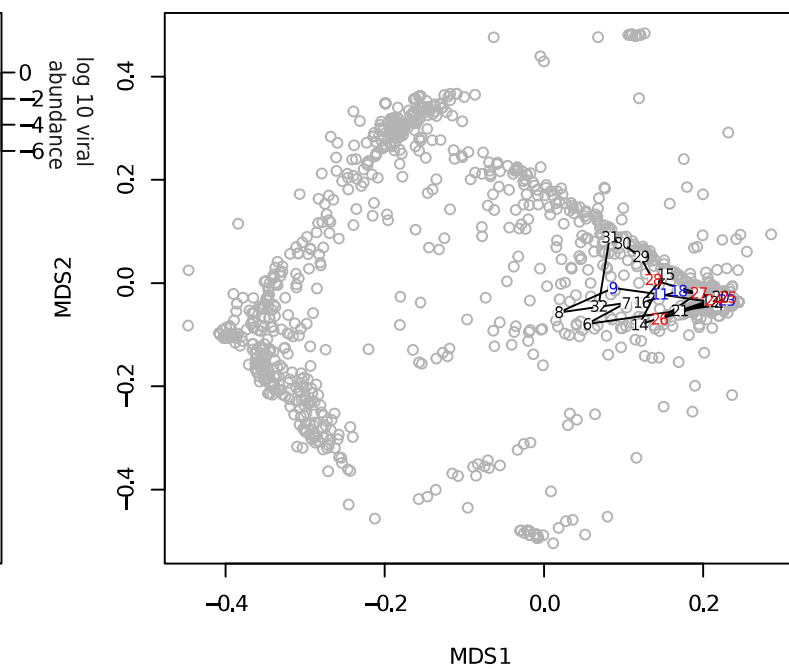
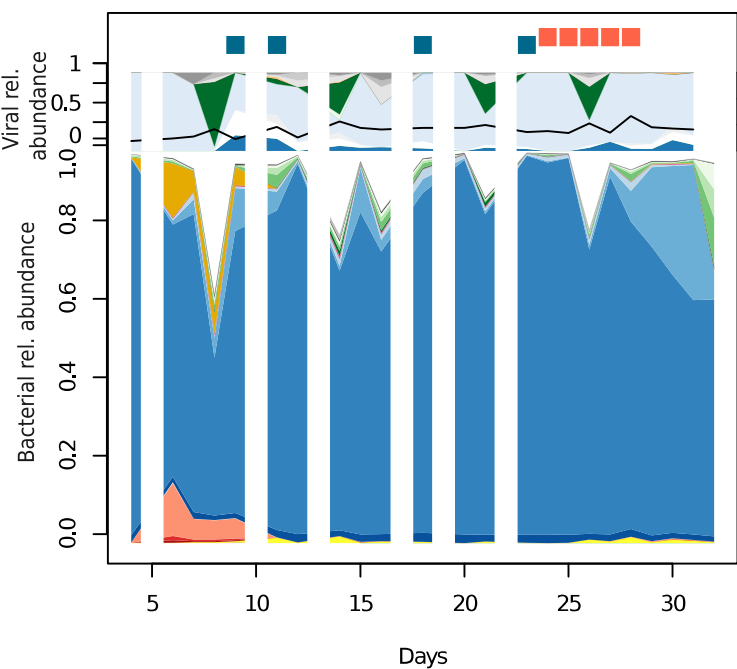
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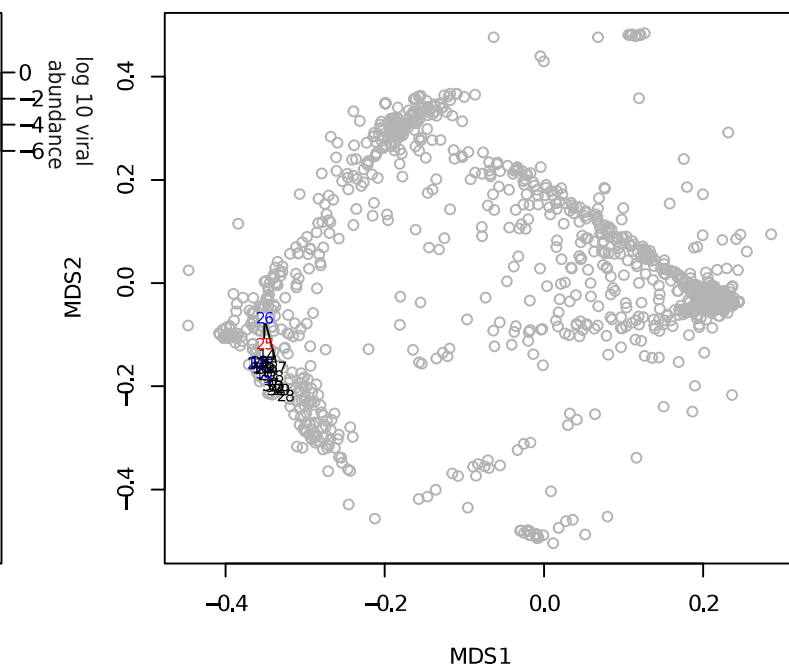
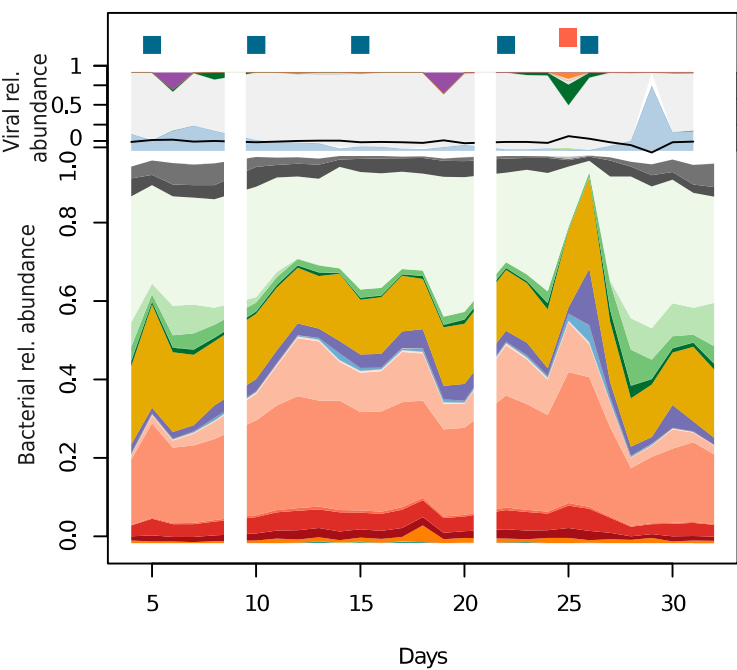
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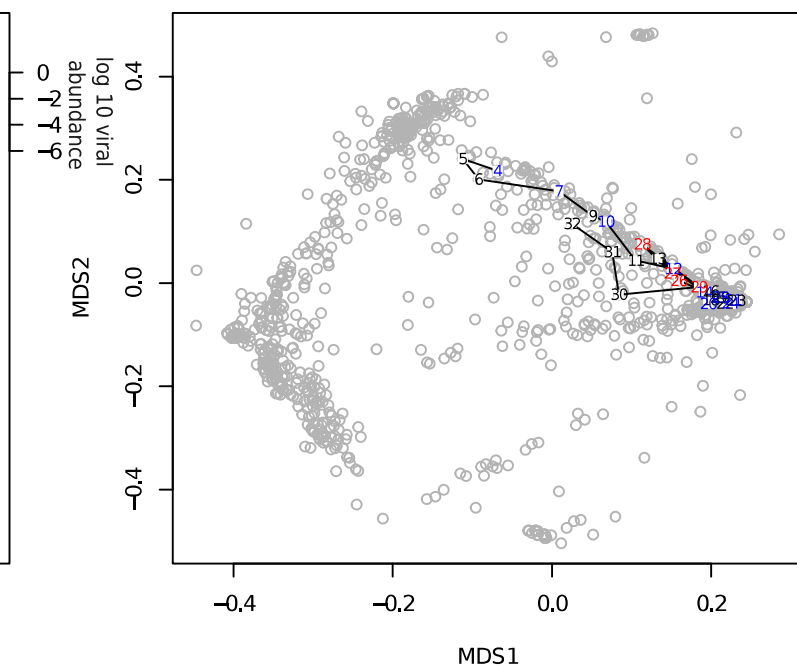
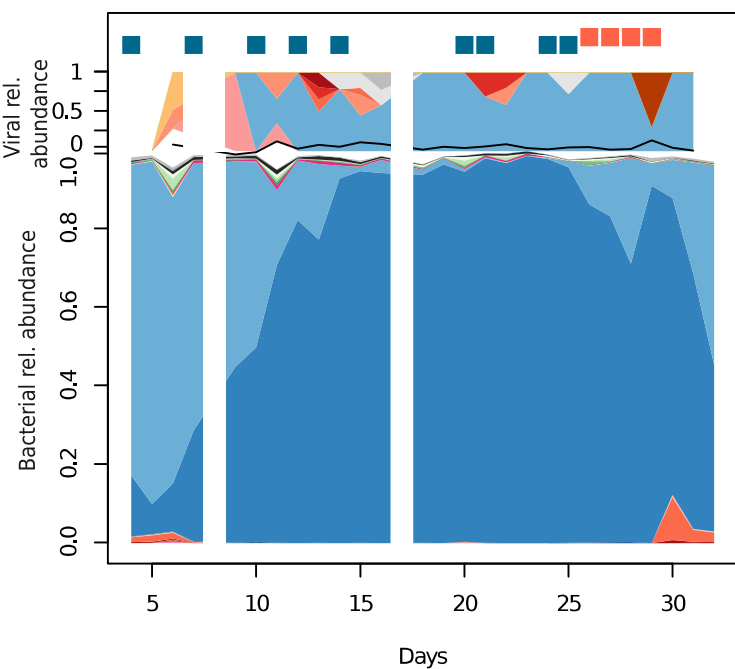
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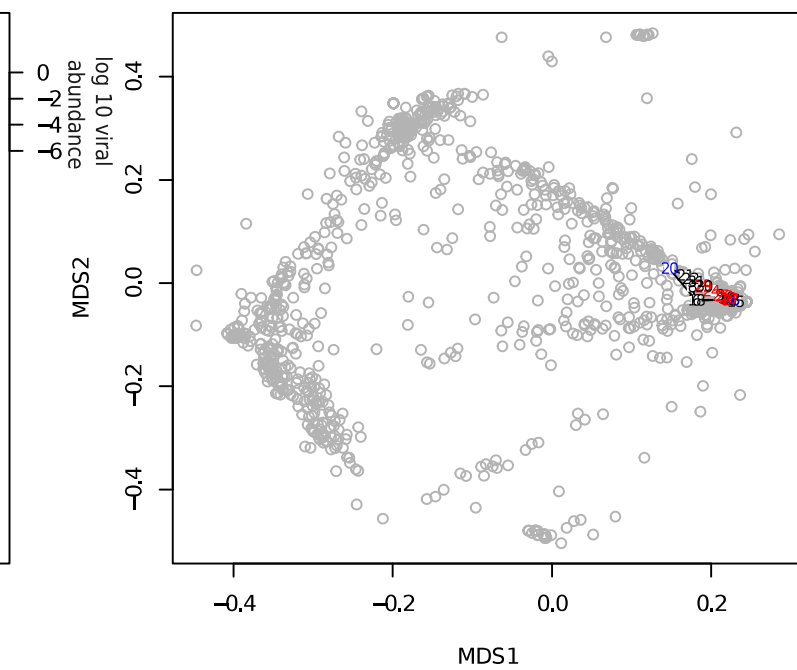
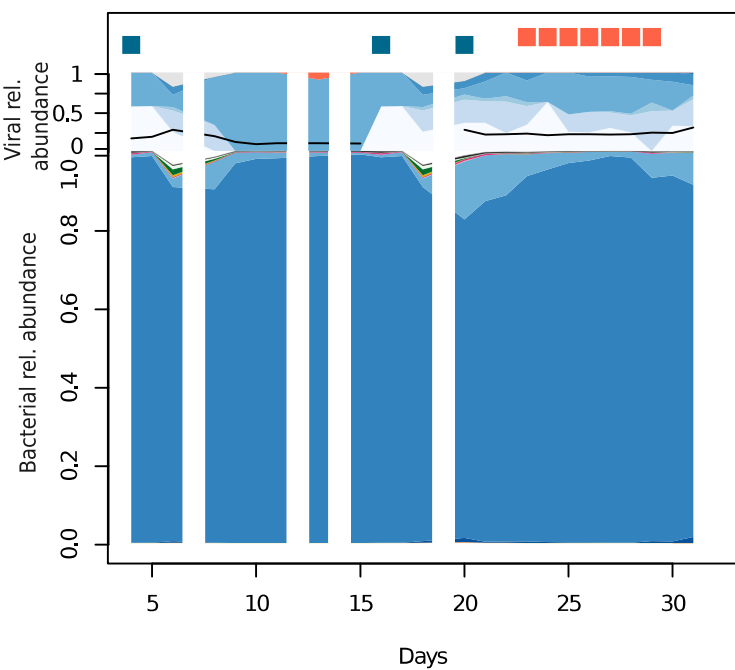
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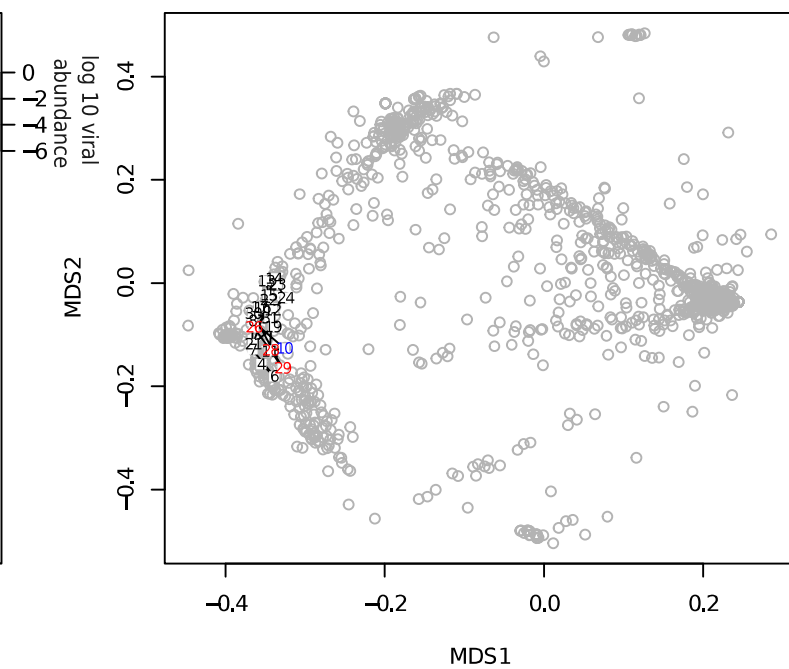
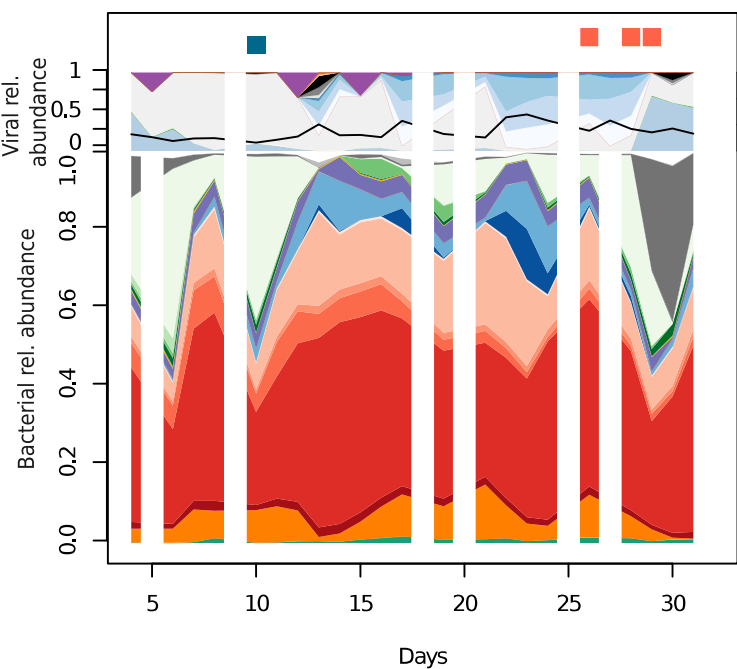
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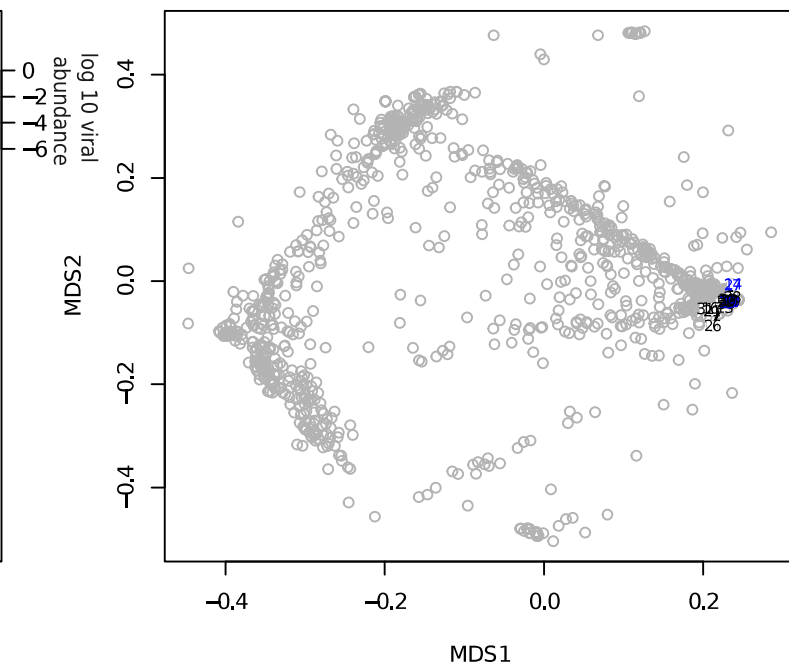
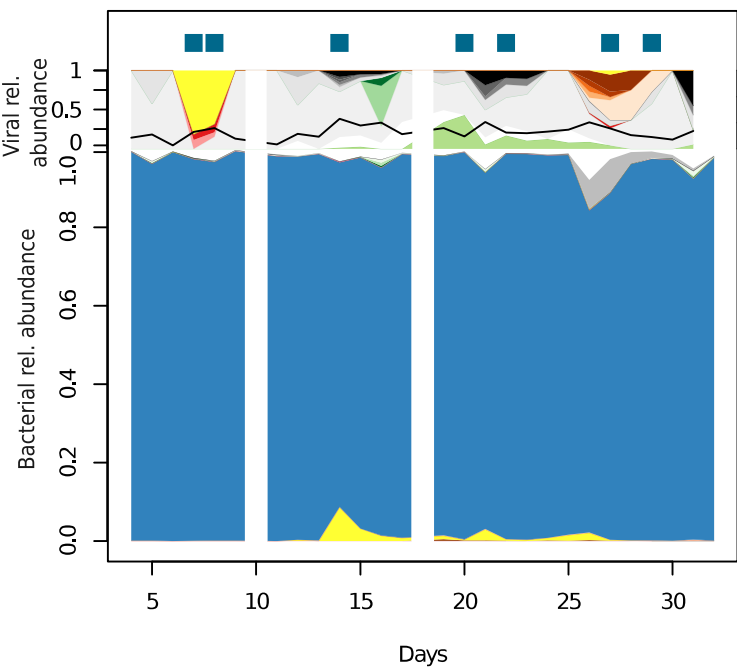
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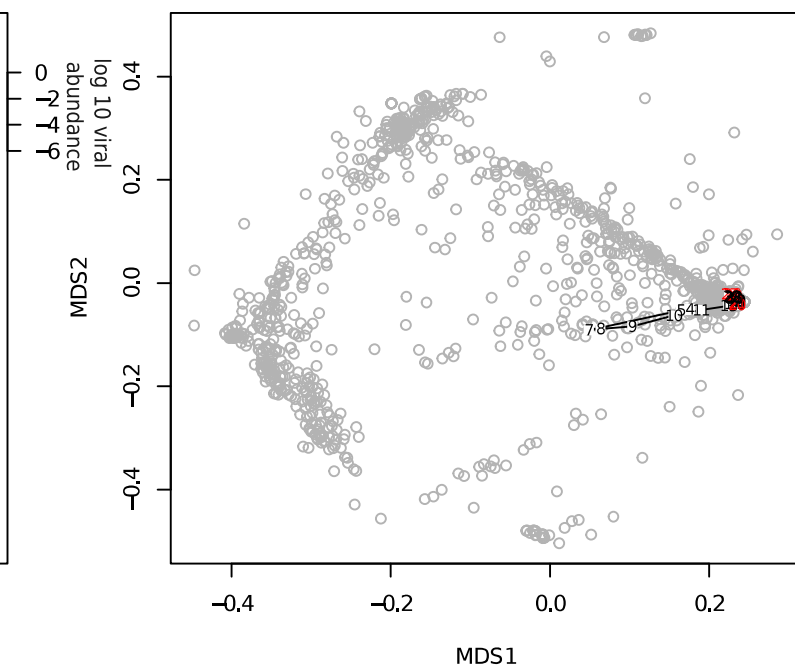
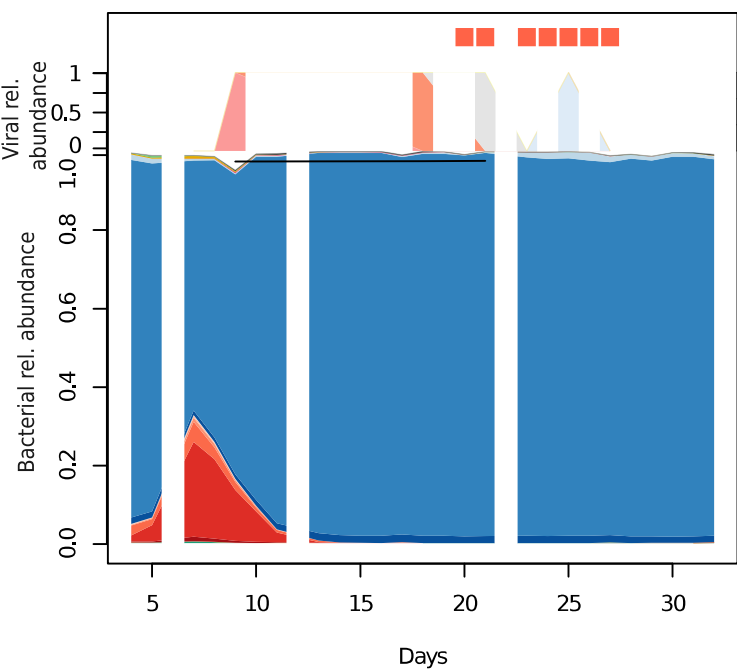
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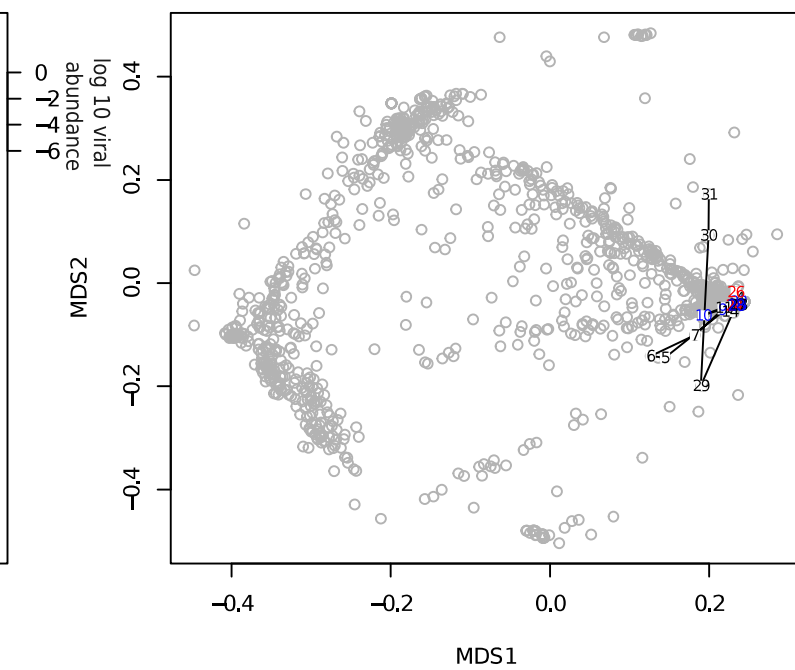
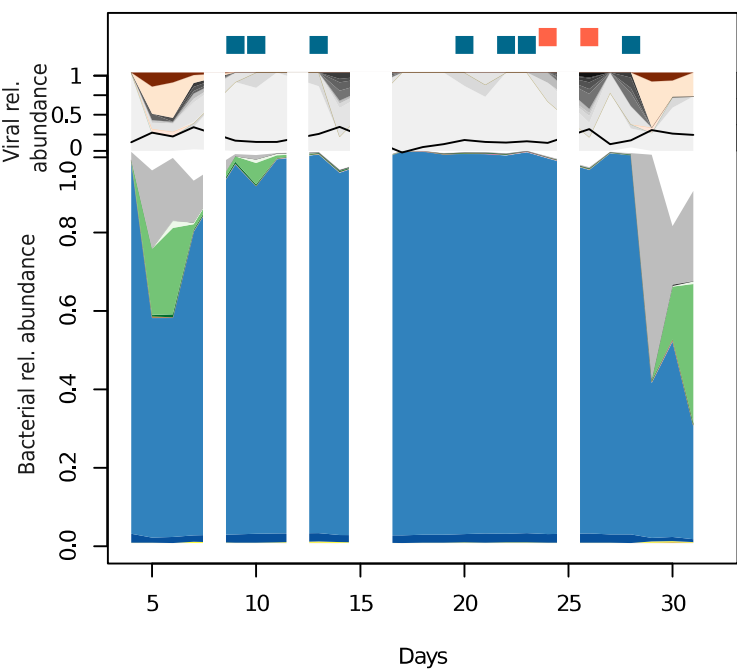
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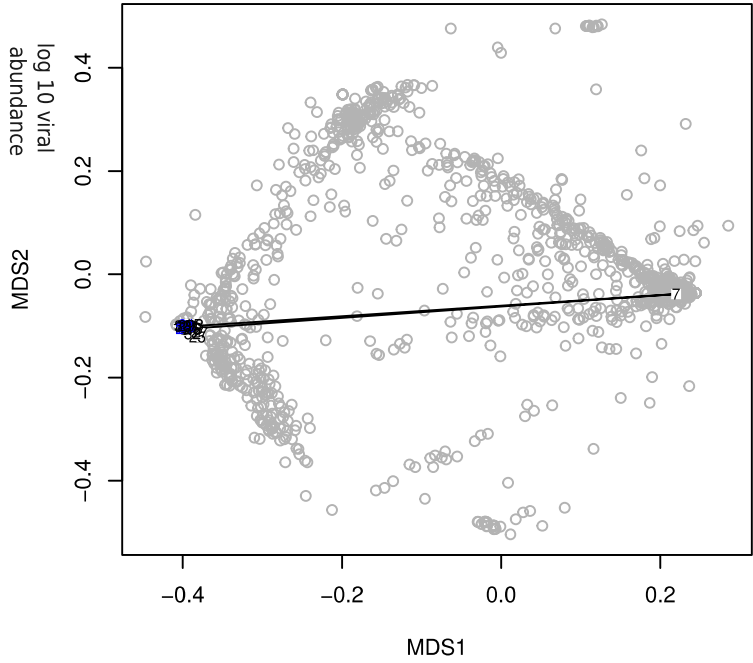
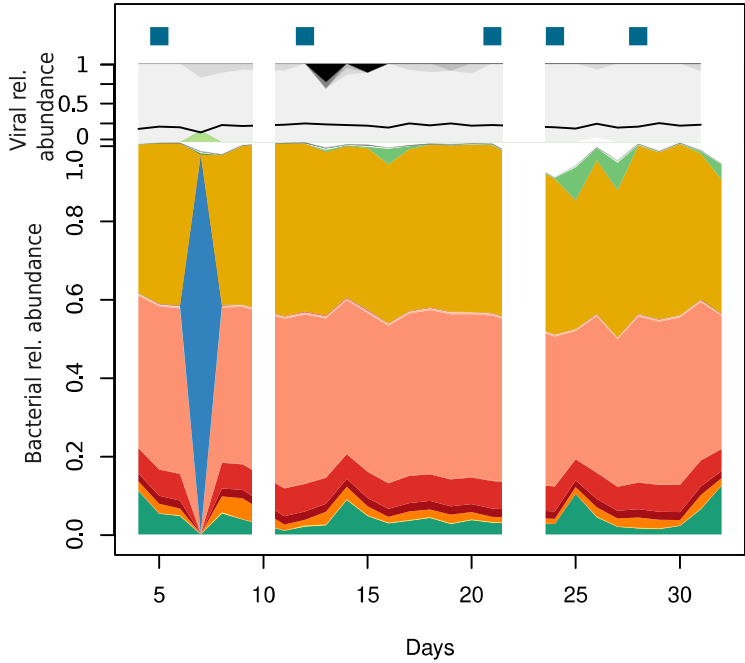
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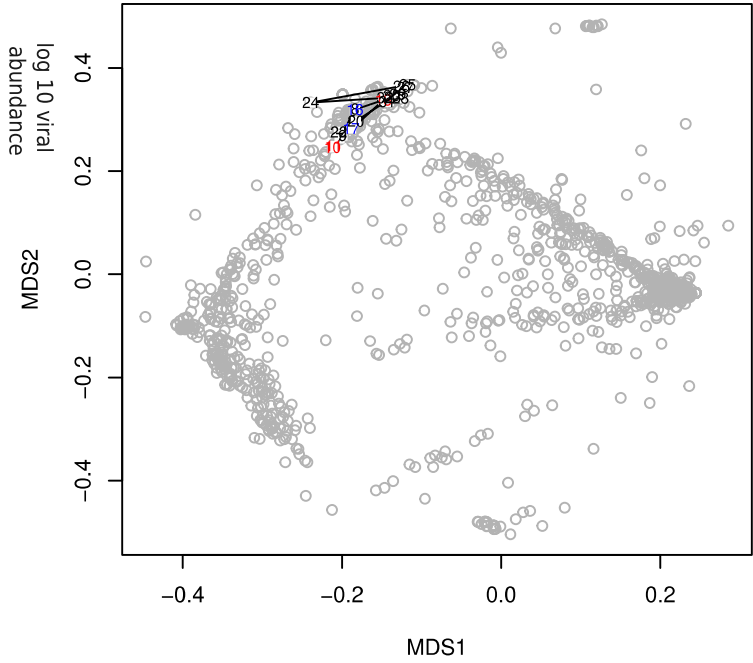
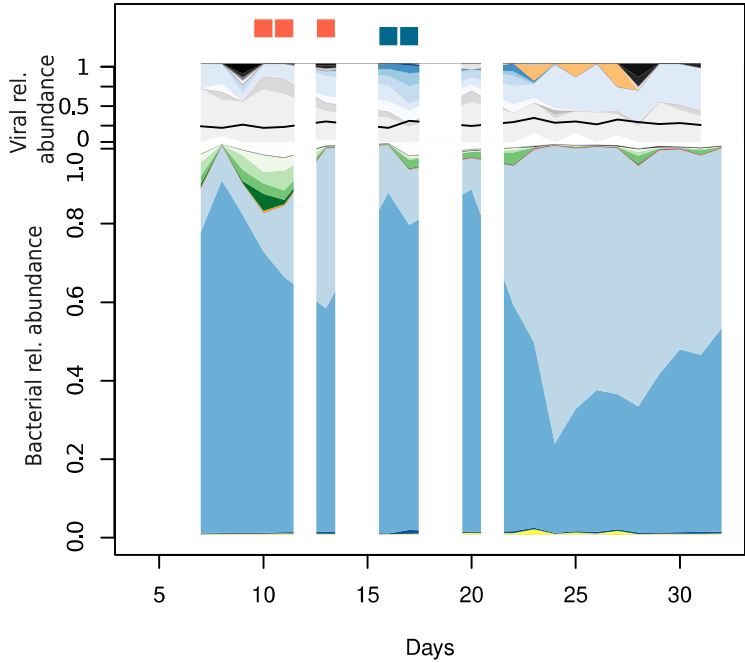
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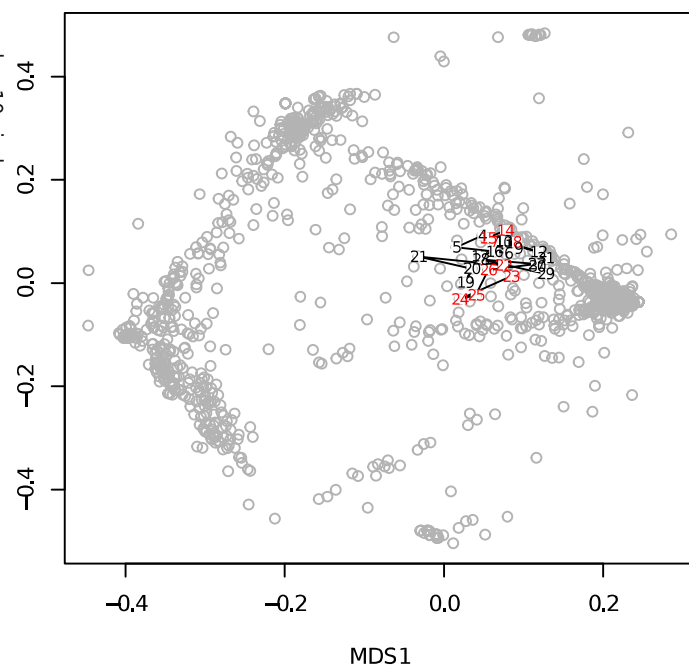
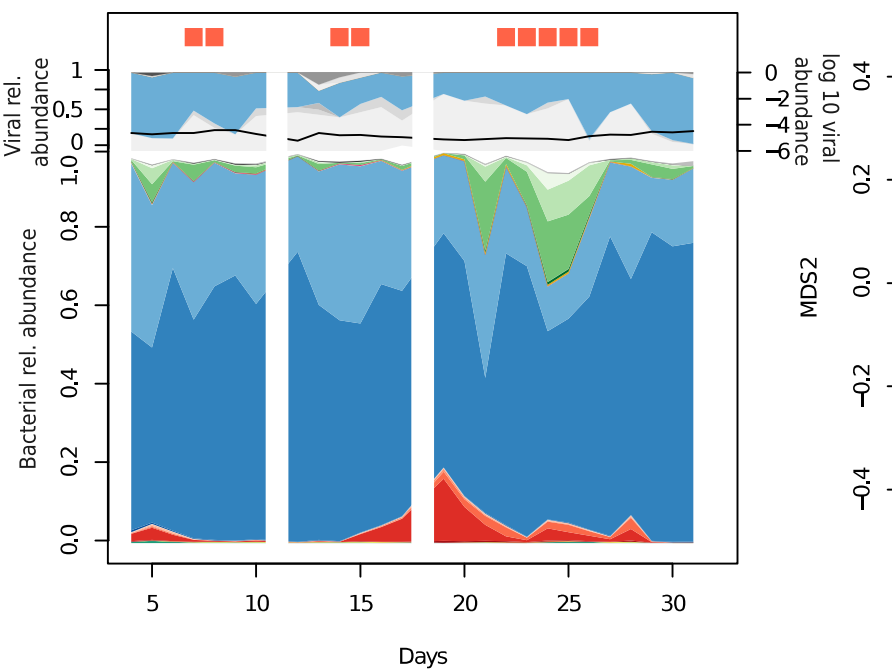
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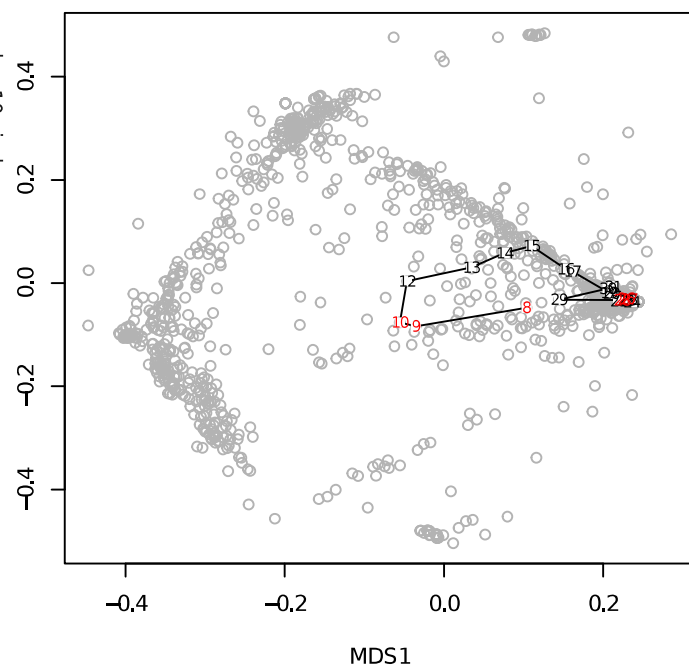
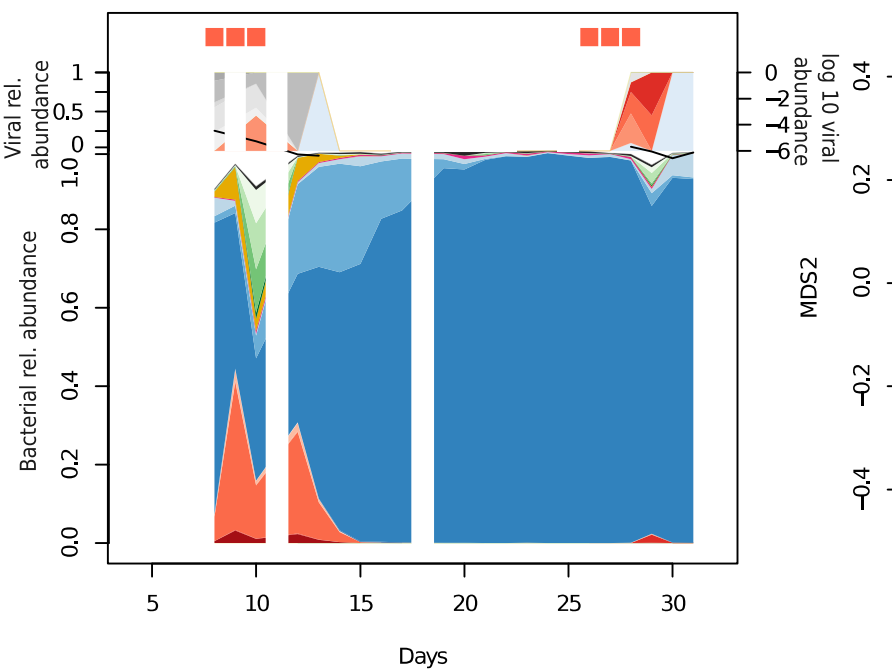
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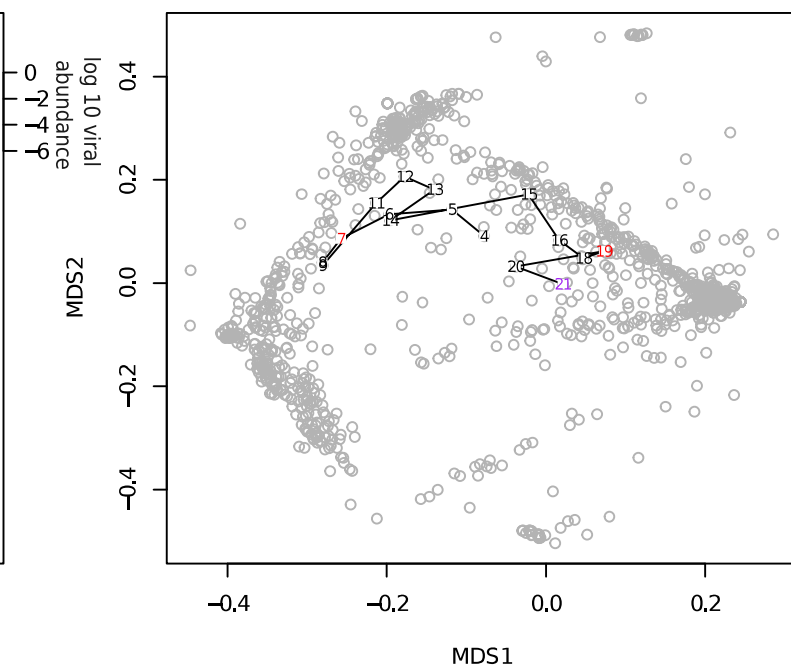
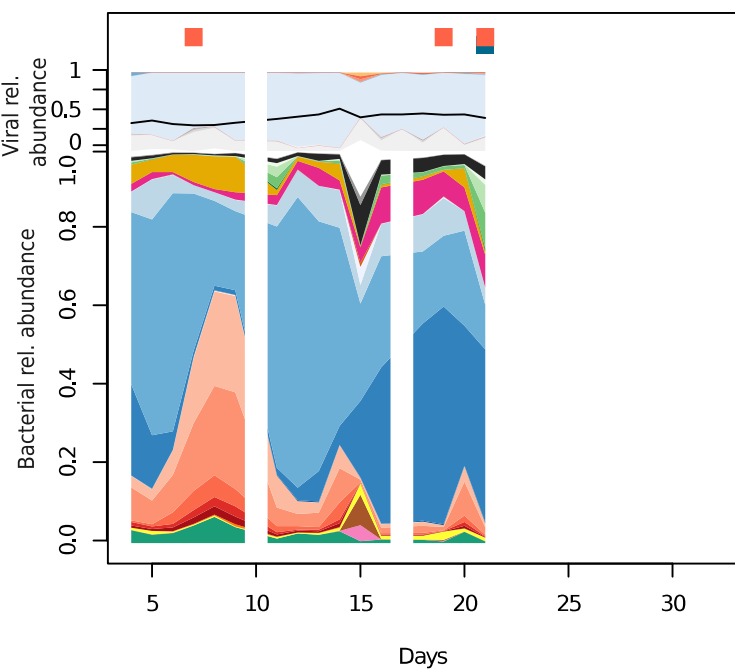
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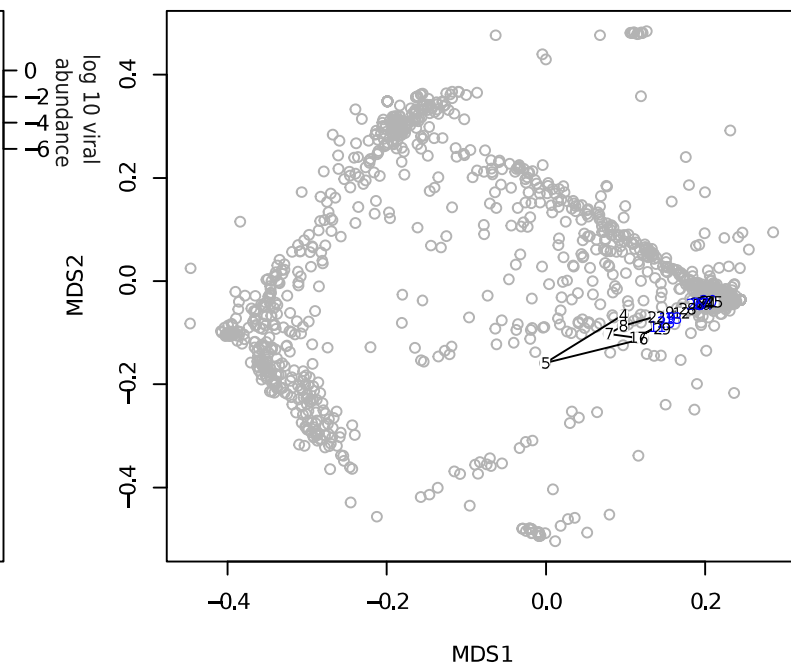
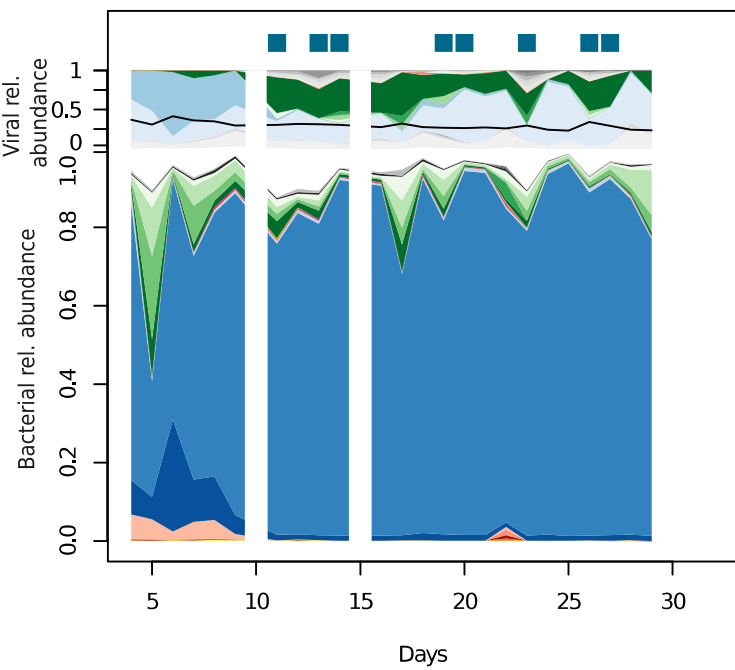
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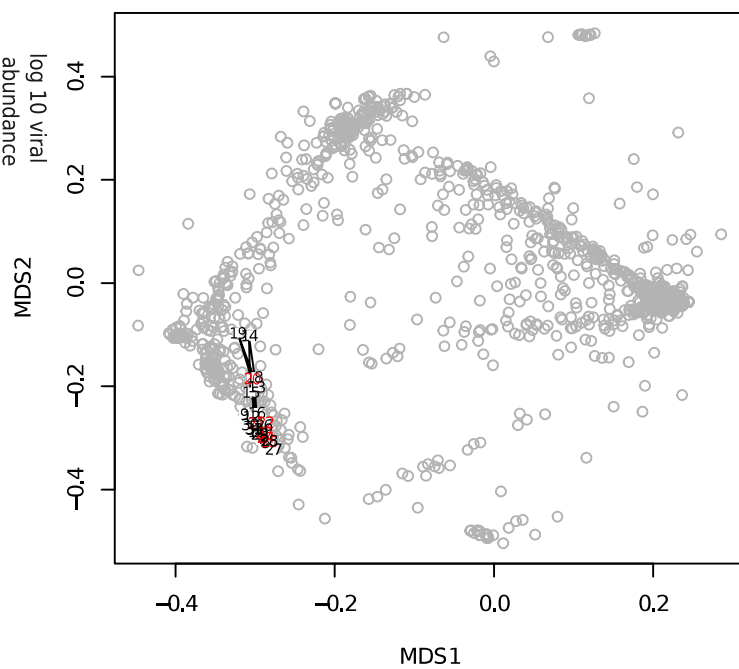
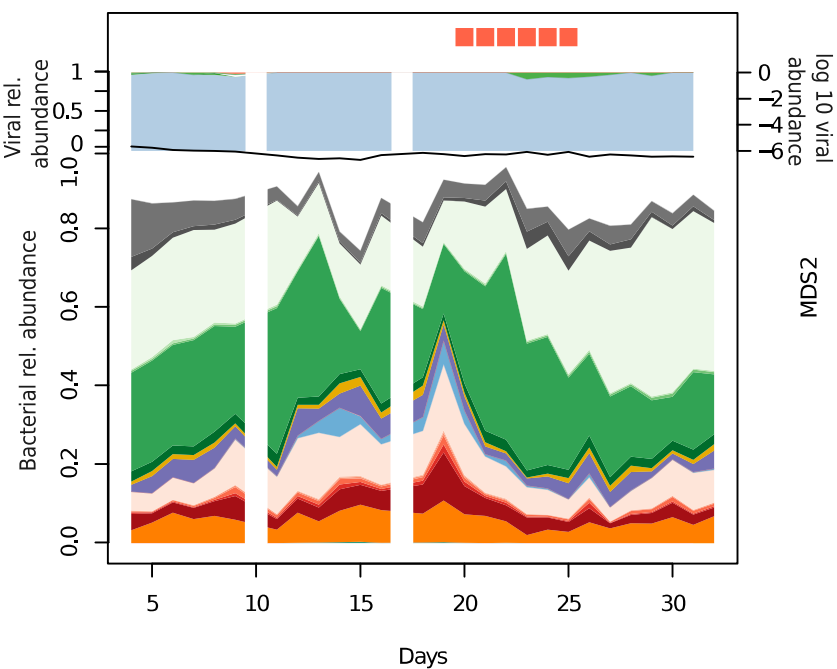
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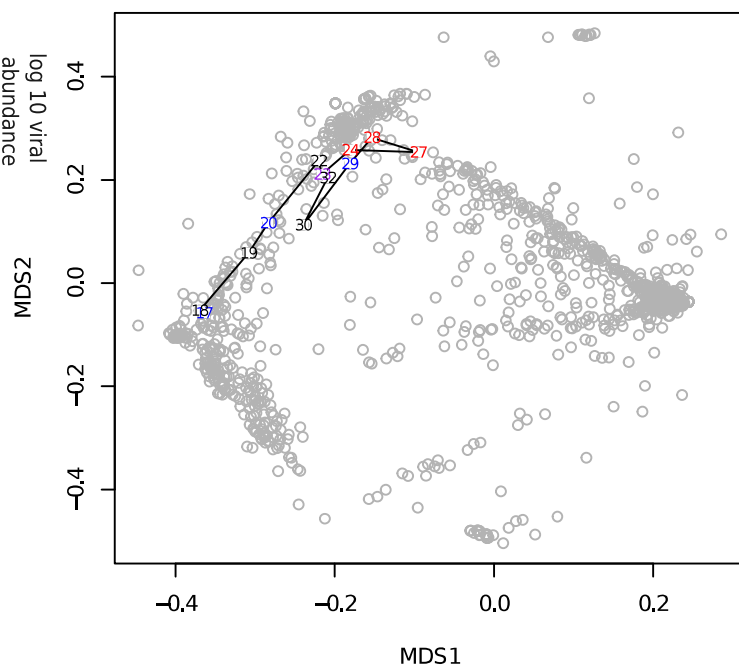
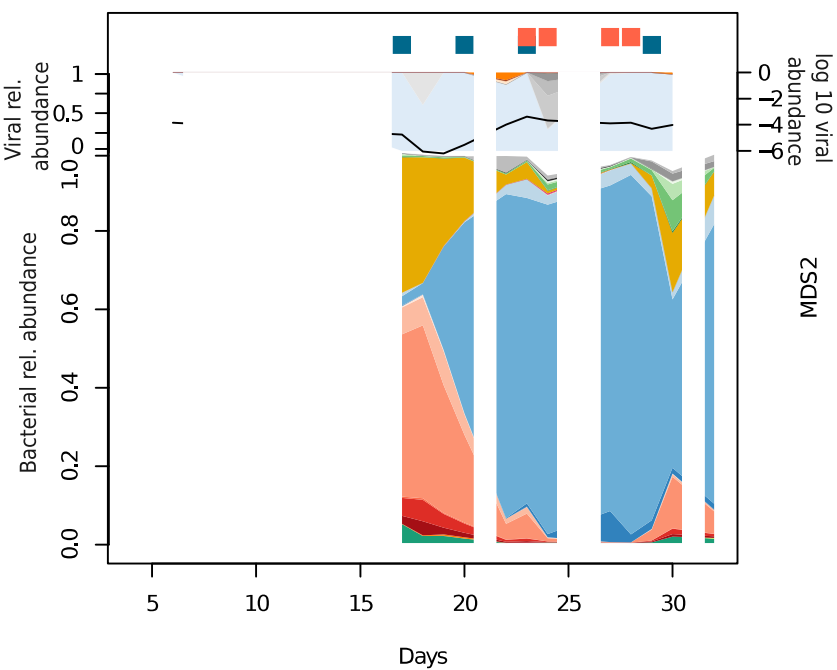
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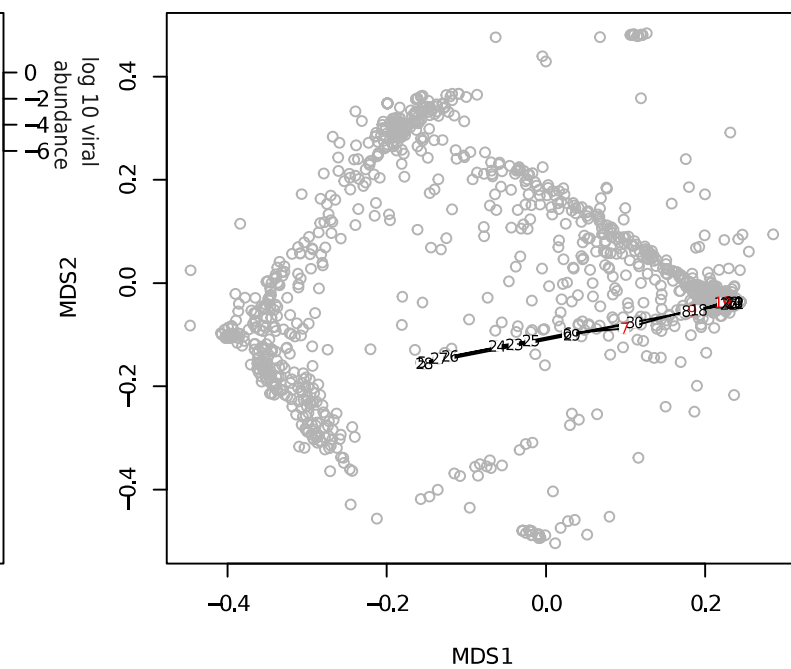
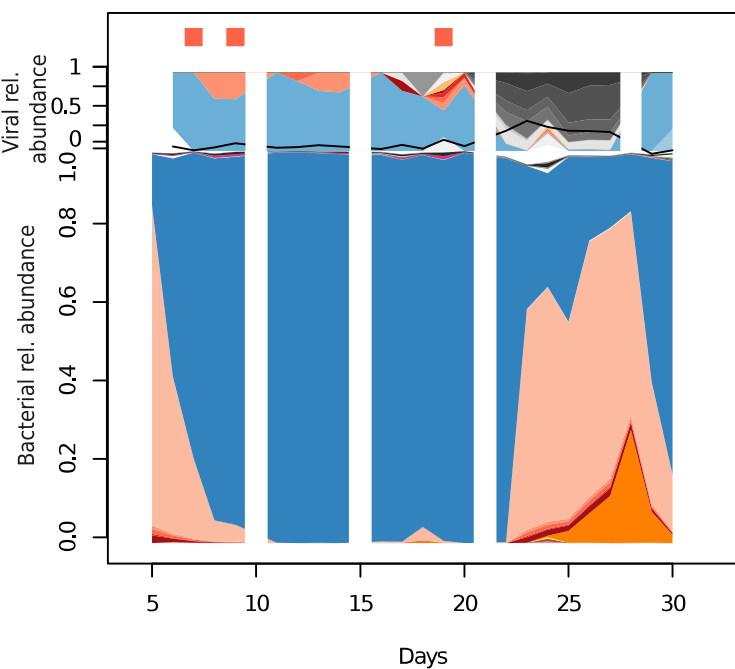
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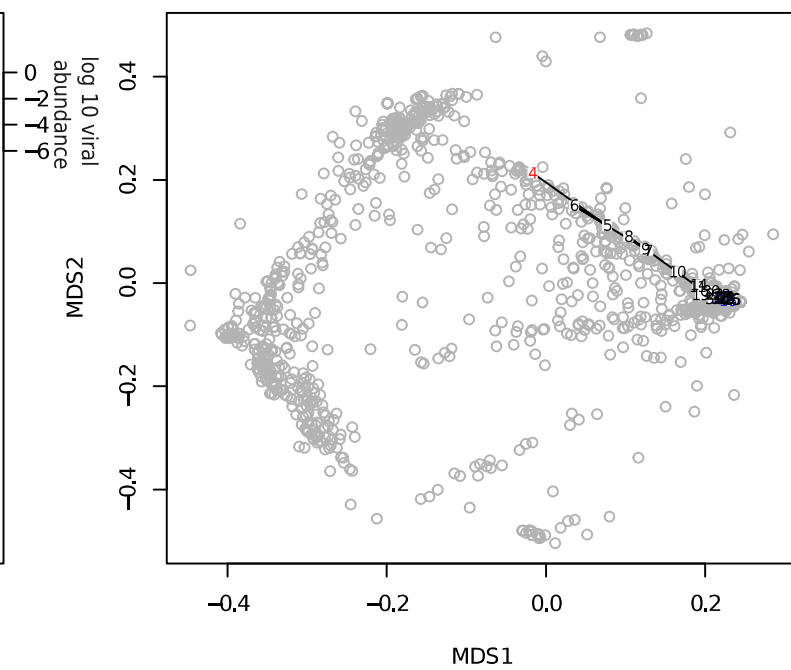
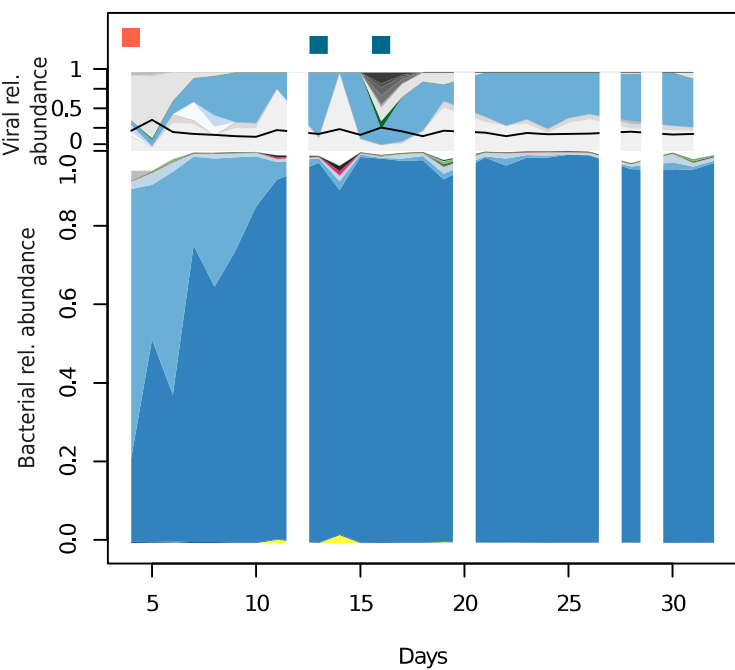
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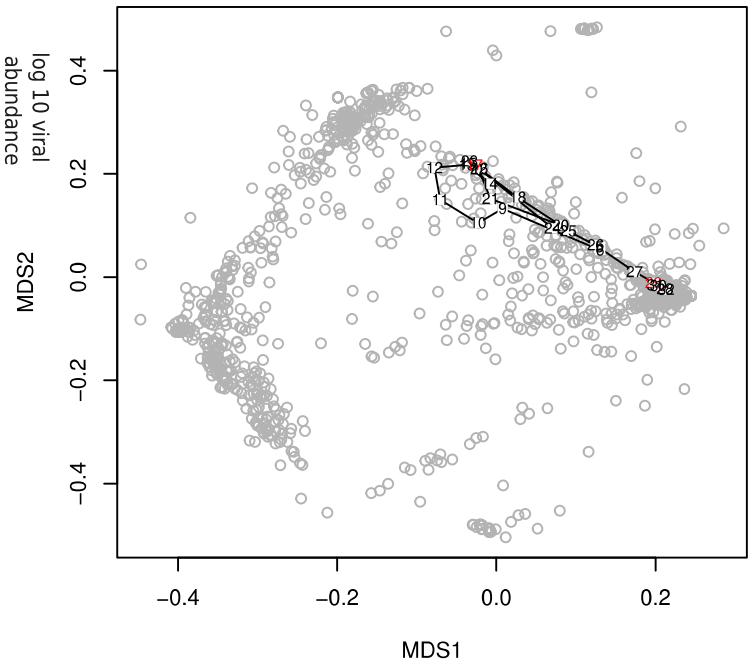
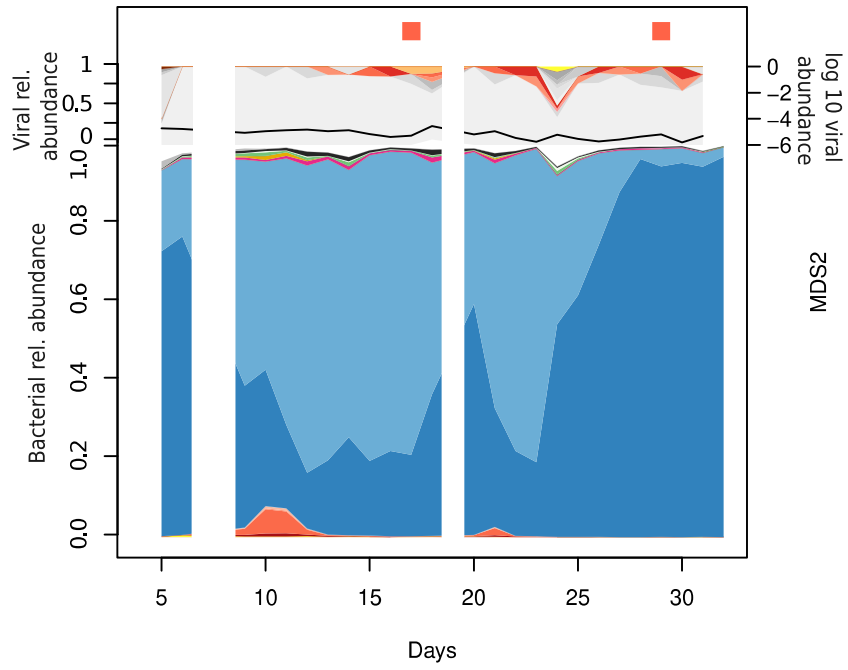
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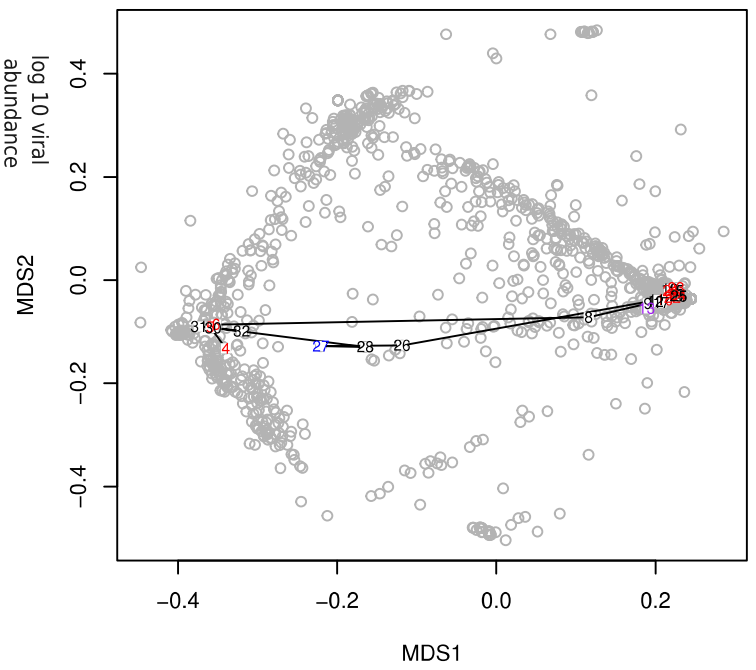
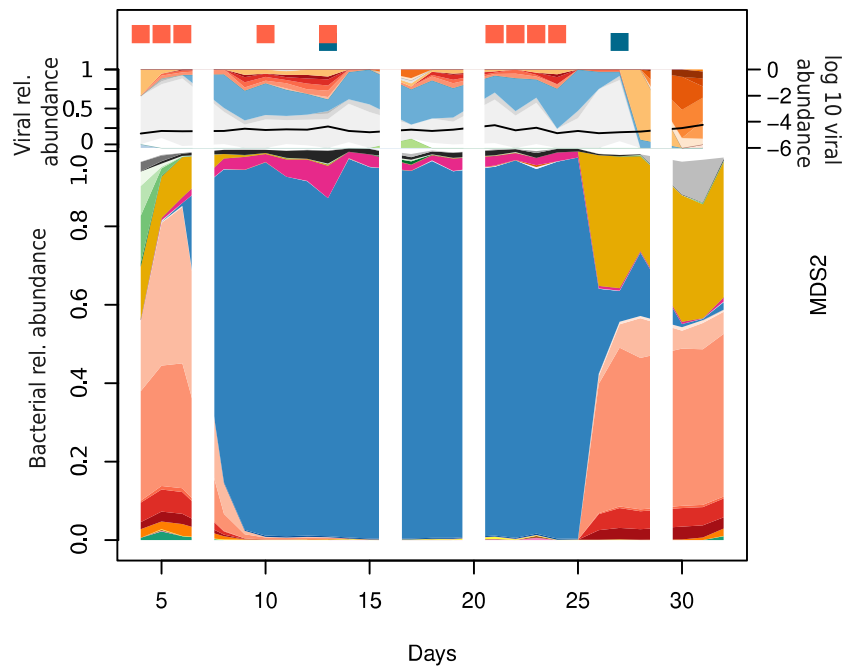
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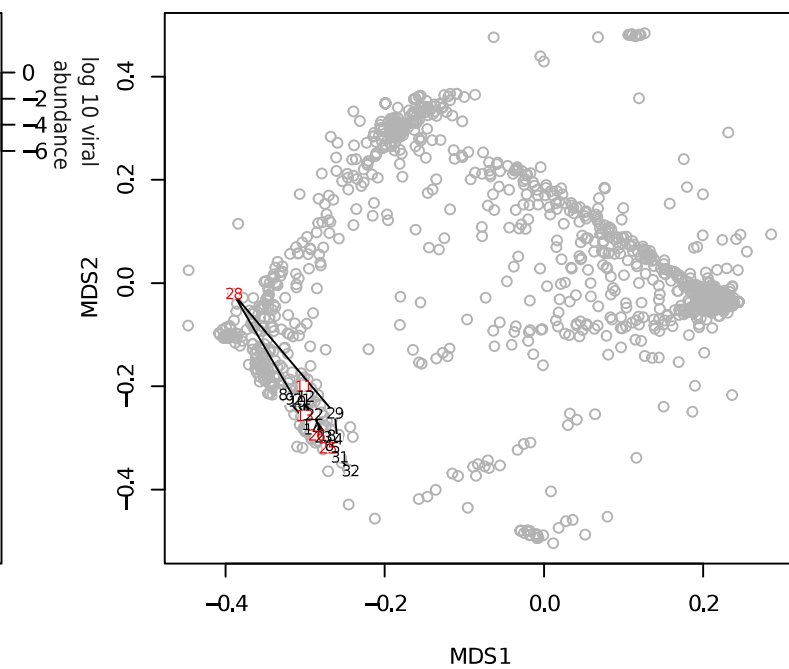
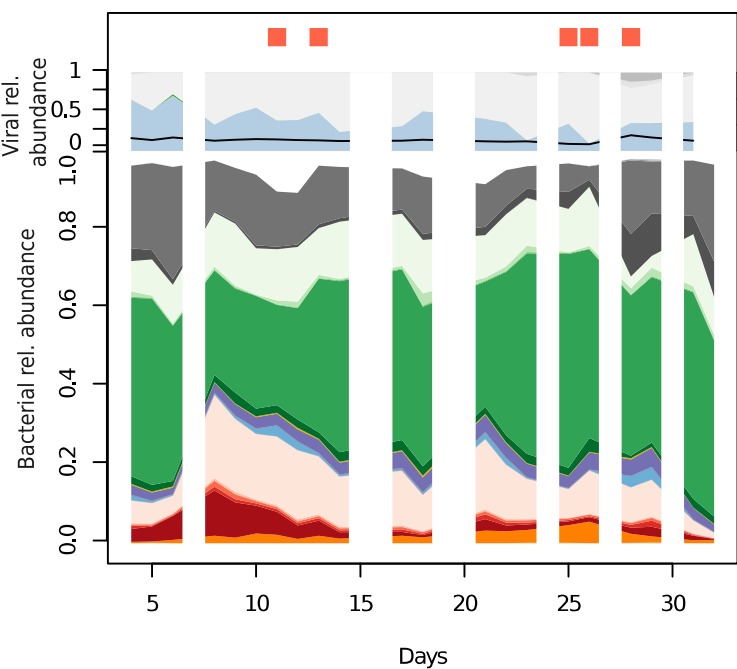
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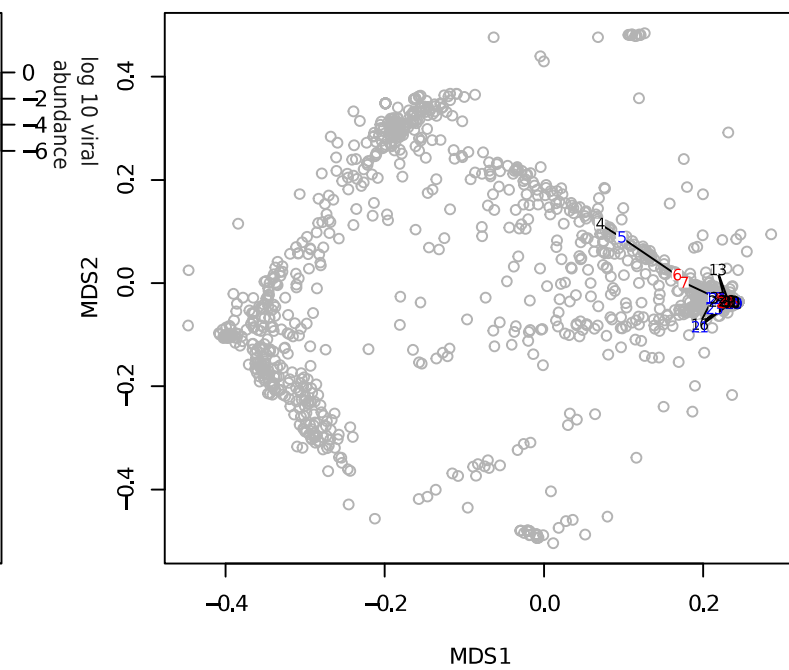
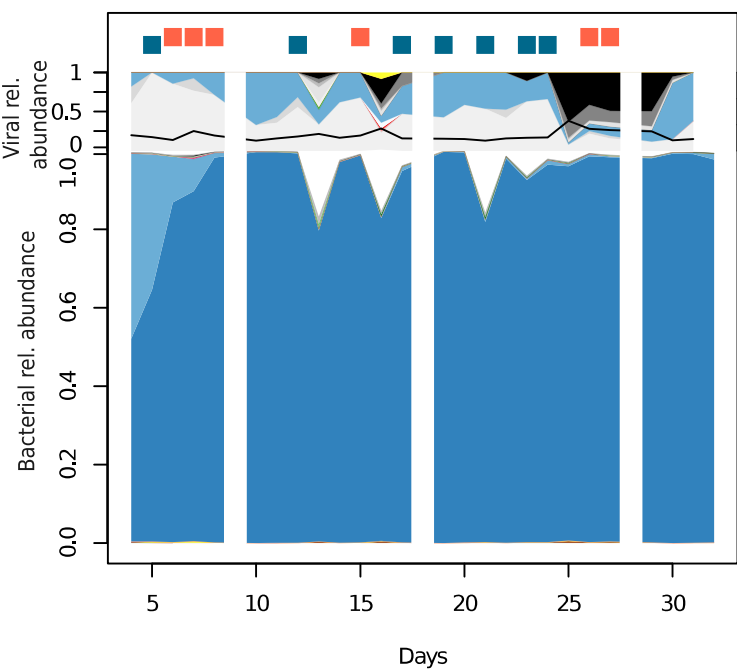
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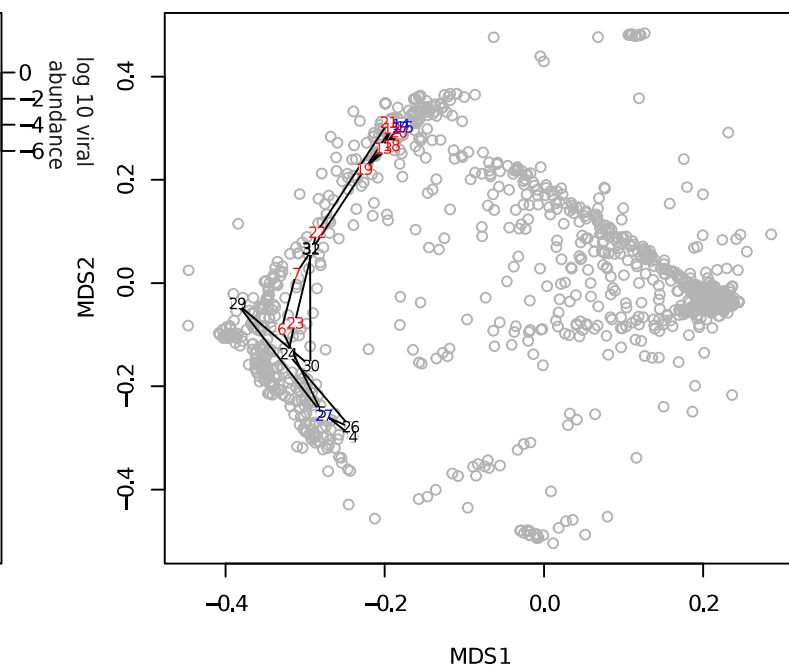
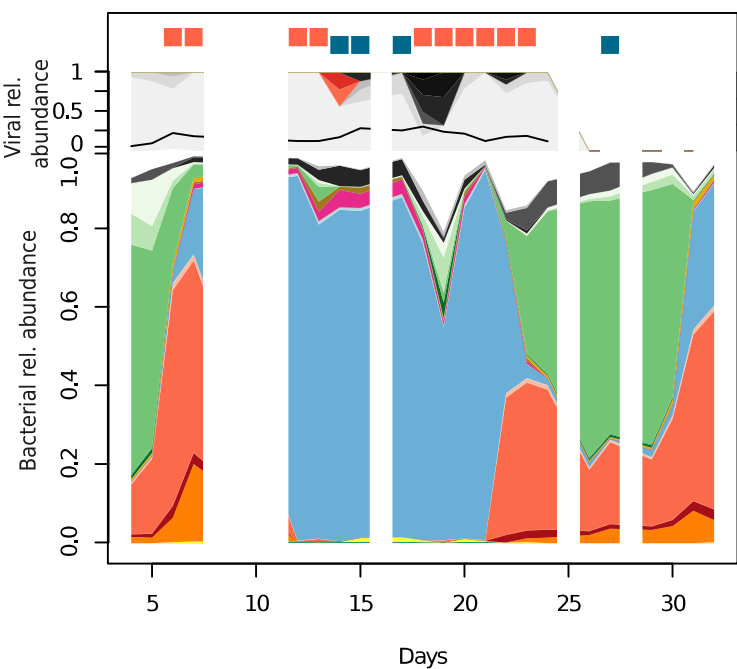
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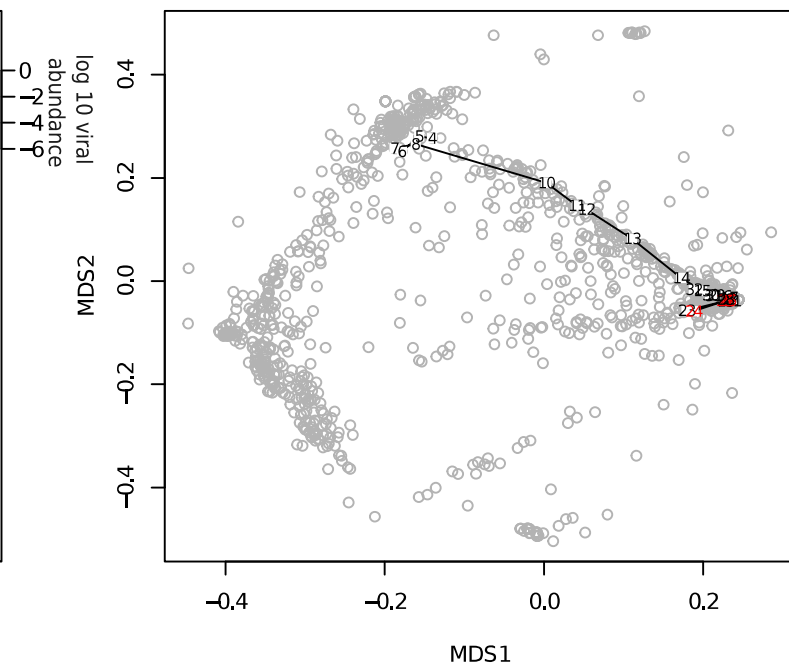
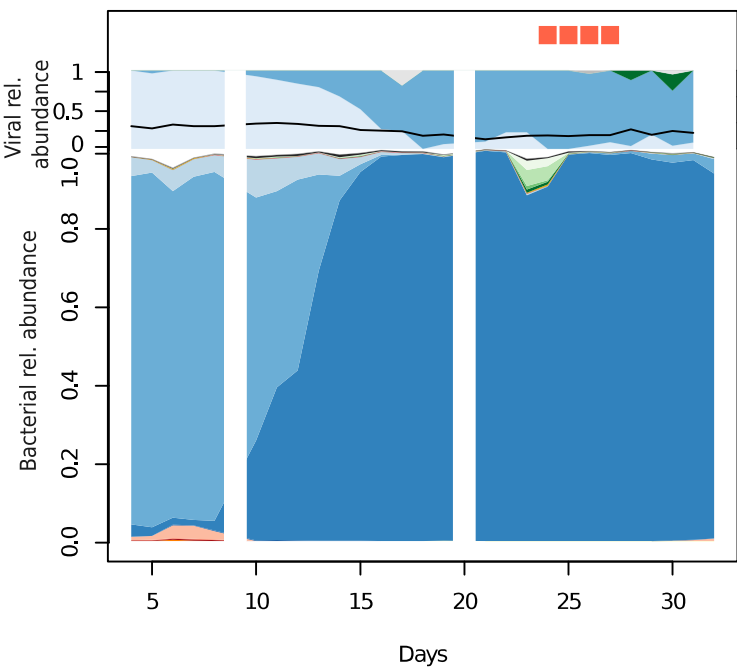
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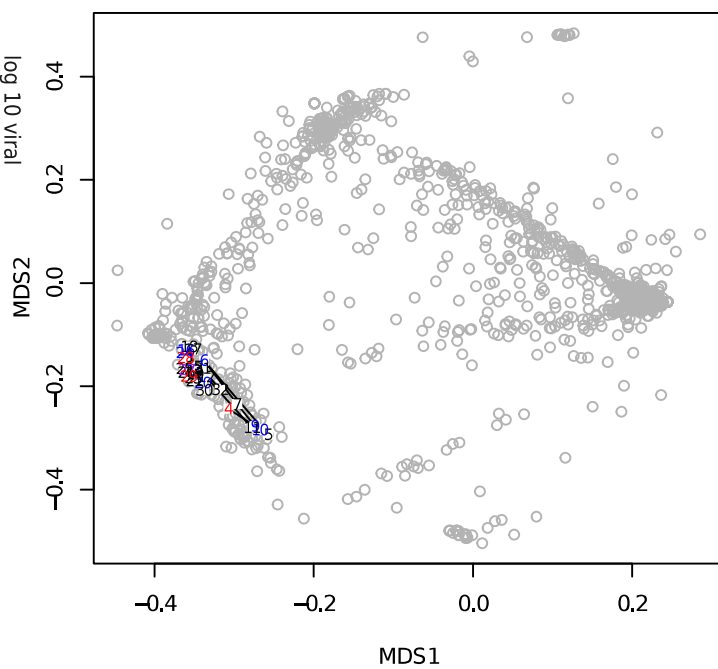
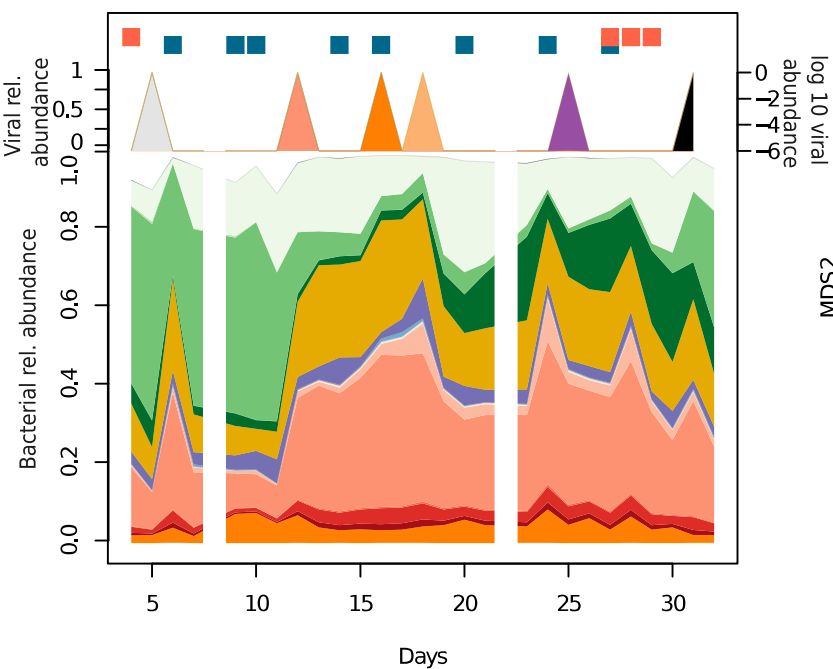
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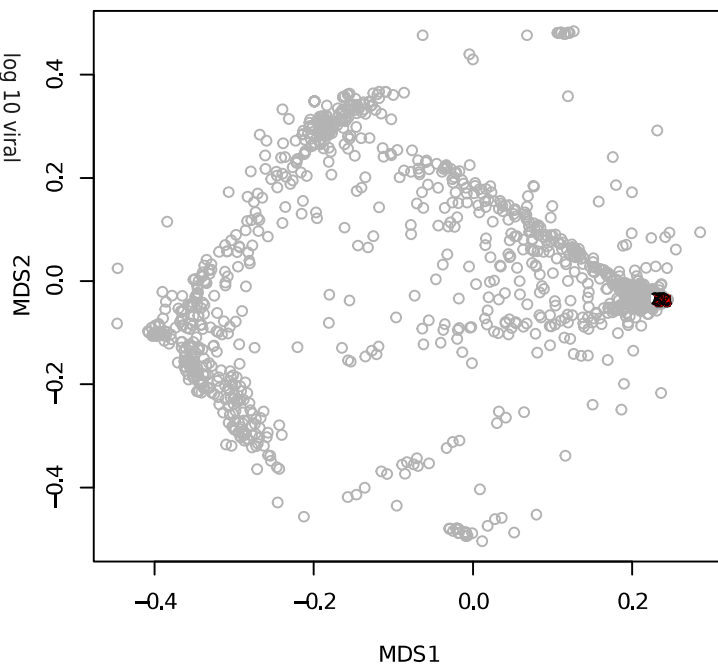
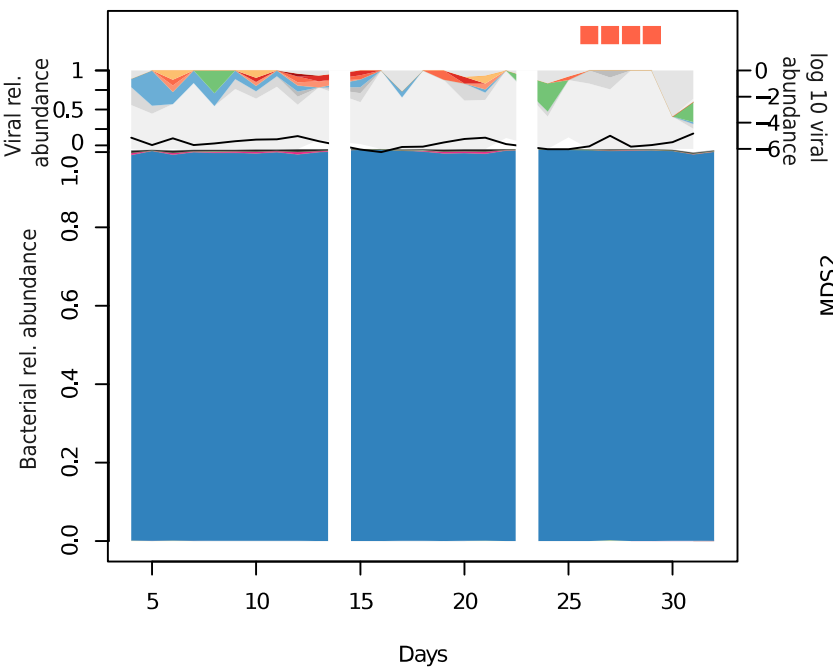
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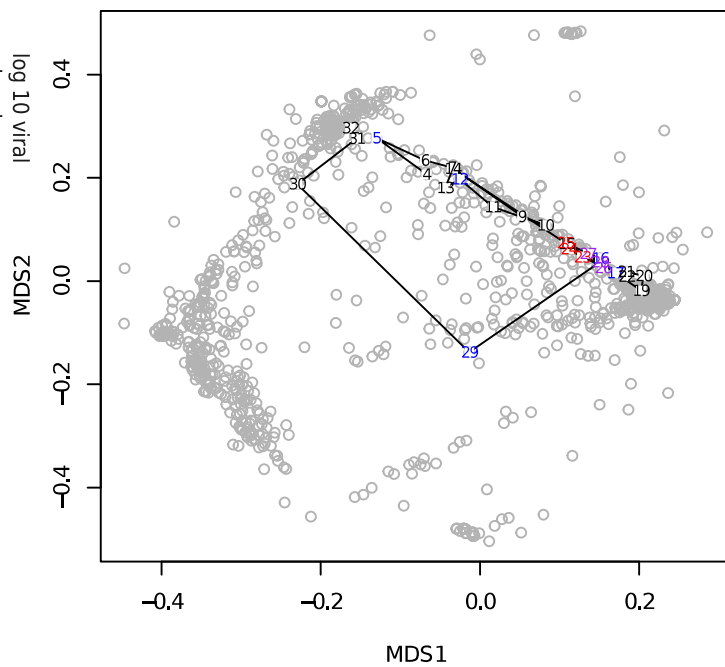
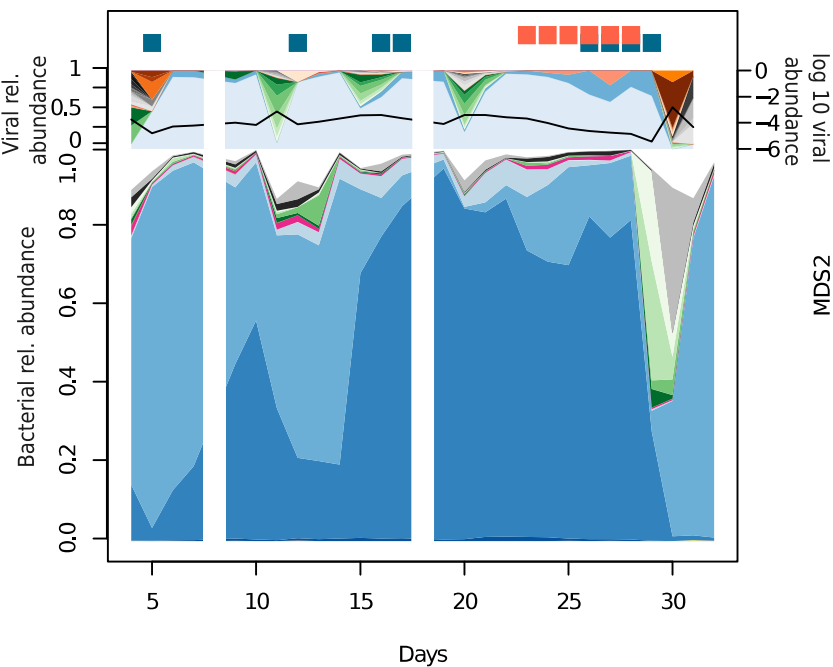
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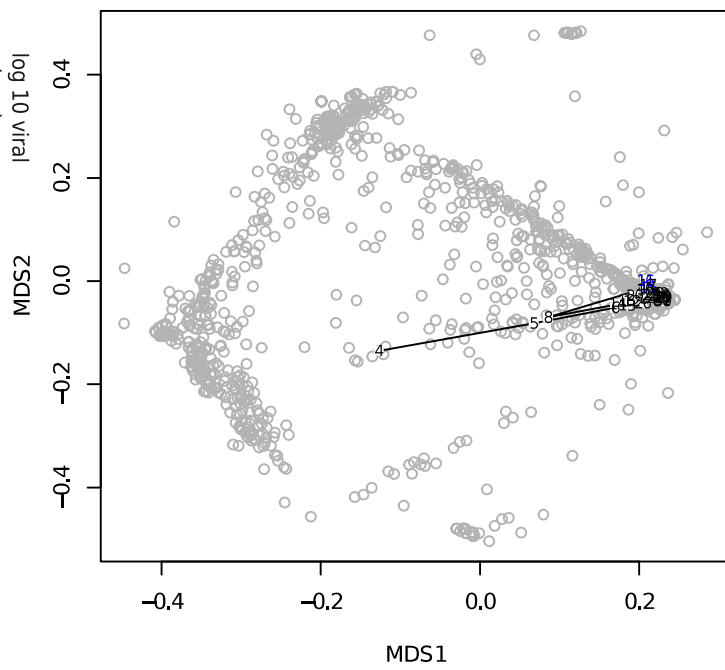
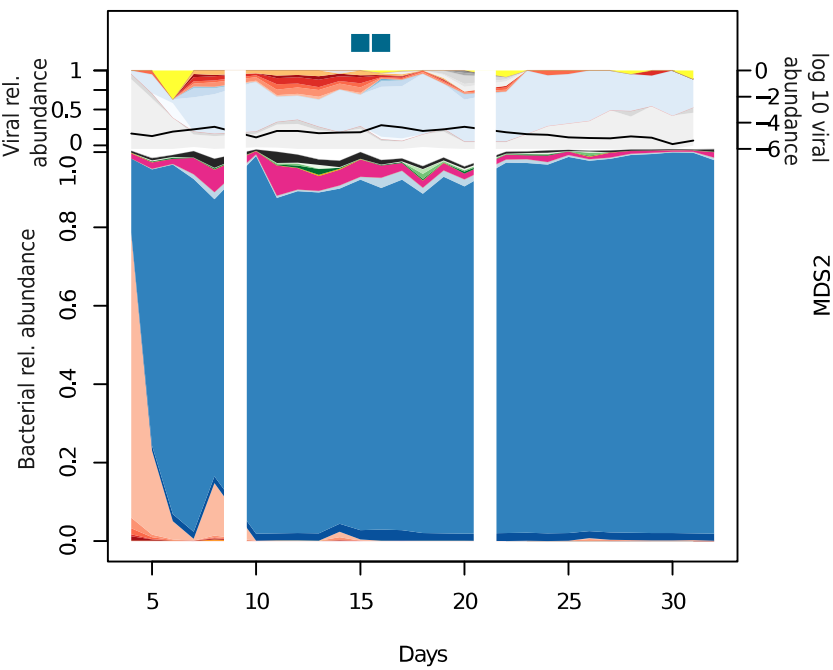
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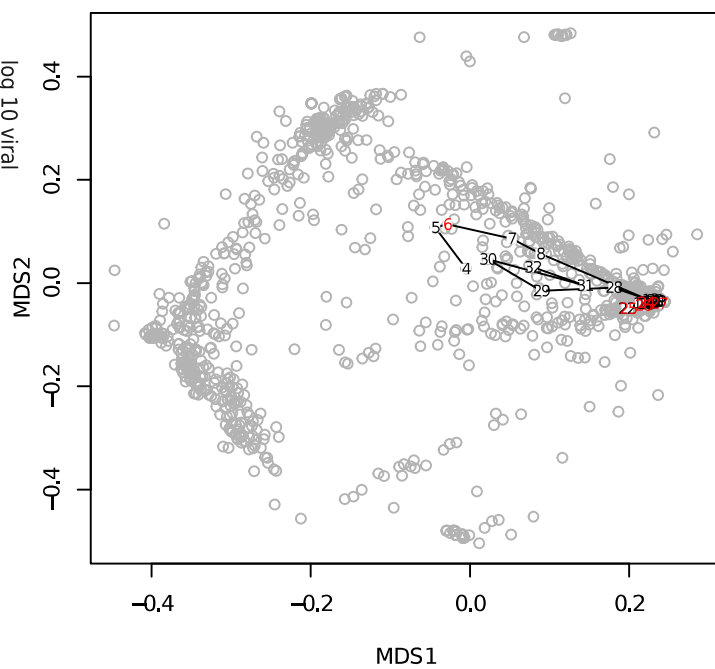
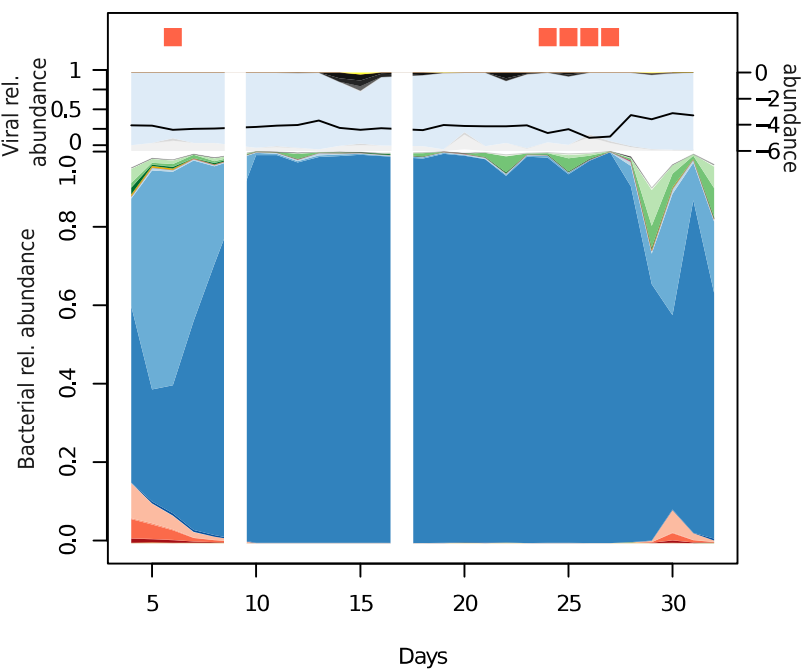
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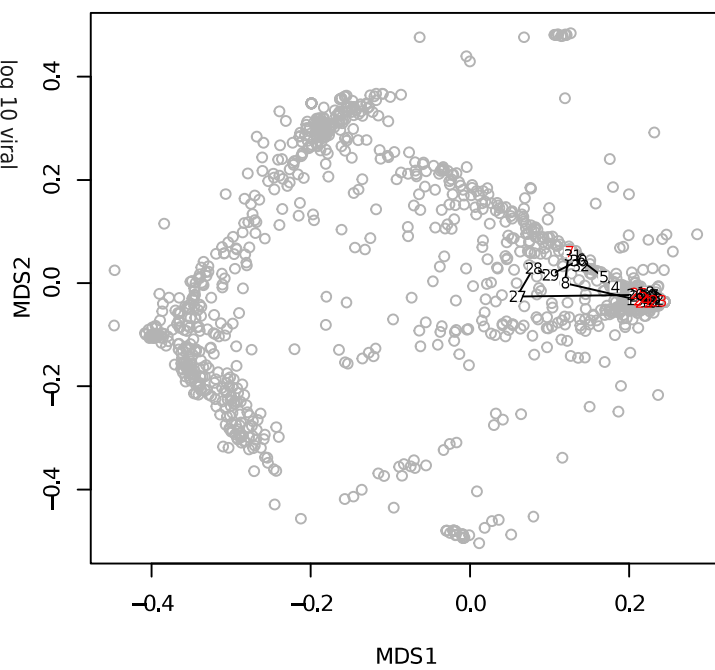
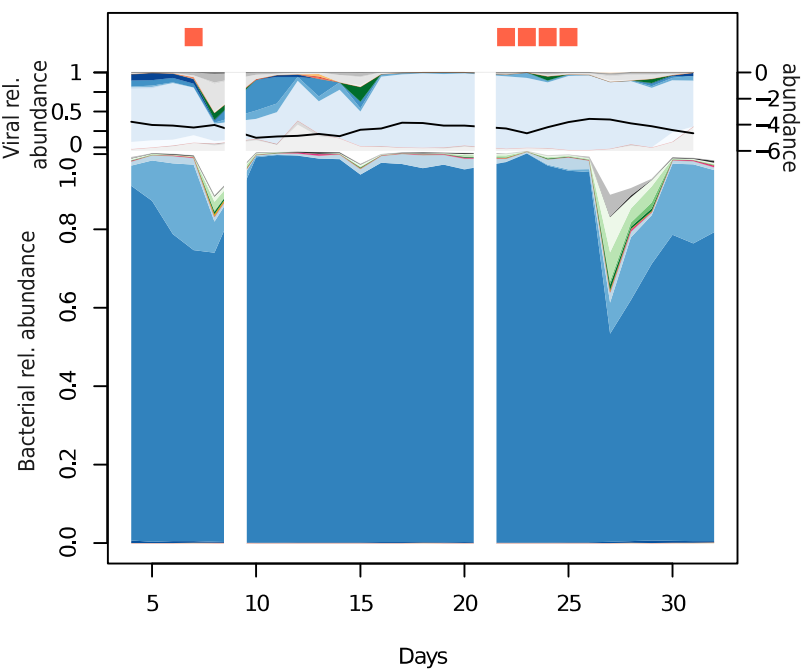
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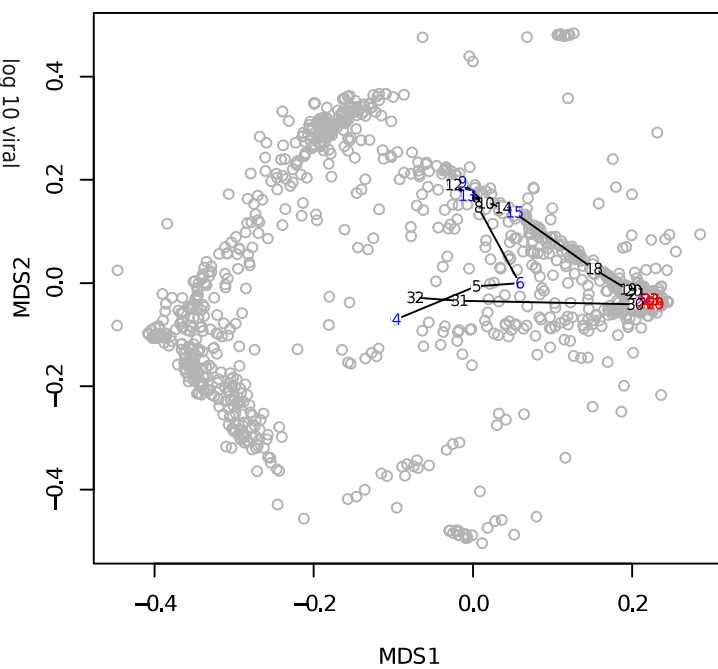
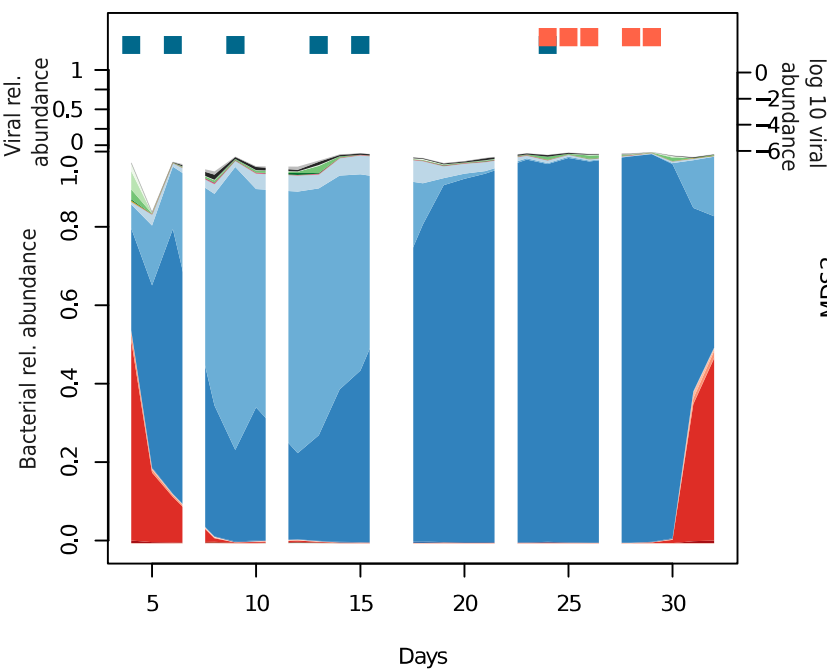
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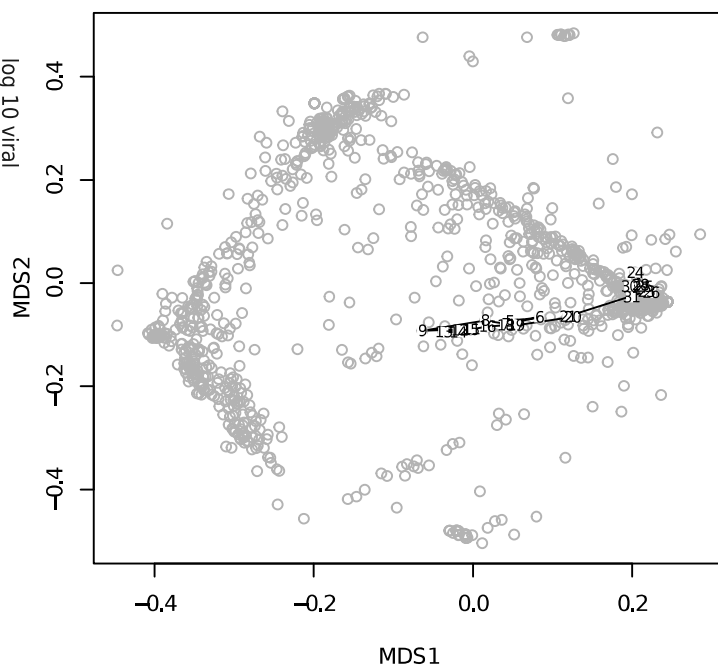
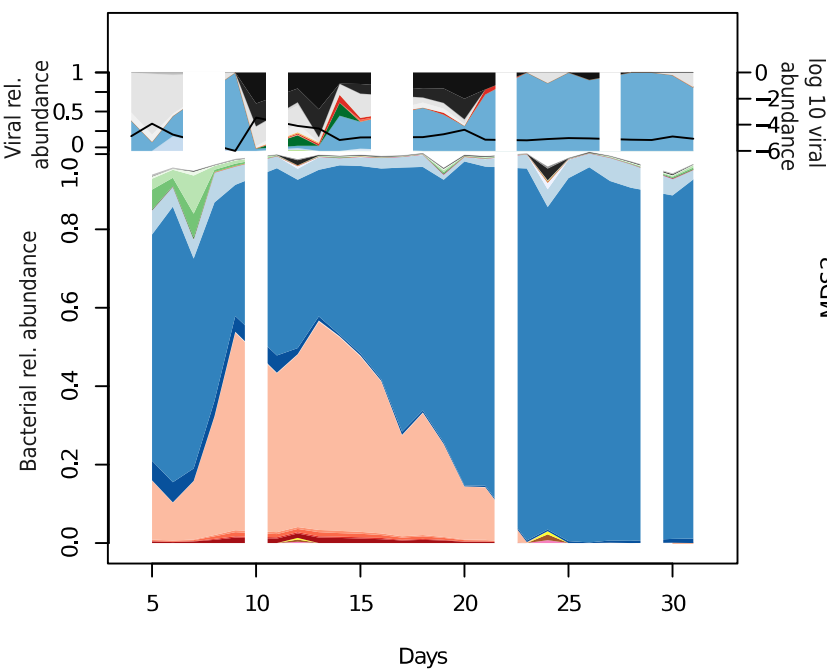
Participant 151



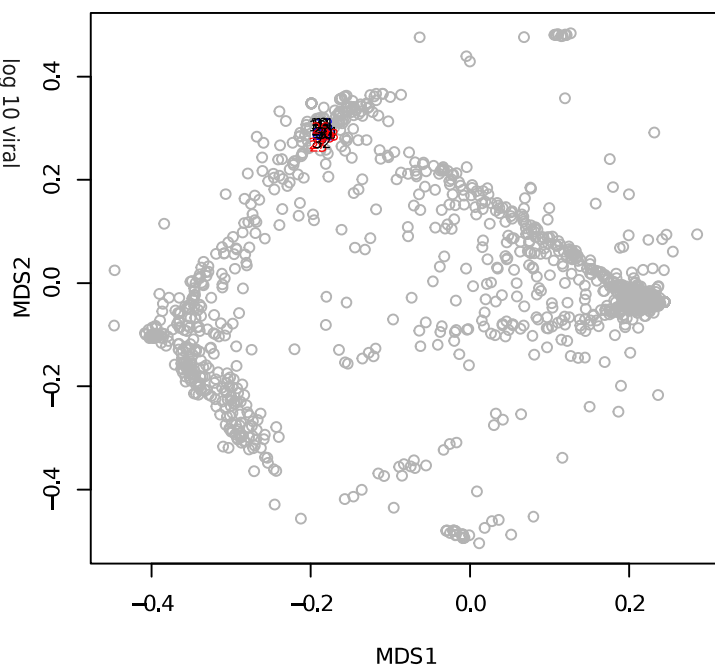
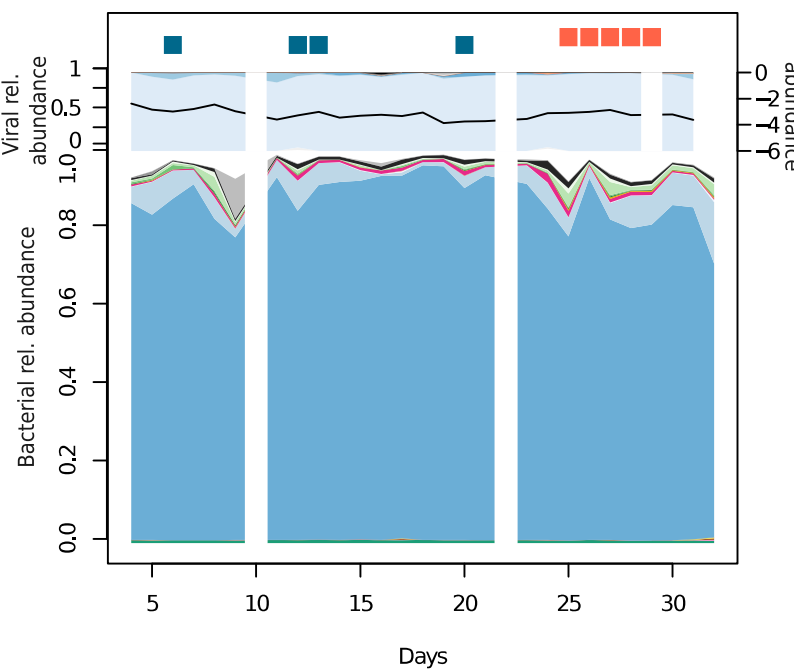
Participant 33



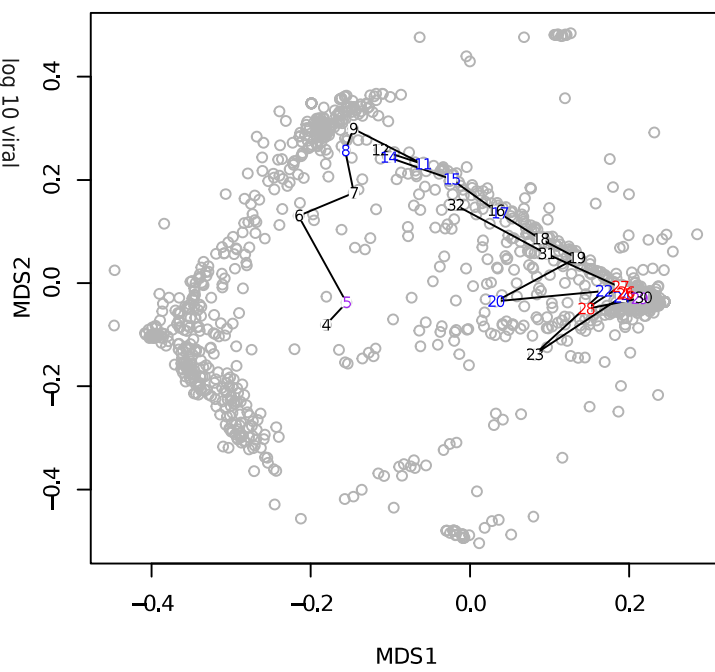
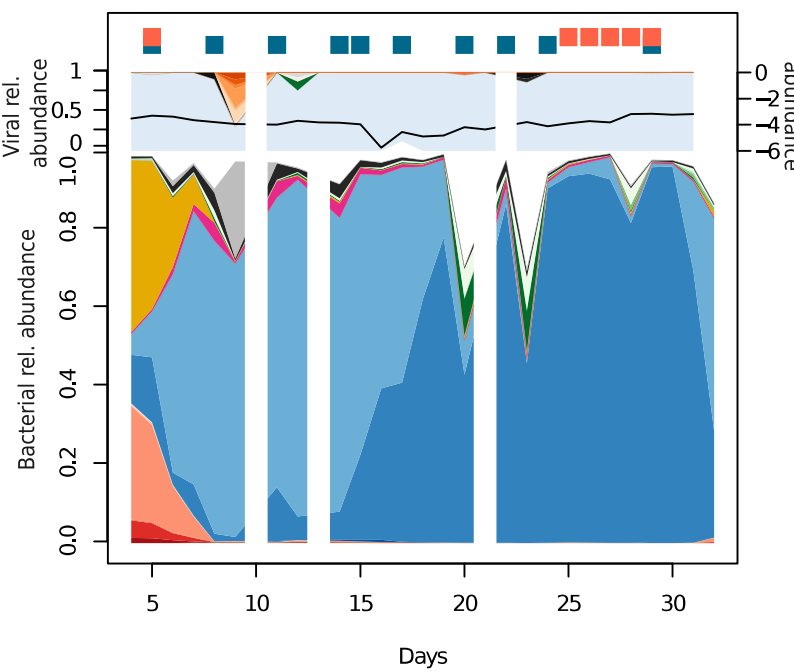
Participant 53



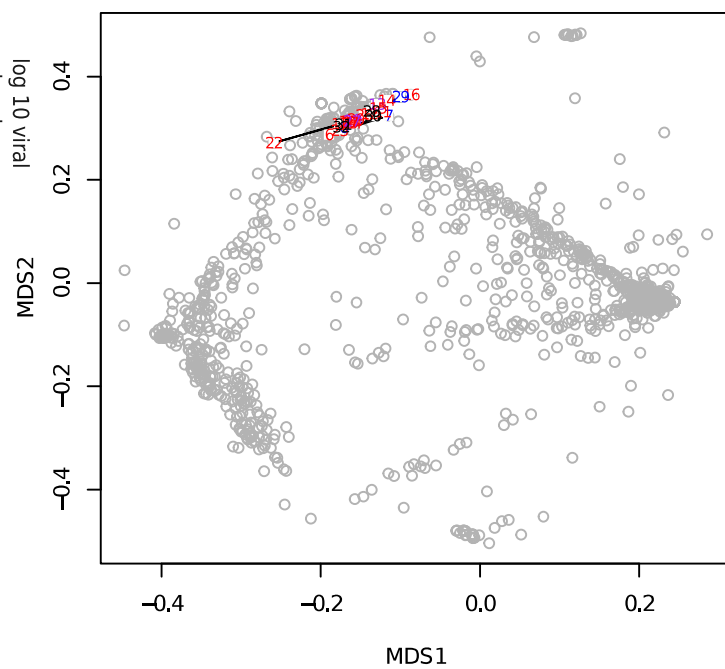
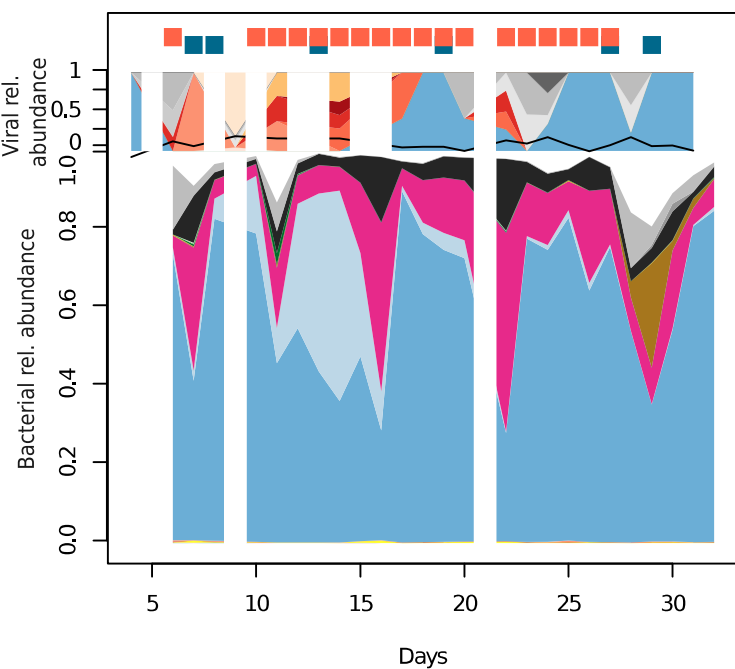
Participant 76



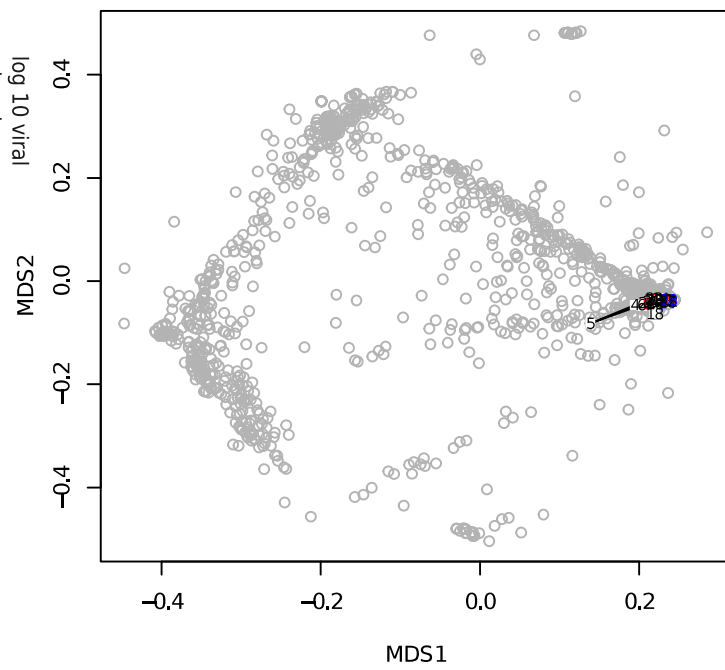
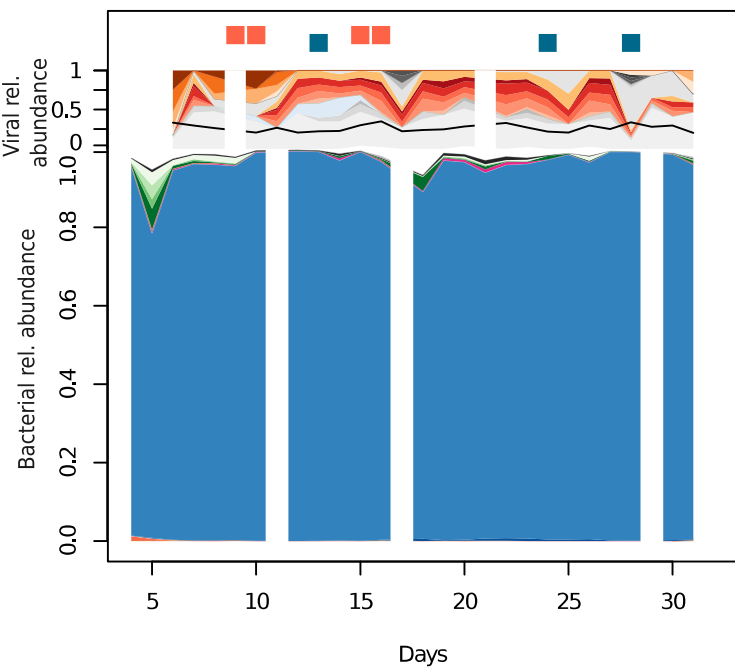
Participant 88



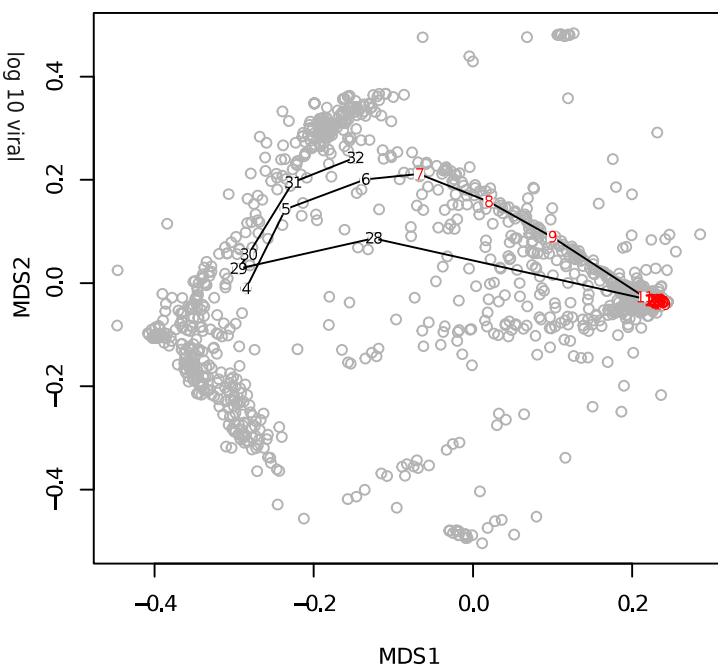
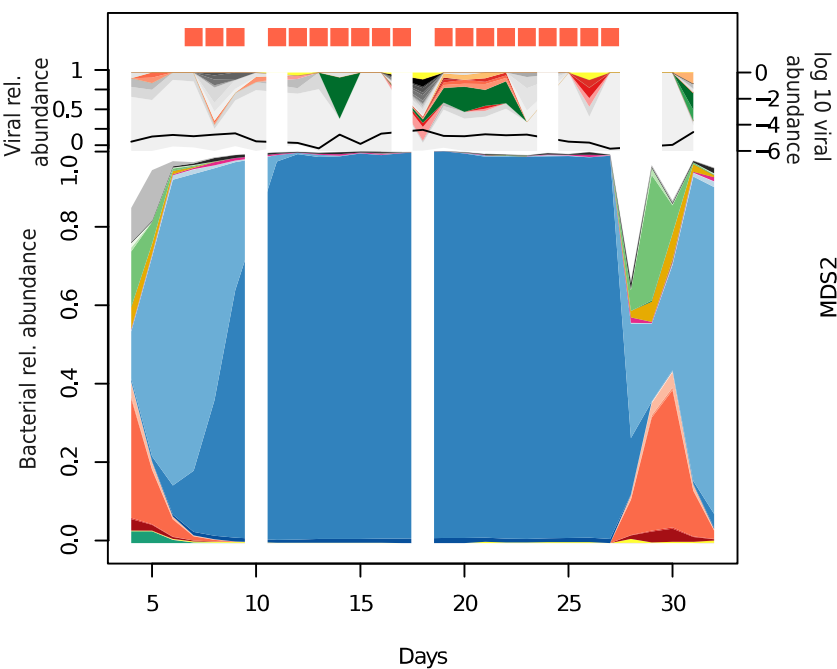
Participant 119



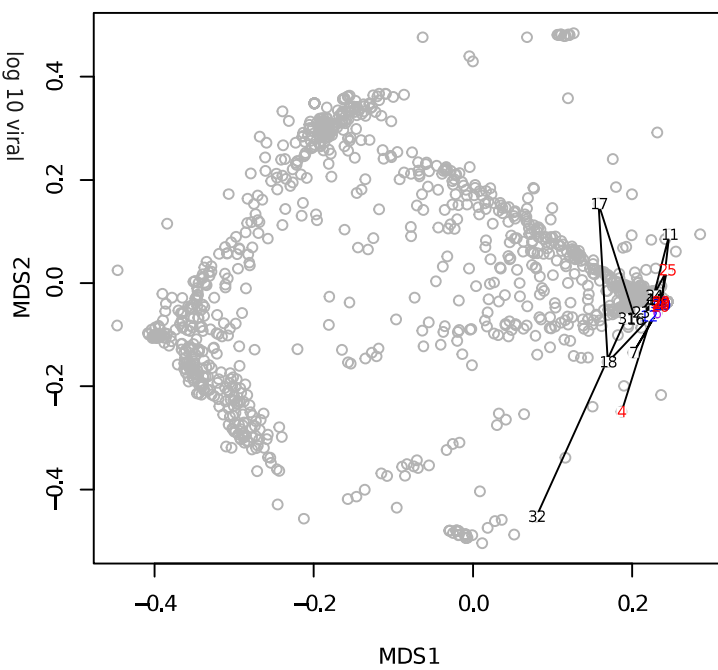
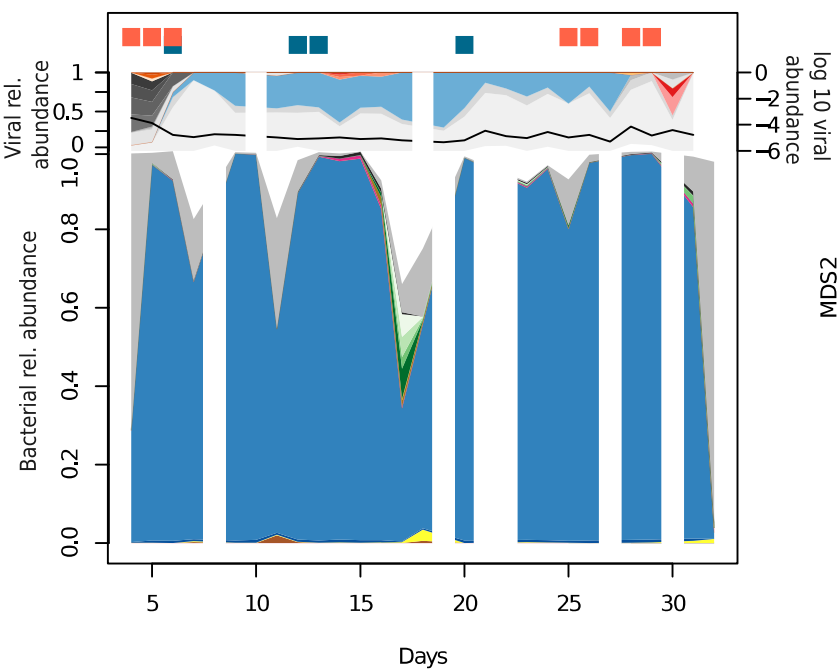
Participant 140



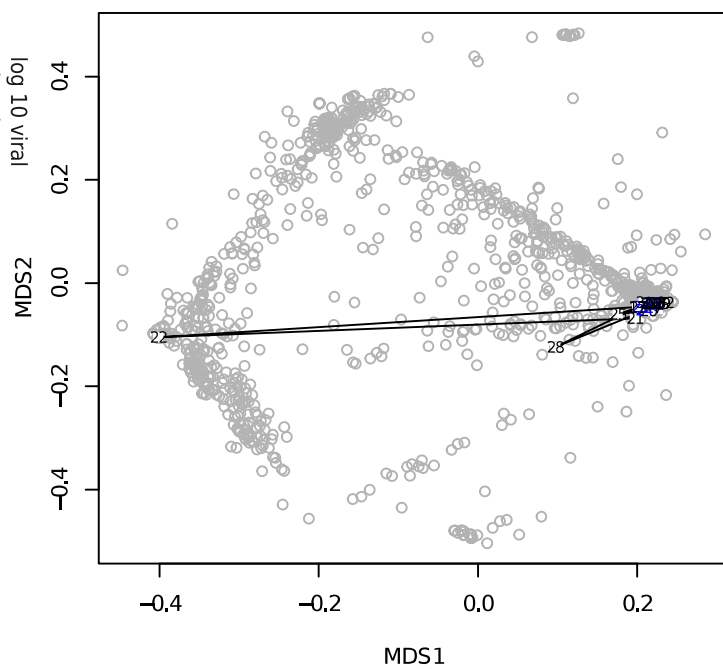
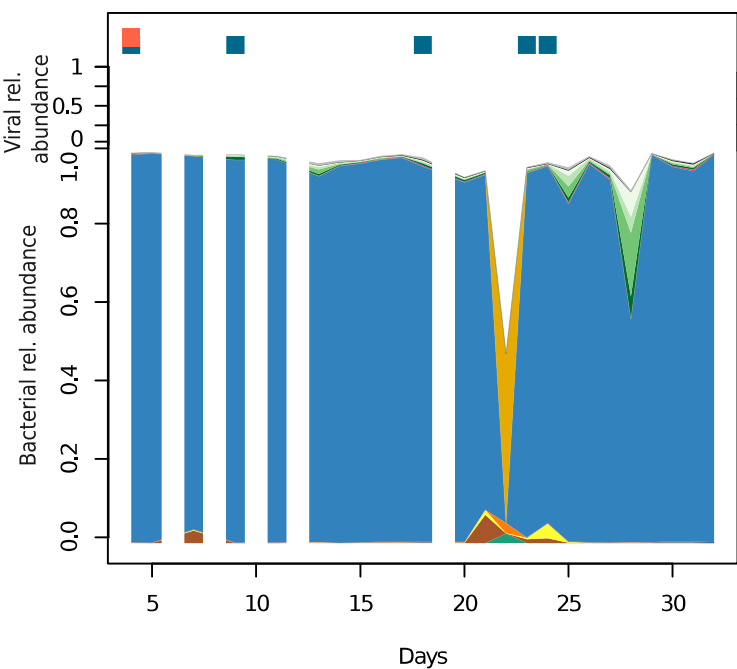
Participant 153



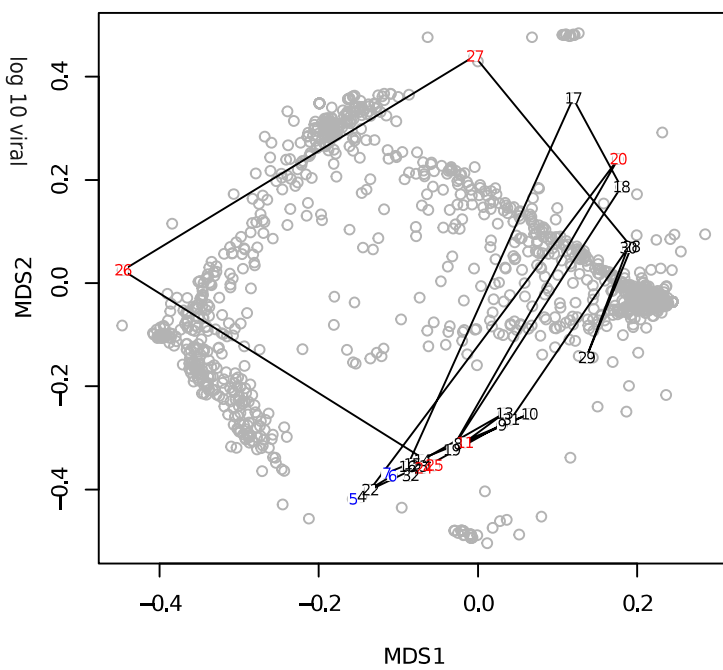
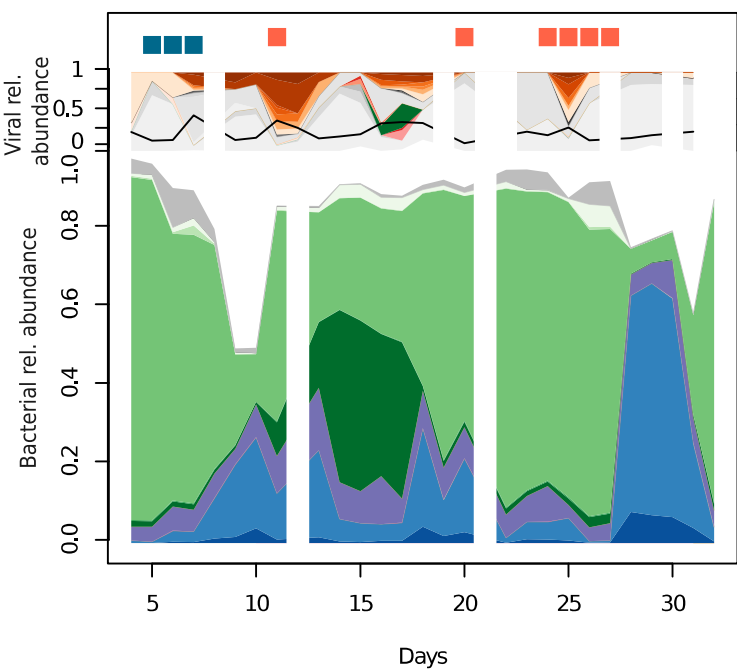
Participant 34



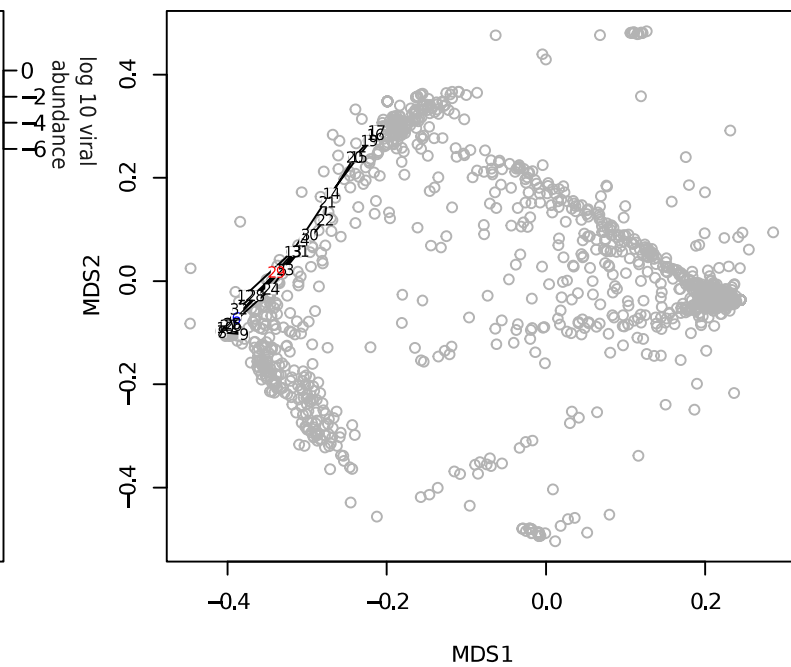
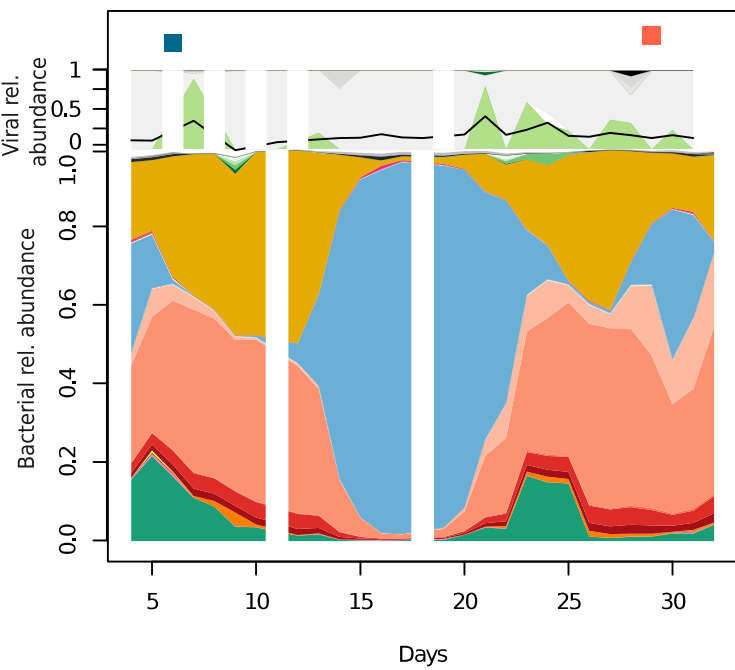
Participant 56



Participant 77



Participant 93

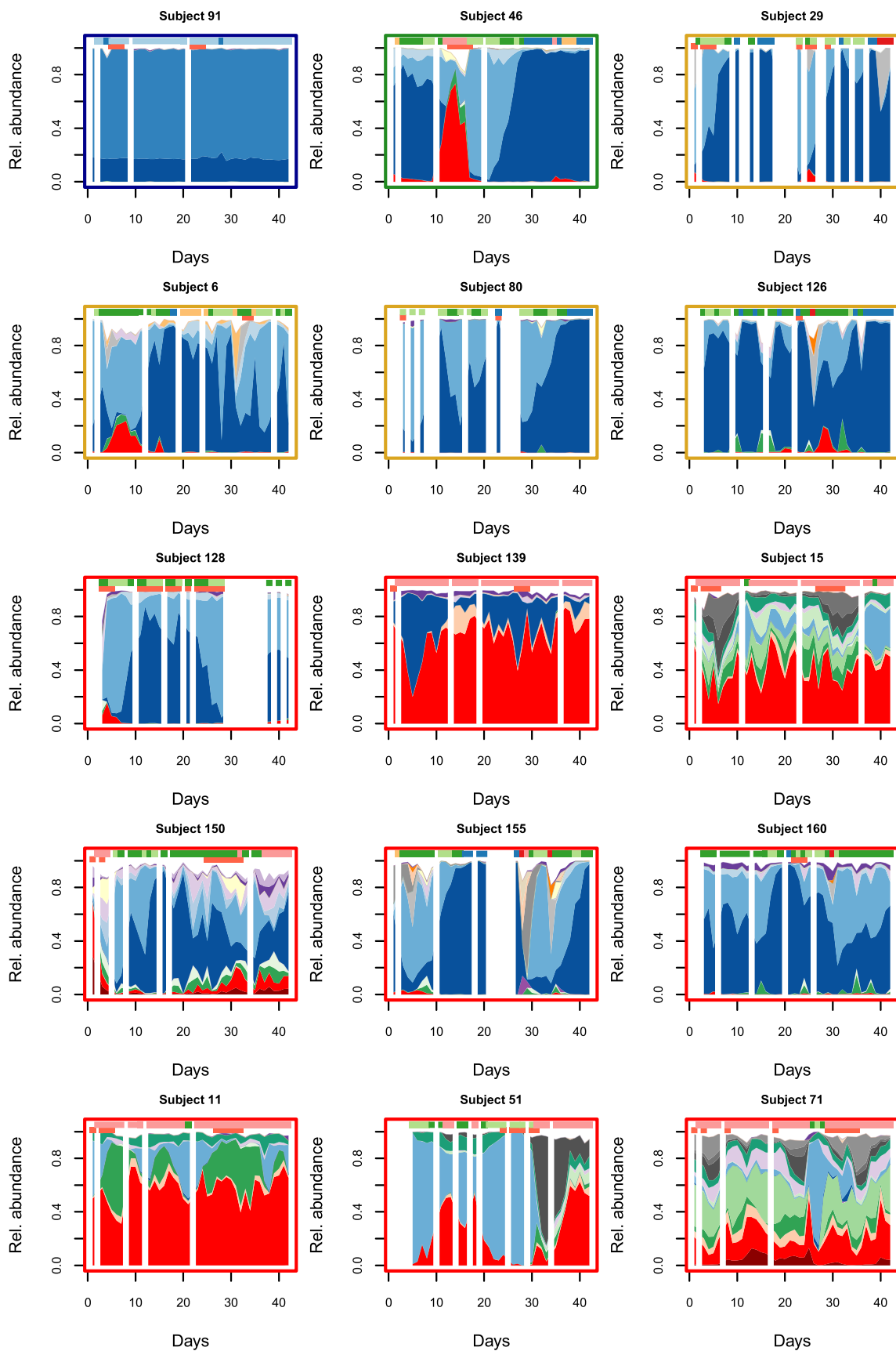


	<i>Streptococcus</i> spp.		uncultured crAssphage
	<i>Staphylococcus aureus</i>		Temperate phage phiNIH1.1
	<i>Sneathia amnii</i>		<i>Synechococcus</i> virus STIM5
	<i>Sneathia</i> spp.		<i>Streptococcus</i> phage T12
	<i>Pseudomonas aeruginosa</i>		<i>Streptococcus</i> phage SpSL1
	<i>Prevotella timonensis</i>		<i>Streptococcus</i> phage SM1
	<i>Prevotella disiens</i>		<i>Streptococcus</i> phage phiARI0462
	<i>Prevotella bivia</i>		<i>Streptococcus</i> phage phiARI0460-1
	<i>Prevotella amnii</i>		<i>Streptococcus</i> phage phiARI0131-2
	<i>Prevotella</i> spp.		<i>Streptococcus</i> phage phiARI0131-1
	<i>Peptoniphilus lacrimalis</i>		<i>Streptococcus</i> phage phiARI0004
	<i>Neisseria</i> spp.		<i>Streptococcus</i> phage PH10
	<i>Megasphaera</i> sp. UPII 199-6		<i>Streptococcus</i> phage P9
	<i>Massilia timonae</i>		<i>Streptococcus</i> phage K13
	<i>Listeria</i> spp.		<i>Streptococcus</i> phage 20617
	<i>Limosilactobacillus fermentum</i>		<i>Staphylococcus</i> virus St134
	<i>Lactobacillus jensenii</i>		<i>Staphylococcus</i> virus Sextaec
	<i>Lactobacillus iners</i>		<i>Staphylococcus</i> virus SEP9
	<i>Lactobacillus crispatus</i>		<i>Staphylococcus</i> virus PH15
	<i>Lactobacillus</i> spp.		<i>Staphylococcus</i> virus IPLA7
	<i>Gardnerella vaginalis</i> H		<i>Staphylococcus</i> virus IPLA5
	<i>Gardnerella vaginalis</i>		<i>Staphylococcus</i> virus CNPH82
	<i>Gardnerella swidsinskii</i>		<i>Staphylococcus</i> virus Andhra
	<i>Gardnerella piovii</i>		<i>Staphylococcus</i> virus 37
	<i>Gardnerella leopoldii</i>		<i>Staphylococcus</i> phage StB27
	<i>Gardnerella</i> spp.		<i>Staphylococcus</i> phage StB20-like
	<i>Fannyhessea vaginae</i>		<i>Staphylococcus</i> phage StB20
	<i>Escherichia</i> spp.		<i>Staphylococcus</i> phage StB12
	<i>Enterococcus faecalis</i>		<i>Staphylococcus</i> phage SPbeta-like
	<i>Bacillus subtilis</i>		<i>Staphylococcus</i> phage IME-SA4
	<i>Aerococcus</i> spp.		<i>Salmonella</i> virus SPN3US
			<i>Salmonella</i> virus SJ 46
			<i>Pseudomonas</i> virus phiCTX
			<i>Pseudomonas</i> virus phi3
			<i>Pseudomonas</i> virus Pfl
			<i>Pseudomonas</i> virus H66
			<i>Pseudomonas</i> virus Dobby
			<i>Pseudomonas</i> phage PPpW-3
			<i>Propionibacterium</i> virus PHL041M10
			<i>Propionibacterium</i> virus P105
			<i>Propionibacterium</i> virus P1001
			<i>Propionibacterium</i> virus MrAK
			<i>Propionibacterium</i> phage Moyashi
			<i>Propionibacterium</i> phage Enoki
			<i>Mycobacterium</i> virus Giles
			<i>Lactobacillus</i> prophage Lj965
			<i>Lactobacillus</i> prophage Lj928
			<i>Lactobacillus</i> prophage Lj771
			<i>Lactobacillus</i> phage phiAQ113
			<i>Lactobacillus</i> phage phiadh
			<i>Lactobacillus</i> phage phi jlb1
			<i>Lactobacillus</i> phage Lv-1
			<i>Lactobacillus</i> phage KC5a
			<i>Faecalibacterium</i> virus Toutatis
			<i>Faecalibacterium</i> virus Mushu
			<i>Escherichia</i> virus T7
			<i>Escherichia</i> virus M13
			<i>Escherichia</i> virus DE3
			<i>Escherichia</i> phage 500465-1
			<i>Enterococcus</i> virus EEP01
			<i>Enterococcus</i> phage EF62phi
			<i>Enterobacteria</i> phage P4
			<i>Enterobacteria</i> phage HK225
			<i>Clostridium</i> phage C-st
			<i>Bacillus</i> phage vB_BceS-MY192

Supplementary figure 2: CST distribution and time-series dynamics for the 16S samples

CSTs are shown as colored dots as per the legend in the page 31. The outline of each box depicts the assignment to vaginal community dynamics. Missing samples are omitted. Bleedings are marked as red dots. Blue: constant eubiotic. Green: menses-related dysbiotic. Yellow: unstable. Red: constant dysbiotic.

Figure S2 extends for two pages, the first one with the data, and the second with the colour key.



- Dynamics**
- constant eubiotic
 - menses dysbiotic
 - unstable
 - constant dysbiotic

- CST**
- V
 - IV-C
 - IV-B
 - III-B
 - III-A
 - I-B
 - I-A

- bleeding**
- yes

- Taxa**
- Ureaplasma_urealyticum
 - Ureaplasma
 - Haemophilus_influenzae
 - Haemophilus
 - Salmonella
 - Escherichia/Shigella
 - Sneathia_sanguinegens
 - Sneathia_amnii
 - Sneathia
 - Veillonella_montpellierensis
 - Megasphaera
 - Dialister
 - Fastidiosipila
 - Ezakiella
 - Streptococcus
 - Lactobacillus_jensenii
 - Lactobacillus_iners
 - Lactobacillus_crispatus
 - Lactobacillus
 - Enterococcus
 - Prevotella_disiens
 - Prevotella_amnii
 - Prevotella
 - Atopobium_vaginae
 - Gardnerella_vaginalis
 - Gardnerella

Supplementary figure 3: CST distribution and time-series dynamics for the shotgun samples

CSTs are marked as colored dots above the taxonomic profiles as per the legend. The outline of each box depicts its dynamic group. Bleedings are marked as light red dots. Missing samples are omitted. Blue: constant eubiotic. Green: menses-related dysbiotic. Yellow: Unstable. Red: constant dysbiotic.

Fig. S3 extends from page 32 to page 38. The color scheme is repeated in both these pages.

Dynamics

- constant eubiotic
- menses dysbiotic
- unstable
- constant dysbiotic

CST

- V
- IV-C
- IV-B
- III-B
- III-A
- I-B
- I-A

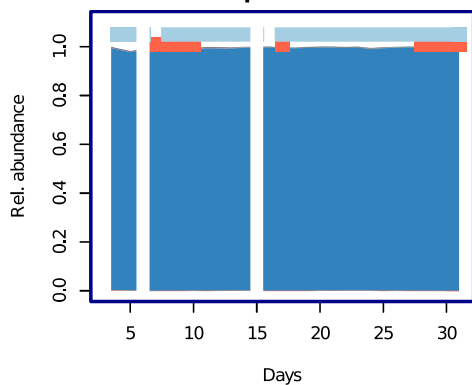
bleeding

- yes

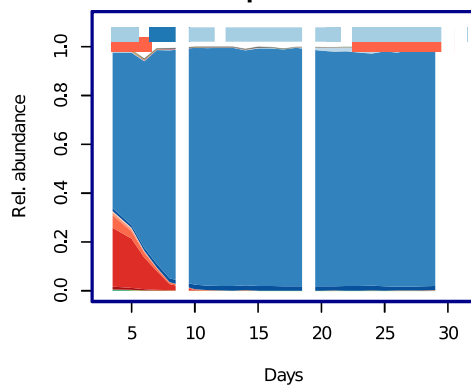
Taxa

- Streptococcus* spp.
- Staphylococcus aureus*
- Sneathia amnii*
- Sneathia* spp.
- Pseudomonas aeruginosa*
- Prevotella timonensis*
- Prevotella disiens*
- Prevotella bivia*
- Prevotella amnii*
- Prevotella* spp.
- Peptoniphilus lacrimalis*
- Neisseria* spp.
- Megasphaera* sp. UPII 199-6
- Massilia timonae*
- Listeria* spp.
- Limosilactobacillus fermentum*
- Lactobacillus jensenii*
- Lactobacillus iners*
- Lactobacillus crispatus*
- Lactobacillus* spp.
- Gardnerella vaginalis* H
- Gardnerella vaginalis*
- Gardnerella swidsinskii*
- Gardnerella piovii*
- Gardnerella leopoldii*
- Gardnerella* spp.
- Fannyhessea vaginae*
- Escherichia* spp.
- Enterococcus faecalis*
- Bacillus subtilis*
- Aerococcus* spp.

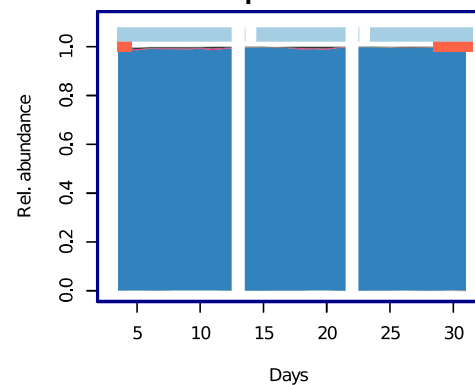
Participant 156



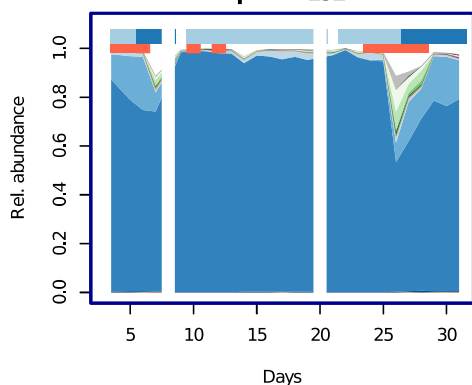
Participant 28



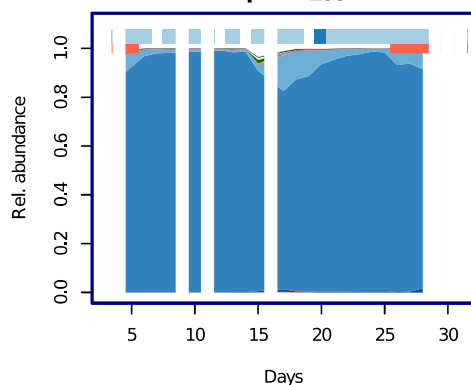
Participant 75



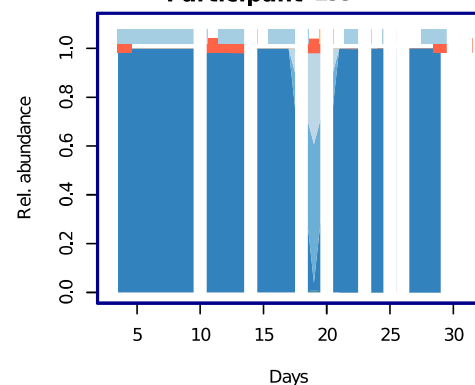
Participant 151



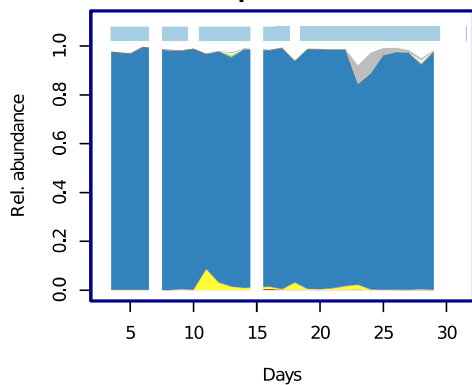
Participant 106



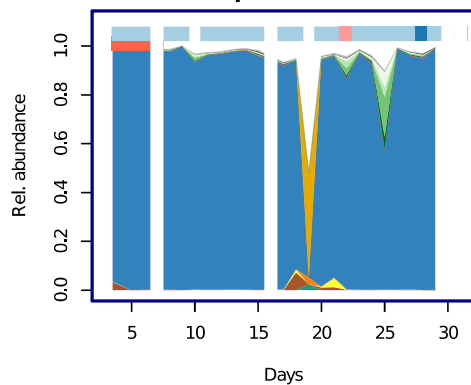
Participant 158



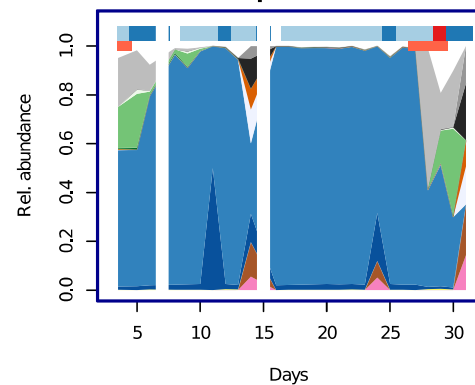
Participant 144



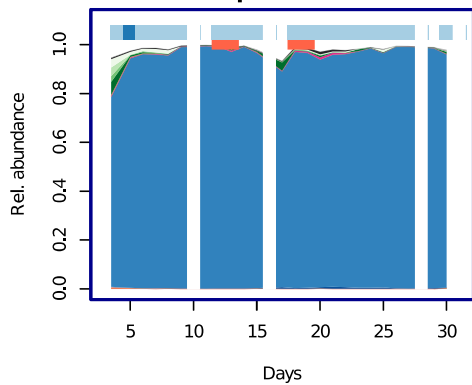
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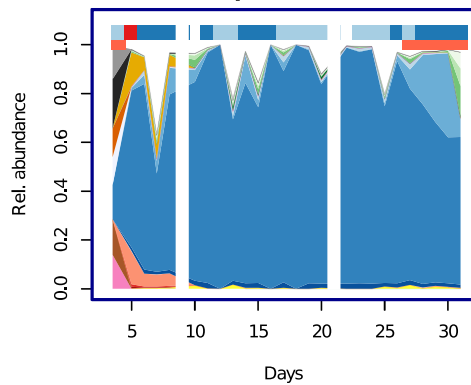
Participant 45



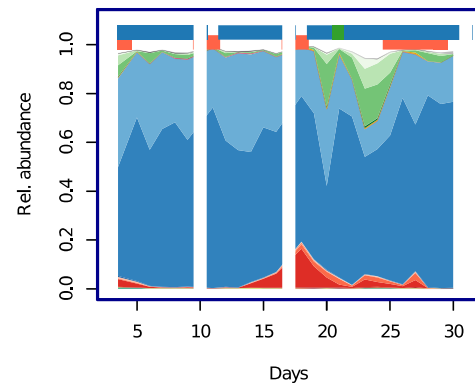
Participant 140



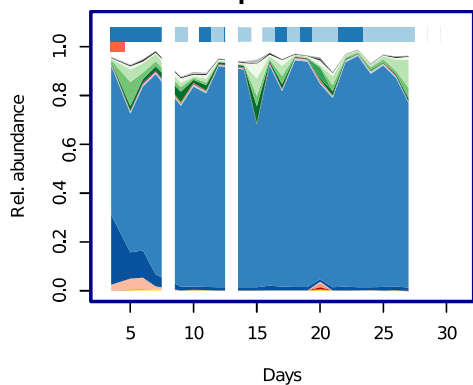
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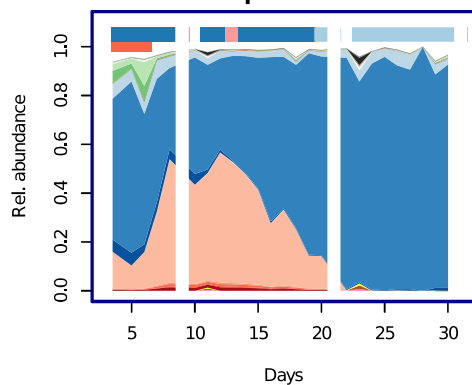
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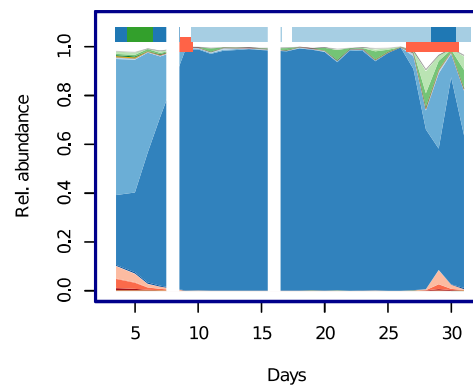
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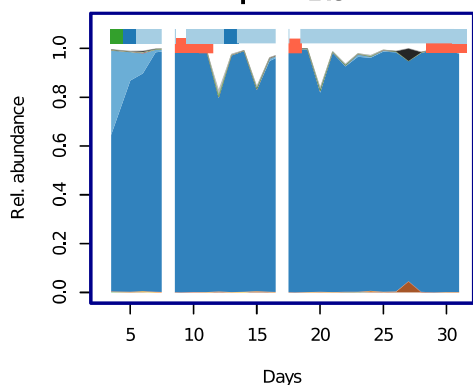
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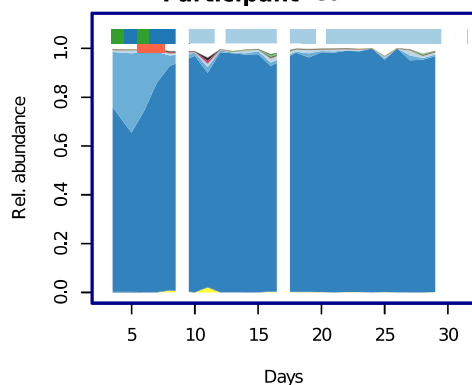
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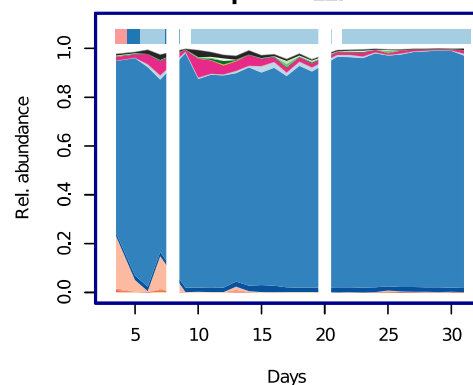
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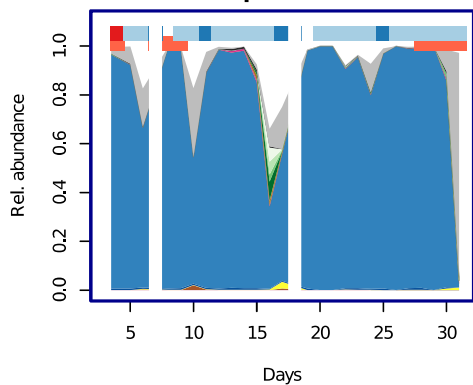
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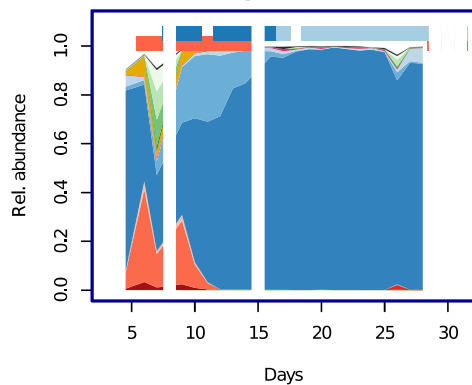
Participant 117



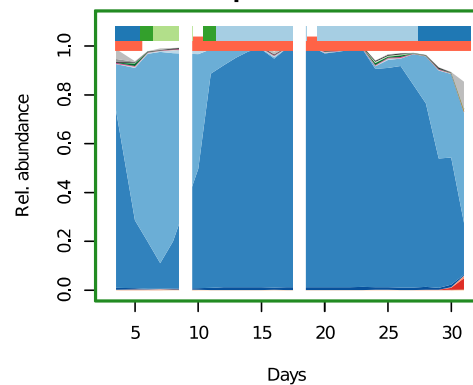
Participant 34



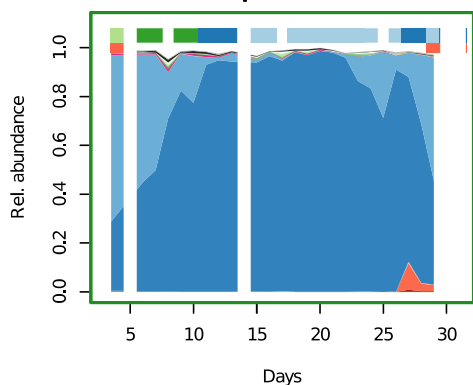
Participant 110



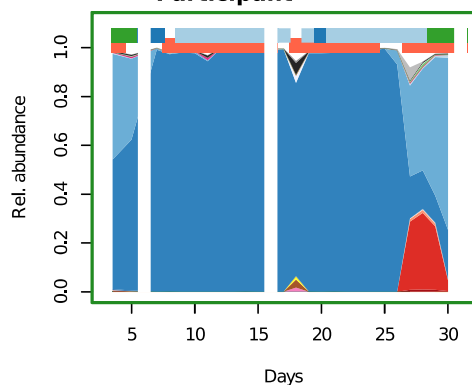
Participant 35



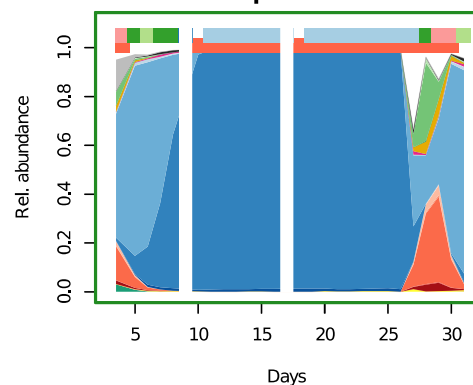
Participant 95

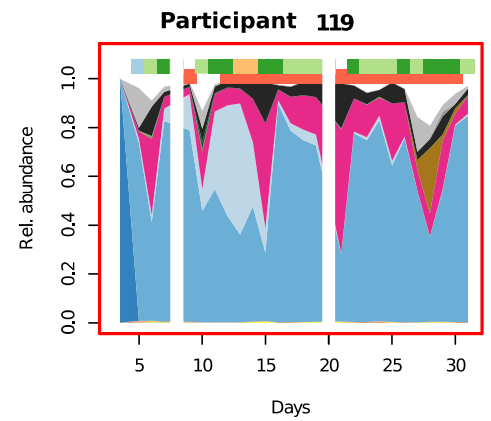
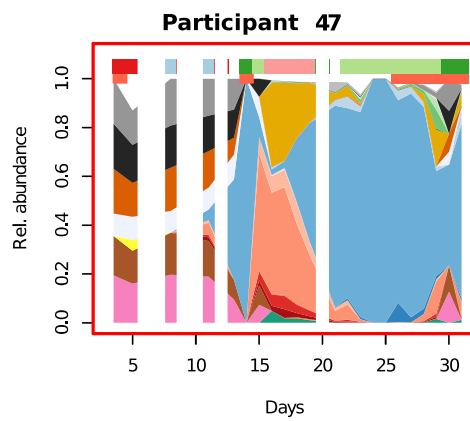
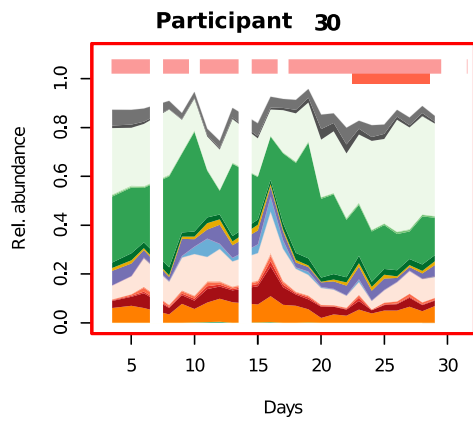
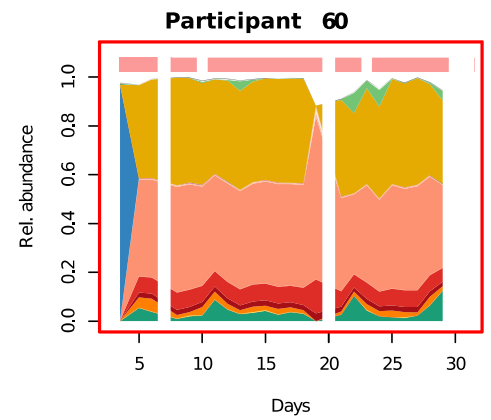
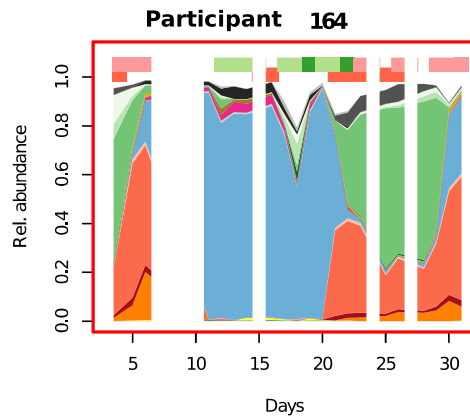
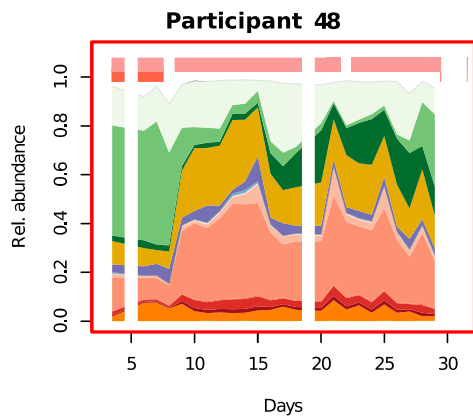
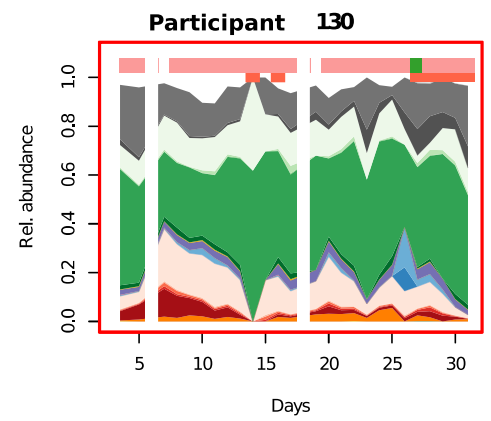
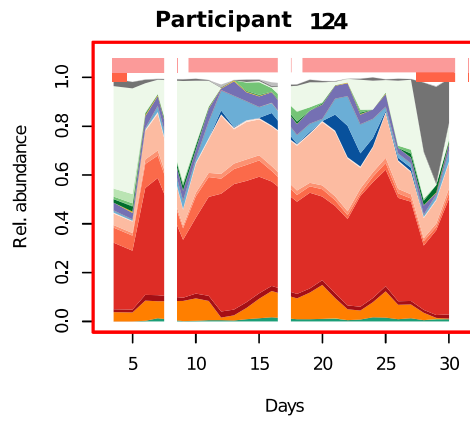
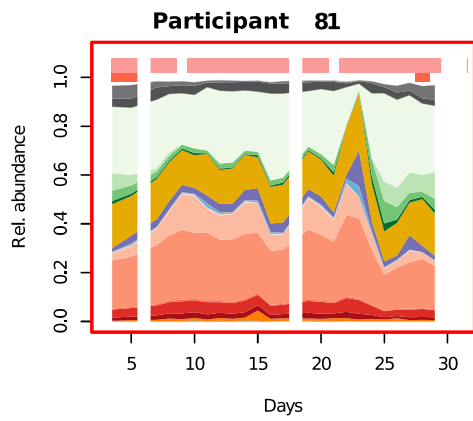
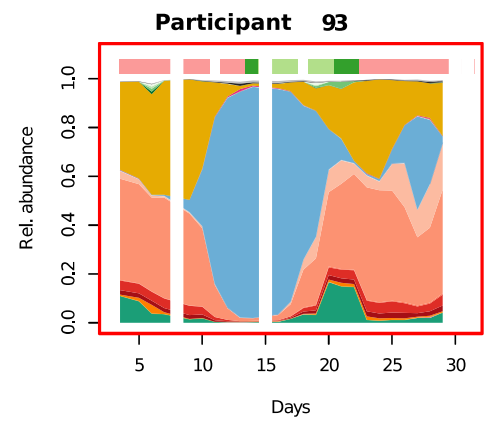
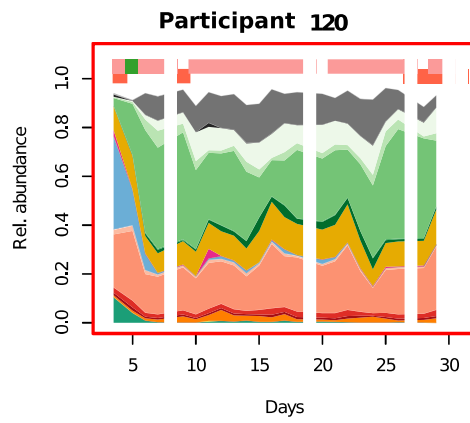
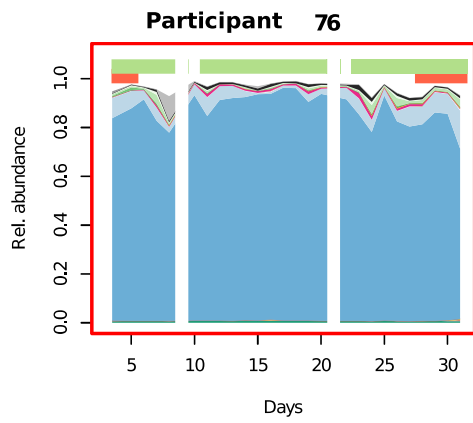


Participant 26



Participant 153





- Dynamics**
- constant eubiotic
 - menses dysbiotic
 - unstable
 - constant dysbiotic

- CST**
- V
 - IV-C
 - IV-B
 - III-B
 - III-A
 - I-B
 - I-A

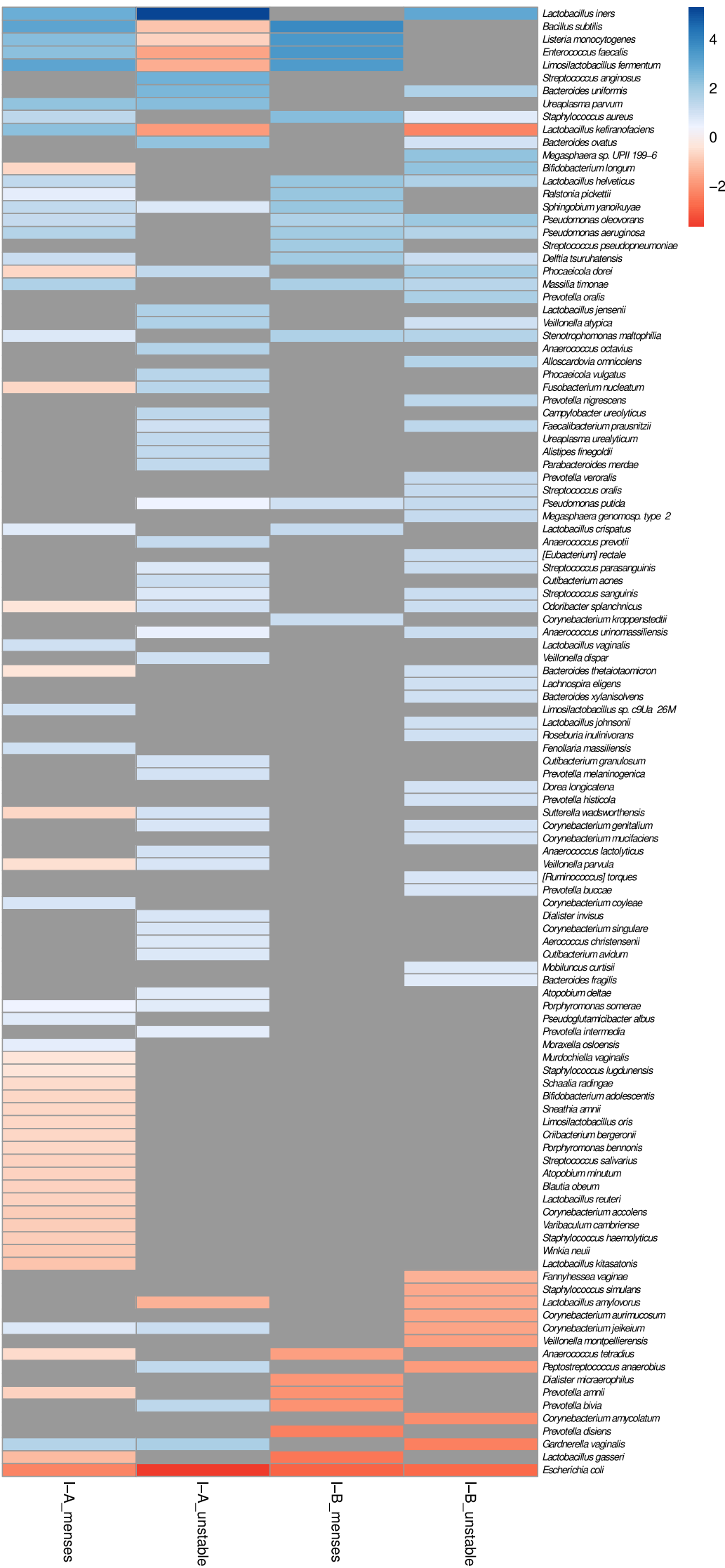
- bleeding**
- yes

- Taxa**
- Streptococcus* spp.
 - Staphylococcus aureus*
 - Sneathia amnii*
 - Sneathia* spp.
 - Pseudomonas aeruginosa*
 - Prevotella timonensis*
 - Prevotella disiens*
 - Prevotella bivia*
 - Prevotella amnii*
 - Prevotella* spp.
 - Peptoniphilus lacrimalis*
 - Neisseria* spp.
 - Megasphaera* sp. UPII 199-6
 - Massilia timonae*
 - Listeria* spp.
 - Limosilactobacillus fermentum*
 - Lactobacillus jensenii*
 - Lactobacillus iners*
 - Lactobacillus crispatus*
 - Lactobacillus* spp.
 - Gardnerella vaginalis*H
 - Gardnerella vaginalis*
 - Gardnerella swidsinskii*
 - Gardnerella piovii*
 - Gardnerella leopoldii*
 - Gardnerella* spp.
 - Fannyhessea vaginae*
 - Escherichia* spp.
 - Enterococcus faecalis*
 - Bacillus subtilis*
 - Aerococcus* spp.

Supplementary figure 4: Log-fold change of bacterial species in samples from CST-I

Samples in CST-IA and CST-IB from menses-related dysbiotic or unstable individuals were compared to constant eubiotic individuals. The heatmap shows the log-fold change of all significant differences. Gray fields represent no significant change.

This figure occupies a single page.



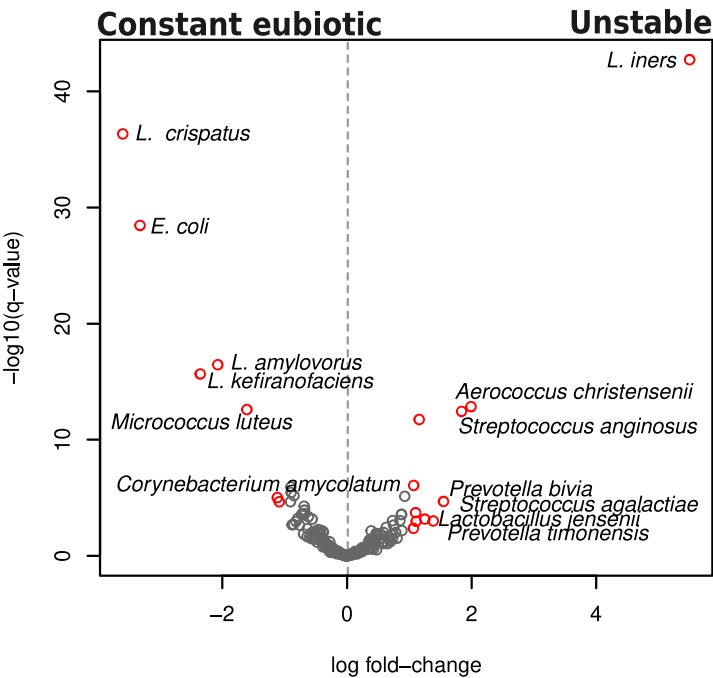
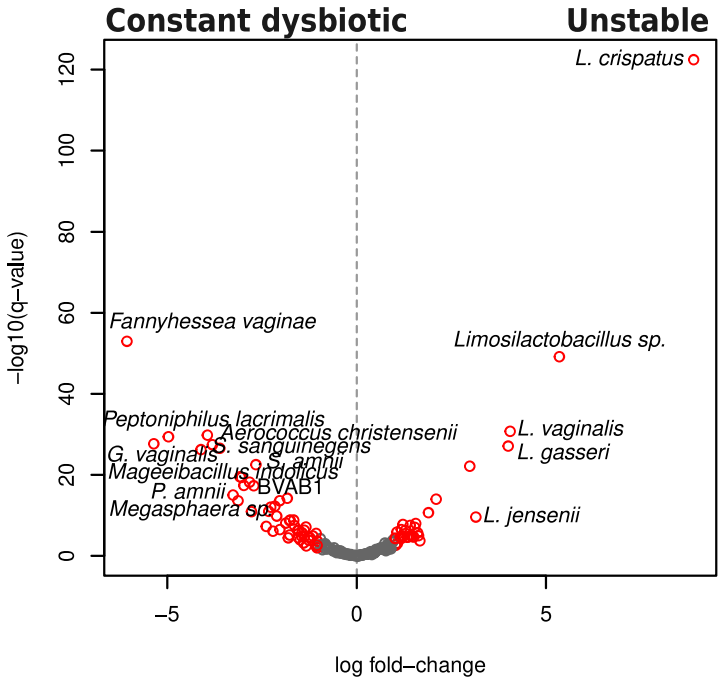
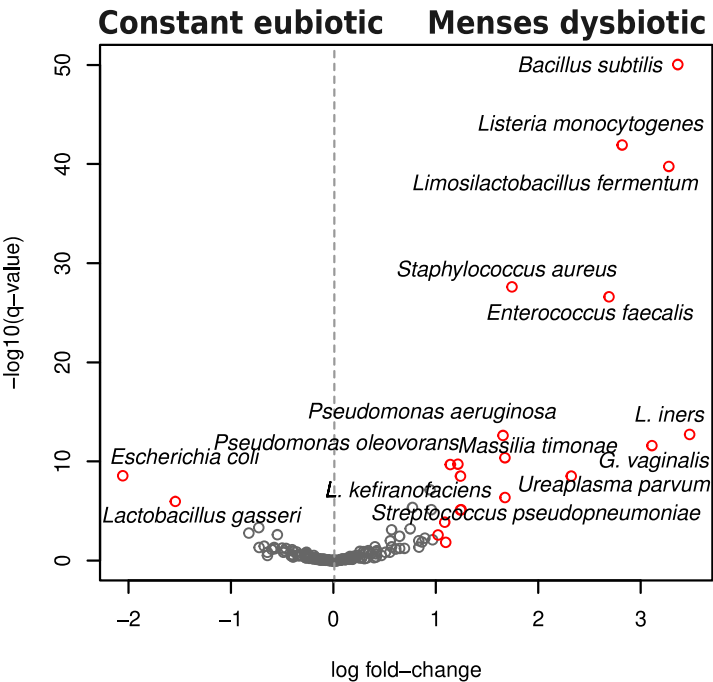
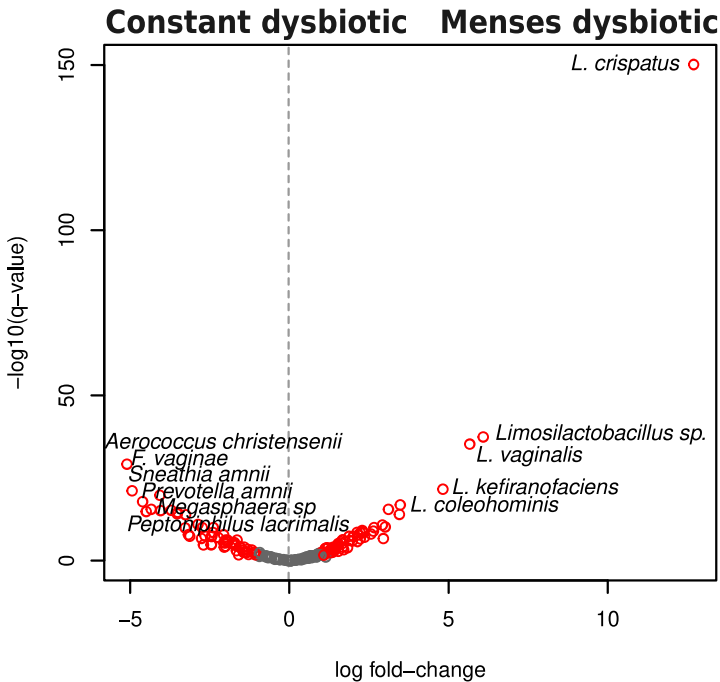
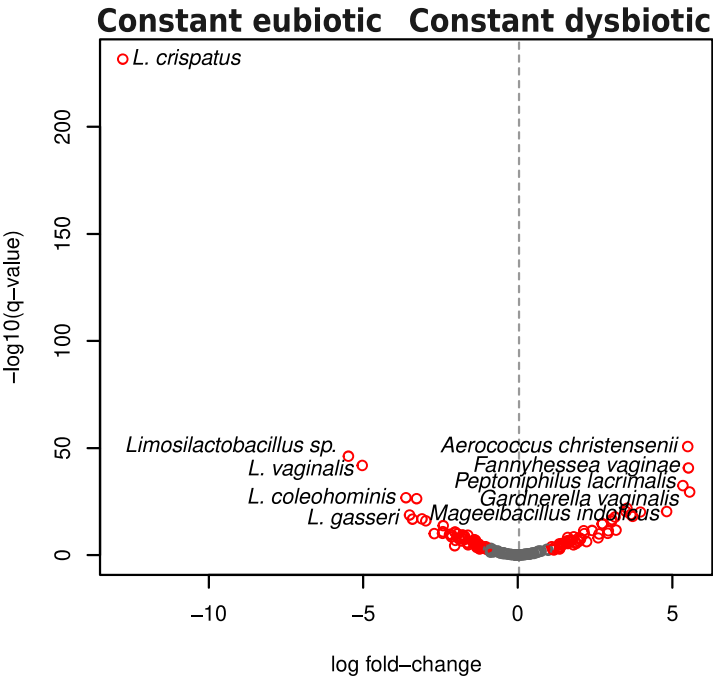
Supplementary figure 5: Log-fold change of bacterial species in samples from CST-III

Samples in CST-IIIA and CST-IIIB from menses-related dysbiotic or unstable individuals were compared with constant dysbiotic individuals. The heatmap shows the log-fold change of all significant differences. White fields represent no significant change.

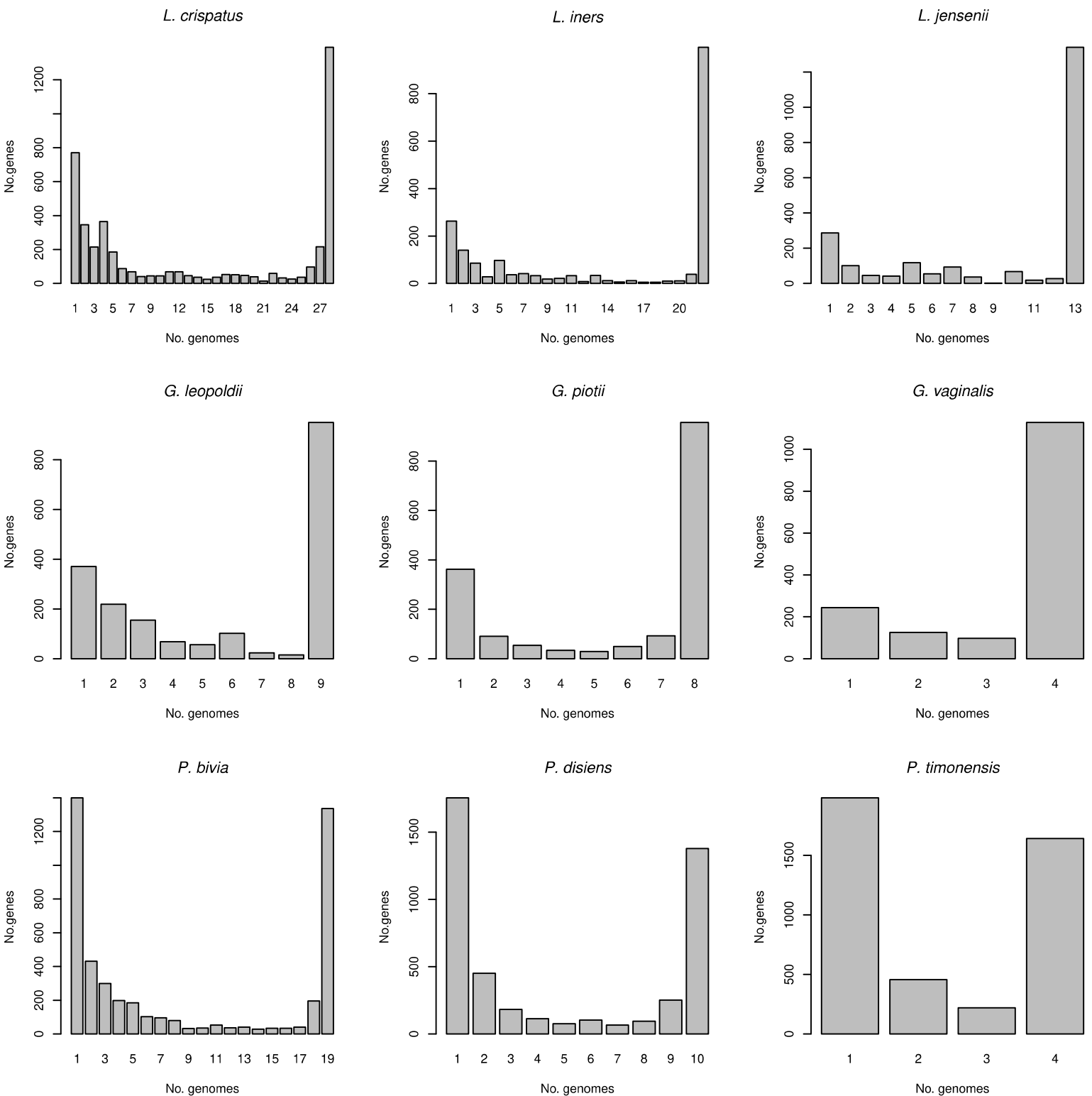
This figure occupies a single page.



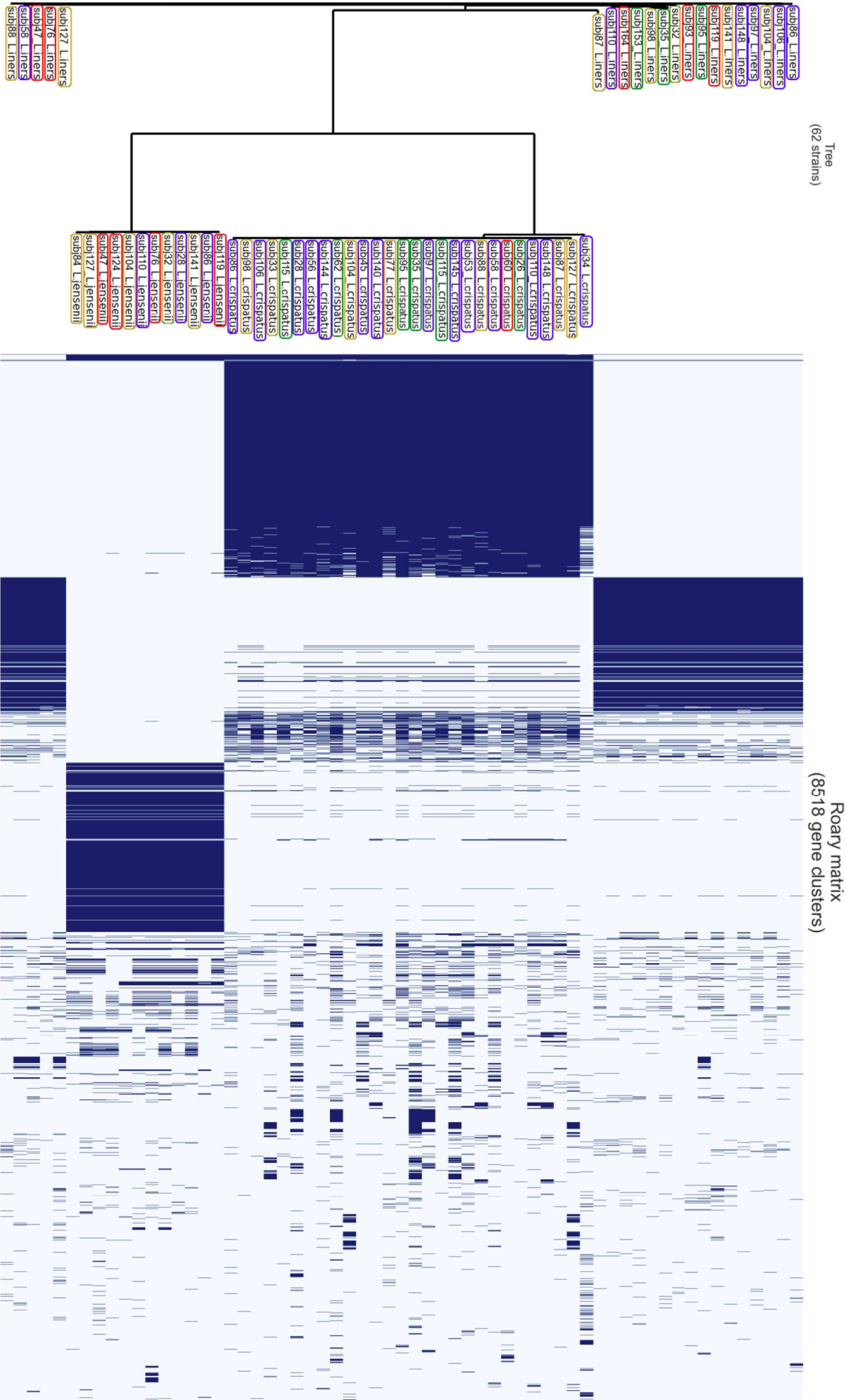
Supplementary figure 6:
Volcano plots for the vaginal
community dynamics
compared to either constant
eubiotic or constant
dysbiotic



Supplementary figure 7: Histograms showing gene cluster prevalence in nine relevant pangenomes
For each species, the prevalence (number of genomes containing each gene cluster) of each gene cluster is shown as a histogram. Gene clusters present in most or all genomes are considered “core”, while those in one or very few genomes can be considered “cloud”. The “shell” genomes, present in many, but not all genomes, are less frequent



Supplementary figure 8: Phylogenomic analysis of Lactobacillus genomes
 Phylogenomic analysis of all detected Lactobacillus species does not find a correlation between the womens’ vaginal community dynamics and the observed phylogeny. The presence of a gene is represented in dark blue and its absence in light blue. Blue: constant eubiotic. Red: constant dysbiotic. Yellow: unstable. Green: menses-related dysbiotic.



Supplementary figure 9: Phylogenomic analysis of Prevotella genomes

Phylogenomic analysis of all detected Prevotella species does not find a correlation between the womens' vaginal community dynamics and the observed phylogeny. The presence of a gene is represented in dark blue and its absence in light blue. Blue: constant eubiotic. Red: constant dysbiotic. Yellow: unstable. Green: menses-related dysbiotic.

