

Comparative analysis of prophages carried by human and animal-associated *Staphylococcus aureus* strains spreading across the European regions.

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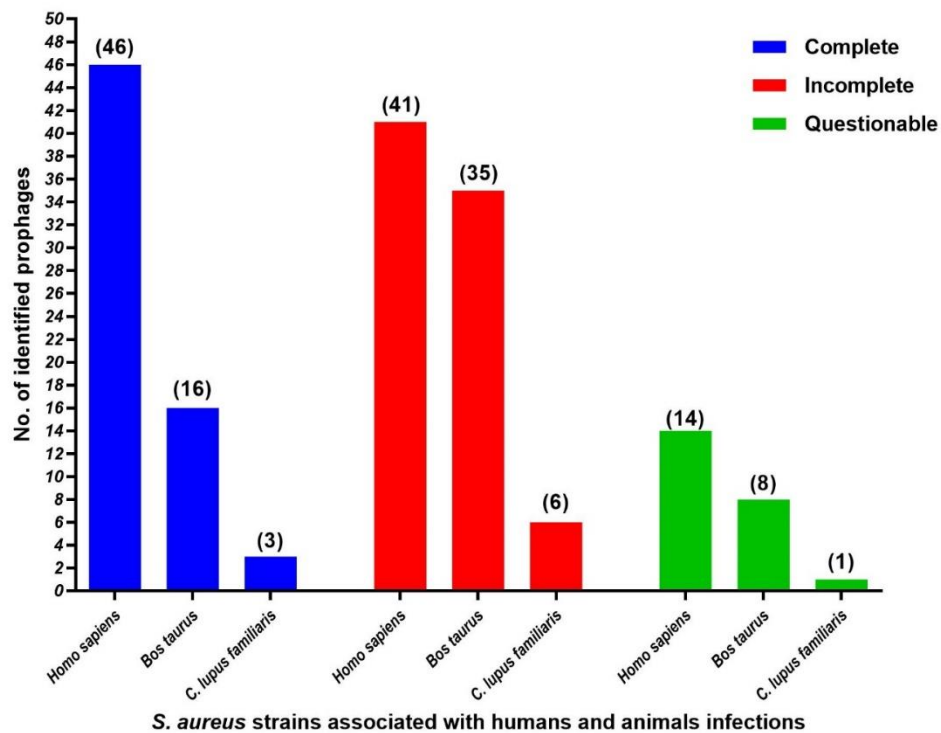
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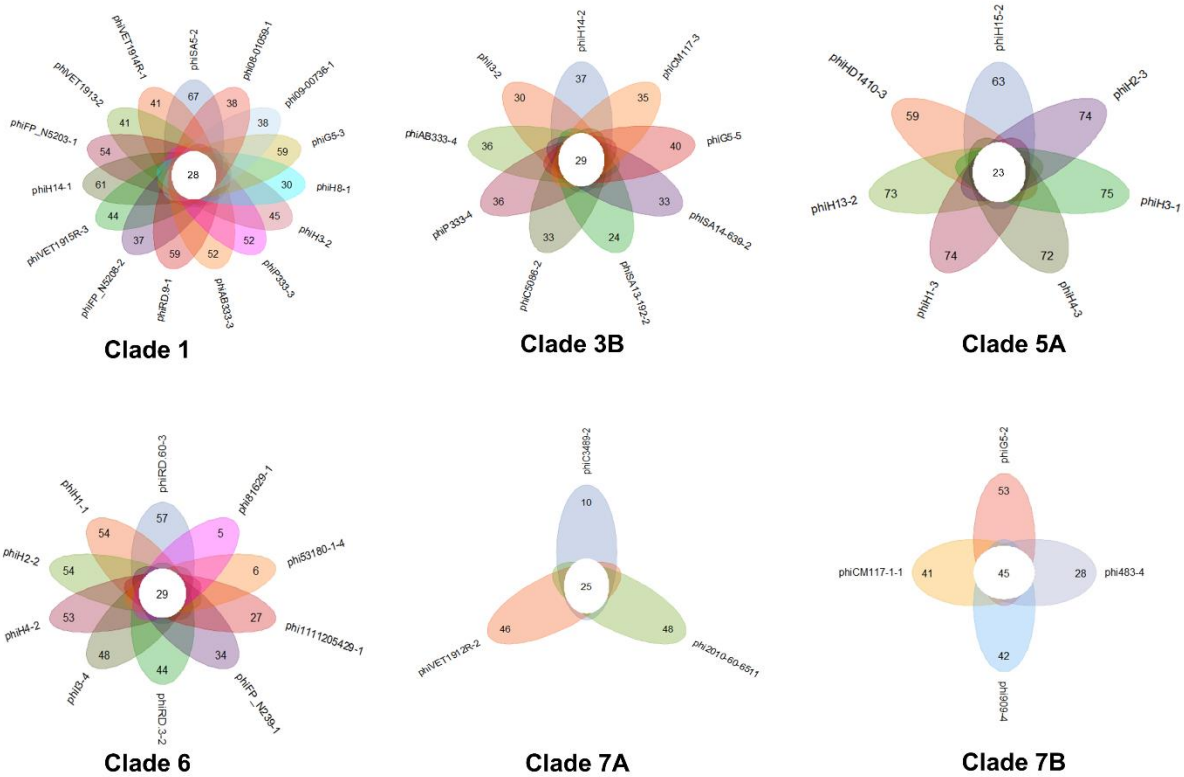
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Supplementary Fig. S1 Map showing the geographical locations of selected *S. aureus* strains. The geographical locations of *S. aureus* strains used in this study were pin with blue, green, orange, and yellow colors on the map.



Supplementary Fig. S2 Prophages distribution in *S. aureus* genomes.



Supplementary Fig S3. Flower-plot showing the genes of core-genome (center) and accessory genes (petal). Each prophage is represented by an oval with a different color. In clade 1, the pan-genome has 168 CDS, and the core-genome has 28 CDS (Clade 1**). In subclade 3B, the pan-genome has 111 CDS, and the core-genome has 29 CDS (**Clade 3B**). In subclade 5A, the pan-genome has 159 CDS, and the core-genome has 23 (**Clade 5A**). Clade 6 has a pan-genome comprised of 170 CDS, and the core-genome has 29 CDS (**Clade 6**). Subclade 7A formed pan-genome consists of 86 CDS, and core-genome size has 25 CDS (**Clade 7A**). In subclade 7B, the pan-genome has 115 CDS, and the core-genome consists of 45 (**Clade 7B**).**

Table S2. General features of prophages extracted from the *S. aureus* genomes

Sl. No.	Prophages	Size (Kb)	GC%	CDS	Located region	Score	Host	Origin	Country	GenBank Accession
1	phi08-01059-1	46.9	33.23	65	11485-58400	Intact (130)	<i>S. aureus</i> 08-01059	Human	Germany	JJEX00000000
2	phi09-00736-1	46.9	33.23	66	11416-58331	Intact (130)	<i>S. aureus</i> 09-00736	Human	Germany	JJEM00000000
3	phiHD1410-1	33.8	32.5	32	287318-321167	Intact (95)	<i>S. aureus</i> strain HD1410	Human	Germany: Tübingen	NXFH01000000
4	phiHD1410-2	59.7	33.5	65	17033-76828	Intact (120)				
5	phiHD1410-3	44.9	32.9	64	56719-101698	Intact (100)				
6	phi111205429-1	41.2	33.83	56	3-41249	Intact (130)	<i>S. aureus</i> 111205429	Human	Netherlands	JJDO00000000
7	phiVET1915R-3	48	33.69	73	243-48313	Intact (140)	<i>S. aureus</i> VET1915R	Human	Netherlands	JIFU00000000
8	phiVET1914R-1	47.3	33.67	67	137706-185045	Intact (130)	<i>S. aureus</i> VET1914R	Human	Netherlands	JIFV00000000
9	phiVET1913R-2	47.3	33.67	66	239198-286537	Intact (130)	<i>S. aureus</i> strain VET1913R	Human	Netherlands	JIFW00000000
10	phiVET1912R-2	43.2	34.86	72	30927-74209	Intact (120)	<i>S. aureus</i> strain VET1912R	Human	Netherlands	JIFX00000000
11	phi81629-1	30.4	33.78	35	3-30465	Intact (100)	<i>S. aureus</i> 81629	Human	Denmark	JJAH00000000
12	phiI3-1	33.8	32.5	31	302540-336406	Intact (95)	<i>S. aureus</i> strain I3	Human	Denmark: Aalborg	MVFW00000000
13	phiI3-2	41.7	33.4	60	1-41759	Intact (108)				
14	phiI3-4	63.3	32.8	65	33452-96810	Intact (110)				
15	phiCM101-2	56.7	32.2	68	15026-71738	Intact (130)	<i>S. aureus</i> strain CM101	Human	Italy: Florence	PZVM01000000
16	phiCM124-1	64.8	33.8	64	21328-86146	Intact (150)	<i>S. aureus</i> strain CM124	Human	Italy: Florence	PZUR01000000
17	phiCM124-2	60.2	32.5	78	32094-92386	Intact (140)				
18	phiCM117-1	49.5	34.2	63	153991-203576	Intact (140)	<i>S. aureus</i> strain CM117	Human	Italy: Florence	PZUX01000000

19	phiCM117-3	46.3	32.8	65	10397-56750	Intact (100)				
20	phiCM112-3	28.1	34.4	33	729-28851	Intact (110)	<i>S. aureus</i> strain CM112	Human	Italy: Florence	PZVC01000000
21	phiCM60-3	28.6	35.1	37	257-28905	Intact (100)	<i>S. aureus</i> strain CM60	Human	Italy: Florence	PZWT01000000
22	phiH4-2	62.2	32.6	73	187368-249650	Intact (140)	<i>S. aureus</i> strain H4	Human	Austria: Carinthia	NKCT00000000
23	phiH4-3	56.6	32	67	3980-60610	Intact (100)				
24	phiH2-2	63.2	32.5	73	187298-250551	Intact (140)	<i>S. aureus</i> strain H2	Human	Austria: Carinthia	NKCW00000000
25	phiH2-3	59.9	32.2	74	31830-91747	Intact (110)				
26	phiH8-1	44.2	33.2	55	17487-61726	Intact (120)	<i>S. aureus</i> strain H8	Human	Austria: Carinthia	NKCP00000000
27	phiH3-1	59.9	32.4	70	1136-61074	Intact (110)	<i>S. aureus</i> strain H3	Human	Austria: Carinthia	NKCU00000000
28	phiH3-2	53.5	33	63	3382-56909	Intact (120)				
29	phiH1-1	63.2	32.5	73	187368-250621	Intact (140)	<i>S. aureus</i> strain H1	Human	Austria: Carinthia	NKCW00000000
30	phiH1-3	59.9	32.2	74	31829-91746	Intact (110)				
31	phiH7-2	24.8	34.4	29	3-24873	Intact (100)	<i>S. aureus</i> strain H7	Human	Austria: Vienna	NKCQ00000000
32	phiAb333-3	60.4	32.6	73	1536165-1596570	Intact (140)	<i>S. aureus</i> strain Ab333	Human	France: Rennes	LSGN01000000
33	phiAb333-4	45.8	32.8	66	162378-208180	Intact (100)				
34	phiP333-3	60.4	32.6	73	1534491-1594896	Intact (140)	<i>S. aureus</i> strain p333	Human	France: Rennes	LSGO01000000
35	phiP333-4	45.8	32.8	66	88453-134255	Intact (100)				
36	phiSA13-192-1	32.1	34	54	524-32652	Intact (110)	<i>S. aureus subsp. aureus</i> strain SA13-192	Human	France: Tours	LNJF00000000
37	phiSA13-192-2	33.8	33.5	53	515-34393	Intact (110)				
38	phiSA14-639-2	44.5	33	65	13727-	Intact (120)	<i>S. aureus subsp. aureus</i>	Human	France: Tours	LNJO00000000

					58297		strain SA14-639			0
39	phiG4-3	87.8	33.92	132	1944955-2032780	Intact (150)	<i>S. aureus subsp. aureus</i> strain SA G6	Human	Germany	RAHA00000000
40	phiG5-2	61.2	33.59	90	682931-744225	Intact (150)	<i>S. aureus subsp. aureus</i> strain SA G8	Human	Germany	QZFC00000000
41	phiG5-3	68.2	32.59	79	1517828-1586108	Intact (130)				
42	phiG5-5	51.8	32.22	59	2040204-2092008	Intact (106)				
43	phiH13-2	56.4	32.16	66	1013609-1070087	Intact (100)	<i>S. aureus subsp. aureus</i> strain SA H27	Human	Hungary	CP032468
44	phiH14-1	73.3	32.75	73	1502314-1575621	Intact (120)	<i>S. aureus subsp. aureus</i> strain SA H29	Human	Hungary	CP032161
45	phiH14-2	45.5	32.94	64	2018439-2063982	Intact (100)				
46	phiH15-2	58.7	33.56	70	736189-794911	Intact (150)	<i>S. aureus subsp. aureus</i> strain SA H32	Human	Germany	RAHP00000000
47	phi2010-60-6511-10-1	46.7	34.76	68	222914-269656	Intact (120)	<i>S. aureus</i> 2010-60-6511-10	Animal	Netherlands	JJCG00000000
48	phi22835-2	44.7	33	68	98989-143737	Intact (100)	<i>S. aureus</i> 22835-2	Animal	France	JJBV00000000
49	phi53180-1-4	31.5	33.72	36	82-31604	Intact (110)	<i>S. aureus</i> 53180-1	Animal	Italy	JJAW00000000
50	phiFP_N239-1	46.4	33.55	64	142176-188632	Intact (110)	<i>S. aureus</i> FP_N239	Animal	Netherlands	JJYQ00000000
51	phiFP_N5203 OX-1	63.7	33.15	71	1137-64873	Intact (140)	<i>S. aureus</i> FP_N5203 OX	Animal	Netherlands	JJYP00000000
52	phiFP_N5208 OX-2	48.1	33.49	62	239490-287619	Intact (120)	<i>S. aureus</i> FP_N5208 OX-2	Animal	Netherlands	JJYO00000000
53	phi483-4	55.1	33	80	35402-90527	Intact (150)	<i>S. aureus</i> 483-4	Animal	Netherlands	QFCY01000000
54	phi909-4	55	33.1	80	35713-90759	Intact (140)	<i>S. aureus</i> 909-4	Animal	Netherlands	QFCZ01000000
55	phi22825-1	44.7	33	68	63597-108345	Intact (100)	<i>S. aureus</i> 22825	Animal	France	JJBW00000000
56	phi22837-1	44.7	33	68	91414-136162	Intact (100)	<i>S. aureus</i> 22837	Animal	France	JJBU00000000
57	phi22838-1	44.7	33	68	63604-108352	Intact (100)	<i>S. aureus</i> 22838	Animal	France	JJBT00000000

58	phi22841-1	44.7	33	66	63656-108404	Intact (100)	<i>S. aureus</i> 22841	Animal	France	JJBS00000000
59	phiSa52-2	73.2	33	74	40846-114049	Intact (140)	<i>S. aureus</i> Sa52	Animal	Denmark	NBNF00000000
60	phiRd.3-2	57.2	33.99	59	26855-84075	Intact (110)	<i>S. aureus</i> Rd.3	Animal	Germany	JIWZ00000000
61	phiRd.9-1	70.2	33.2	69	4314-74563	Intact (140)	<i>S. aureus</i> Rd.9	Animal	Germany	JIWT00000000
62	phiRd.60-3	67.6	33.6	63	7053-74719	Intact (130)	<i>S. aureus</i> Rd.60	Animal	Germany	JIWV00000000
63	phi23237-1	44.7	33	68	63656-108404	Intact (100)	<i>S. aureus</i> 23237	Animal	France	JJBO00000000
64	phiC3489-2	29.2	35.38	38	2-29221	Intact (140)	<i>S. aureus</i> C3489	Animal	Spain	JIZE00000000
65	phiC5086-2	44.5	33.11	65	320203-364773	Intact (120)	<i>S. aureus</i> C5086	Animal	Spain	JIYX00000000

