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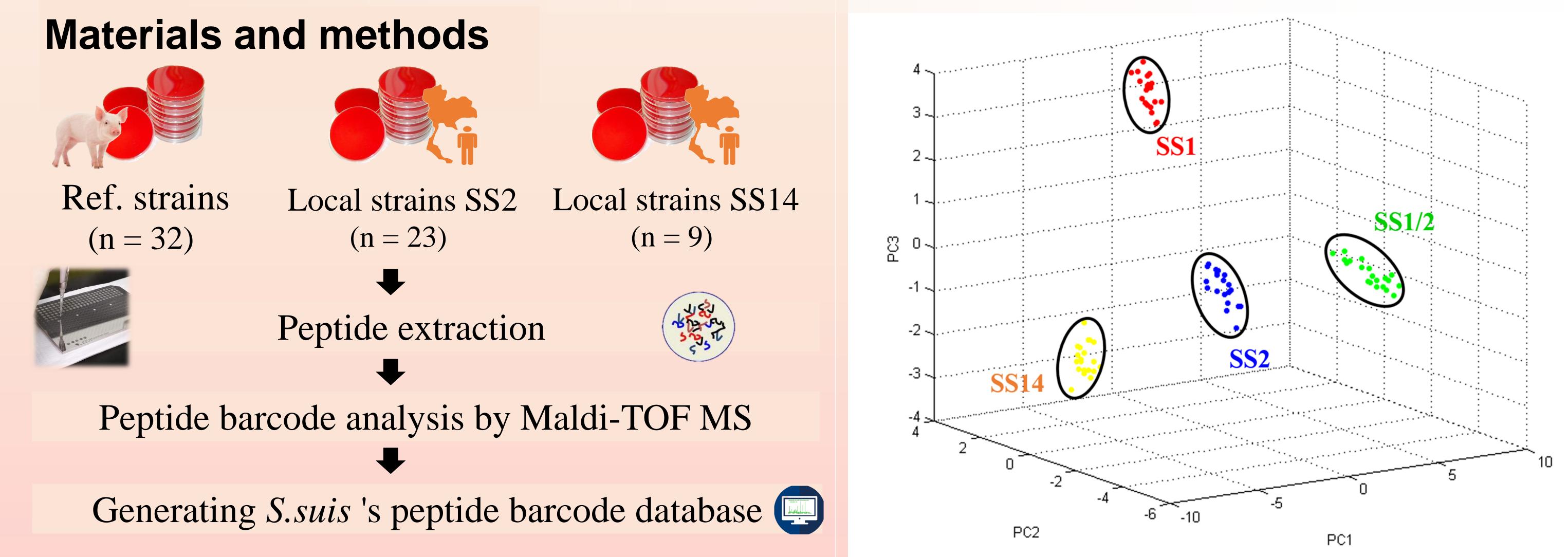
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#### Introduction



- Streptococcus suis, particularly S. suis serotype (SS2)
- Important zoonotic pathogen causing meningitis in humans worldwide
- The current serotyping methods are significantly limited.
- In the present study, the peptide barcode generated by matrix-assisted laser desorption/ionization time-of-flight mass spectrometry (Maldi-TOF MS) was developed to improve the classification of S. suis.



## **Results and Discussions**

1 20 <sup>14</sup> 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5	Streptococcus suis SS1	(in store) 1.0	<u>8845.830</u> 4421.385 5970.853	Streptococcus suis SS8	
5970.870 0.5 3322.117 8281.290		1 <u>E</u> 0.5	3418.524 8281.424 9039.164 10475.853		
	19865.152 1	0.0 ['n'E] 5	4630.528	Strantoscara quia SSO	
0.00	Streptococcus suis SS1-2	uten 3	5339.813 6761.099	Streptococcus suis SS9	
0.50 0.25 4429.886 6817.607 8289.998		21	2983.597		
0.00 0.00	Streptococcus suis SS2	(in e) 2.0	4087.638	Streptococcus suis SS10	
S 10		te 1.5 1.0	6641.008 5339.725		
og		0.5 0.0 1 x10 <sup>5</sup>	3320.588 9003.963		
417/539 674858 10 5902 594 8264.182	Streptococcus suis SS3	Intens. [a.u	2990.756	Streptococcus suis SS11	
0.5 3414.793 9017.012 10441.317.11826.139		1	, <u>4424.755</u> 5970.542 8288.725 10.443.528		
0.0	Streptococcus suis SS4	[i x10 <sup>4</sup>	3314.765	19587.648 Streptococcus suis SS12	
4 <u>4421.666</u>		su 1.0	44 19:10/ 5333.448		
<u>8393 925</u> 9534.701 10934.383 14160.497		0.5	2978.006		
109 442200 6447503 0.75 1 1 1 1 8222.271	Streptococcus suis SS5	0.0 n x10 <sup>4</sup>	3005.117	Streptococcus suis SS13	
0.50		si a uten 3			
0.025 0.		1	<u>4417.193</u> <u>5957.229</u> <u>8990.822</u>		
5357.601 6758.630	Streptococcus suis SS6	[intens, [a.u.]	4415.908 5962.803 7042.890	Streptococcus suis SS14	
		E 0.5	8262.745		
x10 <sup>4</sup> 4422.964 422.964 x220 ist	Streptococcus suis SS7	0.0 [in x10 <sup>4</sup>	<u>3415.112</u> <u>5967.829</u> <u>5967.829</u>	Streptococcus suis SS16	
		1 support	<u>3979.159</u> <u>5337.138</u> <u>7959.923</u>	Streptococcus suis 3376	
0.0 3418.930 0.0 3418.930		1	<u>9019.434</u> <u>10616.745</u>		
	000 18000 20000 ml		00 4000 8000 8000 10000 12000 14000	18000 18000 20000 m/z	
x10 <sup>4</sup> 5367.242 g 6 4424.651 6943.787 8 6 4424.651 8271.214	Streptococcus suis SS26	n x104	4422.084 6843.152	Streptococcus suis SS17	
<sup>2</sup> 4 0071.913 10425 044		1.0 0.5	3418.035 8276.062 9056,790 10638.308 14009 1		
3 4122 663 14132 302 3 15 5 169 663		0.0 = ×10 <sup>4</sup>			
5. 1.5. <u>4422.170</u> <u>7966.676</u>	Streptococcus suis SS27	8.0 is 160 is 160 is	4132,939 5308,992 6043,503 6280,344	Streptococcus suis SS18	
0.5 3419.224 9030.558 10635.628 15058.409		0.4	3416.541		
6846.317	Streptococcus suis SS28	0.0 3 x10 <sup>4</sup> 5 0.8	4420.673 6841.464 7964.788	Streptococcus suis SS19	
4 5338.604 2 4421.598 804 2 4421.598 8281.259		10.8 10 0.6	5336.477		
1 <u>3418.331</u> 9 <u>13562.516</u> 9 <u>13562.516</u>		0.2 0.0 = x10 <sup>4</sup>	3417219 B340,802 10832789 150845	19	
z x10 <sup>3</sup> 5331.843 6833.485 g 6 4417.961 corp. 346 7953.237	Streptococcus suis SS29	면 0.8-	5365.611 4421354 8843.912 1000	Streptococcus suis SS20	
		른 0.6- 0.4-	3418,390 9033,287 10442,514 15100.7		
2 <u>341757</u> 13594.849 15048.813 110 <sup>9</sup> <u>5389,313</u> 8848,460	0444	0.2 0.0 2 ×10 <sup>4</sup>	<u>4425286</u> <u>5577,166</u>		
	Streptococcus suis SS30	1 utens. [a	6850,609	Streptococcus suis SS22	
2- <u>3420.283</u> 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		1	3422.510 8283.902 1 9040.296 10451.934		
E x10 <sup>4</sup> 4420,483	Streptococcus suis SS31	1 x10 <sup>5</sup>		Streptococcus suis SS23	
1.5 <u>5338480</u> <u>6442.511</u> 1.0 <u>5278.191</u>		su 2			
0.5 2982.018 8992.733			4420.580 5970.045 7974.386 9357.852 10658.293 15152.0	51	
003 103 103 103 103 103 103 103 103 103	Streptococcus suis SS32	1 x10 <sup>4</sup>	4084.129	Streptococcus suis SS24	
E 1.0		탄 0.6 0.4	2082.434		
5 x10 <sup>4</sup>		0.2 0.0 1 x10 <sup>5</sup>	2002.434 		
4400.310 5954.152 7080.999 8.10 9454.341	Streptococcus suis SS34	e 1.00 supp 0.75		Streptococcus suis SS25	
0.5 2835.674		0.50	2062.212 4420.603 6847428 7876.074 8362.301 10865.846		
0.0 Lander Marker Ma		0.00			

- Repeatability = 68.8% (22/32)
- Validation = 56.5% and 77.8%  $\bullet$ (SS2 and SS14)
- Reproducibility = 56.3%
- Degree of test agreement unweighted Kappa score = 0.522Theoretically, in order to improve the score, more peptide barcodes of S. suis should be included.

Fig 2. The PCA, based on the peptide barcodes, of the ambiguous serotypes of S. suis SS2, SS1/2, SS1, and SS14.

- Capable of discriminating between the high similarity serotypes pairs of (i) SS2 and SS1/2 and (ii) SS1 and SS14
- Importantly, SS2 and SS14 are the most major S. suis infections where misidentifying the pathogen could causative delay the



Fig 1. The peptide mass spectra from each individual serotype generated a particular peptide barcode that contained their individual unique mass(es) and so differentiated each serotype from one another. Overall, 4420, 5337, 5965, 6634, 6748, 6834, and 8260 Da peptide masses were commonly found in most of the S. suis.

## Acknowledgment

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#### appropriate treatment.

# Conclusion

- Successfully differentiated the ambiguous serotypes of S. suis
- Providing an alternative method for S. suis classification
- Useful for S. suis infection diagnosis and epidemiological study of this zoonotic pathogen