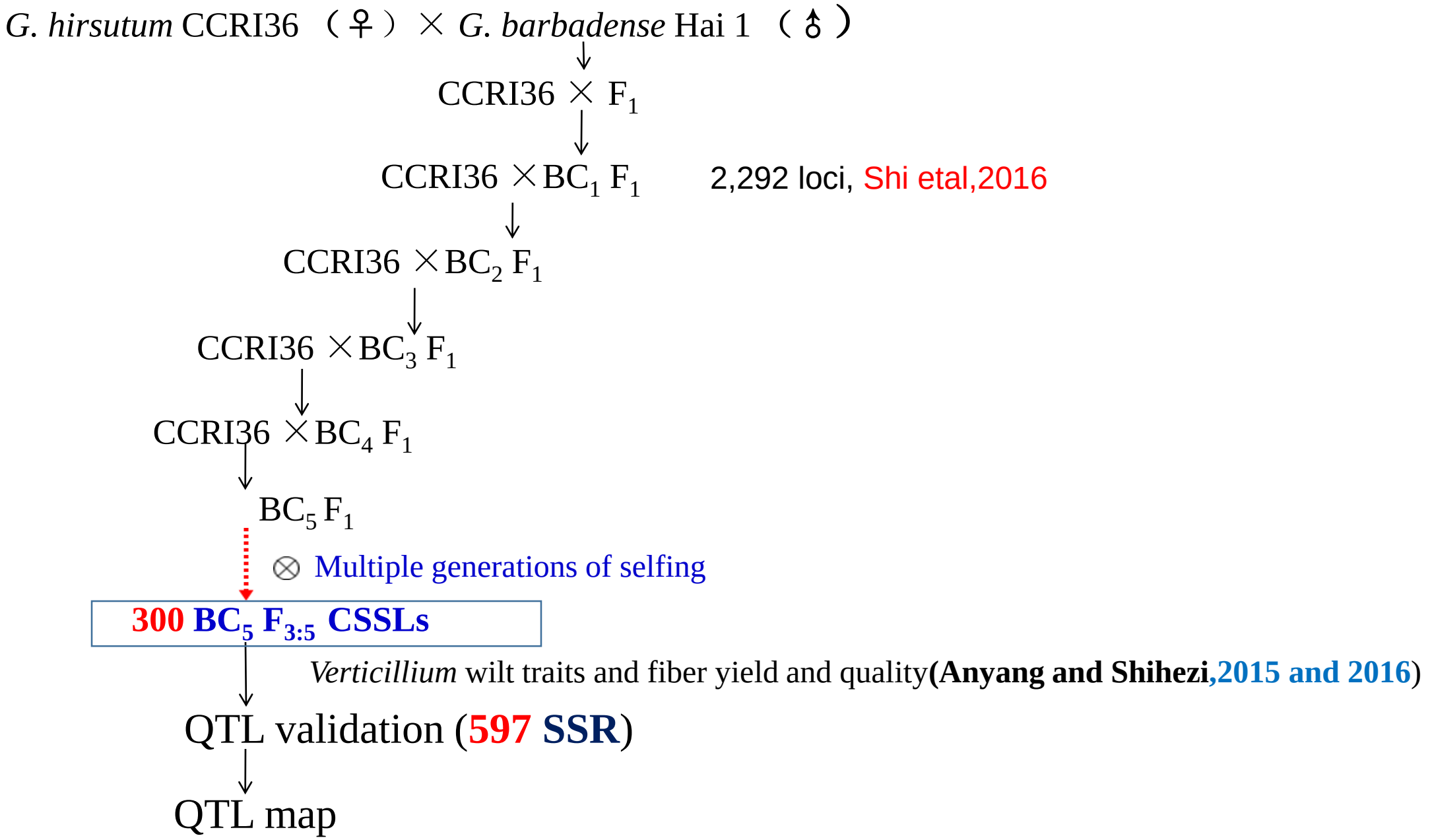
Genome Wide QTL Mapping for Resistance to Verticillium Wilt, Fiber Quality and Yield Traits in Cotton Chromosome Segment Substitution Lines

Youlu Yuan

Institute of Cotton Research, CAAS
State Key Laboratory of Cotton Biology China
yuanyoulu@caas.cn

Figure 1 The details of CSSLs development



QTL forVerticillium wilt resistance(DI), fiber quality and yield related traits

- A total of **251** QTLs have been detected. Among them **98** of the fiber quality traits and **93** of the yield
- related traits,**60** for forVerticillium wilt resistance(DI) . Of these, **86** QTLs are consistent

- Three chromosomes **Chr05, Chr19 and Chr20** contained more QTLs

Table 1 QTL details in the CSSL population

	DI	FL	FS	FU	FM	FE	BW	LP	SI	PH	Total QTLs
Total QTLs	**60**	32	21	8	24	13	38	18	10	27	**251**
Stable QTLs	**32**	12	8	0	5	2	10	6	5	6	**86**
Located on Chr No.	**21**	15	11	6	16	9	17	10	5	15	-
Max. on one Chr.	**15**	6	5	2	3	3	4	4	5	5	-
Chr. having Max. No.	**5**	20	20	19	15	05	19	18	20	05	-

clusters for VW diseae index and fiber related traits

- A total of **30** on **16** chromosomes. Chromosome **19** (**6** clusters)
- Most of the QTLs for **fiber traits** were clustered with the **disease index**.
- **Six** clusters, **C01-cluster-1, C05-cluster-4, C07-cluster-1, C19-cluster-2, C22-cluster-1 and C22-cluster-2**, which had **positive** correlation between VW resistance and fiber quality traits.
- **Two** clusters, **C10-cluster-1 and C25-cluster-1** had also **positive** correlation between VW resistance and yield related traits, **boll weight** and **lint percentage**.
- **One** cluster, **C20-cluster-1** is important for both VW resistance and fiber related traits.

QTLs	Env	Triats	LOD	Add	PV (%)
qVW-Chr20-1	AYJuly15	VW	3.64	-6.31	6.74
	AYAug15	VW	2.73	-4.07	4.53
	AYJul16	VW	2.80	-4.56	4.89
	AYAug16	VW	3.41	-5.61	6.15
	XJJul16	VW	6.52	-6.54	11.14
	XJAug16	VW	5.73	-7.87	9.69
qBW-Chr20-1	AY15	BW	3.07	**0.26**	5.26
	XJ15	BW	2.56	**0.14**	4.72
	XJ16	BW	3.22	**0.15**	5.42
qLP-Chr20-1	XJ15	LP	5.76	**1.01**	9.46
	AY16	LP	2.87	**1.01**	4.99
	XJ16	LP	6.24	**1.05**	10.06
qFL-Chr20-5	AY15	FL	4.89	**0.66**	8.21
	XJ16	FL	4.19	**0.44**	7.26
	XJ15	FL	2.64	**0.37**	4.67
qFS-Chr20-5	AY15	FS	5.34	**1.35**	9.20
qFM-Chr20-1	XJ16	FM	3.56	**0.12**	6.46
	AY15	FM	3.60	**0.13**	5.48
qPH-Chr20-3	PHAY15	PH	2.92	**3.18**	4.77
	PHAY16	PH	3.39	**4.07**	5.70
	PHXJ16	PH	3.09	**2.10**	5.44
	PHAY16	PH	3.30	**3.03**	5.06