

## Supplementary files

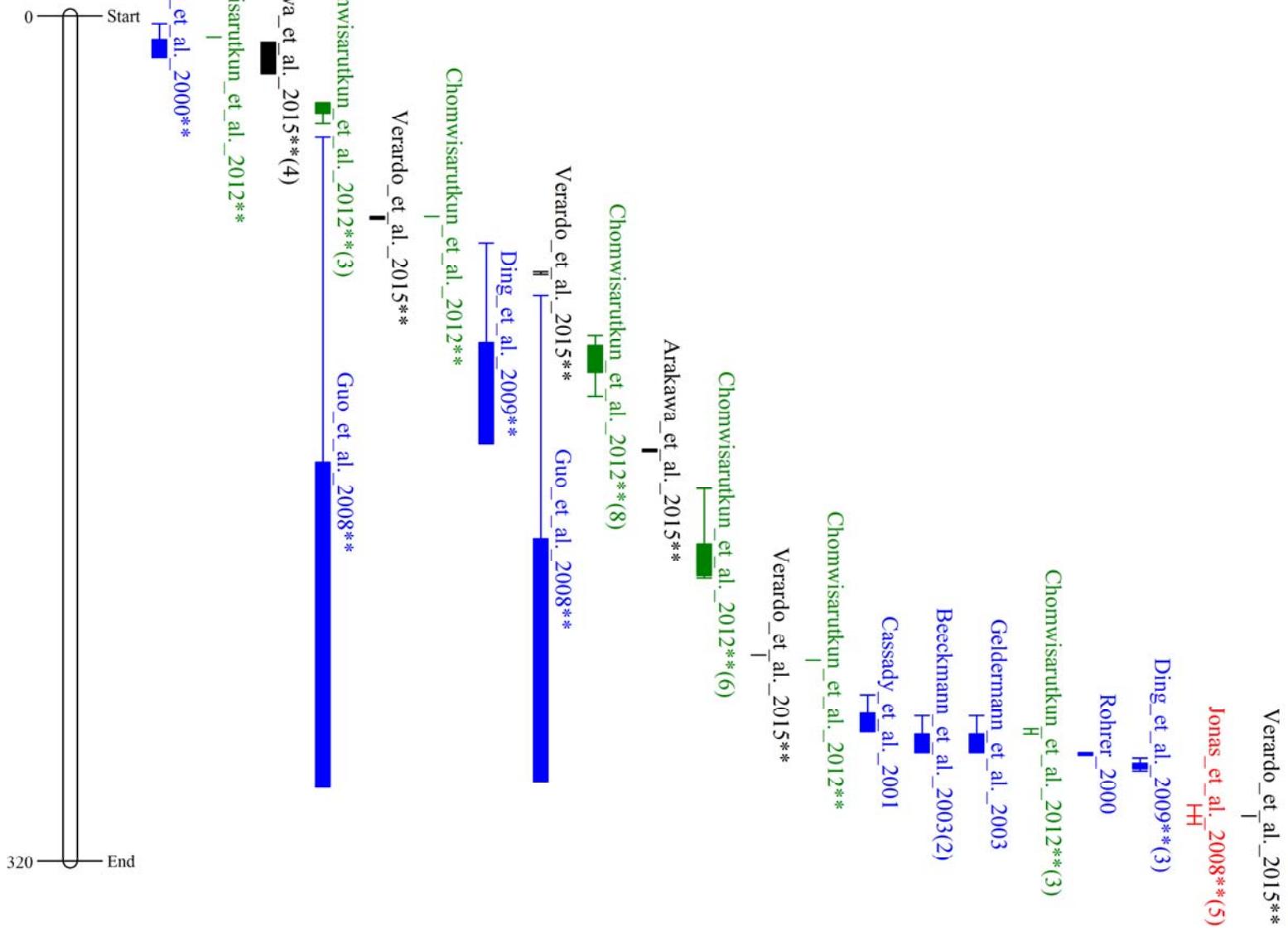
Figures showing the assembly of own results and published results across all autosomes (chromosome 1-18, SSC1-18) and the X chromosome.

Shown are results for expression studies for inverted teats (green), QTL studies for inverted/ functional teats (red), association studies for inverted/ functional teats (dark red), QTL studies for number of teats (blue) as well as association studies for number of teats (black). If multiple loci were reported from the same study, loci were combined; the number of combined loci is shown in parenthesis behind the reference. It is indicated if results were significant (\*\*, P>0.05), suggestive (\*, P>0.1), or if no information given. Positions are given in approximations and information were taken from the literature and the Pig QTLDB (*Hu Z-L, Park CA, Reecy JM (2016) Developmental progress and current status of the Animal QTLdb Nucleic Acids Research 44:D827-D833 doi:10.1093/nar/gkv1233*). Charts were designed using MapChart (*Voorrips RE (2002) MapChart: Software for the Graphical Presentation of Linkage Maps and QTLs Journal of Heredity 93:77-78 doi:10.1093/jhered/93.1.77*). References used are the following:

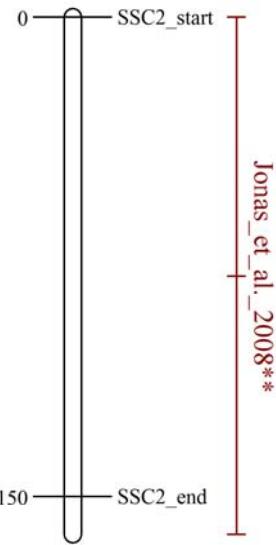
- Arakawa A et al. (2015) Genome-wide association QTL mapping for teat number in a purebred population of Duroc pigs *Animal Genetics* 46:571-575 doi:10.1111/age.12331
- Beeckmann P, Moser G, Bartenschlager H, Reiner G, Geldermann H (2003) Linkage and QTL mapping for Sus scrofa chromosome 8 *J Anim Breed Genet* 120 doi:10.1046/j.0931-2668.2003.00425.x
- Bidanel JP et al. (2008) Detection of quantitative trait loci for teat number and female reproductive traits in Meishan X Large White F2 pigs *Animal* 2:813-820 doi:10.1017/s1751731108002097
- Cassady JP, Johnson RK, Pomp D, Rohrer GA, Van Vleck LD, Spiegel EK, Gilson KM (2001) Identification of quantitative trait loci affecting reproduction in pigs *Journal of Animal Science* 79:623-633
- Cepica S, Reiner G, Bartenschlager H, Moser G, Geldermann H (2003) Linkage and QTL mapping for Sus scrofa chromosome X *J Anim Breed Genet* 120 doi:10.1046/j.0931-2668.2003.00436.x
- Chomwisorutkun K, Murani E, Ponsuksili S, Wimmers K (2012) Gene expression analysis of mammary tissue during fetal bud formation and growth in two pig breeds - indications of prenatal initiation of postnatal phenotypic differences *Bmc Developmental Biology* 12 doi:10.1186/1471-213x-12-13
- Ding N et al. (2009) Genome-wide QTL mapping for three traits related to teat number in a White Duroc x Erhualian pig resource population *BMC Genet* 10 doi:10.1186/1471-2156-10-6
- Dragos-Wendrich M, Moser G, Bartenschlager H, Reiner G, Geldermann H (2003) Linkage and QTL mapping for Sus scrofa chromosome 10 *J Anim Breed Genet* 120 doi:10.1046/j.0931-2668.2003.00427.x
- Duijvesteijn N, Veltmaat JM, Knol EF, Harlizius B (2014) High-resolution association mapping of number of teats in pigs reveals regions controlling vertebral development *BMC Genomics* 15:1-12 doi:10.1186/1471-2164-15-542
- Geldermann H et al. (2003) Genome-wide linkage and QTL mapping in porcine F2 families generated from Pietrain, Meishan and Wild Boar crosses *Genomweite Kopplungs- und QTL-Kartierung in porcinen F2-Familien, erzeugt aus Kreuzungen von Pietrain, Meishan und Wildschwein* *Journal of Animal Breeding and Genetics* 120:363-393 doi:10.1046/j.0931-2668.2003.00408.x
- Guo YM, Lee GJ, Archibald AL, Haley CS (2008) Quantitative trait loci for production traits in pigs: a combined analysis of two Meishan x Large White populations *Anim Genet* 39 doi:10.1111/j.1365-2052.2008.01756.x
- Hernandez SC, Finlayson HA, Ashworth CJ, Haley CS, Archibald AL (2014) A genome-wide linkage analysis for reproductive traits in F(2) Large White × Meishan cross gilts *Animal Genetics* 45:191-197 doi:10.1111/age.12123

- Hirooka H et al. (2001) A whole-genome scan for quantitative trait loci affecting teat number in pigs J Anim Sci 79
- Holl JW, Cassady JP, Pomp D, Johnson RK (2004) A genome scan for quantitative trait loci and imprinted regions affecting reproduction in pigs J Anim Sci 82
- Jonas E et al. (2008) QTL for the heritable inverted teat defect in pigs Mammalian Genome 19:127-138 doi:10.1007/s00335-007-9086-5
- King AH, Jiang Z, Gibson JP, Haley CS, Archibald AL (2003) Mapping quantitative trait loci affecting female reproductive traits on porcine chromosome 8 Biol Reprod 68 doi:10.1095/biolreprod.102.012955
- Lee SS et al. (2003) Linkage and QTL mapping for Sus scrofa chromosome 2 J Anim Breed Genet 120 doi:10.1046/j.0931-2668.2003.00419.x
- Rodriguez C et al. (2005) QTL mapping for teat number in an Iberian x Meishan pig intercross Anim Genet 36
- Rohrer GA (2000) Identification of quantitative trait loci affecting birth characters and accumulation of backfat and weight in a Meishan-White Composite resource population J Anim Sci 78
- Sato S et al. (2006) Identification of quantitative trait loci affecting corpora lutea and number of teats in a Meishan x Duroc F-2 resource population Journal of Animal Science 84:2895-2901 doi:10.2527/jas.2006-176
- Tortereau F, Gilbert H, Heuven HCM, Bidanel J-P, Groenen MAM, Riquet J (2010) Combining two Meishan F2 crosses improves the detection of QTL on pig chromosomes 2, 4 and 6 Genetics Selection Evolution 42 doi:10.1186/1297-9686-42-42
- Verardo LL, Silva FF, Varona L, Resende MDV, Bastiaansen JWM, Lopes PS, Guimarães SEF (2014) Bayesian GWAS and network analysis revealed new candidate genes for number of teats in pigs Journal of Applied Genetics 56:123-132 doi:10.1007/s13353-014-0240-y
- Wada Y et al. (2000) Quantitative trait loci (QTL) analysis in a Meishan×Göttingen cross population Animal Genetics 31:376-384 doi:10.1046/j.1365-2052.2000.00696.x
- Yue G, Schröffel J, Moser G, Bartenschlager H, Reiner G, Geldermann H (2003) Linkage and QTL mapping for Sus scrofa chromosome 12 J Anim Breed Genet 120 doi:10.1046/j.0931-2668.2003.00429.x
- Zhang J et al. (2007) Detection of quantitative trait loci associated with several internal organ traits and teat number trait in a pig population J Genet Genomics 34 doi:10.1016/s1673-8527(07)60032-0

SSC1



SSC2



Chomwistarutkun et al. 2012\*\* (4)

OWN\*\*  
|

Chomwistarutkun et al. 2012\*\*

Duijvesteijn et al. 2014\*

Arakawa et al. 2015\*\*

Chomwistarutkun et al. 2012\*\*

Chomwistarutkun et al. 2012\*\*

Chomwistarutkun et al. 2012\*\* (3)

Chomwistarutkun et al. 2012\*\*

Duijvesteijn et al. 2014\*

Chomwistarutkun et al. 2012\*\*

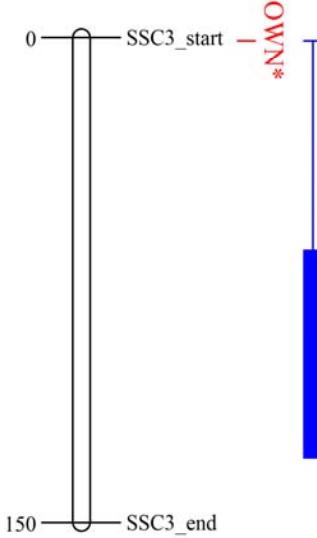
Jonas et al. 2008\*\*

Lee et al. 2003

Arakawa et al. 2015\*\* (2)

Hirooka et al. 2001\*\*

### SSC3



Duijvestein et al. 2014\*(2)

Ding et al. 2009\*\* (2)

Sato et al. 2006\*\*

Bidanel et al. 2008\*\* (2)

Duijvestein et al. 2014\*

Chomwisa et al. 2012\*\*

Rohrer 2000

Chomwisa et al. 2012\*\*

Jonas et al. 2008\*\* (5)

Chomwisa et al. 2012\*\*

Ding et al. 2009\*\*

Ding et al. 2009\*\*

Duijvestein et al. 2014\*

Duijvestein et al. 2009\*\*

Chomwisa et al. 2012(4)

Jonas et al. 2008\*\*

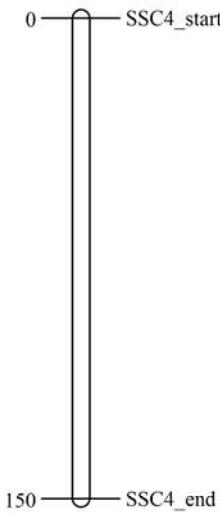
Jonas et al. 2008\*\* (2)

Chomwisa et al. 2012(7)

Guo et al. 2008\*\*

OWN\*

SSC4



Duijvesteijn et al. 2014\*

Chomwistarutkun et al. 2012(5)

Jonas et al. 2008\*\* (6)

Chomwistarutkun et al. 2012

Verardo et al. 2015\*\*

Chomwistarutkun et al. 2012(3)

Verardo et al. 2015\*\*

Chomwistarutkun et al. 2012(6)

Jonas et al. 2008\*\*

Chomwistarutkun et al. 2012\*\* (2)

Arakawa et al. 2015\*\* (2)

Verardo et al. 2015\*\*

Chomwistarutkun et al. 2012\*\*

Chomwistarutkun et al. 2012\*\* (2)

Verardo et al. 2015\*\*

Tortereau et al. 2010\*

Ding et al. 2009\*\* (2)

Chomwistarutkun et al. 2012\*\*

Bidanel et al. 2008\*\*

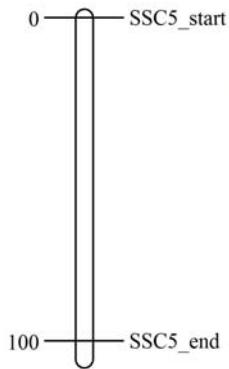
Ding et al. 2009\*\*

Bidanel et al. 2008\*\*

Guo et al. 2008\*\* (2)

Chomwistarutkun et al. 2012\*\* (3)

## SSC5



Arakawa et al. 2015\*\* (2)

Jonas et al. 2008\*(2)

Chomwisanutkun et al. 2012\*\*

Ding et al. 2009\*\* (3)

Chomwisanutkun et al. 2012\*\* (5)

Lee et al. 2003

Chomwisanutkun et al. 2012\*\* (3)

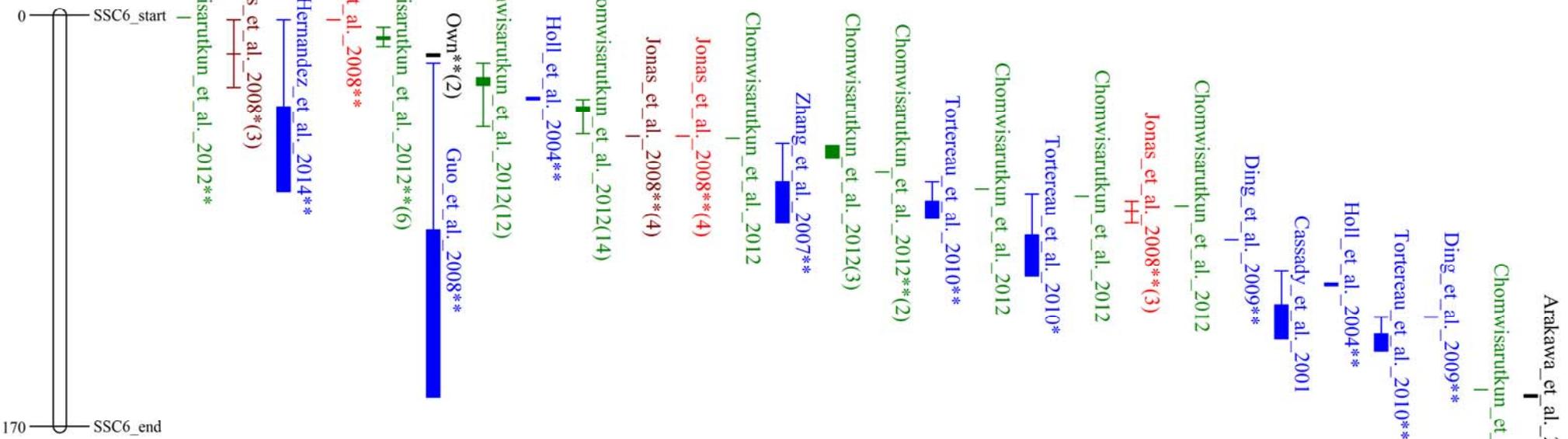
Hernandez et al. 2014\*\*

Chomwisanutkun et al. 2012\*\*

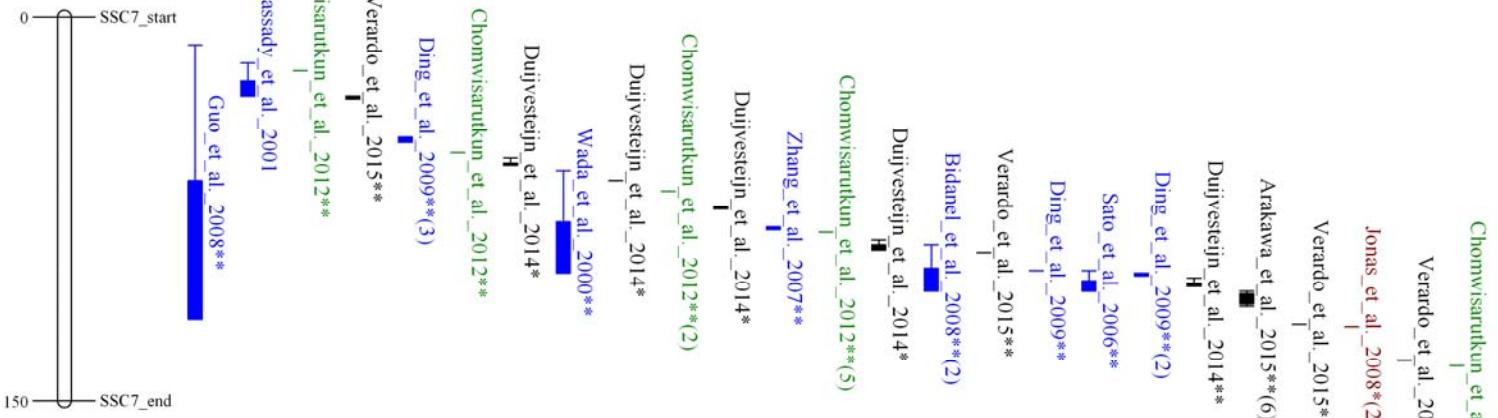
Jonas et al. 2008\*\*

Jonas et al. 2008\*\* (2)

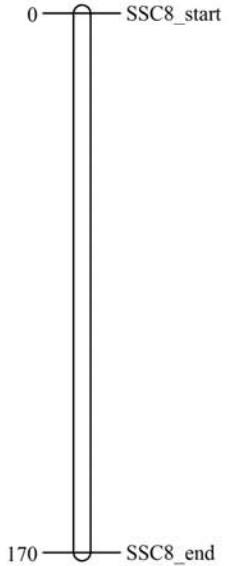
Rodriguez et al. 2005\*\*



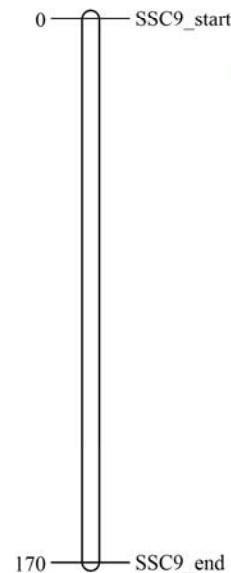
SSC7



SSC8



## SSC9



Chomwistarutkun et al. 2012\*\*

Chomwistarutkun et al. 2012\*\*

Duijvestein et al. 2014\*

Duijvestein et al. 2014\*

Chomwistarutkun et al. 2012\*\* (2)

Chomwistarutkun et al. 2012\*\* (4)

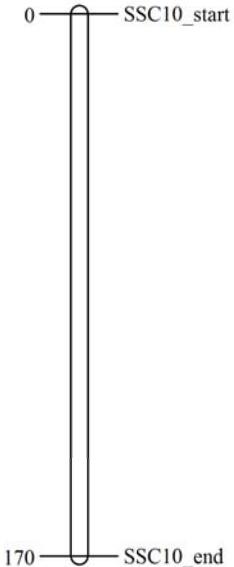
Duijvestein et al. 2014\*

Jonas et al. 2008

Jonas et al. 2008\*\*

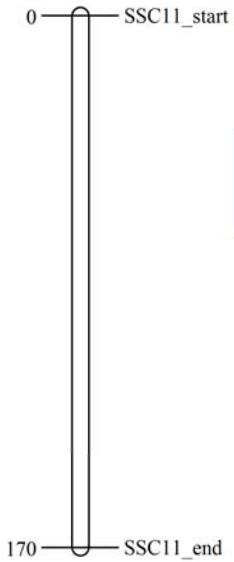
Chomwistarutkun et al. 2012\*\*

SSC10



- Jonas et al. 2008\*\*
- Chomwisorutkun et al. 2012\*\*
- Dragos-Wendrich et al. 2003
- Duijvesteijn et al. 2014\*\*<sup>(2)</sup>
- Rohrer 2000
- OWN\*
- Rodríguez et al. 2005\*\*
- Hirooka et al. 2001\*\*
- Chomwisorutkun et al. 2012\*\*
- OWN\*
- Dragos-Wendrich et al. 2003
- Jonas et al. 2008\*
- Arakawa et al. 2015\*\*

SSC11



Bidanel et al. 2008\*\*\*

Chomwisorutkun et al. 2012

Jonas et al. 2008\*\*<sup>(5)</sup>

Chomwisorutkun et al. 2012(3)

Jonas et al. 2008\*\*<sup>(2)</sup>

Jonas et al. 2008\*\*<sup>(3)</sup>

Chomwisorutkun et al. 2012\*\*<sup>(4)</sup>

Jonas et al. 2008\*\*

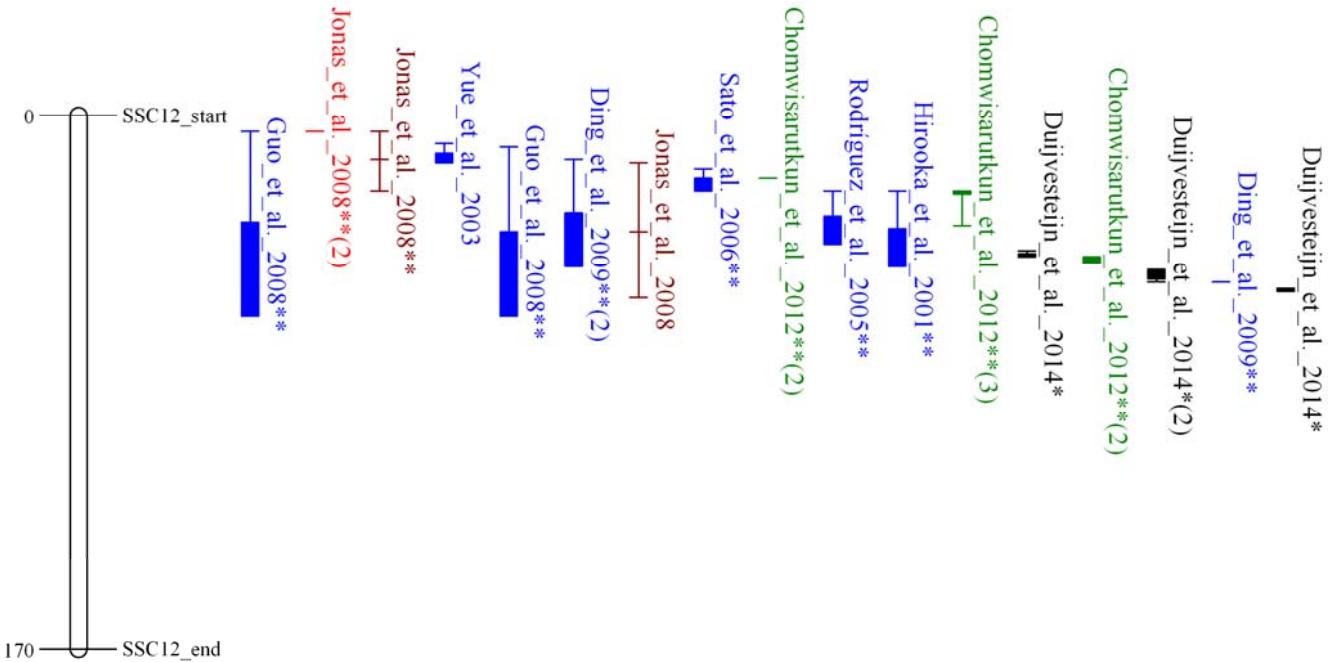
Cassady et al. 2001

Duijvesteijn et al. 2014\*

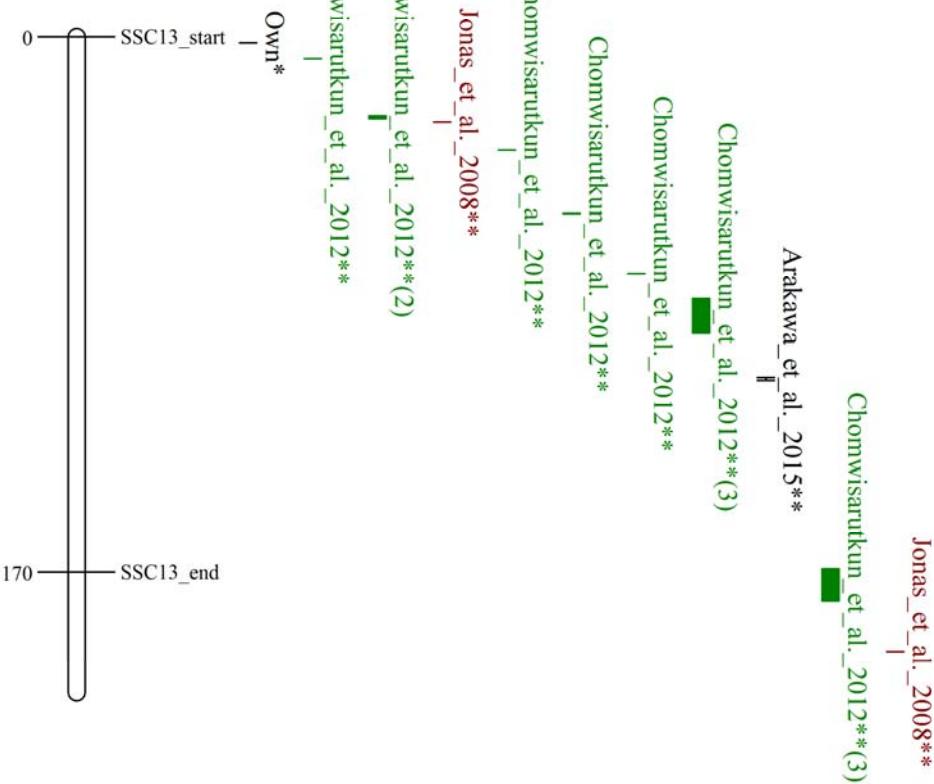
Chomwisorutkun et al. 2012\*\*

Guo et al. 2008\*\*

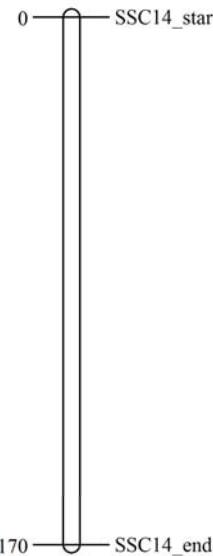
SSC12



### SSC13



SSC14



Arakawa et al. 2015\*\*

Own\*\* (2)

Jonas et al. 2008\*\* (5)

Chomwisiarutkun et al. 2012\*\*

Jonas et al. 2008\*\*

Duijvestein et al. 2014\*\*

Chomwisiarutkun et al. 2012\*\* (3)

Chomwisiarutkun et al. 2012\*\*

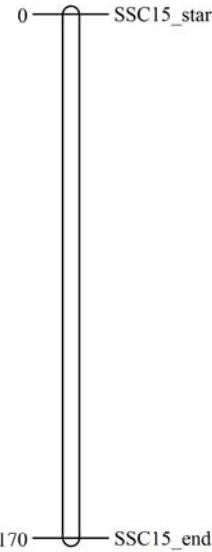
Chomwisiarutkun et al. 2012\*\*

Chomwisiarutkun et al. 2012\*\* (2)

Chomwisiarutkun et al. 2012\*\*

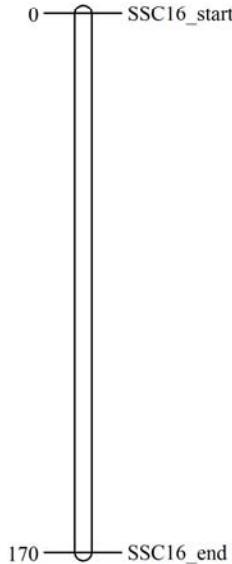
Arakawa et al. 2015\*\*

SSC15



- Duijvesteijn et al. 2014\*(2)
- Holl et al. 2004\*\*
- Chomwiarutkun et al. 2012\*\*
- Arakawa et al. 2015\*\* (2)
- Holl et al. 2004\*\*
- Chomwiarutkun et al. 2012\*\* (3)
- Chomwiarutkun et al. 2012\*\* (3)
- Arakawa et al. 2015\*\*
- Chomwiarutkun et al. 2012\*\*
- Chomwiarutkun et al. 2012\*\*
- Duijvesteijn et al. 2014\*
- Jonas et al. 2008\*(2)
- Duijvesteijn et al. 2014\*(2)

SSC16



Jonas\_et\_al.\_2008\*\*<sup>(2)</sup>

Arakawa\_et al.\_2015\*\*

Jonas\_et al.\_2008\*\*

Chomwissarutkun\_et al.\_2012\*\*<sup>(3)</sup>

Arakawa\_et al.\_2015\*\*<sup>(3)</sup>

Duijvestein\_et al.\_2014\*

Sato\_et al.\_2006\*\*

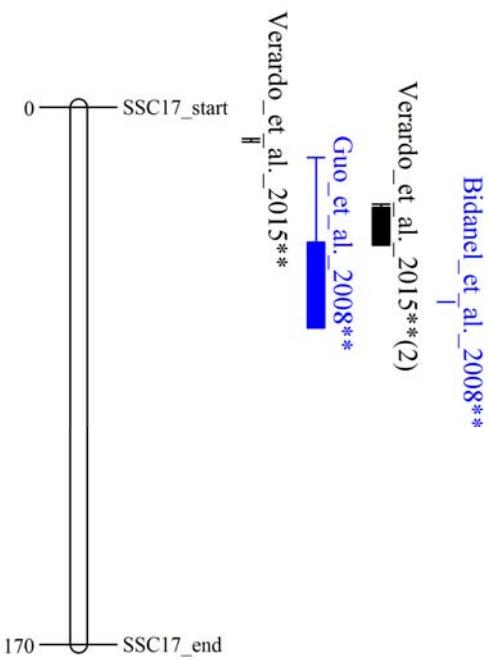
Bidanel\_et al.\_2008\*\*

Bidanel\_et al.\_2008\*\*

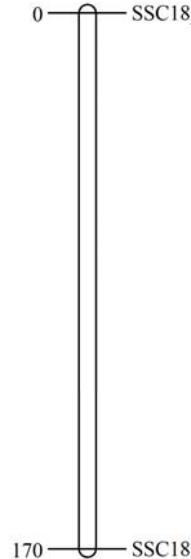
Duijvestein\_et al.\_2014\*

Guo\_et al.\_2008\*\*

# SSC17



SSC18



Duijvestein et al. 2014\*

OWN\*\*

Jonas et al. 2008\*\*<sup>(4)</sup>

Chomwisaarutkun et al. 2012\*\*

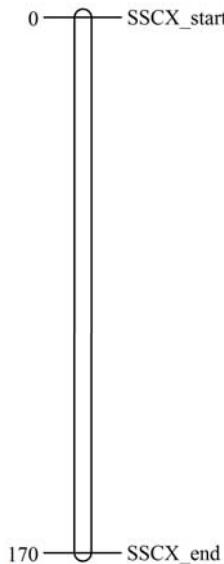
Jonas et al. 2008\*\*

Duijvestein et al. 2014\*

Chomwisaarutkun et al. 2012\*\*<sup>(3)</sup>

Hernandez et al. 2014\*\*

## SSCX



Cepica et al. 2003

OWN\*

Chomwisanutkun et al. 2012\*\*

Chomwisanutkun et al. 2012\*\* (2)

Chomwisanutkun et al. 2012\*\*