

**Figure S3** BAC contig Ctg619 (bottom solid bar) spans the entire *Qphs.pseru-3AS* region. Top bar is the linkage map of *Qphs.pseru-3AS* with the *Qphs.pseru-3AS* region labeled by red oval. Solid bars between the linkage map and the contig bar are different BACs in the contig. Three BACs with red color that cover the entire QTL region were selected for sequencing to identify candidate genes for *TaPHS1*.

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