**Table S1. Detail Information of plant materials used for RNA-seq data acquisition**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **population** |  | **Line** | **Material** | **characteristics** | **Species** | **Accessions** | **Institution** | **Reference** |
|  |  | TM-1 | Standard line | Standard | *G. hirsutum* | PRJNA248163 | NAU | Zhang et al., 2015 |
| sGK9708 × 0-153 | RILs | 0-153 | Paternal line | Excellent fiber, low yield | *G. hirsutum* | PRJNA542946 | ICR, CAAS | Sun et al., 2012; Zhang et al., 2015, 2016, 2017; Jamshed et al., 2016 |
| sGK9708 | Maternal line | fair fiber quality, good yield | *G. hirsutum* |
| 69307 | A RIL | Higher fiber strength and length | *G. hirsutum* |
| 69362 | A RIL | Poor fiber quality and yield | *G. hirsutum* |
| CCRI45 × Hai1 | CSSLs | CCRI45 | Recurrent parent line | Higher yield, lower fiber quality | *G. hirsutum* | SRP084203 | ICR, CAAS | Shi et al.2015 |
| Hai1 | Donor parent line | *Verticillium* wilt resistant, excellent fiber | *G. barbadense* |
| MBI7561 | A CSSL | Higher fiber strength | CSSL |
| MBI7747 | A CSSL | Higher fiber strength | CSSL |
| MBI7285 | A CSSL | Lower fiber strength | CSSL |
| CCRI36 × Hai1 | CSSLs | CCRI36 | Recurrent parent line | Higher yield, lower fiber quality | *G. hirsutum* | SRX2843778 | ICR, CAAS | Shi et al.2015 |
| Hai1 | Donor parent line | *Verticillium* wilt resistant, excellent fiber | *G. barbadense* |
| MBI9915 | A CSSL | Higher fiber strength and length | CSSL |
| MBI9749 | A CSSL | Higher fiber strength and length | CSSL |
|  | | | | | *G. arboreum* | PRJNA179447 | ICR, CAAS | Du et al. 2018 |
|  | | | | | *G. raimondii* | PRJNA79005 | ICR, CAAS | Wang et al. 2012 |