

**Table S2. Sequences used in analysis of GBSSI exons (Fig. 6).**

| Taxon                             | Subfamily, Tribe            | GBSSI    |
|-----------------------------------|-----------------------------|----------|
| <i>Hordeum californicum</i>       | Pooideae, Triticeae         | AF079273 |
| <i>Psathyrostachys fragilis</i>   |                             | AF079279 |
| <i>Pseudoroegneria spicata</i>    |                             | AF079281 |
| <i>Taeniatherum caput-medusae</i> |                             | AY011010 |
| <i>Elymus repens</i> 1c           |                             | AY360826 |
| <i>Elymus repens</i> 1g           |                             | AY360858 |
| <i>Elymus repens</i> 2aa          |                             | AY360830 |
| <i>Elymus repens</i> 2h           |                             | AY360859 |
| <i>Elymus repens</i> 3a           |                             | AY360833 |
| <i>Elymus repens</i> 3g           |                             | AY360860 |
| <i>Elymus repens</i> 5b           |                             | AY360861 |
| <i>Elymus repens</i> 6dd          |                             | AY360845 |
| <i>Bromus catharticus</i>         | Pooideae, Bromeae           | DQ157055 |
| <i>Bromus tectorum</i>            |                             | AY362757 |
| <i>Briza scabra</i>               | Pooideae, Poeae             | EU395864 |
| <i>Briza erecta</i>               |                             | EU395852 |
| <i>Cutandia memphitica</i>        |                             | AY362758 |
| <i>Erianthecium bulbosum</i>      |                             | EU395853 |
| <i>Glyceria grandis</i>           | Pooideae, Meliceae          | AF079291 |
| <i>Melica cupanii</i>             |                             | AF079296 |
| <i>Arundinaria gigantea</i>       | Bambusoideae, Arundinarieae | JN131985 |
| <i>Fargesia yulongshanensis</i>   |                             | AF445184 |
| <i>Yushania polytricha</i>        |                             | AF445190 |
| <i>Bambusa ventricosa</i>         | Bambusoideae, Bambuseae     | JN131925 |
| <i>Chusquea exasperata</i>        |                             | AF079293 |
| <i>Chusquea oxylepis</i>          |                             | AF079294 |
| <i>Pariana radiciflora</i>        | Bambusoideae, Olyreae       | AF079297 |

Sequence sources: AF0792xx [1]; AY011010 [2]; AY3608xx and AY362758 [3]; DQ157055 [Liu et al., unpubl.]; EU3958xx [4]; JN1319xx [5]; AF4451xx [6].

1. Mason-Gamer RJ, Weil CF, Kellogg EA (1998) Granule-bound starch synthase: structure, function, and phylogenetic utility. *Molecular Biology and Evolution* 15: 1658–1673.
2. Mason-Gamer RJ (2001) Origin of North American species of *Elymus* (Poaceae: Triticeae) allotetraploids based on granule-bound starch synthase gene sequences. *Systematic Botany* 26: 757–768.
3. Mason-Gamer RJ (2004) Reticulate evolution, introgression, and intertribal gene capture in an allohexaploid grass. *Systematic Biology* 53: 25–37.
4. Essi L, Longhi-Wagner HM, de Souza-Chies TT (2008) Phylogenetic analysis of the *Briza* complex (Poaceae). *Molecular Phylogenetics and Evolution* 47: 1018–1029.
5. Zhang YX, Zeng CX, Li DZ (2012) Complex evolution in Arundinarieae (Poaceae: Bambusoideae): incongruence between plastid and nuclear GBSSI gene phylogenies. *Molecular Phylogenetics and Evolution* 63: 777–797.
6. Guo Z-H, Li D-Z (2004) Phylogenetics of the *Thamnocalamus* group and its allies (Gramineae: Bambusoideae): inference from the sequences of GBSSI gene and ITS spacer. *Molecular Phylogenetics and Evolution* 30: 1–12.