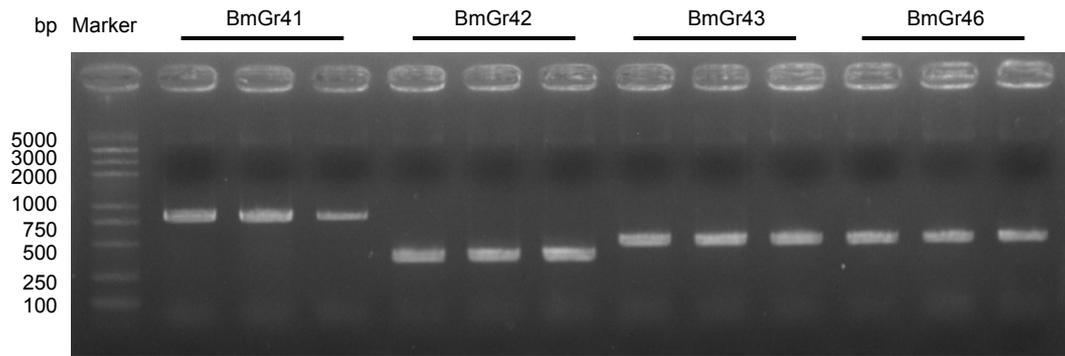
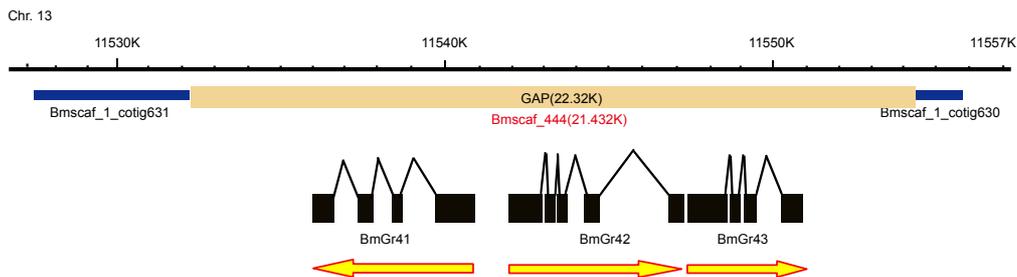


## Document S2. Chromosome mapping of *BmGr41*, *BmGr42* and *BmGr43*

We checked the assembly of the chr13 gene cluster and found it was split into three parts: [*BmGr45/46/48*], [*BmGr32-37/40/47*] and [*BmGr39*]. Adjacent to the first set of *Grs*, i.e., *BmGr45*, *BmGr46* and *BmGr48*, we found an approximate 22kb gap located between Bm\_scaf1\_contig631 and Bm\_scaf1\_contig630 [chr13: 11532372–11554690]. Phylogenetic analysis (Figure 3) indicated that *BmGr41*, *BmGr42*, *BmGr43*, *BmGr45*, *BmGr46* and *BmGr48* formed a clade; expression profiling (Figure S1) showed this gene cluster was highly expressed in larval organs, but had almost no expression in moth. However, *BmGr41*, *BmGr42* and *BmGr43* were located on unmapped Bm\_scaf444 with a size of 21,432bp. We inferred Bm\_scaf444 should be associated with this gap. PCR results using BAC077B06 as a template verified the location of Bm\_scaf444 in the 22kb gap of chr13 adjacent to *BmGr46*. We infer from a phylogenetic tree that the first+third portions of the gene cluster are evolutionarily older than the central cluster. This suggests the centrally located *Grs* may have been inserted into a domain composed of the first set of *Grs* and *BmGr39*, which is located in the third portion, after which gene duplication events occurred to generate a cluster of 8 *Gr* genes, which are mainly expressed in moth organs.



**Figure S5A. PCR results for *BmGr41*—*43* and *BmGr46* using BAC077B06 as template.** The experiment was conducted using specific primer sets for each gene and then did clones to check the sequence of the products of each primer set. The primer sets are *BmGr41F/BmGr41R*, *BmGr42F/BmGr42R*, *BmGr43F/BmGr43R*, *BmGr46F/BmGr46R* respectively (Table S2).



**Figure S5B. Chromosome mapping of *BmGr41*, *BmGr42* and *BmGr43*.** Sequencing results confirmed *BmGr41*, *BmGr42* and *BmGr43*, which are located in Bmscaf\_444, were in a gap on chr13. Filled boxes show each gene exon and yellow arrows indicate the transcriptional direction.