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**Identification of chromosomal regions associated with segregation distortion of SSR**

**markers and the genes controlling the low-gossypol seed & high-gossypol plant trait of**

***Gossypium sturtianum*.**

**H. Benbouza**, (benbouza@hotmail.com), Agronomy Department, Faculty of Science, Batna

University, Algeria.

F.B. Diouf, Ecole Nationale Supérieure d’Agriculture de Thiès (ENSA), Sénégal

J. Scheffler, (Jodi.Scheffler@ars.usda.gov), USDA-ARS Stoneville, MS 38776 662-686-5219,

USA

O.Konan, Department of Tropical Crop Husbandry and Horticulture. Gembloux Agro Biotech,

Liege University. Passage des Déportés 2, 5030 BE-Gembloux, Belgium

G. Mergeai, (gmergeai@ulg.ac.be), Department of Tropical Crop Husbandry and Horticulture.

Gembloux Agro Biotech, Liege University. Passage des Déportés 2, 5030 BE-Gembloux,

Belgium

Distorted segregation of DNA markers is commonly encountered, especially in inter-specific

crosses. Our main objective in this study was to identify chromosomal regions consistently

associated with segregation distortion in [(*G. hirsutum* x *G. raimondii*) x *G. sturtianum*] (HRS)

hybrid. Segregation distortion skews the genotypic frequencies from their Mendelian

expectations. In HRS progeny, chi square analysis (P < 0.01) showed significant skewed in all

targeted linkage groups c2-c14, c3-c17, and c6-c25. Chromosomal region was regarded as

being associated with skewed segregation, if three or more closely linked markers exhibited

significant segregation distortion in one or more population(s). The targeted introgression

regions in the tested population seem to be favourable for segregation distortion. Segregation

distortion in HRS hybrid progenies differed in male and female gametes. Furthermore, the

data indicated that the environment has strongly influenced the transfer of SSR markers

through microspores. The consistent location of these chromosomal regions in selfed and

backcross of HRS derivatives indicate probably the identification of segregation distortion

regions (SDRs) in HRS hybrid. Comparison with results regarding the segregation distortion

regions obtained in previous research by other authors and results we obtained regarding the

absence of recombinations between BNL3436 and BNL1153 markers mapped on c6-c25

chromosome and spanned by 64 cM on the *G. hirsutum* map, after several generations of

selfing, arise the question of the conservation of the gene order and spacing in *G. sturtianum*.

Results showed that three SSR markers mapped on c6-c25 linkages groups were

systematically transmitted in all selected progenies of the HRS tri-specific hybrid.

Furthermore, the high percentages of loci with significant segregation distortion observed in

this study suppose that a genetic mechanism may exist for preferential transmission of alien

chromosomes segments. High heterozygosity frequencies (+/- 80%) were observed for all

conserved *G. sturtianum* SSR markers, after several generations of backcrossing and selfing,

which indicate that the cytogenetic and genetic conditions for obtaining homozygotes at high

frequency are not met.

Notes: