

研究论文

# 栽培大麦 (*Hordeum vulgare* L.) 与纤毛鹅观草 (*Roegneria ciliaris* (Trin) Nevski) 属间杂种F1、F2和BC1的形态和细胞学研究

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**摘要** 采用幼胚培养技术, 获得了栽培大麦纤毛鹅观草之间的属间杂种。研究了杂种F1, F2和BC1的形态和细胞学特点。结果表明: 杂种形态介于双亲之间, 不同生育阶段其主要特征分别倾向双亲之一。在结实率和主要经济性状上F2和BC1较F1有相当大的提高, 但生育期进展不大。根尖染色体计数和花粉母细胞减数分裂构型分析表明: F1、F2和BC1均为混倍体。F1平均染色体数为22.14条, 其中以28条染色体的细胞所占比例较高。F2和BC1降至16条左右, F2比BC1稍多, 但F2混倍体细胞的百分率极显著地高于BC1, 总趋势是向14条靠近。F1具28条染色体的花粉母细胞减数分裂MI的构型平均值为:

$$1.92I+7.91II+2.08II+1.08III+0.75IV$$

每细胞平均交叉数为22.51。F2和BC1具14条染色体的花粉母细胞MI构型的特点是单价体和棒形二价体较栽培大麦增多, 还有少数多价体出现。减数分裂AI, F2和BC1不正常分裂细胞的百分率分别为37.5%和18.84%, F2显著高于BC1。正常四分体百分率分别为56.7%和78.1%, BC1极显著高于F2。以上情况说明, 杂种的染色体组间实现了遗传物质的交换。自交后代的异质性显著高于回交后代。F2较F1结实率大大提高, 而BC1又高于F2。说明通过连续的自交或回交, 有可能将纤毛鹅观草的某些基因引入到栽培大麦中去。

**关键词** [属间杂种](#), [大副部长](#), [混倍体](#), [染色体排除](#), [遗传物质交换](#)

分类号

## Morphology and Cytology of Intergeneric Hybrid between *Hordeum vulgare* L. and *Roegneria ciliaris* (Trin) Nevski in F1, F2, and BC1

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**Abstract** Intergeneric hybrid between cultivated barley (*Hordeum vulgare* L.  $2n=14II$ ) and *Roegneria ciliaris* (Trin) Nevski, ( $2n=28, SSYY$ ) was successfully obtained by means of embryo culture. The morphology and cytology of the hybrid F1, F2 and BC1 were studied. The results indicated that the hybrid F1 and its progenies were intermediate between the parents in morphology, and the main traits resembled either parent at different development of stages. The main economic characters except growing period were much improved in F2 and BC1 compared with F1. Chromosome counts in root tip cells and the chromosome configurations in PMCs revealed: all the F1, F2 and BC1 were mixoploids. In F1, the average number of chromosomes was 22.14, and cells with 28 chromosomes was few dominant. In F2 and BC1, average number of chromosomes were decreased to about 16, and that of F2 was slightly fewer than that of BC1. The frequency of the mixoploid cells in F2 was much higher than that in BC1. Generally, chromosome number per cell in these progenies tended to be 14. The mean configuration of PMCs at MI in meiocytes with 28 chromosomes was  $1.92I+7.91II+2.08II+1.08III+0.75IV$  in F1. An average of 22.51 chiasmata per cell was observed. The chromosome configuration for the cells with 14 chromosomes in F2 and BC1, showed more univalents and rod bivalents than that in barley, and a few multivalents which were rarely observed in barley. At anaphase I, the frequency of cells with abnormal division in F2 was much higher than that in BC1, being 37.5% for F2 and 18.84% for BC1, respectively. The frequency of normal tetrad in BC1(78.1%) was remarkably higher than that in F2(56.7%). These features suggest that homoeologous syndesis might have taken place between genomes I, S or Y in the F1, i. e. exchange of genetic materials between the genomes might occur in the hybrid, and the degree of chromosome heterogeneity in F2 was much higher than that in BC1. Seed set in F2 was much higher than that in F1, and lower than that in BC1. It is possible that to transfer *R. Ciliaris* genes into cultivated barley by back crossing and selfing in conjunction with embryo culture.

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**Key words** [Intergeneric hybrid](#) [Barley](#) [Mixoploid](#) [Chromosome elimination](#) [Exchange of genetic materials](#)

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