

镜鲤体长、体高、体厚性状QTL定位分析

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摘要 以镜鲤全同胞家系为材料, 用246个SSR和306个SNP标记构建了鲤鱼的连锁图谱, 利用GridQTL软件对体长(SL)、体高(H)、体厚(BT)和体长/体高(SLH)进行了QTL定位分析。结果显示: 共检测到14个相关的QTL, 分布在7个连锁群上。其中, 7个与体长相关的QTL——LG6、LG17、LG21、LG23和LG35连锁群上的QTL为显著水平($P < 0.05$), LG1和LG28上达到极显著水平($P < 0.01$), 可解释表型变异为6.6%~12.6%; 3个与体高相关的QTL均为极显著水平($P < 0.01$)位于LG17、LG23和LG28上, 可解释表型变异分别为11.6%、12.7%和 15.6%; 2个与体厚相关的QTL均为显著水平($P < 0.05$)位于LG23和LG28上, 可解释表型变异分别为8.6%和7.2%; 2个与体长/体高相关的QTL均为显著水平($P < 0.05$)位于LG21和LG35上, 可解释表型变异均为8.2%。

关键词: 鲤 连锁图谱 QTL 体长 体高 体厚

Abstract: Based on a full-sib family, the genetic linkage map was constructed with 246 microsatellite and 306 SNP markers, which was used to detect the QTLs for standard length (SL), body depth (H), body thickness (BT), and the ratio of standard length and body depth (SLH) in mirror carp by GridQTL software. The results indicated that a total of 14 related QTLs distributed on the 7 linkage groups were obtained. Seven QTLs were related to standard length, of which the linkage groups of LG6, LG17, LG21, LG23, and LG35 were at 5% significant level, and linkage group LG1 and LG28 were at 1% significant level, which explained 6.6%—12.6% of the phenotypic variance. Three QTLs were identified for body depth on the linkage groups of LG17, LG23 and LG28 ($P < 0.01$), accounting for 11.6%, 12.7%, and 15.6% of the phenotypic variance, respectively. Two QTLs were associated with body thickness on the linkage of LG23 and LG28 ($P < 0.05$), which explained 8.6% and 7.2% of the phenotypic variation, respectively. Two QTLs were responsible for the ratio of standard length and body depth on the linkage of LG21 and LG35 ($P < 0.05$), both of which explained 8.2% of the phenotypic variance. The results provide a useful reference for further candidate gene research and molecular marker as-sisted selection in mirror carp.

Keywords: mirror carp (*Cyprinus carpio* L.), genetic linkage map, QTL, standard length, body depth, body thickness

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