



*Research Paper*

## CORRELATION BETWEEN VITELLOGENIN RECEPTOR GENE EXPRESSION AND FECUNDITY IN SILKWORM, *BOMBYX MORI*

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### ABSTRACT

Insect vitellogenin receptor (VgR) belongs to the low-density lipoprotein receptor (LDLR) gene superfamily and plays a critical role in oocyte development by mediating the endocytosis of the major yolk protein, vitellogenin (Vg). However, the extent of *VgR* expression level playing a role in determining the fecundity among various genotypes is less known. Herein, we show the transcriptional expression of *Bombyx mori* *VgR* in various developmental stages of ovary by RT-PCR and *in situ* hybridization. The *VgR* expression levels were found to be high in pre- and vitellogenic phases of the ovary and declined in the post-vitellogenic phase. Further, using TaqMan Real Time PCR, we determined the mRNA expression levels of *VgR* gene among different strains of silkworm. The *VgR* gene expression levels were measured among 17 silkworm genotypes, in which high transcript levels were observed in BBE0213, BB10255, BBE0244, BBI0293, BBI291, BBE0247, BBI0325, and BBI0290 among bivoltine strains and in a multivoltine strain, BMI0007. These breeds are high yielders in terms of fecundity ( $\geq 500$ ) whereas, the rest 7 low yielders ( $< 500$ ) showed lower *VgR* expression levels. The highest expression level was seen in BBE0213 with correspondingly high fecundity of 590 followed by BBI0255 whose fecundity was 572. Overall, the differential expression levels of *VgR* in silkworm strains were found to be correlated with that of fecundity; a high *VgR* transcript level leads to high fecundity. In addition, comparative expression levels of *VgR* transcripts had revealed better manifestation in bivoltine silkworm strains than multivoltine strains indicating their importance in egg production. Our results clearly indicate that the *VgR* gene is a potential target for better egg production strategies in sericulture.

**Key words:** *Bombyx mori*, fecundity, gene expression, vitellogenin receptor.