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The endocrine function of germ cells directly regulate body composition in fish

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This study evaluates the interactions between body composition and reproduction between male and female tilapia (*Oreochromis mossambicus*). Reproductive organs are known to be important organs for somatic growth, but direct evidence for their role is not available elsewhere. Here, using a fish model, we report direct evidence that gonads are endocrine organs equal to the pituitary in controlling body growth. Gonadal loss of function, gain of function and rescue of growth were investigated. Gonadectomy significantly retarded body composition; however, this retardation was rescued by the implantation of extirpated gonads in the body cavity. GH is classically associated with pituitary and IGF-1 is the liver. This study clearly exhibit that both hormones are expressed as mRNA and protein in the testis and ovary. GH was expressed in the sertoli cells of testis and in the granulosa and fibroblast (thecal) cells of ovary. Real time-PCR and enzyme linked immunosorbent assays (ELISA) were used to measure changes in the rate of synthesis growth hormone (GH), insulin like growth factor-1 (IGF-1) and sex steroids in sham operation, gonadectomy and ectopic transplanted fish. After the 50 days post-surgery, gonadectomized fish had significant lower body weight then sham-operated fish. The gonadectomized fish did not exhibit advancement of spermatogenesis and oogenesis; thus prevention of sexual maturation by gonad removal was accompanied by retarded body growth. Measurement of sex steroid hormones 11-ketotestosterone (11-KT) in males and es-tradiol-17 β (E2) in females decreased significantly in gonadectomized fish and concentrations in fish with ectopically transplanted gonads recovered to the same level as those in sham operated fish. Gonadal GH, sex steroids and advancement of spermatogenesis and oogenesis at the auto-transplanted site suggests that in addition to pituitary, gonads are major participants in the regulation body growth in tilapia.

Biography

Sandip Bhatta has completed his Master's degree and PhD in Agriculture Sciences from United Graduate School of Agriculture Sciences (UGAS), Ehime University, Japan with major 'Bio-resource production sciences' specialized in Fisheries Research under supervision of honorable Professor Takeshi Miura. Currently, he is joining a Fisheries Research Program at Nepal Agriculture Research Council.

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