Infection by the cestode Schistocephalus solidus increases GnRH – and GTH mRNA levels in the three- spined stickleback, *Gasterosteus aculeatus*

Yi Ta Shao[1], Yung Che Tseng[2], Susanne Trombley[3], Pung Pung Hwang[2], Monika Schmitz[3] and Bertil Borg[1]*

[1] Department of Zoology, Stockholm University, Stockholm, Sweden, [2]Institute of Cellular and Organismic Biology, Academia Sinica, Taipei, Taiwan, [3] Department of Comparative Physiology, Evolutionary Biology Centre, Uppsala University, Uppsala, Sweden.

The tapeworm, *Schistocephalus solidus,* is a common parasite in three-spined sticklebacks (*Gasterosteus aculeatus*). The infection can have severe consequences for sexual maturation. The aim of this study was to investigate the impact of parasite infection on the brain-pituitary-gonadal (BPG) axis. To that end, the mRNA levels of gonadotropin (GtH) and gonadotropin releasing hormone (GnRH) were measured via Q-PCR. mRNA levels of salmon GnRH were higher in infected fish than in healthy fish in both sexes, but no difference was found in cGnRH II expression levels. The mRNA levels of both FSH-β and LH-β were significant higher in infected males than unifected males. In females, FSH-β mRNA level was higher in infected individuals than others, but there was no difference found in LH-β expression. The inhibitory effect of *Schistocephalus* on reproduction in this species appears not be caused via inhibition on the brain/pituitary level in the BPG axis. The above effects may be due to compensatory feedback mechanisms when the parasite suppressed gonadal development.