

**Abstract:** Mating decisions and parental care may have a significant impact on reproductive success in many organisms. This thesis evolves around mating and parental care in a small marine fish, the two-spotted goby *Gobiusculus flavescens*. It is a common inhabitant of shallow waters around the European coastline and the male provides exclusive parental care. A number of factors, both environmental and social, may affect mating decisions and parental care in this and other species.

Although females often are referred to as the choosy sex and males to be indiscriminate, males are not always unselective. I tested whether male two-spotted gobies preferred larger females. Males that were allowed to choose between small and large females only displayed a weak preference for large females even though large females produce more eggs and hence should give the male a higher reproductive success. However, the evolution of mating preferences require sufficient variation in the preferred character for a preference to evolve and female two-spotted gobies have a very low coefficient of variation in fecundity and it was suggested that this limits the potential benefits male two-spotted gobies may gain from being selective. The thesis also explored how male courtship and mate choice was affected by a naturally occurring microsporidian parasite and by previous mating experience. The results showed that parasitized males did not court at the same rate as unparasitized males did, while previous mating experience had the opposite effect. Males that had mated with a female, and thus had eggs in their nest, increased their courtship dramatically. I suggested that the reason for this was to obtain additional egg clutches as soon as possible, as males could care for several at the same time, and simultaneous clutches should lower the caring cost per clutch. Mate choice, on the other hand, was unaffected by parasites and mating experience.

Reproductive success of male two-spotted gobies is not only about successful mating, but also about caring for the offspring. In the thesis, I experimentally tested how males traded mating effort against parental effort in situations where they were guarding eggs. In the experiment, some males had visual access to additional potential mates. There appeared to be a trade-off between mating effort and parental effort, but this did not affect the hatching success of offspring in the laboratory. Furthermore, males did not take advantage of the situation and consume their offspring (filial cannibalism) to larger extent than other males, unlike what has been reported in other species.

As parental care may be a costly activity for the caretaker, the thesis examines how a parasitic infection that affects the muscle tissue could influence parental care. Interestingly, parasitized males were equally good at caring for their eggs as uninfected males and both parasitized and unparasitized males experienced a similar hatching success in the laboratory.

In summary, male two-spotted gobies have proven to be a good model for investigating mating behaviour and parental care. In this thesis, I have tested how these behaviours are affected by parasites, mating experience and mate availability. It shows that animal behaviour, in particular courtship can be dynamic and vary depending on prevailing conditions, probably to maximise the individual's reproductive success.

Inst. för Marin ekologi, Göteborgs universitet  
Göteborg 2004  
ISBN 91-89677-11-0  
Printed in Sweden  
Vasastadens Bokbinderi AB, Göteborg

Cover illustration: Male two-spotted goby  
guarding his blue mussel nest with eggs.  
By Annika Rockström