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Observations of the Copulatory Behaviour of the Ocean Pout, *Macrozoarces americanus*

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The Ocean Pout (*Macrozoarces americanus*) is a common species of eelpout found off the coast of Newfoundland. It has previously been suggested that the Ocean Pout is an internally fertilizing species but no direct observations of this have been reported. What is thought to be the first observation of the copulatory behaviour of mature Ocean Pout in the wild is described here. Similar behaviour was videotaped under laboratory conditions.

Key Words: Ocean Pout, *Macrozoarces americanus*, copulation, Newfoundland.

The Ocean Pout (*Macrozoarces americanus*) is one of 15 known species of eelpout (Zoarcidae) reported to occur in the waters of the Canadian Atlantic (Scott and Scott 1988). The Ocean Pout is a benthic species which typically inhabits the Shelf regions of the North West Atlantic (Anderson 1985). Ocean Pout move inshore during the spring, pair during the summer and spawn in late summer and autumn (Keats et al. 1985; Methven and Brown 1991). This species is thought to be oviparous because its egg mass typically consists of relatively few but large eggs (Anderson 1985). Female Ocean Pout exhibit parental care during the 2.5–3 months incubation period by fanning the egg mass to increase water flow around it and by protecting it from predation (Keats et al. 1985; Methven and Brown 1991). Although nesting and egg guarding has been previously observed in the Ocean Pout, direct field observations on reproduction (particularly copulation) have not been reported.

What we believe to be the first field observation of the copulatory behaviour of mature Ocean Pout

was observed at approximately 11:30 a.m., 29 August 1992, while SCUBA diving at St. Phillip's, Newfoundland (47° 35'N, 53° 57'W) at a depth of approximately 12 m. The substrate at this location consists mainly of large boulders and scoured bedrock with extensive sandy patches. The pout were observed on a large (approximately 10 m in diameter) sandy patch, surrounded by large rocks imbedded in the substrate. There was no vegetation in the immediate area and the pout were observed to be at least 10 m from any potential nesting site(s). This fact is interesting in that it has previously been thought that Ocean Pout do not mate outside of the burrow or nest site.

The fish were sexed based on sexually dimorphic characteristics. Size was estimated to be 50 cm (female) and 45 cm (male). The fish were stationary on the substrate in a ventrum to ventrum position. The male was lying on its side, with the dorsal surface at a 45° angle to the substrate. The female was in a superior position (i.e., with its ventral surface at a 45° angle to the substrate). The pectoral fins were crossed at the

base (i.e., interlocked) and the tails were coiled together. The male exhibited quick successive lateral movements of the head (quivering) while arching its dorsal surface (forcing the ventral surfaces together). The behaviour was observed for several minutes until the female broke off the coupling.

Mating behaviours were also captured on videotape in a group of broodstock Ocean Pout held at the Ocean Sciences Centre. A group of six Ocean Pout were videotaped in a 1.25 m x 1.25 m tank on 13 to 14 August 1992. The videotapes revealed that male and female Ocean Pout do indeed make ventrum to ventrum contact while mating, and their elongate tails do coil and wrap around each other. The interlocking of pectoral fins while making ventral contact was also seen on the videotapes. These behaviours were observed to occur in artificial crevices (sections of 20 cm pipe) unlike the field observations which took place in an open clearing. However, the relatively high stocking density in the tank may account for the use of the pipes. In the rearing tank, fertilized eggs were recovered, suggesting that species-typical mating behaviour had occurred.

It has been suggested that Ocean Pout are internal fertilizers and require this form of copulatory behaviour to ensure insemination. This speculation is derived from a number of physiological observations and characteristics of the Ocean Pout. Yao and Clearwater (personal observations) have found that there is a dramatic decrease in the motility of the Ocean Pout's sperm when it comes in contact with seawater. In addition, male pout produce very few sperm (relative to other marine fish species) and the tails of the sperm are quite long, suggesting sperm have to travel relatively long distances in order to reach potential eggs for fertilization. Demersal spawning species, unlike Ocean Pout, typically have

large numbers of sperm which are characterized by short tails. Since eggs and milt of these species are mixed in the water column, long distance swimming bouts are not required. Therefore, both laboratory and field observations provide evidence supporting internal fertilization as the means of reproduction in the Ocean Pout.

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