

**DIRECT EVIDENCE THAT 7 α ,12 α ,24-TRIHYDORXY-5 α -CHOLAN-3-
ONE 24-SULFATE FUNCTIONS AS A MALE ATTRACTANT IN THE
SEA LAMPREY *PETROMYZON MARINUS***

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EXTENDED ABSTRACT ONLY – DO NOT CITE

The sea lamprey (*Petromyzon marinus*) is a member of superclass Agnatha, and one of the earliest evolving vertebrates still alive today. Previous research has established that sexually mature sea lampreys rely on sex pheromones to communicate among individuals of opposite sex. Recently we have found that male sea lampreys release a potent sex pheromone, 7 α ,12 α ,24-trihydroxy-5 α -cholan-3-one 24-sulfate (3 keto-petromyzonol sulfate; 3KPZS) upon spermiation. This compound appears to induce preference behavior and locomotion in ovulating females under controlled laboratory conditions. It has yet to be demonstrated that a synthetic copy of 3 KPZS stimulates the olfactory organ and induces characteristic behaviors in ovulating females. To provide direct evidence that synthetic 3-keto petromyzonol sulfate functions as a sex pheromone in a natural spawning environment, we first used electro-olfactograms (EOG) to determine the detection thresholds and dose response curves of the synthetic pheromone. Then in a section of spawning stream we observed the behavioral response of ovulating females to the synthetic pheromone (at concentrations determined by EOG experiments). EOG results showed that the synthetic pheromone is detected at approximately 10⁻¹² M. When introduced into the spawning stream section, ovulating females swam to and stayed at the source of the synthetic pheromone. We conclude that synthetic

3 keto-petromyzonol sulfate functions as a sex pheromone in a natural environment at concentrations that are likely to be encountered in the wild.

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