バラタナゴのスニーカー雄はどのようなタイミングで産卵前放精を行うか

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要約

貝に産卵するバラタナゴ *Rhodeus Ocellatus* では、ペア産卵とグループ産卵が観察される。

スニーカー雄は、しばしば雌の産卵の前に放精する(Kanoh1996)。

本研究では、スニーカー雄の産卵前放精のタイミングを調べるために、縄張り雄の保守的行動(侵入個体に対する行動)の時間間隔とその頻度を計測した。

その結果、特徴的な相の性質として、3 つのタイプの行動分布を得た。

1)ナワパリ形成期における周期的な分布、

2)安定期における確率的な侵入による指数分布、

3)ナワパリ崩壊期におけるベキ分布である。

このベキ分布は頻度順にランクをとり両対数で表わすとき、指数 D＝1 のジップの法則に従った。

また、ナワパリ崩壊期には、縄張り雄の防御率の低下と雌に対する追い払い率の増加がみられ、この時期にスニーカー雄の産卵前放精が頻繁に行われていることが明らかになった。

このジップの法則に従う縄張り雄の行動は、縄張り雄の雌雄に対する判定の不定さが増す時に現われ、その時期はスニーカー雄の産卵前放精のタイミングとよく一致した。

Territorial male behavior conforming to Zipf's law during a territorial breakdown

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Abstract

In the rose bitterlings *Rhodeus ocellatus*, which spawn into mussels, pair and group spawnings were observed. Sneaker males often performed pre-oviposition ejaculation (ejaculating movement by male before female egglaying; Kanoh. The relative success rate of territorial males versus sneaker males, on an individual basis, was negatively correlated with male density. It looks like an adaptable behavior when the territorial males abandon their own territories triggered by increasing of the male density. In this study to exalnine timing of sneaker male ejaculation, I counted the time interval between conservative behaviors (reaction to other individuals) of territorial male and its frequency. I obtained three types of behavioral distribution as the characteristic of a particular phase; Ⅰ) periodic distribution as a result of short chasing movements in a formative phase of the territory, Ⅱ) exponential distribution as a result of conservative movements toward invaders andlor females coming into the territory with a constant probability in a stable phase of the territory, Ⅲ) power law distribution with exponent D=1, which is called Zipf's law, in a break-down phase of the territoty. Also in the break-down phase, a decrease in defensive rate and a increase in ejaculation frequency of sneaker males were observed. Gunji et al. proposed a model rest upon the autonomous alternation of generation and degeneration of information. In the model exact and universal 1/f noise or distribution exactly conforming to Zipf's law occurs independent of the notion of phase space. It shows that it looks as if phase transition in a phase space proceeded, while there is no well-defined order parameter. The behaviors in the break-down phase, can be attributed to indefiniteness of information possessed by the territorial males in the local situations.