

## A Temperature-Dependent Index of Mitotic Interval ( $\tau_0$ ) in Greenling, *Hexagrammos otakii*

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### Introduction

The greenling, *Hexagrammos otakii* Jordan et Starks, is a member of the typical seawater Hexagrammidae and an commercially important greenling species. In this study, we determined temperature-related cleavage rates or mitotic intervals, measured as the "Dettlaff unit" ( $\tau_0$ ) for greenling in order to establish the efficient procedures for chromosome manipulation.

### Materials and Methods

Egg incubation temperatures were maintained using temperature controlled water baths set at 5, 10, 15, 20 and 25 °C. The time (minutes from activation) when approximately 10% of the developing embryos reached the 2 ( $\tau_{II}$ ) and 8 ( $\tau_{III}$ ) cell stages was recorded. The value of 10% was selected based on the recommendation of Ignatyeva. Mean mitotic cycle intervals ( $\tau_0$ ) were calculated as  $\tau_0 = (\tau_{III} - \tau_{II}) / 2$ . The relationship between mean mitotic intervals and water temperature was examined by simple linear regression using SPSS.

### Results and Conclusions

At higher temperatures, eggs developed faster and underwent more identical development.  $\tau_0$  for greenling were 341.13.60 min at 5 °C, 275.54.53 min at 10 °C, 189.76.93 min at 15 °C, 99.28.27 min at 20 °C and 34.28.74 min at 25 °C. There were strong, negative correlations between  $\tau_0$  and water temperatures for all five temperatures application ( $Y = 79.3X + 425.3$ ,  $R^2 = 0.9968$ , where Y is mitotic interval and X is temperature) (Fig. 1).

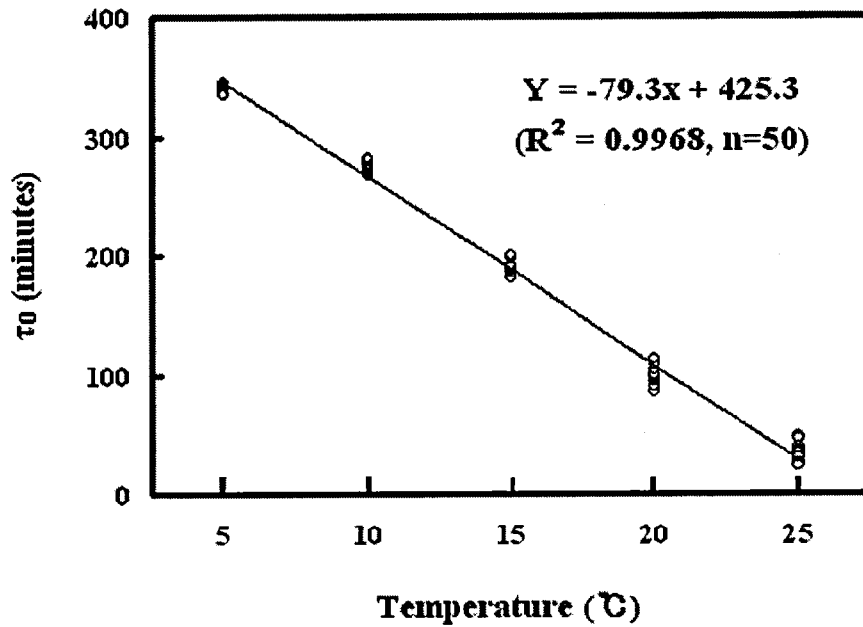


Fig. 1. Mitotic intervals ( $\tau_0$ , Y) for greenling as functions of temperature (X). The temperatures used are within the normal range for spawning and early development in this species. Eggs from three female were fertilized with pooled sperm from five males and were distributed among the temperature treatments.

#### References

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