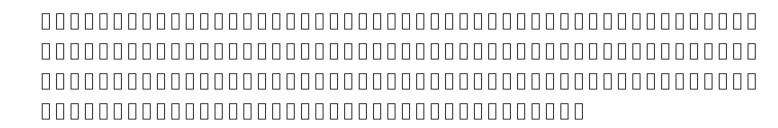
Effects of temperature, salinity, illumination and Cu²⁺ on o xygen consumption of juvenile Chinese sturgeon *Acipenser sinensis*

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Abstract

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The oxygen consumption rate (OCR) of juvenile Chinese sturgeon Acipenser sinensis (Body weight, range 5 - 32 g) were determined under different environmental conditions, including water temperature, salinity, illumination intensity and metal ion concentration [Cu 2+ ] by single factor experimental analysis. OCR and opercula frequency (
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```
OF
) increased with rising of water temperature
. The
linear relationships between water temperature (
WT
) and
OF
with
OCR
can be described as
OCR
= 0.018
WT
+ 0.016 (
R
2
= 0.988,
P
< 0.01),
OCR
= 2.737
OF
+ 77.726 (
R
2
= 0.64,
P
< 0.01), respectively. The acute exposure experiments showed
that the
OCR
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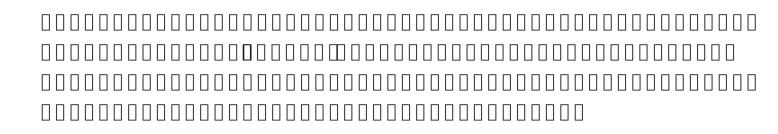
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also increased initially with an increase in salinity. The linear
relationships between salinity (
S
) and
OCR
can be described as
OCR
= 8.1 \times 10
-5
S
3
-3.01 \times 10
-3
S
+ 0.0263
S
+ 0.2729 (
R
2
= 0.995,
P
< 0.01). Three days of acclimation to different salinities, the
OCR
s decreased sharply relative to the first day exposure values.
The equation
OCR
= -6.29 \times 10
-4
S
```

```
+0.0238
S
+ 0.2797 (
R
2
= 0.988,
P
< 0.01) illustrates the linear relationship between salinity and
OCR
s after
3-day exposure. After 3-day acclimation, the
OCR
s increased also with increasing light intensity, except for the
ambient light group (
i.e., 2000 lx) and the group exposed to direct sunlight (i.e.,
20000 lx). After 1-day exposure to different Cu
2+
concentrations (
C
), the
OCR
s decreased rapidly in all of the groups. But the
OCR
level being gradually different with the increasing of Cu
2+
concentration,
OCR
= 0.237
e - 0.09
C
```

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(
R
2
= 0.898,
```

< 0.01). The results provided us with some useful guide lines which may apply into protection and cultivation management of this endangered species.

Keywords: Chinese sturgeon, *Acipenser sinensis*, Opercula frequency, Oxygen consumption rate, Temperature, Salinity, Illumination, Cu



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