Other problems involved in cage culture are clogging, fouling and autoentry. Out of these, the first two problems could be solved through periodical cleaning of the cage wall using a brush. Similarly the problem of autoentry could be solved to a certain extent by the periodical removal of the autoentered fin and shellfishes using scoop net or hand net.

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Effect of bacterial ulcer on the haematology of *Channa punctatus* (Bloch.)

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Haemoglobin concentration and RBC count were made in control and ulcerative *Channa punctatus*. Bacterial ulcer caused an abrupt decrease in the number of erythrocytes along with reduction in the amount of haemoglobin. The loss of water from the plasma and tissue via wound proved to be anti haemopoietic and a reason behind fish death.

Like all animals, fishes have their full complement of disease and parasites and of abnormalities both malignant and benign. The ulcerative fish disease in epizootic form in some areas of Eastern Indian states such as Tripura, Meghalaya, Assam and West Bengal was reported in May 1988. The disease severely affected almost all districts of West Bengal. Later the disease also spread to Orissa, Bihar, UP, Sikkim, Manipur and Nagaland.

Two fluorescent pseudomonads (R1 and R2), one aeromonad, *Aeromonas hydrophila* (R3) and *Micrococcus* variant (C) were isolated from the ulcer tissue of air-breathing fishes. Other workers also studied the cause of ulcer and its effects on fishes.

Two fluorescent pseudomonads (R1 and R2), one aeromonad, *Aeromonas hydrophila* (R3) and *Micrococcus* variant (C) were isolated from the ulcer tissue of air-breathing fishes. Other workers also studied the cause of ulcer and its effects on fishes. The findings and views of earlier workers are not uniform and scanty work has been done on the haematological alterations in fishes due to ulcer. Hence, it seems necessary to study the changes in haematological parameters of fish due to ulcer on its induction.

The commonly available freshwater teleost, *Channa punctatus* was used as experimental animal, since this fish along with others was found to suffer from ulcer. Fishes were collected from ponds and swamps of Darbhanga. Care was taken to collect healthy and infected specimens. The healthy fishes were acclimatized in the laboratory aquarium for a fortnight with proper supply of fish-feed. The ulcer was induced in healthy fishes keeping a few ulcerative fishes amongst healthy ones. Blood was collected in a plastic syringe using EDTA as an anti-coagulant directly from cauda dorsalis. Haemoglobin was estimated by acid-haematin method. Erythrocyte count was made by Thoma Zeiss haemocytometer.

The weight of healthy males was 47 ± 7 g. In these, the haemoglobin content was 14.99 ± 0.328 g% and the RBC count was 4.1016 ± 0.178 × 10⁶ mm⁻³. The ulcerative males weighed 48.8 ± 0.55 g. The haemoglobin content and RBC count were 7.65 ± 0.221 g% and 1.8222 ± 0.157 × 10⁶ mm⁻³ respectively. Ulcer caused an abrupt and significant fall in the level of haemoglobin as well as in the number of erythrocytes (Table 1).

The control and ulcerative female specimens weighed 50 ± 0.65 g and 52.8 ± 0.67 g respectively. The haemoglobin content and number of RBC recorded in healthy fishes were 13.21 ± 0.203 g% and 3.7085 ± 0.221 × 10⁶ mm⁻³ respectively. In ulcerative females the haemoglobin content was 5.56 ± 0.296 g% and RBC count was 1.729 ± 0.159 × 10⁶ mm⁻³.

Thus both haemoglobin and RBC count followed the same pattern as in the case of male specimens. The haemoglobin content and RBC count were higher in males than in females. However, the decreasing trend was similar in both the sexes.

Since the haemoglobin content of blood is directly related to the number of erythrocytes, in the present investigation the number of erythrocytes fell to a great extent. Thus, erythroplaenia in the present work might be the reason behind the decrease in the concentration of haemoglobin.
Table 1. Effect of bacterial ulcer on haematology of Channa punctatus

<table>
<thead>
<tr>
<th>Specimen</th>
<th>Sex</th>
<th>Weight (g)</th>
<th>Haemoglobin (g%)</th>
<th>RBC (10 mm$^{-3}$)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Healthy</td>
<td>Male</td>
<td>47</td>
<td>0.734</td>
<td>14.99</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>50</td>
<td>0.651</td>
<td>13.21</td>
</tr>
<tr>
<td>Ulcerative</td>
<td>Male</td>
<td>48</td>
<td>0.534</td>
<td>7.65</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>52</td>
<td>0.677</td>
<td>5.56</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4.1016</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.7085</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.8222</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.7291</td>
</tr>
</tbody>
</table>

Possibly loss of water from the plasma to the tissue or haemopoiesis resulted in reduction of the production of erythrocytes.


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Sd/-
(Dr. J. Nagaraju)
Deputy Director