Pigmentation in the Elvers of the Japanese Eel.*

Since 1969, elvers of the European eel (Anguilla anguilla) have been imported in large numbers into Japan from France as seeds for eel culture. Morphological and physiological comparisons between the elvers of the Japanese eel (Anguilla japonica) and those of the European eel (hereafter abbreviated as EJE and EEE, respectively) are therefore of considerable scientific and practical interest. In this study, the anatomies of EJE and EEE were compared and distinct differences in the process of pigmentation in the early stages of elvers of the two species were found.

In EEE, the process of pigmentation has been studied in detail by European workers and the extension of the pigment is known to be useful in classifying the successive stages of metamorphosis1). On the contrary, no work of this kind has been done for EJE.

On the basis of observations made on many specimens, the author could divide EJE into the following stages according to the extension of pigment.

<table>
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<th>Stages</th>
<th>Pigmentation</th>
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<td>I.</td>
<td>Pigmentation only occular.</td>
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| II.    | a - Nerve-cord pigmentation anterior.  
|       | b - Nerve-cord pigmentation more extensive. Cerebral nerve-cord pigmentation. |
| III.   | Nerve-cord pigmentation reaching the end of the tail. Cephalic cutaneous pigmentation above the skull and in the snout. |
| IV.    | a - Caudal fin and dorso-lateral caudal cutaneous pigmentation.  
|       | b - Cephalic cutaneous pigmentation more extensive, extending to the tip of the lower jaw and the cheek. |
|       | a - Dorsal cutaneous pigmentation at the back of the head and along the base of the dorsal fin.  
|       | b - Dorso-lateral cutaneous pigmentation to the limits of the muscular segments.  
|       | c - Dorso-lateral cutaneous pigmentation, generalized. |

In the European eel, nerve-cord pigmentation begins to form at the posterior part in the first semi-larval stage and develops from the tail towards the head, reaching the latter in the third or last semi-larval stage, viz., the pre-elver stage. Cutaneous pigmentation in the caudal fin starts to take place in the second semi-larval stage, and invades all the caudal fin in the last stage. Accordingly, the elvers have in the initial stage well-developed pigment spots all over the nerve-cord and in the caudal fin. Subsequently, caudal and cephalic cutaneous pigment spots begin to appear, each developing into a sharply-outlined, distinct spot.

On the contrary, in EJE at the initial stage, no pigment spot is found on the nerve-cord, caudal fin, or in any other part of the body, except for the eyeball. In the following stage nerve-cord pigmentation starts to form in the anterior part and extends towards the tail, in direct contrast to EEE. Cutaneous pigmentation occurs first on the head and afterwards in the caudal fin and simultaneously at the extremity of the tail. Cutaneous pigment spots at the top of the head and in the caudal fin are rather inconspicuous, however, in comparison with those of EEE.

These differences in pigmentation are useful in distinguishing between the elvers of the Japanese eel and the European eel.

Reference


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* ニホンウナギのシラス期における色素沈着
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