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Fluorescence microscopy in estimation of organic matter maturation

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In fluorescence microscopy spectral wavelength (\(\lambda_{\text{max}}\)) of light emitted by excited palynomorph is considered for maturation level estimation. Case study of subsurface samples studied from well E-A of Bengal Basin has been illustrated. \(\lambda_{\text{max}}\) recorded from palynomorphs is correlated with the other two parameters: mean vitrinite reflectance and thermal alteration index recorded from the same samples.

QUANTITATIVE spectral wavelengths are measured on MPV-3 fluorescence microscope. Pollen, spores and other organic matter are excited with ultraviolet light of spectral wavelength range 200–400 nm and examined under the microscope to observe fluorescence colours in


Figure 1. Location map of studied well in Bengal Basin
Figure 2. Spectral wavelength curve and maturation levels in well E-A.

Table 1. Spectral wavelength ranges and maturity levels in well E-A

<table>
<thead>
<tr>
<th>Depth (m)</th>
<th>Formation</th>
<th>Age (after Mathur et al.1)</th>
<th>Spectral wavelength range (nm)</th>
<th>Mean vrR (after Thomas et al.2)</th>
<th>TAI (after Mathur et al.1)</th>
<th>Maturity levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-850</td>
<td>Ranaghat</td>
<td>Pleistocene</td>
<td>460-540</td>
<td>No data</td>
<td>1.5</td>
<td>Immature</td>
</tr>
<tr>
<td>850-2725</td>
<td>Ranaghat</td>
<td>Late Miocene to Early Pleistocene</td>
<td>540-560</td>
<td>No data</td>
<td>1.5-1.75</td>
<td>Immature</td>
</tr>
<tr>
<td>2725-3900</td>
<td>Matla</td>
<td>Middle to Late Miocene</td>
<td>560</td>
<td>0.42</td>
<td>1.75</td>
<td>Immature</td>
</tr>
<tr>
<td>3900-4450</td>
<td>Diamond Harbour</td>
<td>Oligocene to Early Miocene</td>
<td>560-570</td>
<td>0.44-0.45</td>
<td>1.75-2.25</td>
<td>Immature</td>
</tr>
<tr>
<td>4450-4700</td>
<td>Memari</td>
<td>Oligocene</td>
<td>570</td>
<td>0.45-0.46</td>
<td>2.25</td>
<td>Immature</td>
</tr>
<tr>
<td>4700-4770</td>
<td>Kupli/Sylhet</td>
<td>Late Eocene</td>
<td>570-585</td>
<td>0.47-0.48</td>
<td>2.25 (+)</td>
<td>Immature</td>
</tr>
<tr>
<td>4770-5074</td>
<td>Sylhet</td>
<td>Middle Eocene</td>
<td>585-590</td>
<td>0.48-0.50</td>
<td>2.25 (+)-2.5</td>
<td>Early phase of maturation</td>
</tr>
</tbody>
</table>
Evidence for the role of wavelengths of light on the reproduction of wild male bird, black-headed munia *Munia malacca*

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Effects of different wavelengths of light (red and blue) and continuous incandescent light (LL) were studied in the seasonal reproduction of black-headed munia. While almost normal gonadal cycle was observed both in red and blue light treated groups, it was abolished under continuous incandescent light. Although red light failed to mimic the effects of continuous light, it could delay the gonadal regression for two months, indicating a better photoperiodic effect than blue light.

REPRODUCTION in most wild birds is known to be regulated by one or more environmental factors. Photoperiod is one such factor which has drawn maximum attention of the avian biologists\(^1\). However, only one aspect of avian photoperiodism, i.e. daylength has been studied in detail. Importance of wavelength has been studied only in very few species and the reports available on this aspect to date are restricted to domesticated species\(^2\). Particularly on wild birds, not a single experimental study has been made. It was therefore considered useful to study the importance of wavelength, if any, in black-headed munia, *Munia malacca* in which reproduction is known to be regulated by daylength\(^3\).

During the first week of December 1989, adult black-headed munia were procured from a local bird supplier and were acclimatized to laboratory conditions for 14 days. The birds were then sexed by laparotomy and only males were used in the experiment. Four groups of 9 each were established in separate wirenet cages (20 x 16 x 14 inches). Birds of group 1 were exposed to continuous illumination (LL) of white incandescent light. Group 2 birds were exposed to red light (RL) through a monochromator filter (wavelength, 760 nm) every day for 6 hours (from 10.30 to 16.30 hour of the day). Group 3 birds were exposed to blue light (BL) through another monochromator filter (W. L. 420 nm) every day for the same duration. These two groups received white incandescent light for the remaining 18 hours of the day as LL group. Group 4, receiving normal day length (NDL) served as a control group. The study was continued for more than one year covering a complete reproductive phase and was terminated in February 1991. Every month the left testis of each bird was measured in *situ* and the gonadal volume was


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