Figures 1 and 2. 1. Infected leaf showing typical mosaic symptoms, and 2. Electron micrograph of virus particles (× 50,000).

zation of the virus are in progress. This is the first record of a virus disease in betelvine in India or elsewhere.

21 December 1987; Revised 14 April 1988


EFFECT OF RAPE-SEED MEAL ON THE LONGEVITY OF ZAPRIONUS PARAVITTIGER (DIPTERA)

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Aging is greatly influenced by a wide range of factors of which nutrition is of prime importance. Various components of diet affect the longevity of different organisms\(^1\). Rape-seed, an unconventional dietary source, contains about 40% oil and yields a supplement containing about 38% protein\(^2\). However, the presence of glucosinolates and myrosinase enzyme limits its utilization\(^3\). The present communication deals with the effect of rape-seed meal (RSM) on the longevity of banana fruitfly, Zaprionus paravittiger.

\(Z.\) paravittiger flies were reared at 26 ± 2°C on standard corn mean agar (CMA) medium\(^4\). Seeds of \(Brassica\) campestris were cleaned, crushed and extracted by soxhlet using petroleum ether (b.p. 60–80°C). The meal was dried (60–70°C; 6 h) and substituted for yeast granules and maize powder. The percentage composition of the experimental media containing RSM, brown sugar and corn starch was RSM I–0.9 (0.3% protein), 1.8, 0; RSM II–1.4 (0.5% protein), 4.1, 0; RSM III–1.4 (0.5% protein), 4.1, 2.9 respectively, the rest of the ingredients being the same as in the standard medium. The flies of the control group were fed continuously with CMA medium throughout their development as well as adulthood. Correspondingly, the flies of
the above test groups were fed with respective RSM media. Life table analysis was carried out from the daily record of the survival and death.

The median (LT₅₀) and maximum (LT₁₀₀) life spans (the mean number of days when 50 and 100% individuals of the population were dead) of flies fed with CMA medium (0.5% corn protein) were 40 and 84 days for males, and 41 and 87 days for females respectively. The effect of RSM on the longevity of both sexes of banana fruitfly is shown in figure 1. The RSM I (0.3% RSM protein) feeding to flies resulted in decreased longevity, viz. 57.8, 57.1% of control for male, and 54.4, 58.6% for female median and maximum life spans respectively. Such decrease in the longevity may be due to dietary carbohydrate and protein deficiency. The RSM II (0.5% RSM protein) resulted in 17.6 and 7.1% increase for males, and 24 and 6.9% for females LT₅₀ and LT₁₀₀ respectively. The effect was even more pronounced with RSM III (0.5% RSM protein + 2.9% corn starch) feeding.

The increased longevity observed due to balanced RSM feeding to flies can be attributed to its high protein as well as mineral content. It is suggested
that RSM does not have any toxic influence on longevity of the flies when provided in the appropriate proportions with carbohydrates. This may be because the insect has a detoxification mechanism or the enzyme myrosinase is inactive in the insect. Such a suppression of toxic effects of RSM-glucosinolates is interesting in the insect system and requires further study.

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OCCURRENCE OF MULTIPLE PERFORATION PLATE IN THE VESSEL ELEMENTS OF CALAMUS (LEPIDOCARYOIDAE)

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The type of perforation plate of tracheary elements plays an important role not only in phylogeny and taxonomy but also in efficiency and safety of water conduction in seed plants. Monocotyledons particularly palms received relatively little attention of anatomists to examine the vessel perforation plates. According to Cheadle, vessel members with simple perforation plates are the most specialized and those vessel members with long scalariform plates are the most primitive. Based on the perforation plate character, chamaedoreoid and iriarteoid palms are considered to be “least specialized”; the arcoide, nypoid and phoenicoid palms to be “unspecialized”; the caryotoid, cocsoid, coryphoid and scandent lepidocaryoid palms to be “moderately specialized” and the borassoid and scandent lepidocaryoid palms to be “most specialized”. Tomlinson reported that end wall of tracheary element in stem and root of the genus Calamus, a lianoid lepidocaryoid palm, is simple and transverse in contrast to the scalariform and oblique type in leaf. Klotz supported the view that the lepidocaryoid lianas, being the most specialized group, have simple perforation plates in the stem in contrast to the occurrence of multiple, mixed multiple and simple or simple perforation plates in the stem of lepidocaryoid palms.

The purpose of this paper is to present the anatomical observations on the form of vessel perforation plates of nine Calamus species (lepidocaryoid lianas) growing in Kerala forests (table 1). For each species, basal most internode was selected from two stems and small slivers were cut from inner two third of the cylinder in the middle portion of the internode for the maceration of tissues using 1:1 hydrogen peroxide and acetic acid mixture. Macerated cells were stained with Heidenhain’s haematoxyline using iron alum as mordant after

<table>
<thead>
<tr>
<th>Species</th>
<th>Locality</th>
<th>Identification/collection No.</th>
<th>Per cent of vessel elements with scalariform perforations</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. gambeli Becc.</td>
<td>Pamba (Kakki)</td>
<td>Renuka 3173:24.5.1984</td>
<td></td>
</tr>
<tr>
<td>C. mizianus Schlecht.</td>
<td>Nilambur</td>
<td>Renuka 3061:27.3.1984</td>
<td></td>
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<tr>
<td>C. pseudodendron Becc.</td>
<td>Peermedu</td>
<td>Nambiar and Renuka 2625:24.11.1982</td>
<td>2</td>
</tr>
<tr>
<td>C. rouang Linn.</td>
<td>Quilon Asram</td>
<td>Renuka and Sasidharan 3443:18.1.1985</td>
<td>–</td>
</tr>
<tr>
<td>C. thwaitesii Becc.</td>
<td>Achenkovel</td>
<td>Nambiar and Renuka 2903:8.2.1983</td>
<td>3</td>
</tr>
<tr>
<td>C. vattayila Renuka</td>
<td>Thanmala</td>
<td>Renuka 4003:11.10.1985</td>
<td></td>
</tr>
</tbody>
</table>

- = Not found.