Lip region narrow truncated slightly set off from the body, distinguished by strong sclerotization; about 1/8-1/10th of the body width at lip region. Lips six amalgamated amphid cup-shaped. Odonostyle straight cylindrical 18-20 μ long. Guiding ring single, about 60-65 μ from anterior end. Nerve ring 106-115 μ from anterior extremity. Anterior two-third of the oesophagus slender, expanding gradually to form basal expanded portion having a wide lumen about one-fifth to one-sixth of its width. Oesopha-gointestinal junction with triangular cardia. Pre-rectum about three anal body widths. Tail filiform ending in a round terminus, 8-9 anal body widths long.

Vulva a transverse slit, vagina at right angles to body axis, 20-23 μ long, gonad monoopisthodelphic, anterior uterine branch rudimentary, about 14-17 μ long, oviduct and uterus distinctly separated by sphincter. Spermatheca absent, sperms not observed. Oocytes arranged in multiple rows.

Male: Generally similar to female but tail is little shorter and more drawn outwards than the female. Spicules dorylaimoid, gubernaculum and lateral guiding pieces absent. Supplements not seen. Two caudal pores on each side of the anus.

Habitat and Locality: Collected from the soil around the roots of Solanum melongena L. from Kaij, district Beed, Maharashtra, India.

Type specimens: Holotype and twenty paratype females on slide No. BPT/Indo/77/2-1-3-0, allototype and 4 paratype males on Slide No. BPT/Indo/77-1 3-1-3-4 are deposited in the Zoology Department, Marathwada University, Aurangabad, Maharashtra, India.

Differential diagnosis: Indodorylaimus kanhobia n.sp. differs from the only known species I. wickeni Ali and Prabha, 1973 in having thinner and longer body, shorter oesophagus and anteriorly located vulva.

Hence, it is regarded as a new species and named as Indodorylaimus kanhobia n.sp.

One of the authors (BPT) is grateful to CSIR for award of a Junior Research Fellowship.

Department of Zoology,
Marathwada University,
Aurangabad, India,
September 1, 1979.

INFECTIVITY OF BOVINE LEUKEMIA VIRUS TO RABBITS, LAMBS AND RATS

Bovine leukemia virus has been propagated in calves and lambs on experimental inoculation of lymphocytes from leukemic cattle/culture fluid infected with bovine leukemia virus³-⁴. The virus has not yet been propagated in laboratory animals and efforts to propagate it in rats are not successful. During these studies attempts were made to inoculate rabbits, lambs and rats with lymphocytes from a calf positive for antibodies against glycoprotein antigen of bovine leukemia virus. The lymphocyte culture fluid of the calf had glycoprotein antigen. Rabbits were also inoculated with lymphocyte culture fluid filtered through 450 m/μ filter pads. In an effort to determine whether 1 × 10⁴ lymphocyte can induce infection in lambs, the experiment was conducted to determine the possible role of blood sucking arthropode vectors in transmission of the disease from an infected animal to healthy animals.

The rabbits and the rats have been found to be negative for bovine leukemia virus antigen and antibodies. The lambs were found to be negative for the antibodies against bovine leukemia virus glycoprotein antigen.

Lymphocytes for inoculation in rabbits, lambs and rats were obtained from an experimentally inoculated calf positive for antibodies against glycoprotein antigen of bovine leukemia virus. The lymphocyte culture fluid of the calf was found to contain antigen similar to glycoprotein antigen of bovine leukemia virus. Lymphocytes from the calf obtained from the peripheral blood collected in EDTA solution was centrifuged at 2,500 RPM (30 min) and the buffy coat was collected. It was suspended in phosphate buffered saline (PBS) and was overlayed on lymphoprep (Nyegaard and Co., Oslo, Norway), centrifuged at 2,000 RPM for 30 min. The lymphocytes at the interface of the two solutions were collected, washed and suspended in phosphate buffer saline for inoculation.

Lymphocytes were grown in a growth medium containing Eagle's medium (Gibco/Bio-Cult B. V. Schiphol-east, The Netherlands), 20% foetal calf serum, penicillin 100 units/ml and streptomycin 100 μg/ml at pH 7.2 Phyloha/magglutinin M was added at 2 ml/50 ml.

Antigen was prepared from the lymphocyte culture fluid by ammonium sulphate precipitation (30 gm/100 ml fluid) incubated at 4°C for 18 hours. It was centrifuged at 2,500 RPM for 30 min and the precipitate was dissolved in distilled water (1/10 of original volume) dialysed overnight against phosphate buffer saline and concentrated by polyethylene glycol 4,000 to 1/100 of original volume.

Ten ml of lymphocytes suspension (1 x 10^6 cells/ml) was inoculated intravenously in rabbits and 2 ml intraperitoneally in rats. One ml of the lymphocyte suspension (1 x 10^6 cells/ml) was inoculated in each lamb. In another experiment 10 ml of lymphocyte culture fluid was inoculated intravenously in rabbits.

For immunodiffusion, the gel diffusion medium containing 8% sodium chloride, 1% agarose in phosphate buffer saline at pH 7.2 was used and the wells were kept at a distance of 2 mm; the distance between central and peripheral well was kept at 4 mm. Plates were charged with antigen in the central well and serum samples in peripheral wells. An alternate peripheral well of positive serum was kept. Plates were kept in humidified atmosphere at room temperature and the final reading was recorded after 96 hours.

The results of immunodiffusion test of sera samples of rabbits inoculated intravenously by lymphocytes from a calf positive for bovine leukemia virus antigen and antibodies are shown in Table I.

**Table I**

<table>
<thead>
<tr>
<th>Rabbit Number</th>
<th>Postinoculation interval (Weeks)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 2 4 6 8 10 12</td>
</tr>
<tr>
<td>1.</td>
<td>– – – – + + +</td>
</tr>
<tr>
<td>2.</td>
<td>– – – + + + +</td>
</tr>
<tr>
<td>3.</td>
<td>– + + + + + +</td>
</tr>
<tr>
<td>4.</td>
<td>– – – – – –</td>
</tr>
<tr>
<td>5.</td>
<td>– + + + + + +</td>
</tr>
<tr>
<td>6.</td>
<td>– – + + + + +</td>
</tr>
</tbody>
</table>

It can be noticed that 3 rabbits were positive for antibodies against glycoprotein antigen of bovine leukemia virus at 4th week postinoculation while the fourth rabbit showed the presence of antibodies at 8th week onwards. Two rabbits were found negative for such antibodies throughout the course of the studies. It is further to be emphasized that the rabbit sera had a high antibodies titre as the reaction in immunodiffusion test was observed even after the alternate well of positive serum was avoided. As seen earlier with cattle sera, the positive reaction of field serum samples can only be observed when alternate well of positive serum is kept. The antigen prepared from the lymphocyte culture fluid of three rabbits positive for antibodies against glycoprotein antigen of bovine leukemia virus was tested for reaction against standard serum obtained from National Animal Disease Center, Ames, Iowa. Two antigen samples from rabbit Nos. 3 and 5 were found to react and a line of identity with standard antigen was observed. The antigen from rabbit No. 6 was found to be negative.

Three rabbits were inoculated intravenously with lymphocyte culture fluid containing bovine leukemia virus antigen. The lymphocytes were taken from the calf already positive for antibodies against bovine leukemia virus antigen. It was observed that only one rabbit was showing the presence of antibodies against glycoprotein antigen of bovine leukemia virus at 20th week postinoculation while 2 rabbits remained negative up to the period of 28 week postinoculation. It can be concluded that bovine leukemia virus is infective to rabbits and further studies of its multiplication in rabbit tissues can be conducted.

The serological response of lambs on inoculation of 1 ml of 1 x 10^6 lymphocyte suspension has been shown in Table II.

**Table II**

<table>
<thead>
<tr>
<th>Lamb Number</th>
<th>Postinoculation interval (Weeks)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 4 8 12 14 18 22</td>
</tr>
<tr>
<td>652</td>
<td>– – + + + + + +</td>
</tr>
<tr>
<td>655</td>
<td>– – + + + + + +</td>
</tr>
<tr>
<td>657</td>
<td>– – – + + + + +</td>
</tr>
<tr>
<td>665</td>
<td>– – – – – – –</td>
</tr>
<tr>
<td>Incontact control</td>
<td></td>
</tr>
<tr>
<td>Ten lambs</td>
<td>– – – – – – –</td>
</tr>
</tbody>
</table>

It can be seen that the lambs inoculated with only 1 x 10^6 lymphocytes also developed antibodies against glycoprotein antigen bovine leukemia virus. Such a small number of lymphocytes can easily be transmitted in nature even by blood sucking arthropod vectors.

Six rats were inoculated intraperitoneally with lymphocytes of a calf positive for bovine leukemia virus antigen and antibodies. The rats at 24th week postinoculation were found to be negative for antibodies against bovine leukemia virus (glycoprotein antigen).

Infectivity of bovine leukemia virus to rabbits has not yet been reported in the literature while the lambs have been found to be susceptible for bovine leukemia virus infection1,3,4. Rats have also been found to be
refractory to bovine leukemia virus infection. The findings in this study are in conformity with the above workers while the infectivity of bovine leukemia virus to rabbits is being reported for the first time in the present work.

On inoculation of lymphocytes from a calf positive for bovine leukemia virus infection rabbits were found to produce antibodies against bovine leukemia antigens at 4th week postinoculation. The antigen prepared from the lymphocyte culture of rabbits positive for bovine leukemia virus antibodies reacted with standard serum and a line of identity with bovine leukemia virus antigen was observed. The reports of transmission of bovine leukemia to rabbits are not available in the literature. On inoculation of $1 \times 10^4$ lymphocytes in lambs, two out of 4 lambs showed the presence of antibodies against glycoprotein antigen of bovine leukemia virus at 8th week postinoculation. One more lamb developed antibodies at 12th week postinoculation. One lamb was negative for such antibodies throughout the course of experiment. It was observed that the rats after inoculation of lymphocytes from a calf positive for bovine leukemia virus infection do not show the presence of antibodies in their sera even up to 24th week post-inoculation.

The authors are thankful to Dr. M. J. Van Der Maaten, National Animal Disease Center, Ames, Iowa, for the supply of Glycoprotein antigen of bovine leukemia virus and its sera. The authors are also thankful to Dr. C. M. Singh, Director, Indian Veterinary Research Institute, Izatnagar, for valuable guidance and necessary facilities. Bovine Lymphosarcoma Project, M. P. BANSAL, Indian Veterinary Research Institute, K. P. SINGH, Izatnagar 243 122 (U.P.),

September 18, 1979.


**EFFECT OF CORPUS CARDIACUM EXTRACT ON FECUNDITY OF DYSERECUS KOENIGII**

Extract of corpus cardiacum has been known to affect various physiological processes in insects. While Davey reported that it affects the frequency and amplitude of spontaneous rhythmic activity of muscles, like those of heart, malpighian tubules, oviducts, gut, etc., Novak found it to be affecting the pigment migration activity pattern, water balance and other metabolic processes. Mordue and Goldsworthy recorded the increase in blood carbohydrate level and phosphorylase activity after its administration. They concluded that the two lobes of corpora cardiaca have different constituents and cause different changes after administration. The present paper deals with the effect of administration of corpus cardiacum extract of male *Periplaneta americana* on the fecundity of *Dysdercus koenigii*.

**Materials and Methods**

Extract of corpora cardiaca was prepared by homogenising corpora cardiaca in saline water from freshly killed male *Periplaneta americana* using a ground glass homogeniser to make the concentration of the extract, 1 pair gland per 50 μl of the saline. A colony of *D. koenigii* was raised in the laboratory and 40 insects of each sex were picked up from the colony just after emergence and placed in separate glass jars. After 12 hrs a group of 10 females were given 12.5 μl, another 25 μl and the third group 50 μl doses of the freshly prepared extract and were then left with the males in separate jars. Fourth group acted as control and was given saline instead of the extract.

**Results and Discussion**

Effect of corpus cardiacum extract was studied on the copulation time, time gap between copulation and egg laying and the number of eggs laid in each batch.

The normal female *D. koenigii* lays nearly 250 eggs in two batches after approximately 9 hrs and a copulation period for about 10 hrs. More eggs are, however, laid in the first batch.

Table I shows that the gap between the copulation and egg laying was reduced after treatment. With the increase in the amount of the extract administered, the time was reduced. Treatment increased the number of eggs laid in each batch and the number of eggs increased with the dose. There seems to be a correlation in the time lapse between copulation and the egg laying and the number of eggs laid with the decrease in the time, the number of eggs laid increased (Table I). The results were compared with those of Govindan and Pillai's work who studied the process after thiotepa treatment. They noted that 4 μg dose of thiotepa reduced the number of eggs to 113 ± 6 and 93 ± 8 in the first and the second batches respectively from 121 ± 7 and 114 ± 11 (Table I).

The copulation time also is affected by corpus cardiacum extract and it is reduced to less than half after 12.5 μl dose and one-fourth after 50 μl. It is also interesting to note that the mortality increased with