parasætemia and antitypanosome rabbit serum, in gel was usually marked by formation of precipitin band (Fig. 1). No precipitin line was observed between the sera of these affected animals and the normal rabbit serum.

SOLUBLE ANTIGEN OF *T. EVANSI* IN BLOOD SERUM OF INFECTED ANIMALS

*Trypanosoma evansi* is a hemoprotozoa affecting many animal species like cattle, buffalo, horse, dog and mouse. The disease caused by *T. evansi* is commonly called *Surra* in Hindi and is naturally transmitted by arthropod vectors. Several methods are reported for demonstrating the antigen-antibody reactions in trypanosomiasis. Soluble protozoal antigens in the blood serum of the affected host have been demonstrated in experimental babesiosis and in African trypanosomiasis.

This preliminary report is on the serologic evidence of a trypanosome-soluble antigen in the blood serum of camel and buffalo suffering from the natural infection (*Surra*).

The trypanosomes were collected from acutely affected animal as described by Gill, and homogenate prepared according to Seed. Rabbits were immunized by injecting 4 ml. dose of the above homogenate by subcutaneous route at 4–5-day interval on five occasions. Bleeding of the rabbits was done by cardiac puncture. Hyperimmune serum was preserved at 4°C after adding sodium azide in the final dilution of 1:1000.

The sera of *Surra*-affected animals was also collected aseptically and preserved at 4°C by adding sodium azide as above. The procedure of Parde and Pathak was used in the gel diffusion test.

The reaction, between the sera of the naturally infected camel or buffalo showing parasætemia and antitypanosome rabbit serum, in gel was usually marked by formation of precipitin band (Fig. 1). No precipitin line was observed between the sera of these affected animals and the normal rabbit serum.

During the course of these studies with gel reactions, precipitin bands were also observed occasionally in between the cups containing sera samples from different trypanosome-affected or carrier animals. Such reactions indicate the presence of a diffusible trypanosome precipitogen and specific precipitin antibody in the blood of animals having trypanosomiasis (*Surra*) of a varying duration.

Similar soluble antigen has been reported in equinebabesiosis. The earlier workers studying *Babesia* infections have suggested that production of the antigen in detectable quantities is dependent on a certain stage of the growth and developmental cycle of the parasite. Sibinovic et al. have further speculated the similarity between the soluble antigens of *Babesia* and some African trypanosomes and that they also possess the ability to stimulate production of immune antibody in infected animals. The role of such soluble antigens (in protozoan infection) in the pathogenesis of the disease vis-a-vis host-parasite relationship is not clear at the moment and needs further investigation.

The facilities provided by the Principal, U.P. College of Veterinary Science and Animal Husbandry, Mathura, are gratefully acknowledged.
A LABORATORY TECHNIQUE FOR MASS REARING OF THE TOBACCO CATERPILLAR SPODOPTERA LITTORALIS (BOISD.) PRODENIA LITTURA (F.) (NOCTUIDAE : LEPIDOPTERA) ON SYNTHETIC DIET

Artificial diets for a number of Lepidopteran insects have been developed by various workers. An attempt was made to develop a synthetic diet for Spodoptera littoralis (Boisd.) that will facilitate rearing of this insect all through the year in the laboratory.

The composition and various ingredients used for preparing the diet are given below:

Soaked peas (Pisum sativum L.) 50 g.; Yeast of this semi-solid food was poured into a test-tube of $7.5 \times 2.5$ cm, which has been previously sterilized by heating in an air oven, and set aside to cool under the fan.

Freshly hatched larvae obtained from a single egg mass were introduced into each tube at the rate of 10 per tube and the tubes were plugged with sterile cotton plugs. Three or more tubes were held together and kept inverted for the first few days as described by Nachiappan. At the end of the 5th day, the larvae were separated and kept at the rate of two per tube. They were subsequently separated on the 10th day and kept individually in each tube, till they pupated. During these growing periods the tubes were kept horizontally. Fresh food was supplemented once in five days at the time of separating the larvae as the food had been eaten by them.

The control larvae were maintained on castor leaf in small jars as described by Eldefrawi et al. The rearing of control and test larvae was carried out at $85 \pm 2^\circ$ in a cabinet wherein sufficient quantity of water was kept to maintain the temperature throughout the rearing period. The cabinet lid was kept partially open to allow free circulation of air inside the cabinet.

The results of observations on the development, growth of larvae and pupae and the fecundity of adults are summarised in Table I.

<table>
<thead>
<tr>
<th>Food</th>
<th>No. of larvae in test</th>
<th>Percentage of survival</th>
<th>Mean developmental periods in days</th>
<th>Mean weight in mg.</th>
<th>Mean No. of eggs per female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Larva</td>
<td>Pupa</td>
<td>Total</td>
</tr>
<tr>
<td>Castor leaf</td>
<td>50</td>
<td>30</td>
<td>14-44</td>
<td>13-00</td>
<td>27-44</td>
</tr>
<tr>
<td>Synthetic diet</td>
<td>50</td>
<td>92</td>
<td>14-59</td>
<td>12-13</td>
<td>26-72</td>
</tr>
</tbody>
</table>

The data show that there is no great difference in larval period and pupal period of larvae fed on the synthetic diet, synthetic diet has enhanced not only the weight of various stages of insects but also increased the fecundity of adults as compared to that of natural food. No difference in hatching of eggs of moths reared on natural food and moths reared on the synthetic diet was observed. The increased mortality in the insect reared on natural food is due to contamination by certain pathogens.

No fungal growth was observed on the diet kept continuously for 5 days. This may