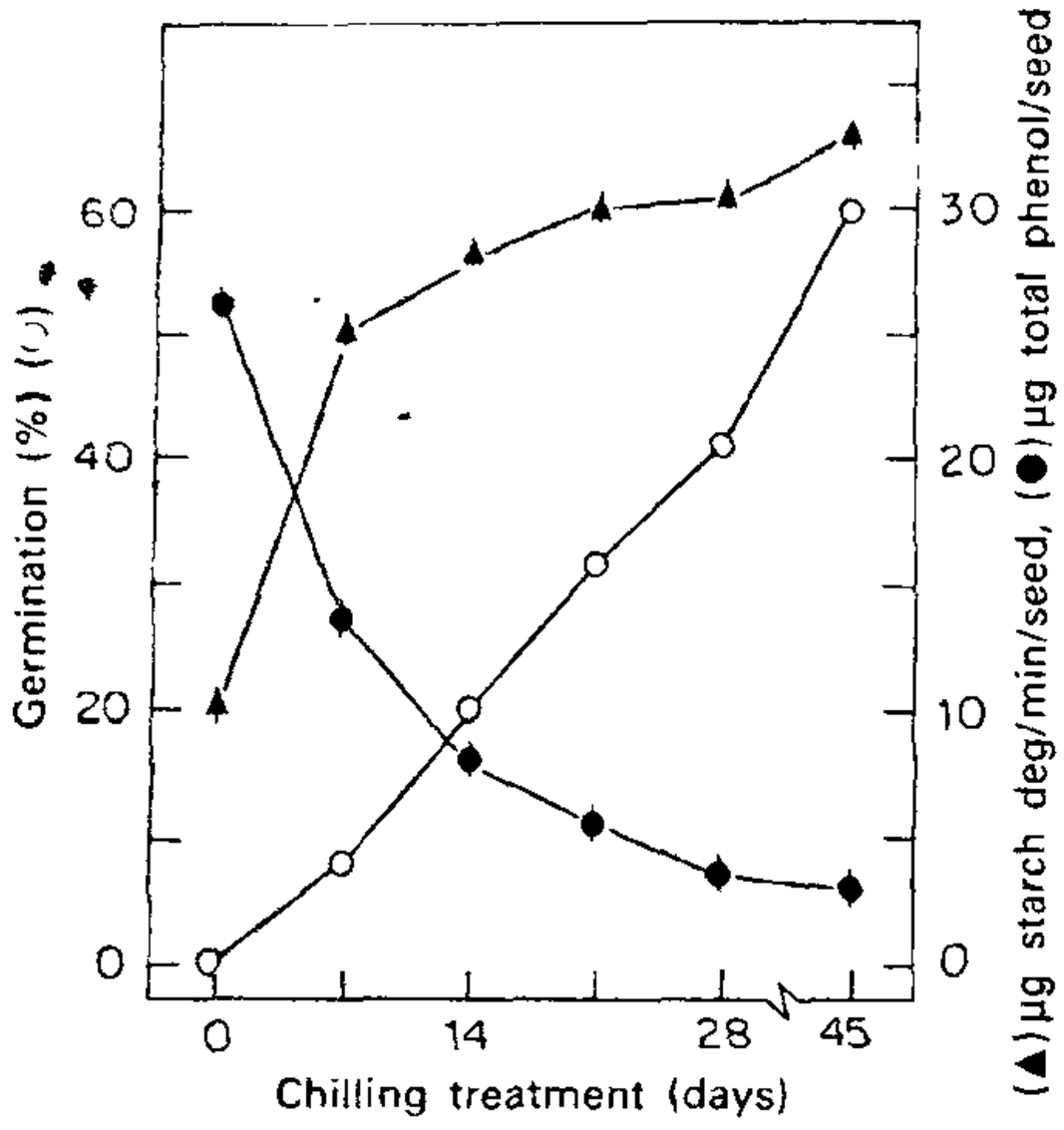

Figure 1. Removal of seed dormancy in *Rosa macrophylla* by low temperature treatment of seeds exhibiting the relative phenolic content and α-amylase activity as a function of time. Vertical bars represent S.D.

requires low temperature treatment (5–10°C) for 2 months for dormancy removal, whereas *Rosa rubiginosa* requires 6 months stratification. Regarding the biochemical changes occurring in the seeds during removal of chill-induced dormancy, most important perhaps is the induction of gibberellin in *Corylus avellana* seeds[11] and a decline in levels of ABA in the kernels of *Juglans regia*[12].

Our experiments reveal that breaking of seed dormancy in *R. macrophylla* is induced by a low temperature treatment, and is paralleled by a gradual decline in the total phenolic component levels of the seeds. The inhibitory effect of phenolics on germination of *Enonymous europaeus* is attributed to the presence of *p*-coumaric acid during stratification[13]. Enhancement in the activity of hydrolytic enzymes in the seeds during chilling has already been demonstrated[14–16]. It seems likely that phenolics have a repressive effect on α-amylase activity and lowering of the phenolics results in a significant induction of α-amylase activity during germination of *R. macrophylla* seeds. That phenolic compounds have a regulatory role through interaction with ABA on α-amylase activity has already been shown by us[17].

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HAEMOLYMPH RESPONSE TO THE DEVELOPMENT OF MICROFILARIAE OF *WUCHERERIA BANCROFTI* IN *CULEX QUINQUEFASCIATUS*

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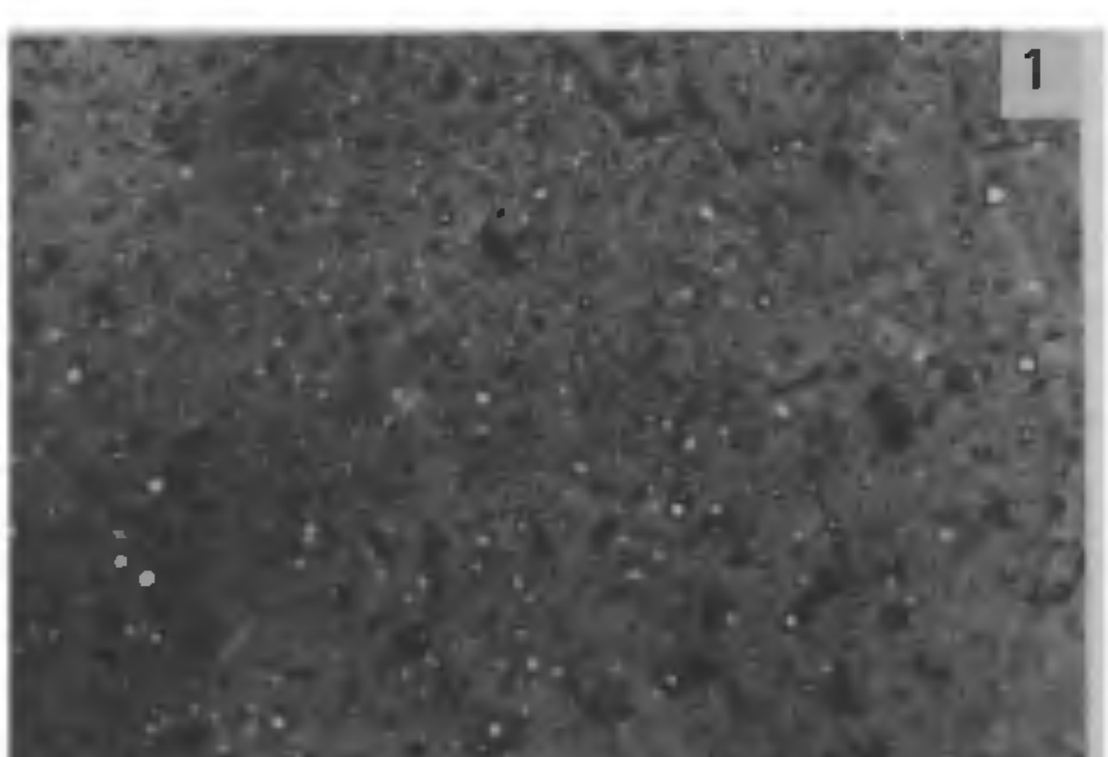
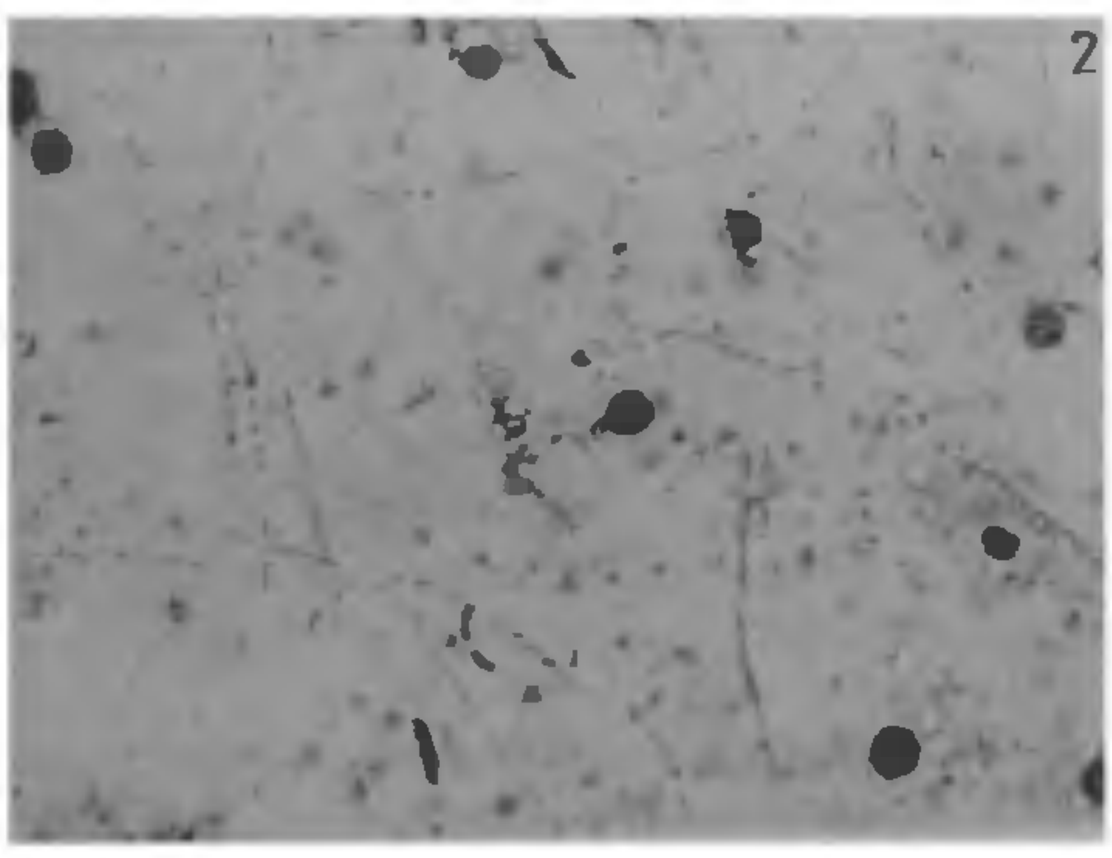
THE haemolymph of mosquito is a rich and varied fluid and its study has provided many surprises. Changes in haemolymph during infection may reflect the nature of the pathological and defensive

reactions of the host. Different types of haemocytes have been described but a comprehensive classification is difficult because individual cells can have very different appearances under different conditions[1–4]. Many authors suggested that tsetse fly haemocytes may have an important role in the control of trypanosoma infections, in addition to their defensive role[5–7]. Manson-Bahr[8] reported encapsulation of *Wuchereria bancrofti* and *Dirofilaria immitis* in various mosquitoe species. Although the significance of encapsulation is not clear it is accepted as a true defensive measure. This process is evident because of their size[1].

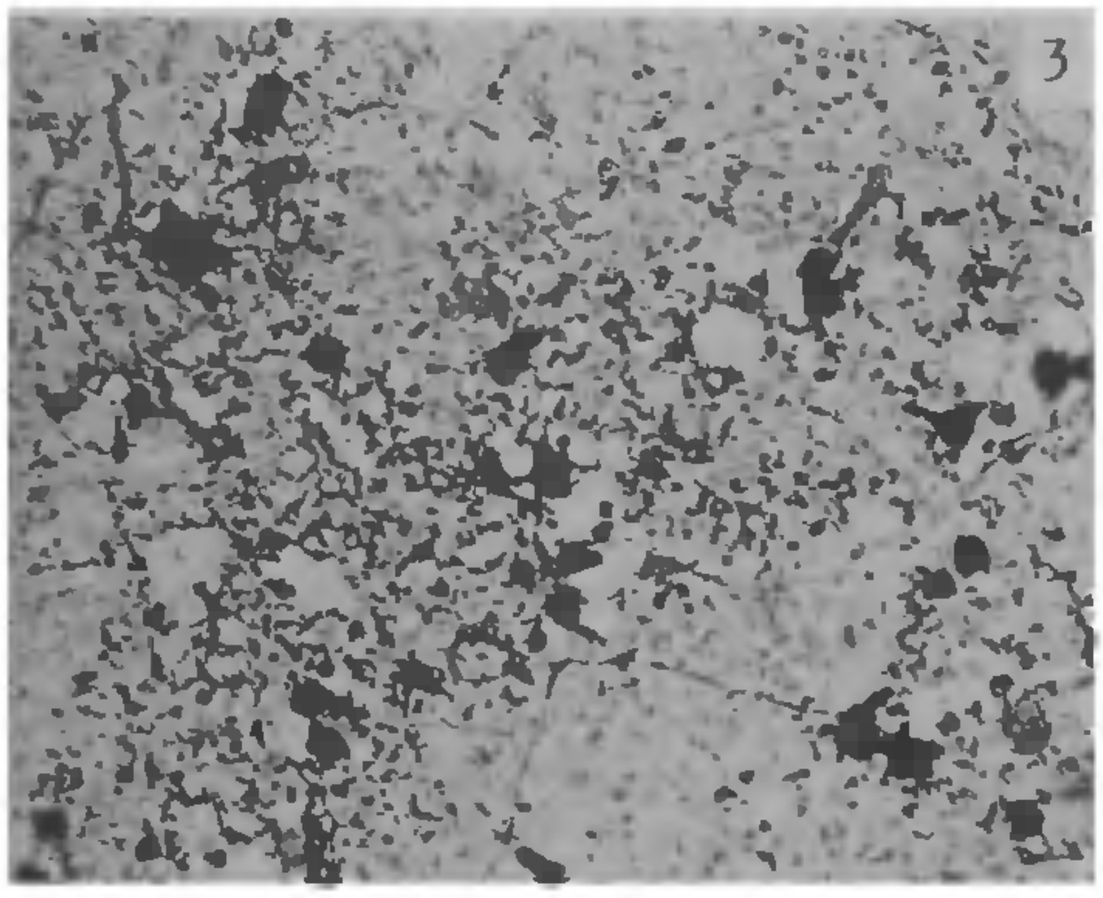
Studies carried out using virgin, control blood fed and infected (mf +ve) blood fed female *Culex quinquefasciatus* mosquitoes form the subject matter of this communication. Membrane-feeding technique wherein chicken duodenum is used in the feeder was used for feeding the mosquitoes. This technique was adopted from the Liverpool School of Tropical Medicine. The oozed out haemolymph by needle prick was smeared, dried and stained in Leishmann as differential count staining of white blood corpuscles. Morphological studies were carried out by light microscope and measurements taken by micrometry.

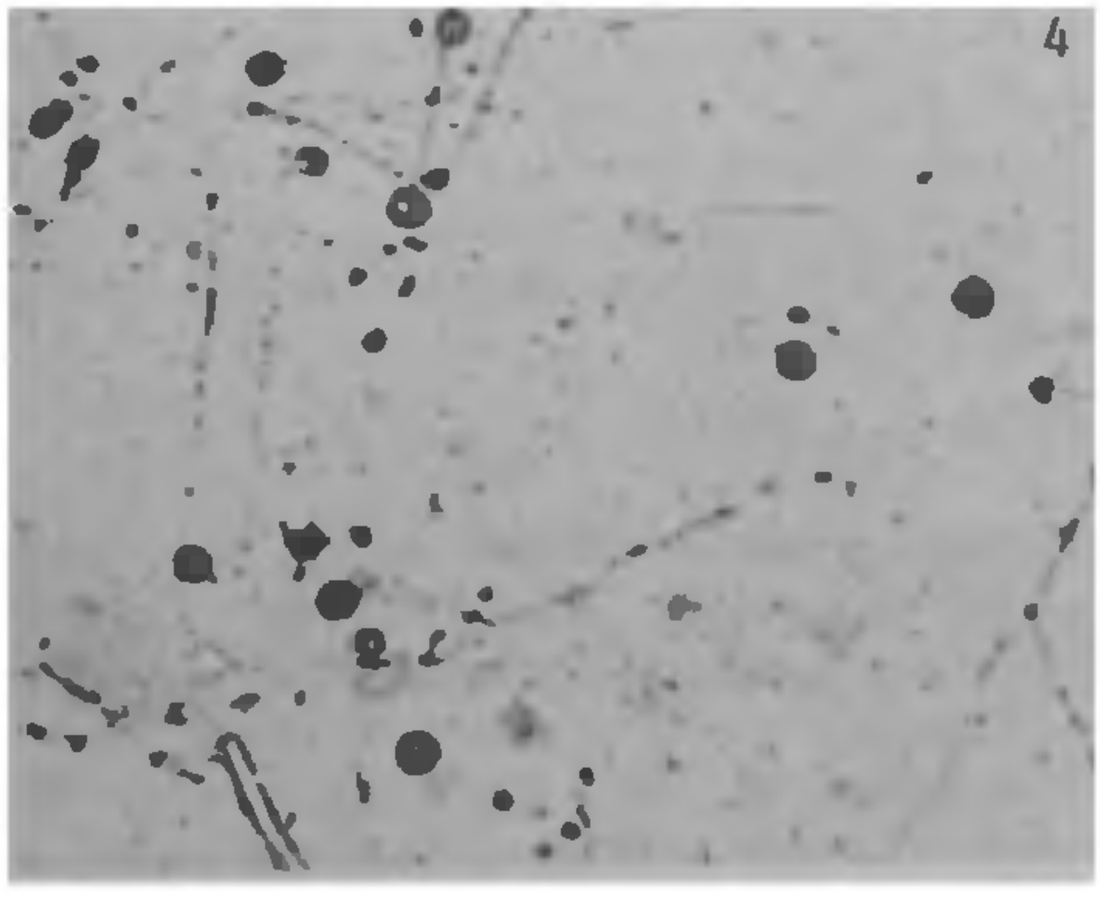
Clearcut proliferation was observed in the infected blood fed samples as against control blood fed samples (figures 1, 2). At least three different morphological types were seen although these may represent various stages in one or more developmental series because haemocytes develop along predetermined paths and change their characteristics in these situations[9]. A small but non-specific increase in the amount of haemocytes was also shown by virgin and control blood fed mosquitoes (figures 3, 4) but comparing the cells in the two sets (figures 1, 2 and 3, 4) it is clear that only the large





Figures 1 and 2. (×295). Haemocyte—*Culex quinquefasciatus* mosquito. Infected blood fed- **1.** 1st day after blood feeding, and **2.** 2nd day after blood feeding.





Figures 3 and 4. (×311). Haemocyte—*Culex quinquefasciatus* mosquito. **3.** Normal virgin, and **4.** Control blood fed-2nd day after blood feeding.

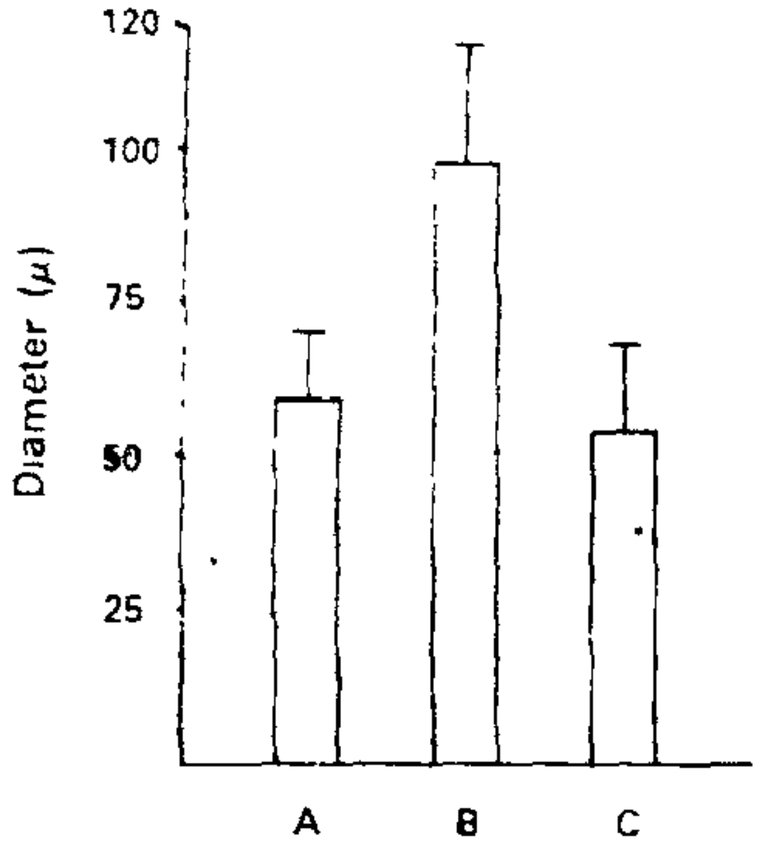


Figure 5A-C. Haemocyte diameter of *Culex quinquefasciatus* mosquitoes. **A.** Normal virgin, **B.** mf positive blood fed (2nd day), and **C.** Control blood fed (2nd day). Vertical bars represent S. D.

circular cells in the infected sample clearly showed proliferation. Figure 5 shows that there is only marginal or insignificant difference between virgin mosquito and control blood fed samples, while distinct differences were observed between control and infected blood fed samples. The difference was proportional to the mf count.

Blood feeding results in the formation of egg clusters. However control blood does not appear to cause any proliferation of the haemocytes. But infective blood causes proliferation. Thus the results clearly show that infection leads to proliferation of haemocytes. This differential effect in the proliferation by the control and infected blood fed is very interesting. It is possible that proliferation is a response on the part of the vector against the development of microfilariae to infective larvae through different moulting stages. The nature of this is currently being worked out.

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EFFECT OF IODOPHOR TREATMENT ON THE HATCHING OF *ARTEMIA* CYSTS

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THE dormant eggs or 'cysts' of the brine shrimp *Artemia* form an important source of live feed for a variety of finfishes and shellfishes. Earlier studies have either reported contamination of the cysts with bacterial/fungal spores[1,2] or heavy bacterial load in canned cysts[3,4]. Thus, there is a possibility of predator organisms getting infected. It is therefore necessary to disinfect *Artemia* cysts before their use. Use of 'Antiformin'[5], hypochlorite solution[6], decapsulation technique[7] and antibiotics[4,8] has been found to be effective in suppressing bacterial growth and increased hatchability of cysts. Iodophor (POLYSAN—Polypharm Pvt. Ltd, Bombay) is a non-selective germicide with a surface-active agent (alkyl phenoxy polyoxyethylene ethanol) and provides a minimum of 1.6% titratable iodine. Iodophor is known to be an effective disinfectant in aquaculture practices[9,10]. The present work was undertaken to study the effect of iodophor treatment at different concentrations and exposure time on the hatchability of *Artemia* cysts and survival of associated bacteria.

Iodophor solutions with different concentrations of active ingredient were prepared in sterile distilled water containing 0.05% $NaHCO_3$. To weighed amounts of *Artemia* cysts (5 mg), different concentrations of iodophor (25, 50, 75 and 150 ppm) were added and exposed for 30, 60, 120 and 300 s. At the