**RESEARCH NOTE**

**Effect of Biomphalaria straminea Plasma in the Phagocytosis of Biomphalaria glabrata Hemolymph Cells**

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Key words: Biomphalaria - hemolymph cells - phagocytosis

Mollusc defensive system that discriminates self from non self molecules, include fixed cells that can trap particles like endothelial cells, reticular and pore-cells, and circulating elements (WPW Van Der Knaap & ES Loker 1990 *Parasitol Today* 6: 175-182). Hemocytes, cells with phagocytic capacity, are determinant elements in the resistance or susceptibility of Biomphalaria snails to *Schistosoma mansoni* infection (FS Bezerra et al. 1997 *Rev Inst Med Trop S Paulo* 39: 197-201). Biomphalaria resistance or susceptibility to *S. mansoni* infection is well defined as genetically determined (JV Santana et al. 1978 *Rev Saúde Públ S Paulo* 12: 67-77). Allograft of producing amebocyte organ from resistant snails to susceptible ones, enhance its resistance suggesting that the phenomenon is dependent on hemocytes activity (JT Sullivan et al. 1995 *J Parasitol* 5: 829-33). On the other hand, inoculation of hemolymph from *B. tenagophila* infected with either *S. mansoni* or with other trematoda furcocercaria, raised significantly the cellular response of susceptible mollusc (SM Reis et al. 1995 *Rev Saúde Públ* 29: 259-264).

Susceptible *B. glabrata* snails hemocytes made phagocytosis more efficient when latex particles were covered with resistant strains plasma. Furthermore, the results from our laboratory showed that *B. straminea*, a highly resistant mollusc to *S. mansoni* infection, is the only parasite host found in many endemic areas of northeast Brazil [FF Amâncio et al. 1989 *Mem Inst Oswaldo Cruz* (Suppl. I) 84: 253]. Therefore we tried to observe the influence of soluble products from *B. straminea* plasma in the phagocytic capacity of *B. glabrata* hemocytes.

*B. glabrata* hemocyte monolayer was prepared from hemolymph, collected through cephalo-podal bleeding and incubated at 22°C during 40 min in humid chamber. After washing, to remove non adherent cells, the monolayers were incubated with 10^5 cells of yeast (*Saccharomyces* sp.) for 1 hr at 22°C.

The slides were washed to detach non ingested yeast, fixed with methanol and stained with Giemsa. For determination of the phagocytic index, 200 cells per slide were counted.

When necessary, *B. straminea* plasma was previously incubated with the yeast suspension for 1 hr at 22°C. Another procedure was carried out using the plasma previously warmed at 56°C during half an hour (plasma 56). Following this schedule, five groups were done:

- **Group A:** monolayer + fresh *B. straminea* plasma + yeast suspension
- **Group A 56:** monolayer + *B. straminea* plasma 56 + yeast suspension
- **Group B:** monolayer + incubated fresh plasma + yeast suspension
- **Group B 56:** monolayer + incubated plasma 56 + yeast suspension
- **Group control:** monolayer + Hanks + yeast suspension.

Analysis of the results of the Tukey test (Table), led us to conclude that the incubation with *B. straminea* plasma raises significantly the phagocytic capacity of *B. glabrata* hemocyte. Previous incubation of yeast with plasma, does not facilitate the uptake of the yeast, on the contrary, there was a decrease of phagocytosis. The enhancing effect of plasma is temperature dependent, decreasing significantly after half an hour at 56°C.

These results strongly suggest that soluble and termosensible products present in the *B. straminea* plasma, increase the phagocytic capacity of susceptible *B. glabrata* to *Saccharomyces* sp. yeast.

This work was supported by Finep (Grant no. 66920454000).  
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Received 4 May 1998  
Accepted 31 August 1998
TABLE

Effect of *Biomphalaria straminea* plasma in the phagocytosis of *B. glabrata* hemocytes

<table>
<thead>
<tr>
<th>Assay</th>
<th>% phagocytosis</th>
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</thead>
<tbody>
<tr>
<td>Control group (monolayer + Hanks + yeast)</td>
<td>27.8 ± 2.5</td>
</tr>
<tr>
<td>Group A (monolayer + fresh plasma 1hr + yeast)</td>
<td>34.6 ± 3.3&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Group A 56 (monolayer + plasma 56 1hr + yeast)</td>
<td>19 ± 1.9</td>
</tr>
<tr>
<td>Group B (monolayer + yeast + fresh plasma)</td>
<td>26.6 ± 3.0&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Group B 56 (monolayer + yeast + plasma 56)</td>
<td>20.2 ± 3.2</td>
</tr>
</tbody>
</table>

<sup>a</sup>: significative values by Tukey test.