tion between the 2 A subgroups. In addition, its reaction with 0 cells may not be related to the T antigen because of the positive agglutination with papainized and pronased 0 cells. A high anti-A,B activity was also obtained with trypsin, papain and pronase and the differences between the A subgroups were significant.

The hemolymph of *B. straminea* does not agglutinate human 0, rabbit, hamster and duck red cells[4]; our extracts did not react with the cells of a New World monkey, an interspecific hybrid of the genus *Callitrix*. We have not found hemolysins against human erythrocytes in this snail.

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Agglutinins and hemolysins from *Biomphalaria tenagophila* snails

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Summary. A saline anti-A and incomplete anti-A,B agglutinin were found in spawn extracts of *Biomphalaria tenagophila* snails. Significant differences after papain and pronase treatments were also found for A_1 and A_2 subgroups. The hemolysin titers are high, and unspecific.

The snail *Biomphalaria tenagophila,* one of the most important intermediary hosts of *Schistosoma mansoni* in Brazil, has been shown to contain agglutinins and hemolysins. A strong anti-A and a weak anti-B activity in the albumen gland have been described previously[2]. In 2 specimens from Rio de Janeiro an anti-A,B agglutinin more active with A_1 than with A_2 was reported; and in a 3rd, an anti-A agglutinin against normal red cells, which does not differentiate between the A subgroups[3]. In addition, the hemolymph from infected and non-infected snails was found to be unspecifically hemolytic in low titers (1:4)[3].

This communication a) identifies the agglutinins and hemolysins found in fresh spawn, b) describes their reaction with red cells treated with neuraminidase and proteolytic enzymes and c) their hemolytic patterns.

Materials and methods. 3 pools of 70,54 and 33 individual samples of fresh spawn from pigmented animals reared in the laboratory were extracted and titrated following techniques already described elsewhere[4,5].

Results and discussion. An anti-A agglutinin against normal cells and an anti-A, B, weak anti-B and high anti-A, against trypsin treated cells, are the principal features of the spawn extracts of this snail. It is possible to differentiate between the A subgroups using papain and pronase (table 1).

The hemolysin titers are high and unspecific (table 2). All the enzymes have practically identical patterns of hemolytic activity with all the ABO antigens. The hemolysins appear to be highly characteristic of this species, since they have never been found in the spawn of *B. glabrata*[6] or in *B. straminea*[5].

Our extracts agglutinate and hemolyze normal and neuraminidase-treated red cells from a New World monkey, a hybrid of *Cullitrix penicillata* × *Cullitrix jacchus.* Variations have been shown for the lectins of *B. glabrata*[3]. This variation may be attributed in part to geographic differences and possible consequent genetic differences[6,7]. However, it may also be explained by 1. differences in serological methods, for instance, tube test or slide test technique; 2. manual or sonicated extracts; 3. diverse concentrations of red cell suspensions; 4. variability of the lectinic content among the different tissues of the animal and 5. 'complete' or 'incomplete' nature of the agglutinin. A weak activity can be easily overlooked when a whole body extract is used instead of the most active organ or tissue.

Table 1. Agglutinin average end-point titers form spawn of *B. tenagophila*

Treatment	A_1	A_2	B	O
Normal	65	33	0	0
Papain	10735	1458	259	90
Trypsin	272	97	7	0
Pronase	57052	258	-	-

Table 2. Hemolysin average end-point titers from spawn of *B. tenagophila*

Treatment	A_1	A_2	B	O
Normal	129	258	82	82
Papain	515	515	258	129
Trypsin	65	129	65	65
Pronase	515	515	182	92
Neuraminidase	65	65	65	33

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