

**Background:** Marine invertebrates rely solely on innate immune mechanisms, the cellular component of which is characterized by hemocytes that phagocytize microbes and secrete soluble antimicrobial and cytotoxic substances. In this regard, marine invertebrates are a potential source of promising antimicrobial compounds with novel mechanisms of action.

**Objective:** The objective of this study was to evaluate extracts of the gut, gonad, spines and mouth parts of the sea urchin *Tripneustes gratilla* for antimicrobial and haemolytic activities *in vitro*.

**Methods:** Potentially bioactive metabolites were extracted using methanol and chloroform and tested for activity against *Salmonella typhi*, *Escherichia coli*, *Shigella sonnei*, *Pseudomonas aeruginosa* and *Penicillium* spp. using the agar disc diffusion method. Toxicity was determined by assaying for hemolysis against human red blood cells.

**Results:** Bioactivity against the tested bacteria was observed mainly with the methanol and chloroform extracts of the gonads and gut. Higher antibacterial activity was present in the methanol extracts compared to chloroform extracts. Activity against the *Penicillium* spp was detected only in the methanol extracts, while the chloroform extracts showed no activity. The various extracts of the sea urchin lacked any detectable hemolytic activity against human erythrocytes.

**Discussion:** These research findings suggest that marine echinoderms are a potential source of novel antimicrobial compounds.

**Key words:** *Tripneustes gratilla*, antimicrobial activity, marine invertebrates