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EFFECTS OF ANESTHETIC, TEMPERATURE, AND PRESSURE ON VASOMOTOR ACTIVITY OF THE MICROCIRCULATORY NETWORK OF *Nereis* sp.

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The marine clam-worm (*Nereis* sp.) has a closed circulatory system which exhibits vasomotion. Vasomotion is a periodic contraction and relaxation of muscle cells in the walls of metarterioles, small arteriolar blood vessels which lead into a capillary bed. The resulting changes in blood vessel diameter cause a decrease and increase, respectively, in blood flow rate. Observations were made on the microvascular beds of parapodia, lateral leg-like extensions of the worm's body wall. The parapodia of animals anesthetized in a magnesium chloride solution were transilluminated and observed microscopically. Subsequent to finding an appropriate blood vessel to study, recordings of vasomotor periods were taken at consecutive time intervals after removal from the anesthetic solution. This would determine the extent to which the anesthetic agent interfered with normal vasomotor activity. The vasomotor periods are composed of the time interval during which the blood vessel had a small diameter, a constriction, followed by the time interval during which the vessel had a large diameter, a dilation. The resulting data show that the anesthetic had no significant effect on the constriction or dilation periods. Because the parapodia were transilluminated using a heat producing light source, the animals' temperatures rose slightly while under observation. In order to determine the extent to which this mild heating could alter normal vasomotor responses, a study of the temperature effects on vasomotion was performed. Recordings of the vasomotor periods were taken at one degree temperature intervals within the range of fifteen to twenty-four degrees Celsius. The data show no significant temperature-induced changes in the vasomotor periods. Lastly, because these animals are found at various depths under the surface of the water, the effects of ambient pressure were studied. The worms were put in a glass bottle in which the pressure was varied from atmospheric pressure, up to 800 mm. Hg. above atmospheric pressure, and back down to atmospheric pressure. Recordings of the vasomotor periods were taken at pressure intervals of 100 mm. Hg. Resulting data do not show a significant change in the vasomotor periods. An additional worm was observed at 200 mm. Hg. pressure intervals, but a fifteen minute exposure to each of the pressures was required before recording the data. This design allows more time for the pressure to affect the vascular activity. These recordings were made in the range between atmospheric pressure and 800 mm. Hg. also. Collected data suggest that the dilation period decreases with increasing pressure, and the constriction period is not affected.