The Antibacterial and Cytotoxic Effects of Wiliwili (Erythrina sandwicensis)

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Wiliwili, or Erythrina sandwicensis, is an endemic tree that Hawaiian translator Akaiko Akana said was used to treat venereal diseases. With no published modern medicinal testing on wiliwili, it is imperative to explore the natural properties associated with this unique plant. Antibacterial disk assays were conducted using extracts made of nine different plant parts and an acetone or methanol solvent. Antibacterial properties were found to be most abundant in the bark of the plant, with up to 0.3cm inhibition zones for a 31mg dose against Micrococcus luteus. Select extracts were then tested against K562 leukemia (suspension) cells using a Hemocytometer and a Trypan Blue exclusion test to quantify cell growth. Bark extracts proved to be very effective ($p<0.05$), decreasing the cell counts by about 50% by the third day. Bark extracts also proved to be effective against LNCaP prostate cancer (adherent) cells. However, taking a close look at the cells through a microscope, it was found that the bark extracts cause the disruption of cell membranes, possible signs of apoptosis. Because of the notable inhibition caused by the bark extracts, bark of a 1.5-month-old wiliwili tree was tested against K562 leukemia cells, showing that younger bark inhibits K562 leukemia cells less than older bark. From a dose response, it was found that the lowest bark extract concentration with significant inhibition is a methanol extract diluted to about 25%. Perhaps the use of this plant in modern medicines will spark a desire to preserve the wiliwili and other native Hawaiian plants.

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