

Medicinal Properties of Mangrove Trees

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The unique family of *Rhizophoraceae* includes the halophytic (salt tolerant) species of mangrove tree that are endemic to tropical coasts. The *Rhizophora* species are adapted to salt water. They possess a distinct property called ‘vivipary’ or ‘live birth’ where seeds germinate while still attached to the parent tree, avoiding the harsh salt-water environment. This unique property also enables the mature seedlings to settle in the immediate ecosystem viable for mangroves.

Like many other species of higher plants *Rhizophora* trees release through their roots and leaves chemical compounds which prevent the growth of invasive plants and algae that may compete with the *Rhizophora* in its immediate ecosystem. This phenomenon is termed ‘allelopathy’ and is referred to any biochemical interaction among plants, including micro-organisms (Rice, 1974). Chemical compounds released by plants have wide medical applications. One issue of interest pertaining to the “allelopathic” characteristic of *Rhizophora* is the observation that certain substances secreted by the plants suppresses new tissue growth—thus the prevention of invasive plants in its ecosystem. Research needs to be conducted to determine the suppressive inhibitory compounds because of the obvious implications for applications with out-of-control tumor growth and pathogens in humans.

Healing properties are attributed to *Rhizophora* trees in popular/folk medicine. Root, leaf and stem extracts of *Rhizophora* trees have inhibitory properties, affecting the growth of various human pathogenic organisms. Among these are bacteria, fungi and viruses (Hernandez and Perez, 1978). A physician in Cali, Colombia, reported to cure throat cancer, with gargles of mangrove bark (Garcia-Barriga, 1975). Bark of red mangrove trees have been used in folk remedy for a wide array of diseases (Duke and Wain, 1981; Morton, 1981).

Recently in Japan, Premanathan et al. (1999) reported that a polysaccharide extracted from the leaf of *Rhizophora apiculata* (designated as RAP) inhibited **HIV-1** or **HIV-2** or **SIV** strains in various cell cultures and assay systems. According to this report, the RAP extract blocked the expression of **HIV-1** antigen in **MT-4** cells and abolished the production of **HIV-1 p24** antigen in peripheral blood mononuclear cells (PBMC); RAP also reduced the production of viral mRNA when added before virus adsorption. These results suggest that RAP may inhibit AIDS virus in an early stage of its life cycle. Recently, Alarcon-Aguilara et al. (1998) reported that extracts of *Rhizophora mangle* had anti-diabetic and anti-hyperglycemic property.

In Fiji mangrove stalks are called ‘Titi’. The Fijians traditionally prepare tea by extracting juice from the **Titi**, and drink the warm extract to cure various ailments. Titi is used routinely for symptoms associated with the common cold such as nasal congestion, bronchial congestion, runny nose, etc. It is also used for a variety of other ailments.

The medicinal properties of mangrove trees provide a wide domain for medical uses; most yet to be explored. Nature's Nurse, Inc. has begun contributing to the research effort through its contractual work with Terradyne Labs of Woodbine, Iowa. Much more work remains to be done.

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