

Mangrove forest

Shannon and Ian Jacobs

A regular swamp is a permanent wetland with a diversity of plant species that provide food and shelter for many creatures. A mangrove 'forest' by comparison is close to a monoculture.



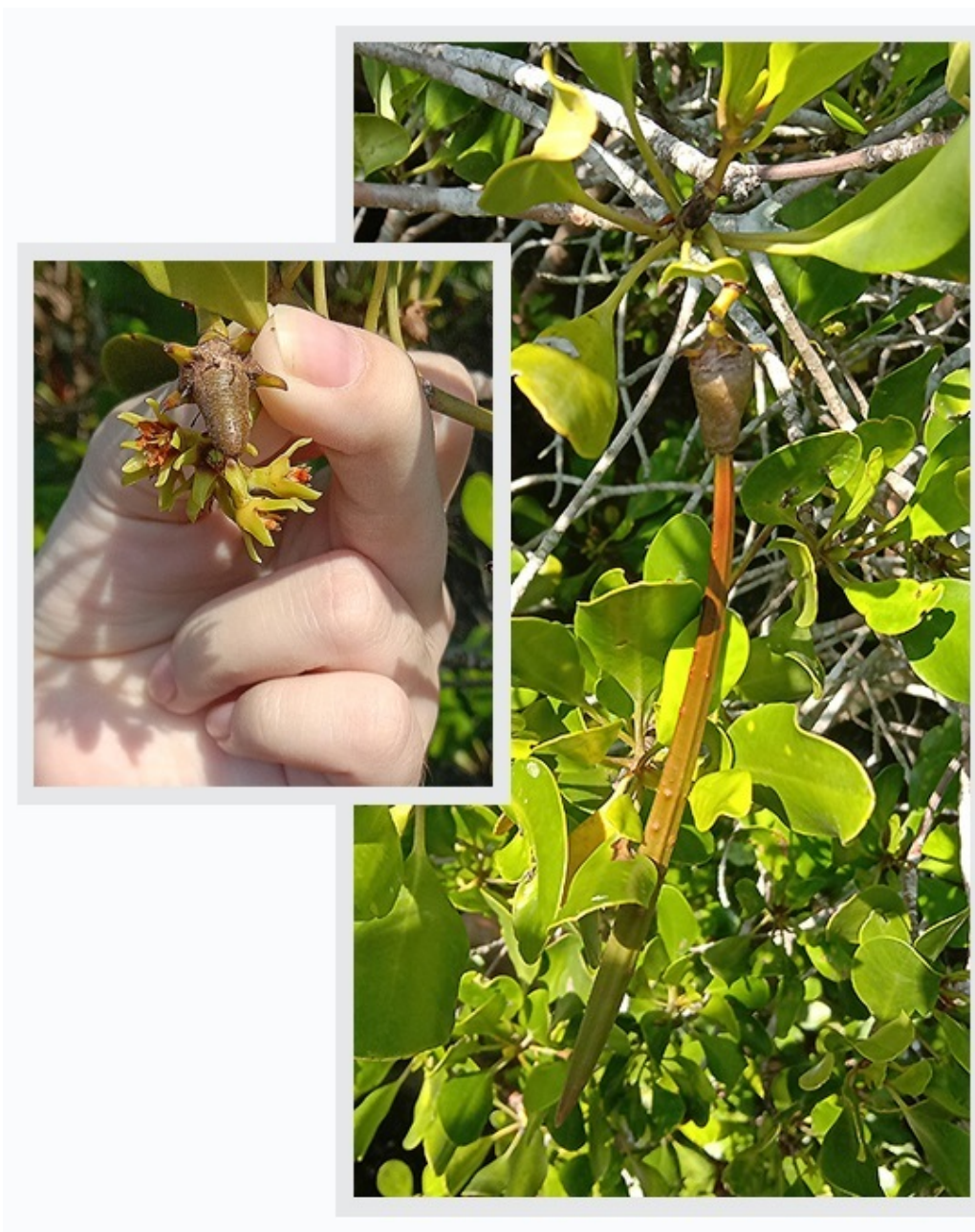
Tropical mangrove forest in Pranburi, Thailand.

This natural forest was an impenetrable tangle of head-high roots in metre-deep water over soft mud until a board walk was built ten years ago as access for tourists.

There have been few visitors for 18 months because of the COVID 19 pandemic. We walked for an hour essentially by ourselves. The forest was silent, in good condition, and appeared to be undisturbed.



The trees were flowering.



A seed (upper left) germinates in place, forming a *propagule* (right) attached to the tree. The propagule eventually drops to become embedded in the mud below.

Mangroves are the only trees that grow on mud flats with tidal flows where the salt concentration in the water varies depending on proximity to the sea, to rivers and streams, and the frequency of tropical downpours. The trees are adapted to self propagate and grow in the low-oxygen mud with aerial root thickets and leathery waxy leaves that secrete excess salt.

Mangrove roots and trunks above calm turbid water.



The water contains permanently suspended colloidal particles that scatter shorter wavelength blue light. Sunlight returned from deep in the water is reddish because of the removal of blue wavelengths by scattering (as in the atmosphere at sunset). Diffuse bluish regions can be seen around the red patches (not to be confused with the reflected blue of the sky). The effect is seen in milk greatly diluted with water (Appendix below).

Our thanks to Les Cowley for email conversation and explanation at www.atoptics.co.uk/fz426.htm

Fauna: mixed habitat

There are large crabs, many smaller crustaceans and the juveniles of many species of fish in the water among the roots. If we lived in a coastal region we would have the opportunity to sample water at intervals and find out something about these creatures but our current interest is primarily in insects. An hour in one afternoon is not long enough to make any sort of study or collection, but we can make a preliminary comparison with a more familiar areas.

Monoculture farming in the tropics is plagued by population explosions of specific insect consumers, that are not controlled by the natural range of predators in a mixed forest or grassland.

A one hour walk with camera in hand above the beach and the planted surrounds of low density single-story visitor housing close to the beach, (largely empty over the last 18 months), produced the following informal species count on and under leaves only. (Familiar species + ones new to us).

Flies (15+5), Beetles (8), true bugs (8+1), butterflies and moths (8) caterpillars (4), parasitic wasps (1+1), large wasps (3), bees (3), ants (4), mantids (3), dragonflies (4). Spiders (4).



Thumb-nails without ID's are included to show the range of insects and spiders easily found on and under leaves in mixed habitat close to the mangrove forest.

Fauna: mangrove forest

We were able to make a comparison over an hour of careful looking in the mangrove forest.

We sighted one large flying black wasp (probably a Scoliid wasp), mosquitoes (Diptera), two species of dragon fly, one individual of each, and one newly constructed red-ant nest. A total of five species, all at low density.



The few insects we saw are common. Red ants are found in forests everywhere in Thailand.

There was evidence of more insect species: grazing on isolated leaves and we found a leaf mine that we believe was made by the larva of a moth.



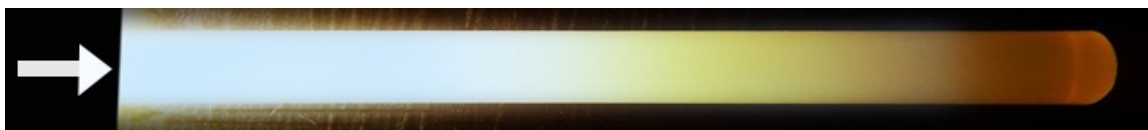
Altogether our initial guess is that insects are present in the mangroves at something less than 10% in terms of species and much less than that in numbers compared to our yard at home in Rangsit, Pathum Thani.

Appendix

The sun at an elevation of 85° shines through overhead leaves into a black bucket half full of water with a few drops of milk.



A bluish tinge is apparent in shaded areas from the preferential scattering of blue light by tiny fat globules in the milk. Light returned from the bottom of the bucket is reddish, as is the light illuminating clouds at sunset because of the scattering of blue light in the atmosphere. The effect is stronger with a longer path length in the water and the milk solution must be suitably dilute. A similar effect is seen when white light passes along the axis of a slightly cloudy hot-glove stick.



The stick appears bluish on the left, yellow and then red as the shorter wavelengths are progressively removed by scattering.