light (½ tsp.) application of 14-14-14 with minor elements was also applied when some plants showed signs of nutritional stress.

The nursery spray program for prevention of insects and disease included periodic treatments of tribasic copper or benlate to control fungus organisms and Cygon or Sevin to control insects.

To date, the plants are doing remarkably well and are being planted heavily in the gardens surrounding Punalu'u Restaurant and Ninole Sea Village Hotel adjacent to the Black Sand Beach.

Only time will tell if the addition of 2,000 plus new trees will again bring this endemic into prominence as part of Ka'u's unique scene.

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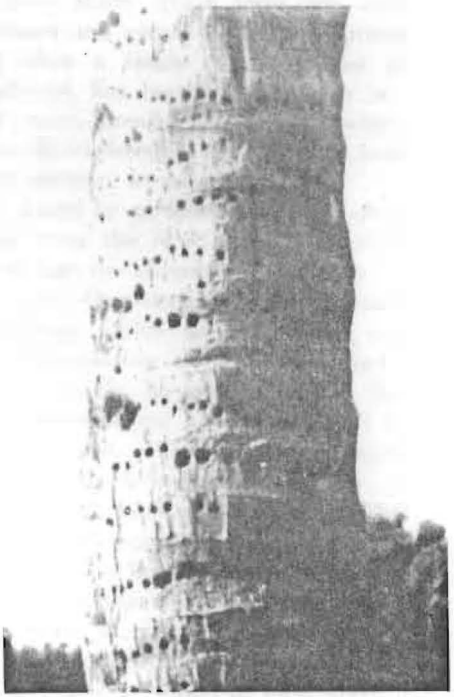
Sapsuckers: Do They Suck Palm Sap?

The yellow-bellied sapsucker (*Sphyrapicus varius*) is a species of woodpecker which seems to feed on the sugary phloem sap of trees. It drills a series of holes about 5 mm. wide in stems. These are often arranged in "bands," but occasionally also in "spirals" and "columns" (Fig. 1). In the early 1900's a controversy arose over the feeding habits of this bird. Some considered that released sap merely served to attract insects which formed the bird's food. Others believed that the bird actually imbibed the sap, and ate the insects as an incidental garnish. This latter theory is now strongly supported by observation and other evidence. Thus birds apparently feeding on sap have a copious and frequent cloacal discharge.[1] Also the beak, unlike that of a true woodpecker which has a harpoon-shaped tip, is tipped with an absorbent brush.[2] However studies of intestinal contents and droppings have shown that solid plant material and insects do also form an important part of the diet.



1. Sapsucker wounds in *Cocos* trunk. The holes are arranged in the typical horizontal "banded" pattern.

We saw sapsucker wounds on coconut palms (*Cocos nucifera* cv. 'Malayan Dwarf') on the Jenning's Estate in Miami. This is interesting because it is notoriously difficult to extract phloem sap from the trunks of palms. Sap is transported in phloem tissue through

[1] Tate, J. Jr. Methods and annual sequence of foraging by the sapsucker. The Auk 90: 810-856 (1973).

[2] Pearson, T. G. Chap: Woodpeckers, guardians of our trees. *The Book of Birds*, 2: 51-63 Ed. G. Grosvenor and A. Wetmore (1939).

sievetubes which contain relatively high concentrations of sugars (around 20% w/v) and at remarkably high pressures (up to about 15 bars). Highly efficient sealing mechanisms seem to protect this vulnerable pipeline. They operate instantaneously to prevent an excessive loss of sugars and other plant nutrients when sievetubes are punctured. If sapsuckers really drink the sap the interesting question is how they manage to avoid the tendency of the phloem sievetubes to seal.

Although sapsucker activities on palms are well known locally, we have been unable to find published records of their feeding on palm trees. Sapsucker damage has been studied in the northern states where trees are often damaged and even killed. It is curious that often a single palm, but *not* its neighbors, has been attacked over several years, possibly during the winter when the birds migrate southwards from their summer breeding grounds.

It would be an advantage if we could learn from the bird where and when to cut into the phloem sievetubes to obtain sap. Our studies of translocation physiology which are connected with the transmission of lethal yellowing disease, might be assisted if we had more observations on the bird and its feeding habits. Time of day, season, region of trunk bored, and the type of palm are all interesting. It seems that varietal and even individual differences between trees may influence the birds preferences, presumably in response to the release of sap. If anyone has the opportunity to observe sapsuckers feeding on palms we would be most grateful to hear about it.

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Some Observations on the Palm Weevil Rhynchophorus cruentatus

In the past few years we have been warned repeatedly that the Canary Island palm (*Phoenix canariensis*) is always a tempting feast for the palm weevil, but by most home owners this warning is usually taken lightly until the weevil strikes. This was true in my case: this pest always worked on some one else's palm, not on mine. However, in the fall of 1972, when I was living in Venice, Florida, a sudden wind storm blew a frond out of the top of my date palm and when examined, it had been chewed off by an insect. This began an interesting study of the palm weevil on my part.

In order to get to the damaged fronds it was necessary to cut off *all* the fronds, so it was denuded (Fig. 1). In the very heart of the palm, I found a lot of damage where the insect had been working. I also found some of the pupal cases. This pupal case is made from coarse palm fibers and is about 2½ inches long. The larvae bore into the leaf sheath and, if left alone, can kill

1. Treating my Canary Island date palm with BHC.