# DISCUSSION

## JUVENILE CHARACTERS OF ROYAL PALMS

FOUR species of royal palms are now represented in southern Florida and may be distinguished in their juvenile stages by leaf characters that are not apparent in the adult palms. Flowers and fruits are not produced until the palms are from 25 to 30 feet tall, when the leaves and inflorescences are out of reach for comparison. Little dependence can be placed upon the sizes and shapes of the trunks, which vary with conditions of growth from slender and tapering to robust and ventricose. Most of the adult palms in Florida are of the native species, *Roystonea floridana,* which is being used extensively for street and ornamental planting, but other species are being introduced, so that means of distinguishing them are of increasing interest.

The Barbadian royal palm, *Roystonea oleracea,* is characterized by the pinnae of the juvenile leaves being wide and pendent, in contrast with narrow spreading or erect pinnae in the other species at the corresponding stages of growth, when the plants are from 3 to 6 feet high. In the younger stages of *oleracea,* the leaf-sheath, petiole and rachis are tinged with a deep red, the color being nearly the same as that of the small appressed scales scattered over the surface, while in the other species the surfaces are green, though the scales are reddish or brownish.

The leaves of the Cuban royal palm, *Roystonea regia,* have close-set narrow erect pinnae, in contrast with spreading or horizontal pinnae in other species at the same stage of growth. Also the reddish-brown scales of the leaf-sheaths continue in the Cuban species to be very abundant after the trunk-forming stage of the plant has been reached, and on many individuals even to the fruiting stage, while the other species have fewer and smaller scales, so that the leaf-sheaths usually appear entirely clean by the time that the trunks are a few feet high.

The royal palm of Puerto Rico, *Roystonea borinquena,* and the native royal palm of Florida, *Roystonea floridana,* are alike in the narrow spreading pinnae of their juvenile leaves, but the Puerto Rican species has a lighter green color and the surface scales reach a larger size, so that the rachis and petiole have a notably freckled appearance; also the midrib of the pinna has a readily perceptible row of scales, while in the Florida species the scales are relatively minute and inconspicuous, the difference being obvious when the pinnae are about half an inch wide.

The pinnae of *Roystonea floridana* later are much wider and rather close-set and drooping, in notable contrast with narrower and more erect pinnae in *Roystonea regia,* the Cuban species. Even in the adult stage a greater tendency to erect pinnae may be seen in the Cuban palm, though all the species share the adult character of having the pinnae inserted at different angles to the rachis. Another adult difference is that the petioles of the Florida palms tend to be more rigid, so that the leaves do not droop around the leaf-sheath bundle as in the Cuban species, but form a broad umbrella crown, in this respect having a greater resemblance to the Barbadian species, *Roystonea oleracea.*

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## SYNCHRONOUS FIREFLY FLASHING

IN his recent note on synchronous flashing of fireflies experimentally produced,[1] Mr. John Bonner Buck regards his experiments with *Photinus pyralis* as indicating that "the whole process depends on the fact that all the [sedentary] females reply to each of the flashes of the male at the same definite [time] interval," thus gradually causing all the males approaching them on the wing to flash in unison. From the wording of the last two paragraphs of his note I infer that Mr. Buck interprets his observations on this one insect as offering a possible solution to the problem of synchronous flashing of fireflies in general. A tropical species of *Photinus,* however, a medium-sized, dark-colored Jamaican insect identified by Mr. H. S. Barber as probably *P. maritimus* E. Olivier, behaves so differently from *P. pyralis* as to convince me that there must be several causes of synchronous flashing and that the habit therefore needs to be separately studied and explained in each species that exhibits it.

On a broad open "common" near Mandeville, Jamaica, I found *Photinus maritimus* abundant during the latter part of February and the early part of March, 1931. I was told that simultaneous flashing was not unusual, but until March 8 I failed to see it. On that date, between 10 and 10:30 P. M., and on subsequent nights, I saw constellation-like groups of simultaneously flashing insects forming and disintegrating at different points among the large and active firefly population then on the wing. Sometimes it was possible to see as many as three such groups, each flashing like a constellation of from 20 to 40 stars. The flashes were single, of short duration, their apparent brightness at distances of from 50 to 75 yards intermediate between the luminosity of the north star

[1] SCIENCE, 81: 339–340, April 5, 1935.