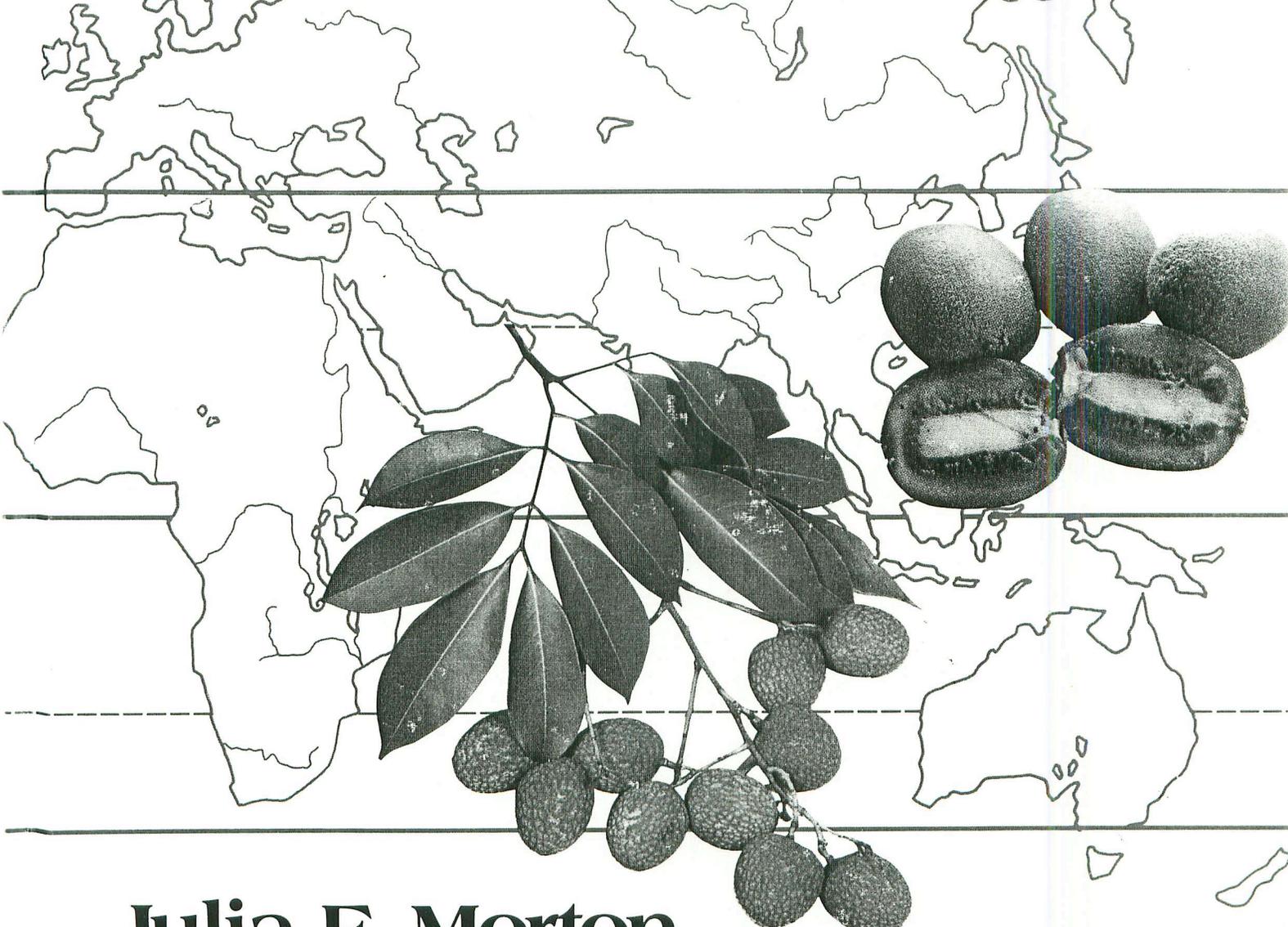


Soursop

FRUITS OF WARM CLIMATES



Julia F. Morton

Of the 60 or more species of the genus *Annona*, family Annonaceae, the soursop, *A. muricata* L., is the most tropical, the largest-fruited, and the only one lending

itself well to preserving and processing. It is generally known in most Spanish-speaking countries as *guanabana*; in El Salvador, as *guanaba*; in Guatemala, as *huabana*; in Mexico, often as *zapote de niegas*, or *cabeza de negro*; in Venezuela, as *catoche* or *catuche*; in Argentina, as *anona de puntitas* or *anona de broquel*; in Bolivia, *smim*; in Brazil, *araticum do grande*, *graviola*, or *jaca do Pará*; in the Netherlands Antilles, *sorsaka* or *zuuzzak*, the latter name also used in Surinam and Java; in French-speaking areas of the West Indies, West Africa, and Southeast Asia, especially North

Vietnam, it is known as *corossol*, *grand corossol*, *corossol ephineux*, or *cachiman ephineux*. In Malaya it may be called *durian belanda*, *durian maki*, or *seri kaya belanda*; in Thailand, *thu-ran-hack*. In 1951, Prof. Clery Salazar, who was encouraging the development of soursop products at the College of Agriculture at Mayaguez, Puerto Rico, told me that they would like to adopt an English name more appealing than the word "soursop", and not as likely as *guanabana* to be mispronounced. To date, no alternatives have been chosen.

Description

The soursop tree is low-branching and bushy but slender because of its upturned limbs, and reaches a

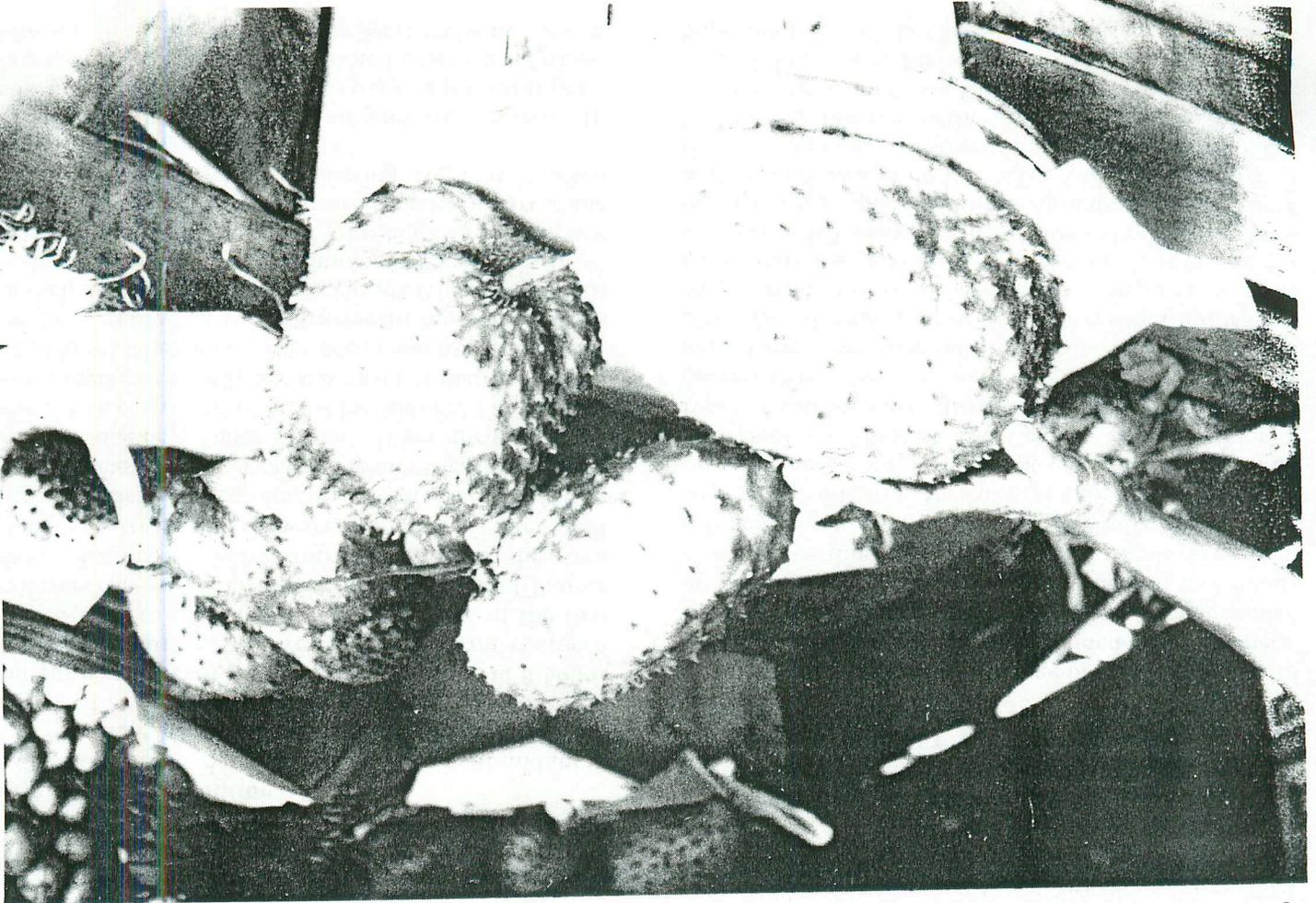


Fig. 20: Exceptionally large and well-formed soursops (*Annona muricata*) in a Saigon market, 1968.



Fig. 21: The soursop tree may bear fruits anywhere on its trunk or branches. Multiple-stems of this tree are the result of its having been frozen to the ground more than once.

Fruit Company. He described the fruit as large and handsome (as shown in the photograph accompanying the introduction record No. 51050) and he declared the tree to be the most productive he had seen.

Climate

The soursop is truly tropical. Young trees in exposed places in southern Florida are killed by only a few degrees of frost. The trees that survive to fruiting age on the mainland are in protected situations, close to the south side of a house and sometimes near a source of heat. Even so, there will be temporary defoliation and interruption of fruiting when the temperature drops to near freezing. In Key West, where the tropical breadfruit thrives, the soursop is perfectly at home. In Puerto Rico, the tree is said to prefer an altitude between 800 and 1,000 ft (244–300 m), with moderate humidity, plenty of sun and shelter from strong winds.

Soil

Best growth is achieved in deep, rich, well-drained, semi-dry soil, but the soursop tree can be and is commonly grown in acid and sandy soil, and in the porous, oolitic limestone of South Florida and the Bahama Islands.

Propagation

The soursop is usually grown from seeds. They should be sown in flats or containers and kept moist and shaded. Germination takes from 15 to 30 days. Selected types can be reproduced by cuttings or by shield-budding. Soursop seedlings are generally the best stock for propagation, though grafting onto custard apple (*Annona reticulata*), the mountain soursop (*A. montana*), or pond apple (*A. glabra*), is usually successful. The pond apple has a dwarfing effect. Grafts on sugar apple (*A. squamosa*) and cherimoya (*A. cherimola*) do not live for long, despite the fact that the soursop is a satisfactory rootstock for sugar apple in Ceylon and India.

Culture

In ordinary practice, seedlings, when 1 ft (30 cm) or more in height are set out in the field at the beginning of the rainy season and spaced 12 to 15 ft (3.65–4.5 m) apart, though 25 ft (7.5 m) each way has been suggested. A spacing of 20 x 25 ft (6x7.5 m) allows 87 trees per acre (215/ha). Close-spacing, 8 x 8 ft (2.4x2.4 m) is thought sufficient for small gardens in Puerto Rico. The tree grows rapidly and begins to bear in 3 to 5 years. In Queensland, well-watered trees have attained 15 to 18 ft (4.5–5.5 m)

to fruit cups or salads, or chilled and served as dessert with sugar and a little milk or cream. For years, seeded soursop has been canned in Mexico and served in Mexican restaurants in New York and other northern cities.

Most widespread throughout the tropics is the making of refreshing soursop drinks (called *champola* in Brazil; *carato* in Puerto Rico). For this purpose, the seeded pulp may be pressed in a colander or sieve or squeezed in cheesecloth to extract the rich, creamy juice, which is then beaten with milk or water and sweetened. Or the seeded pulp may be blended with an equal amount of boiling water and then strained and sweetened. If an electric blender is to be used, one must first be careful to remove all the seeds, since they are somewhat toxic and none should be accidentally ground up in the juice.

In Puerto Rican processing factories, the hand-peeled and cored fruits are passed through a mechanical pulper having nylon brushes that press the pulp through a screen, separating it from the seeds and fiber. A soursop soft drink, containing 12 to 15% pulp, is canned in Puerto Rico and keeps well for a year or more. The juice is prepared as a carbonated bottled beverage in Guatemala, and a fermented, cider-like drink is sometimes made in the West Indies. The vacuum-concentrated juice is canned commercially in the Philippines. There soursop drinks are popular but the normal "milk" color is not. The people usually add pink or green food coloring to make the drinks more attractive. The strained pulp is said to be a delicacy mixed with wine or brandy and seasoned with nutmeg. Soursop juice, thickened with a little gelatin, makes an agreeable dessert.

In the Dominican Republic, a soursop custard is enjoyed and a confection is made by cooking soursop pulp in sugar sirup with cinnamon and lemon peel. Soursop ice cream is commonly frozen in refrigerator ice-cube trays in warm countries.

In the Bahamas, it is simply made by mashing the pulp in water, letting it stand, then straining to remove fibrous material and seeds. The liquid is then blended with sweetened condensed milk, poured into the trays and stirred several times while freezing. A richer product is made by the usual method of preparing an ice cream mix and adding strained soursop pulp just before freezing. Some Key West restaurants have always served soursop ice cream and now the influx of residents from the Caribbean and Latin American countries has created a strong demand for it. The canned pulp is imported from Central America and Puerto Rico and used in making ice cream and sherbet commercially. The pulp is used, too, for making tarts and jelly, sirup and nectar. The sirup has been bottled in Puerto Rico for local use and export. The nectar is canned in Colombia and frozen in Puerto Rico and is prepared fresh and sold in paper cartons in the Netherlands Antilles. The strained, frozen pulp is sold in plastic bags in Philippine supermarkets.

Immature soursops are cooked as vegetables or used in soup in Indonesia. They are roasted or fried in north-eastern Brazil. I have boiled the half-grown fruit whole, without peeling. In an hour, the fruit is tender, its flesh

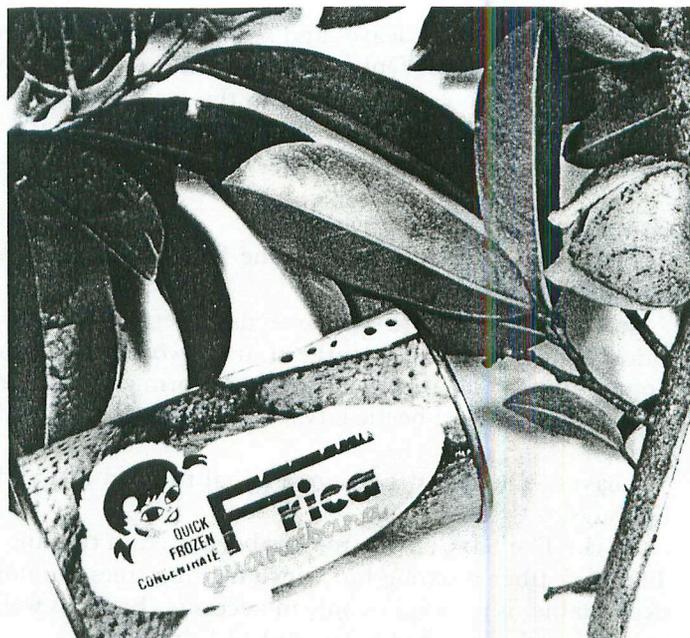


Fig. 22: Canned soursop concentrate is produced in Venezuela. On the branch at the right is a soursop flower.

off-white and mealy, with the aroma and flavor of roasted ears of green corn (maize).

Toxicity

The presence of the alkaloids anonaine and anoniine has been reported in this species. The alkaloids muricine, $C_{19}H_{21}O_4N$ (possibly des-*N*-methylisocorydine or des-*N*-methylcorydine) and muricinine, $C_{18}H_{19}O_4$ (possibly des-*N*-methylcorytuberine), are found in the bark. Muricinine is believed to be identical to reticuline. An unnamed

Food Value Per 100 g of Edible Portion*	
Calories	61.3-53.1
Moisture	82.8 g
Protein	1.00 g
Fat	0.97 g
Carbohydrates	14.63 g
Fiber	0.79 g
Ash	60 g
Calcium	10.3 mg
Phosphorus	27.7 mg
Iron	0.64 mg
Vitamin A (β -carotene)	0
Thiamine	0.11 mg
Riboflavin	0.05 mg
Niacin	1.28 mg
Ascorbic Acid	29.6 mg
Amino Acids:	
Tryptophan	11 mg
Methionine	7 mg
Lysine	60 mg

*Analyses made at the Laboratorio FIM de Nutricion, Havana, Cuba.