

SOME OBSERVATIONS ON MEDICINAL PLANTS OF FLORIDA.*

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Nature has been generous to Florida. Several eminent botanists who have studied and written regarding the plant life of this state have remarked that in no other state of the Union do we find the large number of plant families with the large representation of genii and species that occur in Florida. Probably in no other state do we find as great a range in native plant life, inasmuch as in this state are found representatives of tropical, subtropical and temperate plant types. Furthermore, many plants which are native to the northern states will not only grow but will thrive in Florida while, on the other hand, many of the plants native to Florida cannot be grown under the climatic conditions existing further north. Dr. Pammel of the University of Iowa remarks that not only is the plant life of Florida important from the standpoint of number of species, but also from the standpoint of interest in regard to the peculiar life history and methods of struggling for existence, and as an example he cites the strangling fig.

The unusual plant life in Florida is due in part to the fact that the state extends through approximately six degrees of latitude, which give it tropical, subtropical and temperate climatic features; in part also to the fact that it extends through approximately seven degrees of longitude which make possible a great variety in soil conditions and physiographic features; third, to its peculiar location in relation to other land bodies and to bodies of water.

The effect of a wide range of latitude is too evident to require elaboration. With reference to soil conditions and physiographic features it might be interesting to note that the peninsular part of the state consists primarily of a lime rock formation, called Miami oolite, which in the lower part has not yet been sufficiently weathered nor has it yet borne vegetation sufficient to form a layer of soil of any appreciable depth, except in strips called hammocks. It might be interesting to note here also that the fruit growers, in planting the trees, first blast out a hole a foot or so in diameter and two or three feet deep for the tap root of the tree, and pulverize with a pickax a shallower area for the secondary roots. Farther north is a continuation of the Everglade region. This consists of underlying rock covered with a layer of muck formed from decayed plants. This is a vast prairie, broken by hammocks, and during the rainy season much of this area is under water. Still farther north is the sandy area and to the westward, in the region of Tallahassee, are found the clay hills. This probably is sufficient to illustrate the variation in soil and physiography.

With respect to the third factor influencing the plant life of Florida, namely, its peculiar location with reference to land and water bodies, Paradise Key might serve as an interesting example. Paradise Key is an island in the Everglades; it is one of the so-called hammocks, but is peculiar in that it is completely surrounded by a flooded area. Dr. Thompson, a retired botanist now living in Miami, advances the interesting theory that at one time a great tidal wave submerged the

* Presented at Plant Science Seminar, Boston, 1929.

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lower part of Florida, bringing with it seeds and plants from the tropical islands, particularly Porto Rico. With the receding of this tidal wave these seeds and plants were deposited and formed the beginnings of tropical plant life for this region. However, due to destructive fires, clearing of forests, etc., this tropical plant life was destroyed in all parts except Paradise Key, where, due to its isolation, it remains undisturbed. W. E. Safford, former economic botanist, U. S. Department of Agriculture, summarizes the situation very aptly in the following words:

"Paradise Key, an island in the heart of the Everglades of Florida, is almost unique from a biological point of view, presenting as it does a remarkable example of a subtropical jungle within the limits of the United States in which primeval conditions of animal and plant life have remained unchanged by man, and thus offering a striking contrast to the keys along the coast of Florida as well as to other Everglade keys in which normal biological conditions have been greatly disturbed by destructive fires, clearing of forests, or the construction of drainage canals, which not only affect the original physical conditions, but at the same time permit aquatic animals and plants previously unknown to penetrate into the Everglades. The region is also remarkable for the fact that it is a meeting place for many temperate and tropical types of plants and animals." "Paradise Key owes its preservation from fires and other destructive agencies chiefly to its isolation and to a deep slough near its eastward border which never becomes dry, even during periods of greatest drought."

It will not be possible within the limits of this paper to list all of the medicinal plants occurring in Florida. However, it might be advisable to mention a few, particularly with reference to the three influences discussed above. Along the borders of Paradise Key are found a number of marsh-loving shrubs, such as Wax Myrtle, from the root of which bayberry bark is obtained, and the Swamp Bay with an aromatic fragrance like that of bay rum. Among the plants of tropical origin found on Paradise Key, Bitterwood, Guaiac and Sarsaparilla may be mentioned as illustrations. In the Everglades outside of Paradise Key, Poke Root grows to an enormous size. Here also are found Black Mustard, Jimson Weed, Mandrake, Castor Bean, Snake Root and Cassia Cinnamon. American Storax is found quite generally distributed over the state but more particularly in the northern half. The medicinal pines, *Pinus palustris* and *P. taeda*, are most extensive in the sandy areas, Gainesville being approximately in the geographical center of the pine region. In this same region the Prickly Ash is found, also Witch Hazel, Stillingia, Sumac, Gelsemium and Saw Palmetto. In the western part of the state some of the most interesting, if not the most important, medicinal plants are found, such as, Fringe Tree, Seven-Barks and Dioscorea, as well as *Betula lenta* and *Prunus serotina*.

The collection of native botanical drugs for the market is now receiving considerable attention in this state. This work is done in some cases by itinerant collectors; in other instances it is followed as a sort of pin-money proposition by farmers, truck-growers and country storekeepers and in a few cases the collection of medicinal plants is the major occupation and is depended upon as a means of livelihood and family support. If we could consider the pine products as purely medicinal this latter group would be enormously increased. It appears that the medicinal demand for these products is nevertheless great enough to warrant their consideration in this connection. That this viewpoint is justifiable is supported by a recent statement of Carl Speh, Secretary of the Pine Institute of America, Jacksonville, to the effect that if the old custom of keeping a bottle of turpen-

tine in every home for medicinal use were to be revived the turpentine producers would have little occasion to worry about marketing this product. For the past twenty odd years, Florida has been the largest producer of turpentine and rosin in this country. From 1905 up to the time of the World War, Florida produced approximately 45% of the turpentine of the United States, with a maximum of 54%, in 1910. Since the War, Florida's proportion has dropped and Georgia appears to be forging to the front. The total value of the naval stores' crop in 1925 was above 12 million dollars and furnished support for 60,000 people. In the December 15, 1926 issue of the *Southern Lumber Journal*, O. H. L. Wernicke, President of the Pine Institute of America, states:

"Recent research carried on by the Pine Institute of America indicates that the markets and products of this industry are but in their infancy, because their possibilities have been barely scratched. Turpentine and rosin are only the simplest and crudest of the products which will be obtained from oleoresin (the gum of the pine trees). New products, which mean new industrial establishments, are being devised, which start with oleoresin as a base, much as crude petroleum is the base for great varieties of products which touch our lives at every angle."

Other important drugs from the standpoint of collection are Saw Palmetto berries and *Stillingia* root. Saw Palmetto is quite generally distributed throughout the state, but it is claimed that the berries produced within four or five miles of the sea-coast are better than those produced further inland. They are better from the standpoint of general appearance, uniformity in size and yield, and hence, most of the collecting is done along the Middle Atlantic Coast of the state. It is estimated that the annual demand for Saw Palmetto berries is in the neighborhood of 200,000 lbs.

Stillingia root is collected primarily in Putnam and Marion Counties and in the northern region of the Indian River. Some of this is sold to American pharmaceutical manufacturers but it appears that most of the growers sell directly to exporters. No estimate as to the amount collected annually has been obtained.

Other drugs collected are Blue Flag root, Deer Tongue and Water Eryngo. Deer Tongue is used for the production of coumarin, and Water Eryngo or Button Snakeroot has been used as a substitute for Senega. No estimate has been obtained regarding the quantity of these drugs collected.

The cultivation of medicinal plants in this country is a comparatively recent innovation and is still only in its earliest infancy from the standpoint of development. This may be attributed to the fact that natural supplies have been sufficient to meet the demand and could be placed on the market more cheaply than the cultivated product; secondly, to the fact that it is financially impossible to compete with the cheap labor of foreign countries. However, due to destructive methods of harvesting and the spread of agriculture and other industries which require clearing of the land, the natural supplies in some cases are being rapidly depleted and undoubtedly the time is not far distant when it will be necessary to resort to cultivation to supply the demand for many crude drugs. Cultivation of medicinal plants is also being stimulated by the operation of drug plant gardens and the introduction of courses in the cultivation of medicinal plants by Colleges of Pharmacy, thus making it possible for students to secure training in the fundamentals of medicinal plant production. Interest in the possibility of successfully raising drug plants for market is growing yearly. This interest is evident in the

State of Florida and is manifested by the large number of inquiries concerning drug cultivation received by the College of Pharmacy.

There are a few successful growers in this state, but this industry is only a side-line and has not yet developed to the point where it is made a major business. It has been already demonstrated that there are a large number of drug plants that will grow in Florida but it remains to be determined whether or not these can be grown profitably; but the number of plants suitable for profitable cultivation is probably relatively small. This is due in part to the fact that the demand for many of them is small and irregular and consequently the market is unstable and spasmodic.

Several essential oil-bearing plants flourish as weeds in this state, and also grow well under cultivation. Among such plants are American Wormseed and *Monarda punctata* (Horse Mint). Peppermint and Spearmint also grow well and there is a possibility that the commercial production of these plants could be made a profitable industry. There are already several growers of peppermint in Florida, a few of whom are extending their acreage as rapidly as possible.

Many crude drugs are derived from plants which thrive in the Tropics or Subtropics and these undoubtedly offer a possibility to Florida. One individual is now embarking on this venture and is planning to experiment with such drugs as Aloes, Jalap, Assafœtida and Squill. Experimentation with the growing of camphor trees on a large scale has already been carried on in this state. The results indicated that the cost of producing camphor gum is necessarily high and that under present conditions, production of camphor under cultivation is not feasible.

Florida offers great possibilities from the standpoint of scientific investigation of medicinal plant resources. It is said that at present about 600 crude drugs are used in the preparation of medicines in the United States. It is now known that about 20% of this number occur in this state and it has been demonstrated that an additional 20% will grow in Florida. There is no doubt but that this percentage will be shown by further investigation to be considerably higher. However, it appears not only possible but probable that there may be a variation in percentage of constituents as well as character of constituents of plants grown under Florida conditions when compared with the same species of plants grown under conditions existing in other localities, and in this connection there is undoubtedly a fruitful field for scientific plant investigation. Furthermore, there are undoubtedly plants in this state possessing important medicinal qualities, possibly surpassing those of plants now in use. The College of Pharmacy, University of Florida, has during the past year received several letters describing medicinal virtues of plants heretofore not known to possess such qualities. Here again is a fruitful field for investigation. Who knows but that within the borders of Florida may be a Chinese Ma Huang, a Cinchona or a Cassia Senna waiting to be discovered by some ambitious and budding pharmacist.

Rapid City Convention, August 19th-31st: The Plant Science Seminar, the National Conference on Pharmaceutical Research, the AMERICAN PHARMACEUTICAL ASSOCIATION, the American Association of Colleges of Pharmacy, the National Association of Boards of Pharmacy, the Conference of Pharmaceutical Secretaries, a Symposium on the Genus *Mentha*, a Conference of Pharmacy Law Enforcement Officials.