



UNIVERSITY OF BRISTOL

DEPARTMENT OF AGRICULTURE AND HORTICULTURE,

RESEARCH STATION,
LONG ASHTON,
BRISTOL.

Director:

Professor H. G. H. KEARNS, O.B.E., B.Sc., Ph.D.

29th July, 1964.

APW/JW

Dr. Grote Reber,
C.S.I.R.O.,
Tasmanian Regional Laboratory,
"Stowell",
Stowell Avenue, Hobart,
Tasmania, Australia.

Dear Dr. Grote,

Dr. Donald Wilson thanks you for your letter concerning *Dioscorea*. He has asked me to reply to your queries as I am more closely concerned with growing these plants.

There are about 800 known species of *Dioscorea* scattered throughout the tropical, semi-tropical and temperate regions of the world. Rather more than half the species twine to the right and the rest twine to the left (clockwise).

Diosgenin, a sapogenin, is acknowledged to be the best starting compound for the manufacture of Cortisone and the Cortico-steroid range of drugs.

Diosgenin is found in a number of plants especially in members of the Liliiflorae, but, so far, only in the tubers of a relatively few species of *Dioscorea*, has a sufficient percentage been found to make its extraction a commercial possibility. The tubers used for commercial *diosgenin* extraction to-day are those of *Dioscorea* species growing wild in the Mexican forests. *Dioscorea* species known to contain *diosgenin* have also been found in British Honduras, Eastern U.S.A., many countries in the East and Middle East, and in Southern Africa. All these species, including those in Mexico, have vines which twine to the left.

Poisonous compounds (i.e. *dioscorine*, used as an arrow poison) are found in a few *Dioscorea* species (i.e. *D. dumetorum*, *D. hispida*) and these plants also are sinistrose twiners.

Among the *Dioscorea* tubers grown for food are the following species:-

<i>D. alata</i>	Linne	twines to the right
<i>D. esculenta</i>	Burkill	twines to the left.

The most comprehensive monograph on the *Dioscorea* of the East and Middle

/East

East is to be found in the

Annals of the Royal Botanic Garden, Calcutta. Vol XIV

An account of the genus *Dioscorea* in the East, Burkill, I. H. & Prain, D. Bengal Government Press.

Part I. The species which twine to the left (1936) 2 vols. with plates

Part II. The species which twine to the right with an addenda to Part I and a Summary (1939) 2 vols. with plates.

Of the Australian *Dioscorea*, Maiden, in his "Useful Nature Plants of Australia incl. Tasmania" (Trüber & Co) mentions three species growing on the mainland - seed of which could probably be obtained from the Botanic Gardens in Sydney or Perth.

- D. hastifolia* Endl. Western Australia. Yam used for food. Twines to the right,
- D. sativa* Linne (bulbifera) Queensland & N. Australia. Karro Yam cultivated for food. Twines to the left.
- D. traversa* R.Br. Central Queensland. Kowar, Long yam, food. Twines to the right.

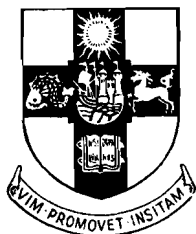
None of these species contain diosgenin. Maiden gives a good description of the characteristics of genus.

Dr. L. C. Luckwill has told us something of your work with climbing plants. We think you might like some seed of both right and left twining *Dioscorea* to grow yourself. We are, therefore, sending you under separate cover seed of the following two species:-

- D. sylvatica* Eckl. a southern African species, grows above 4000 ft. alt. on the Drakenberg Range. Left hand twiner, tuber contains diosgenin.
- D. cotonifolia* Knuth an African species. Right handed twiner. Has a rootstock with stolons bearing large black potato-like tubers which contain no diosgenin.

These two species are much alike in their bine growth, both climb to 15 - 20 ft. up scrub and small trees. Both have fruits in the form of a three winged capsule and seeds with a single apical wing, but the details are

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different in each species.

Dioscorea seedlings do not usually flower in the first year. In their second year, some of the male plants will probably flower and in the third year both male and female plants flower. To ensure the set of the seed the female flowers should be hand pollinated. Bean poles are suitable as a support for the vines. For healthy growth the plants need calcium, magnesium and also nitrogen and phosphate.

Another reference which might be of interest to you is - The Organography and the Evolution of Dioscoreaceae, the family of Yams. I. H. Burkill, F.L.S., J. Linn. Soc. (Bot.) 56, 367, pp. 319-412 in which is discussed right and left hand twining and the types of fruits and seeds found in the family.

We hope that the seeds arrive safely and that these few notes will be of assistance.

Yours faithfully,

A. P. Wilson. (Hui)

A. P. Wilson