for examining the material and communicating his views.

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Fyzabad,
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A Note on the Gametophyte of *Botrychium virginianum* var. *lanuginosum*, SW.

Our knowledge of the prothalli, the germination and growth of spores of *Botrychium*, though scanty, is derived from the researches of Douglas Campbell[1] and Edward Jeffrey[2] who have described the American forms of the species *Botrychium virginianum*. The occurrence of this species of *B. virginianum* var. *lanuginosum* is reported from various places in India, but till now no account of its developmental history has been made known. The purpose of this note is to record a preliminary account of the gametophytes of the Indian variety *B. virginianum* var. *lanuginosum*, which in certain respects differs from the published accounts.

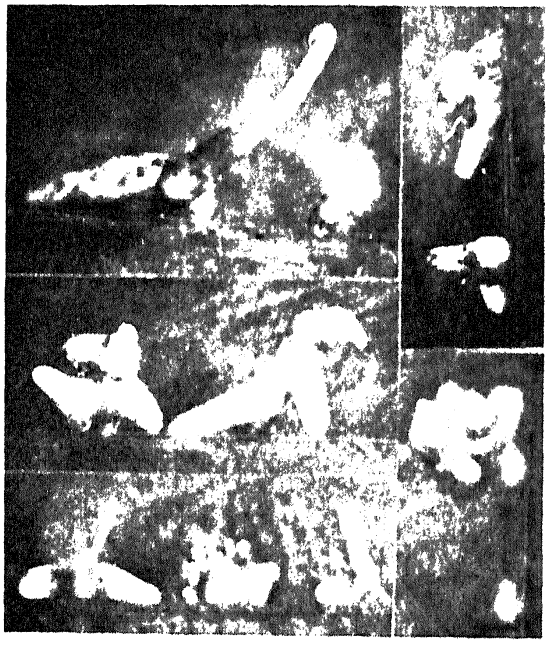

Fig. 1

Gametophytes of *Botrychium virginianum* var. *lanuginosum*, of different ages. Note the diversity of form and shape. At the left upper corner the first leaf of a sporophyte with its circinate vernation can be seen. 6.

In 1937, I obtained a large number of gametophytes of the variety *lanuginosum* from Kodaikanal and in the subsequent year several younger stages were collected. The [illegible] which is under investigation has [illegible] peculiarities well worth reporting at once. Campbell working on old prothalli has described them as flattened tubers, covered with root hairs, with folded in margins and with reproductive organs buried on the superior surface. Regarding colouration, they were brown externally, though white in section. Jeffrey working on fresh material has described the prothalli as flat and oval with root hairs. According to him the growing point is at the narrow anterior end, the hinder part becomes thicker and wider. The antheridial ridge on the dorsal surface widens out in the older prothalli. The gametophytes of other species of *Botrychium* such as: *B. lunaria*, *B. obliquum* and *B. simplex* have been described as being flat and dorsiventral bodies of varying shape, with an antheridial ridge on the superior surface. The prothalli of the Indian variety show essential differences. They are not flat

Fig. 2

Young prothallus with [illegible]

dorsiventral bodies, but are spherical in shape, white in colour, having a number of irregular

indents on the otherwise smooth surface. They are generally smaller than the corresponding stages of the prothalli of the other species; and the subsequent growth of the former results in the assumption of a large variety of shapes shown in Fig. 2.

Endophytic fungus can be easily detected in bodies varying in size from 0·5 mm. to 0·2 mm. and if a young prothallus of this dimension is kept in a moist chamber, the fungus grows out in profusion. Separate cultures of the fungus have been prepared for studying the details of its life-history and association. The prothalli at the stage of the emergence of the endophytic fungus are devoid of rhizoids. The appearance of rhizoids synchronises with the change in colour of the prothalli from white to brown, and also marks the increase in their size (Fig. 1). When the colour changes into deep brown, the rhizoids are lost, fertilisation is completed, and on the young sporophyte developing, the prothalli increases in the size. Certain cases of prothalli almost entirely composed of sporophytic tissue have been noticed.

The results of further investigation will appear elsewhere.

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Eugenia jambolana

THE bark, the seeds and the fruit pericarp of this plant have some reputation as cures for diabetes, chronic diarrhœa and dysentery and as gargle for sore-throat. Though a certain amount of work has been done regarding the chemical composition of the seeds, rather conflicting reports have been made. The earlier workers reported the presence of a glucoside (Börsch)[1], quercitol and cinnamic acid (Pottiez)[2] and that an extract of the kernels prevented diastatic hydrolysis of starch (Stephenson)[3]. Later workers (Power and Callan[4], Hart and Heyl[2]) were of the opinion that the seeds contained no alkaloid, glucoside or enzyme. Further some of the samples that were examined do not seem to have been preserved in good condition. The results of our examination of a fresh sample of the seeds obtained locally agree with those of Hart and Heyl except in regard to the presence of free sulphur which we could not detect. Ellagic and gallic acids together with tannins are probably responsible for the medicinal value of the seeds. We have also obtained small quantities of a sweet smelling yellowish green oil and a colourless crystalline solid which has the properties of a wax. It melts at 81–83° and the unsaponifiable part of it has been identified as myrical alcohol.

The fleshy pericarp of the fruits has not been examined before. It is now found that the sweetness of this material is entirely due to the presence of reducing sugars and that there is a total absence of sucrose. The sourness and astringency seem to be due to the presence of gallic acid and tannin. A fairly high percentage (0·6% of the weight of the dried pericarp) of ammonium chloride could be isolated. The beautiful purple colour is partly due to the occurrence of an anthocyanin, which has been identified as cyanin. During our attempts to isolate this pigment, it was realised that a considerable portion of the colour is due to the presence of a second pigment, which is phenolic in nature and crystallises from dilute alcohol as snuff-coloured plates melting above 300° C.

Two colourless crystalline compounds have also been isolated from the pericarp, one melting at 149° C. and the other at 232° C. The first is easily soluble in alcohol and gives a bluish violet fluorescence when dissolved either in aqueous sodium carbonate or sodium hydroxide or in concentrated sulphuric acid. It seems to belong to the group of hydroxybenzopyrones. The second is far less soluble in alcohol and gives a pale green fluorescence