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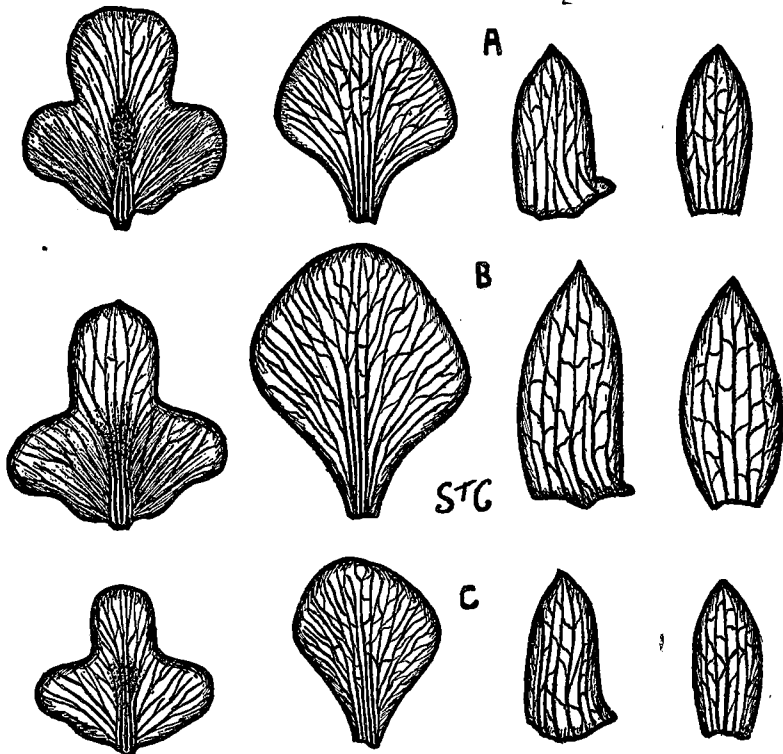
No. 115

Some Notes on *Dendrobium bigibbum* Lindley, and a Suggested Reclassification of Its Numerous Forms

BY S. F. ST. CLOUD

This species and its variants have been the subject of considerable controversy in the past, and it is the purpose of this paper to assist in clarifying the status of some of the many forms in which it occurs. It is realised that

while we, in North Queensland have access to an unlimited amount of living material for study, others are not so fortunate. Their opinions are consequently formed on findings from a relatively small amount of ma-



Key to Plate—A. *D. bigibbum*. B. forma *phalaenopsis*. C. forma *compactum*.
L. to R.—Labelum, petal, lateral sepal, dorsal sepal.
All segments flattened, and selected without regard for size.

terial, and there seems little doubt that many errors of the past have stemmed from this fact. Numerous size and colour forms of this species have been described (and some merely ascribed), as varieties and sub-varieties, but none are of significant morphological difference to warrant inclusion in a scientific paper, and a list of their synonyms would make this paper so unwieldy that it would be worthless, and consequently they have been omitted. *D. bigibbum* is subject to variation in colour and dimension of flower, but to no greater degree than other species. Flowers collected over an area extending from Cape York to a little north of Cooktown, show on careful examination, that they are constant in morphology, and it is with this fact that we are to be concerned.

A well-grown plant of the species attains a usual length of 100-120 cm. in the stem, and this dimension was commonplace before the wholesale plunder of these plants in recent times. The species and its forms, with the exception of sub-var. *compactum* White, cannot be separated when not in flower. There are certain variants that have evolved from the type, and it is in these members that the differences are so marked, to such a degree at times, that it is difficult to differentiate between species and forms. It seems beyond doubt that these variations have also played an important part in creating a misunderstanding of the species. Authors with limited material to work with, have apparently assumed that the various forms were constant and warranted specific or varietal status.

Observations in the field, and in cultivation have proven that these factors, principally colour and dimension which are unimportant in the determination of status, are not fixed. On individual plants, an annual variation is commonly shown in the flowers, and habitat and host appear to play an important role in producing these variants. Comparison of the flowers of *D. bigibbum* with that of its forms, shows that there are two which are sufficiently stable to warrant attention,

forma *phalaenopsis* Fitz. and forma *compactum* White, and of these two forms the only substantial difference from the type form is in the labellum. In the type species, the disc has five smooth callus ridges, emerging from the short claw, contracting at about one-third of the length of the lamina, then forming a dense white ovate mass of fringed callosities, with irregular short lines diverging outward, merging with and disappearing on to the veins of the mid-lobe. In all other forms, the callus ridges, after about one-third of the length of the lamina, subdivide into 5-7 irregular rows of purple fringed callosities, which extend on to and disappear at the junction of the mid-lobe. In the type form the sepals and petals are usually recurved, and in all other forms these segments are straight. Forma *phalaenopsis* has a greater number of flowers than the type, and they are usually larger with the segments forming an unbroken circle. All forms are prominently double spurred as in the type, and in the column, stigma, anther and pollinia, are also identical with those of that species.

There are certain features of forma *compactum* that warrant special mention; the plant separates readily from other forms by reason of the sturdy compact growth, the stems of which reach a usual length of 12-18 cm.; which is rarely exceeded. The flowers are usually fewer in number and more richly coloured than those of any other form. An average raceme bears 8-10 flowers up to 9 cm. across the perianth. The plant has evolved a peculiar method of growth to fit the extremely arid conditions which prevail on the Macalister Range where it is to be found in greatest quantity. During the monsoon rain period, these rock faces on which the plants grow, are continually wet, but for the remainder of the year the area is extremely dry, the cliffs are practically devoid of shade, and the rocks are hot to the touch. Delicate root tips and fresh new growths are not affected, the small quantity of moisture needed to sustain life in the plants can be obtained only from the dew, or

from the night mist from the sea close by. The range of habitat is from altitudes of 1000 feet to 2000 feet, growth below this level is not successful, for the sunlight being obscured in the lower rock gullies is evidently the cause of this. A small number of these plants has trees and shrubs for hosts, and despite the relatively cooler habitat and more abundant plant food, they show no tendency to revert to the long stems of the forma *phalaenopsis*.

On occasions a reversion to type can be seen in the form of a distinctly *compactum* form of plant, with a *bigibbum* flower. Flowers with varying degrees of albinism are more common in this form than any other, and there is no evidence in the quantity and distribution to suggest reproduction. Certain isolated colours occur in the flowers, notably shell pink and lilac, and the occurrence of lilac in any member of the *bigibbum* group is unusual. The mineral element contained in the rocks may play an important part in producing these colour variations. Plants growing under apparently identical conditions, but on different rocks, show colour variations too marked to be explained by any other means. The general colour range is from pale pink to deep rose purple, and by this latter colour, the forma *compactum* is best known. The largest flowers with the richest colours are usually produced by the most exposed plants which are smaller than average and matured to a brick red colour by exposure to the sun. It would appear almost a rule that the finest floral response is to the harshest conditions.

An interesting feature of this area is the occurrence in quantity of *D. undulatum* R. Br. This species grows well on the rocks, very often in close proximity to the forma *compactum*, often so close that the roots of both are intertwined. The flowering season of *D. undulatum* begins in July-August, and continues into December, the season for the forma *compactum* extends into September and later. I have seen many plants of both flowering together, the flowers infested with *Oecophylla virescens* (Green Tree Ant), and also visited by *Trigona hockingi* (Native Bee). Both

flowers are of equal dimension, particularly in the column, stigma and pollinia, and of such structure generally to suggest equally facile entry by a common insect.

I have failed to discover any evidence of hybridisation between these flowers. The nearest known occurrence of the forma *phalaenopsis* is 10-12 miles in a direct line from this area. I am satisfied after visiting these ranges regularly for several years, and observing the great range of plants and flowers that this form evolved from the forma *phalaenopsis*. The very rare white form should be specifically mentioned as an albino flower, identical in its morphology with the type form. It does not reproduce itself and as such does not warrant varietal status. On the few occasions that these plants have been found, despite wide search by the collectors, no duplicates have been found within an extensive radius of such specimens, and the plants that have been cultivated from the seed of the white flowers have produced purple blooms without exception. In years of cultivation, the white flower has proved to be a constant feature of each plant, and variations in culture show no tendency to upset this fact. Varying degrees of albinism are commonly seen in all forms of *D. bigibbum*.

A series of comparative drawings from living material has been done to illustrate the close alliance between this species and the related forms. It must be stressed that the drawings refer to the shape by which each specimen is most commonly known. In all three, the mid lobe of the labellum in particular, has a range of shapes from deltoid to flabelliform, and from emarginate to apiculate, and the apiculate tip is not uncommon in the sepals and petals of all members of this group. Comparison of these accompanying drawings will show that there is insufficient evidence to support the past status of these two members of this group, and as all other named varieties of this species have proved to be unstable colour variants of forma *phalaenopsis* and forma *compactum*, I venture to suggest that they be suppressed; they can be of interest only to horticulturists.

REVISION OF DENDROBIUM LICHENASTRUM (F. Muell.) Krzl. AND ITS ALLIED FORMS (Orchidaceae)

BY A. W. DOCKRILL

In Proc. Linn Soc. N.S.W. 72:237 etc. (Jan., 1948), Rupp and Hunt expressed dissatisfaction with Nicholls' treatment of the group:—*D. lichenastrum*, *D. prenticei* (F. Muell.) Nich., *D. variabile* Nich. and *D. aurantiaco-purpureum* Nich. (cf. N.Q. Nat. 8: No. 55 (Sept. 1938); *ibid.* No. 56 (Dec. 1938) and *ibid.* 10: No. 68 (March, 1942)). The present author was familiar with some of these forms, having seen them in parts of the Seaview Range and Atherton Tableland about 17 years ago; and during the past three years it has been his good fortune to receive from a number of ardent collectors, particularly S. F. St. Cloud, J. H. Wilkie and W. W. Abell, numerous fresh and preserved specimens of all four, together with their field observations on them—from the Trinity Bay, Atherton Tableland, Seaview Range and Babinda-Mt. Bartle Frere areas. In the light of this evidence, Rupp's and Hunt's apprehensions appear well founded.

Doubts about the validity of the specific rank accorded to some of these forms were first entertained about three years ago when a number of preserved flowers were received, the identity of any one of which I was unable to establish: in each case the flower was distinct from any of the four "species." I became increasingly interested as more and more specimens came to hand; of these only a few were reconcilable with one or the other of the published "species," while many had flowers of one "species" in conjunction with leaves of another; most, however, were either intermediate between some two or showed some variation from all four.

Conclusions drawn from the examination of this material:—

1. The leaves of *D. lichenastrum* are flattish and more or less orbicular or broad-elliptical, and may or may not be somewhat obtusely pointed and do not vary greatly under changing environ-

ment. The flowers, on the other hand, are quite variable and indistinguishable from those of most other forms of this group.

2. As for the other three "species," the leaf variations and the various means by which leaf is attached to rhizome, as illustrated by Nicholls l.c. (and there are even further variations), may all be found on the ONE plant, depending on the growth of its rhizome from a shaded to a more exposed position (or vice versa) on the host tree. Possibly nutritional factors enter into it also. The leaf variation is truly amazing, ranging through terete, ellipsoid and subcylindrical; some are slightly channelled and others even falcate.

3. It is quite common to find more than one flower form on the one plant.

4. The only flower form of sufficient morphological stability to justify its separation from the others is *D. aurantiaco-purpureum*. It is not found in association with leaves of the *D. lichenastrum* shape, but its leaves are indistinguishable from the others and just as variable.

5. It would seem that Nicholls either received very few specimens on which to base his findings or else his specimens were selected in the field and not just collected at random.

The following scheme is a proposed reclassification of the group:—

Dendrobium lichenastrum (F. Muell.) Krzl. (emend. incl. var. Dock.).

1. var. *lichenastrum*
Syn. *Bulbophyllum lichenastrum* F. Muell., *Fragm.* 7:60 (1869); Benth., *Fl. Austr.* 6:287 (1873); F. M. Bail., *Q. Flor.* 5:1537 (1902).
- D. lichenastrum* (F. Muell.) Krzl., *Engl. Pflzr.* 6: 2b, 21, 289 (1910); Nich., *N.Q. Nat.*, 8:, no. 55 (Sept., 1938). *Ibid.* Et no. 56 (Dec. 1938)

2. var. *prenticei* (F. Muell.)
Dock. comb. nov.

(a) forma *prenticei*

Syn. *Bulbophyllum prenticei* F. Muell., Wing's Sth. Sci. Rec. 1:173 (1881); F. M. Ball., Q. Flor., 5:1539 (1902).
B. lichenastrum Fitzg., Austr. Orch., 2: Pt. 5 (1893), non F. Muell.
D. prenticei (F. Muell.) Nich., l.c.
D. variabile Nich., l.c.

(b) forma *aurantiaco - purpureum* (Nich.) Dock. comb. nov.

Syn. *D. aurantiaco - purpureum* Nich., *ibid.*, 10: no. 68 (March 1942).

It is considered that the inclusion of the various forms within the species *D. lichenastrum* constitutes an interpretation of the species considerably different to that originally outlined by Mueller and calls for the addition of an emend. in this proposed interpretation of it.

An aid to the identification of forma *aurantiaco - purpureum* is its relatively robust ovary and flower, broad mentum and labelum, which is only slightly, if at all channelled, widely expanding segments and prominently red-striped and recurved sepals. This may sound impressive, but the morphological differences between it and the other forms are very slight when the variability of the

species as a whole is taken into account, and other variations closely approximate to it, so that attributing formal rank to it is not done without some misgiving. The form illustrated by Fitzg. l.c. hardly conforms to this description of forma *aurantiaco - purpureum* (as suggested by Nicholls l.c.): a careful comparison between the illustrations of Fitzgerald and Nicholls reveals a number of differences, particularly in the labella. The author has never seen labellum ridges as depicted by Fitzg. l.c. on any fresh flower of any form of this species, but an occasional flower, when dried appears to show them.

The grouping into the one species of plants with leaves as different as those of var. *lichenastrum* and var. *prenticei* may at first seem unjustified but it is the morphology of the flower with which we should be concerned; and when all this is said and done, these leaf differences are little or no greater than those seen in other species, e.g. *Thelymitra ixioides* Sw., *T. pauciflora* R.Br., *Bulbophyllum aurantiacum* F. Muell. It is worth noting also that immature leaves of var. *lichenastrum* are often swollen and ellipsoid in shape, and flatten and broaden on maturity.

The value of Nicholls' excellent illustrations should not be overlooked, as they serve to indicate some of the variations of this complex species.

New Variety of *Dendrobium Canaliculatum* (Orchidaceae) from Cape York Peninsula

BY A. W. DOCKRILL

Dendrobium canaliculatum R.Br.
var. *pallidum*, var. nov.

Planta formae typicae similis; ab hac, a var. *ni-grescens* Nich. et a var. *foelschei* (F. Muell.) Krzl praecipue differt:—Labello albo; lobo medio lato ac brevi, eius lineis alte elevatis et prominentibus. Segmentis perianthis crassis, non tortis, albis, eorum extremis sub-viride-flavis. Sinu

inter sepala lateralia latiore. Columna lata ac firma. Anthera subplana sed canaliculata.

Cape York Peninsula:—Starcke River 8/1954 and 8/1955. Leg. C. G. Le Roy.

Holotype in the National Herbarium of N.S.W.

Plant similar to var. *canaliculatum* but readily distinguished from it, var. *ni-grescens* Nich. and

var. *foelschei* (F. Muell.) Krzl. when in flower, the labellum being pure white, its mid-lobe short and broad and the ridges thereon very tall; perianth segments stout, not twisted, white with pale yellowish-green apices; sinuses of lateral sepals broader; column broader and more robust; anther flattish and distinctly channelled.

All these features combine to give this flower not only a distinctive colour but "set," making its identification very simple.

To the collector, who states that this variety is abundant in the area, goes the credit for bringing to notice yet another interesting orchid from inhospitable Cape York Peninsula.

An Amended Classification of the Orchid Genera Occurring in Australia and New Zealand

By Edwin D. Hatch, Laingholm, Auckland, S.W.4, N.Z., and
A. W. Dockrill, George's Hall, N.S.W.

In the Honduras journal CEIBA 4: 222 (1954) Hatch published an amended classification of the primary orchid categories, designed to bring Schlechter's 1926 arrangement into line with the International Code of Botanical Nomenclature. Two points in the CEIBA paper require comment:—

- (a) The 'D' in *orchidoideae* and *orchideae* was deleted inadvertently and should be retained.
- (b) It is conceivably desirable that the old subfamily names 'Monandreae' and 'Diandrae' should be conserved, but at the moment they contravene Articles 2 and 29 of the Code, and are therefore invalid. So that unless and until they are published as *nomina conservanda* by some future International Congress, the names of the subfamilies are CYPRIPEIDIOIDAE and ORCHIDOIDAE respectively.

The following list contains the 85 orchid genera at present known to occur in Australia and New Zealand, arranged according to the CEIBA classification. Naturalised exotic genera are included, as well as a couple of probable escapes (*Aerides* and *Dactylochis*). † Indicates naturalised genera and * genera which occur in New Zealand but are absent from Australia.
Family ORCHIDACEAE

- Subfamily 2 ORCHIDOIDAE
Anther-type (1) ACROTO-NEAE
Tribe (ii) EPIPACTIDAE
Subtribe PTEROSTYLIDINAE —
Pterostylis R. Br.
Subtribe DIURIDINAE — *Orthoceras* R. Br.; *Diuris* Sw.
Subtribe THELYMITRINAE —
Thelymitra Forst.; *Epiblema* R. Br.; *Calechilus* R. Br.
Subtribe PRASOPHYLLINAE —
Microtis R. Br.; *Prasophyllum* R. Br.; *Genoplesium* R. Br.; *Corunastylis* Fitzg. *Goadbyella* Rogers.
Subtribe DRAKAEINAE — *Chiloglottis* R. Br.; *Caleana* R. Br.; *Drakaea* Lindl.; *Spiculaea* Lindl.
Subtribe CALADENIINAE—*Glossodia* R. Br.; *Eriochilus* R. Br.; *Adenochilus* Hook. f.; *Caladenia* R. Br.; *Petalochilus* Rogers*; *Aporostylis* Rupp and Hatch*; *Burnettia* Lindl.; *Leptoceras* Lindl. *Lyperanthus* R. Br.; *Rimacola* Rupp.
Subtribe ACIANTHINAE—*Acianthus* R. Br.; *Townsonia* Cheesmn.
Subtribe CORYBADINAE—*Corybas* Salisb.
Subtribe CRYPTOSTYLIDINAE —
Cryptostylis R. Br.
Subtribe VANILLINAE — *Galeola* Bl.
Subtribe NERVILLINAE—*Nervilia* Gaud.
Subtribe EPIPOGINAE — *Epipogon* Gmel.
Subtribe GASTRODIINAE—*Gastrodia* R. Br.; *Didymoplexis* Griff.

- Subtribe RHIZANTHELLINAE—
Rhizanthella Rogers; Cryptan-
themis Rupp.
- Subtribe SPIRANTHINAE—Spir-
anthes L. C. Rich.
- Subtribe PHYSURINAE—Good-
yera R. Br.; Cheirostylis Bl.;
Zeuxine Lindl.; Anoectochilus
Bl.; Hetaeria Ldl.
- Subtribe TROPIDIINAE—Corym-
borchis Thou. ex Bl.
- Tribe (iii) EPIDENDRAE
Inflorescence-type A. AC-
RANTHAE
- Subtribe LIPARIDINAE—Obero-
nia Lindl.; Liparis L. C. Rich.;
Malaxis Sw.
- Subtribe COELOGYNINAE—Pho-
lidota Lindl.
- Subtribe EPIDENDRINAE—Epi-
dendrum L.†
- Subtribe DENDROBIINAE—Den-
drobium Sw.; Cadetia Gaud.;
Eria Lindl.
- Subtribe GLOMERINAE—Earina
Lindl.*
- Subtribe PODOCHILINAE—Podo-
chilus Bl.
- Subtribe POLYSTACHINAE —
Bromheadia Lindl.
- Inflorescence - type B.
PLEURANTHAE
Growth-form (a) SYM-
FODIA
- Subtribe PHALINAE — Calanthe
R. Br.; Phaius Lour.; Spatho-
glottis Bl.; Pachystoma Bl.
- Subtribe BULBOPHYLLINAE —
Cirrhopetalum Lindl.; Bulbo-
phyllum Thou.
- Subtribe CYRTOPODIINAE —
Geodorum Jacks.; Eulophia R.
Br.
- Subtribe CYMBIDIINAE—Dipo-
dium R. Br.; Cymbidium Sw.
- Subtribe THELASINAE — Phre-
atia Lindl.
- Subtribe THECOSTELINAE —
Acriopsis Reinw. Ex Bl.
Growth-form (b) MO-
NOFODIA
- Subtribe SARCANTHINAE —
Thrixspernum Lour.; Chilo-
schista Lindl.; Drymoanthus
Nich.; Sarcophilus R. Br.; Rhi-
nerrhiza Rupp; Peristeranthus
Hunt; Phalaenopsis Bl.; Luisia
Gaud.; Vanda R. Br.; Saccola-
bium -Bl.; Mobilabium Rupp;
Schoenorchis Bl.; Sarcanthus
Lindl.; Camarotis Lindl.; Tae-
niophyllum Bl.; Aerides Lour.†
- Anther-type (2) BASI-
TONEAE
Tribe (iv) ORCHIDEAE
- Subtribe ORCHIDINAE—Dacty-
lorchis Verm.*†
- Subtribe HABENARIINAE—Hab-
enaria Willd.
- Subtribe DISINAE—Monadenia
Lindl.†

* TWO HUMUS MAKING FERNS

Drynaria rigidula (Sw.) and *D. sparsisora* (Desv.) Moore

By K. KENNEDY, Townsville

A green-house gardener always has a quantity of humus on hand to be used when re-potting his plants. The making of humus, however, is not solely a human practice. It has been evolved by Nature, for some ferns have the power of holding fallen leaves and other forest debris by means of specialised fronds, and, when the retained material has decayed into humus, they use it as food.

This habit is especially noticeable in the genus *Drynaria*, two species of which grow on the slopes of the Paluma Range, and on Mount Cook, Magnetic Island. One, *Drynaria rigidula* can be

seen perched on rocks and trees, where it often forms huge clumps. Sometimes, it entirely surrounds the upper trunk of a tree and projects outwards like a shelf, forming a container which holds the humus it has caught. This is made possible by the shape and texture of some of its leaves, for it is dimorphic, having two kinds of fronds—normal fronds and nest, or as they are sometimes called, scale leaves. The normal leaves are photo-synthetic and bear the sori. They are pinnate, the pinnae being lanceolate with undulatory edges, measure four to five inches in length, and have a reticulated venation. The sori

are orbicular and arranged in two rows, one on each side of the mid-rib. Each is slightly sunk in a small depression which shows out on the dorsal surface of the pinna as two rows of pustules.

The nest or scale leaves are entirely different in shape and texture, for they are simple, broad, sessile and scarious with a rigid venation which remains after the scanty cellular material has decayed. As the genus belongs to the Family Polypodiaceae, the rhizome is creeping and is thickly covered with ramenta or paleae.

Bailey in his Queensland Flora, 1902, describes *D. rigidula* under the synonym of *Polypodium rigidulum*, and mentions two varieties, the first being var. *vidgeni* Bail., found at Oxley Creek, Brisbane River, by J. G. Vidgen after whom it was named, and near Herberton, N.Q., by C. J. Wild. In this variety, the pinnae are lanceolate, undulate and irregularly incised. Some fine examples can be seen in the Botanic Gardens, Brisbane, and there are a few growing in Townsville greenhouses, where it is sometimes known as the tinsel fern. The other variety mentioned is var. *cristatum*, in which the ends of the pinnae are dichotomously forked forming tassels.

Later, in his Comprehensive Catalogue of Queensland Plants, 1909, Bailey figures two more varieties—var. *whitei* Bail., named after the late C. T. White, and var. *diversipinne* Bail. The pinnae of the former are deltoid in outline and deeply incised. The latter variety consists of aberrant pinnae as its name indicates. A fine basket of var. *whitei* can be seen growing in the orchid house of Mr. Charles Freeman, Belgian Gardens, Townsville.

D. rigidula is found throughout the eastern part of Queensland, and extends southwards into New South Wales as far as the Blue Mountains (1). To the north it reaches the Malay Archipelago, and eastwards to the Pacific Islands (2).

Lower down on the forest floor grows another *Drynaria*, *D. sparsisora*, which rambles amongst

rocks and soil. In this species, the fertile fronds are not pinnate, but are simple and deeply pinnatifid, and the sori are not sunk in depressions. The sterile fronds are similar in appearance to those of *D. rigidula*, but they form their nests on the ground. The rhizome is thicker and flatter than that of *D. rigidula*. It also extends to the Malay Archipelago and the Pacific, but to my knowledge it does not reach New South Wales.

In both species, the pinnae of *D. rigidula* and the lamina of *D. sparsisora* are articulated to the rachis, and when they wither they abscise leaving the stipe standing. Several of these rigid and persistent stipes give the fern a "porcupine" appearance, and are an additional help in holding fallen leaves, twigs, etc. for future nourishment.

Both *D. rigidula* and *D. sparsisora* are completely modern ferns, for their rhizomes are dictyostelic and densely covered with ramenta, and the veins of the leaves are reticulated. All these attributes are signs of an evolutionary advance.

Viewed under the microscope a ramentum (paleae or chaffy scale) of these two species is seen to be elongate, and has ciliate edges which fall off when the ramentum gets older.

D. rigidula and *D. sparsisora* are easily grown in a warm climate, but need an acid humus; lime kills them. As it grows in the thinner forest, *D. rigidula* requires plenty of light, and if cultivated in a hanging basket the scale leaves will form an imbrication underneath it like fish scales. *D. sparsisora* being a denizen of the darker forest floor does not need so much light.

(1) WATTS, W. W., Ferns Mosses and Hepatics, N.S.W. Handbook, British Association for the Advancement of Science, 1914, p.451.

(2) BAILEY, F.M., Queensland Flora, p.1987.

* From paper read at meeting of Townsville and District Naturalists' Club, March, 1956.