Bothalia 9, 1:169–171

A New Species of the Dictyotales from South Africa

by

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Whilst examining some seaweeds from Natal, I came across a few specimens collected by Mr. M. Meyer, Lecturer at the Botany Department of the University of Natal, which had the appearance of a dichotomising *Zonaria*. The specimens were mounted on a single sheet and came from Kosi Bay in the District of Ingwavuma. The characteristics of these plants were unlike any *Zonaria* previously described from South Africa and it was therefore decided to make a detailed study of them.

Externally, the plant looks like a small *Dilophus suhrii* (Kutz.) Papenf. with its dichotomising, strap-shaped branches with distinctly darker margins. Near the base of the plant, multicellular brown rhizoids are produced, forming a stupose mat. The resemblance to *Dilophus* ends here because the Kosi Bay plant has a terminal meristem instead of a single apical cell. The fronds develop zonately, a dark transverse band marking the termination of a period of growth. Scattered over both surfaces, particularly towards the distal parts of the fronds, were raised sori of two kinds: one containing nothing but multicellular uniseriate filaments (Fig. 1, C) and the other containing large oval bodies, which were empty or had undivided contents, together with occasional marginally disposed uniseriate filaments as in the other type of sorus. The large oval bodies were sessile. Neither type of mature sorus was found with a complete indusium but the remnants of the ruptured cuticle were always visible at the margins of the sectioned sori (Fig. 1, C). The multicellular uniseriate filaments are interpreted as hairs (paranemata) because they show no signs of being fertile. The oval bodies appear to be fertile since they were often observed to be without contents. Because their contents, when present, were undivided they are almost certainly oogonia. No sporangia or male sori were found.

Closely appressed tubular skeletons of a Bryozoan forming, as it were, an additional tissue were often seen. The Bryozoan, so far as could be seen, was confined to the ventral surface of the fronds. Although the presence of the Bryozoan did not seem to prevent sori from developing, the sori on the affected surface were not as frequent as on the other surface.

The tissue is differentiated into four : two epidermal layers, a cortex and a medulla (Fig. 1, A, B, and C). The dorsal epidermis consists of a single layer of rather small sub-isodiametric cells, whereas the ventral epidermis has somewhat longer cells. A central medulla of a single layer of elongated and relatively high cells is contained within a dorsal and ventral multi-layered cortex. The medullary cells differ from the cortical cells only by their greater height. The cells of the internal tissue are almost always twice as wide as the epidermal cells (Fig. 1, B) except that the subepidermal layer, on the dorsal side only, sometimes has cells of the same width as the epidermis. On the other hand cells of the ventral epidermis are occasionally also twice as wide as those of the dorsal epidermis. Thus, the differentiation into dorsal and ventral surfaces is quite clear. In longitudinal section (Fig. 1, E) the origin of new tissue in the zonate bands is seen to be from the medulla and inner cortex, the superficial remnant layers forming flaps of truncated tissue heavily pigmented on the upper and lower surfaces.

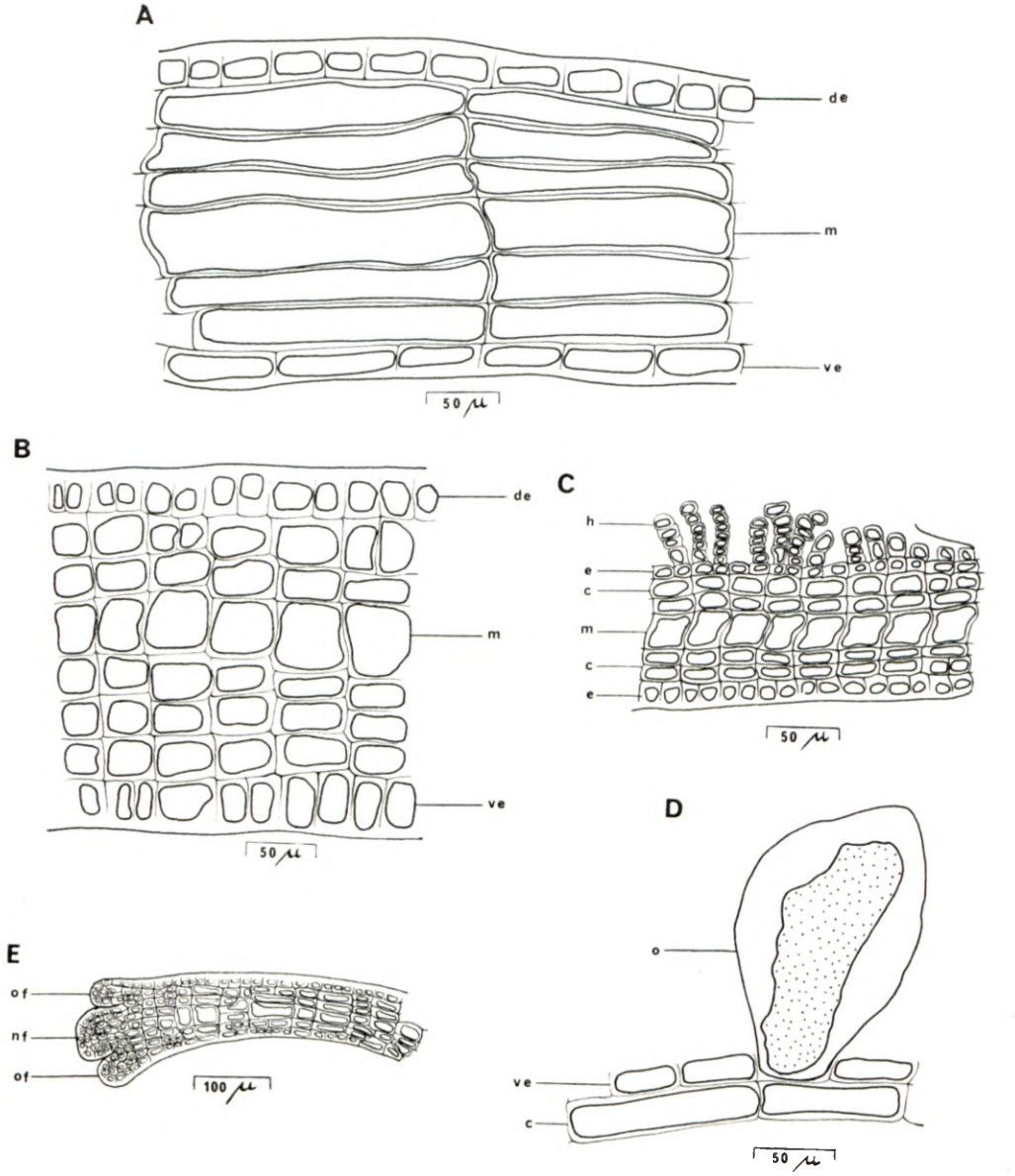

FIG. 1.—*Pocockiella dichotoma* Simons: A, L.S. of mature frond; B, T.S. of mature frond; C, T.S. of frond showing hairs; D, L.S. through an oogonium; E, L.S. of frond through zone of regeneration.

c: cortex; de: dorsal epidermis; e: epidermis; h: hairs; m: medulla; nf: new frond; o: oogonium; of: old frond; ve: ventral epidermis.

As to the relationships of this plant, its zonate development and terminal meristem indicate that it is allied to species of *Zonaria*. Besides, new tissue originates from the middle layers of the frond (Fig. 1, E) as in *Zonaria* (Simons, 1964). it does not agree in all features, however with the typical *Zonaria* construction. The absence of a stalk cell at the base of an oogonium is found only in *Zonaria tournefortii* and *Pocockiella variegata* (=*Gymnosorus variegatus*) amongst the Dictyotales (fide Papenfuss, 1943).

Secondly, the presence of the medulla as distinct from the cortex is not found in species of *Zonaria*. Thirdly, there is a tendency towards dorsiventrality of the thallus as evidenced by the longer ventral epidermal cells. Finally, the arrangement of hairs in discrete sorus-like groups instead of transverse bands is not found in species of *Zonaria*.

A plant which differs from typical *Zonaria* in like manner to the above is *Pocockiella variegata* on which the genus *Pocockiella* Papenfuss is based. The present plant could therefore be placed in *Pocockiella*. The characteristic separating *Pocockiella* from *Zonaria* is the absence of paraphyses in its sporangial sori. These structures, unfortunately, are not present on the Kosi Bay specimens. Papenfuss in his discussion (l.c., p. 465) expressed the opinion that the peculiar internal differentiation into cortex and medulla found in *P. variegata* was diagnostic and on that basis transferred *Gymnosorus nigrescens* (Sond.) J. Ag. to *Pocockiella*. On the same basis, therefore, the present plant should be regarded as a *Pocockiella* and it is described in this genus below. The specific epithet refers to its distinctive dichotomous habit.

Pocockiella dichotoma *Simons* sp. nov.

Thallus dorsiventralis, ramosus, ramis linearibus, pseudodichotomis, margine integerrimis, zonatis, inferne rhizoides gerens, ex quattuor stratis, stroma dorsali cellularum subisodiametricarum, strato pleiostromatico corticali, stroma centrali medullari et stroma ventrali cellularum sub-elongatarum, constans; cellulis corticalibus medullaribusque aeque elongatis sed medullaribus in altitudine majoribus, utriusque quam cellulis superficialibus duplo latioribus et ad usque octem longioribus; paranemata et oogonia in soris discretis nudis; oogonia is sessilia; sporangia et antheridia ignota.

Type: Natal: Ingwavuma, Kosi Bay, *Meyer* sub Simons 625 (PRE, holo.).

References

PAPENFUSS, G. F., 1943. Notes on Algal nomenclature. II. *Gymnosorus* J. Agardh. Amer. J. Bot., 30 (7): 463–468.

SIMONS, R. H., 1964. Notes on the species of *Zonaria* in South Africa. Bothalia 8: 195–200.