

The form of the spicules in both groups is exactly the same. Hence there is good reason for supposing that the Chalininæ have been derived from the Renierinæ by the development of spongin at the expense of the spicules, and, moreover, they seem to be of polyphyletic origin, descended from several distinct genera of Renierine sponges.

In the Heterorrhaphidæ we find examples of exactly the same thing. The genus *Gelliodes* differs from the genus *Gellius* only in the greater development of horny fibre, and the genus *Toxochalina* contains so much spongin in the fibre that it has hitherto been placed amongst the Chalininæ, although its spiculation shows it to be one of the Heterorrhaphidæ.

Amongst the Desmacidonidæ we have abundant instances. We have species of the genus *Esperella* with little or no horny matter, and other species with a well-developed horny skeleton, and precisely the same thing occurs in the genus *Myxilla*. *Clathria* and *Echinoclathria* are other instances of genera of the Desmacidonidæ in which there is a very highly developed horny skeleton.

In the Axinellidæ the same facts may again be observed, and the Challenger dredgings have brought to light a highly instructive example of an Axinellid sponge (*Axinella fibrosa*, nobis) possessed of a very strongly developed horny skeleton.

We have already remarked the fact that the siliceous skeleton decreases in proportion as the horny skeleton increases, until ultimately it disappears and leaves us face to face with a horny sponge. No wonder then, considering their probable origin from many distinct groups of siliceous sponges, that Poléjaeff found such great difficulty in classifying his Keratosa.

We must mention in this place another very suggestive and important fact with regard to spongin, and that is, that its degree of development depends upon locality. Sponges with horny fibre are far and away more abundant in tropical or subtropical seas than in temperate or frigid areas. When a sponge gets into a warm area it tends to develop horny fibre. This is true at least of the Halichondrina amongst Monaxonida, as is sufficiently shown by a glance at our tables of geographical distribution and the description of those species obtained from the warmer areas.

As regards the value of the minute anatomy and histology from a systematic point of view we are hardly able as yet to form any conclusions, for our knowledge of this subject is at present in its earliest infancy. We have in the last chapter given details on this head which will, we hope, ultimately be of use in settling the question; at present all we can do is to collect information. So far as our researches yet go it seems that the nature of the ectosome, *i.e.*, whether it forms a fibrous cortex or exists as a thin dermal membrane or as a thick gelatinous layer, is likely to be of great systematic value. Amongst the Halichondrina we know of only a single instance, the genus *Phelloderma*, nobis, in which the ectosome forms a distinct, fibrous cortex, whilst amongst the Clavulina a distinct, thick, fibrous cortex is almost invariably present. The arrangement of the