

The most primitive form among the living Thecosomata has scarcely been sought for in any special manner, and opinions differ very greatly on this subject; some think that it is to be found among the Cavoliniidæ (*Clio*, subgenus *Creseis*), others are of opinion that it belongs to the family Limacinidæ.

In order to arrive at a positive result on this question we shall study the mutual relations of the three groups of Thecosomata (Limacinidæ, Cavoliniidæ, Cymbuliidæ), comparing their organisation.

These relations are not very easy to explain, taking into consideration the great apparent differences presented by the three above-named families—differences which have not been sufficiently considered hitherto in the relationships which the three groups bear to each other.

1. If in the first place we consider the Cymbuliidæ, we find that their affinities are very obscure. Boas¹ seems to regard them as specialised Cavoliniidæ, and for my own part, before I had had the opportunity of studying the organisation of the genus *Peracelis*, I was in a state of the most complete uncertainty regarding their relationships. The knowledge of this genus, however, has thrown some light upon their affinities.

Apart from the presence of the "cartilaginous shell," which has no homology with the calcareous shells of other Thecosomata, we may see that the Cymbuliidæ differ from the Cavoliniidæ by very definite characters, particularly in the shape of the head, which, in the former, is very distinct and quite symmetrical as regards the tentacles, which have no sheath, and in the arrangement of the central nervous system, which has three visceral ganglia instead of two closely placed as in the Cavoliniidæ.

On the other hand, we have seen that among the Limacinidæ, *Peracelis*, which, in all other respects resembles the Cymbuliidæ quite as much as does any of the Cavoliniidæ, has a distinct head agreeing with that of the older larvæ of the Cymbuliidæ in its general form and also in the symmetry of its tentacles, which are further devoid of a sheath; besides this the nervous system is constructed on the same type and has three visceral ganglionic masses arranged in the same manner.

Of all other Thecosomata, then, *Peracelis* is the one which most closely resembles the Cymbuliidæ, and with which this family has the closest affinity.

2. On the other hand, the Cavoliniidæ, as well as the Cymbuliidæ, have undoubted affinities to the Limacinidæ, but these are with the genus *Limacina*, which presents numerous resemblances to the subgenus *Creseis* of *Clio*. The head is indistinct and has the same asymmetrical arrangement as regards the tentacles and penis; besides which the fins in *Creseis* present the small tentacular lobe which is found in many *Limacinæ*.

If, however, the Cavoliniidæ and Cymbuliidæ, which are not directly connected with each other, have each of them close affinities with the Limacinidæ (*Limacina* or *Peracelis*), these relations between the straight Thecosomata (Cavoliniidæ and Cymbuliidæ),

¹ *Spolia atlantica*, p. 188.