

Series 1. SPIRES (*σπειρα*, ἡ, Lat. *spira*, in plural the twisted coils of a serpent, called spires by Milton).

These spicules have the form of a screw helix, of less or more than one revolution and of various pitch.

1. *Sigmataspire* (Fig. XII., *b*, *c*).—A slender rod twisted through about a single revolution of a spiral. This spicule has the form of the letter “c” or “s” according to the direction in which it is viewed, and has in consequence been regarded by authors as a variable spicule, sometimes twisted in one manner and sometimes in another, but the two forms are always associated in the same sponge, and by causing one of them to turn round it will be found to assume the appearance of the other, so that there can be no doubt as to its spiral form. By making little models of screw spirals with pieces of wire the form of this spicule and its different appearances according to circumstances will readily be understood.

2. *Toxaspire*.—A spiral rod in which the twist a little exceeds a single revolution. The pitch of the spiral is usually great and the spicule consequently appears bow-shaped when viewed laterally (tricurvate).

3. *Polyspire* (*spirula*, Carter) (Fig. XII., *q*).—A spire of two or more revolutions. It makes but little difference whether we employ the term *spirula* or *polyspire*. I am myself inclined to adopt Carter's term since it has priority, and the term *polyspire* is only introduced here to show the relations of this spicule with other spires; not by any means out of that desire for uniformity, which is “the curse of small minds.”

4. *Sigma* (Fig. XII., *d*).—A slender rod-like spicule curved in the form of the letter “c.” This spicule is not spiral though it probably arises from a *sigmaspire* by increase in size and loss of the spiral twist. It does not occur in the Tetractinellida.

The toxa and chela which originate from the sigma :—

5. *Toxa* (Fig. XII., *p*).—A bow-shaped spicule, also without spiral twist. It may sometimes develop from the sigma and sometimes from an aster, as in *Isops* (*Caminus*) *apiarium* (Pl. XLIII. fig. 10).

6. *Chela*.—This spicule, which also arises from the sigma, does not occur in the Tetractinellida.

7. *Globule* (Fig. XII., *α*) or spherule.—A minute spicule which presents a more or less spherical form. This spicule occurs in the Tetillidæ associated with *sigmaspires*; it is also found in other sponges (*Caminus sphæroconia*), but in them is probably derived from an aster by reduction, while in *Tetilla* it is possibly a primitive form. It is placed with the spires for want of a better place, to avoid making a special group for it.