

## Family VIII. STAUROSPHÆRIDA, Haeckel (Pl. 15).

*Staurosphaerida*, Haeckel, 1881, Prodrömus, p. 449.

*Definition.*—Sphæroidea with four radial spines on the surface of the spherical shell, forming a regular cross, being opposite in pairs in two axes perpendicular to one another; living solitary (not associated in colonies).

The family *Staurosphaerida* is distinguished from the other *Sphæroidea* by the possession of four radial spines, which are opposite in pairs in two perpendicularly crossed axes. By these "two main axes" an equatorial plane is determined, which approximates them to the *Discoidea*. But in the latter the shells as well as the central capsule become more or less flattened, lenticular, or discoidal, whilst in the former they remain spherical. However, some forms of both groups are very similar, and inspection from different sides (and mainly from the margin of the equatorial plane) is required to determine certainly the spherical (not compressed) shell-form of the *Staurosphaerida*. As a rule the species of this family are much rarer, and much less numerous, than those of all other *Sphæroidea*.

The most simple *Staurosphaerida* are the *Staurostylida*, with one single spherical lattice-shell. To this ancestral group all other subfamilies can be opposed as "*Staurosphaerida concentrica*," since their carapace is composed of two or more concentric lattice-shells; two in the *Staurolonchida*, three in the *Stauracontida*, four in the *Staurocromyida*, five or more in the *Staurocaryida*. In all these four subfamilies the concentric shells are simple (not spongy) fenestrated spheres. In a sixth subfamily, in the *Staurodorida*, the shell is wholly or partially composed of irregular spongy wickerwork, with or without a medullary shell in the centre.

*The Four Radial Spines* in all *Staurosphaerida* are normally opposed in pairs in two axes perpendicular one to another, and therefore together form a rectangular cross. But in many species besides this normal form individual abnormalities occur, in which the four spines in the equatorial plane are not quite accurately opposed, so that the four angles between them are not right angles, but more or less unequal. More rarely also their position in the equatorial plane is not accurately retained, so that they are placed in two, three, or four different meridian planes, intersecting at very small variable angles.

In the greater part of *Staurosphaerida* all four radial spines are quite equal, and of the same size and form. But in some genera there takes place a more or less considerable differentiation of the four spines, commonly in pairs, so that the two opposite spines of each pair are equal, but the pairs different (*Staurostylus*, *Staurolonchidium*). More rarely also both spines of one pair become unequal, whilst those of the other pair remain equal (*Stauroxiphos*). Very rarely all four spines assume a different size or form.