



Annals and Magazine of Natural History

Series 1

ISSN: 0374-5481 (Print) (Online) Journal homepage: <http://www.tandfonline.com/loi/tnah07>

Observations on the development of the Echinidæ (Echinus esculentus)

M. Dufossé

To cite this article: M. Dufossé (1847) Observations on the development of the Echinidæ (Echinus esculentus), Annals and Magazine of Natural History, 19:126, 282-284, DOI: [10.1080/037454809494554](https://doi.org/10.1080/037454809494554)

To link to this article: <http://dx.doi.org/10.1080/037454809494554>



Published online: 17 Dec 2009.



Submit your article to this journal [↗](#)



View related articles [↗](#)

pharus Kitaibeli. The Secretary presented a monography, upon which he had been engaged, of the order Testudineæ, besides a systematic enumeration of the Reptiles and Amphibia of Europe. Genè gave an interesting description of the amours of the Snakes which greatly entertained the Assembly, dispelling entirely the horror and needless dread of these crawling animals.

As to Fishes, the Secretary explained the characters of the chief divisions; and the Assistant-Secretary read a notice on the *Petro-myzon marinus*, and discoursed convincingly on the puncture of the *Trachini*. Important observations on European Fish were made by Rüppell, and numerous additions to the list of Ligurian Fish by Verany, among which is the new species *Cybius Bonapartii*, an engraving of which he distributed. Amati gave an account of an African fish inhabiting thermal waters, which drew from Prof. Orioli some remarks evincing his science and erudition. D'Hombres Firmas exhibited the fossil teeth of the *Sphærodus Gigas*, and Nardo contributed his ichthyological lucubrations. The Marquis Mazzarosa of Lucca gave us in the department of Insects an important communication on the *Tryps* which injures the olives. Achilles Costa described some species of Neapolitan Coleoptera; G. Bertoloni four new species from the coast of Mozambique; the Swede Loewenhjelm the *Phryganea phalænoides*, never found since the days of Linnæus. In Mollusks, Verany described and figured new and rare Cephalopodi, and Kœlliker related curious facts respecting the males of these animals. Calcara gave a catalogue of the Mollusca of Sicily, with a description of new species.

As to Radiata, Michelin described a remarkable new species of Echinoderm; and the very eloquent Professor Meneghini, the pride of Italian Algology, very fully illustrated the anatomical plates of Ranieri, hitherto removed from the light of science.

Beyond the sphere of its own department, the Section of Zoology extended its attention to subjects in connexion with commissions serviceable to humanity, to pasturage, and to agriculture, resolving queries proposed by other Sections, teaching the hygiene of cattle through the instrumentality of Fossati, and overthrowing ridiculous prejudices by the authoritative voice of Genè. Our Section was honoured by a copious correspondence of the first zoologists of Asia and America, besides those of Europe, among which it will suffice to enumerate a Müller, a Heckel, a Strickland, an Owen, a Geoffroy St. Hilaire, and above all an Oken, who wrote to express his strong feeling of regard for Italy, and the interest he took in our annual Scientific Congress.

Observations on the Development of the Echinidæ (Echinus esculentus).

By M. DUFOSSÉ.

I have ascertained that all the eggs contained in the ovary of the *Echinidæ* may be artificially fecundated, by placing some of the points of their testaceous membrane in contact with a drop of semen and of sea-water sufficiently renewed. The duration of the embryonic life of the *Echinus* seemed to me to vary from twenty-four to

forty-two hours, according to the temperature, and various other circumstances. From thirteen to fifteen minutes after the impregnation, the vitelline mass is seen most commonly to vibrate and become animated with a more or less rapid rotatory motion. From the fourth to the sixth hour the vitellus begins to divide, and the segments which result from this division become more and more transparent. Then a number of little globules are produced on the surface, from the large globules, subsequently surrounding them completely, and thus constituting a pretty thick layer. When this layer of globules, which is the rudiment of the tegumentary envelope, is extended to the whole of the vitelline surface, the embryo has nearly acquired the form under which it will issue from the egg. The vitelline membrane, very distinct during the first period of the division, has completely disappeared, and the albumen, at first opaline, has become as transparent as sea-water. Soon after, the tegumentary surface of the embryo is covered with filiform appendages, of extreme tenuity. Generally towards the twenty-fourth hour, but sometimes a little later, the embryo agitates its appendages with a great velocity, which have acquired sufficient force to serve it as locomotive organs. The animal then soon divests itself of the testaceous membrane of the egg.

At the moment of hatching, the larva of the *Echinus* has a form very analogous to that of the *Medusæ* and the *Radiata* in general. Its body is rounded like that of the adult animal, presenting simply, at one point, a slight concavity, in the centre of which is the outline of the mouth. That portion may be distinguished whose degree of development is more advanced than other parts of the body, by the name of *oral pole*. By the aid of its filiform appendages the larva moves with tolerable facility, and almost always revolving upon itself. In the sixth or eighth day the form of the animal is modified; half its body, that where the anus is situated, and which may be termed the *anal pole*, is a little elongated. The surface of the exterior envelope has become more compact and transparent; the large globules which were in the centre of the body have disappeared. We then observe the first rudiments of the intestinal canal, in which a short œsophagus is distinguished, a stomach having the form of a large ampulla, and a very short intestine. About the twelfth or the fifteenth day, the body of the larva has become completely pyriform; the circumference of the anus presents little discs forming a sort of small rosette, and deep circular lines are seen on the portion of the tegument comprised between the two poles; the dimension of the oral pole has considerably increased, and we now perceive, around the mouth, appendages analogous to labial tentacula.

Arrived at this stage of development, that is to say, towards the sixteenth to the eighteenth day, the larva of the *Echinus*, which has lost all its agility, attaches itself, by the anal pole, to the body near which it has rested; and a cylindrical pedicle of tolerable size, and once and a half as long again as the diameter of the body, is developed very rapidly. Thus fixed on a flexible stem, the young ani-

mal has no other motions than those which are given it by the agitation of the liquid. During this period, small buds are distinguished, arranged in regular rows around the oral pole. Towards the twentieth day spiniform processes are developed on the top of these buds, of a great length in comparison to the bulk of the animal. The calcareous matter already enters so largely into their composition, that the least shock is sufficient to break them without making them bend.

I have followed the progress of the animal up to the moment when it is detached from its pedicle, doubtless to live under the form which it retains during the rest of its existence. However incomplete may be my observations, I think that they may give a general idea of the development of the *Echinus*, and allow us to draw from them the following deductions:—From the moment when the embryo has a form of its own, all the parts of its body are arranged almost symmetrically around the *bucco-anal* axis, and, consequently, it bears in the highest degree all the characters of the type of the zoological class in which it is arranged, that is to say, of the radiate type.

It is around the *bucco-anal* axis that the activity of the genesic process is manifested from its origin, and is maintained greater during the whole course of the development; and it is principally from the two extremities of this axis that it radiates, and extends gradually to the other parts of the tegumentary envelope.

Search as much as we may, in the arrangement of the different parts of the *Echinus esculentus*, for a tendency to bilateral development similar to that pointed out by M. Sars in an *Asteria*, not the least trace will be found, even during the shortest duration of one of the phases of the genesic phenomena. In the larva of the *Echinus*, when the body elongates as well as when it contracts, to return to nearly its primitive configuration, these changes take place in the direction of the *bucco-anal* axis, so that the radiate form is not at all affected by it. In short, as soon as we can discover the first organic lineaments of this being, it is already a *radiate embryo*, and the animal, in all the other phases of its life, remains invariably *radiate*.—*Comptes Rendus*, Jan. 4, 1847.

Remarks on Opalina Naïdos, an Entozoon found in the Naïdæ.

By Dr. O. SCHMIDT.

The very interesting discovery of this entozoon was made in a species of *Naïs* nearly allied to *N. elinguis*, which is furnished with a bundle of hooks at each fourth hook. When the *Naïd* lies upon its side, a spot in which the oral fissure appears as a notch and the ciliary motion in the *œsophageal* bulb may be very distinctly perceived. I was looking for the fleshy ridges, which in *Stylaria* I correctly considered to be regarded as forming the tongue, and was delighted on perceiving that a somewhat elongated body situated in the *œsophageal* bulb, and which was pointed anteriorly, frequently moved nearly as far as the oral fissure, and then, as it appeared to me, was again retracted. I had not expected to find so moveable a