

properly referred to *O. antiquorum* of Linnæus and to *Anonis legitima antiquorum* of Tournefort, nor have I any reason to doubt its being the *Ononis vel Anonis* of Pliny.

Reichenbach refers our *O. arvensis* to *O. repens*, Linn.: this may admit of some doubt, as the specimen marked *repens* and one from the Upsal Garden marked both *arvensis* and *spinosa*, are by no means so convincing as that of *O. antiquorum*; yet I think it safe to remain as we are, considering the usual and healthy state of *O. arvensis* to be *O. spinosa* and *mitis* of the 'Species Plantarum,' and *O. arvensis* of the 'Systema Naturæ'; when in age the ends of the shoots appear naked, it becomes we suppose *O. spinosa*  $\beta$  *spinosa*, Sp. Pl., and when buried in sea sands, *O. repens*, Sp. Pl. and Sys. Nat., and we adopt the name of *arvensis* after Linnæus himself, who wisely changed it from *spinosa* to *arvensis* in his twelfth edition of the Systema. I cannot perceive sufficient reason for imagining that Linnæus included *O. hircina*, Jacq., in his *O. spinosa mitis*.

It is much to be regretted that in the last edition of the British Flora no notice is taken of *O. antiquorum*; the synonym of Engl. Bot. Supp. t. 2658. is referred to in such a manner as to imply that the same thing has been twice described and figured; the two plants are not even marked as varieties, though the difference is very striking to those who have seen them in their native places of growth: but as my present object is not to point out the distinction, but to check an unfounded report, I will only add, if further testimony be required, that Professor Don was present when I examined the Linnæan specimen, and his opinion coincided entirely with mine.

4th September, 1838.

## XII.—On the Genus *Syngnathus*. By B. FR. FRIES\*.

THE discovery of the remarkable peculiarity existing in the sexes, by which the males are not only destined as protectors of the eggs and of the birth, but are also for this purpose endowed with a peculiar organ in which the eggs are deposited,

\* From the German translation by Dr. Gaus of Stockholm, in Wiegmann's Archiv, Part III. 1838.

developed, and hatched, and in which the young in their tender state find a sure protection, has obtained for this genus of late a greater attention than would else have probably been the case. The Royal Swedish Academy contains in its Acts this beautiful discovery of C. M. Eckström, as also the anatomical observations of A. Retzius, which, besides explaining various interesting details respecting the internal structure of these fish, confirmed the above discovery\*.

If I at present recall the attention of the Academy to this genus, it is with a view to submit to a systematical examination the species which are admitted in our native Fauna and into that of England, to add to a distinct knowledge of the species by the publication of the results of my personal observations, and to endeavour to reduce the synonymy and nomenclature to a state of better arrangement than that in which I have found it in my predecessors.

It is not uncommon to find in the field of natural history one and the same subject described under many different names, and this can hardly be avoided in the progress of the science. This however is easily discovered, and as soon rectified. But the confounding of well-known and generally adopted names is of much more importance and more apt to cause errors, as such confusion easily escapes the attention of others, and requires for its rectification a long and tedious comparison of authors. With the genus *Syngnathus* it is not only in the old works that we find such errors admitted, but also in the most recent, which renders a revision of the species of this genus the more necessary.

The genus *Syngnathus*, conceived according to the views of Cuvier, forms two subdivisions quite natural, which may most easily be known by the species of the one possessing pectoral fins, while they are missing in all the species forming the second subdivision. To designate the first I shall adopt the Swedish provincial name, and will call them *Tångsnällor* (on account of their quick motions among Algæ), and retain for the

\* Latterly Mr. Yarrell has stated that the same discovery was made in 1785 by an Englishman of the name of Walcott, recorded in his unpublished manuscript.

latter the common name *Hafsnålar*. They may be characterized in the following manner :

I. MARSUPIAL PIPE-FISH (*Tångsnällor*). *Syngnathi marsupiales, pinnis pectoralibus instructi*.

Corpore distincte angulato, pinnis caudæ, ani, pectoralibusque radiatis ; cauda natatoria. *Mares* in folliculo, marsupii instar, rima longitudinali dehiscente, sub cauda proxima infra anum inserto, utraque medium caudæ extenso, ova fovent pullosque exclusos includunt.

II. OPHIDIAL PIPE-FISH (*Hafsnålar*). *Syngnathi ophidii, pinnis pectoralibus carentes*.

Corpore tereti, angulis saltem minus conspicuis, pinnis pectoralibus anique nullis ; cauda prehensili, longa, gracillima, pinna aut nulla aut rudimentaria. *Mares* in superficie inferiore abdominis ova in cellulis apertis affixa trahunt.

I. MARSUPIAL PIPE-FISH\*.

To this subdivision belong the two species *S. Acus* and *S. Typhle*, which names Linnæus had adopted in our Fauna. The author, after reviewing the various works treating on this subject, states, "Never having been so fortunate as to find more than one species of *Tångsnällor* I had almost come to the conclusion of excluding *Typhle*, in the impression that our Scandinavian species was the true *Acus*, but when I received Yarrell's beautiful work on the British Fish I immediately saw my error." The author then gives the diagnostic and synonyms of *S. Acus*, which we here omit, as they may be found in the works of Jenyns and Yarrell, and concludes with the remark, "that with the exception of Pennant and Montagu all the English Faunists appear to agree with respect to *S. Acus*, and to them must be ascribed the having first given the true diagnosis between this and the following species (*S. Typhle*.)"

Rare on the Swedish coasts, but common on the English, where it is said to attain only the length of 16 to 18 English inches.

We have then the diagnosis and synonyms of *S. Typhle*, with the following remark : "This is the most common species which occurs on the Swedish coasts both in the Baltic and also in the Cattegat. Its general length at these places is between 9 and 10 Swedish inches. In both seas two coloured varieties

\* As what is stated respecting this first division will be found in general in the works of Mr. Jenyns and Yarrell, we have only given an extract of it.



are found ; one green with yellow spots and the belly passing into a brass yellow, the other olive brown sprinkled with a quantity of white spots and markings, with whitish belly. These two are also not constant, but between both are a series of transitions. They stand in no definite relation to age or sex."

## II. OPHIDIAL PIPE-FISH.

If the Swedish Ichthyologists have been guilty of a confusion of names in the other division, the English authors on the other hand have confounded in a remarkable way the species belonging to this division. Our Fauna has hitherto contained only one species, *S. Ophidion*, while the British Fauna has three, *æquoreus*, *Ophidion*, and *lumbriciformis*. However, so far from these names having designated one and the same species with all authors, we here find a great confusion. As late observations have shown that the three species occur on our coasts, I find myself enabled to trace the origin of these errors. With respect to our *Ophidion*, we should least of all expect to find this name in the English Fauna designating quite a different species from the one so called by us, as this appears to be the most rare which occur on the English coasts, and as Englishmen have paid little or no attention to the descriptions of Artedi, but have held to the short specific characters of Linnæus ; and these proving to be insufficient, sought explanation in Bloch, who has been especially unfortunate in the determination of the species of *Syngnathus*. That however which was not to be supposed has really happened ; in the most recent works treating of the British fish the name of *Ophidion* is reserved to designate merely the *one sex* of the most remarkable species of this subdivision, while the other sex is received under the right name *S. æquoreus*. Thus we find in Jenyns's 'Manual of Brit. Verteb. Animals,' as also in Yarrell's 'Hist. of Brit. Fish,' both describe rightly the female as *S. æquoreus*, Linn., but call the male *S. Ophidion*, Bloch. I will certainly not maintain that Bloch under his *Ophidion* may not at the same time have included *æquoreus* ; on the contrary, I rather consider Bloch's *Ophidion* to be synonymous with the whole subdivision, for the description may be applied partly to the one, partly to the other spe-

cies. The specimen which served for the original of his figure was probably *S. æquoreus*, Linn.\* It is quite certain that the name *Ophidion* must be retained for that species to which Linnæus first gave it; which this was, we find without any shadow of doubt in Artedi, who has given a very complete description of it in his 'Descript. Spec.' (P. 1. No. 1). It has also latterly been described by all our Swedish authors, without exception, under the same name. The only thing which we may remark is, that Artedi, and subsequently Linnæus, extended the synonymy too far, including a small distinct species, which Willoughby has described under the name of *Acus lumbriciformis*. This, which appears to be the most common in England, obtained from Pennant and subsequent authors the name *Ophidion*, till Jenyns considered it advisable to transfer this designation to the male of *æquoreus*. The name *lumbriciformis* is then again adopted by that writer, but not more happily applied; since he, without noticing it, describes under this name the true *Ophidion* of Linnæus. This is the only satisfactory explanation I have been able to find of our *Ophidion* also occurring in England. After Jenyns, Yarrell also adopts the name *lumbriciformis*, citing at the same time the description of the former, but himself describing under this name quite evidently the original species to which this name rightly belongs. Although, therefore, none of the above-mentioned authors were acquainted with more than two species of pipe fish, yet, on collecting the species adopted by them, we have the results that three species occur in England, and this is also the case, as I have before mentioned, on our coasts. No cause of doubting their identity with the English species has occurred to me.

Before I enter into the special description of our native species I will direct the attention to certain general peculiarities, which furnish some important points for the specific descriptions.

1. *The position of the anal aperture* in relation to its distance from the snout has already been made use of as a character

\* [The only specimen from Bloch's collection is in the Berlin Museum, and probably served as original for the drawing; it is however *S. Ophidion*, agreeing at least with the characters assigned to this species by M. F. Fries. —Prof. Wiegmann.]

for distinguishing the species. If this character has been obtained from a comparison of the same sex I would acknowledge its justness, but not otherwise; for the rule, that the anal aperture in the female is at a far greater distance from the snout than in the male, holds good in all pipe fish, and especially in *S. æquoreus* is this distinction between both sexes very remarkable. The age must also be taken into consideration; for if we compare a young specimen with an old one, both of one sex and the same species, we find in the former the distance rather shorter than is the case in the latter.

2. It is worthy of remark, that although the anal aperture in the male is situated closer to the snout than in the female, we still find the same number of plates, and of rings formed of these, in both sexes, both between anus and head as well as between anus and caudal extremity. Hence follows that the number of plates affords a very good character for the species if their enumeration were not connected with some difficulty and uncertainty, as they partly merge into one another, and in living and quite fresh specimens it is almost impossible to distinguish them.

3. *The form of the body* is quite different in the two sexes. We may take it as a rule, that the body in the female is higher and broader, that there is a raised keel or ridge on the back as well as under the belly, which the male, which has a more cylindrical trunk, possesses only traces of under the belly. Although the trunk in living specimens of both sexes scarcely exhibits any traces of three ridges running on each side, with the exception of one species, where they are more prominent; yet they are apparent in all, if they have been laid in spirits for some time or dried.

4. *The length of the head* in proportion to the rest of the body, in all small and long fishes, is not constant; disregarding the difference which age brings with it in this respect. As in young individuals the head is always found relatively longer, we also meet in the *Syngnathi* with considerable individual differences.

5. *The position of the dorsal fins* stands always in a rather constant proportion to the anal aperture, and if not fixed too minutely affords a very good character, which holds good in both sexes.



6. *The rays of the dorsal fins* vary, it is true, in number, as is the case in most fish; but the difficulty of counting them with certainty renders the character which might hence be adduced less applicable, and is undoubtedly the chief cause of the different statements which we find in various authors respecting their number. To be able to determine the number with certainty, the fins must be spread out under water, and the rays counted with the help of a lens.

7. *The colour of the body* is quite characteristic for our native species, if they are examined when alive, although, as in most fishes, it is subject to great variation with respect to markings and depth. The colour is, however, for a diagnosis of a second-rate value, since in order to determine it, it is necessary to have live specimens at hand. It is impossible to judge of the colour of a living specimen from one which has laid in alcohol.

8. *The length of the snout*, in proportion partly to the length, partly to the height of the head, I regard as being the character most easily seized for distinguishing the species, and shall therefore especially employ this character in the diagnoses. The distinction is very perceptible, and indeed no measurement is necessary: but in order to determine distinctly this character by terms, and to leave no room for doubt respecting the scale of measurement, I will previously explain that I take the length of the snout from its extremity to the centre of the eye, and compare this length with the distance from the centre of the eye to the posterior edge of the operculum. I am convinced from numerous comparisons that this character is constant in both sexes and in specimens of different size and age of the same species.

In order to distinguish our three native species in the easiest way, they may be divided as follows into two sections.

\* *Pinna caudali rudimentaria e radiis  $\frac{3}{4}$  brevissimis composita (parte majore pinnae dorsalis ante latitudinem ani sita.)*

To this section belongs only one species.

*ÆQUOREAL PIPE-FISH, Syngnathus æquoreus, Linn.*—Trunco sat distincte angulato; longitudine rostri distantiam a centro oculi ad marginem operculi superante.

Syn. S. æquoreus, *Linn. Syst. Nat. i. p. 417; Mont. in Wern. Mem. i. p.*

85. pl. 4. f. 1; *Penn. Brit. Zool.* vol. iii. pl. 23. f. 61; *Flem. Brit. An.* p. 176.

♀ = *S. æquoreus*, *Jenyns's Manual*, p. 486; *Yarrell's Brit. Fish*, II. p. 335.

♂ = *S. Ophidion*, *Jenyns's Man.* p. 487; *Yarr. Brit. Fish*, II. p. 335.

*Stenaale*, No. 2, Ström., Söndm. beskrif.

Of all the Scandinavian species of *Syngnathus* this is the largest and most distinguished. It attains a length of 2 feet. The general size of the females amounts to between 18 and 20 inches; the males, which appear to be constantly smaller, are generally met with between 13 to 16 inches in length. The colour is a beautiful burnt or brownish yellow; along the sides run rather wavy whitish oblique stripes parallel to each other, and which are inclosed by a brown frame. Between head and anal aperture are 29 to 30 plates or rings, and between the aperture and the caudal extremity about 70. The dorsal fin consists of 40 to 44 rays, and extends over 12 rings and somewhat over the 13th. The trunk of the female is pretty evidently octangular; then at each side proceed three ridges, a rather sharp keel on the belly, and along the back is a smaller ridge, which appears to pass over into a fold of the skin. The males have a more bordered trunk; the lateral ridges and the ventral keel are more even and the back quite plain, without a trace either of a ridge or a folding of the skin. In the female the anal aperture is situate at about the middle of the body, in the male much more anteriorly. The males have the eggs fastened to the belly in several rows (in 8 to 10).

This beautiful fish was formerly not admitted in the Swedish Fauna; it occurs sparingly if not rarely on the Bohusland coasts.

\*\* *Pinna caudali omnino nulla (parte majore pinnae dorsalis pone latitudinem ani sita.)*

To this section belong two distinct species, which have previously been confounded one with the other.

COMMON PIPE-FISH, *Syngnathus Ophidion*, Linn.—Corporis teretiusculo gracili, fere lineari; longitudine rostri distantiam a centro oculi ad marginem operculi æquante; ano circa medium corporis sito.

Syn. *S. Ophidion*. *Linn. Fn. Suec.* No. 375; *Syst. Nat.* i. 417; *Retz. Fn. Suec.* p. 312. No. 21; *Ekström, Abh. d. Akad. d. Wiss.* 1831. p. 280; *Nilsson, Synops.* p. 488.

*S. lumbriciformis*, *Jenyns's Man.* p. 488.

*Artedi Descript. Spec.* p. 1. No. 1. *Synon.* p. 2. No. 4. *Gener.* p. 1. No. 2.



The body is very small and of almost equal breadth ; the tail gradually diminishes in size, and almost imperceptibly ends in an extremely fine point. Of all the species this is the longest in proportion to the height of the body, or about the proportion 60:1. The usual length amounts to about 9 to 10 inches. The colour is olive green above, passing into yellow beneath, with a quantity of small, blueish white, frequently round spots at the sides, and above the gill covering with a quantity of minute beautiful azure blue stripes, which proceed abruptly towards the sides of the body. Between head and anal aperture are situated 30 to 31 rings, and from this last to the caudal extremity about 60 and above. The dorsal fin consists of 34 to 38 rays, and extends over 10 segments of the body. The anal aperture occupies in the male nearly the middle of the body ; in the females it is found somewhat behind this point. The eggs are placed in 3 to 4 rows.

This species is very easily distinguished from the following one by its longer projecting and somewhat pointed snout, which surpasses in some degree in length (reckoned from the centre of the eye) the greatest height of the head.

It is this species which is so very common on our coasts, occurring both in the Baltic and Cattegat. The females are in greater plenty than the males.

LITTLE PIPE-FISH, *Syngnathus lumbriciformis*, Yarr.—Corpore teretiusculo, crassiore, rostro apice reflexo, brevior, distantiam a centro oculi ad marginem operculi non attingente ; ano circa anteriorem  $\frac{1}{2}$  longitudinis corporis sito.

Syn. *Aeus lumbriciform*. Willoughb. *Hist. Pisc.* p. 160.—Little Pipe Fish. *Penn. Brit. Zool.* p. 23. No. 62.—*S. lumbriciform*. Yarrell, *Brit. Fish.* ii. p. 340.

Compared with the preceding species, which most resembles this, we have the body somewhat thicker in proportion to its length, about 1 to 35—40, the tail is also somewhat thicker. This little fish, which only attains a length of 5—6 inches, possesses from its short snout, which is bent somewhat upwards and at the extremities is rather obtuse, an appearance easily recognizable. The usual colour is chestnut brown, which in some is brighter, in others darker ; along the back are situated irregular large spots of a whitish grey colour,

which towards the tail become much smaller, and thus give it a kind of marbled appearance. The distance from the nasal extremity to the centre of the eye is shorter than the greatest height of the head, and than the distance from the centre of the eye to the hinder portion of the gill covering. Between head and anal aperture are 19 segments, and between this aperture and caudal extremity about 50.

The dorsal fin consists of 26 rays (in all specimens which I have hitherto examined this has been constant) and extends only over 7 segments. The anal aperture is situated in the male at the anterior third part of the length of the body. The eggs are arranged in four rows.

I discovered this little recruit to our Fauna on the Bohusland coast. Lately I found several specimens, all males, of which two had roes. This pipe-fish is probably not so rare, but all the specimens I obtained were fished up from the bottom of a water 16 fathoms deep, which appears to show that it inhabits deep water; a circumstance, which renders the catching of this small fish so difficult, that it easily escapes. I have never seen it caught on the shores. The female I am unacquainted with.

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XIII.—*Enumeration of the Plants collected by Mr. Schomburgk, British Guiana.* By GEORGE BENTHAM, Esq., F.L.S.

MR. ROBERT SCHOMBURGK was in the year 1834 appointed by the Royal Geographical Society to command an expedition into the interior of British Guiana, with permission at the same time to make, on his own account, collections in the various branches of natural history, one set being deposited in the British Museum. Having procured a certain number of subscribers to the dried plants which he should collect, it was further arranged that Mr. Schomburgk should make them up in sets and forward them to me for transmission to the subscribers, and that each species should be marked with corresponding numbers in the several sets, with a view to identifying them when published.

Mr. Schomburgk, having received his final instructions, left George Town, Demerara, on the 21st of September, 1835; ascended the Essequibo, and its tributary, the Rupunoony, as far as the creek Anna-y, where he established a temporary habitation or head-quarters; made several excursions from thence during a stay of about