

PLEURONECTIDÆ, a family of fishes of the order Malacopterygii and section Subbrachiales. This family contains the Soles, Flounders, and Turbot, and some other fishes, all of which are readily distinguished by the flattened form of the body and in having both the eyes on one side. This want of symmetry in the form of the head, Cuvier states, is unique amongst vertebrate animals. The side of the body which is uppermost is always coloured, and might be mistaken for the back of the fish, whilst the opposite side is white. The two sides of the mouth are unequal, and it is uncommon to find the two pectoral fins equal; the dorsal and anal fins extend the whole length of the back and abdomen respectively; the ventrals appear like a continuation of the anal; the branchiostegous membrane has six rays.

The *Pleuronectidæ* are divided into the following genera:—

Genus 1. *Platessa*, in which the jaws are each furnished with a single row of obtuse teeth; on the pharyngeans are generally some teeth like paving-stones; the dorsal fin is only extended in front to a line with the eye, and leaves, as well as the anal, an interval between it and the caudal. The form of the body is rhomboidal, and the eyes are usually on the right side.

To this genus belongs the common Plaice (*Platessa vulgaris*, Cuv.), which is usually about a foot or rather more in length; of a brown colour above, spotted with red or orange; on the eye side of the head are some osseous tubercles; the lateral line is curved above the pectoral fin; the body is smooth, and the teeth are blunt and contiguous.

This fish is very abundant on various parts of the British coast, and is said sometimes to attain the weight of fifteen pounds.

The Flounder (*P. Flesus*), Dab (*P. Limanda*), and Lemon Dab (*P. microcephala*), are also examples of the genus *Platessa*.

Genus 2. *Hippoglossus*, Cuv. The species of this genus differ from the Plaices proper in having the body usually more elongated, and the jaws and pharyngeans armed with strong and pointed teeth.

The Holibut (*Hippoglossus vulgaris*, Flem.) is not uncommon on some parts of our coast, and is often exposed for sale in the London market. It is usually of large size. One specimen, taken in the Isle of Man, is said to have measured seven feet and a half in length. In the northern parts of Britain it is called the *Turbot*: the Holibut however is of a much longer form than the *Turbot*, and by no means equal to it in flavour.

Genus 3. *Rhombus*, Cuv. The species of this genus have the jaws and pharyngeans furnished with thickly set small pointed teeth; the dorsal fin commences immediately above the upper lip, and this fin, as well as the anal, extends very nearly to the tail. the eyes are generally on the left side.

The *Turbot*, Brill, Muller's Topknot, Bloch's Topknot, the Whiff, and the Scaldfish are British examples of the genus *Rhombus*.

The *Turbot* (*Rhombus maximus*, Cuv.), next to the Holibut, is one of the largest of the *Pleuronectidæ* found on our coast, and is the most highly esteemed for the table. The *Turbot* is of a short and broad form, and rather deeper than many of the flat fishes. Its prevailing colour is brown, and the whole of the coloured side is studded with hard and roundish tubercles; the lateral line is considerably arched above the pectoral fin, and thence runs straight to the tail: it is called in Scotland the Rawn Fleuk and Bannock Fleuk.

'On the coasts of Durham and Yorkshire,' says Mr. Yarrell, 'a considerable fishery of *Turbot* is carried on by the fishermen of Hartlepool and Scarborough with long lines.'

'A large portion of the *Turbot* produced in the English market is taken on or near the various sand-banks between the long line of our eastern shore and the coast of Holland.'

The Brill (*Rhombus vulgaris*, Cuv.) is very similar to the *Turbot* in appearance, but inferior in flavour; it is common in the markets, and may at once be distinguished by its less broad form, the want of the osseous tubercles on the coloured side of the body, and the colouring, which is reddish or sandy brown varied with darker brown, and minutely spotted with white. It is moreover a smaller fish.

Genus 4. *Solea*, Cuv., contains the Soles, which are distinguished generally by their more elongated form and the blunt and rounded shape of the muzzle. The eyes, as well as the colouring, are on the right side; the teeth are small and confined to that side of the mouth which is opposed to the eyes; the dorsal fin commences in front of the line over the eyes, and extends, as well as the anal, to the tail-fin.

Cuvier separates as a subgenus from the Soles proper those species which have the pectoral fin on the side with the eyes very small, and that on the opposite side either rudimentary or altogether wanting. They are termed *Monochirus*.

The common Sole (*Solea vulgaris*, Cuv.) inhabits the sandy shore all round our coast, where it keeps to the bottom, and feeds upon small testaceous animals and the fry of other fishes; as they will not readily take bait, they are almost entirely caught by trawling. 'Eighty-six thousand bushels of Soles were received at Billingsgate-market only within the last twelve months.' (Yarrell's *British Fishes*, vol. ii., p. 25.)

Another species belonging to this section, called the Lemon Sole (*Solea pegusa*, Yarrell), is occasionally taken with the common species, from which it differs in being rather broader and of a yellowish colour.

Of the subgenus *Monochirus*, one species is found on the British coast, and is known by the names Variegated Sole, Red-backed Flounder, &c. (*M. linguatulus*). There are moreover certain Soles in which the pectoral fins are altogether wanting; they constitute the subgenus *Achirus* according to Lacépède.

PLEUROPTERA, the name of a tribe of quadrupeds generally known as Flying Lemurs (*Galeopithecus* of Pallas; Flying Cats and Flying Foxes of voyagers). They are generally arranged under the order Carnassiers, and some authors place them in the division *Cheiroptera*; but they differ from the *Bats* inasmuch as the toes of their anterior extremities, which are all furnished with sharp claws, are not more elongated than those of the hind feet, so that the membrane which occupies the interval between the extremities to the sides of the tail can hardly operate in executing more than the functions of a parachute.

Dental formula:—Incisors, $\frac{4}{6}$; canines, $\frac{0-0}{0-0}$; molars,

$$\frac{6-6}{6-6} = 34.$$

This is the formula given by M. Lesson; but Cuvier, in his *Règne Animal*, states that the canines are dentilated and short like the molars. He states that the two upper incisors are also dentilated and much separated from each other; and that the six lower ones are split into narrow strips like combs, a structure peculiar to this genus.

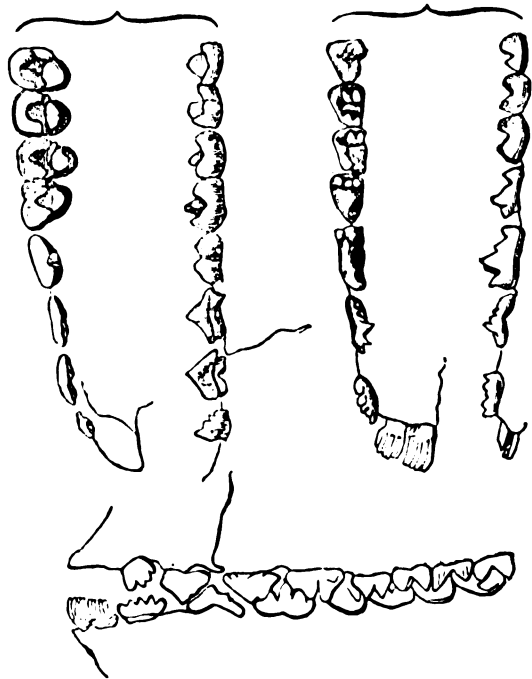
M. F. Cuvier's formula is similar to that of M. Lesson, and was probably copied by the latter. M. F. Cuvier describes the 12 molars in both jaws as consisting of four false molars and eight molars. He tells us that in the upper jaw, the intermaxillary bone, though very extensive, has no teeth in its anterior part, in the posterior part there are two on each side. The descending line in the upper part of the lower figure marks the extent of the intermaxillary bone.

The dentition, as it appears to Mr. Waterhouse, is as follows:—

$$\begin{array}{l} \text{Incisors } \frac{2-2}{4}; \text{ canines } \frac{0-0}{1-1}; \text{ false molars } \frac{2-2}{2-2}; \text{ true} \\ \text{molars } \frac{4-4}{4-4} = 34. \end{array}$$

The same author observes that the six foremost teeth in the lower jaw of the *Lemur* (four only of which are, in his opinion, incisors; for he agrees with Geoffroy in considering the remaining two as canines) together bear a remarkable resemblance to a single incisor of *Galeopithecus*. He compares the two canines to the outer *laminae* of one of these incisors. Like one of these *laminae*, the *Lemur*'s canine is dilated immediately above the base, and has a longitudinal ridge on the upper side, whilst the incisors, like the intermediate *laminae*, are grooved on the outer side near the apex. In their almost horizontal direction there is also a resemblance. In the number of teeth the *Galeopithecus* agree with the *Lemurs*, excepting that in the former the upper canines are wanting. In both these groups of animals the incisors of the lower jaw are, he observes,

opposed to a toothless portion of the intermaxillaries. (*Zool. Trans.*, vol. ii., part 4.)



Teeth of *Galeopithecus*, one-third larger than nature. (P. Cuvier.)

Geographical Distribution of the Genus, Habits, &c.—Cuvier and others state that the *Galeopithecii* live on trees in the islands of the Indian Archipelago, and there pursue insects, and perhaps birds, as their prey: judging from the detrition of the teeth with age, he thinks that they must also feed on fruits. They have a very large cæcum. In their teeth they present many analogies to the *Lemuridae*.

Mr. Gray makes the *Galeopithecidae* the fourth family of the (quadrupedoid) *Primates*, and places it between the *Lemuridae* and *Vespertilionidae*. (*Outline, &c.*, in *Ann. of Philosophy*, 1825.)

Speaking of the *Galeopithecus* of Pallas, Mr. Swainson observes: 'To give its most striking character in a few words, it is a lemur, with the limbs connected by a bat-like membrane, or, in other words, surrounded by a thin skin which they support, as the framework of an umbrella supports its covering. By this singular structure, the animal is supported in the air; yet without the power, like the bats, of sustaining a continued flight. Linnæus places this remarkable genus with the lemurs, while every one must perceive its intimate affinity to the bats; like them also, these bat-lemurs are nocturnal and insectivorous; the mammae are pectoral; and they sleep suspended by their hind legs with their heads downward. M. Geoffroy St. Hilaire therefore justly considers them as the form by which the lemurs and bats are connected; while their greater resemblance to the former induces us to consider *Galeopithecus* as one of the aberrant types of the *Lemuridae*, among which Mr. Swainson arranges the genus, in the third part of his volume, between *Aotes* and *Cheirogaleus*. (*Natural History and Classification of Quadrupeds*, 1835.)

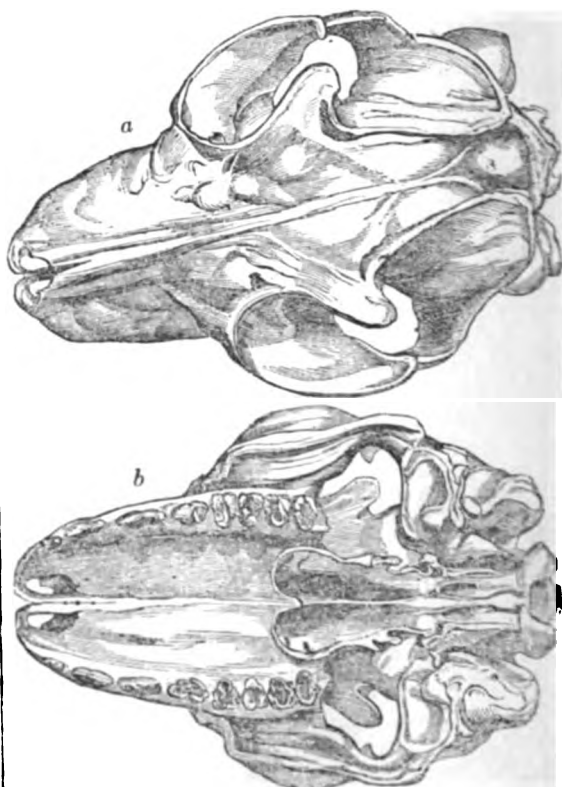
Three species have been recorded: 1, *Galeopithecus rufus*, Geoff., Audub. (*Lemur volans*, Linn.); 2, *Galeopithecus variegatus*, Cuv., Geoff.; 3, *Galeopithecus Ternatensis*, Geoff.: but the general opinion seems to have been that one only, the *Lemur volans* of Linnæus, had been satisfactorily made out. In October, 1838, some specimens of Flying Lemurs were upon the table at a meeting of the Zoological Society of London, and in reference to them Mr. Waterhouse pointed out certain characters which appeared to him to indicate the existence of two species in those specimens.

He remarked that in systematic works three species of the genus *Galeopithecus* are described, founded upon differences of size and colour: as regards the latter character, he had never seen two specimens which precisely agreed; and, with respect to size, the dimensions given of two out of the three species are, he observed, evidently taken from extremely young animals. Mr. Waterhouse then proceeded

to distinguish the two species on the table, and proposed for them the specific names of *Temminckii* and *Philippinensis*.

The first and larger species measured about two feet in total length, and its skull was 2 inches 11½ lines in length. The anterior incisor of the upper jaw is broad, and divided by two notches into three distinct lobes; the next incisor on each side has its anterior and posterior margins notched; and the first molar (or the tooth which occupies the situation of the canine) has its posterior edge distinctly notched. This tooth is separated by a narrow space, anteriorly and posteriorly, from the second incisor in front and the second molar behind; the temporal ridges converge towards the occiput, near which however, he observed, they are separated usually by a space of about four lines. This is probably the *Galeopithecus volans* of authors; but the identity cannot be said to be certain.

The second species, *G. Philippinensis*, was described by Mr. Waterhouse as being usually about 20 inches in length, and its skull as measuring 2 inches 7 lines in length. He observed that this species may be distinguished from *G. Temminckii* by the proportionately larger ears and the greater length of the hands. The skull too he described as narrower in proportion to its length, the muzzle as broader and more obtuse, and the orbit as smaller. The temporal ridges, he remarked, generally meet near the occiput, or are separated by a very narrow space. The anterior incisor of the upper jaw is narrow, and has but one notch; the next incisor on each side is considerably larger, longer, and stronger than in *G. Temminckii*, and differs moreover in having its edges even—the same remark applies to the first false molar. In this species the incisors and molars form a continuous series, each tooth being in contact with that which precedes and that which is behind it. But Mr. Waterhouse concluded by observing that the most important difference perhaps which exists between the two species in question consists in the much larger size of the molar teeth in the smaller skull, the five posterior molars occupying a space of 10 lines in length, whereas in *G. Temminckii*, a much larger animal, the same teeth only occupy 9 lines. Several minor points of distinction existed besides those here mentioned. (*Zool. Proc.*, 1839; and see further *Zool. Trans.*, vol. ii., p. 335.)



Skull of *Galeopithecus Temminckii*.

a, seen from above; b, seen from below. (Waterhouse, *Zool. Trans.*)