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A TRAGEDY OF ERRORS: THE STATUS OF *CARCHARHINUS* BLAINVILLE, 1816; *GALEOLAMNA* OWEN, 1853; *EULAMIA* GILL, 1861; AND THE IDENTITY OF *CARCHARHINUS* COMMERSONII BLAINVILLE, 1825

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With Plates VII-VIII and 1 textfigure

During recent research on a small number of freshwater sharks from Lake Jamoer, Netherlands New Guinea, I was struck by the fact that the consulted literature clearly showed a deplorable lack of agreement in the choice of a generic name for the species belonging to the genus *Carcharhinus* Blainville, sensu Bigelow & Schroeder (1948, p. 320), even among recent authors. Though by far the majority of contemporary authors now seem to have accepted *Carcharhinus*, a decreasing number still uses either *Galeolamna* Owen or *Eulamia* Gill, or occasionally even *Carcharias* Cuvier.

In the restricted list of literature given at the end of the present paper, eleven of the post-1900 authors finally used *Carcharhinus* (or *Carcharinus*), only two used *Galeolamna* (Whitley, 1939 et seq.; Fowler, 1956), while of the three using *Eulamia* two subsequently accepted *Carcharhinus* (Munro, 1956; Smith, 1951 et seq.) and the third recently preferred *Galeolamna* (Fowler, 1956). Only two authors still used the apparently erroneous name *Carcharias* (Rendahl, 1922; Blegvad, 1944). A more comprehensive list of literature would have illustrated even much better the preference given by modern authors to *Carcharhinus* Blainville.

As the authoritative monograph on Atlantic sharks by Bigelow & Schroeder (l.c.) will obviously be used for a considerable time as standard for nomenclatorial purposes, it is unfortunate that I am not able to agree with some of the arguments or conclusions these authors put forth in support of *Carcharhinus* Blainville. As will be discussed in more detail further on, I fear that a strict application of the International Rules of Zoological Nomenclature must lead to the acceptance of the rarely used name *Galeolamna* Owen.

Emphasizing once more the fact that most authors now use the name *Carcharhinus*, and probably will continue to do so, it seems desirable to have that name officially accepted, if necessary arbitrarily, by suspension of the rules of nomenclature. This procedure would be much facilitated by a reasonably convincing identification of *Carcharhinus commersonii* Blainville, the species most frequently indicated as the type of *Carcharhinus*. To that end, some interesting new or hitherto overlooked information on *C. commersonii*, partly leading into an unexpected direction, will be given in the final part of the present paper.

Carcharhinus Blainville, 1816

Blainville (1816a, pp. 120 *), 121) divided his "SELACA (*Arist.*)" or cartilaginous fishes into three parts named "RAIA", "SQUATINA", and "SQUALUS". While he indicated *Squatina*, containing only the single species "Angelus", solely as "Genus", both *Raia* and *Squalus* are more extensively indicated as "Genus aut Fam.", obviously meaning a slightly higher taxonomic category for these large groups than a mere genus, possibly a tribe. Consequently, the name *Squalus* should not be quoted as a generic name in references to Blainville's species, and the name *Squalus* (*Carcharhinus*) *commersonii* Blainville, as used in literature, depends on an incorrect interpretation of Blainville's text.

Blainville again divided his "tribe" *Squalus* into nine groups, evidently genera, the seventh being *Carcharhinus*. The complete paragraph on *Carcharhinus* reads as follows (p. 121):

"7°. CARCHARHINUS. Car. Dentibus magnis, triangularibus, saepiùs serratis; Insp. nullis; P. S. 2, 1a. dorsali; P. A. parva: fossulâ semilunari ad radicem sup. et inf. P. C. bilobatae, lobo sup. multùm longiore et pinnâ speciali terminato.

Spec. Commersonii; Lamia; Lividus; Ustus; Heterodon; Verus; Broussonetii; Glaucus; Caeruleus; Megalops; Heterobranchialis; Cornubicus; Monensis? Vulpes."

The whole paper, including the quoted parts, was reissued verbally the same only a few months later (Blainville, 1816b, pp. 244-267).

It is interesting to note that Blainville did not mention the authors of his specific names though some evidently were taken from previous publications, as confirmed by additional data in a later account (Blainville, 1825). In a similar case, concerning the species *lamia* Gill, Bigelow & Schroeder (p. 320,

*) Erroneously numbered 112.

footnote 3) state: “*lamia* Gill” was a *nomen nudum*, no account having ever been published by Gill himself of any shark under that name, or even any indication as to whether he referred to the “*lamia*” of Rafinesque, 1810, of Risso, 1826, or of Müller & Henle, 1841.” Accepting this way of reasoning, all Blainville’s specific names are to be considered mere *nomina nuda*, never having been mentioned by this author in a previous publication, and no indications being added in the quoted account. The fact that, in contradistinction to Gill, Blainville afterwards gave additional information, is of no practical importance. It is not clear why Bigelow & Schroeder, considering *lamia* Gill a *nomen nudum*, on the same page (p. 320, footnote 1a) accept some of Blainville’s names, unless the ambiguity of Gill’s species was considered decisive, an argument that was not put forth in their discourse. As some of Blainville’s names can be ascribed to previous authors without the slightest doubt or ambiguity, their validity should not be doubted.

Of the fourteen names of species that Blainville included in his new genus, only five seem to have been taken from the previous literature and, consequently, can be identified without using additional information provided afterwards. These are: *glaucus* Linnaeus, 1758 (= *Prionace glauca* (Linnaeus)); *cornubicus* Gmelin, 1789 (= *Lamna nasus* (Bonnaterre)); *monensis* Shaw, 1804 (= *Lamna nasus* (Bonnaterre)); *vulpes* Gmelin, 1789 (= *Alopias vulpinus* (Bonnaterre)); and possibly *lamia* Rafinesque, 1810 (= *Carcharodon carcharias* (Linnaeus)).

If indeed taken from Rafinesque, Blainville’s application of the name *lamia* apparently was incorrect, as is shown by later evidence provided by that author (Blainville, 1825, p. 88; refers to Duhamel, 1782, p. 297, pl. 19). While, as stated before, *lamia* Rafinesque is now considered identical with *Carcharodon carcharias* (Linnaeus), *lamia* Blainville is a composite species partly referable to *Galeocerdo cuvier* (Lesueur) on account of Duhamel’s illustrations of the teeth (pl. 19, figs. 4 & 5), and partly to a *Carcharhinus* of uncertain identity.

The further nine names that Blainville enumerated were all *nomina nuda*, but some became valid afterwards when Blainville (1825) provided indicative information (e.g., *commersonii*), and one (*verus*) became valid already in 1817, the authorship passing to Cloquet (1817, p. 69). Though this has been done frequently, it seems incorrect to select as the type species of *Carcharhinus* a species mentioned in the original paper only as a *nomen nudum*. The fact that some of these *nomina nuda* afterwards became valid evidently is of no importance here. Moreover, validly named species were enumerated with the *nomina nuda* and are available, as was shown in a previous paragraph. According to Follett’s version of the rules of nomenclature (1955,

p. 39), the type species should be selected from "those species possessing a specific name validly published with an indication", this obviously meaning "validly published" before or at the moment the new genus was proposed!

Since Blainville first proposed his genus *Carcharhinus* in 1816, several authors in various ways tried to accurately interpret and to restrict the genus, placing it differently in their selachian systems, thereby causing much confusion. To my knowledge, five different species were indicated as type species, two of which do not even occur in Blainville's original enumeration.

The first author designating a type species evidently was Bosc (1816, p. 277), who selected "*Squalus carcharias*" as type though that species does not occur among the fourteen that Blainville originally listed in his genus, being mentioned and described only in that author's subsequent paper on the present subject (1825, p. 89). As already remarked by Bigelow & Schroeder (1948, p. 320), this designation consequently must be considered invalid.

Agassiz (1838, pl. 36, figs. 10-13; not seen, reference taken from Bigelow & Schroeder, 1948, p. 321) proposed the new genus *Glyphis*, with the type species *G. hastalis* Agassiz, on the mere evidence of only two fossil teeth. According to Bigelow & Schroeder, these teeth "resemble the anterior lower teeth of *Carcharias* (*Prionodon*) *glyphis* Müller & Henle, 1841, which falls in *Carcharhinus*" as defined by these authors. This would make *Glyphis* Agassiz the first alternative name to be used in case *Carcharhinus* Blainville became unavailable for this group, but I fully agree with Bigelow & Schroeder when they state that they "doubt the propriety of reviving the name *Glyphis* for any modern shark on the evidence of these two teeth alone". I consequently leave *Glyphis* out from the further discussion.

While Müller & Henle (1841) not even mentioned Blainville's *Carcharhinus*, Gray (1851, p. 43) considered it to be only a subgenus of his genus *Squalus*, which covers a considerable part of the Carcharhinidae as understood by Bigelow & Schroeder. Gray also removed Blainville's species *cornubicus* and *monensis* to the genus *Isurus* (p. 59) and *vulpes* to *Alopias* (p. 64), and he never indicated any type species.

Owen (1853, p. 96) never mentioned the name *Carcharhinus*, although he founded his new genus (and type: *G. greyi*) *Galeolamna* on a pair of jaws obviously from a species belonging to the genus *Carcharhinus* sensu Bigelow & Schroeder (cf. Whitley, 1940, p. 100). It is deplorable that the characters given by Owen are very scanty, since the type material of *Galeolamna greyi* must be considered lost by bombing during the last war (Trewavas, in personal communication).

Gill (1861a, p. 401) reduced *Carcharhinus* Blainville to the synonymy of *Cynocephalus* Klein, designating *Squalus glaucus* Linnaeus as type species

of the last named genus. However, the fact that Klein's name has been invalidated by suspension of the rules of zoological nomenclature (Opinion 89 (D. S. Jordan), 1925, p. 27) does not mean that *Squalus glaucus* Linnaeus can be considered by deduction to become the type species of *Carcharhinus*, as has been done by Whitley (1940, p. 107). Whitley's erroneous interpretation led him to replace *Prionace* Cantor, 1849 by *Carcharhinus* Blainville, 1816. Gill (pp. 399-401) also distinguished five separate genera together comprising the genus *Carcharhinus* sensu Bigelow & Schroeder, the first being *Eulamia*, with the type species *Eulamia milberti* (Müller & Henle).

Some subsequent authors either considered the name *Carcharhinus* Blainville impracticable because "le nom ... ne peut pas être conservé à cause du grand nombre d'espèces appartenant à des genres différents, que ce naturaliste y a rapportées" (Duméril, 1865, p. 351), or wholly neglected it (Günther, 1870; Day, 1878, 1889), but it was again revived by Jordan & Gilbert (1883, p. 22), *Carcharhinus commersonii* Blainville being designated as the type species. In a first addendum (l.c., p. 60), these authors referred most of the included species to a separate genus, *Eulamia* Gill, leaving only "*C. glaucus* (L.) Jordan & Gilbert" (= *Prionace glauca* (Linnaeus)) in their genus *Carcharhinus* sensu stricto. In a final addendum (p. 872), both *Carcharhinus* and *Eulamia* are considered mere subgenera of the genus *Carcharias* Rafinesque, type species *Squalus glaucus* Linnaeus. Fortunately, Jordan & Gilbert in their addenda did not make any remarks with regard to their earlier designation of *C. commersonii* as the type species of *Carcharhinus* sensu lato, so both addenda can be omitted from the further discourse.

Up to the present, most authors using the name *Carcharhinus* seem to have accepted Jordan & Gilbert's designation of the ambiguous *C. commersonii* Blainville as the type species, apparently considering a satisfactory identification of that species the principal problem left to solve. As a matter of fact, whatever may be the identity of *C. commersonii*, that name was doubtlessly a nomen nudum at the time Blainville proposed his genus *Carcharhinus* (1816a), and subsequent information provided by that author (1825) does not make it available as a type species, unless by suspension of the rules of nomenclature. This subject will be discussed more extensively in the second part of this paper.

Fowler (1908, p. 62) appears to have been the first author pointing out the invalidity of Jordan & Gilbert's designation, correctly considering *commersonii* Blainville, 1816, a nomen nudum. Agreeing to this, we have to accept Fowler's choice as a type species of Blainville's last named species *vulpes*, which makes *Carcharhinus* Blainville, 1816, a synonym of *Alopias* Rafinesque, 1810. On the other hand, Fowler was wrong when he stated

that for the present genus "the next name available is *Eulamia* Gill, which had best be adopted". Leaving out *Glyphis* Agassiz as a genus dubius, *Galeolamna* Owen apparently becomes the next available name.

Whitley (1932, p. 324) reintroduced into literature the hitherto overlooked name *Galeolamna* Owen, 1853, and adopted it correctly in subsequent papers (1939, 1940, 1943, 1944, 1954) for the genus under discussion, though slightly restricted by his separation of a few new genera of dubious value. An early paper (1934, p. 184) in which Whitley, without knowledge of the actual wording of Blainville's original publication, accepted Bosc's designation of *Squalus carcharias* Linnaeus (= *Carcharodon carcharias* (Linnaeus)) as the type species, needs not be considered here.

While Whitley was right in his choice of the generic name, his opinion on *Carcharhinus* Blainville and its type species was less fortunate. In the relevant paragraph (1940, p. 107), he states: "The first valid genotype selection seems to be the designation of *Squalus glaucus*, the Great Blue Shark, by Gill (Ann. Lyceum Nat. Hist. New York, vii., 1862, under *Cynocephalus*). Therefore, *Carcharhinus* replaces *Prionace* for the European *glaucus* and the Australasian *mackiei*". As has already been pointed out previously, Whitley's reasoning with regard to the type species designation must be considered incorrect.

Tortonese (1938, p. 298; 1939, p. 23), while accepting *Carcharhinus* Blainville as the generic name, considered *C. commersonii* Blainville the type species and assumed it to be identical with *Carcharias lamia* Risso, 1826, a species which he afterwards found to be indefinable (Tortonese, 1956, p. 151, footnote). More recently (1950, p. 5; 1956, p. 146), still accepting *Carcharhinus* Blainville, he rather arbitrarily designated *Squalus plumbeus* Nardo (= *C. milberti* auct.) as the type species, the previous designation of *commersonii* now being considered erroneous on account of the fact that *commersonii* should be regarded as a species dubius and its name as a nomen nudum. This designation as type species of *plumbeus* Nardo, 1827, a species not included in Blainville's original publication, apparently in invalid. Tortonese never convincingly showed that previous designations of a type species are invalid, that none of the species included in Blainville's original paper is available for designation, and he apparently never submitted a proposal on this subject to the International Commission of Zoological Nomenclature.

As has already been remarked above, Bigelow & Schroeder (1948, p. 320) accepted *Carcharhinus* Blainville as generic name, while they adopted *commersonii* as the type species because (note 1a) it "cannot properly be discarded, for, as pointed out, the illustration on which it was based is identifiable with reasonable certainty at least as to genus if not to species".

Though they stated on the same page that the species *commersonii* Blainville, 1816, was nominal only until Blainville defined his species in 1825, they do not attach much importance to this fact.

Finally, Fowler (1956, pp. 16, 22), having previously already given the first wholly acceptable type species designation (1908, p. 63, *C. vulpes* Blainville), also correctly used the earlier generic name *Galeolamna* Owen instead of *Eulamia* Gill, thereby being the first author making use of the available data in previous literature in complete accordance with the official rules.

Summing up, the following may be stated:

a. Of the fourteen names of species that Blainville (1816a) included in his genus *Carcharhinus*, nine (including *commersonii*) were nomina nuda and therefore not available for the designation of a type species.

b. The subsequently provided information on some of the species previously indicated with nomina nuda only (Blainville, 1825), does not alter their status as a nomen nudum in the original publication, and does not make them available for type species selection.

c. The first valid designation of a type species for *Carcharhinus* Blainville, 1816, was by Fowler (1908, p. 63), who selected *C. vulpes* Blainville. This made *Carcharhinus* Blainville, 1816, identical with *Alopias* Rafinesque, 1810, and no longer available for the present genus.

d. The first available name to be used for the genus *Carcharhinus* Blainville, sensu Bigelow & Schroeder, is *Galeolamna* Owen, 1853.

e. The only way to preserve the generally used name *Carcharhinus* for the present genus is by suspension of the International Rules of Zoological Nomenclature, making use of the plenary powers of the International Commission to set aside the Rules on behalf of uniformity.

The preservation of *Carcharhinus* Blainville, 1816

As has been shown before, stability in shark nomenclature would be greatly promoted if the name *Carcharhinus* Blainville could be preserved for that genus as understood by Bigelow & Schroeder (1948, p. 320). It has also been shown that this can only be accomplished by suspension of the rules of zoological nomenclature. Finally, if we accept this procedure, it seems preferable to designate as type species one of those enumerated in Blainville's original publication (1816a).

Of the fourteen names of species that Blainville included in his genus, only five can be considered valid, while the concerned species are now referred to different genera. The choice of one of these as type species for Blainville's genus would make *Carcharhinus* either a synonym of *Alopias*

Rafinesque, 1810, or a prior substitute for *Galeocерdo* Müller & Henle, 1837, *Prionace* Cantor, 1849, or *Lamna* Cuvier, 1817, an unfortunate procedure resulting only in nomenclatorial confusion and not making the generic name available for the genus *Carcharhinus* sensu Bigelow & Schroeder.

Of the remaining nine species, all indicated as nomina nuda only in the original paper, two subsequently became valid when Blainville (1825, p. 90) provided more adequate information: *commersonii* and *caeruleus*. Of these, the second apparently is identical with *glaucus* Blainville and therefore must be referred to the genus *Prionace* Cantor, 1849. Blainville's other species remained indefinable and the names nomina nuda, though some early authors subsequently used identical specific names (*ustus* (Duméril) Cuvier, 1829 = *Carcharhinus melanopterus* (Quoy & Gaimard), 1824; *verus* Cloquet, 1817; Agassiz, 1836 = *Carcharodon carcharias* (Linnaeus), 1758).

If we want to preserve for the genus now under discussion the name *Carcharhinus* Blainville, there are apparently only the following three possibilities, all needing suspension of the rules of nomenclature:

a. The designation of *Carcharhinus commersonii* Blainville as type species, as was done already by Jordan & Gilbert (1883), whose designation has been accepted by numerous, even recent, authors. As the principal drawback remains the fact that nobody hitherto has been able to identify *commersonii* with reasonable certainty, neglecting its original status as a nomen nudum.

b. The designation of *ustus* Blainville (= *Carcharhinus melanopterus* (Quoy & Gaimard)) as the type species. Though much can be said in favour of such a procedure, *ustus* never seems to have been selected as type species. *Carcharhinus melanopterus* is a well defined species rather frequently occurring in the Indo-Pacific area, less frequently in the eastern Mediterranean. It has been considered identical with Lacépède's "Squale requin" (e.g., Müller & Henle, Duméril, Gray), on the figure of which Blainville based his species *commersonii*¹).

c. The designation as type species of a species not occurring in Blainville's original enumeration (1816a). This seems to be the least elegant procedure and therefore should be adopted only in case those mentioned previously (a & b) prove impracticable or not recommendable. In that case, Tortonese's designation of *plumbeus* Nardo, 1827, as the type species may be officially accepted.

As I prefer the procedure as indicated under a, I will give in the final chapter of this paper some important additional information on *commersonii*

1) According to Desmarest (1847, p. 544, footnote 2), *Squalus ustus* Duméril (= *melanopterus* Quoy & Gaimard) is identical with *commersonii* Blainville!

Blainville, hitherto neglected or overlooked by previous authors. I hope that this will enable a satisfactory identification of that species. Unfortunately, our own collection does not contain sufficient comparative material from the area in which we have to look for *commersonii*, viz., the eastern Indian Ocean.

In case this identification of *commersonii* proves possible, an official proposal to the International Commission remains necessary in order to obtain suspension of the rules of nomenclature, requisite on account of the time that elapsed between the erection of the genus *Carcharhinus* Blainville in 1816 and the moment the species *commersonii* Blainville became valid (1825).

On the other hand, if a reasonably certain identification of *commersonii* still remains impossible, we will have to accept one of the two further possible proceedings (b & c), both of which also need suspension of the rules.

Carcharhinus commersonii Blainville, 1816

While in his first publication Blainville (1816a, p. 121) mentioned the species *commersonii* only as a nomen nudum, he afterwards (1825, p. 90) made it valid by providing the following information:

"Je n'ose citer pour cette espèce la synonymie de Gmelin et des autres ichthyologistes, crainte d'erreur; je me borne à celle de Broussonnet, Acad. des Sc., 1780, p. 670, no. 19, le Requin, vulgairement le Requiem. M. de Lacépède figure sous ce nom, t. I, pag. 169, pl. 5, fig. 1, une espèce distincte, à laquelle j'ai donné le nom de Commerson".

As already indicated by previous authors, the reference to Lacépède's plate 5 is erroneous, plate 8 obviously being intended. It may further be emphasized that the wording used by Blainville does not prevent taking also Lacépède's text into consideration.

Using the still very scant information provided by Blainville and (apparently) only the figure given by Lacépède, several authors have tried to identify the present species, with different results. Thus *commersonii* has been considered identical with *Squalus carcharias* Risso, 1810 (Garman, 1913; White, 1937), *Carcharias lamia* Risso, 1826 (Garman, 1913; Tortonese, 1938, 1939), *Carcharias leucas* Müller & Henle, 1841 (Garman, 1913; White, 1937; Bertin, 1939a; Springer, 1950), and *Squalus longimanus* Poey, 1861 (Garman, 1913; Springer, 1950). Of these, *lamia* Risso has been identified with *longimanus* Poey (e.g., Bigelow & Schroeder, 1948, pp. 354, 362), an opinion not shared by Tortonese (1951), who proved that thus far *longimanus* is not known to occur in the Mediterranean, the type locality of *lamia* Risso. Of the four species Tortonese records from the Mediterranean, *melanopterus*

only recently invaded the Mediterranean via the Suez Canal, *maculipinnis* is apparently extremely rare, and the occurrence there of *obscurus* still needs confirmation, making *lamia* Risso most likely identical with *plumbeus* Nardo, 1827 (= *milberti* auct.). About the same reasoning may apply to the identification of *carcharias* Risso, also with the Mediterranean as type locality, but with the added complication that here the species was moreover combined with *Carcharodon carcharias* (Linnaeus).

It is evident that the main difficulty is caused by the fact that Lacépède's figure (see fig. 1, lower figure) represents a Carcharhinid shark drawn in accordance with the taste of the time, showing few (if any) reliable specific features, while the textual information is based on a mixture of species (*Carcharodon*, *Carcharhinus*) and taken from various sources without the required critical judgment, making it very hard, if not impossible, to sort out the reliable and relevant data.

To the defense of Lacépède should be remarked that the circumstances under which he had to work were extremely unfavourable (Bertin, 1939a, p. 53) and that the confusion in his text was not wholly caused by lack of knowledge but also the result of a deliberate mixing of available information on sharks in general. Thus he states as follows (1798, p. 229; 1st 12mo ed.):

"Au reste, les espèces de squales ne diffèrent dans leurs formes et dans leurs habitudes que par un petit nombre de points. Nous indiquerons ces points de séparation dans des articles particuliers; mais c'est en nous occupant du plus redoutable des squales, que nous allons tâcher de présenter en quelque sorte l'ensemble des habitudes et des formes du genre. Le requin va être, pour ainsi dire, le type de la famille entière; nous allons le considérer comme le squalé par excellence, comme la mesure générale à laquelle nous rapporterons les autres espèces".

Some important information on Lacépède's figure 1, plate 8, representing his "Squalé requin", apparently hitherto overlooked, was found in that author's first volume under the heading "Avertissement et explication de quelques planches de cet ouvrage" (pp. ix, x):

"Nous croyons devoir annoncer d'ailleurs que les figures 1 et 2 de la planche VI, 1, 3 et 4 de la planche VIII, . . . , ont été copiées sur les dessins originaux exécutés dans les isles des mers d'Afrique, ou des Indes, par feu Commerson, ou sous les yeux de ce célèbre voyageur, et qui, transmis dans le temps à Buffon, ont été remis entre mes mains par cet illustre naturaliste".

This interesting information not only shows where we have to look for the original figure, viz., Commerson's MS, but also clearly indicates the type

locality of Blainville's species. In this connection, it is important to notice that:

a. Commerson never visited the West Indies or the Atlantic coasts of Africa, having sailed from France in 1766 directly to the Brazilian coast, to Montevideo and Buenos Aires, and on to Tierra del Fuego (Cuvier & Valenciennes, 1828, p. 122, footnote).

b. The name "mer des Indes" was at the time used to indicate the Indian Ocean, the expression "mer des Indes Orientales" being used for the seas around the Indo-Australian Archipelago.

c. Commerson lived from 1768 to 1773 on Isle de France (Mauritius), in the Indian Ocean, visiting some surrounding islands and collecting specimens.

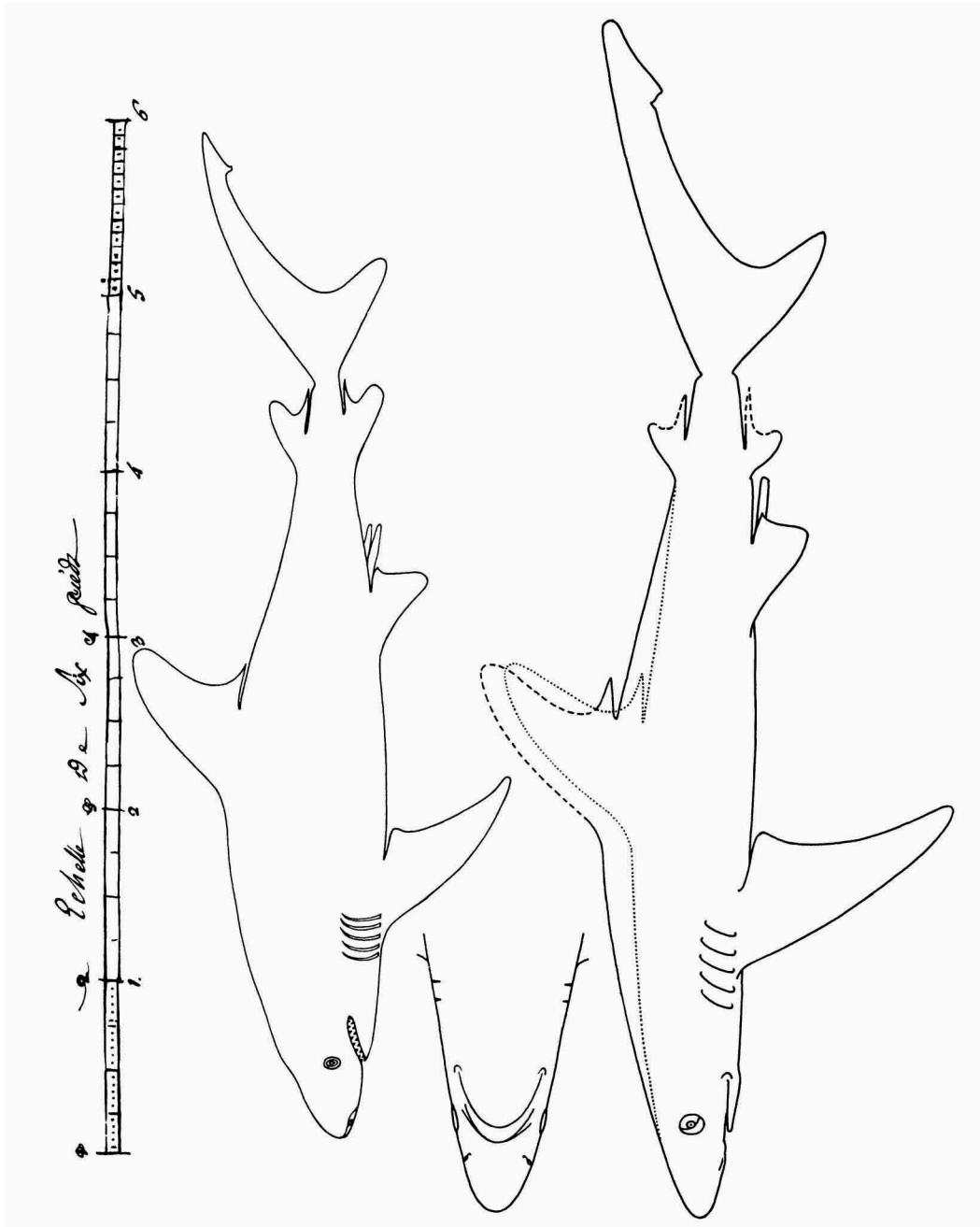
d. Of the 162 species with records of Commerson's locality that I found in Lacépède's *Histoire Naturelle des Poissons* (11 vols., 1798-1803), 153 are Indo-Pacific, 1 is from the Magellan Strait, and only 8 are from the South-western Atlantic; of the 153 Indo-Pacific species, about 125 were reported from the Indian Ocean, the majority from Mauritius, Réunion, Madagascar, and surrounding islands and seas.

Ever since Garman (1913, p. 140) re-established the name *commersonii* Blainville, various authors have tried to carefully define its identity by comparing the available information (as far as known) with Atlantic and Mediterranean species. Of the species taken into consideration, as listed above, *plumbeus* Nardo is recorded only from the Atlantic and the Mediterranean; *leucas* Müller & Henle is only known to occur in the Atlantic unless it should be considered identical with *gangeticus* Müller & Henle (see Smith, 1952b, pp. 857, 858), reported from the Indo-Pacific; while *longimanus* Poey was known only from the Atlantic until Hubbs (1951, p. 78) gave a first record from the eastern tropical Pacific.

However, it now becomes evident that the real type locality of *Carcharhinus commersonii* Blainville must be looked for in the Indian Ocean while, moreover, it seems warrantable to restrict it to the seas around Mauritius, Réunion, Madagascar, and the neighbouring islands.

According to Professor J. L. B. Smith of Grahamstown, South Africa (personal communication), the following species have been recorded from the area north and east of Madagascar, including some records of doubtful validity:

Species of <i>Carcharhinus</i> Blainville	Recorded by
<i>albimarginatus</i> Rüppell, 1835	Smith, 1955
<i>amblyrhynchus</i> Bleeker, 1856	Fraser-Brunner, 1952
<i>bleekeri</i> Duméril, 1865 (= <i>spallanzanii</i> auct.)	Fowler, 1940



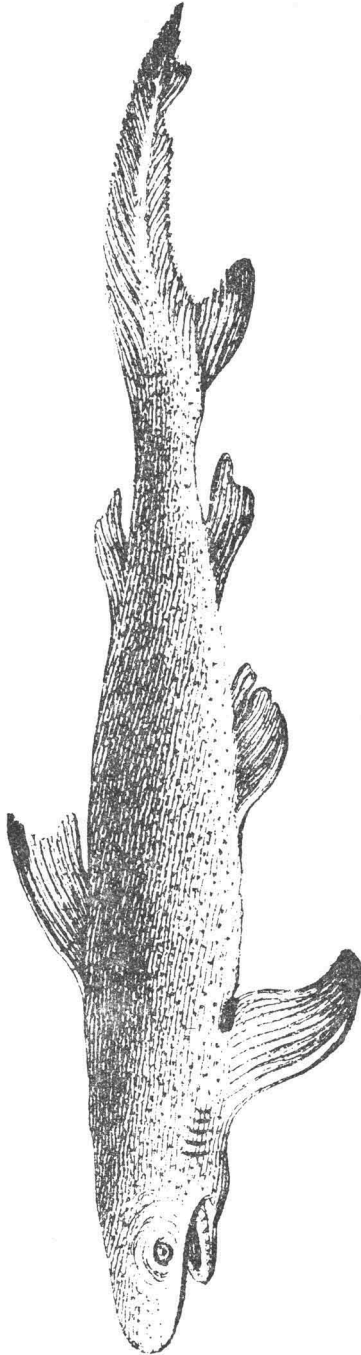


Figure 1. — Upper figure: reproduction of Commerson's drawing of a shark, made after a photostat copy of the original manuscript still extant in the library of the Muséum National d'Histoire Naturelle at Paris, including a reproduction of Commerson's scale. Photostats provided by Dr. J. Guibé, Paris; H. Heijn del. — Middle figures: reconstructions of a shark wholly based on the measurements provided by Commerson (in manuscript), as largely copied by Lacépède (1798, pp. 244-247 in 12mo edition). The dotted outline is in exact accordance with the given measurements, probably made after a specimen lying on the belly and therefore slightly deformed. The continuous outline gives the corrected shape when an about circular cross section of the body is accepted. The broken lines indicate uncertain outlines when sufficient data were not available. Reconstruction by the author; H. Heijn del. — Lower figure: inverse reproduction of Lacépède's "Squale requin" (Lacépède, 1798, pl. 8, fig. 1). Photostat H. F. Roman.

<i>dussumieri</i> Müller & Henle, 1841	Fowler, 1940
<i>elliotti</i> Day, 1866 (doubtful identification)	Steindachner, 1902
<i>limbatus</i> Müller & Henle, 1841	Smith, 1949
<i>longimanus</i> Poey, 1861 (doubtful identification)	Lunel, 1881 ¹⁾
<i>macrura</i> Ramsay & Ogilby, 1887	Wheeler & Ommanney, 1953
<i>melanopterus</i> Quoy & Gaimard, 1824	Smith, 1949
<i>menisorrah</i> Müller & Henle, 1841	Garman, 1913
<i>sorrah</i> Müller & Henle, 1841	Fowler, 1940
<i>temmincki</i> Müller & Henle, 1841	Garman, 1913
<i>zambezensis</i> Peters, 1852 (= ? <i>gangeticus</i> Müller & Henle, 1841)	Smith, (1949?) 1952

Although it remains quite possible that other species still are to be found in the present area, it seems very likely that one of those mentioned in the above list will prove identical with *Carcharhinus commersonii* Blainville.

At this point of the discourse it becomes clear that only a very careful reexamination of Commerson's manuscript may enable us to satisfactorily identify Blainville's species *commersonii* and Lacépède's figure. In this connection I am greatly indebted to Dr. J. Guibé of the Muséum National d'Histoire Naturelle, Paris, who kindly took the trouble to locate the manuscript and to send me the photostats now partly reproduced at the end of this paper (pls. VII & VIII). Unfortunately, the manuscript is written in a rather difficult handwriting, with numerous additions and corrections, the major part in a latin not without linguistical flaws, so no attempt has been made to provide a complete translation of the sometimes ambiguous or obscure text.

The chapter of Commerson's manuscript now under discussion begins with a long list of measurements, for the major part accurately copied in Lacépède's description (pp. 244-247). The few additional measurements may prove to be of some importance, but their evaluation is often difficult, if not impossible, as Commerson nowhere accurately stated how he took them. Moreover, at least in one case, the distance between the tips of the two pectoral fins, the information provided is evidently erroneous, while some

1) Carefully searching throughout Lunel's only paper on fishes from Mauritius (G. Lunel, 1881: *Mélanges Ichthyologiques*. Mém. Soc. Phys. Genève, vol. 27, pp. 267-303, 10 figs., 1 pl.), I only found references to "*Carcharias (Prionodon) lamia* Risso", without descriptive data, and to "*Mustelus vulgaris?* Müller & Henle", a species with a broadly rounded, *longimanus*-like, dorsal fin, but with the teeth "régulièrement arrangées en losanges, petites".

further measurements do not agree with either Commerson's drawing or with his textual data. Therefore, it seems advisable not to attach too much importance to this list. A reconstruction of a shark in approximate accordance with these measurements is given (fig. 1, middle figures), showing some evident differences in comparison with Commerson's figure.

Next (fig. 1, upper figure), Commerson gives a nice and apparently very realistic drawing of his shark. This impression of realism is supported by the fact that the drawing seems originally to have been made on a separate piece of paper, and to have been reproduced on the manuscript by pin-pricks all along the outline, indications of such a procedure still being evident. This procedure undeniably proves that Commerson was well aware of the importance of making the drawing as accurate as possible.

Another striking, though less fortunate fact is that this drawing widely differs from the figure given by Lacépède (fig. 1, lower figure). To explain this, we must take into consideration the difficult circumstances under which Lacépède had to work and the lack of accuracy shown throughout his "Histoire Naturelle des Poissons". Therefore, it seems safe to assume that, though Lacépède gave this artist the order to make an illustration after Commerson's original drawing, a very bad interpretation more in accordance with the taste of the time was made, while Lacépède had not the opportunity to verify it before it was printed. It may be added that most of Lacépède's illustrations are remarkably inaccurate.

However, independent on the acceptability of this explanation, we must stick to the facts that Blainville founded his species *commersonii* on the "Squale requin" as figured by Lacépède, and that Lacépède plainly stated to have had his figure made after Commerson's original drawing. Therefore, Commerson's manuscript figure, as reproduced here, is the principal item to be consulted for the identification of *Carcharhinus commersonii* Blainville.

Finally, Commerson gives a very extensive description consisting of a morphological, an anatomical, and a biological section, containing much interesting information, a considerable part of which was copied, often verbally, by Lacépède. As the morphological data (pls. VII & VIII) appear most relevant in connection with the present discourse, some of this information will now be given in translation. I may add that this translation is not meant to be verbal, that occasionally a different interpretation may be possible, and that it concerns only a small portion of this part of the manuscript. In deciphering and translating these parts I received the kind and invaluable assistance of Drs. E. Hulshoff Pol, of the Leiden University Library, and C. O. van Regteren Altena, of the Rijksmuseum van Natuurlijke Historie at Leiden.

The slender elongate body is covered with a finely granulated skin. The colour of back and lateral parts is dark ash-grey, becoming a dirty white on the belly.

The head is depressed, dorsally flattened, with the snout more narrow though still about semicircular from eye to eye. (This does not agree with Commerson's measurements of the length of the snout: "5 pouc. 4 lign." and the width between the eyes: "5 pouc.", but may well agree with his figured type of shark. Even Lacépède's figure (fig. 1, lower figure), showing the head apparently in a slightly dorsal view, gives the impression of a rather widely rounded snout. This feature may considerably restrict the number of possible identifications with species reported from the type locality, as listed above).

The nostrils are situated on both sides below the (lower) margins of the snout, about halfway between the tip of the snout and the eyes, but slightly nearer the eyes.

The mouth is very wide, below the head, oblique, semicircular. The teeth are triangular, with both margins serrated, numbering about 24 in the outer row of the upper jaw, and generally in six rows. On the lower jaw, the teeth are narrower and sharper, with a finer serration along the margins, and also in six rows.

Compared with the size of the body, the eyes are not very large, circular, with the cornea a dirty white, the iris greenish gold, and the pupils blue and transverse (or oblique). A hard, leathery, white nictitating membrane in the anterior corner of the eye, able to cover obliquely the whole eye.

Gill openings five on each side, situated obliquely above and before the pectoral fins.

All fins are cartilaginous, strong, and stiff. The pectoral fins are largest, triangular, the distance between the tips of the two pectoral fins being about three feet. (In his measurements, this distance is given as "1 pied 3 pouc. 6 lign.", probably erroneous for "3 pieds 3 pouc. 6 lign.").

The first dorsal fin is several times larger than the second dorsal, has hardly the same basal width as the pectoral fins, but the top is shorter and blunter, and it extends posteriorly with a sharp point.

The anal fin reaches about the basis of the caudal fin; it is small, posteriorly deeply emarginate, about forked.

The second dorsal fin, the smallest of all, is blunt posteriorly and extends backwards with a very slender point.

The caudal fin is divided into two parts, two unequal and diverging lobes. The upper lobe is isocèle, oblique, twice as long as wide, and is characterized by a small triangular flap at the posterior margin not far from the tip.

The lower lobe is of semilanceolate shape; at the base of the caudal fin there is a sickle-shaped pit, with the convex side anteriorly.

It is to be hoped that the present information, with the necessary material unfortunately lacking in our collections, may enable a definite identification of *Carcharhinus commersonii* Blainville, making that species available for indication as a type species for the genus *Carcharhinus* Blainville by suspension of the rules of nomenclature, in order to finally establish nomenclatorial stability in the present group of sharks. However, until this is accomplished, *Galeolamna* Owen should be considered the correct generic name.

Finally, I want to express my gratitude for assistance rendered in various ways by Dr. E. Trewavas, British Museum (Natural History), London; Dr. J. Guibé, Muséum National d'Histoire Naturelle, Paris; Professor J. L. B. Smith, Rhodes University, South Africa; Dr. E. Hulshoff Pol, University Library, Leiden; Dr. C. O. van Regteren Altena and Dr. L. B. Holthuis, Rijksmuseum van Natuurlijke Historie, Leiden.

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EXPLANATION OF THE PLATES

Plate VII

Reproduction of the morphological part of Commerson's manuscript discourse on a shark, extensively used by Lacépède (1798) for the description of his "Squale requin", and subsequently named *Carcharhinus commersonii* by Blainville (1825). Photostat provided by Dr. J. Guibé, Paris.

Plate VIII

Reproduction of the morphological part of Commerson's manuscript discourse on a shark, continuation. Photostat provided by Dr. J. Guibé, Paris.

[illegible]

3
 Sinna ani Pande hujus fere basin attingit approximated
 Pande parva, Retro emarginata profundi Emarginata et
 Quasi bifurca.
 Sinna Dorsalis 2da omnium minima Retro emarginata
 postica fere Pande et in marginem apicem sub-littoralem
 Dorso fere contiguum atromata.
 Pande Sinna Lobus Divaricator ad pinnas admodum bipartita
 Lobus superior nonnulli et apice Lobus inferior in
 Lobus inferior semilanceolatus. Sinna v. Hujus causa pinnas
 ne magna sit. Sinna v. Hujus causa pinnas
 Sinna inferior semilanceolatus. Sinna v. Hujus causa pinnas
 Sinna ad basin Pande emarginata Sinna v. Hujus causa pinnas
 Crescenti formam ferre emulans, emarginata anterior
 Respiciente obsoleta Sinna v. Hujus causa pinnas
 Sinna laterali obsoleta Sinna v. Hujus causa pinnas
 Quam profuso vultu, ab eadem apertura branchiarum ad basin
 inquantula producta sed in principio vixi obsoleta obsoleta
 Vixit adeo pinnas et eadem pinnas. Eadem vixi obsoleta
 Oculi ac vultus pinnas inquantula vixi obsoleta. Quodam Capite
 morder non desistat pinnas si famam pinnas. Haec autem
 fames vere Pande pinnas. Sinna v. Hujus causa pinnas
 dant non tantum ab emarginata pinnas quae Cardiacorum quae Cardiacorum
 maxima. Pande ad basin a Numeris Canis, Ventriclem
 et futura Hujus pinnas obsoleta. Sinna v. Hujus causa pinnas
 pinnas pinnas pinnas et pinnas medias Tunicas vixi obsoleta
 Vixi nunc pinnas pinnas in Pande Ventriclem Sinna v. Hujus causa pinnas
 et Quasi inflammatione corruptam a Multitudine Tunicas. Vixi
 culorum quae Sinna pinnas. Sinna v. Hujus causa pinnas
 et Sinna pinnas Sinna v. Hujus causa pinnas
 Respiciente Sinna v. Hujus causa pinnas
 Etiam mortuo pinnas aliquandiu superat.