

# The Sea-Leopard and the Oxyrrhynchus Shark (Ael. NA 11, 24)\*

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The paper analyzes Ch. 24 of the 11th book of Aelian's *De natura animalium* devoted to the so-called sea-leopard (πάρδαλις) and the oxyrrhynchus fish, both living in the Red Sea. Aelian compares the body colour of the sea-leopard to the mountain leopard, i.e. the snow leopard or the ounce (*Panthera uncia* Schreber, 1775). This comparison clearly demonstrates that the sea-leopard is to be identified with the sand tiger shark or the spotted ragged-tooth shark (*Carcharias taurus* Rafinesque, 1810). This fish usually resides and hunts in the depths of the sea, but also swims to the coast and sometimes attacks the swimming people. The attacks of sand tiger sharks must have taken place in ancient times, so the fish was easily recognizable not only by the Greeks but also by the inhabitants of the Red Sea's seashore. The Greek ichthyonym δξύ(ρ)ρυγχος refers to five different species of fish, but Aelian uses it to denote an oriental kind of shark existing in the Red Sea (NA 11, 24). The oxyrrhynchus shark has an elongated mouth, golden eyes and white eyelids, i.e. nictitating membranes, typical of sharks belonging to the order *Carcharhiniformes*. Its tail is oblong in shape and its fins are black and white. There are also pale and green parts of its body. On the basis of Aelian's description it is possible to suggest that the unknown fish should be identified with the bignose shark (*Carcharhinus altimus* S. Springer, 1950).

*Keywords:* animal terminology, etymology, Greek language, leopards, sharks, vocabulary, zoological literature.

## 1. The description by Aelian

The 24<sup>th</sup> chapter of the eleventh book of Aelian's *Περὶ ζῴων ιδιότητος* presents two unidentified kinds of fish living in the Red Sea. The Greek text runs as follows:

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Πάρδαλις δὲ ἰχθύς ἐν τῇ Ἐρυθρᾷ φύεται θαλάττῃ, ὡς οἱ θεασάμενοι λέγουσι, καὶ ἔοικε τὴν χρῶαν καὶ τὰ στίγματα τὰ περιφερῆ τῇ ὀρείῳ παρδάλει. ὁ δὲ ὀξύρρυγχος ὁ ἐνταῦθα γινόμενος ἔχει μὲν πρόμηκες τὸ στόμα, τοὺς δὲ ὀφθαλμοὺς χρυσοειδεῖς, τὰ δὲ βλέφαρα αὐτῷ λευκὰ· τῷ δὲ νώτῳ οἱ σημεῖα τε ἐπέστικται ὠχρά, καὶ πτέρυγες αὐτῷ αἰ μὲν παρ' ἑκάτερα μέλαινα, αἰ δὲ νωτιαῖαι λευκαί· καὶ ἡ οὐρὰ προμήκης τὸ σχῆμα, τὴν δὲ χρῶαν πράσινός ἐστι, μέσση δὲ αὐτὴν διείληφε χρυσοειδῆς γραμμὴ (NA 11, 24).<sup>1</sup>

The Leopard-fish is native to the Red Sea, according to those who have seen it, and in its colour and circular markings resembles the leopard of the mountains. The Oxycorynchus, which occurs there, has an elongated mouth, eyes like gold, and white eyelids. There are pale markings on its back, but the fins on the either side are black, while the dorsal fins are white. Its tail is oblong in shape and its colour is green, and a streak of gold bisects it. (Transl. by Alwin F. Scholfield; partly adapted.)<sup>2</sup>

## 2. Sea-leopards in ancient sources

The fish called πάρδαλις appears in two ancient texts. Oppianus mentions it among different sea-monsters (κήττα<sup>3</sup>) of the Mediterranean using the Aeolic spelling πορδάλις:

Κήττα δ' ὀβριμόγυια, πελώρια, θαύματα πόντου,  
ἀλκῆ ἀμαιμακέτῳ βεβριθότα, δεῖμα μὲν ὄσσοις  
εἰσιδέειν, αἰεὶ δ' ὄλοῃ κεκορυθμένα λύσση,  
πολλὰ μὲν εὐρυπόροισιν ἐνιστρέφεται πελάγεσσιν,  
ἔνθα Ποσειδάωνος ἀτέκμαρτοι περιωπαί,  
παῦρα δὲ ῥηγμίνων σχεδὸν ἔρχεται, ὄσσα φέρουσι  
ἠΐονες βαρύθοντα καὶ οὐκ ἀπολείπεται ἄλμη.  
τῶν ἦτιοι κρυερός τε λέων βλοσυρή τε ζύγαινα  
πορδάλιές τ' ὄλοαὶ καὶ φύσαλοι αἰθυκτῆρες.

(*Halieutica* 1, 360–368<sup>4</sup>)

The Sea-monsters mighty of limb and huge, the wonders of the sea, heavy with strength invincible, a terror for eyes to behold and ever armed with deadly rage — many of these there be that roam the specious seas, where are the unmapped prospects of Poseidon, but few of them come nigh the shore, those only whose weight the beaches can bear and whom the salt water does not fail. Among these are the terrible lion [i.e. the basking shark. *Cetorhinus maximus* Gunnerus] and the truculent hammerhead [i.e. the smooth hammerhead, *Sphyrna*

<sup>1</sup> We quote the Greek text from the bilingual edition by Scholfield (1959, II 392), as well as that by Maspero (1998, II 670). We have also consulted the most recent edition by García Valdés, Llera Fueyo, Rodríguez-Noriega Guillén (2009, 272).

<sup>2</sup> Scholfield 1959, II 393.

<sup>3</sup> The term κήττα (Attic κήτη) usually stands for marine mammals (whales, dolphins, seals and the like) as well as for large viviparous fish, especially sharks (in opposition to oviparous fish), cf. Kokoszko 2005, 156; Chronē-Vakalopoulos, Vakalopoulos 2008, 153–154; Kurek 2010, 55–62. The concept of κητώδεις (ἰχθύες) is somewhat broader, as it refers to large oviparous fish (e. g. the tunny), both marine and freshwater (Kokoszko 2005, 155–156). κήτος presently lacks etymology; according to Beekes (2010, 690–691) it could be a loan from the Pre-Greek.

<sup>4</sup> See also Opp. *H. 2*, 352; 3, 391; 5, 30. We quote Oppian's text from Schneider's edition, as well as Mair's one, cf. Schneider 1813, 82; Mair 1963, 240, 242. Fajen gives the reading παρδάλις, explaining in his *apparatus criticus* that the alternative variant πορδάλις was suggested by Schneider ("πορδάλις proponit Schneider"), cf. Fajen 1999, 34.

*zygaena* L.], and the deadly leopards and the dashing *physaloi* [i.e. whales]. (Trans. by A. W. Mair, partly adapted.<sup>5</sup>)

Oppianus stresses the aggressive character of sea-leopards, saying that “[d]read is the bite of the Leopard of the land but that of the sea Leopard is more terrible” (Opp. *Hal.* 5, 30–31: πορδαλίων γαίης ὄλοδὸν δάκος, ἀλλὰ θαλάσσης αἰνότερον).<sup>6</sup> It means that the ancient Greeks knew very well that sea-leopards attacked bathing people.

Aelian mentions a sea-leopard in a very similar description of the largest sea-monsters.

Τῶν κητῶν τῶν μεγίστων αἰγιαλοῖς καὶ ἤοσι καὶ τοῖς λεπροῖς καλουμένοις καὶ βραχέσι χωρίοις προσπελάζει οὐδὲ ἓν, οἰκεῖ δὲ τὰ πελάγη. καὶ ἔστι μέγιστα ὁ τε λέων καὶ ἡ ζύγαινα καὶ ἡ πάρδαλις καὶ οἱ φύσαλοι καὶ ἡ πρῆστις καὶ ἡ καλουμένη μάλθη (NA 9, 49).

There is not one of the largest Cetaceans that comes near the shore or the beach or ‘leprous’ (that is, rocky) spots or into shallow water: they live in the deeps. The largest of them are the Sea-Lion, the Hammer-headed Shark, the Sea-Leopard, the great Whales, the Pristis, and the *cetus* called Maltha [i.e. North Atlantic right whale (*Eubalaena glacialis* Müller)]. (Transl. by A. F. Scholfield, adapted and augmented.<sup>7</sup>)

In the *Suda* the enigmatic „sea-leopard” is mentioned under the heading κῆτος (‘a sea-monster, a large fish or a sea-mammal’):

Κῆτος· θαλάσσιον θηρίον πολυειδές. ἔστι γὰρ λέων, ζύγαινα, πάρδαλις, φύσαμος, πρῆστις, ἡ λεγομένη μάλλη, ὃ καὶ δυσανταγώνιστόν ἐστι· καὶ ὁ κριὸς, ἰδεῖν ἐχθρόν ζῶον.

*Ketos*: a marine animal of different appearance. There is a sea-lion, a hammerhead, a sea-leopard, a whale, a sawfish, the so-called *malle*, which is difficult to beat, and also the sea-ram, a hostile animal at first glance. (Transl. is ours.)

Elsewhere, Aelian, probably referring to the *Indica* by Megasthenes (*Fr.* 59),<sup>8</sup> seems to indicate the existence of “sea-leopards” in the Indian Ocean around Ceylon:

οἱ δὲ τῇ θαλάττῃ πρόσκοικοι τῆς μὲν ἄγρας τῆς τῶν ἐλεφάντων ἀμαθῶς ἔχουσι, ἀκοῆ δὲ αὐτὴν ἴσασι μόνη· περὶ γε μὴν τὰς τῶν ἰχθύων καὶ τὰς τῶν κητῶν ἄγρας τίθενται τὴν σπουδῆν. τὴν γὰρ τοὶ θάλατταν τὴν περιερχομένην τὸν τῆς νήσου κύκλον ἄμαχόν τι πλῆθος καὶ ἰχθύων καὶ κητῶν τρέφειν φασί, καὶ ταῦτα μέντοι καὶ λεόντων ἔχειν κεφαλὰς καὶ παρδάλεων καὶ λύκων καὶ κριῶν δέ, καὶ τὸ ἔτι θαῦμα σατύρων μορφὰς κήτη ἔστιν ἃ περιφέρει καὶ γυναικῶν ὄψιν, αἷσπερ ἀντὶ πλοκάμων ἄκανθαι προσήρτηται (NA 16, 18).

Whereas those that live near to the sea are ignorant of the way in which elephants are hunted and only know of it by hearsay: they devote themselves to catching fish and sea-monsters. For they assert that the sea which surrounds the circuit of their island [sc. Ταπροβάνη, i.e. Ceylon] breeds a multitude past numbering of fishes and monsters, and moreover that they have the heads of lions and leopards and wolves and rams, and still more wonderful to relate, that there are some which have the forms of satyrs with the faces of women, and these have spines attached in place of hair. (Trans. by A. F. Scholfield.<sup>9</sup>)

<sup>5</sup> Mair 1963, 241, 243.

<sup>6</sup> Mair 1963, 460 (Greek text), 461 (English translation).

<sup>7</sup> Scholfield 1959, II 267, 269.

<sup>8</sup> Schwanbeck 1846, 177 (*Fr. incert.* 59, 33–34).

<sup>9</sup> Scholfield 1959, III 285.

It is completely uncertain whether mysterious sea-monsters with leopard's head, existing in the Indian Ocean around Ceylon, should be identified with the Mediterranean sea-leopards or not. Still, it is not impossible to suggest that they are identical with the sea-leopards living in the Red Sea. In fact, the Red Sea is an inlet of the Indian Ocean. Generally, most species of fish and sea-animals, living in the Red Sea, appear in the Indian Ocean as well.

It is worth emphasizing that D'Arcy Wentworth Thompson gives two different meanings for the ichthyonym *πάρδαλις*: 1. 'a great, fierce fish, or sea-monster'; 2. 'a fish of the Red Sea, spotted as a leopard'.<sup>10</sup> Apparently, the scholar is not sure whether the sea-leopards living in the Mediterranean and the Red Sea represent the same species. It is highly probable, however, that the ancient writers describe the same cosmopolitan sea-fish of monstrous size, living both in the Atlantic Ocean (including the Mediterranean Sea) and the Indian Ocean (including the Red Sea).

Thompson gives no concrete identification of the fish in question, whereas Maria Chronē-Vakalopoulos and Angelos Vakalopoulos connect the sea-monster called *πάρδαλις* with the great white shark (*Carcharodon carcharias* L.).<sup>11</sup> We cannot agree with the latter proposal for two reasons. Firstly, the great white shark was known as *λάμια* or *λάμνα*.<sup>12</sup> According to Nicander (*Fr.* 137, apud Ath. 7, 306d),<sup>13</sup> the same fish was called *καρχαρίας* or *σκύλλα* by the ancient Greeks,<sup>14</sup> but not *πάρδαλις*. Secondly, this shark does not have stained or spotted body, as every leopard has.

In our opinion, four compelling arguments allow to associate *πάρδαλις* with the sand tiger shark (*Carcharias taurus* Rafinesque, 1810), belonging to the family of sand sharks (*Odontaspidae*).<sup>15</sup> These are:

1. The sand tiger shark is a large viviparous fish that fits the concept of *κῆτος*. An adult shark commonly reaches three meters, maximally 4.5 m.<sup>16</sup> Its maximal weight can be around 200 kg (usually 100–150 kg).
2. The fish *Carcharias taurus* (Rafinesque, 1810) lives — in agreement with Aelian's information<sup>17</sup> — not only in the Mediterranean Sea, but also in the Indian Ocean, including the Red Sea.<sup>18</sup>
3. The sand tiger shark as a strong predatory fish with large, sharp teeth, is extremely gluttonous and dangerous for sea animals and even for people swimming in the shallow sea. Oppianus confirms the destructive characteristics of the sea-monsters in question by calling them *ὄλοαί* (*Hal.* 1, 368). This shark usually resides and hunts in the depths of the sea, but also swims to the coast and sometimes attacks bathing people. The attacks of

<sup>10</sup> Thompson 1936, 194.

<sup>11</sup> Chronē-Vakalopoulos, Vakalopoulos 2008, 145.

<sup>12</sup> Thompson 1936, 144; Dalby 2003, 299; Kokoszko 2005, 192–193.

<sup>13</sup> Schneider 1856, 205; Kaibel 1887, II 175.

<sup>14</sup> The identification of *καρχαρίας* with the great white shark (*Carcharodon carcharias* L.) is accepted by Bartol, Danielewicz 2010, 583, fn. 467, as well as Smagowicz 2004, 100. According to Dalby (2003, 299), it "is possibly the porbeagle (*Lamna nasus*)". However, most researchers reach the conclusion that the shark called *καρχαρίας* cannot be identified with certainty, cf. Thompson 1936, 106–107 ("A shark, of uncertain species"); de Saint-Denis 1947, 19 ("le squalé aux dents aiguës, c.-à.-d. le requin"); Kokoszko 2005, 137–139; Montanari 2018, 1040 ('shark or a type of fish with sharp teeth').

<sup>15</sup> Rutkowicz 1982, 130–131; Terofal, Militz 1986, 10–11; Nikiforos 2002, 66–67, tav. 5.2.

<sup>16</sup> Rutkowicz 1982, 131.

<sup>17</sup> Ael. *NA* 9, 49; 11, 24; 16, 18.

<sup>18</sup> Rutkowicz 1982, 131.



Fig. 1. The sand tiger shark or the spotted ragged-tooth shark (*Carcharias taurus* Rafinesque, 1810)  
Source: Rutkowicz 1982, 130.



Fig. 2. The snow panther or the ounce (*Panthera uncia*, Schreber, 1775)  
Source: [https://commons.wikimedia.org/wiki/Panthera\\_uncia/media/File:Panthera\\_uncia\\_-\\_Zoo\\_Karlsruhe.jpg](https://commons.wikimedia.org/wiki/Panthera_uncia/media/File:Panthera_uncia_-_Zoo_Karlsruhe.jpg)

the sand tiger sharks certainly had to happen in ancient times, so the fish was perfectly recognizable by the Greeks.

4. The sand tiger shark has a gray-pale back covered with round darker reddish-brown spots distributed evenly throughout the body (Fig. 1). Aelian indicates that the fish resembles ounce's body (Fig. 2) as to its colour and circular markings (τὴν χροῖαν καὶ τὰ στίγματα).

Hence, the identification of *πάρδαλις* with the sand tiger shark presents itself. In fact, no other species can be taken into consideration.

### 3. The *Oxyrrhynchus* fish

According to Gościwit Malinowski,<sup>19</sup> the ichthyonym *ὄξύ(ρ)ρυγχος* denotes five species:

1. The Egyptian *oxyrrhynchus*, a freshwater fish living in the Nile (Str. 17, 1, 40; 1, 2, 4 etc.; Ael. NA 10, 46); it is commonly suggested that this fish belongs to the family

<sup>19</sup> Malinowski 2003, 231, fn. 60.

- Mormyridae*. The identification with the Egyptian trunkfish (*Mormyrus niloticus* Bloch & J. G. Schneider, 1801) seems the most probable.
2. The marine fish ὀξύρρυγχος living exclusively in the Caspian Sea (Ael. NA 17, 32; Ps.-Hes. Fr. 372, 5–6, apud Ath. 3, 116b);<sup>20</sup> it refers probably to the Persian sturgeon (*Acipenser persicus* Borodin, 1897) or some related species, e.g. starry sturgeon (*Acipenser stellatus* Pallas, 1771).
  3. The marine fish ὀξύρρυγχος existing in the Red Sea (Ael. NA 11, 24);<sup>21</sup>
  4. ὀξύρρυγχος, an alternative name of the fish called κεστρεύς (Diphilus Siphnius Fr. 5, apud Ath. 7, 356a)<sup>22</sup>; according to Strabo, it represents an anadromous fish, which every spring swims up the river Nile to spawn.<sup>23</sup> The fish is found and caught not only in the marine and brackish waters but also in freshwater lakes and rivers. It is identified with the flathead grey mullet (*Mugil cephalus* L., 1758).<sup>24</sup>
  5. ὀξύρρυγχος, an epithet or an alternative name of the fish called ῥαφίς (Epicharm Fr. 45, apud Ath. 7, 304c; 7, 319d);<sup>25</sup> it is commonly identified as needlefish (*Belone belone acus* Risso, 1827), a member of the family *Belonidae*.

In a broader context ὀξύ(ρ)ρυγχος means nothing other than ‘having a sharp snout; sharp-snouted, sharp-pointed’.<sup>26</sup> It is obvious, then, that every ichthyonym derived from this adjective implies a fish having a rostrum (like a sturgeon) or an elongated mouth (like a garfish).<sup>27</sup>

In the initially cited report Aelian describes the fish called ὀξύρρυγχος rather carefully. To identify the species, the following premises are helpful:

1. The fish lives in the Red Sea (ὁ ἐνταῦθα γινόμενος), but contrary to the sea-leopard (i.e. the sand tiger shark, as stated above) it is completely absent in the Mediterranean.
2. “An elongated mouth” (πρόμηκες τὸ στόμα).
3. “Eyes like gold, and white eyelids” (τοὺς δὲ ὀφθαλμοὺς χρυσοειδεῖς, τὰ δὲ βλέφαρα λευκά).
4. “Pale markings on its back” (τῷ δὲ νώτῳ οἱ σημεῖά τε ἐπέστικται ὠχρά).
5. “The fins on its sides are black, while the dorsal fins are white” (πτέρυγες αὐτῷ αἱ μὲν παρ’ ἐκάτερα μέλαιναί, αἱ δὲ νωτιαῖαι λευκαί).
6. “Its tail is oblong in shape and green, and a streak of gold bisects it” (ἡ οὐρὰ προμήκης τὸ σχῆμα, τὴν δὲ χροάν πράσινός ἐστι, μέσην δὲ αὐτὴν διείληφε χρυσοειδῆς γραμμὴ).

Point 3 above makes clear that the fish has the so-called nictitating membranes, i.e. transparent or translucent third eyelids, which additionally protect eyes. This is a rare anatomic structure among fish. It is exclusively exhibited by sharks belonging to the order *Carcharhiniformes*.<sup>28</sup> The third eyelid covers the eye to help protect it, while the shark is attacking prey. Thus, βλέφαρα λευκά evidently document that this kind of ὀξύρρυγχος represents a species of shark.

<sup>20</sup> Merkelbach, West 1967 (Fr. 372); Kaibel 1887, I 266.

<sup>21</sup> Francesco Maspero (1998, 671) introduces “storione” [i.e. sturgeon], explaining his decision in fn. 45: “Traduciamo con «storione», anche se probabilmente si tratta di un pesce che gli somiglia”.

<sup>22</sup> García Lázaro 1982, 49–91, s.v. Diphilus Siphnius (Fr. 5); Kaibel 1887, II 279.

<sup>23</sup> Strabo 17. 8. 23. See also Malinowski 2003, 226.

<sup>24</sup> Thompson 1936, 108–110.

<sup>25</sup> Kassel, Austin 1986, s.v. Epicharmus (Fr. 45); Kaibel 1887, II 170, II 203.

<sup>26</sup> See *LSJ* s. v. and Montanari 2018, 1469.

<sup>27</sup> Strömberg 1943, 43.

<sup>28</sup> Gruber 1977, 454–455; Nayara Poscai et al. 2017, 359–364.

Although *Carcharhiniformes* is the largest order of sharks including ca. 50% of all species currently described (509 species in general),<sup>29</sup> it is not impossible to provide an identification of the oxyrrhynchus shark. Actually, only three species can be considered:

- (A) the bignose shark (*Carcharhinus altimus* S. Springer, 1950), see Fig. 3;<sup>30</sup> it is a large predatory fish frequenting deep waters around the edges of the continental shelf. Males and females probably reach 2,6–2,8 m in length with the registered weight 168 kg.
- (B) the silky shark (*Carcharhinus falciformis* J.P. Müller & Henle, 1839, syn. *Carcharhinus menisorrhah* J. P. Müller & Henle, 1839), see Fig. 4;<sup>31</sup> the adult male shark reaches usually 2, 5 m in length, females even 3–3,5 m (with the weight ca. 300–350 kg).
- (C) the bull shark (*Carcharhinus leucas* J.P. Müller & Henle, 1839), see Fig. 5.<sup>32</sup> Adult females, which are larger than males, reach a maximum size of 3,5 m and the weight of 315 kg. Larger bull sharks are probably responsible for most attacks on bathing people.<sup>33</sup>



Fig. 3. Bignose shark (*Carcharhinus altimus* S. Springer 1950)

Source: [https://commons.wikimedia.org/wiki/File:Carcharhinus\\_altimus\\_nefsc.jpg](https://commons.wikimedia.org/wiki/File:Carcharhinus_altimus_nefsc.jpg)

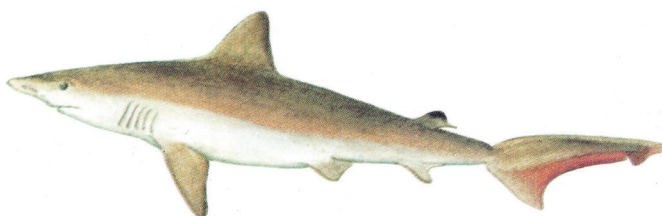


Fig. 4. Silky shark (*Carcharhinus falciformis* J.P. Müller & Henle, 1839)

Source: Rutkowicz 1982, 136.

<sup>29</sup> Weigmann 2016. See also Compagno 2005.

<sup>30</sup> Compagno 1984, 457–458; Nikiforos 2002, 66, tav. 5.10.

<sup>31</sup> Rutkowicz 1982, 136–137, no. 23; Compagno 1984, 470–472; Nikiforos 2002, 66, tav. 5.16.

<sup>32</sup> Rutkowicz 1982, 136–137, no. 22; Compagno 1984, 478–481.

<sup>33</sup> Rutkowicz 1982, 137 (“Podobno atakuje kąpiących się ludzi, bywa więc niebezpieczny” [Apparently the bull shark attacks bathers, so it can be dangerous]).

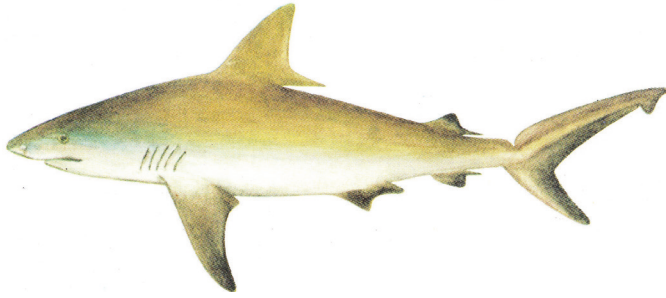


Fig. 5. Bull shark (*Carcharhinus leucas* J. P. Müller & Henle, 1839).

S o u r c e: Rutkowicz 1982, 136.

Below we comment on Aelian's description (points 1–6 above) taking into account these three species.

1. The bignose sharks, the silky sharks and the bull sharks are well documented in the Red Sea. They do not belong to the typical Mediterranean fauna (though nowadays they sometimes flow into the Mediterranean Sea through the Suez Canal). The bignose sharks have been registered in the Spanish waters of the Mediterranean Sea. Two remaining species are generally absent in the Mediterranean Sea. The agreement with Aelian's description is complete.
2. The bignose shark has a long, broad, and bluntly pointed snout with the nostrils preceded by well-developed, triangular flaps of skin (Fig. 3). The English name, as well as the Russian one (Большеносая акула), expresses its prominent snout very well. The silky shark has also an elongated mouth (Fig. 4). The bull shark has a little less protruding snout. Aelian's description as well as the adjectival epithet *oxyrrhynchus* per se might refer to all three species, but the bignose shark seems to be a preferable option.
3. The bignose shark has relatively large, circular eyes equipped with protective third eyelids. The medium-sized eyes of the silky shark has nictitating membranes as well.<sup>34</sup> It is obvious, however, that βλέφαρα λευκά should be exhibited by the bull shark too, since it also belongs to the family *Carcharhinidae*.
4. The coloration of the bignose shark is gray to bronze on the back, with pale stripes on the flank and white below (Fig. 3). The silky shark has a pale-brown or dark gray back and the snowy white belly. The bull shark shows a similar body colour (see Fig. 5). It is evident that each of the three species presents "pale markings on its back".
5. "Black fins on the sides and white dorsal fins" create a problem, since no species of shark has white dorsal fins. In fact, most sharks have a white or whitish belly. Still, their lower fins present a dark or black colour on the upper side and the white colour on the lower side (Fig. 6). That could explain the black-white opposition. If this is correct, the feature is equally characteristic not only of the silky shark (Fig. 6), but also of the bignose shark and of the bull shark.
6. The last passus of Aelian's description refers to the caudal peduncle of the *oxyrrhynchus*. All three species of sharks have a fairly high caudal fin accompanied by a well-developed lower lobe. Their tail may be green, blue-green, blue-gray, brown or even black in

<sup>34</sup> Rutkowicz 1982, 137: "oczy z przesłoną migawkową" [eyes with nictitating membranes].





Fig. 6. The big pectoral fins and small pelvic fins of the silky shark

Source: [https://commons.wikimedia.org/wiki/File:Carcharhinus\\_falciformis\\_piro4.jpg](https://commons.wikimedia.org/wiki/File:Carcharhinus_falciformis_piro4.jpg)

colour.<sup>35</sup> A strong (usually golden-pale or whitish) ventral notch is seen in the caudal fins of all three analyzed sharks. Regardless of whether Aelian's words describe the bignose shark, as they seem to do it (see Fig. 3), or refer to the other two species, the presentation meets the point precisely.

The detailed analysis of all possible data logically brings to the assumption that Aelian's ὀξύρυγχος should be connected with the bignose shark, as three of the six characteristics (big nose, pale colour and green tail) coincide with confirm this species. Of course, it is also possible that the ancients were unable to distinguish exactly the sharks belonging to the family *Carcharhinidae* (requiem sharks). If so, the Greek term ὀξύρυγχος could be used for all three aforesaid species.

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<sup>35</sup> One of two anonymous reviewers correctly stresses that only the bignose shark has “a green sheen along the gills of freshly collected specimens”, see Fig. 2 and the profile of this shark on the site of the Florida Museum of Natural History: <https://www.floridamuseum.ufl.edu/discover-fish/species-profiles/carcharhinus-altimus/>. It seems to be an additional argument for the identification of Aelian's *oxyrrhynchus* fish with the bignose shark.

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