

**THE ITALIAN ANNOTATED BIBLIOGRAPHY ON THE MEDITERRANEAN
SPEARFISH (*TETRAPTURUS BELONE*, RAFINESQUE, 1810), ON OTHER
BILLFISH AND SPEARFISH SPECIES,
INCLUDING A COMPREHENSIVE OVERVIEW**

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SUMMARY

*Italian scientists have a long tradition of studies and research on the many large pelagic species, including spearfish and other billfish. One of these species (*Tetrapturus belone*) can show relevant catches in some years, while other species are incidental. This paper completes the previous annotated bibliography on these species, listing additional papers published so far by Italian scientists concerning the biology, the fisheries and many other scientific issues. The aim of this paper is to improve as much as possible the annotated bibliography, with specific key words, although it is still surely incomplete, because sometimes the Mediterranean spearfish is hidden in some papers on other pelagic fisheries. In total, it was possible to find additional 48 papers, bringing the total to 141 papers on spearfish and billfish. This bibliography was set together to serve scientists and to help them find some rare references that might be useful for their work.*

RÉSUMÉ

*Les scientifiques italiens ont une longue tradition d'études et de recherches sur les nombreuses grandes espèces pélagiques, y compris les *Tetrapturus* spp. et d'autres istiophoridés. L'une de ces espèces (*Tetrapturus belone*) présente des captures importantes certaines années, alors que d'autres espèces sont capturées en tant que prises accessoires. Cet article complète la bibliographie annotée précédente sur ces espèces, en énumérant d'autres articles publiés jusqu'à présent par des scientifiques italiens concernant la biologie, la pêche et de nombreuses autres questions scientifiques. L'objectif de ce document est d'améliorer autant que possible la bibliographie annotée, avec des mots clés spécifiques, bien qu'elle soit encore certainement incomplète, car parfois le marlin de la Méditerranée est dissimulé dans certains articles sur d'autres pêcheries pélagiques. Au total, il a été possible de trouver 48 documents supplémentaires, ce qui porte le total à 141 documents sur le *Tetrapturus* spp. et les istiophoridés. Cette bibliographie a été établie pour scientifiques afin de les aider à trouver des références rares qui pourraient leur être utiles leur travail.*

RESUMEN

*Los científicos italianos tienen una larga tradición de estudios e investigaciones sobre muchas especies de grandes pelágicos, lo que incluye a *Tetrapturus* spp. y otros istiofóridos. Una de estas especies (*Tetrapturus belone*) puede presentar capturas importantes algunos años, mientras que otras especies son captura incidental. Este documento completa la bibliografía anotada previa sobre esta especie, incluyendo documentos adicionales publicados hasta ahora por científicos italianos sobre biología, pesquerías y otros muchos temas científicos. El objetivo de este documento es mejorar en la medida de lo posible la bibliografía anotada, con palabras clave específicas, aunque la lista sea seguramente incompleta a causa de que a veces el marlín del Mediterráneo está oculto en algunos documentos sobre otras pesquerías pelágicas. En total, fue posible hallar 48 documentos adicionales, por lo que los documentos totales sobre *Tetrapturus* spp. E istiofóridos ascienden a 141. Esta bibliografía se reunió para servir a los científicos y ayudarles a hallar algunas raras referencias que podrían resultarles útiles para su trabajo.*

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KEYWORDS

Mediterranean spearfish, *Tetrapturus belone*, *shortbill spearfish*, *Tetrapturus angustirostris*, *Roundscale spearfish*, *Tetrapturus georgii*, *Longbill spearfish*, *Tetrapturus pfluegeri*, *white marlin*, *Kajikia albida*, *black marlin*, *Istiompax indica*, *blue marlin*, *Makaira nigricans*, *Atlantic sailfish*, *Istiophorus albicans*, *billfish species*, *spearfish species*, *bibliography*, *biology*, *reproduction*, *feeding*, *history*, *fishery*, *catches*, *techniques*, *systematics*, *nomenclature*.

1. Foreword

This paper was prepared for trying to complete the annotated overview of the Italian literature on Mediterranean spearfish (*Tetrapturus belone*, Rafinesque, 1810) and on other more occasional or incidental billfish species, such as the shortbill spearfish, *Tetrapturus angustirostris*, Tanaka, 1815, the roundscale spearfish, *Tetrapturus georgii*, Lowe, 1841, the longbill spearfish, *Tetrapturus pfluegeri*, Robins and de Sylva, 1963, the white marlin, *Kajikia albida* (Poey, 1860), the black marlin, *Istiompax indica* (Cuvier, 1832), the Atlantic sailfish, *Istiophorus albicans* (Latreille, 1804), and the blue marlin, *Makaira nigricans*, Lacépède, 1802, following the very first Italian annotated bibliography on the same species (Tinti *et al.*, 2020).

The choice was driven by the fact that the Mediterranean spearfish is reported and observed since old times (even if it is not always considered by ICCAT statistics), while most of the incidental species are known since at least one century in the Mediterranean Sea; a few ones are recent immigrants. All these species have a good market and, therefore, they are important for the fishery.

Many papers are written in Italian, a language which is not on the list of the three used in ICCAT (English, French and Spanish), and possibly some scientists may have problems in understanding the contents.

Another reason for setting-up this additional annotated bibliography is because several papers are not available in electronic format and therefore some young colleagues, who are not used to study and mine in traditional libraries anymore, seem not able to detect the many studies that have been carried out so far on these species.

However, as a matter of fact, most of the modern (the last 200 years) studies on Mediterranean spearfish and other more incidental billfish and spearfish had Italian or Spanish authors, even if Italian authors are the large majority.

Therefore, it is again a sort of national proudness to add this annotated list of Italian papers on the Mediterranean spearfish (*Tetrapturus belone*, Rafinesque, 1810) and other less frequent billfish and spearfish species that it was possible to find so far, annotating them with keywords for improving the opportunities to detect them with an electronic searching engine.

Not-annotated literature reviews billfish and spearfish were provided by Nakamura (1985) and Ehrhardt and Fitchett (2016).

2. Criteria

As in the previous Italian annotated bibliography on these species, the bibliography on Mediterranean spearfish (*Tetrapturus belone*) and other more occasional billfish and spearfish species included in this work was selected when an Italian scientist was the only author of a paper or when one or more Italian scientists were among the authors of collective papers.

This was the only criterium that has been used for selecting the many papers, independently if they were peer-review papers, books, not-peer-review papers, papers present to conferences or meetings or congresses, reports to public administrations or project reports.

Of course, each paper included in this additional list is directly related to Mediterranean spearfish (*Tetrapturus belone*) and other billfish and spearfish species, even if, in some cases, these species are concerned by just a part of the text.

For the old papers, it was reported the first edition that it was possible to find, independently from the date of the original work.

When vernacular names or old scientific names were used in the original paper, they were possibly listed in the annotation; old scientific names or old vernacular names made the selection work even more difficult. The annotations required each paper to be checked in detail and this implied a huge workload.

The annotations show the main subjects in the content, and the descriptors proposed by ASFIS (Fagetti, Privett and Sears, 2009) have been mostly used, adding additional descriptors when necessary. As concerns the main species included in each reference, we used both the international common name(s) and the Latin name(s).

3. Discussion

One of the major problem for the current paper was the need to homogenise the style of all citations, which were reported under many different styles. Apparently, this fact can appear as a minor problem, but it required an amount of work and time.

The number of titles which are now available (including those previously provided by Tinti *et al.*, 2020) surely constitutes a very useful reference list for all the colleagues working on Mediterranean spearfish (*Tetrapturus belone*, Rafinesque, 1810) and other spearfish and billfish species, which are often neglected particularly when discussing about the spearfish and billfish in the Mediterranean Sea, including SCRS and ICCAT in recent years. The opportunity provided in recent times by the web is improving the number of available articles on these species and their fisheries.

This additional annotated bibliography required an amount of work and a lot of attention, due to the fact that several documents were published not only by marine scientists, but also by scientists and journalists dealing with other disciplines, making the search very wide and difficult, certainly very multidisciplinary.

Even limiting the bibliography to the works where an Italian scientist was among the authors, the number of citations discovered so far is higher than it was imagined at the beginning, being anyway conscious that the list is certainly incomplete.

At the same time, during this work, it was amazing to learn so many details about all these species. Going through the various titles (and the text behind) in the bibliography it is possible to find important catch data and biological information, but also historical information which is important particularly for other billfish and spearfish species. Furthermore, it is important to notice that few papers and books concerning the Mediterranean spearfish were published before the official description of the species was made, because it was described just with a local vulgar name, but the species was clearly identifiable.

This work is providing and listing additional 48 papers, which are now added to the previous list provided by Tinti *et al.*, (2019), bringing the total to 141 papers² (**Figure 1**). Among these, 24 were published before the end of the XIX century, with a peak of 17 in the last part of the XIX century, but papers were published also in the XVIII century. 18 papers were published between 1900 and 1949, with a maximum of 5 papers in the '30s. Of course, between 1940 and 1949 the number of scientific papers decreased, due to the 2nd World War.

A increasing of the Italian scientific production on billfish and spearfish initiated just after the 2nd World War, slowly growing over the decades: 4 in the '50s, 10 in the '60s, 7 in the '70s, for growing much more in the '80s, when the first national research triennial plan was adopted by the Ministry of Merchant Marine. It was followed by a series of triennial research plans, with an Italian coordinated activity on large pelagic species, till the year 2002, providing 14 papers in the '80s and 12 papers in the '90s. Then, most of the research activities were enhanced by the EC Data Collection Programme, followed by the EC Data Collection Framework, which is still active; 24 papers were published in the years 2000-2009, while a peak 26 papers have been published in the last decade. 2 papers have been published so far in 2020.

A large majority of the papers (78.01%, equal to 110 papers) are in Italian and this is the most important part of the problem in recent times. These papers were published when the Italian language was mandatory, or when

² The total number of papers was checked several times, rechecking the contents of the list provided by Tinti *et al.*, 2019, for avoiding any possible duplication or mistake.

foreign languages were not used, or because they were official domestic reports. For these papers, the current annotation in English now allows all scientists to better understand the contents. The remaining 21.99% of the papers are written in other 2 languages, being those in English the majority (20.57%, equal to 29 papers), while 2 papers or books (1.41%) are in Latin, a classical language that was used by many authors till the XVIII century. **Figure 2** provides a graphic image of the languages used by the Italian authors in papers on billfish and spearfish which are listed in the annotated bibliography.

The annotation allows identifying most of the many themes included in each paper. **Table 1a** and **Table 1b** show the most relevant themes in the annotations and it is interesting to see how many aspects of the spearfish and billfish “world” have been examined by the various Italian authors over the centuries. Almost all papers are specifically related to the Mediterranean Sea (140, equal to 99.29%), while the Atlantic Ocean is mentioned in 8 papers (5.67%), the Tyrrhenian Sea is in 34 papers (24.11%), the Strait of Messina is in 25 papers (17.73%), the Adriatic Sea is in 21 papers (14.89%), the Ligurian Sea is in 20 papers (14.18%), the Ionian Sea is in 19 papers (13.48% each), the Strait of Sicily is in 15 papers (10.64%), and the Sardinian Sea is in 3 papers (1%). Italy is in 21 papers (14.89%), but several other Mediterranean countries are also mentioned in various papers. Sicily, being one of the main Italian fishing areas for all Mediterranean spearfish and other billfish species, is in 15 papers (10.64%).

The fishing methods have also a clear relevance: the trap fishery is mentioned in 32 papers (22.70%), followed by the harpoon fishery (31 papers (21.99% each), followed by the longlines (25 papers, equal to 17.73%), the driftnets (17 papers, equal to 12.09%), the lines (hand-lines and troll lines) (13 papers each, equal to 9.22%), the purse-seines (12 papers, equal to 8.51%), sport/recreational fisheries (8 papers, equal to 5.67%) and the small-scale/artisanal fisheries (7 papers, equal to 4.96%). Various impacts caused by the gears are mentioned on 4 papers (2.84%) and by-catch is reported in 2 papers (1.42%). Catches and yields are obviously important (24 papers, equal to 17.02%), including the statistics (12 papers, equal to 8.51%), the CPUE (7 papers, equal to 5.15%) and the size frequencies/composition (6 papers, equal to 4.26%).

The species distribution is reported by 35 papers (24.82%), migrations are reported by 12 papers (8.51%), while the biology is very present (29 papers, equal to 20.57%), and in particular the reproduction, the reproductive biology and spawning (6 papers each, equal to 4.26% each). Larvae are studied in 14 papers (9.93%), juveniles are in 12 papers (8.51%) and eggs are in 10 papers (7.09%). The environment is a relevant theme (10 papers, equal to 7.09%), along with the management and the economy (6 papers each, equal to 4.26% each). History is also important (13 papers, equal to 9.22%) but fishermen too (6 papers equal to 4.26%). Literature and poetry are not relevant like it happens for other more iconic tuna and tuna-like species.

As concerns the species, the nomenclature is in 26 papers (18.44%), the systematics is in 11 papers (7.80%) and the vernacular names are reported in 9 papers (6.38%). The description of the species is in 28 papers (19.86%) and the morphology is in 27 papers (19.15%). Generic “billfish” are reported in just 2 papers (equal to 1.42%), generic “spearfish” species in just 1 paper (0.71%), while the Mediterranean spearfish is the most relevant species (126 papers, equal to 89.36%), followed by the white marlin (29 papers, equal to 20.57%), the black marlin and the Atlantic sailfish (11 papers each, equal to 7.8% each), the roundscale spearfish (9 papers, equal to 6.38%), the blue marlin (7 papers, equal to 4.86%), the shortbill spearfish (5 papers, equal to 3.55%) and the longbill spearfish (2 papers, equal to 1.42%).

Table 2 shows the ranking of the main authors included so far in the Italian annotated bibliography on billfish and spearfish, over a total of 176 different authors. Knowing the working location of each author, it is very clear that the main authors are belonging to the traditional research poles for the large pelagics studies in Italy: Messina, Bologna, Genova and Venezia, but also with relevant presence of Cagliari, Palermo and Naples, where Universities and other research institutes were historically located. Among the main authors, there are most of the Italian national research coordinators for the large pelagics over the years (Arena, Orsi Relini, Piccinetti and Di Natale).

Due to the number of references, the additional annotated bibliography is provided in **Annex 1** to this paper.

4. Conclusion

The Mediterranean spearfish and the other incidental billfish and spearfish species in the Mediterranean Sea usually are not mentioned by the ICCAT SCRS Billfish Species Group, even if in the past, for few years, the Mediterranean spearfish was included in the report, along with the catch table. This unespliable problem shall be urgently fixed by the ICCAT SCRS Billfish Species Group, because this will result, also, in improving the catch reported to ICCAT.

The list of Italian books and scientific papers on spearfish and billfish here provided is still certainly incomplete and there is the hope that this work may further stimulate scientists to provide additional titles, with the purpose to create a complete reference literature list to be used by all the colleagues working on this subject or on related subjects, for helping them in their work.

Several other documents are certainly still kept in various archives, either public or private, sometimes in ancient libraries, old company's archives, and in other places, being the Mediterranean spearfish a usual historical by-catch in tuna traps. Indeed, this is a never-ending work and we should be conscious that this work will be never completed, hoping that the same will be carried out in other countries.

One of the most traditional fishing technique for the Mediterranean spearfish, the harpoon fishery, has a know-how that remained almost the same since centuries, with very limited technological improvements (mostly in the last half-century), allowing also for good scientific research on the species. The development of the driftnet fishery till the year 2000 (before the ban in 2002) and the longline fishery, changed considerably both the fishing and the opportunities for the biological sampling for all the spearfish and billfish species.

As it was mentioned in a previous paper (Di Natale, 2018), in recent years many scientists and particularly (but not only) young colleagues are adopting a sort of selective attitude when they prepare their papers, avoiding even to mention papers which were not published in peer-review journals or by scientists who are competing with them. This attitude is clearly causing a sort of scientific disaster, because there are several very recent papers which are not at all using the knowledge available till the '70s, which sometimes means forgetting the largest part of the scientific knowledge we already have.

Clearly, there is the need to improve the knowledge on previous available studies on the Mediterranean spearfish and other spearfish and billfish which were and are present in the Mediterranean Sea and this additional annotated bibliography was made exactly for providing a helping hand to all the colleagues working on this species.

References

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- Tinti F., Addis P., Di Natale A., Garibaldi F., Piccinetti C., 2019. The Italian annotated bibliography on Mediterranean spearfish (*Tetrapturus belone*, Rafinesque, 1810) and other billfish and spearfish species. Coll. Vol. Sci. Pap., ICCAT, 76 (4): 293-310.

Table 1a. Percentages of the different themes included in the annotations to the Italian bibliography on billfish and spearfish (first part).

Annotations			Annotations		
Themes	no.	%	Themes	no.	%
Nomenclature	26	18,44	Dorsal rays/Spines	3	2,13
Systematics	11	7,80	Vertebrae	1	0,71
Vernacular names	9	6,38	Scales	1	0,71
Dictionary	1	0,71	Size frequencies	6	4,26
Bibliography	4	2,84	Weight	4	2,84
Billfish species	2	1,42	Feeding	5	3,55
Spearfish species	1	0,71	Diet	2	1,42
Istiophoridae	1	0,71	Trophic chain	3	2,13
Mediterranean spearfish	126	89,36	Stomach contents	2	1,42
Shortbill spearfish	5	3,55	Fish/flesh quality	1	0,71
Roundscale spearfish	9	6,38	Analyses	1	0,71
Longbill spearfish	2	1,42	Biomarkers	1	0,71
White Marlin	29	20,57	Bioaccumulation	2	1,42
Black marlin	11	7,80	Heavy metals	1	0,71
Blue marlin	7	4,96	Trace elements	1	0,71
Atlantic sailfish	11	7,80	Food safety	2	1,42
Morphology	27	19,15	Vitellogenin	1	0,71
Description	28	19,86	Zona radiata	1	0,71
Distribution	35	24,82	Top predators	1	0,71
Migrations	12	8,51	Fleets	3	2,13
Seasonality	7	4,96	Vessels	4	2,84
Populations	3	2,13	Fishing gear	10	7,09
Behaviour	5	3,55	Driftnets	17	12,06
Biology	29	20,57	Gillnets	3	2,13
Reproductive biology	6	4,26	Longlines	25	17,73
Sex ratio	1	0,71	Purse seine	12	8,51
Reproduction	6	4,26	Harpoon	31	21,99
Sexual maturity	2	1,42	Traps	32	22,70
Spawning	6	4,26	Hand line/Troll line	13	9,22
Eggs	10	7,09	Sport/recreational fishery	8	5,67
Larvae	14	9,93	Small-scale or artisanal fishery	7	4,96
Growth	4	2,84	Gear impact	4	2,84
Juveniles	12	8,51	Catches/yields	24	17,02
YOY	2	1,42	By-catch	2	1,42
Ageing	2	1,42	CPUE	7	4,96
Otoliths	1	0,71	Statistics	12	8,51

Table 1b. Percentages of the different themes included in the annotations to the Italian bibliography on billfish and spearfish (second part).

Annotations			Annotations		
Themes	no.	%	Themes	no.	%
Stocks	1	0,71	Black Sea	1	0,71
Stock assessment	1	0,71	Indian Ocean	2	1,42
Stock structure	2	1,42	Pacific Ocean	2	1,42
Stock status	4	2,84	Algeria	1	0,71
Species identification	6	4,26	Croatia	3	2,13
Models/modelling	2	1,42	Cyprus	1	0,71
Multidisciplinary approach	1	0,71	France	2	1,42
Biodiversity	3	2,13	Greece	2	1,42
Environment	10	7,09	Italy	21	14,89
Oceanography	2	1,42	Malta	1	0,71
Thermal fronts	1	0,71	Spain	1	0,71
Tides	1	0,71	Turkey	2	1,42
Currents	5	3,55	Sicily	15	10,64
Plankton	4	2,84	Calabria	4	2,84
Pollution	1	0,71	Apulia	1	0,71
Management	6	4,26	Economy	6	4,26
RFMO(s)	2	1,42	Markets	1	0,71
ICCAT	4	2,84	Canning	1	0,71
GFCM	2	1,42	Salted products	1	0,71
FAO	1	0,71	Salt plants/salt pan/saline	1	0,71
IUCN	9	6,38	Trade	1	0,71
Regulations	1	0,71	Import	1	0,71
Rules	1	0,71	Export	1	0,71
Royalties	1	0,71	Social aspects	5	3,55
Threats	1	0,71	Fishermen	6	4,26
Geography	1	0,71	Rais	1	0,71
Atlantic Ocean	8	5,67	Anthropology	1	0,71
Mediterranean Sea	140	99,29	Rituals	1	0,71
Sardinian Sea	3	2,13	Traditions	1	0,71
Ligurian Sea	20	14,18	Architecture	1	0,71
Strait of Sicily	15	10,64	History	13	9,22
Tyrrhenian Sea	34	24,11	Medium Age	2	1,42
Strait of Messina	25	17,73	Modern Age	1	0,71
Adriatic Sea	21	14,89	Legends	3	2,13
Ionian Sea	19	13,48	Culture	1	0,71
Aegean Sea	1	0,71	Food habits	1	0,71
Levantine Sea	1	0,71	Recipes	1	0,71

Table 2. List of the main authors included in the Italian annotated bibliography on billfish and spearfish.

ranking	Author	number of MSP & BIL papers
1	Di Natale Antonio	22
2	Tortonese Enrico	11
3	Andaloro Franco	10
3	Garibaldi Fulvio	10
3	Mangano Antonia	10
4	Orsi Relini Lidia	10
4	Navarra Enrico	9
4	Relini Giulio	9
4	Valastro Massimiliano	9
5	Vacchi Marino	6
6	D'Onghia Gianni	5
6	Fiorentino Fabio	5
6	Nardo GianDomenico	5
6	Potoschi Antonio	5
6	Tunesi Leonardo	5
Other Authors (between 4 and 2 papers), over a total of 176 Italian Authors		
Battaglia P., Fortibuoni T., Romeo T., Cavanna G., Celona A., Conci C., Costa F., Giovanardi O., Griffini A., Pederzoli A., Rossi G., Schimmenti G., Spartà A., Torchio M., Addis P., Ancora S., Arena P., Bini G., Bonaparte C.L.J.L., Canestrini G., Castriota L., Cicero N., Cima C., Consoli P., Doderlein P., Fossi M.C., Giglioli E., Lanteri L., Lo Bianco S., Magrini A., Manganaro A., Manzoni P., Maurizi A., Montaldo L., Palandri G., Pedà C., Perzia P., Piccinetti C., Pinca S., Placenti V., Potoschi A.jr., Torchia G., Trois E.F., Zava B.		

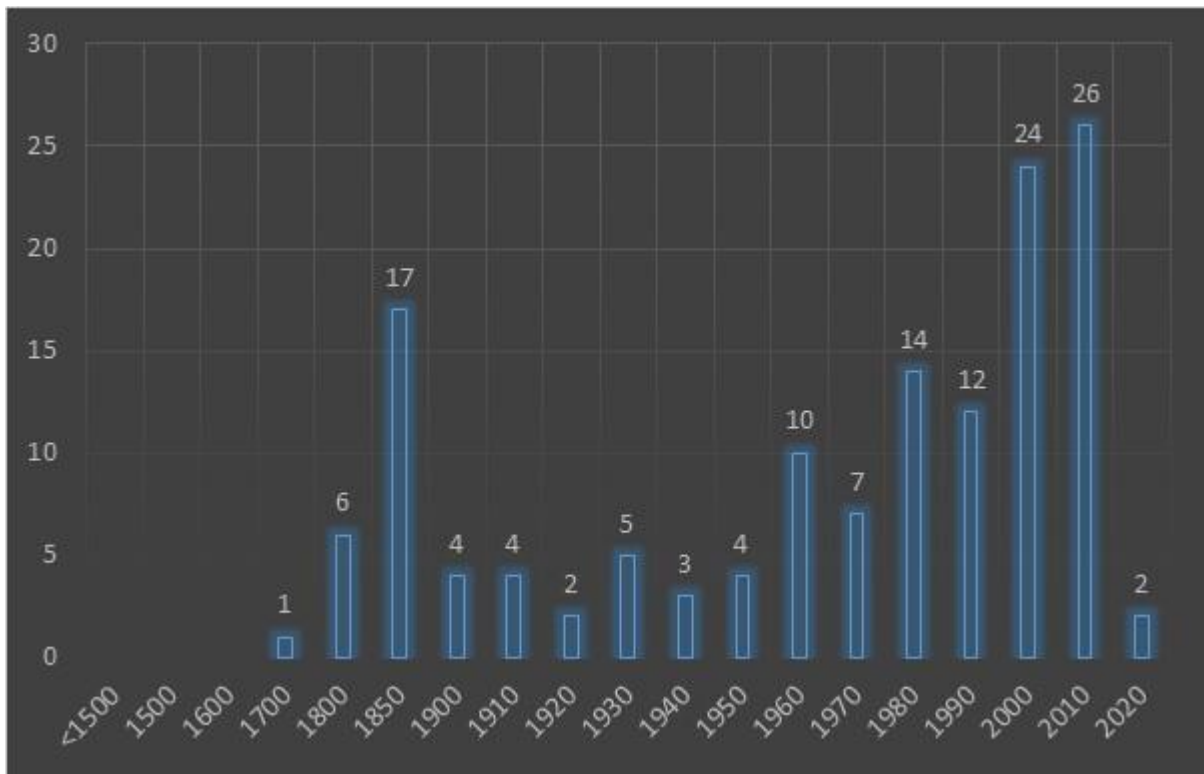


Figure 1. Number of the papers published on spearfish and billfish species by Italian authors over the years (since before 1500 to 2020).

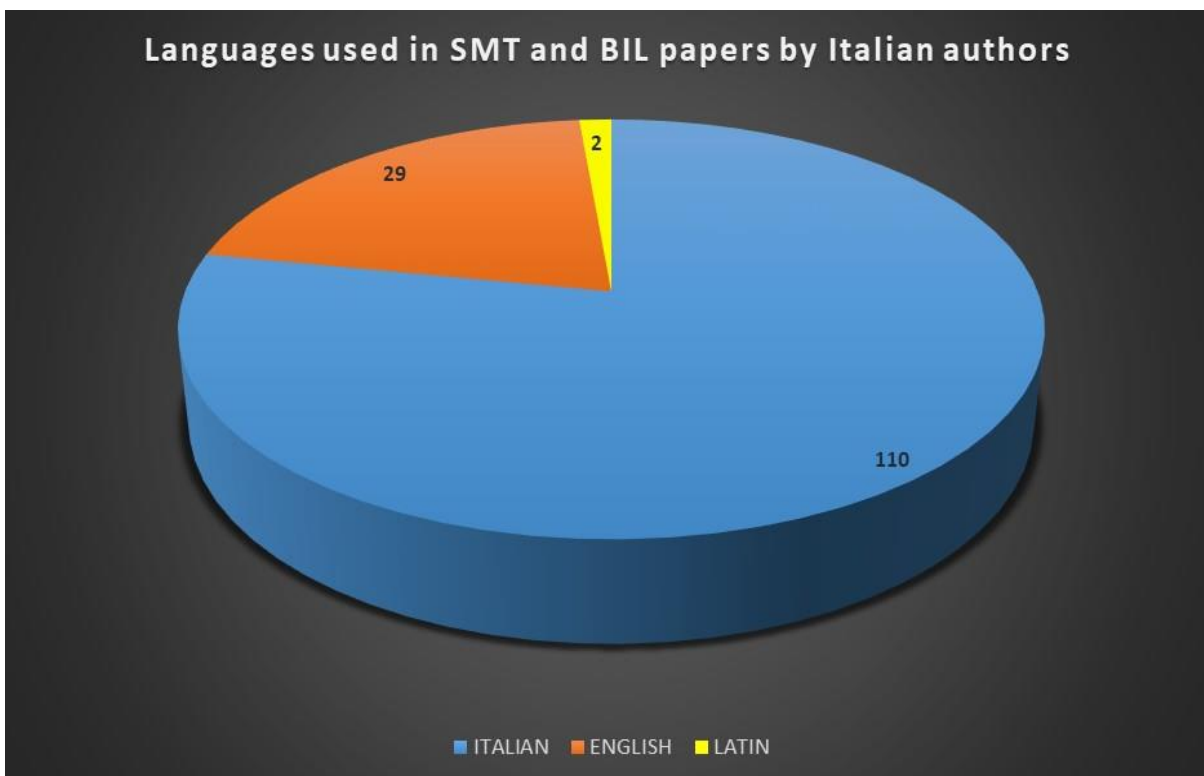


Figure 2. Graphic proportion of the different languages used by Italian authors in papers related to billfish and spearfish

ANNEX 1: Annotated Bibliography

1. Ancora S., Mariotti G., Ponchia R., Fossi M.C., Leonzio C., Bianchi N., 2020. Trace elements levels in muscle and liver of a rarely investigated large pelagic fish: The Mediterranean spearfish *Tetrapturus belone* (Rafinesque, 1810). *Mar. Poll. Bull.*: 151. <https://doi.org/10.1016/j.marpolbul.2019.110878>
 - i. Trace elements, heavy metals, bioaccumulation, Hg, Cd, Pb, Se, Se-Hg correlation, Se-Cd correlation, detoxification mechanism, Se protective effects, Mediterranean spearfish, *Tetrapturus belone*, Mediterranean Sea.
2. Azzurro E., Sbragaglia V., Cerri J., Bariche M., Bolognini L., Ben Souissi J., Busoni G., Coco S., Antoniadou C., Fanelli E., Ghanem R., Garrabou J., Gianni F., Grati F., Kolutari J., Guglielmo L., Lovrenc L., Mazzoldi C., Milone N., Pannacciulli F., Pešić A., Samuel-Rhoads Y., Saponari L., Tomanic J., Topcu N.E., Vargiu G., Moschella P., 2019. Climate change, biological invasions, and the shifting distribution of Mediterranean fishes: a large-scale survey based on local ecological knowledge. *Glob. Chang. Biol.* 25 (8), 2779–2792. <https://doi.org/10.1111/gcb.14670>
 - i. Biological invasions, climate change, fisheries, local ecological knowledge, surveys, shifting distribution, fish species, population trends, bluefin tuna, *Thunnus thynnus*, swordfish, *Xiphias gladius*, Mediterranean spearfish, *Tetrapturus belone*, Atlantic bonito, *Sarda sarda*, narrow-barred Spanish mackerel, *Scomberomorus commerson*, Tyrrhenian Sea, Adriatic Sea, Aegean Sea, Ionian Sea, Algerian Sea, Provençal Basin, Levantine Sea, Strait of Sicily, Mediterranean Sea.
3. Bonaparte C.L.J.L., 1832-1841. Iconografia della fauna italiana per le quattro classi degli animali vertebrati. Parte Terza, Pesci. Tipografia Salviucci, Roma, III: 1-266 + 68 t.
 - i. Nomenclature, systematics, bluefin tuna, *Thunnus thynnus*, swordfish, *Xiphias gladius*, albacore, *Thunnus alalunga*, Mediterranean spearfish, *Tetrapturus belone*, bullet tuna, *Auxis rochei*, Atlantic little tunny, *Euthynnus alletteratus*, Atlantic bonito, *Sarda sarda*, skipjack, *Katsuwonus pelamis*, plain bonito, *Orcynopsis unicolor*, wahoo, *Acanthocybium solandri*, narrow-barred Spanish mackerel, *Scomberomorus commerson*, Italian seas, Mediterranean Sea, European seas.
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