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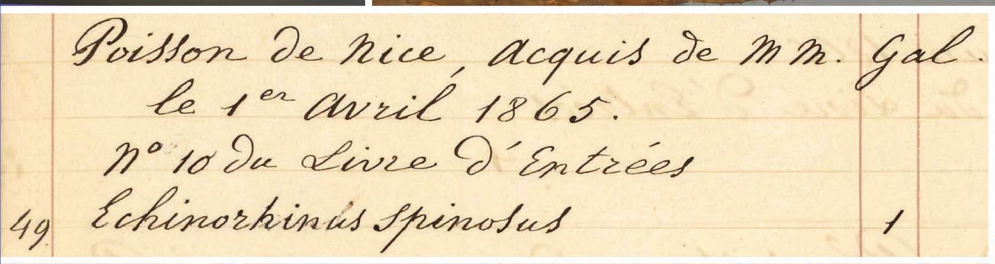
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An inventory of Bramble sharks *Echinorhinus brucus* (Bonnaterre, 1788) (Elasmobranchii, Echinorhinidae) in natural history collections worldwide for conservation status assessment

Frederik H. MOLLEN & Samuel P. IGLÉSIAS



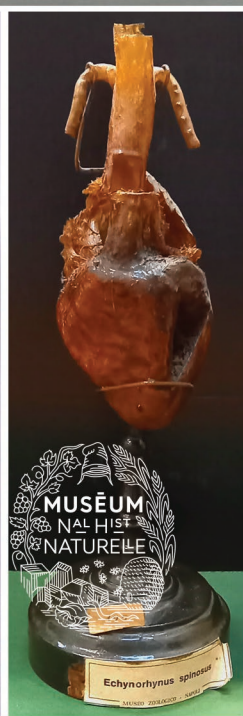


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Couverture / *Cover* :
Selected voucher material of the Bramble shark *Echinorhinus brucus* (Bonnaterre, 1788) in natural history collections worldwide: ERB* 1080 (Entry 9) [complete specimen, dermal denticles and teeth], MHNLR P186 (Entry 71) [embryo], MHNLR 2010.0.652 (Entry 70) [head], MNHN-IC-A9688 (Entry 92) [logbook], OUM-NH.ZC.896c (Entry 206) [brain], (CMSNF) Z6629 (Entry 118) [heart], RMNH.PISC.D.2561 (Entry 144) [label].

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An inventory of Bramble sharks *Echinorhinus brucus* (Bonnaterre, 1788) (Elasmobranchii, Echinorhinidae) in natural history collections worldwide for conservation status assessment

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ABSTRACT
Many elasmobranch populations were already depleted well before fishery surveys had even started, which means historical investigations are needed to reveal their ignored declines. This is probably the case for the Bramble shark *Echinorhinus brucus* (Bonnaterre, 1788) whose populations in Europe are suspected of having decreased significantly. In order to document this data deficiency, an inventory of Bramble shark material that had been preserved in natural history collections, was conducted in the period 2014-2022. A total of 128 collections were contacted around the world, and additional sources of information were traced and consulted (e.g. collection labels, museum registers, digital databases, index cards, pictures, manuscripts and publications). This resulted in a list of 234 entries, subsequently assigned to 169 individual Bramble sharks. These exhibits are, or had been deposited in 80 different collections, spread over 22 countries, whereas the other 48 collections yielded no results. At least 40 entries are presumed lost, so that fewer than 200 entries have been preserved to date, some of them in bad condition. Due to their historic and scientific importance, extensive efforts to preserve these specimens are more than justified. A significant number of 64 individuals, representing more than 37% of all specimens that were recorded in this survey, have never been published, and are reported here for the first time. Associated geographical data and collection dates are present for nearly all specimens. These 'new historical records' can add significantly to our knowledge of the Bramble sharks' relative abundance and geographical distribution in time. These data will be included in the ongoing *Bramble shark Cold Case*, a project that will document its suspected decline, and to implement appropriate conservation measures for this iconic, little-known and endangered shark species.

KEY WORDS
Spinous shark, endangered species, historical ecology, data mining, museum, voucher.

RÉSUMÉ
Inventaire des squales bouclés Echinorhinus brucus *(Bonnaterre, 1788) (Elasmobranchii, Echinorhinidae) dans les collections d'histoire naturelle du monde entier pour l'évaluation de leur statut de conservation.*
De nombreuses populations d'élasmobranches se sont effondrées bien avant le début des relevés halieutiques, de sorte que des enquêtes historiques sont nécessaires pour révéler leurs déclins ignorés. C'est probablement le cas du squale bouclé *Echinorhinus brucus* (Bonnaterre, 1788) dont les populations en Europe sont suspectées d'avoir diminué drastiquement. Afin de combler ce manque de données, un inventaire des spécimens de squale bouclé conservés dans les collections d'histoire naturelle a été mené au cours de la période 2014-2022. Au total, 128 collections d'histoire naturelle ont été contactées de par le monde et des sources d'informations additionnelles ont été recherchées et consultées (par exemple les étiquettes de collections, registres de musées, bases de données numériques, fiches, images, manuscrits, publications). En a résulté une liste de 234 entrées (spécimens), par la suite réattribuées à 169 individus de squales bouclés. Ces « pièces à conviction » sont, ou ont été, déposées dans 80 collections distinctes, réparties dans 22 pays, alors que les 48 autres collections interrogées n'ont donné aucun résultat. Au moins 40 spécimens sont présumés perdus, de sorte que moins de 200 spécimens sont encore conservés à ce jour, certains d'entre eux en mauvais état. En raison de leur importance historique et scientifique, des efforts de préservation de ces spécimens sont fortement justifiés. Un nombre important de signalements individuels (n = 64), plus de 37 % du total des spécimens présentés dans cette étude, n'ont jamais été publiés et sont ici signalés pour la première fois. Les données géographiques associées et les dates de collecte sont présentées pour presque tous les spécimens. Ces « nouveaux signalements historiques » peuvent considérablement accroître les connaissances sur l'abondance relative et la répartition géographique historique du squale bouclé au cours du temps. Ces données seront intégrées à l'étude en cours *Bramble shark Cold Case* (*Affaire classée sur le Squale bouclé*), un projet visant à documenter le déclin suspecté de cette espèce et à aider à la mise en œuvre des mesures de conservation appropriées pour ce requin emblématique, peu connu et menacé.

MOTS CLÉS
Squale bouclé,
espèce menacée,
écologie historique,
exploration de données,
muséum,
spécimen.

INTRODUCTION

Defaunation resulting from human activities is especially documented, assessed, and managed for large, charismatic species that appeal the general public (Small 2011, 2012; Brambilla *et al.* 2013; Colléony *et al.* 2016). However, the extinction of animal species continues at a considerable rate, many of which remain unnoticed (Edgar *et al.* 2005). Small, discreet, and distant taxa that are endemic to small geographical areas are probably the most affected (e.g. Fonseca 2009; Régnier *et al.* 2009; Eisenhauer *et al.* 2019). Nevertheless, 'silent extinctions' might also apply to larger species that were once common, exploited, and even omnipresent in people's everyday lives. This is possibly the case for sharks and rays (Iglésias *et al.* 2010; White *et al.* 2019), a taxonomic group that often has to deal with negative perceptions from humans (Simpfendorfer *et al.* 2011; Friedrich *et al.* 2014; Neff 2014; Ostrovski *et al.* 2021). Moreover, elasmobranch fishes generally display low reproduction potential because of slow growth, late sexual maturity and long gestation, so that their populations are particularly vulnerable when overexploited (Dulvy & Forrest 2010). Due to overfishing, many populations of elasmobranch fishes risk local or even global extinction, as it is already demonstrated for some very specific, iconic taxonomic subgroups such as Angel sharks (Squatinidae Blainville, 1816), Sawfishes (Pristidae Bonaparte, 1835), Wedgefishes (Rhinidae Müller & Henle, 1841), Guitarfishes (Rhinobatidae Bonaparte, 1835) and Devil rays (Mobulidae Gill, 1893) (Dulvy *et al.* 2014a; Pardo *et al.* 2016; Kyne *et al.* 2020; Lawson *et al.* 2020). Consequently, conservation issues need to be addressed urgently (Cavanagh & Gibson 2007; Dulvy *et al.* 2014b; Jabado *et al.* 2018; Pacoureau *et al.* 2021).

The Red List of Threatened Species of the International Union for Conservation of Nature (IUCN) is an important tool for conservationists and policy-makers in the agenda setting and to prioritise conservation efforts amongst species (Vié *et al.* 2008). Based on the extinction risk, it defines conservation status categories to which species are assigned after evaluation. According to the latest version of the IUCN Red List, 32.6% of all elasmobranch fish are now considered threatened, i.e., categorised *Vulnerable* (VU, 15%), *Endangered* (EN, 10%), or even *Critically Endangered* (CR, 8%) (Dulvy *et al.* 2021). The assessment of individual species is based on sets of quantitative criteria that are linked to the population trend, population size, and geographic range. Basically, this requires good historic data such as long-run fisheries statistics on a species level. However, the availability of such data is often limited or even lacking (Cashion *et al.* 2019; Perry 2021; Barone & Friedman 2021; Ellis *et al.* 2021). As a result, many sharks and rays are still listed as *Data Deficient* by the IUCN (Walls & Dulvy 2020; Dulvy *et al.* 2021). In order to assess the conservation status of such species properly, the search and collection of other data sources by historical ecologists should be promoted, in particular sightings (Bland *et al.* 2017; Leonetti *et al.* 2020). Effectively, individual specimen records have proven useful in the past to document the occurrence of certain species at a specific locality and time (e.g. Hudgins *et al.* 2019). Even though isolated records might be considered

inferior data or even ill-suited for the job (Yan *et al.* 2021), exhaustive searches for individual records might result in large datasets that can contribute to reconstruct changes in elasmobranch species abundances over time, even for larger geographic regions (Holcer & Lazar 2017; Boldrocchi *et al.* 2017; Moro *et al.* 2020). This approach seems appropriate for large species that are morphologically distinct, that risk little taxonomic confusion, and that are often reported when observed, or even retained when caught. In these studies, individual records are most often retrieved from the scientific literature, but traces of records can also be found in grey literature, unpublished manuscripts, photographs, newspapers, social media (Boldrocchi & Storai 2021; Jambura *et al.* 2021), and, last but not least, museum collections. Although natural history collections were initially established with the aim to serve as taxonomic repositories, the current biodiversity crisis and climate change offer a new vocation for these collections as witnesses to potential changes in population dynamics, including the disappearances of species (e.g. Davis 1996; McCarthy 1998; Bickel 1999; Ponder *et al.* 2001; Gotelli *et al.* 2021; Johnson *et al.* 2023). Like sealed rooms in courthouses, today's museum naturalist collections retain physical evidence of the past presence of species in time and space, making it possible to detect defaunation patterns and to start exploring the underlying causes. The screening of naturalia collections worldwide for specific species which are poorly documented today but whose disappearances are suspected may thus enable us to put such declines in a historical perspective. As such, naturalist collections constitute legitimate and unmistakable testimonies. For extinct species, these collections frequently offer the last physical evidence of their past existence.

In 2014, an integrative study in historical ecology (in fact, a thorough data mining project) was initiated to inventory all possible records for the Bramble shark *Echinorhinus brucus* (Bonnaterre, 1788) (Iglésias & Mollen 2018; Iglésias *et al.* 2018). This species, most often reported as the spinous shark *Echinorhinus spinosus* (Gmelin, 1789) in the 19th century, represents a sluggish, bottom-dwelling species that exceeds three metres in total length and whose populations in Europe are suspected to have decreased significantly (Quéro 1998; Quéro *et al.* 2014). It is considered to occur in both the Atlantic (type-locality), including the Mediterranean Sea, but not the Black Sea, and the Indian Ocean, from shallow waters down to depths of more than 1200 metres (Compagno 1984; Serena 2005; Kabasakal *et al.* 2005; Ebert 2013; Ebert & Stehmann 2013). However, recent molecular studies suggest that specimens from India and Oman (Northern Indian Ocean) are distinct from Atlantic *E. brucus* (Naylor *et al.* 2012a, b; Fariña *et al.* 2014; Henderson *et al.* 2016). Awaiting further taxonomic research, the Indian species is tentatively referred to as *Echinorhinus* sp. or *E. mccoyi* Whitley, 1931, an Australian nominal species that was previously considered to represent a junior synonym for *E. brucus*. Consequently, records of *Echinorhinus* originating from the Indian Ocean are not included in our study. *E. brucus* can hardly be mistaken with other shark species in Europe, especially because of its skin that is covered with enlarged, round dermal denticles that have a flat base with a central upright spine. In addition to this unique squamation, the Bramble shark is also characterised by its two small dorsal fins that are both positioned posteriorly, that is behind the origin of the pelvic fin, and its caudal fin that is short, falcate, and that lacks clear posterior and subterminal notches. In contrast to other shark families, the lateral line in Echinorhinidae is open and internally enforced with C-shaped cartilage structures as seen in holocephalans. Consequently, *E. brucus* is a perfect candidate for this case study. This project, also called the *Bramble shark Cold Case*, resulted in a wealth of new historical information and many records unknown to science, too many to integrate and discuss in a single paper. Therefore, the present paper will only focus on the inventory of *E. brucus* material in natural history collections worldwide. Records from other data sources (literature, manuscripts and media) will be presented in other, separate papers. Finally, all these data will be combined and analysed in an integrative study attempting to demonstrate the species relative abundance and geographical distribution in time. Finally, it should be noted that the *Bramble shark Cold Case* was started at a time when this species was still listed as *Data Deficient* by the IUCN (Iglésias & Mollen 2018; Iglésias *et al.* 2018). In the meantime, the preliminary results of the project have contributed to update the Bramble shark's conservation status to at least *Endangered* on the IUCN Red List of Threatened Species (Finucci *et al.* 2020), but action plans and specific conservation measures (regional, national, or global) have not been defined, nor implemented to date.

METHODS

Abbreviations

Institutions

A list of institutional abbreviations is provided in Appendix 1.

Metric abbreviations and conversion

cm	centimetre;
cwt	hundredweight (1 cwt = 100 lbs = 45.5 kg);
ft	feet (1 ft = 30.48 cm);
fth	fathom (1 fth = 6 ft = 182.88 cm);
in	inch (1 in = 2.54 cm);
kg	kilogram;
lbs	pound (1 lbs = 0.454 kg);
mi	miles (1 mi = 1609 m);
nmi	nautical miles (1 nmi = 1852 m).

Data source abbreviations

crd	card from an index system;
com	personal comment;
dat	digital database;
ins	inscription;
lab	label;
log	logbook, register;
ms	manuscript;
pic	picture, photograph;
pub	publication.

Definition of entry vs individual

Entry – In this study, an entry can refer to any trace of Bramble shark material that had been preserved in a collection worldwide, registered or not; the material can either be of biological or non-biological origin (artefact); the trace can be material that was derived from the shark itself, or it can refer to other, indirect evidence of its past existence (for details see *Data source abbreviations* above and *Methodology* below). Examples of entries are manifold such as complete specimens that have been preserved in alcohol, anatomical preparations of specific organs, replicas, or just a museum label with a collection number that has been preserved to date. Different entries can refer to the same individual.

Individual – An individual in this study refers to a unique, individual (one) Bramble shark. An individual can be represented by multiple entries.

Methodology

In order to list all voucher material of *E. brucus* that had been preserved in collections worldwide (i.e., entries), natural history museums (national and local), as well as private collectors, were contacted individually or were even visited by the authors (period 2014-2022). They were selected based on the importance of their fish collections and geographical position (i.e., Europe, and other countries surrounding the Mediterranean Sea and the Atlantic Ocean), but also based on specific clues for *E. brucus* voucher material that were found in publications. Online databases also provided valuable clues to material of *E. brucus* that had been preserved in museums, but these data might prove incomplete or even erroneous. Consequently, collection managers were always contacted to double-check such data. In case vouchers are lost, other sources can also prove their past existence, such as preserved labels, museum logbooks (i.e., registers), index cards, manuscripts, photos, publications, or even oral testimonies.

Vouchers (listed as entries) can include a variety of materials, such as complete taxidermied specimens, anatomical preparations, gut contents, or even non-biological samples such as replicas (e.g. a plaster cast). Here, registered tissue samples taken from registered voucher material, are not considered representative of separate vouchers; they are only considered so in the rare event that no other material of the same individual specimen has been preserved. Each 'voucher' does not necessarily represent a separate, individual specimen. A single specimen might end up as multiple vouchers, even spread over multiple collections (e.g. a taxidermied specimen in one collection, and anatomical preparations of the same specimen in another collection). In order to avoid duplicate records, vouchers considered to represent different shark individuals are labeled with distinct numbers (i.e., INDIVIDUAL-001, INDIVIDUAL-002, etc.), whereas multiple vouchers originating from the same shark were given the same INDIVIDUAL number. Embryos and fetuses were always referred to the female adult specimen they originate from. If vouchers lacked sufficient information to give them a proper assessment, and/or there was a serious risk of 'double-dipping', no INDIVIDUAL number is attributed to them [i.e., INDIVIDUAL-000]. For each voucher, the INDIVIDUAL number is listed between the entry number of the voucher and the official collection number of the museum.

The entries of the vouchers are numbered and arranged as follows: first, alphabetically, according to the two letter code of the country in which the material is currently located, second, also alphabetically, according to the institution acronym in which the material is currently located, and third, the collection number of the material, with numerals taking precedence over letters (material that is unregistered is listed at the end, and, if available, chronologically following the date of its entry in the collection). Acronyms are mainly based on Sabaj (2020). Each entry follows a strict structure that includes the following sections: *voucher*, *individual data*, *date*, *capture*, *remark*, *references* and *info*.

Voucher. In this section, a general description of the material is provided, followed by its current preservation method (in most cases *dried* or *in alcohol*). The following phrases or terms are used: *complete specimen* (i.e., from snout tip to tail end), *gutted* (i.e., internal organs removed), *stuffed* (i.e., abdominal cavity filled after gutting), and *mounted* (i.e., final preparation mounted on a base). Consequently, a dry taxidermy of a complete specimen, put on a wooden base, is here listed as a *complete specimen, gutted, stuffed, dried and mounted*. In all cases, one or more attempts were made to find and observe the material, either by the curator or by the visiting author(s) [all in the period 2014-2022]. According to the success of finding the material, the following terms are used: *located* (i.e., the material was found), *not located* (i.e., search efforts were unsuccessful and the specimen is missing), *seen* (i.e., the specimen was observed by one of the visiting authors, or at least one photo of the material was provided by the collection manager), and *not seen* (i.e., the specimen was located, but the specimen was not observed by one of the visiting authors, nor was a photo provided). Evidently, specimens that were *not located*, were *not seen*. If the outcome of a search effort is not available (e.g. no response from the curator), the term *not located* is omitted, and only the phrase *not seen* is reported. In some cases, there is evidence that the material was lost or destroyed, either by accident (e.g. after a fire, or a bombing during a war) or intentionally (e.g. destruction of material in bad condition, or presumed useless). In such cases, the terms *lost* and/or *destroyed* are used, followed by the date of destruction (if available). In case the material was not located, and probably lost, the phrase *here presumed lost* is used. If other voucher material originating from the same individual had been preserved in the same and/or another museum(s), under a different official collection number(s), this is indicated at the end of this section.

Individual data. This section includes the sex of the specimen (male or female), its total length (in cm) and total weight (in kg). If the specimen was gutted prior to weighting, the term

gutted is provided between brackets. If the original account expressed these data in a different metric system (e.g. in ft), these original data are listed in brackets too. The maturity stage of the specimen is not given, except for embryos and fetuses when describing the material (see *Voucher*).

Date. In the best-case scenario, this is the exact date on which the specimen was actually *caught* (e.g. based on a newspaper report, a scientific publication, or a specimen label). In other cases, the date of the specimen is based on its *first registration* (e.g. the date of its first entry in a museum logbook) or its *first publication* (i.e., the first time that the specimen was published). Each date is thus followed by one of these phrases or terms. If a specimen might have been caught prior to its *first registration* or *first publication*, the phrase *or before* is added.

Capture. This section starts with the location of its capture, as precise as possible, starting with the location seen from land (e.g. city, region, country, continent), followed with the location on sea, listing the most detailed information first (e.g. bay, sea, ocean). Available coordinates are only added if they have not been published previously. If available, other information on its capture is added in the following order: station, depth, the fishing gear used, and the name of the fishing vessel (captain, ship owner).

Remark. This section includes the name of the person(s) who was/were involved in securing the material for scientific purposes (e.g. collection, purchase, donation). If the material was (once) on public display, this information is also listed as a remark. Other peculiarities about the material are sometimes offered in this section too, such as extreme records in terms of date (most ancient or most recent individual), and size (largest total length), worldwide or for a specific geographic region.

References. This section includes all references in which the specimen was mentioned. These references are not restricted to publications mentioning the voucher itself (e.g. a specific anatomical part), but also general papers that refer to the complete specimen. References can also include unpublished manuscripts (e.g. handwritten documents, typed letters, collection lists). If no published references were found, the phrases *unpublished* or *none, here presumed unpublished* are used depending on how sure it is that the specimen has not been published before. Museum logbooks, index cards and digital databases are often referred to when describing the voucher but are only listed under *references* if they can be specified with a name and/or date, and/or if confusion between multiple logbooks of a single institution may occur. Photographic extracts of logbooks and index cards are provided in the accompanying *figures* as much as possible.

Info. This last section includes the name of the person(s) who provided information on the voucher material, or the record in general. This section ends with an enumeration of the available sources of information, using data source abbreviations (see above).

If conflicting data are present for one or more of these sections, the most convincing data were listed first (i.e., data found in the original account, or data found in later, more detailed descriptions), followed by the conflicting data. The latter are put in between rectangular brackets, including their reference(s). Citations, including those from labels, registers, or other data sources, are written between quotation marks.

RESULTS

From different data sources to entries of Bramble shark material

The survey, combining all the different types of data sources, enabled us to list 234 entries that are presented in Appendix 2 (Table 1 for a general overview). The corresponding material had been deposited in 80 different collections (Figs 1; 2), nearly all of them institutional with only a few exceptions. The collections are spread over 22 different countries, spread over Europe (n = 58), North America (n = 8), South America (n = 8), Africa (n = 3), Australia (n = 2) and Asia (n = 1) (Table 1A). Another 48 institutional collections were contacted as well, but these investigations only yielded negative results (Appendix 3). The highest number of entries could be found at the South African Museum in Cape Town (SAM; n = 27), the Muséum national d'Histoire naturelle in Paris (MNHN; n = 22), and the Oxford University Museum of Natural History (OUMNH; n = 13). These museum collections are followed by the Natural History Museum in London and Tring (NHMUK; n = 11), the Museum voor Dierkunde in Ghent (UGMD; n = 9) and the Centro Musei delle Scienze Naturali e Fisiche in Naples (CMSNF; n = 9). The top-3 museum collections account for more than 26% of all entries worldwide. From a total of 80 collections, 41 collections yielded a single entry only.

Most of the entries represent complete specimens (n = 78), complete heads, jaw or teeth (n = 58), anatomical preparations (e.g. brain, heart, eye, vertebrae sections) (n = 44), portions of skin, including isolated dermal denticles (n = 14) or embryos/fetuses (n = 7) (Table 1B). Two entries had been represented by a tissue sample, and another single entry by ova. For three other entries, the voucher material does not represent a biological sample, but a set of registered photographs (MOVI 10158, Entry 37), a plaster cast (MEFC unregistered, Entry 186), and a registered radiograph (USNM RAD107112-001, Entry 232). For the other remaining entries (n = 27), the type of material is unknown. The preservation of the material is most often dry (n = 116), or in liquid (n = 96). Three entries represent complete, frozen specimens, one of which is lost, and two others that await further handling and preparation. Except for the three non-biological samples, the preservation of the other remaining entries (n = 16) is unknown. Of the total of 234 entries listed, 156 entries were *located*, of which 139 were *seen*. Of the same total, another 95 entries were *not seen*, of which 47 were *not located*. At least 40 entries are (presumed) *lost* and/or *destroyed* whether or not intentionally. As a result, and to our knowledge, fewer than 200 entries have been preserved worldwide.

TABLE 1. — Overview of Bramble shark material, *Echinorhinus brucus* (Bonnaterre, 1788), that had been preserved worldwide, with (**A**) the number of natural history collections grouped per continent, and details for countries that hold the most entries; (**A**, **B**) the number of entries, their appearance and preservation; and (**C**) the number of individuals, their geographic origin and collection date per century. Material originating from the Indian Ocean, here considered to represent a possible distinct species, is not included.

A) Collections			B) Entries		C) Individuals	
Repository	**Collections**	**Entries**	**Voucher material**		**Geographical origin**	
Europe	58	168	Complete specimen	78	North-eastern Atlantic	47
United Kingdom	13	42	Head / jaw / teeth	58	Mediterranean Sea	49
France	11	41	Anatomical preparation	44	Eastern Atlantic	5
Italy	12	27	Skin / dermal denticles	14	South-eastern Atlantic	36
Belgium	3	21	Embryo / fetuses	7	North-western Atlantic	9
Others	19	37	Tissue	2	South-western Atlantic	16
Africa	3	31	Ova	1	Unknown	7
South Africa	1	30	Non-biological	3	**Date of capture (decade known)**	
Others	2	1	Unknown	27	17th century	1
North America	8	12	**Voucher preservation**		18th century	0
South America	8	19	Dry	116	19th century	68
Brazil	5	15	Liquid	96	20th century	81
Others	3	4	Frozen	3	21st century	10
Australia	2	3	Other	3	Decade unknown	9
Asia	1	1	Unknown	16	**Published (yes/no)**	**105/64**
Total	80	234	Total	234	Total	169

TABLE 2. — Overview of material originating from extreme individuals of Bramble shark *Echinorhinus brucus* (Bonnaterre, 1788) in collections worldwide, in terms of (**A**, **B**) date (most ancient vs most recent), and (**C**) size (largest total length). Results are classified into three categories according to presence in collections to date (still present, or not), and to appearance (any material, or complete specimens only). Extremes worldwide are highlighted in bold.

Extreme individuals in collections	European waters		American waters		African waters	
	NE Atlantic	**Mediterranean**	**NW Atlantic**	**SW Atlantic**	**SE Atlantic**	**E Atlantic**
A 1) Most ancient	**MNHN ?unregistered INDIVIDUAL-067 1680**	RMNH.PISC.D.2561 INDIVIDUAL-106 1827	USNM 225111 INDIVIDUAL-168 1968	MACN unregistered INDIVIDUAL-001 1898	MNHN-IC-A9688 [sic.] INDIVIDUAL-074 1837	MCZ 39633 INDIVIDUAL-162 1955
2) Most ancient still preserved	BMNH 1856.12.10.654 INDIVIDUAL-139 1837	**RMNH.PISC.D.2561 INDIVIDUAL-106 1827**	USNM 225111 INDIVIDUAL-168 1968	MACN unregistered INDIVIDUAL-002 1955	RMNH.PISC.D.2562 INDIVIDUAL-107 1838 or before	MCZ 39633 INDIVIDUAL-162 1955
3) Most ancient still preserved complete spec.	(?) ZMB 4536 INDIVIDUAL-040 between 1848-1860	**RMNH.PISC.D.2561 INDIVIDUAL-106 1827**	(?) USNM 225111 INDIVIDUAL-168 1968	(?) MOVI 10158 INDIVIDUAL-028 1985	RMNH.PISC.D.2562 INDIVIDUAL-107 1838 or before	MCZ 39633 INDIVIDUAL-162 1955
B 1) Most recent	RM unregistered INDIVIDUAL-112 *c.* 1998	ERB 1157 INDIVIDUAL-010 2010	TNEC-MT INDIVIDUAL-169 2012	MOVI 37569 INDIVIDUAL-032 2004	**ERB 1206-1209 INDIVID.-11-13, 104 2018**	USTL UM REC 146 INDIVIDUAL-077 1983
2) Most recent still preserved	RM unregistered INDIVIDUAL-112 *c.* 1998	ERB 1157 INDIVIDUAL-010 2010	(?) TU 172379 INDIVIDUAL-167 1994	MOVI 37569 INDIVIDUAL-032 2004	**ERB 1206-1209 INDIVID.-11-13, 104 2018**	USTL UM REC 146 INDIVIDUAL-077 1983
3) Most recent still preserved complete spec.	MHNN.Z.019419 INDIVIDUAL-60 1968	(?) MSNTC Pe 0081 INDIVIDUAL-090 1934 or before	(?) TU 172379 INDIVIDUAL-167 1994	MOVI 37569 INDIVIDUAL-032 2004	**ERB 1206-1209 INDIVID.-11-13, 104 2018**	MCZ 39633 INDIVIDUAL-162 1955
C 1) Largest	NMINH 1885.102.1 INDIVIDUAL-078 290 cm TL (9½ ft)	MSNM 2008 INDIVIDUAL-088 296 cm TL	NCSM 44134 INDIVIDUAL-163 280.8 cm TL	**MOFURG 79-021 INDIVIDUAL-026 300 cm TL**	PMH223-10 INDIVIDUAL-166 253 cm TL	(?) ERB 1286 INDIVIDUAL-014 ?228-240 cm TL
2) Largest still preserved	NMINH 1885.102.1 INDIVIDUAL-078 290 cm TL (9½ ft)	MSNG 18110 INDIVIDUAL-087 230 cm TL	NCSM 44134 INDIVIDUAL-163 280.8 cm TL	**MOVI 26229 INDIVIDUAL-030 298.0 cm TL**	PMH223-10 INDIVIDUAL-166 253 cm TL	(?) ERB 1286 INDIVIDUAL-014 ?228-240 cm TL
3) Largest still preserved complete spec.	MHNLR 2010.0.652 INDIVIDUAL-057 262 cm TL	MSNG 18110 INDIVIDUAL-087 230 cm TL	NCSM 44134 INDIVIDUAL-163 280.8 cm TL	**MOVI 26229 INDIVIDUAL-030 298.0 cm TL**	RMNH.PISC.D.2562 INDIVIDUAL-107 183 cm TL	MCZ 39633 INDIVIDUAL-162 165.0 cm TL

Since *E. brucus* entries have proven relatively rare in museum collections worldwide, combined with its precarious preservation status, each voucher is of scientific and historic importance. However, several vouchers are in bad to very bad condition (e.g. NMW 50137, Entry 4; UF103000-UF103001, Entries 223-224). In these cases, restoration efforts are more than justified. If this is not possible anymore, photographic documentation of the material is recommended, and salva-

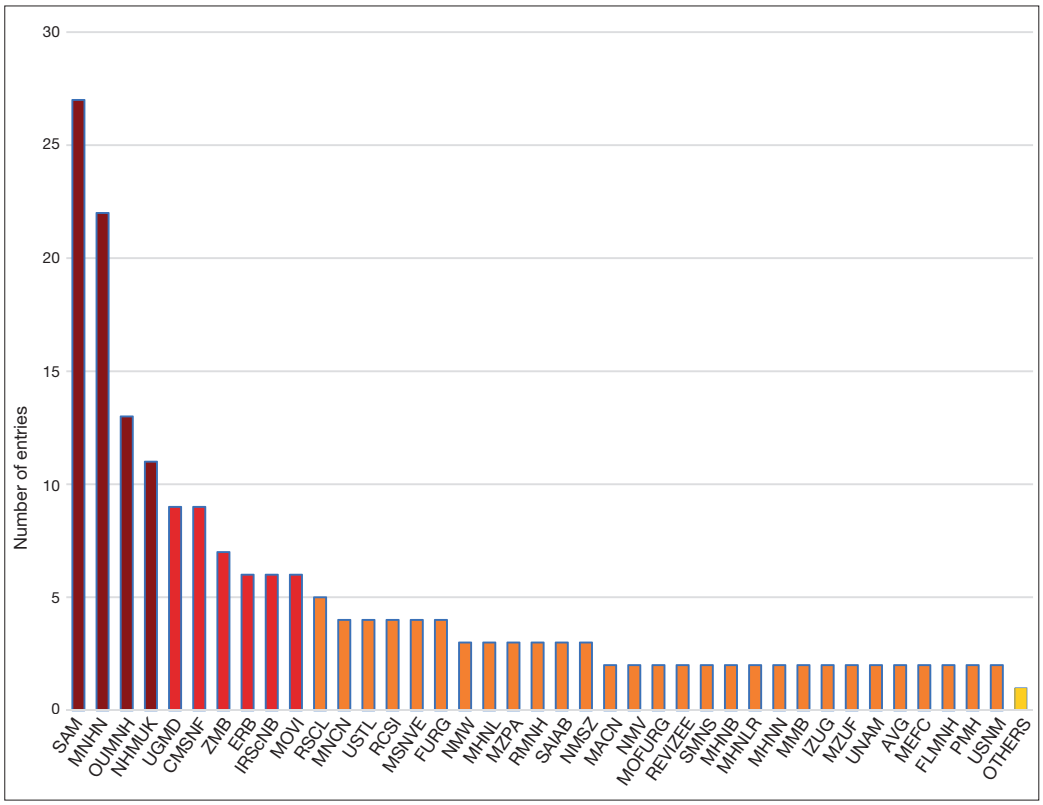


Fig. 1. — Number of entries of *Echinorhinus brucus* (Bonnaterre, 1788) in natural history collections. Total number of entries equals 234; total number of collections equals 80; category 'OTHERS' represents 41 distinct collections that include a single entry only. Colours according to the legend of the distribution map in Figure 2. For institutional abbreviations see Appendix 1.

tion of the better parts (e.g. some teeth, a complete jaw and/or even skin portions from a stuffed specimen in decay) is preferred above total destruction. It should be noted that an old specimen in the Muséum national d'Histoire naturelle (Paris) [MNHN 376, Entry 78], once considered undocumented, in poor condition, and destroyed in 1904, might have been the holotype of *E. brucus* as recently revealed by Iglésias & Mollen (2020a).

From entries to individual Bramble shark specimens

Out of the total of 234 entries, 169 individual specimens could be identified (Appendix 2; Tables 1C; 2). The difference between the number of entries and the number of individual specimens can be explained by voucher material that was insufficient to be considered as an individual specimen (25 entries) [i.e., entries with label 'INDIVIDUAL-000'] or individual specimens whose material was split into several parts with different collection numbers (40 entries). The latter was often the case for multiple anatomical preparations originating from single individual specimens.

The individual specimen that groups the highest number of entries is that of a male specimen caught in January 1893 (Galloper Bank, North Sea). This individual specimen is represented by a complete specimen, gutted, stuffed and mounted (ERB* 1080, Entry 9), and nine anatomical preparations (UGMD RE_2546 to UGMD RE_2554, Entries 21-29) (Fig. 3). It should be stressed that the stuffed specimen and the anatomical preparations are spread over two different collections in Belgium (ERB and UGMD respectively). The splitting of materials from a single individual specimen over two collections are not unique, though rare. Such dispersal has only been observed (or presumed) for two other individual specimens, i.e., one caught in March 1872 (off Brixham, Devon) [INDIVIDUAL-137, Entries 186 and 217] (in MEFC and RCSL collections respectively, both United Kingdom) and another male specimen caught in 1891 (off Nice, Alpes-Maritimes) [INDIVIDUAL-142, Entries 191 and 232] (in BMNH and USNM collections, United Kingdom and United States respectively). However, the break-up is in both these cases explained by the fact that one of the entries is not a biological sample, but a plaster cast, and a radiograph respectively. Another individual that is represented with a considerable number of entries is a large female caught in February 1875 (Mount's Bay, Cornwall) [INDIVIDUAL-152, Entries 202-210]. This individual specimen is also represented by nine anatomical preparations (all at OUMNH, United Kingdom) (Fig. 41A-L), but this time its skin has not been preserved as is the case for the specimen from the Galloper Bank [INDIVIDUAL-009, Entry 9].

The highest number of individual specimens can be found in the South African Museum in Cape Town (SAM; n = 18), the Muséum national d'Histoire naturelle in Paris (MNHN; n = 12), and the Natural History Museum in London and Tring (NHMUK; n = 10). These museum collections are followed by Elasmobranch Research, Belgium (ERB), the Institut

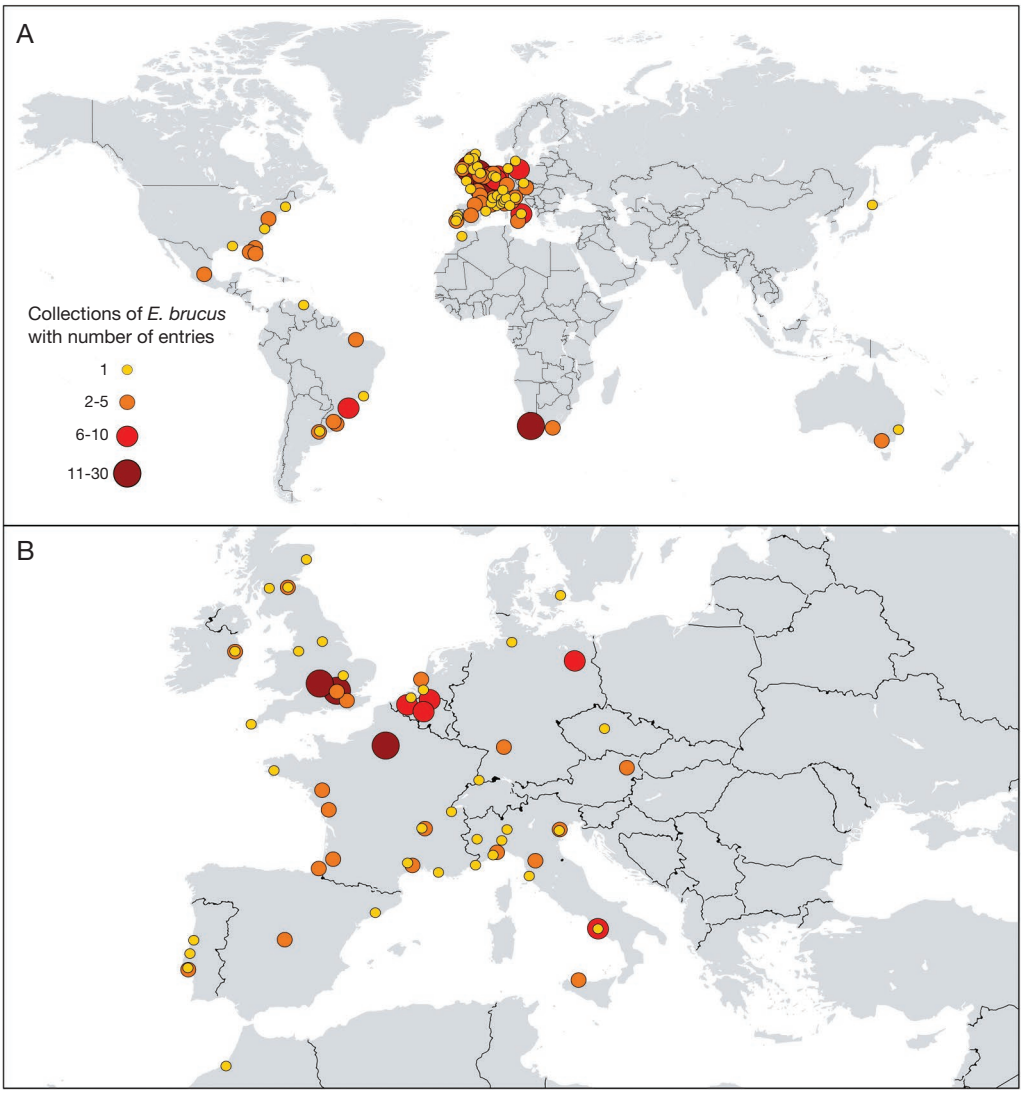


Fig. 2. — Distribution map of natural history collections that include one or more entries of *Echinorhinus brucus* (Bonnaterre, 1788): **A**, global; **B**, Europe.

Royal des Sciences naturelles de Belgique (IRSNB) and the Museu Oceanográfico Univali, Universidade do Vale do Itajaí (MOVI) (for each, n = 6). The top-3 museum collections account for more than 23% of all individual specimens worldwide. Out of a total of 74 collections, 41 collections yielded a single individual specimen only. About 62% of all individual specimens have been published (n = 105), some of them in grey literature only, such as old newspaper records (n = 5). Out of the total of 169 individuals, a significant number of 64 specimens are here being reported for the first time. These records are new to the scientific community and provide lots of historical and biological data (e.g. morphometrics, length/weight information, size at maturity).

Different types of data sources: discoveries and curiosities

For the entries, the availability of different types of information varied significantly: labels (47%), collection inscriptions (9%), collection registers/logbooks (26%), digital databases (45%), manuscripts (5%), index cards (4%), pictures, both old and new (60%), publications (64%) and personal comments (98%). In most cases, voucher material could be documented by multiple sources of information. In general, linking information from different sources was straightforward. However, in some cases, this was quite challenging, especially for voucher material that has been preserved to date, but that was lacking detailed labels (e.g. IRSNB 24897, Entry 20; MNHN-IC-AA-0042, Entry 99; IZUG unregistered, Entry 119; MZPA P517, Entry 131; BMNH 2004.12.5.25, Entry 195; NMS.Z. unregistered, Entry 200; OUMNH.ZC.17618, Entry 214). Based on the best available information, assumptions had to be made in some of these cases. These are always explicitly mentioned in the entries' description. Upon doubt, the basis for creating a new INDIVIDUAL-number is explicitly given. This can be either the voucher material, or the reference(s).

This was for instance the case for two original, antique photographs depicting preserved Bramble sharks, both discovered in the course of this survey. The first was taken at

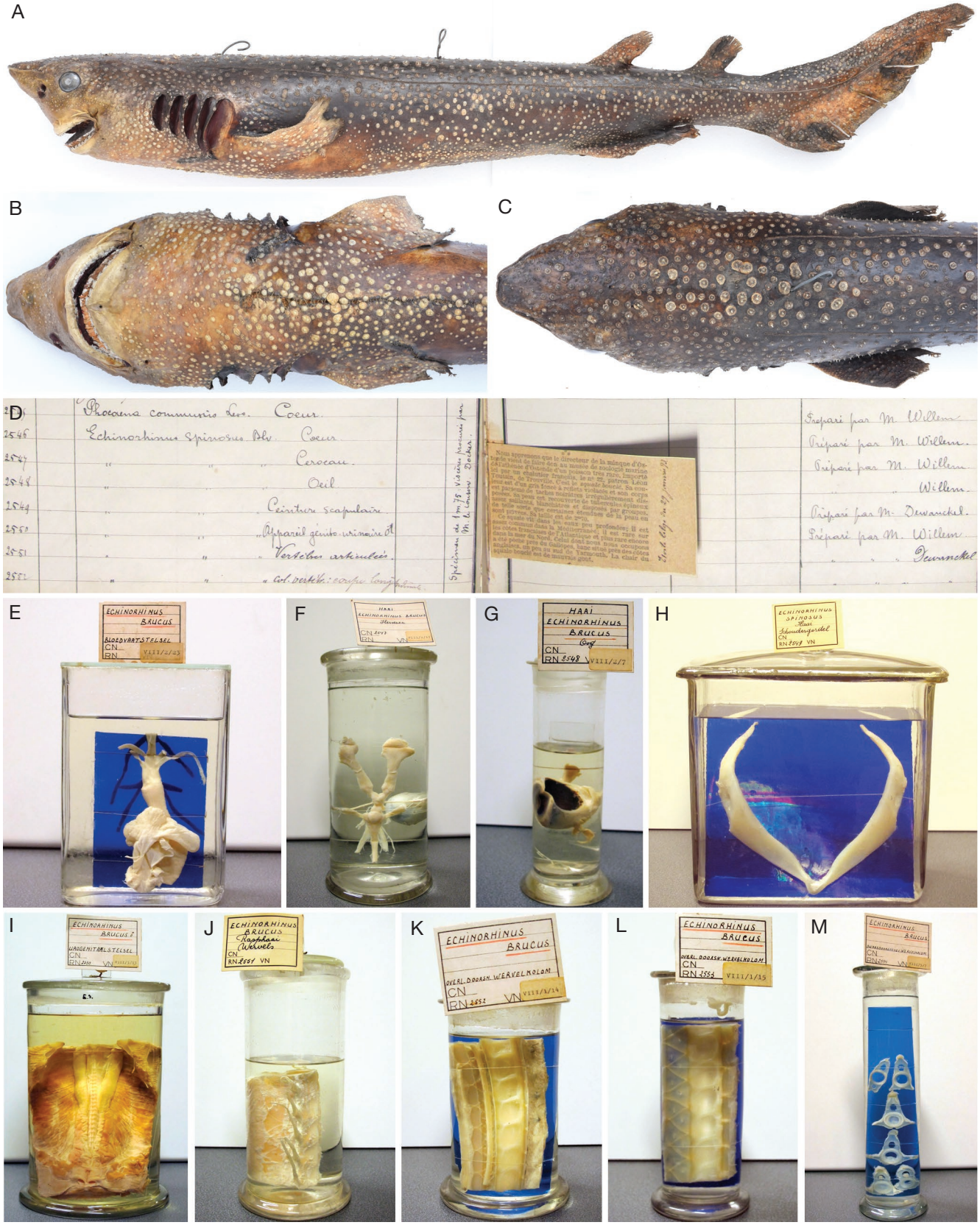


FIG. 3. — *Echinorhinus brucus* (Bonnaterre, 1788) in Belgian (Bonheiden and Ghent) collections: **A**-**C**, ERB* 1080, taxidermied skin (Entry 9); **D**-**M**, UGMD RE_2546 to UGMD RE_2554, anatomical preparations (Entries 21 to 29). All material originates from a single male specimen [INDIVIDUAL-009], Galloper Bank, North Sea (January 1893), spread over two collections.

the International Fisheries Exhibition in Berlin by Günther (1880; Fig. 28A), showing one of several Italian expositions, and representing the oldest Bramble shark photo to our knowledge. According to an exhibition catalogue (Gasco 1880; Doderlein 1880), at least two Bramble sharks were present at the exhibition (i.e., one from the University of Genoa, and another from the University of Palermo), but, in view of the other associated species on the photo [e.g. the Shortfin Mako shark *Isurus oxyrinchus* Rafinesque, 1810, the Basking shark *Cetorhinus maximus* (Gunnerus, 1765), the Atlantic torpedo *Tetronarce nobiliana* (Bonaparte, 1835)], the specific set-up on the photo was identified as the one from the University of Genoa (not Palermo). However, to complicate things, two Bramble sharks were once present at the University of Genoa, one of which has been preserved to date, but without any informative label. After careful consideration, the Berlin photo was tentatively linked to the specimen that has survived at the University (see IZUG unregistered, Entry 119 and reference therein). The second photo of a preserved Bramble shark was taken at the Penzance Natural History Society Museum, by Gibson of Scilly & Sons (*c.* 1900; Fig. 42A). The museum collection once included a Bramble shark that was caught in Mount's Bay in 1865, but also a second specimen (caught in 1870) was planned to go to the museum. However, it is unclear if the latter specimen ever made it to PZNAS collections. Consequently, the photo was tentatively linked to the specimen that was caught in 1865 (not 1870), and that had been present in the museum for sure (PZNAS unregistered, Entry 216 and references therein).

In contrast to these old photos, manuscripts could often be linked to specific voucher material more easily. A discovery worth mentioning is that of a nice collection of manuscript letters by François-Joseph Cantraine (1827) in RMNH Archives, stating the exact date and location of a stuffed specimen in the Naturalis Biodiversity Center (Leiden) that had been considered without such data by its curators. Based on this new information, it now represents the second specimen of a Bramble shark ever in a museum collection, the first from the Mediterranean Sea, and the oldest museum specimen that has survived to date (RMNH.PISC.D.2561, Entry 144 and references therein). The first specimen that was collected and preserved in a museum was that of the holotype of *E. brucus*. Although fragments of the holotype might be still preserved at the Muséum national d'Histoire naturelle (MNHN, Paris), the specimen is presumed lost. Nonetheless, this survey resulted in the discovery of original drawings of the lost type, and additional manuscript material that points to the date and exact location of its capture (i.e., Bayonne, 1680). Since the publication of this discovery (Iglésias & Mollen 2020a, b), it became clear that the manuscript attributed to Du Verney & La Hire (1679-1680) was preceded with a draft version. This older version, now at the Österreichische Nationalbibliothek (Vienna), and attributed only to La Hire (1679-1680), represents a collation of original sketches that have been cut, arranged and pasted on plain plates (Entry 85 and references therein).

In several cases, specimens were obtained through professional dealers in natural history objects. The dealer's name that was encountered the most was that of 'Gal frères'. The 'Gal brothers' were at least involved in the acquisition of six, possibly seven Bramble sharks in the period 1865-1902 by natural history museums across Europe, i.e., the BMNH, London (Fig. 39F), the IRSNB, Brussels (Fig. 10A, D, F) [2 specimens], the MNHN, Paris (Fig. 23D, E), the NMW, Vienna (Fig. 6H), the ZMUC, Copenhagen (Fig. 16B), and less certainly, the MHNG, Genève. All these specimens from Gal frères originate from the Mediterranean Sea, and the Ligurian Sea in particular (Entries 5, 16, 17, 45, 58, 92 and 191), and are either dried taxidermies or in liquid. Other names of dealers that were encountered more than once during this survey were that of Laurent de Gréaux (also for specimens from the Ligurian Sea, in the 1860s; Entries 68, 86 and 94) and that of (Jules) Verreaux (for specimens from South Africa, in the 1830s; Entries 93 and 145).

DISCUSSION

Availability of geographical data and collection dates

In order to unravel the Bramble shark's relative abundance and geographical distribution in time based on individual records, the availability of associated geographical data and collection dates is crucial. Unexpectedly, such information is present for about 157 individual specimens (out of a total of 169 individuals), and thus omnipresent compared to individual data such as the sex, length and weight of the specimen that are regularly lacking. Without going into details, the individual specimens originate from Europe (n = 99), Africa (n = 42), South America (n = 18) and North America (n = 7). For another three individuals, the origin is unknown. The African records are mainly from southern Africa (n = 36), and western Africa (n = 5). In terms of oceanographic origin, the European records originate almost equally from the Mediterranean Sea (n = 49), and the north-eastern Atlantic (n = 47). For the other three remaining European specimens, this information is not present. For the majority of the specimens (n = 90), the date of capture was registered, or could be found in associated literature, unpublished manuscripts or in other archival material. In many cases, the 'first registration' in the collection followed soon after the date of capture. Consequently, such 'first registrations' offered a good alternative for dating specimens for which the exact collection date was unknown (n = 60). In most cases, the date of 'capture' or 'first registrations' was straightforward, but in 18 cases, these dates were deduced based on other available information, such as the chronology of collection numbers. In the rare event that such dates were unavailable, but specimens had been published, the date of their 'first publication' was used as a proximal date (n = 10). Even though this alternative dating methodology might result in an underestimation of their true age in some cases, and thus resulting in a 'delay' in their reporting, this effect is rather negligible when dealing with the complete set of data.

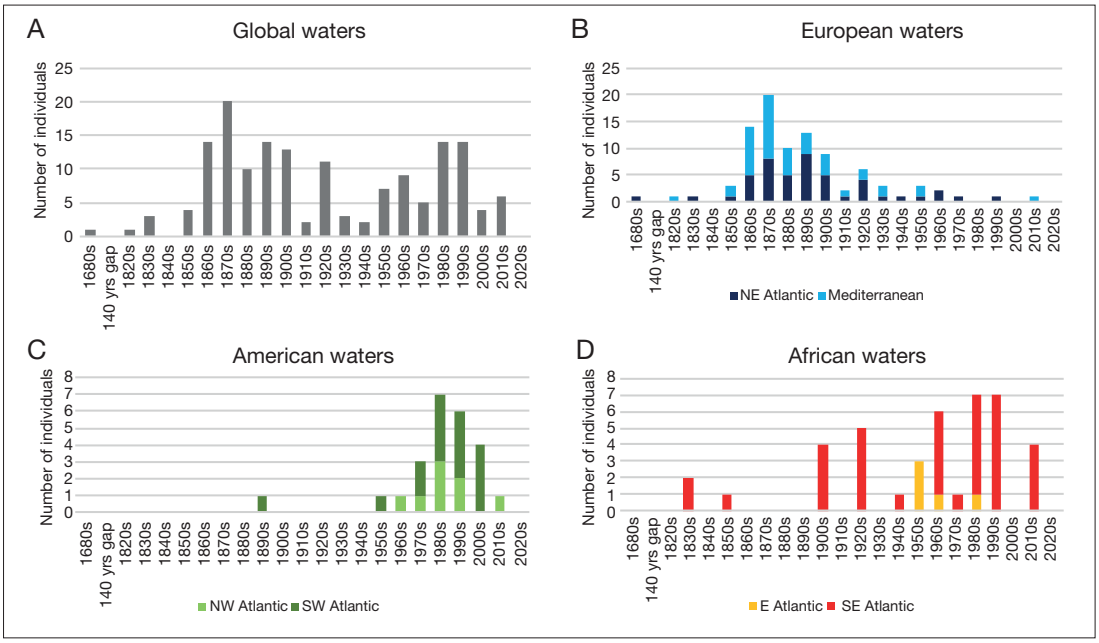


Fig. 4. — Numbers of individual Bramble sharks *Echinorhinus brucus* (Bonnaterre, 1788) in natural history collections worldwide, dated and grouped per decade (this survey, n = 157): **A**, Global waters (the Atlantic Ocean); **B**, European waters, including the north-eastern Atlantic Ocean and the Mediterranean Sea; **C**, American waters, including the north-western and the south-western Atlantic Ocean; **D**, African waters, including the eastern and the south-eastern Atlantic Ocean.

Trends in the collection of *E. brucus* material

The collection of material is first documented from Europe (1680 for the north-eastern Atlantic Ocean; 1827 for the Mediterranean), followed by Africa (1837), South America (1898) and finally North America (1968) where *E. brucus* records have always been extremely rare (Table 2A). For the African continent, the 'begin dates' clearly follow the colonial occupation, starting with South Africa (1830s – English occupation), followed by Namibia (*c.* 1890s – German occupation), and finally western Africa (1950s – French occupation). After the first specimen was recorded in the 17th century, no collection records are known from the 18th century. After this century-long break in collecting, 68 specimens were recorded in the 19th century, followed by 81 specimens in the 20th century. Since the beginning of the 21st century, only 10 specimens have been collected to our knowledge (Table 1C). For another nine specimens, the collection date is unknown.

Exactly 338 years span between the most ancient (1680) and the most recent collection records (2018), resulting in an average collection rate of almost 0.5 specimens per year (n = 169). This average doubles to more than 1.1 specimens each year if the large gap between the first (1680) and the second (1827) specimen is not taken into account. The period between 1870 and 1880 is the most productive decade, with an average collection rate of 2.0 specimens per year. This first peak in the number of individuals that were collected is mainly due to European records (Fig. 4A, B). Both for the Mediterranean Sea and the north-eastern Atlantic Ocean, collection rates started to increase rapidly in the 1860s, with an absolute peak in the 1870s and 1880s respectively. As fast as the collection rates increased, these rates decreased again in the following decades. The collection of 'new' specimens from European waters became quite rare from the 1920s onwards. Possible collection biases can be observed in the 1910s and the 1940s, during the First and the Second World War respectively. As a result of the latter, some museum collections also suffered great losses, including Bramble sharks. Nevertheless, some specimens that were destroyed or got lost, remain documented to date (e.g. MSNM 2008, Entry 123; Fig. 29C). A second peak in the number of individuals that were collected worldwide is situated in the 1980-1990s (Fig. 4A), and mainly a result from specimens that originate from American and African waters combined (Fig. 4C, D). More detailed analyses of these historic data are beyond the scope of this paper and will be dealt with in a later phase of the *Bramble shark Cold Case*, when records from all other data sources have been made available. As for now, we can conclude that 64 collection specimens (out of 169 individuals in total) represent new records to the scientific community and provide valuable data such as geographical origin and collection date. As such, the results of this inventory of natural history collections will contribute to conservation issues for this iconic, little-known and endangered shark species.

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patience and ever-recurring helpfulness have been appreciated enormously. Many of them also welcomed us to visit the collections and libraries under their care. They are too numerous to acknowledge here, but all their names are listed in Appendices 2, 3, and for each entry separately. We apologise for any shortcomings in this list. In addition, special thanks go to the librarian teams of The British Library, the Institut Royal des Sciences Naturelles de Belgique and the Vlaams Instituut voor de Zee (VLIZ, Belgium), and to Chilekwa Chisala and Fons Verheyde in particular, for chasing (grey) literature that was hard to find. The same applies for Keith Armishaw (SACGB and Angling Heritage, UK) and Kevin Clifford (ex Carp Fishing News Ltd). Both reviewers, María Cristina Oddone (FURG, Brazil) and Fabrizio Serena (IRBIM, Italy), are thanked for their constructive comments. The same applies to Anne Mabille (MNHN, France) for editorial help. Finally, this paper is dedicated to the memory of Jacques Herman (ex IRSNB, Belgium), John [Jack] Musick (VIMS, US) and Carolus Maria Vooren (FURG, Brazil), three remarkable colleagues who passed away too early and in the final stage of our Bramble shark correspondence.

Photo credits

Individuals and institutions to be credited for photographs used in this paper are Sergio Bogan, CFA (Fig. 5A-C), Gustavo E. Chiaramonte, MACN (Fig. 5D, E), Aleksanedr Naseka, NMW (Fig. 6A-J), Australian Museum, Sydney (Fig. 7A-C, F), Patricia Egan, AMS (Fig. 7D, E), Martin F. Gomon, NMV (Fig. 8A-C), María Cristina Oddone, FURG (Fig. 11A-G), Museu Oceanográfico Univali (Fig. 12A-D), Getúlio Rincón, UFMA (Fig. 13A-D), Muséum d'Histoire naturelle, Genève (Fig. 14A), Naturhistorisches Museum Basel (Fig. 14B), Národní muzeum, Prague (Fig. 14C), Dagmar Beermann (Fig. 15A), Simon Weigmann, Hamburg (Fig. 15K, L), Marcus Anders Krag (Fig. 16A-C), Gema Solís Fraile, MNCN (Fig. 16D-F), Direction du Patrimoine naturel et environnemental, Bayonne (Fig. 17B), Musée des Confluences, Lyon (Fig. 18A, E, G), Elena A. Luchetti, ex MNHN (Fig. 19D), Marie-Laure Guérin, MHNN (Fig. 20C-E), Cédric Audibert, MHNL (Fig. 25A), Sylvain Adnet, USTL (Fig. 25B), National Museum of Ireland – Natural History (Fig. 26A, C), Thomas Barreau, MNHN (Fig. 26B), Nicola Maio, ex CMSNF (Fig. 27A-E), Zentral- und Landesbibliothek Berlin (Fig. 28A), Dipartimento di Scienze della Terra dell'Ambiente e della Vita, IZUG (Fig. 28B), Museo Civico di Storia Naturale, Genova (Fig. 29A, B), Museo Civico di Storia Naturale di Milano (Fig. 29C), Museo di Storia Naturale dell'Università di Pavia (Fig. 29D-F), Simone Farina, MSNTC (Fig. 29G), Museo di Storia Naturale di Venezia (Fig. 30A-F), Museo Zoologico, Treviso (Fig. 30G), Jesús Alvarado Ortega, UNAM (Fig. 31A, B), Luis Del Moral-Flores, UNAM (Fig. 31C, D), Pepijn Kamminga, RMNH (Fig. 33A), Naturalis Biodiversity Center (Fig. 33C, F), Ronald de Ruiter, ex RMNH (Fig. 33E,I), Aquario Vasco da Gama, Lisboa (Fig. 34B, D), Ana Rufino, MZC (Fig. 34F), South African Institute for Aquatic Biodiversity (Fig. 35A-C), South African Museum (Fig. 35D-F), Melia Knecht, ABDUZ (Fig. 36A-C), Glasgow Museums Resource Centre (Fig. 37A), World Museum, National Museums Liverpool (Fig. 37B), Grant J. K. Jesse, World of Water, Heyop (Fig. 37C), The Science and Society Picture Library, London (Fig. 37D, E), Museums Sheffield (Fig. 37F), Trustees of the Natural History Museum, London (Figs 38A-D; 39A-J; 40A), National Museums of Scotland (Fig. 40B-G), Oxford University Museum of Natural History (Fig. 41A-O), Penlee House Gallery & Museum / Gibson of Scilly & Sons (Fig. 42A), Royal College of Surgeons of England (Fig. 42B), University Museum of Zoology, Cambridge (Fig. 42C-F), Robert H. Robins, FLMNH (Fig. 43A, B), Museum of Comparative Zoology, Harvard University (Fig. 43C), Gabriela M. Hogue, NCSM (Fig. 43D-H), Patrick Mark Harris (Fig. 43I, J), National Museum of Natural History, Washington D.C. (Fig. 43K) and Laboratorio de Ecología de Peces Marinos, Cumaná (Fig. 44A-D). All other photos were taken by the authors, Frederik H. Mollen, ERB (Figs 3A-M; 9D, E; 10A-K; 15B-J; 32A-C; 33B, D, G, H) and Samuel P. Iglésias, MNHN (Figs 9A-C; 17A; 18B-D, F, G; 19A-C; 20A, B; 21A-D; 22A-E; 23A-H; 24A-L; 34A, C, F, G).

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APPENDICES

Appendix 1. — List of institutional abbreviations and collections.

Public collections

ABDUZ	University Museums, University of Aberdeen;
AMS	Australian Museum, Sydney;
ANFC	Australian National Fish Collection, Hobart;
ASHNHC	Natural History Collections, University of Edinburgh;
AVG	Aquario Vasco da Gama, Lisboa;
BMB	Booth Museum of Natural History, Brighton;
BMNH	British Museum (Natural History), London;
CCU	Coastal Carolina University, Conway;
CFA	Fundación de Historia Natural Félix de Azara Colección, Universidad Maimónides, Buenos Aires;
CMSNF	Centro Musei delle Scienze Naturali e Fisiche, Università di Napoli Federico II, Naples;
CSIC	Consejo Superior de Investigaciones Científicas, Madrid;
CSIRO	Commonwealth Scientific and Industrial Research Organisation, Hobart;
Ec-501UDO	Laboratorio de Ecología de Peces Marinos, Departamento de Biología, Universidad de Oriente, Cumaná;
ERB(*)	Elasmobranch Research, Belgium (* for material that was integrated from other, historic collections, and that was not collected following the protocol by Mollen [2019]), Bonheiden;
FLMNH	Florida Museum of Natural History, University of Florida, Gainesville;
FURG	Universidade Federal do Rio Grande, Instituto de Ciências Biológicas, Rio Grande;
GAB-MOO	Muséum Gwenn-Aël Bolloré, Musée océanographique de l'Odet, Ergué-Gabéric;
GLAHM	The Hunterian (Zoology), University of Glasgow;
GMRC	Glasgow Museums Resource Centre, Glasgow;
GNM	Göteborg Natural History Museum, Göteborg;
HUMZ	Hokkaido University Museum, Sapporo;
ICM-CSIC	Instiut de Ciències del Mar – Consejo Superior de Investigaciones Científicas, Barcelona;
IFAN	Institut fondamental d'Afrique noire, Dakar;
IFREMER	Institut français de Recherche pour l'Exploitation de la Mer, station de La Rochelle – l'Houmeau;
IIPB	Instituto de Investigaciones Pesqueras de Barcelona;
IOR	Institute of Oceanography and Fisheries, Split;
IRBIM	Instituto per le Risorse Biologiche e le Biotecnologie Marine, Mazara del Vallo;
IRSNB	Institut Royal des Sciences naturelles de Belgique, Bruxelles;
(–) I.G.	Inventaire générale;
ISCM	Institut scientifique de Rabat;
IVSLA	Instituto Veneto di Scienze Lettere ed Arti, Venice;
IZUG	Instituto di Zoologia, Università degli Studi di Genova;
(–) DIP.TE.RIS	Dipartimento per lo Studio del Territorio e delle sue Risorse, Genoa;
(–) DISTAV	Dipartimento di Scienze della Terra dell'Ambiente e della Vita, Genoa;
KAO	Koninklijk Atheneum Oostende, Oostende;
KZNSB	KwaZulu-Natal Sharks Board, Durban;
LEAM	Laboratório de Elasmobrânquios e Aves Marinhas da FURG, Rio Grande;
LIVCM	World Museum, National Museums Liverpool;
LJVC	Leonard Joseph Victor Compagno, Cape Town;
MACN	Museo Argentino de Ciencias Naturales (B. Rivadavia), Buenos Aires;
MB	Museu Nacional de História Natural, Lisboa;
MBA	Marine Biological Association, Plymouth;
MCNC	Museu de Ciências Naturais do Cebeclim, Porto Alegre;
MCZ	Museum of Comparative Zoology, Harvard University, Cambridge;
MEFC	Museum of Economic Fish Culture (F. Buckland), London;
MGAB	Grigore Antipa National Museum of Natural History, Bucharest;
MHNB	Muséum d'Histoire naturelle de Bayonne;
MHNG	Muséum d'Histoire naturelle, Genève;
MHNL	Musée des Confluences, Lyon;
MHNLR	Muséum d'Histoire naturelle de La Rochelle;
MHNN	Muséum d'Histoire naturelle de Neuchâtel;
MHNNice	Muséum d'Histoire naturelle de Nice;
MHNN(T)	Muséum d'Histoire naturelle de Nantes;
MMB	Musée de la Mer, Biarritz;
MMNH	Muséum d'Histoire naturelle de Marseille;
MNCN	Museo Nacional de Ciencias Naturales, Madrid;
MNHN	Muséum national d'Histoire naturelle, Paris;
(–) CAC	Catalogue des collections de la galerie d'Anatomie comparée;
(–) CAG	Catalogue des anciennes galeries;
(–) JAC	Journal du laboratoire d'Anatomie comparée;
MOFURG	Universidade Federal do Rio Grande, Museu Oceanográfico Eliézer de C. Rios, Rio Grande;
MOM	Musée océanographique de Monaco;
MOVI	Museu Oceanográfico Univali, Universidade do Vale do Itajaí, Balneário Piçarras;
MPICI	Max Planck Institute of Colloids and Interfaces, Potsdam;
MPUW	Museum of Natural History, University of Wroclaw;
MRSNT	Museo Regionale di Scienze Naturali di Torino, Turin;
MSHF	Museums Sheffield, Natural History Collection, Sheffield;
MSNG	Museo Civico di Storia Naturale, Genova (G. Doria);
MSNM	Museo Civico di Storia Naturale di Milano, Milan;
MSNPV	Museo di Storia Naturale dell'Università di Pavia;
MSNTC	Museo di Storia Naturale e del Territorio, Università di Pisa (Calci);
MSNVE	Museo di Storia Naturale di Venezia (Fontego dei Turchi), Venice;
MTD F	Senckenberg Forschungsinstitut, Ichthyologie, Frankfurt am Main;
MZC	Museu Zoológico da Universidade de Coimbra;
MZGS	Museo Zoologico, Treviso (G. Scarpa);
MZPA	Museo di Zoologia, Università di Palermo (P. Doderlein);
MZUF	Museo di Storia Naturale di Firenze (La Specola), Florence;
MZULG	Aquarium-Muséum de l'Université de Liège;
NCSM	North Carolina Museum of natural Sciences, Raleigh;
NHMC	Natural History Museum of Crete, Iraklion;
NHMO	Natural History Museum, University of Oslo;
NHMUK	Natural History Museum, London and Tring;
NMBA	Naturhistorisches Museum Basel, Basel;
NMBE	Naturhistorisches Museum der Burgergemeinde Bern;
NMI	National Museum of Ireland (Natural History), Dublin;
NMNHS	National Museum of Natural History, Sofia;
NMP	Národní muzeum, Prague;
NMR	Natuurhistorisch Museum Rotterdam;

NMSZ	National Museums Scotland, Edinburgh;
NMV	Museums Victoria, Melbourne;
NMW	Naturhistorisches Museum, Wien;
NMWZ	National Museum Wales (Natural Sciences), Cardiff;
NOAA	National Oceanic and Atmospheric Administration, Washington D.C.;
NRM	Swedish Museum of Natural History, Stockholm;
ORI	Oceanographic Research Institute, Durban;
OUMNH	Oxford University Museum of Natural History, Oxford;
PEM	Port Elizabeth Museum, Port Elizabeth;
PEMM	Porth Enys Museum, Mousehole (Baily's Museum);
PML	Plymouth Marine Laboratory, Plymouth;
PMR	Natural History Museum Rijeka;
PZNAS	Penzance Natural History Society's Museum, Penzance;
RCSI	Royal College of Surgeons in Ireland, Dublin;
RCSL	Royal College of Surgeons of England (Hunterian), London;
RMNH	Naturalis Biodiversity Center, Leiden;
RUSI	Rhodes University, J.L.B. Smith Institute of Ichthyology, Rhodes;
SAIAB	South African Institute for Aquatic Biodiversity, Grahamstown;
SAM	South African Museum, IZIKO, Cape Town;
SFM	Scottish Fisheries Museum, Anstruther;
SMF	Senckenberg Naturmuseum, Frankfurt;
SMNS	Staatliches Museum für Naturkunde, Stuttgart;
SZN	Stazione Zoologica, Napoli (A. Dohrn), Naples;
TMU	Tromsø University Museum, Tromsø;
TU	Tulane University Museum of Natural History, New Orleans;
UAA	University of Alaska Anchorage, Anchorage;
UCBL	Université Claude Bernard Lyon 1, Musée Testut-Latarjet des Sciences Médicales, Rillieux-la-Pape;
UERJ	Universidade do Estado do Rio de Janeiro;
UFMA	Universidade Federal do Maranhão, São Luís;
UFRJ	NUPEM Universidade Federal do Rio de Janeiro – Núcleo de Pesquisas Ecológicas de Macaé;
UGMD	Museum voor Dierkunde, Universiteit Gent;
UMZC	University Museum of Zoology, Cambridge;
UNAM	Universidad Nacional Autónoma de México;
(–) CMR	Colección de Material Reciente para Comparación, Museo María del Carmen Perrilliat, Instituto de Geología, México City;
UNESP	São Paulo State University, São Paulo;
USNM	National Museum of Natural History (Smithsonian), Washington D.C.;
USTL	Université de Montpellier, UM2-ISEM, Montpellier;
V&A	Victoria and Albert Museum (ex South Kensington Museum), London;
VIMS	Virginia Institute of Marine Science, Glaucester Point;
VM	Vitenskapsmuseet, Trondheim;
ZIN	Zoological Institute, Russian Academy of Sciences, St. Petersburg;
ZMB	Museum für Naturkunde, Berlin;
ZMH	Zoologisches Museum, Hamburg;
ZMUB	University Museum of Bergen (Natural History), ;
ZMUC	Zoologisk Museum, Københavns Universitet;
ZMZ	Zoological Museum, University of Zurich.

Private collections

coll. D&M	collection Dirk C. Hovestadt & late Maria Hovestadt-Euler, Terneuzen;
coll. PMH	collection Patrick Mark Harris, New Port Richey;
coll. RM	collection Rui Marques, Mamarrosa.

Other acronyms

DKGSWA	Deutsche Kolonialgesellschaft für Südwest-Afrika;
DSWA	Deutsch-Südwestafrika;
IUCN / UICN	International Union for the Conservation of Nature, Gland;
REVIZEE	Recursos Vivos na Zona Econômica Exclusiva do Brasil;
SFPA	Sea-Fisheries Protection Authority, Dublin.

APPENDIX 2. — Material list of Bramble shark *Echinorhinus brucus* (Bonnaterre, 1788) in natural history collections worldwide, following the methodology described in the main text. Material of Bramble shark populations from the Indian Ocean (*Echinorhinus* sp.) is not included.

The list is ordered by country and museum / collection, both in alphabetical order. The general structure of each entry is presented as follows:

Entry number. [INDIVIDUAL-number] COLLECTION NUMBER (alternative and ex collection numbers).

VOUCHER. — Description of material and preservation / gutted / stuffed / mounted / dried / in alcohol [located / not located / not seen / (here presumed) lost / destroyed, date]; tissue sample; link with other entries.

INDIVIDUAL DATA. — Sex (male / female / sex unknown) / cm TL (preserved / reconstructed / estimated) / kg TW (gutted) [alternative, original metrics / conflicting data].

DATE. — Month / day / year (caught / first registration / first publication) [conflicting data].

CAPTURE. — City / region / country / continent / Bay / Sea / Ocean / coordinates (if not published before) / station / depth / fishing gear / vessel [conflicting data].

REMARK. — Individuals involved in securing the specimen / specimen on public display / extreme individual in terms of date or size / etc.

REFERENCES. — Authors (year / page and illustration numbers) / (none, here presumed) unpublished.

INFO. — Persons (mostly curators) who provided information [lab / log / crd / dat / ms / pic / pub / com]. Fig.

AR – ARGENTINA

MACN – MUSEO ARGENTINO DE CIENCIAS NATURALES (B. RIVADAVIA)

Entry 1. [INDIVIDUAL-001] MACN unregistered

VOUCHER. — Material and preservation unknown [not located, here presumed lost].

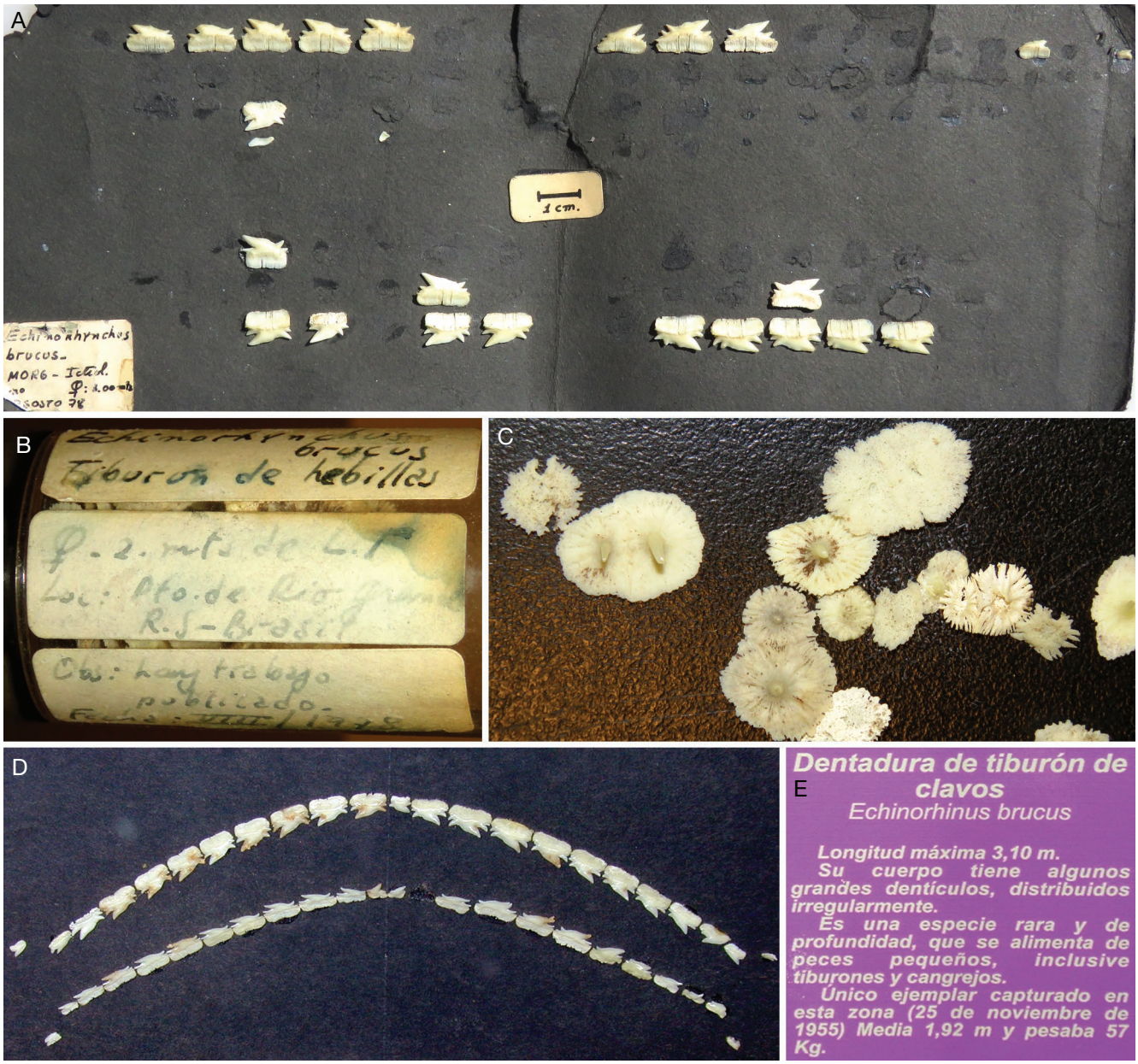


FIG. 5. — *Echinorhinus brucus* (Bonnaterre, 1788) in Argentinian (Buenos Aires) collections: **A**-**C**, CFA–IC–9219 (Entry 234); **D**, **E**, MACN unregistered (Entry 2).

INDIVIDUAL DATA. — Sex unknown, 250 cm TL, weight unknown.

DATE. — 1898 (first registration) or before.

CAPTURE. — Near Buenos Aires, Argentina, South America, Mar del Plata, south-western Atlantic Ocean.

REMARK. — Specimen donated by Francisco Rodogno; extreme individual in terms of date for the south-western Atlantic Ocean (Table 2A).

REFERENCES. — Berg (1898a: 6, 10; b: 10), Bigelow & Schroeder (1948: 530; 1953: 57), McCormick *et al.* (1963: 358) and Barcellos & Pinedo (1980: 71-72).

INFO. — Gustavo E. Chiaramonte (MACN) [pub, com].

Entry 2. [INDIVIDUAL-002] MACN unregistered

VOUCHER. — Complete tooth set, dried (all stuck on a piece of black cardboard) [located, seen, one tooth missing].

INDIVIDUAL DATA. — Sex unknown, 192 cm TL, 57 kg TW.

DATE. — November 25, 1955 (caught).

CAPTURE. — Argentina, South America, south-western Atlantic Ocean.

REMARK. — Specimen on public display at the Puerto Quequén Hydrobiological Station (MACN field station) [June 2021]; extreme individual in terms of date for the south-western Atlantic Ocean (Table 2A).

REFERENCES. — None, here presumed unpublished.

INFO. — Gustavo E. Chiaramonte (MACN) [lab, pic, com]. Fig. 5D, E.

AT – AUSTRIA

NMW – Naturhistorisches Museum, Wien

Entry 3. [INDIVIDUAL-003] NMW 3065 (Cerutti 3496, field number)

Voucher. — Complete specimen, gutted, in alcohol [located, seen].

Individual data. — Male, 93 cm TL (preserved), weight unknown.

Date. — Unknown.

Capture. — Nice, Alpes-Martimes, France, Europe, Ligurian Sea, Mediterranean Sea.

Remark. — Specimen from Cerutti (first name unknown) [?perhaps a misspelling for the Italian marine biologist Attilio Cerruti, 1878/9-1956].

References. — None, here presumed unpublished.

Info. — Anja Palandačić, Alexander Naseka and Ernst Mikschi (all NMW) [lab, dat, pic, com]. Fig. 6A-C.

Entry 4. [INDIVIDUAL-004] NMW 50137

Voucher. — Complete specimen, gutted, stuffed, dried and mounted (in alcohol until 1998) [located, seen].

Individual data. — Female, 170 cm TL (preserved), weight unknown.

Date. — 1884 (caught).

Capture. — Nice, Alpes-Martimes, France, Europe, Ligurian Sea, Mediterranean Sea (according to old label and NMW logbook) [Genoa (Italy) according to Hauer (1886); here presumed erroneous].

Remark. — We here presume that the specimen was once on public display at least from 1896 to 1925 (as fish number '63'); specimen now in bad condition; restoration project planned [December 2020].

References. — Hauer (1886: 22; 1889: 256; 1896: 269-270; 1904: 272-273; 1909: 273; 1910: 273; 1912: 273; 1914: 275; 1917: 275; 1918: 266; 1924: 265; 1925: 265).

Info. — Anja Palandačić, Alexander Naseka and Ernst Mikschi (all NMW) [lab, log, dat, crd, pic, pub, com]. Fig. 6D-G.

Entry 5. [INDIVIDUAL-005] NMW 85158

Voucher. — Complete specimen, gutted, in alcohol [located, seen].

Individual data. — Female, 67 cm TL (preserved), weight unknown.

Capture. — Nice, Alpes-Martimes, France, Europe, Ligurian Sea, Mediterranean Sea.

Date. — November 15, 1910 (first registration, according to label on jar).

Remark. — Specimen from Gal frères (dealer), donated by Franz Steindachner.

References. — None, here presumed unpublished.

Info. — Anja Palandačić, Alexander Naseka and Ernst Mikschi (all NMW) [lab, dat, pic, com]. Fig. 6H-J.

AU – AUSTRALIA

AMS – Australian Museum, Sydney

Entry 6. [INDIVIDUAL-006] AMS B.6711 (also as AMS I.1751)

Voucher. — Complete specimen, gutted, stuffed and dried [located, seen].

Individual data. — Male, length unverified, weight unknown.

Date. — May 1885 (first registration), and registered again in April 1888 (as I.1751); I.1751 'destroyed' according to AMS digital database (accessed June 2017), here presumed erroneous [i.e., a duplicate registration (entry), not a second (lost) specimen according to curators; a view followed here].

Capture. — Tuscany, Italy, Europe, Mediterranean Sea.

Remark. — Specimen acquired by exchange with Enrico H. Giglioli of the Museo di Storia naturale di Firenze (La Specola, MZUF); original correspondence of this transaction has been preserved (Giglioli 1885, Letter 117/1885; Ramsay 1885, Ex. Sch. 21/1885).

References. — Whitley (1931: 311) and Fowler (1941: 278-279).

Info. — Mark A. McGrouther (retired), Amanda C. Hay and Patricia Egan (all AMS) [lab, log, dat, ms, pic, pub, com]. Fig. 7A-F.

NMV – Museums Victoria, Melbourne

Entry 7. [INDIVIDUAL-007] NMV 51369

Voucher. — Complete specimen, preservation unknown [not located, here presumed lost].

Individual data. — Male, 152 cm TL (5 ft), weight unknown.

Date. — May 5, 1887 (first registration), but NMV logbook (Anonymous [s.d.]a: 209-210) reads 'From Gerrard, 1851' [a date followed here].

Capture. — Mediterranean.

Remark. — None.

References. — McCoy (1887: 167).

Info. — Martin F. Gomon and Dianne J. Bray (both NMV) [log, pub, com]. Fig. 8A.

Entry 8. [INDIVIDUAL-008] NMV A15734

Voucher. — Jaw (disarticulated), dried [located, seen].

Individual data. — Sex, length and weight unknown.

Capture. — Unknown [specimen might be of European or Indo-Australian origin].

Date. — Unknown; the oldest label reads 'NRK 1/69' referring to its observation by palaeoichthyologist Noel R. Kemp in January 1969.

Remark. — Labels mention two species names, i.e., *Echinorhinus brucus* and *E. mccoyi*; this jaw (note: disarticulated) perhaps might be a relic of NMV 51369 (INDIVIDUAL-007, Entry 7) that is presumed lost.

References. — None, here presumed unpublished.

Info. — Martin F. Gomon and Dianne J. Bray (both NMV) [lab, pic, com]. Fig. 8B, C.



FIG. 6. — *Echinorhinus brucus* (Bonnaterre, 1788) in Austrian (Vienna) collections: **A**-**C**, NMW 3065 (Entry 3); **D**-**G**, NMW 50137 (Entry 4); **H**-**J**, NMW 85158 (Entry 5).



FIG. 7. — *Echinorhinus brucus* (Bonnaterre, 1788) in Australian (Sydney) collections: **A**-**F**, AMS B.6711 (Entry 6).

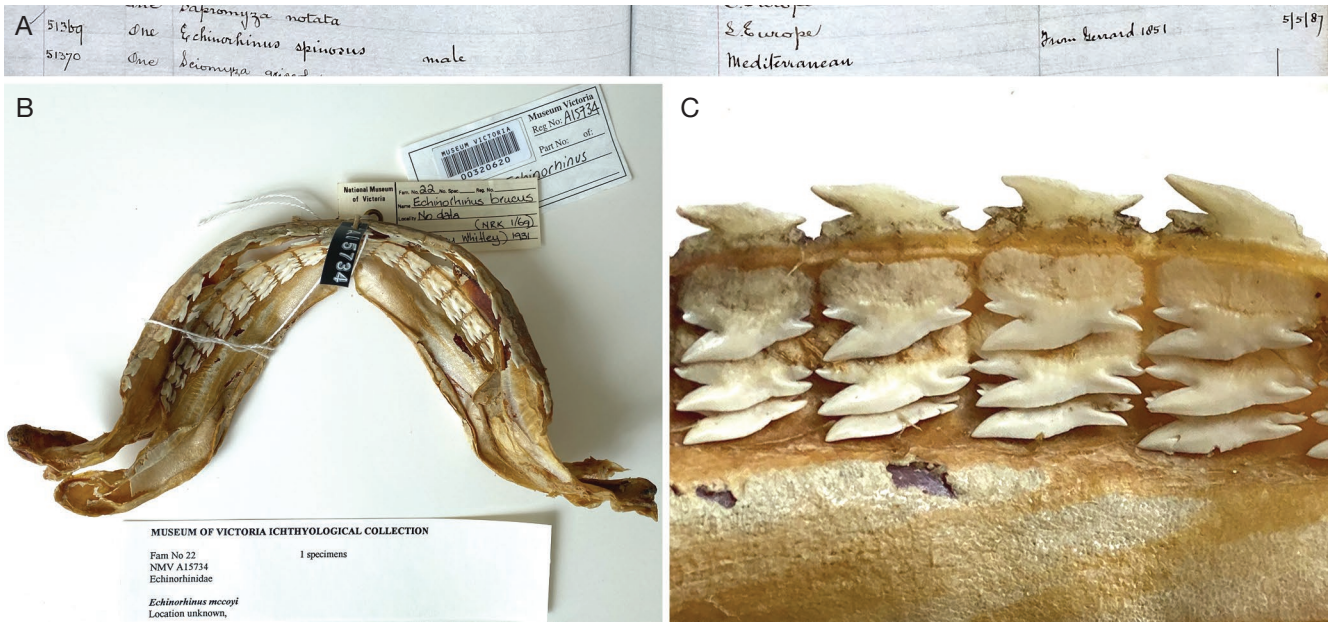


Fig. 8. — *Echinorhinus brucus* (Bonnaterre, 1788) in Australian (Melbourne) collections (continuation): **A**, NMV 51369 (Entry 7); **B**, **C**, NMV A15734 (Entry 8).

BE – BELGIUM

ERB – Elasmobranch Research, Belgium

Entry 9. [INDIVIDUAL-009] ERB* 1080

Voucher. — Complete specimen, gutted, stuffed, dried and mounted (the latter since 2016) [located, seen]; tissue sample taken by Frederik H. Mollen and forwarded to Samuel P. Iglésias (BPS-3068), subsample sent to Gavin J. P. Naylor (GN 17354); anatomical preparations of this specimen have been preserved at the Museum voor Dierkunde, Universiteit Gent (see UGMD RE_2546, RE_2547, RE_2548, RE_2549 RE_2550, RE_2551, RE_2552, RE_2553 and RE_2554, Entries 21-29).

Individual data. — Male, 175 cm TL (fresh, according to UGMD logbook), 157 cm TL (preserved) [270 cm TL according to Anonymous (1893a: 1; 1893b: 2; 1893c: 45), presumed erroneous by Rappé (1984), a view followed here], weight unknown.

Date. — January 1893 (caught).

Capture. — Suffolk, England, United Kingdom, Europe, Galloper Bank, North Sea; commercial trawler *Trouville n° 22* ('patron' Léon Toutain).

Remark. — Specimen collected and preserved by Vital Gilson of the Koninklijk Atheneum Oostende (unregistered) [transferred to ERB, May 14, 2015]; specimen CT-scanned by Frank Hilte and Johan Bauwens at ZNA hospitals, Antwerp (June 24, 2015).

References. — Anonymous (1893a: 1; 1893b: 2; 1893c: 45; 1893d: 89), Beneden (1894: 871-872), Poll (1947: 71), Rappé (1984: 113-115; 1985: 36); Castro (2011: 46 – '1893, all during the summer') [note that the 1893 specimen was caught in the European winter], Anonymous (2014: 15, 23), Assche (2015: 19), Jauquet (2015: 38), Mollen *et al.* (2016: 63-66, figs 1-5), Iglésias & Mollen (2018: 2, unnumbered fig.), Mollen (2019: 295), Iglésias (2020: 40-41, pl. 18) and Buekenhoudt (2020: 11 – photo).

Info. — Berlinda Willaert (KAO) and Frederik H. Mollen (ERB) [lab, log, dat, pic, pub, com]. Fig. 3A-C.

Entry 10. [INDIVIDUAL-010] ERB 1157

Voucher. — Two separate tissue samples (one of the muscles, one of the liver), in alcohol (frozen) [located, seen]; subsample sent to Gavin J. P. Naylor (GN 17759).

Individual data. — Female, length and weight unknown.

Date. — December 6, 2010 (caught).

Capture. — Turkey, Europe, northern Aegean Sea, Mediterranean Sea; trawl.

Remark. — Sample donated by Cem Dalyan; five colour photos showing the Bramble shark on display at an outdoor market stall of a local fish monger; the only known tissue sample taken from a fresh specimen in Europe; extreme individual in terms of date for the Mediterranean Sea (Table 2B).

References. — None, here presumed unpublished.

Info. — Cem Dalyan (Fatih, Istanbul) [lab, log, dat, pic, com].

Entry 11. [INDIVIDUAL-011] ERB 1206

Voucher. — Complete specimen, gutted, stuffed, dried (frozen until 2020) [located, seen], and internal organs and tissue samples, frozen [located, seen]; tissue subsample sent to Gavin J. P. Naylor (GN 19545).

Individual data. — Male, 105.8 cm TL, 8.3 kg TW.

Date. — First half of August 2018 (caught).

Capture. — Namibia, Africa, south-eastern Atlantic Ocean, between 20°45.6'S, 12°40.5'E and 21°10.4'S, 12°45.0'E; 329-338 m depth (180-185 fth); bottom trawl; commercial vessel *Milestone* (Freddie Fish Processors); targeting Devil anglerfish *Lophius vomerinus* Valenciennes, 1837.

Remark. — Specimen donated by Klaas Post (NHR); specimen stuffed by Bernard Bourlès (tadixermist, Concarneau); extreme individual in terms of date for the south-eastern Atlantic Ocean (Table 2B).

References. — Unpublished.

Info. — Wayne Hart (Freddie Fish Processors) and Klaas Post (NHR) [lab, log, dat, pic, com]. Fig. 9A-C.

Entry 12. [INDIVIDUAL-012] ERB 1208

Voucher. — Complete specimen, gutted, frozen [located, seen], and internal organs and tissue samples, frozen [located, seen]; tissue subsample sent to Gavin J. P. Naylor (GN 19547).

Individual data. — Female, 144.4 cm TL, 19.0 kg TW.

Date. — First half of August 2018 (caught).

Capture. — Namibia, Africa, south-eastern Atlantic Ocean, between 20°45.6'S, 12°40.5'E and 21°10.4'S, 12°45.0'E; 329-338 m depth (180-185 fth); bottom trawl; commercial vessel *Milestone* (Freddie Fish Processors); targeting *Lophius vomerinus*.

Remark. — Specimen donated by Klaas Post (NHR); a donation of this specimen to MNHN was planned (February 2022); extreme individual in terms of date for the south-eastern Atlantic Ocean (Table 2B).

References. — Unpublished.

Info. — Wayne Hart (Freddie Fish Processors) and Klaas Post (NHR) [lab, log, dat, pic, com].

Entry 13. [INDIVIDUAL-013] ERB 1209

Voucher. — Complete specimen, gutted, frozen [located, seen], and internal organs and tissue samples, frozen [located, seen]; tissue subsample sent to Gavin J. P. Naylor (GN 19548).

Individual data. — Male, 81.3 cm TL, 3.2 kg TW.

Date. — First half of August 2018 (caught).

Capture. — Namibia, Africa, south-eastern Atlantic Ocean, between 20°45.6'S, 12°40.5'E and 21°10.4'S, 12°45.0'E; 329-338 m depth (180-185 fth); bottom trawl; commercial vessel *Milestone* (Freddie Fish Processors); targeting *Lophius vomerinus*.

Remark. — Specimen donated by Klaas Post (NHR); a donation of this specimen to MNHN was planned (February 2022); extreme individual in terms of date for the south-eastern Atlantic Ocean (Table 2B).

References. — Unpublished.

Info. — Wayne Hart (Freddie Fish Processors) and Klaas Post (NHR) [lab, log, dat, pic, com].

Entry 14. [INDIVIDUAL-014] ERB* 1286 (ex R.397 Jean Cadenat)

Voucher. — Jaw, dried [located, seen], and seven isolated teeth, dried (in gold, for SEM photography) [located, seen]; tissue sample from jaw taken by Samuel P. Iglésias (BPS-2902); tissue subsample sent to Gavin J. P. Naylor (GN 17353); a sectioned tooth of this specimen has been preserved in the private collection of Dirk C. Hovestadt & late Maria Hovestadt-Euler (see coll. D&M unregistered, Entry 141).

Individual data. — Sex, length and weight unknown [female, 228 cm TL according to Herman & Ladeuze [s.d.] and Herman *et al.* (1989a – in part); female, 240 cm TL according to Herman *et al.* (1989a – in part) and Herman & Van Waes (2014)].

Date. — 1958 (caught) [1852 according to Herman & Van Waes (2014), presumed erroneous by Mollen (2019), a view followed here].

Capture. — Kayar, Region of Thiès, Senegal, Africa, eastern Atlantic Ocean [Belgium, North Sea according to Herman *et al.* (1989a – in part) and Herman & Van Waes (2014), presumed erroneous by Mollen (2019), a view followed here].

Remark. — Specimen from Jean Cadenat (IFAN, Gorée); see detailed discussion by Mollen (2019); specimen transferred to Jacques Herman collection in 1983, and later (*c.* 2014), to Elasmobranch Research, Belgium (ERB); possibly an extreme individual in terms of size for the eastern Atlantic Ocean (Table 2C).

References. — Herman & Ladeuze [s.d.], Herman *et al.* (1989a: 102, 106, 135, text-pl. 1, pl. 1; 1989b: 8, fig. 4), Hovestadt & Hovestadt-Euler (1993: pl. 1), Herman *et al.* (2003: 15, text-fig. 49), Herman & Van Waes (2014: 283, pl. 15, figs 1-3) and Mollen (2019: 295-296).

Info. — Jacques Herman (IRSNB, retired) and Frederik H. Mollen (ERB) [lab, ins, crd, dat, pic, pub, com]. Fig. 9D, E.

IRSNB – Institut royal des Sciences naturelles de Belgique

Entry 15. [INDIVIDUAL-015] IRSNB 64 (I.G. 8912)

Voucher. — Jaw (disarticulated), dried [located, seen]; tissue sample taken by Frederik H. Mollen and forwarded to Samuel P. Iglésias (BPS-3083), subsample sent to Gavin J. P. Naylor (GN 17359).

Individual data. — Sex, length and weight unknown.

Date. — 1892 (caught).

Capture. — Europe, (presumed north-eastern) Atlantic Ocean.

Remark. — Specimen from A. Daimeries.

References. — Casier (1961: 49, fig. 34).

Info. — Sébastien Bruaux (IRSNB), Frederik H. Mollen (ERB) and Dirk C. Hovestadt [lab, ins, log, dat, pic, pub, com]. Fig. 10A, B.

Entry 16. [INDIVIDUAL-016] IRSNB 2224 (I.G. 6861)

Voucher. — Complete specimen, gutted, in alcohol [located, seen]; tissue sample taken by Frederik H. Mollen and forwarded to Samuel P. Iglésias (BPS-3079), subsample sent to Gavin J. P. Naylor (GN 17355).

Individual data. — Male, *c.* 110 cm TL (preserved), weight unknown.

Date. — April 3, 1902 (first registration).

Capture. — Unknown, but presumably Nice, Alpes-Maritimes, France, Europe, Ligurian Sea, Mediterranean Sea, because of its origin.

Remark. — Specimen purchased from Gal frères (dealer); identified by Louis Giltay in 1928; specimen transferred to a plastic recipient after the original glass jar broke when opened by the curator (September 11, 2014).

References. — None, here presumed unpublished.

Info. — Sébastien Bruaux (IRSNB) and Frederik H. Mollen (ERB) [lab, log, dat, pic, com]. Fig. 10A, C, D.



Fig. 9. — *Echinorhinus brucus* (Bonnaterre, 1788) in Belgian (Bonheiden) collections (continuation): **A**-**C**, ERB 1206 (Entry 11); **D**, **E**, ERB* 1286 (ex R.397) (Entry 14).

Entry 17. [INDIVIDUAL-017] IRSNB 2224B (I.G. 6861)

Voucher. — Complete specimen, gutted, in alcohol [located, seen]; tissue sample taken by Frederik H. Mollen and forwarded to Samuel P. Iglésias (BPS-3080), subsample sent to Gavin J. P. Naylor (GN 17356).

Individual data. — Female, *c.* 120 cm TL (preserved), weight unknown.

Date. — April 3, 1902 (first registration).

Capture. — Unknown, but here presumed Nice, Alpes-Maritimes, France, Europe, Ligurian Sea, Mediterranean Sea, because of its origin.

Remark. — Specimen purchased from Gal frères (dealer), identified by Louis Giltay in 1928.

References. — None, here presumed unpublished.

Info. — Sébastien Bruaux (IRSNB) and Frederik H. Mollen (ERB) [lab, log, dat, pic, com]. Fig. 10A, E, F.

Entry 18. [INDIVIDUAL-018] IRSNB 2224C (I.G. 6888; ex 217 Raymond Storms)

Voucher. — Braincase, jaw and hyoid arch, all in anatomical connection, dried [located, seen]; tissue sample taken by Frederik H. Mollen and forwarded to Samuel P. Iglésias (BPS-3081), subsample sent to Gavin J. P. Naylor (GN 17357).

Individual data. — Sex, length and weight unknown.

Date. — 1891 (caught).

Capture. — Nice, Alpes-Maritimes, France, Europe, Ligurian Sea, Mediterranean Sea.

Remark. — Specimen donated by Raymond Storms; identified by Louis Giltay in 1928.

References. — None, here presumed unpublished.

Info. — Sébastien Bruaux (IRSNB) and Frederik H. Mollen (ERB) [lab, ins, log, dat, pic, com]. Fig. 10A, G, H.

Entry 19. [INDIVIDUAL-019] IRSNB 2225 (I.G. 6888; ex 517 Raymond Storms)

VOUCHER. — Jaw, dried [located, seen], and two isolated teeth, dried (stored in separate tubes) [located, seen]; tissue sample taken by Frederik H. Mollen and forwarded to Samuel P. Iglésias (BPS-3082), subsample sent to Gavin J. P. Naylor (GN 17358).

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — 1895 (caught).

CAPTURE. — Nice, Alpes-Maritimes, France, Europe, Ligurian Sea, Meditarranean Sea.

REMARK. — Specimen donated by Raymond Storms; identified by Louis Giltay in 1928. *Reference* – Casier (1961: 31, fig. 16; in footnote 40 'n° 6888/2235' should be read 'n° 6888/2225').

INFO. — Sébastien Bruaux (IRSNB), Frederik H. Mollen (ERB) and Dirk C. Hovestadt [lab, ins, log, dat, ms, pic, pub, com]. Fig. 10A, I, J.

Entry 20. [INDIVIDUAL-020; this number is based on the voucher material and is not necessarily linked to the reference] IRSNB 24897

VOUCHER. — Jaw, dried [located, seen]; tissue sample taken by Frederik H. Mollen and forwarded to Samuel P. Iglésias (BPS-3084), subsample sent to Gavin J. P. Naylor (GN 17360).

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — Unknown, but apparently old.

CAPTURE. — Unknown.

REMARK. — Specimen from a laboratory of the Katholieke Universiteit Leuven (transferred to IRSNB in 2011); species name '*Echinorhinus spinosus*' noted in old handwriting on the lower jaw; perhaps this jaw originates from a specimen of 213 cm TL (sept pieds) seen (and collected?) by Pierre Joseph Van Beneden (1870, 1871: iv, footnote 1), who was the curator of the natural history collections at the Koningscollege (Katholieke Universiteit Leuven) at that time.

REFERENCE. — ?None, here presumed unpublished.

INFO. — Wim Wouters (IRSNB) and Frederik H. Mollen (ERB) [lab, ins, pic, com]. Fig. 10K.

UGMD – MUSEUM VOOR DIERKUNDE, UNIVERSITEIT GENT

Entry 21. [INDIVIDUAL-009] UGMD RE_2546

VOUCHER. — Heart, in alcohol [located, seen]; other anatomical preparations of this specimen have been preserved at UGMD (see UGMD RE_2547 to RE_2554, Entries 22-29); stuffed skin of this specimen has been preserved, initially at the Koninklijk Atheneum Oostende (KAO), now at Elasmobranch Research, Belgium (see ERB* 1080, Entry 9).

INDIVIDUAL DATA. — Male, 175 cm TL (fresh, according to UGMD logbook), weight unknown.

DATE. — January 1893 (caught).

CAPTURE. — Galloper Bank, Suffolk, England, United Kingdom, Europe, North Sea; commercial trawler *Trouville n° 22* ('patron' Léon Toutain).

REMARK. — Specimen dissected by G. Docker (curator at UGMD).

REFERENCES. — Anonymous (1893a: 1; 1893b: 2; 1893c: 45; 1893d: 89), Beneden (1894: 871-872), Poll (1947: 71), Rappé (1984: 113-115; 1985: 36); Castro (2011: 46 – '1893, all during the summer') [note that the 1893 specimen was caught in the winter], Anonymous (2014: 15, 23), Assche (2015: 19), Jauquet (2015: 38), Mollen *et al.* (2016: 63-66, figs 1-5), Iglésias & Mollen (2018: 2, fig.), Mollen (2019: 295), Iglésias (2020: 40-41, pl. 18) and Buekenhoudt (2020: 11 - photo).

INFO. — Dominick Verschelde (UGMD) and Frederik H. Mollen (ERB) [lab, log, pic, pub, com]. Fig. 3D, E.

Entry 22. [INDIVIDUAL-009] UGMD RE_2547

VOUCHER. — Brain with eye, in alcohol [located, seen].

INDIVIDUAL DATA, DATE, CAPTURE, REMARK, REFERENCES AND INFO. — See UGMD RE_2546 (Entry 21). Fig. 3D, F.

Entry 23. [INDIVIDUAL-009] UGMD RE_2548

VOUCHER. — Eye, in alcohol [located, seen]; tissue sample taken by Frederik H. Mollen and forwarded to Samuel P. Iglésias (BPS-3085), subsample sent to Gavin J. P. Naylor (GN 17361).

INDIVIDUAL DATA, DATE, CAPTURE, REMARK, REFERENCES AND INFO. — See UGMD RE_2546 (Entry 21). Fig. 3D, G.

Entry 24. [INDIVIDUAL-009] UGMD RE_2549

VOUCHER. — Pectoral girdle, in alcohol [located, seen]; tissue sample taken by Frederik H. Mollen and forwarded to Samuel P. Iglésias (BPS-3086), subsample sent to Gavin J. P. Naylor (GN 17362).

INDIVIDUAL DATA, DATE, CAPTURE, REMARK, REFERENCES AND INFO. — See UGMD RE_2546 (Entry 21). Fig. 3D, H.

Entry 25. [INDIVIDUAL-009] UGMD RE_2550

VOUCHER. — Male urogenital system, in alcohol [located, seen, but apparently not *E. brucus*]; content of the jar is clearly a dorsal portion of a skate [labels of two jars probably switched].

INDIVIDUAL DATA, DATE, CAPTURE, REMARK, REFERENCES AND INFO. — See UGMD RE_2546 (Entry 21). Fig. 3D, I.

Entry 26. [INDIVIDUAL-009] UGMD RE_2551

VOUCHER. — Section of vertebral column, in alcohol [located, seen].

INDIVIDUAL DATA, DATE, CAPTURE, REMARK, REFERENCES AND INFO. — See UGMD RE_2546 (Entry 21). Fig. 3D, J.

Entry 27. [INDIVIDUAL-009] UGMD RE_2552

VOUCHER. — Vertebrae, longitudinal section, in alcohol [located, seen]; tissue sample taken by Frederik H. Mollen and forwarded to Samuel P. Iglésias (BPS-3087), subsample sent to Gavin J. P. Naylor (GN 17363).

INDIVIDUAL DATA, DATE, CAPTURE, REMARK, REFERENCES AND INFO. — See UGMD RE_2546 (Entry 21). Fig. 3D, K.



Fig. 10. — *Echinorhinus brucus* (Bonnaterre, 1788) in Belgian (Brussels) collections (continuation): **A**, IRSCNB Register; **B**, IRSCNB 64 (Entry 15); **C**, **D**, IRSNB 2224 (Entry 16); **E**, **F**, IRSNB 2224B (Entry 17); **G**, **H**, IRSNB 2224C (Entry 18); **I**, **J**, IRSNB 2225 (Entry 19); **K**, IRSNB 24897 (Entry 20).

Entry 28. [INDIVIDUAL-009] UGMD RE_2553

Voucher. — Vertebrae, longitudinal section of neural arch, in alcohol [located, seen].

Individual data, date, capture, remark, references and info. — See UGMD RE_2546 (Entry 21). Fig. 3D, L.

Entry 29. [INDIVIDUAL-009] UGMD RE_2554

Voucher. — Vertebrae, six transverse sections, in alcohol [located, seen].

Individual data, date, capture, remark, references and info. — See UGMD RE_2546 (Entry 21). Fig. 3D, M.

BR − BRAZIL

FURG – Universidade Federal do Rio Grande – Instituto de Ciências Biológicas

Entry 30. [INDIVIDUAL-021] FURG CC00173

Voucher. — Eyes, left nostril, and a portion of the vertebral column, in alcohol [located, seen].

Individual data. — Sex, length and weight unknown.

Date. — February 20, 2004 (caught).

Capture. — Brazil, South America, south-western Atlantic Ocean.

Remark. — None.

References. — None, here presumed unpublished.

Info. — María Cristina Oddone (FURG) [lab, pic, com]. Fig. 11A-D.

Entry 31. [INDIVIDUAL-022] FURG MO 189

Voucher. — Jaw, dried [located, seen].

Individual data. — Sex unknown, 260 cm TL, weight unknown.

Date. — August 28, 1989 (caught).

Capture. — Santa Luzia, Brazil, South America, south-western Atlantic Ocean; 60m depth.

Remark. — Specimen transferred from the 'Instituto de Oceanografia' (Carolus M. Vooren) to the 'Instituto de Ciências Biológicas', same campus, by María Cristina Oddone in 2016; 'MO' probably refers to (ex) 'Museu Oceanográfico' of the Universidade Federal do Rio Grande (MOFURG).

References. — None, here presumed unpublished.

Info. — María Cristina Oddone (FURG) [lab, ins, dat, pic, com]. Fig. 11E.

Entry 32. [INDIVIDUAL-023] FURG MO 190

Voucher. — Jaw, dried [located, seen].

Individual data. — Female, 294 cm TL, weight unknown.

Date. — September 9, 1989 (caught).

Capture. — Rio Grande do Sul, Brazil, South America, south-western Atlantic Ocean.

Remark. — Specimen transferred from the 'Instituto de Oceanografia' (Carolus M. Vooren) to the 'Instituto de Ciências Biológicas', same campus, by María Cristina Oddone in 2016; 'MO' probably refers to (ex) 'Museu Oceanográfico' of the Universidade Federal do Rio Grande (MOFURG).

References. — None, here presumed unpublished.

Info. — María Cristina Oddone (FURG) [lab, ins, dat, pic, com]. Fig. 11F.

Entry 33. [INDIVIDUAL-024] FURG MO 268

Voucher. — Jaw, dried [located, seen].

Individual data. — Female, 285 cm TL, weight unknown.

Date. — October 15, 1993 (caught) [according to label vs October 15, 1983, according to digital database; here presumed less likely in view of the chronology of FURG MO collection numbers].

Capture. — Rio Grande do Sul, Brazil, South America, south-western Atlantic Ocean.

Remark. — Specimen transferred from the 'Instituto de Oceanografia' (Carolus M. Vooren) to the 'Instituto de Ciências Biológicas', same campus, by María Cristina Oddone in 2016; 'MO' probably refers to (ex) 'Museu Oceanográfico' of the Universidade Federal do Rio Grande (MOFURG).

References. — None, here presumed unpublished.

Info. — María Cristina Oddone (FURG) [lab, ins, dat, pic, com]. Fig. 11G.

MOFURG – Fundação Universidade Federal do Rio Grande – Museu Oceanográfico Eliézer de C. Rios

Entry 34. [INDIVIDUAL-025] MOFURG 79-020 (CFA-IC-9219)

Voucher. — Jaw, vertebral column and some dermal denticles, ?dried [not located]; however, material from this specimen has recently been located at CFA-IC (see Entry 234).

Individual data. — Female, 207.6 cm TL, weight unknown.

Date. — August 16, 1978 (caught).

Capture. — Near Rio Grande, South Region of Brazil, South America, south-western Atlantic Ocean; 35m depth; bottom trawl; commercial vessel *Abel I*.

Remark. — Coordinates given by Barcellos & Pinedo (1980) in abstract (i.e., 33°10'S, 53°40'W) differ from those given in the introduction (i.e., 35°10'S, 53°40'W).

References. — Barcellos & Pinedo (1980: 71-72, 74, fig. 1B, C).

Info. — none [pub].

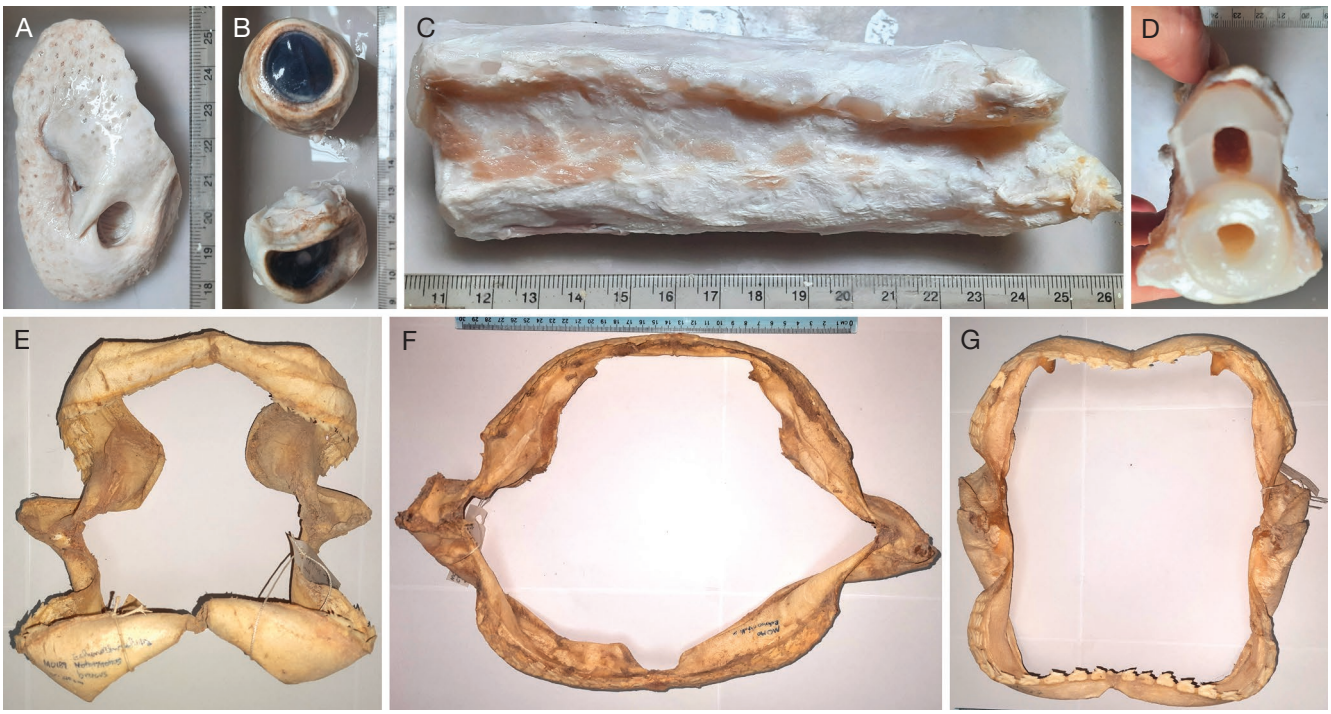


Fig. 11. — *Echinorhinus brucus* (Bonnaterre, 1788) in Brazilian (Rio Grande) collections: **A**-**D**, FURG CC00173 (Entry 30); **E**, FURG MO 189 (Entry 31); **F**, FURG MO 190 (Entry 32); **G**, FURG MO 268 (Entry 33).

Entry 35. [INDIVIDUAL-026] MOFURG 79-021

Voucher. — Jaw, ?dried [not located].

Individual data. — Female, 300 cm TL.

Date. — October 1978 (caught).

Capture. — Near Rio Grande, South Region of Brazil, South America, south-western Atlantic Ocean; bottom trawl; commercial vessel *Abel I*.

Remark. — Extreme individual in terms of size for the south-western Atlantic Ocean and all other oceans (Table 2C).

References. — Barcellos & Pinedo (1980: 72).

Info. — none [pub].

MOVI – Museu Oceanográfico Univali, Universidade do Vale do Itajaí

Entry 36. [INDIVIDUAL-027] MOVI 08572

Voucher. — Complete specimen, gutted, in alcohol [located, not seen].

Individual data. — Male, 202.0 cm TL, 44 kg TW.

Date. — July 30, 1997 (caught).

Capture. — Rio Grande do Sul, South Region of Brazil, South America, south-western Atlantic Ocean; 240 m depth; bottom longline; commercial vessel *FV Master Fish*.

Remark. — Specimen collected and donated by P. C. Rodrigues; two colour photos (MOVI Archives), showing Jules M. R. Soto with the dissected specimen (internal organs, such as bi-lobated liver, are displayed on the dissection table); another colour photo of gutted specimen entered on Fishbase by Otto B. F. Gadig (December 11, 2001).

References. — Soto (2001: 91), Gadig (2001: 50, 315), Soto & Mincarone (2004: 82) and Deynat (2010: 151).

Info. — Jules M. R. Soto, Bibiana da Conceicao Lessa (both MOVI) and Michael M. Mincarone (ex MOVI, now UFRJ–NUPEM) [dat, pic, pub, com]. Fig. 12A.

Entry 37. [INDIVIDUAL-028] MOVI 10158

Voucher. — Set of seven photos, four in colour, three in black and white (not a biological sample) [located, seen].

Individual data. — Female, length and weight unknown.

Date. — July 1985 (caught).

Capture. — Off Cassino beach, Rio Grande, Rio Grande do Sul, South Region of Brazil, South America, south-western Atlantic Ocean; bottom gillnet.

Remark. — Specimen from the Museu de Ciências Naturais do Cebeclim (MCNC, Porto Alegre) [unregistered]; dermal denticles small and numerous; possibly an extreme individual in terms of date for the south-western Atlantic Ocean (Table 2A).

References. — Soto (2001: 91) and Soto & Mincarone (2004: 82).

Info. — Jules M. R. Soto, Bibiana da Conceicao Lessa (both MOVI) and Michael M. Mincarone (ex MOVI, now UFRJ–NUPEM) [dat, pic, pub, com]. Fig. 12B, C.

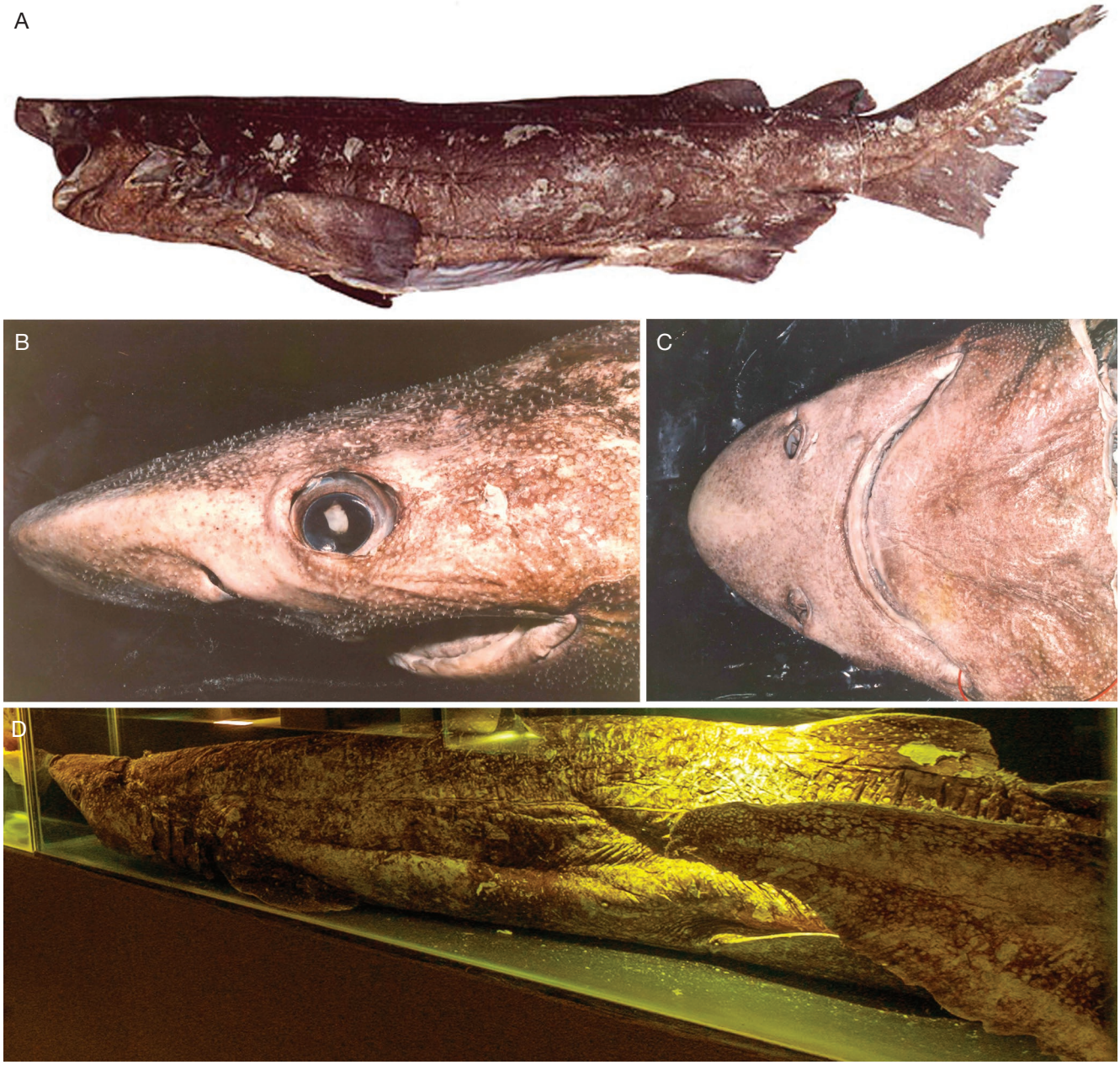


FIG. 12. — *Echinorhinus brucus* (Bonnaterre, 1788) in Brazilian (Balneário Piçarras) collections (continuation): **A**, MOVI 08572 (Entry 36); **B**, **C**, MOVI 10158 (Entry 37); **D**, MOVI 26229 (Entry 39).

Entry 38. [INDIVIDUAL-029] MOVI 24560 (ex LEAM 25)

VOUCHER. — Head, in alcohol [located, not seen].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — 1980s (caught).

CAPTURE. — Rio Grande do Sul, South Region of Brazil, South America, south-western Atlantic Ocean.

REMARK. — Collected and donated by Carolus M. Vooren; specimen from the Laboratório de Elasmobrânquios e Aves Marinhas (LEAM, FURG), transferred to MOVI (September 18, 2002).

REFERENCES. — Soto (2001: 91) and Soto & Mincarone (2004: 82).

INFO. — Jules M. R. Soto, Bibiana da Conceicao Lessa (both MOVI) and Michael M. Mincarone (ex MOVI, now UFRJ–NUPEM) [dat, pub, com].

Entry 39. [INDIVIDUAL-030] MOVI 26229

VOUCHER. — Complete specimen, ?gutted and stuffed, in alcohol [located, seen].

INDIVIDUAL DATA. — Female, 298.0 cm TL, weight unknown.

DATE. — April 23, 2002 (caught).

CAPTURE. — Rio Grande do Sul, South Region of Brazil, South America, south-western Atlantic Ocean; 420 m depth; bottom trawl; commercial vessel *FV Sambaqui III*.

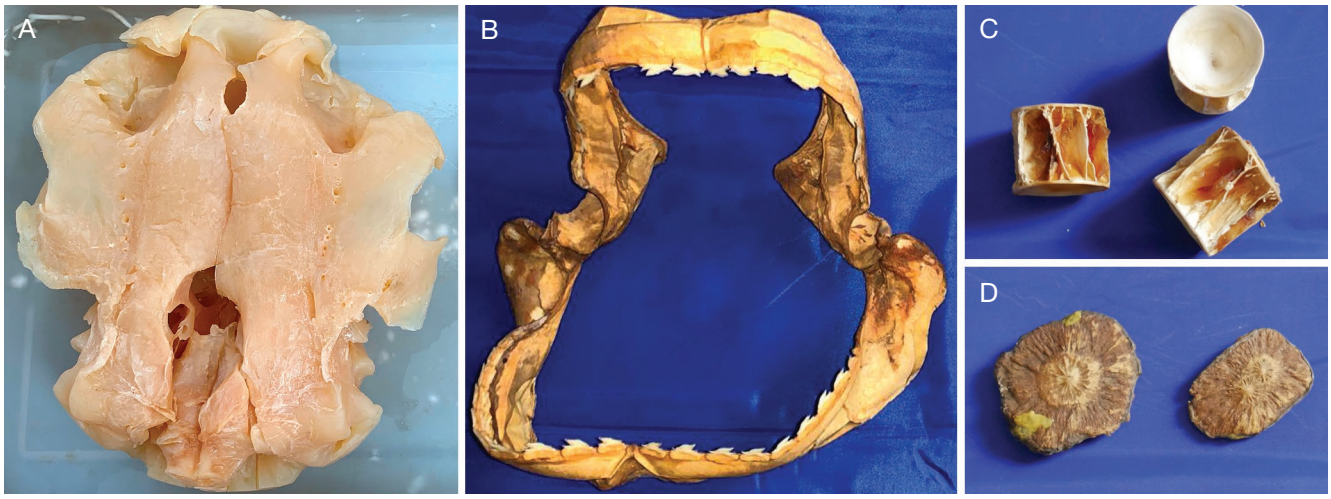


Fig. 13. — *Echinorhinus brucus* (Bonnaterre, 1788) in Brazilian (Balneário Piçarras) collections (continuation): **A-C**, 'REVIZEE 1997' (Entry 42); **D**, 'REVIZEE 1998' (Entry 43).

Remark. — Collected and donated by A. Cordeiro; specimen on public display (in a large fish tank) [March 2021]; extreme individual in terms of size for the south-western Atlantic Ocean and all other oceans (Table 2C) [largest alcohol specimen in the world].

References. — Soto (2001: 91) and Soto & Mincarone (2004: 82).

Info. — Jules M. R. Soto, Bibiana da Conceicao Lessa (both MOVI) and Michael M. Mincarone (ex MOVI, now UFRJ–NUPEM) [lab, dat, pic, pub, com]. Fig. 12D.

Entry 40. [INDIVIDUAL-031] MOVI 27470

Voucher. — Complete specimen, ?gutted, in alcohol [located, not seen].

Individual data. — Female, 222.0 cm TL, 58 kg TW.

Date. — October 13, 2002 (caught).

Capture. — Rio Grande do Sul, South Region of Brazil, South America, south-western Atlantic Ocean; 150 m depth; bottom gillnet; commercial vessel *FV Galena Dourada*.

Remark. — Specimen collected and donated by C. A. Costa.

References. — Soto (2001: 91) and Soto & Mincarone (2004: 82).

Info. — Jules M. R. Soto, Bibiana da Conceicao Lessa (both MOVI) and Michael M. Mincarone (ex MOVI, now UFRJ–NUPEM) [dat, pub, com].

Entry 41. [INDIVIDUAL-032] MOVI 37569

Voucher. — Complete specimen, ?gutted, in alcohol [located, not seen].

Individual data. — Female, 197.0 cm TL, 37.5 kg TW.

Date. — October 10, 2004 (caught).

Capture. — Rio Grande do Sul, South Region of Brazil, South America, south-western Atlantic Ocean; 120 m depth; bottom trawl; commercial vessel *Columbus III*.

Remark. — Specimen collected and donated by J. R. Nascimento; extreme individual in terms of date for the south-western Atlantic Ocean (Table 2B).

References. — Soto (2001: 91) and Soto & Mincarone (2004: 82).

Info. — Jules M. R. Soto, Bibiana da Conceicao Lessa (both MOVI) and Michael M. Mincarone (ex MOVI, now UFRJ–NUPEM) [dat, pub, com].

REVIZEE – Recursos Vivos na Zona Econômica Exclusiva do Brasil

Entry 42. [INDIVIDUAL-033] 'REVIZEE 1997' (Collection of Getúlio Rincón, unregistered)

Voucher. — Braincase, in alcohol [located, seen], jaw, dried [located, seen], and three vertebrae, dried [located, seen].

Individual data. — Male, 198 cm TL, 43 kg TW.

Date. — March 1997 (caught).

Capture. — Off the States of Ceará–Bahia, North-East Region of Brazil, South America, south-western Atlantic Ocean, between 06°12'14"S, 34°51'03"W and 06°15'57"S, 34°53'07"W; 70-330 m depth; bottom longline; research vessel *Prof. Martins Filho*.

Remark. — Lessa *et al.* (1999: 63) mention six specimens, but, to date, only four of them can be confirmed based on evidence (G. Rincón, pers. comm. February 12, 2021), two of which have been preserved in part (including this one).

References. — Rincón & Lessa (1998: 5-6), Lessa *et al.* (1999: 63), Rincón & Lessa (2000: 55) and Rincón *et al.* (2017: 91, tab. 2, not fig. 4l that is 'REVIZEE 1999a').

Info. — Getúlio Rincón (UFMA) [pic, pub, com]. Fig. 13A-C.

Entry 43. [INDIVIDUAL-034] 'REVIZEE 1998' (Collection of Getúlio Rincón, unregistered)

Voucher. — Pair of large dermal denticles, dried [located, seen].

Individual data. — Female, 288 cm TL, weight unknown.

DATE. — November 1998 (caught).

CAPTURE. — Off the States of Ceara-Bahia, North-East Region of Brazil, South America, south-western Atlantic Ocean, between 06°15'50"S, 34°50'50"W and 07°21'41"S, 34°27'25"W; 200-250 m depth; bottom longline; research vessel *Prof. Martins Filho*.

REMARK. — Lessa *et al.* (1999: 63) mention six specimens, but, to date, only four of them can be confirmed based on evidence (Rincón, pers. comm. February 12, 2021), two of which have been preserved in part (including this one).

REFERENCES. — Lessa *et al.* (1999: 63), Rincón & Lessa (2000: 55) and Rincón *et al.* (2017: 91, tab. 2, not fig. 4l that is 'REVIZEE 1999a').

INFO. — Getúlio Rincón (UFMA). Fig. 13D.

UERJ – UNIVERSIDADE DO ESTADO DO RIO DE JANEIRO

Entry 44. [?INDIVIDUAL-022 to INDIVIDUAL-026] AC.DBAV.UERJ.292

VOUCHER. — Single tooth from the lower jaw, dried [located, not seen].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — Unknown.

CAPTURE. — Rio Grande do Sul, South Region of Brazil, South America, south-western Atlantic Ocean.

REMARK. — Once collected by Ulisses L. Gomes from a jaw [(skeleton) at the Universidade Federal do Rio Grande (FURG)]; this tooth might match a specimen still present at (MO)FURG [?INDIVIDUAL-022, INDIVIDUAL-023, INDIVIDUAL-024, INDIVIDUAL-025 or INDIVIDUAL-026 (see Entries 31-35)].

REFERENCES. — Gomes *et al.* (1997: 92), Soto (2001: 91) and Gadig (2001: 315).

INFO. — Ulisses L. Gomes (UERJ) and Sarah T. F. L. Viana (SAIAB) [pub, com].

CH – SWITZERLAND

MHNG – MUSÉUM D'HISTOIRE NATURELLE, GENÈVE

Entry 45. [INDIVIDUAL-035] MHNG 1561.026

VOUCHER. — Complete specimen, gutted, stuffed and dried [located, seen].

INDIVIDUAL DATA. — Male, *c.* 146 cm TL (preserved), weight unknown.

DATE. — Unknown, but most likely 1870-1880 (first registration, by deduction, according to general purchase history of MHNG).

CAPTURE. — Nice, Alpes-Martimes, France, Europe, Ligurian Sea, Mediterranean Sea.

REMARK. — Most likely purchased from Gal frères (dealer), between 1870-1880 [presumption based on general information found in the museum logbooks; Mr. Perrot (year 1819) and François-Jules Pictet (period 1841-1843) are other hypotheses for its origin].

REFERENCES. — None, here presumed unpublished.

INFO. — Sonia Fisch-Muller (MHNG) [lab, pic, com]. Fig. 14A.

NMBA – NATURHISTORISCHES MUSEUM BASEL

Entry 46. [INDIVIDUAL-036] NMB-Ost 9520

VOUCHER. — Jaw, dried [located, seen].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — 1908 or before (first registration, by deduction, i.e., the death of Karl Rudolf Burckhardt).

CAPTURE. — Unknown, probably Italy, Europe, Mediterranean Sea.

REMARK. — Specimen donated by Samuel Schaub (1941), from the heritage of the late Professor Karl Rudolf Burckhardt [1866-1908]; this jaw perhaps matches one of two specimens studied by Burckhardt (1911, published posthumously) for their central nervous system (one of 120 cm TL, another of 200 cm TL), and also by Helbing (1904), but evidence is lacking.

REFERENCES. — Landoldt (1947: 354).

INFO. — Martin Schneider, Denis Vallan and Urs Wueest (all NMBA) [pic, pub, com]. Fig. 14B.

CZ – CZECH REPUBLIC

NMP – NÁRODNÍ MUZEUM, PRAGUE

Entry 47. [INDIVIDUAL-037] NMP6V 05253

VOUCHER. — Complete specimen, gutted, stuffed, dried and mounted [located, seen].

INDIVIDUAL DATA. — Male, 150.0 cm TL, weight unknown.

DATE. — 1898 (caught).

CAPTURE. — Nice, Alpes-Maritimes, France, Europe, Ligurian Sea, Mediterranean Sea.

REMARK. — Specimen on public display [April 2021].

REFERENCES. — Šanda & Maddalena (2003: 64).

INFO. — Radek Šanda (NMP) [pic, pub, com]. Fig. 14C.

DE – GERMANY

SMNS – STAATLICHES MUSEUM FÜR NATURKUNDE, STUTTGART

Entry 48. [INDIVIDUAL-038] SMNS 16252

VOUCHER. — Jaw, dried [located, seen].

INDIVIDUAL DATA. — Female, 190 cm TL, weight unknown.

DATE. — March 1979 (caught).

CAPTURE. — Specimen landed at Algeciras fish market, Province of Cádiz, Andalusia, Spain, Europe, Alboran Sea, Mediterranean Sea; but more likely caught along the southern Spanish-Portuguese coast, north-eastern Atlantic Ocean.



Fig. 14. — *Echinorhinus brucus* (Bonnaterre, 1788) in Swiss (Genève and Basel) and Czech (Prague) collections: **A**, MHNG 1561.026 (Entry 45); **B**, NMB-Ost 9520 (Entry 46); **C**, NMP6V 05253 (Entry 47).

Remark. — Specimen collected and donated by Wolf-Ernst Reif; dermal denticles on SEM-stubs were once housed in the Department of Geology and Paleontology, Tübingen University; in 1985, a transfer was announced regarding these SEM-stubs to Senckenberg Naturmuseum, Frankfurt (SMF) [not located].

References. — Reif (1985: 8, 90, pl. 15).

Info. — Ronald Fricke and Dagmar Beermann (both SMNS), Susanne Dorow (SMF) and Tilman J. Alpermann (ex SMF) [lab, dat, pic, pub, com]. Fig. 15A.

Entry 49. [INDIVIDUAL-039] SMNS 26050

Voucher. — Complete specimen, in alcohol [not located, here presumed lost (probably during WWII)].

Individual data. — Sex, length and weight unknown.

Date. — 1872 (caught).

Capture. — Unknown, but probably collected in the Gulf of Fréjus, Var, France, Europe, Mediterranean Sea.

Remark. — Specimen collected by Schlüter (first name unknown).

References. — None, here presumed unpublished.

Info. — Ronald Fricke and Dagmar Beermann (both SMNS) [dat, com].

ZMB – MUSEUM FÜR NATURKUNDE, BERLIN

Entry 50. [INDIVIDUAL-040] ZMB 4536

Voucher. — Complete specimen, gutted, dried (once stuffed, but not any more) [located, seen].

Individual data. — Male, 150 cm TL (preserved) [158 cm TL according to Hampe (1997)], weight unknown.

Date. — Between 1848-1860 (first registration, by deduction, i.e., during the curatorship of Wilhelm K. H. Peters at ZMB).

Capture. — Lisbon, Portugal, Europe, north-eastern Atlantic Ocean.

Remark. — Specimen donated by Wilhelm K. H. Peters, who possibly received the specimen from José Vincente Barbosa du Bocage; possibly an extreme individual in terms of date for the north-eastern Atlantic Ocean (Table 2A).

References. — Hampe (1997: 42-43, fig. 8).

Info. — Peter Bartsch and Edda Aßel (both ZMB) [lab, dat, pic, pub, com]. Fig. 15B-D.

Entry 51. [INDIVIDUAL-041] ZMB 12541 (in part)

Voucher. — Three embryos, in alcohol [located, seen].

Individual data. — Sex unknown, *c.* 10 cm TL, weight unknown, evidently from a mature female.

Date. — Between 1884-1915 (caught, by deduction), i.e., the period of the German Empire's colony in south-western Africa (Deutsch-Südwestafrika, DSWA).

Capture. — Walvis Bay, Namibia, Africa, south-eastern Atlantic Ocean.

Remark. — All three embryos, equal in length, are here presumed to originate from a single gravid female; embryos stored together with another, larger embryo (INDIVIDUAL-042, Entry 52) in the same jar; specimen donated by the Deutsche Kolonialgesellschaft für Südwest-Afrika (DKGSWA).

References. — None, here presumed unpublished.

Info. — Peter Bartsch and Edda Aßel (both ZMB) [lab, dat, pic, com]. Fig. 15E.

Entry 52. [INDIVIDUAL-042] ZMB 12541 (in part)

VOUCHER. — Embryo, in alcohol [located, seen].

INDIVIDUAL DATA. — Sex unknown, *c.* 30 cm TL, evidently from a mature female, weight unknown.

DATE. — Between 1884-1915 (caught, by deduction), i.e., the period of the German Empire's colony in south-western Africa (Deutsch-Südwestafrika, DSWA).

CAPTURE. — Walvis Bay, Namibia, Africa, south-eastern Atlantic Ocean.

REMARK. — Embryo stored together with three other embryos (INDIVIDUAL-041, Entry 51) in the same jar; donated by the Deutsche Kolonialgesellschaft für Südwest-Afrika (DKGSWA).

REFERENCES. — None, here presumed unpublished.

INFO. — Peter Bartsch and Edda Aßel (both ZMB) [lab, dat, pic, com]. Fig. 15E.

Entry 53. [INDIVIDUAL-043] ZMB 34908

VOUCHER. — Complete specimen, cut into 3 pieces, spread over two jars (head and caudal fin in one jar; abdomen in another), in alcohol [located, seen].

INDIVIDUAL DATA. — Male, *c.* 140 cm TL (reconstructed), weight unknown.

DATE. — 'März 03' (old label), here presumed March 1903 (caught).

CAPTURE. — Specimen from the 'Fischhalle' probably referring to the fish market of Hamburg, Germany, Europe, North Sea.

REMARK. — Three samples taken of the (open) lateral line (Frederik H. Mollen, July 10, 2018); subsequently scanned using micro-CT technology at Max Planck Institute of Colloids and Interfaces (MPICI), Potsdam and returned to ZMB thereafter (courtesy of Mason N. Dean).

REFERENCES. — None, here presumed unpublished.

INFO. — Peter Bartsch and Edda Aßel (both ZMB) [lab, dat, pic, com]. Fig. 15F, G.

Entry 54. [INDIVIDUAL-044] ZMB 34909

VOUCHER. — Incomplete specimen, cut into four pieces, spread over two jars (dissected head, including jaw and gill arches in one jar; vertebral column and fins in another), in alcohol [located, seen].

INDIVIDUAL DATA. — Female, *c.* 205 cm TL (estimated), weight unknown.

DATE. — 'März 03' (old label), here presumed March 1903 (caught).

CAPTURE. — Specimen from the 'Fischhalle', probably referring to the fish market of Hamburg, Germany, Europe, North Sea.

REMARK. — Gill arches with dermal papillae can be easily observed in this dissected specimen.

REFERENCES. — None, here presumed unpublished.

INFO. — Peter Bartsch and Edda Aßel (both ZMB) [lab, dat, pic, com]. Fig. 15H, I.

Entry 55. [?INDIVIDUAL-044] ZMB 34910

VOUCHER. — Skin portion (*c.* 40 cm in length and *c.* 10 cm wide), in alcohol [located, seen].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — Unknown.

CAPTURE. — Unknown.

REMARK. — This portion of skin might originate from ZMB 34909 (INDIVIDUAL-044, Entry 54).

REFERENCES. — None, here presumed unpublished.

INFO. — Peter Bartsch and Edda Aßel (both ZMB) [lab, dat, pic, com]. Fig. 15J.

Entry 56. [INDIVIDUAL-000] ZMB D2291

VOUCHER. — Vertebral column (skeleton), originally in glycerin [not located, here presumed lost].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — Unknown.

CAPTURE. — Unknown.

REMARK. — Specimen from the Anatomical Collection of the Medical Department of Anatomy; material from this collection was distributed among several institutions in Berlin around 1928.

REFERENCES. — None, here presumed unpublished.

INFO. — Peter Bartsch and Edda Aßel (both ZMB) [lab, com].

ZMH – ZOOLOGISCHES MUSEUM, HAMBURG

Entry 57. [INDIVIDUAL-045] ZMH 26192

VOUCHER. — Complete specimen, in alcohol [located, seen].

INDIVIDUAL DATA. — Male, *c.* 69.0 cm TL, weight unknown.

DATE. — Autumn 1966 (caught).

CAPTURE. — 'SW-Africa', referring to Namibia (formerly Deutsch-Südwestafrika, DSWA), Africa, south-eastern Atlantic Ocean; commercial vessel (Fang- und Verarbeitungsschiff) *FVS Walter Dehmel* (German Democratic Republic).

REMARK. — Specimen from the University of Rostock (donation).

REFERENCES. — None, here presumed unpublished.

INFO. — Simon Weigmann (Hamburg, Germany), Ralf Thiel and Irina Eidus (both ZMH) [lab, pic, com]. Fig. 15K, L.

DK – DENMARK

ZMUC – ZOOLOGISK MUSEUM, KØBENHAVNS UNIVERSITET

Entry 58. [INDIVIDUAL-046] ZMUC P2395309 (ex Jrn 436)

VOUCHER. — Jaw, dried [located, seen], and caudal portion of a vertebral column, dried [located, seen]; rest of the specimen discarded in 1963 according to an old note by Jørgen Nielsen in ZMUC catalogue fiche [destroyed].



Fig. 15. — *Echinorhinus brucus* (Bonnaterre, 1788) in German (Stuttgart, Berlin and Hamburg) collections: **A**, SMNS 16252 (Entry 48); **B**-**D**, ZMB 4536 (Entry 50); **E**, ZMB 12541 (Entries 51-52); **F**, **G**, ZMB 34908 (Entry 53); **H**, **I**, ZMB 34909 (Entry 54); **J**, ZMB 34910 (Entry 55); **K**, **L**, ZMH 26192 (Entry 57).

INDIVIDUAL DATA. — Male, length and weight unknown.

DATE. — 1876 (caught).

CAPTURE. — Nice, Alpes-Maritimes, France, Europe, Ligurian Sea, Mediterranean Sea.

REMARK. — Specimen from Gal frères (dealer); Christian Frederik Lütken (University of Copenhagen, Zoological Museum, now ZMUC) once sent a small piece of the dried vertebral column to Johannes Carl Franz Hasse.

REFERENCES. — Hasse (1882: 73, pl. 9) and Ridewood (1899: 347 – referring to Hasse).

INFO. — Peter R. Møller and Marcus A. Krag (both ZMUC) [lab, ins, log, pic, pub, com]. Fig. 16A-C.

ES − SPAIN

IIPB – INSTITUTO DE INVESTIGACIONES PESQUERAS DE BARCELONA

Entry 59. [INDIVIDUAL-047] IIPB 805/1981

VOUCHER. — Complete specimen, frozen [accidentally lost, destroyed].

INDIVIDUAL DATA. — Sex unknown, 122.0 cm TL, 11.0 kg TW.

DATE. — July 21, 1983 (caught) [August 21 (21-VIII) according to Lloris (1986), here presumed erroneous].

CAPTURE. — Namibia, Africa, south-eastern Atlantic Ocean; 289 m depth; BENGUELA V survey.

REMARK. — Specimen included in the results of previous surveys (Lloris 1986 – MUESTREOS), which explains the '1981' in the collection number.

REFERENCES. — Turón *et al.* (1986: 168, 172, 211) and Lloris (1986: 16, 92).

INFO. — Domingo Lloris (ICM-CSIC, retired) [pub, com].

MNCN – MUSEO NACIONAL DE CIENCIAS NATURALES, MADRID

Entry 60. [INDIVIDUAL-048] MNCN_ICTIO 15286

VOUCHER. — Jaw, dried [located, seen].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — July 1925 (caught).

CAPTURE. — 'Santander?', Cantabria, Spain, Europe, Cantabrian Sea, north-eastern Atlantic Ocean.

REMARK. — From 'Pescaderías coruñesas'; not listed in Matallanas *et al.* (1981), but catalogue was not exhaustive (e.g. jaw on public display in the museum were not included).

REFERENCES. — ?Dorda & Ambrosio (1997: 92 – '1 lot'), here presumed unpublished.

INFO. — Ignacio Doadrio and Gema Solís Fraile (both MNCN) [lab, pic, com]. Fig. 16D.

Entry 61. [INDIVIDUAL-049] MNCN_ICTIO 15287

VOUCHER. — Jaw, dried [located, seen].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — July 1925 (caught).

CAPTURE. — 'Santander?', Cantabria, Spain, Europe, Cantabrian Sea, north-eastern Atlantic Ocean.

REMARK. — From 'Pescaderías coruñesas'; not listed in Matallanas *et al.* (1981), but catalogue was not exhaustive (e.g. jaw on public display in the museum were not included).

REFERENCES. — ?Dorda & Ambrosio (1997: 92 - '1 lot'), here presumed unpublished.

INFO. — Ignacio Doadrio and Gema Solís Fraile (both MNCN) [lab, pic, com]. Fig. 16E.

Entry 62. [INDIVIDUAL-050] MNCN_ICTIO 15288

VOUCHER. — Jaw, dried [located, seen].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — July 1925 (caught).

CAPTURE. — 'Santander?', Cantabria, Spain, Europe, Cantabrian Sea, north-eastern Atlantic Ocean.

REMARK. — From 'Pescaderías coruñesas'; not listed in Matallanas *et al.* (1981), but catalogue was not exhaustive (e.g. jaw on public display in the museum were not included).

REFERENCES. — ?Dorda & Ambrosio (1997: 92 - '1 lot'), here presumed unpublished.

INFO. — Ignacio Doadrio and Gema Solís Fraile (both MNCN) [lab, pic, com]. Fig. 16F.

Entry 63. [INDIVIDUAL-000] MNCN unregistered

VOUCHER. — Teeth and portions of skin, ?dried [not located, here presumed lost].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — 1919 (first publication) or before [probably *c.* 1915].

CAPTURE. — San Sebastián, Basque Autonomous Community, Spain, Europe, north-eastern Atlantic Ocean.

REMARK. — Specimen from Fernando de Buen [1895-1962]; species observed at San Sebastián by Buen (1915, 1916).

REFERENCES. — Lozano y Rey (1919: 24) and ?Dorda & Ambrosio (1997: 92 – '1 lot').

INFO. — Ignacio Doadrio and Gema Solís Fraile (both MNCN) [pub, com].

FR − FRANCE

GAB-MOO – MUSÉUM GWENN-AËL BOLLORÉ, MUSÉE OCÉANOGRAPHIQUE DE L'ODET, ERGUÉ-GABÉRIC

Entry 64. [INDIVIDUAL-051] GAB unregistered

VOUCHER. — Head, gutted, stuffed, dried and mounted [located, seen].



Fig. 16. — *Echinorhinus brucus* (Bonnaterre, 1788) in Danish (Copenhagen) and Spanish (Madrid) collections: **A**-**C**, ZMUC P2395309 (Entry 58); **D**, MNCN_ICTIO 15286 (Entry 60); **E**, MNCN_ICTIO 15287 (Entry 61); **F**, MNCN_ICTIO 15288 (Entry 62).

Individual data. — Sex, length and weight unknown.

Date. — Unknown, presumably between 1960-1980 (caught, by deduction).

Capture. — Unknown, possibly off Mauritania, Africa, eastern Atlantic Ocean.

Remark. — Specimen restored in the 1980s by Bernard Bourlès (taxidermist, Concarneau); specimen now in bad condition again.

References. — None, here presumed unpublished.

Info. — Samuel P. Iglésias (MNHN) and Bernard Bourlès (Concarneau, France) [pic, com]. Fig. 17A.

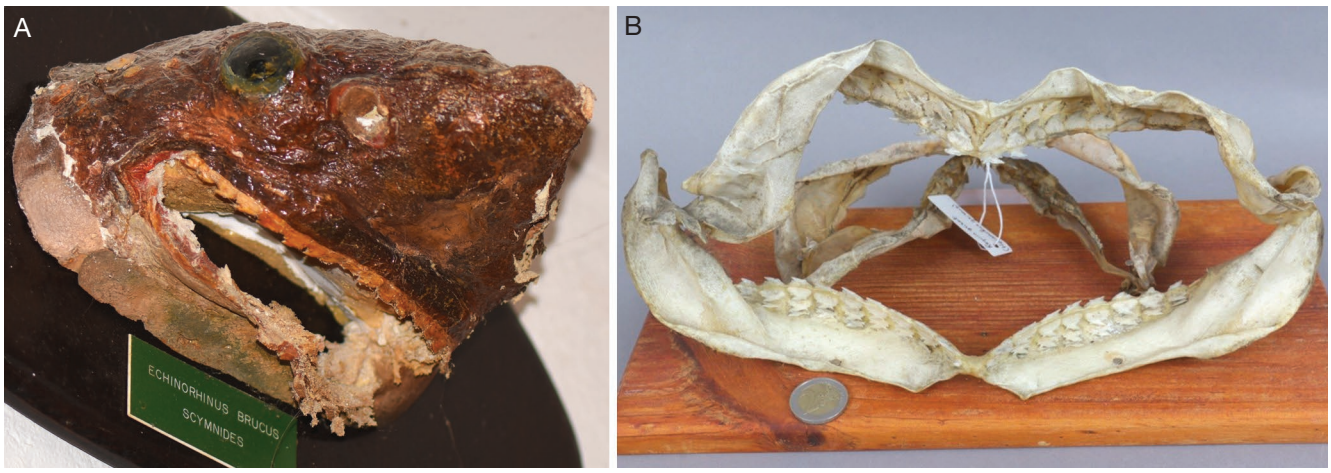


Fig. 17. — *Echinorhinus brucus* (Bonnaterre, 1788) in French (Ergué-Gabéric and Bayonne) collections: **A**, GAB-MOO unregistered (Entry 64); **B**, MHNB 2013.0.162 (Entry 65).

MHNB – Muséum d'Histoire naturelle de Bayonne

Entry 65. [INDIVIDUAL-052] MHNB 2013.0.162

Voucher. — Jaw, dried and mounted [located, seen].

Individual data. — Sex, length and weight unknown.

Date. — 1947 (first registration) or before.

Capture. — Unknown, presumably Pays Basque, Pyrénées-Atlantiques, France, Europe, north-eastern Atlantic Ocean.

Remark. — Jaw mounted on a wooden base, together with the jaw of a Sixgill shark *Hexanchus griseus* (Bonnaterre, 1788).

References. — None, here presumed unpublished.

Info. — Eric Guiho & Charlène Belbeoc'h (both MHNB) [pic, com]. Fig. 17B.

Entry 66. [INDIVIDUAL-053] MHNB unregistered

Voucher. — Complete specimen, ?gutted, in alcohol [destroyed, no date].

Individual data. — Sex, length and weight unknown.

Date. — Before 1940 (first registration, Eric Guiho, pers. comm. July 2016).

Capture. — Unknown, presumably Pays Basque, Pyrénées-Atlantiques, France, Europe, north-eastern Atlantic Ocean.

Remark. — Jar dried out, specimen extremely degraded and subsequently destroyed.

References. — None, here presumed unpublished.

Info. — Eric Guiho & Charlène Belbeoc'h (both MHNB) [com].

MHNL – Musée des Confluences, Lyon

Entry 67. [INDIVIDUAL-054] MHNL 42006230 (ex 5294)

Voucher. — Complete specimen, gutted, stuffed, dried and mounted [located, seen]; tissue sample taken by Samuel P. Iglésias (BPS-3550).

Individual data. — Male, 161 cm TL [160 cm TL according to digital database MHNL], weight unknown.

Date. — December 28, 1869 (first registration) or before.

Capture. — France, Europe, Mediterranean Sea.

Remark. — Specimen purchased from Charles Revil (taxidermist, Lyon), 20 francs (Jourdan 1869: 271-272) [MHNL logbook].

References. — None, here presumed unpublished.

Info. — Cédric Audibert and Jennifer Plantier (MHNL) [lab, log, pic, com]. Fig. 18A-D.

Entry 68. [INDIVIDUAL-055] MHNL 42006231 (ex 5286)

Voucher. — Complete specimen, gutted, stuffed, dried and mounted [located, seen]; tissue sample taken by Samuel P. Iglésias (BPS-3551).

Individual data. — Male, 130 cm TL [123 cm TL according to digital database MHNL], weight unknown.

Date. — May 20, 1867 (first registration) or before.

Capture. — Nice, Alpes-Maritimes, France, Europe, Ligurian Sea, Mediterranean Sea.

Remark. — Specimen purchased from Laurent de Gréaux (dealer, Nice), 80 francs (Jourdan 1867: 221) [MHNL logbook].

References. — None, here presumed unpublished.

Info. — Cédric Audibert and Jennifer Plantier (MHNL) [lab, log, pic, com]. Fig. 18E-G.



Fig. 18. — *Echinorhinus brucus* (Bonnaterre, 1788) in French (Lyon) collections (continuation): **A**-**D**, MHNL 42006230 (Entry 67); **E**-**G**, MHNL 4200231 (Entry 68); **H**, MHNL 50001109 (Entry 69).

Entry 69. [INDIVIDUAL-056] MHNL 50001109

VOUCHER. — Head, dried [located, seen].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — Unknown [apparently old].

CAPTURE. — Unknown, presumably France, Europe, Mediterranean Sea.

REMARK. — None.

REFERENCES. — None, here presumed unpublished.

INFO. — Cédric Audibert and Olivier Garcin (both MHNL) [ins, pic, com]. Fig. 18H.

MHNLR – MUSÉUM D'HISTOIRE NATURELLE DE LA ROCHELLE

Entry 70. [INDIVIDUAL-057] MHNLR 2010.0.652

VOUCHER. — Complete specimen, gutted, stuffed, dried and mounted [located, seen]; tissue sample taken by Samuel P. Iglésias (BPS-3566).

INDIVIDUAL DATA. — Female, 262 cm TL (preserved), weight unknown.

DATE. — 1864 (first publication) or before [prior to 1852 if ex Fleuriau collection].

CAPTURE. — Unknown, presumably off La Rochelle, Charente-Maritime, France, Europe, Bay of Biscay, north-eastern Atlantic Ocean.

REMARK. — Specimen perhaps from Louis-Benjamin Fleuriau de Bellevue [1761–1852]; extreme individual in terms of size for the north-eastern Atlantic Ocean (Table 2C) [largest stuffed specimen in the world].

REFERENCES. — Beltrémieux (1864: 54), Moreau (1881: 367), Harambillet *et al.* (1976: 25) and Quéro *et al.* (1982: 1022; 2014: 461).

INFO. — Guillaume Baron (MHNLR) and Jean-Claude Quéro (IFREMER, retired) [ins, pic, pub, com]. Fig. 19A, B.

Entry 71. [INDIVIDUAL-058] MHNLR P186

VOUCHER. — Embryo, in alcohol [located, seen]; originally three embryos [two not located, here presumed destroyed].

INDIVIDUAL DATA. — Male, 26.0 cm TL, 84 g (without the yolk), evidently from a mature female.

DATE. — 1925 (caught).

CAPTURE. — Unknown, but presumably off La Rochelle, France, Europe, Bay of Biscay, north-eastern Atlantic Ocean.

REMARK. — Specimen from André Baron (shipowner, La Rochelle); transferred from formalin to alcohol by Samuel P. Iglésias (July 8, 2016).

REFERENCES. — Quéro *et al.* (2014: 461).

INFO. — Guillaume Baron (MHNLR) [lab, pic, pub, com]. Fig. 19C.

MHNNICE – MUSÉUM D'HISTOIRE NATURELLE DE NICE

Entry 72. [INDIVIDUAL-059] MHNNice 2013.0.381

VOUCHER. — Complete specimen, gutted, stuffed and dried [located, seen (at MOM)].

INDIVIDUAL DATA. — Male, 130 cm TL, weight unknown.

DATE. — 1865 (first registration).

CAPTURE. — Unknown, but presumably off Nice, Alpes-Maritimes, France, Europe, Ligurian Sea, Mediterranean Sea.

REMARK. — Specimen probably from the Vérany or Barla collections (mid 19th century); specimen on public display at Musée océanographique de Monaco (MOM, Mai 2016) [loan].

REFERENCES. — None, here presumed unpublished.

INFO. — Olivier Gerriet (MHNNICE) and Elena A. Luchetti (ex MNHN) [pic, com]. Fig. 19D.

MHNN(T) – MUSÉUM D'HISTOIRE NATURELLE DE NANTES

Entry 73. [INDIVIDUAL-060] MHNN.Z.019419

VOUCHER. — Complete specimen, gutted, stuffed and dried [located, seen]; tissue sample taken by Samuel P. Iglésias (BPS-3557).

INDIVIDUAL DATA. — Female, 177 cm TL [171 cm TL according to taxidermist; 150 cm TL (preserved)], weight unknown.

DATE. — November 6, 1968 (caught).

CAPTURE. — Off La Côtinière, île d'Oléron, France, Europe, Bay of Biscay, north-eastern Atlantic Ocean; 30 m depth; gillnet; commercial vessel *Sauterelle* (Île d'Yeux).

REMARK. — Specimen observed by Jean-Claude Quéro at the La Rochelle fish market; specimen offered to MHNN by Mr. Barbazon (fish wholesaler at La Rochelle); original receipt for its transport (11.76 FF) has preserved in MHNN Archives (dated November 7, 1968), together with a typed letter to thank Mr. Barbazon (Baudouin 1968, dated November 8, 1968), and, an original drawing (sketch) of the specimen for its taxidermy, performed by Roger Mario (MHNN); extreme individual in terms of date for the north-eastern Atlantic Ocean (Table 2B).

REFERENCES. — Quéro (1970: 282), Quéro *et al.* (1982: 1022), Quéro & Émonnet (1993: 221), Quéro & Cendrero (1995: 46; 1996: 329), Quéro (1998: 494), Castro *et al.* (1999: 10 – 'three specimens have been seen in the last 25 years') [citing Quéro & Émonnet (1993), including this individual specimen], Castro (2011: 46) and Quéro *et al.* (2014: 461).

INFO. — Marie-Laure Guérin (MHNN), Jean-Claude Quéro (IFREMER, retired) and Samuel P. Iglésias (MNHN) [lab, ms, pic, pub, com]. Fig. 20A-E.

Entry 74. [INDIVIDUAL-061] MHNN.Z.019582

VOUCHER. — Complete specimen, gutted, stuffed and dried [located, seen]; tissue sample taken by Samuel P. Iglésias (BPS-3556).

INDIVIDUAL DATA. — Female, 223 cm TL, weight unknown.



Fig. 19. — *Echinorhinus brucus* (Bonnaterre, 1788) in French (La Rochelle and Nice) collections (continuation): **A**, **B**, MHNLR 2010.0.652 (Entry 70); **C**, MHNLR P186 (Entry 71); **D**, MHNNice 2013.0.381 (Entry 72).

Date. — 1882 (caught).

Capture. — Off Le Croisic, Loire-Atlantique, France, Europe, Bay of Biscay, north-eastern Atlantic Ocean.

Remark. — Specimen donated by Edouard Chevreux; in the 1990s mislabeled as MHNN.Z.019604 [in fact an *Acipenser*] after an internal translocation at MHNN (Marie-Laure Guérin, pers. comm. December 22, 2017).

References. — Bureau (1898: 28), Guérin-Ganivet (1913: 51), Legendre (1950: 6) and Quéro *et al.* (2014: 461).

Info. — Marie-Laure Guérin (MHNN) and Samuel P. Iglésias (MNHN) [lab, log, pic, pub, com]. Fig. 21A-D.

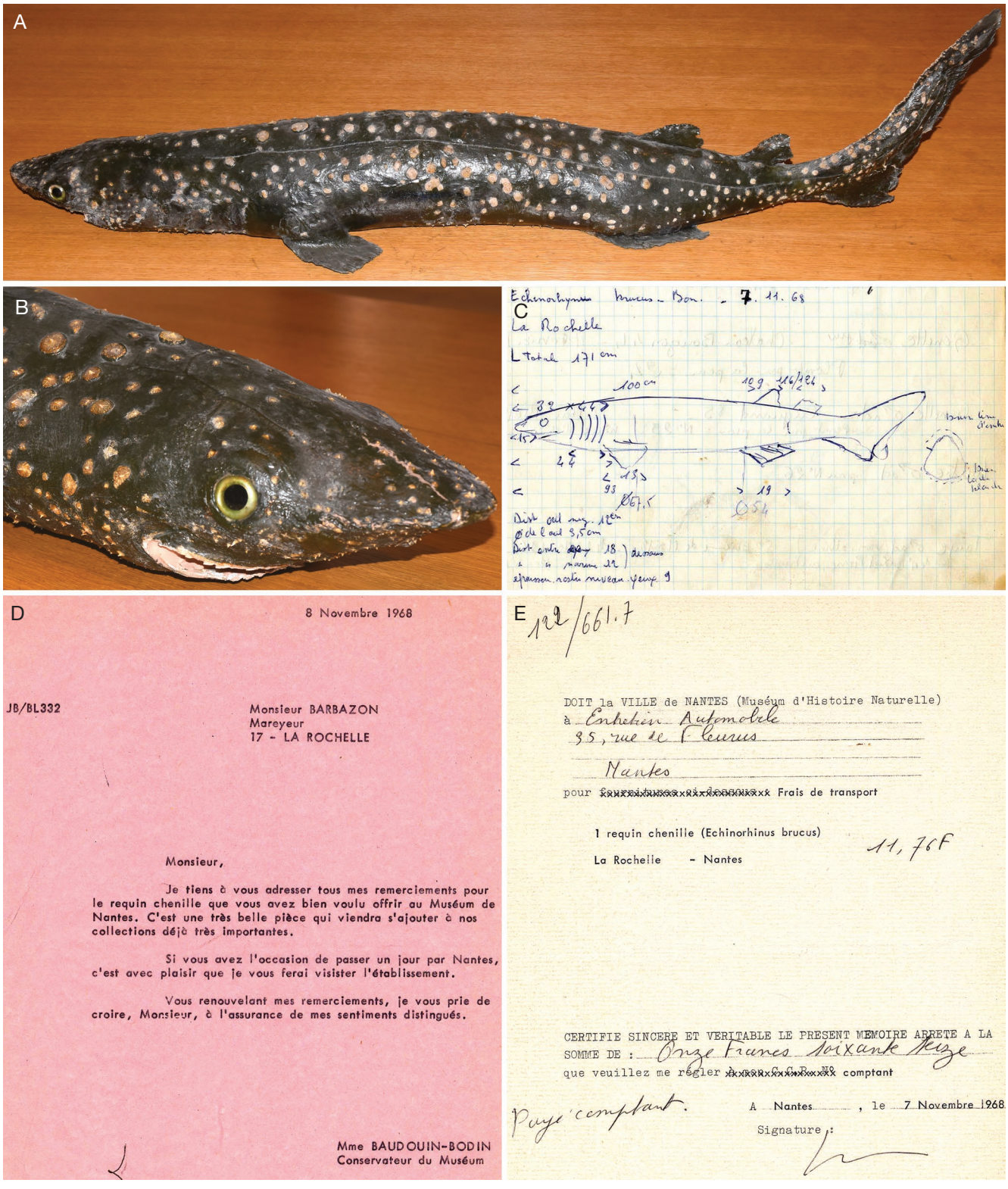


FIG. 20. — *Echinorhinus brucus* (Bonnaterre, 1788) in French (Nantes) collections (continuation): **A**-**E**, MHNN.Z.019419 (Entry 73).



Fig. 21. — *Echinorhinus brucus* (Bonnaterre, 1788) in French (Nantes) collections (continuation): **A**-**D**, MHNN.Z.019582 (Entry 74).

MMB – Musée de la Mer, Biarritz

Entry 75. [INDIVIDUAL-062] MMB 68-29-01

Voucher. — Jaw, ?dried [not located]; portions of skin of the same individual have also preserved at MMB (see MMB 68-29-02, Entry 76) [not located].

Individual data. — Male, 195 cm TL, 49 kg TW.

Date. — June 7, 1968 (caught).

Capture. — Pays Basque, Pyrénées-Atlantiques, France, Europe, north-eastern Atlantic Ocean; vessel *Porte du Large* (Saint-Jean-de-Luz).

Remark. — Specimen brought to the MMB.

References. — Harambillet *et al.* (1976: 24), Quéro *et al.* (1982: 1022), Quéro & Cendrero (1995: 46; 1996: 329), Quéro (1998: 494) and Quéro *et al.* (2014: 461).

Info. — Françoise Pautrizel (MMB) [pub, com].

Entry 76. [INDIVIDUAL-062] MMB 68-29-02

Voucher. — Portions of skin, ?dried [not located]; a jaw of the same individual has also preserved at MMB (see MMB 68-29-01, Entry 75) [not located].

Individual data, date, capture, remark, references and info. — See MMB 68-29-01 (Entry 75).

MMNH – Muséum d'Histoire naturelle de Marseille

Entry 77. [INDIVIDUAL-063] MMNH unregistered

Voucher. — Head, ?dried [not located].

Individual data. — Sex, length and weight unknown.

Date. — April 11, 1880 (caught).

Capture. — Off Cap Couronne, nearby Marseille, France, Europe, Gulf of Lion, Mediterranean Sea.

Remark. — Brought to the fish market of Vivaux (Marseille); the original article in the newspaper *Le Petit Marseillais* (Anonymous 1880a: 1) reads 'la tête a pu être heureusement conservée par notre Muséum d'histoire naturelle' (head preserved at our Natural History Museum) [here presumed MMNH, Marseille]; head not located at MMNH; but, note that a dried head (apparently old, with no data) is present at the Musée des Confluences, Lyon, i.e., MHNL 50001109 (Entry 69); however, evidence to match both records is lacking; subsequently, both records are here presumed to represent different specimens.

References. — Anonymous (1880a: 1; 1880b: 3; 1880c: 2) and Gourret (1890: 313; 1894: 344).

Info. — None [pub].

MNHN – Muséum national d'Histoire naturelle, Paris

Entry 78. [INDIVIDUAL-000] MNHN-376 (old, not renumbered)

Voucher. — Material and preservation unknown, but probably a complete specimen, gutted, stuffed and dried [not located, here presumed lost].

Individual data. — Sex, length and weight unknown.

Date. — Unknown (first registration undated), 1865 (first publication) but evidently caught long before.

Capture. — Unknown, but presumably France, Europe [MNHN logbook (Anonymous [s.d.]b: 43) reads 'Origine?'].

Remark. — One of five specimens in oldest MNHN logbook (Anonymous [s.d.]b: 43), and one of two specimens with unknown origin; according to Duméril (1865: 460), one of two specimens with no origin [here considered the same specimens] was already very old ('fort ancien') and probably the type of Broussonet; specimen in bad condition ('mauvais état : dans une boite sous le hangar [19-IX-04]') and to be disposed ('à réformer') according to old MNHN logbook (Anonymous [s.d.]b: 43); note that the holotype of *E. brucus* [MNHN ?unregistered, not located (INDIVIDUAL-067, Entry 85)] was in bad condition too ('assez mal conservé') according to Blainville (1825: 68); consequently, MNHN 376 might have represented the holotype [195 cm TL (preserved) according to Blainville (1825)]; however, very large ('très-gros') specimens were not present in MNHN according to Duméril (1865: 460) so that Iglésias & Mollen (2020a: 186) did not consider to match them; however, the hypothesis of MNHN 376 being the lost holotype is not impossible.

References. — Duméril (1865: 460 – 'deux autres conservés sans indication d'origine, et décolorés'), Anonymous (1880d: 233 – 'deux sans indication d'origine'; probably citing Duméril 1865) and Iglésias & Mollen (2020a: 186, fig. 10).

Info. — Romain Causse, Patrice Pruvost, Guy Duhamel and Samuel P. Iglésias (all MNHN) [log, pub, com]. Fig. 22A.

Entry 79. [INDIVIDUAL-000] MNHN 377 (old, not renumbered)

Voucher. — Material and preservation unknown, but probably a complete specimen, gutted, stuffed and dried [not located, here presumed lost].

Individual data. — Sex, length and weight unknown.

Date. — Unknown (first registration undated), 1865 (first publication) but probably caught before.

Capture. — Unknown, but probably France, Europe.

Remark. — One of five specimens in the oldest MNHN logbook (Anonymous [s.d.]b: 43), and one of two specimens with unknown origin.

References. — Duméril (1865: 460 – 'deux autres conservés sans indication d'origine, et décolorés'), Anonymous (1880d: 233 – 'deux sans indication d'origine'; probably citing Duméril 1865) and Iglésias & Mollen (2020a: 186, fig. 10).

Info. — Romain Causse, Patrice Pruvost, Guy Duhamel and Samuel P. Iglésias (all MNHN) [log, pub, com]. Fig. 22A.

Entry 80. [INDIVIDUAL-064] MNHN 378 (old, not renumbered)

Voucher. — Material and preservation unknown, but here presumed a complete specimen [destroyed, 1938].

Individual data. — Sex, length and weight unknown.

Date. — January 31, 1865 (first registration) or before.

Capture. — Nice, Alpes-Maritimes, France, Europe, Ligurian Sea, Mediterranean Sea.

Remark. — Specimen from Ed. Molinet; registered as number 11 (1865) in MNHN logbook (Anonymous 1864-1881: 9), referring to 'n°4 du livre des entrées' [the latter not located]; registered as number 378 in another, general MNHN logbook (Anonymous [s.d.]c: 43).

References. — ?Anonymous (1880d: 233 – 'un autre provenant de Nice', Iglésias & Mollen (2020a: 186, fig. 10).

Info. — Romain Causse, Patrice Pruvost, Guy Duhamel and Samuel P. Iglésias (all MNHN) [log, pub, com]. Figs 22A; 23H.

Entry 81. [INDIVIDUAL-000] MNHN-CAC-1884-1048

Voucher. — Jaw, dried (once probably a complete specimen, gutted, stuffed and mounted because of the presence of little holes in the margins of the jaw) [located, seen].

Individual data. — Sex, length and weight unknown.

Date. — Unknown, 1884 (first registration, i.e., inscription) or before.

Capture. — Unknown, but probably France, Europe.

Remark. — Specimen once registered in the 'Catalogue des collections de la galerie d'Anatomie comparée'; an inscription (in red ink) not decipherable (?A100_66) [inscriptions faded]; two later labels read 'A5181', one of them crossbarred; probably a relic of another documented but incomplete or unlocated specimen (see also Iglésias & Mollen 2020a: 186 – 'mâchoires (…) souvant sans informations') [here not presumed to represent a separate individual].

References. — ?Unpublished.

Info. — Philippe Béarez, Romain Causse, Zouhaira Gabsi, Patrice Pruvost, Guy Duhamel and Samuel P. Iglésias (all MNHN) [lab, ins, pic, com]. Fig. 22B.

Entry 82. [INDIVIDUAL-000] MNHN-CAG-VI-1520

Voucher. — Two small portions of a vertebral column, dried [located, seen, but apparently not *E. brucus*].

Individual data. — Sex, length and weight unknown.

Date. — Unknown.

Capture. — Unknown, but probably France, Europe.

Remark. — Specimen once registered in the 'Catalogue des anciennes galleries' (old galleries) [not seen]; label reads '*Echinorhinus spinosus*' [in handwriting on a typed label]; vertebrae of asterospondylic type (not cyclospondylic type) [*sensu* Hasse 1879], diagnostic for galeomorph sharks, not for squalimorph sharks that includes Echinorhiniformes [?erroneous identification or labels switched; even in the latter case, here not presumed to represent a separate individual].

References. — ?None, here presumed unpublished.



Fig. 22. — *Echinorhinus brucus* (Bonnaterre, 1788) in French (Paris) collections (continuation): **A**, MNHN-374-378 (Entries 78-80, 93); **B**, MNHN-CAC-1884-1048 (Entry 81); **C**, MNHN-CAG-VI-1520 (Entry 82); **D**, MNHN-JAC-1884-1066 (Entry 83); **E**, MNHN-JAC-1894-331 (Entry 84).

INFO. — Philippe Béarez, Romain Causse, Zouhaira Gabsi, Patrice Pruvost, Guy Duhamel and Samuel P. Iglésias (all MNHN) [lab, pic, com]. Fig. 22C.

Entry 83. [INDIVIDUAL-065] MNHN-JAC-1884-1066 (CAC-A.10257 and CAG-VI-344 according to a recent label, here considered dubious) [note that the inscription 'A.10257' seems to be present on another voucher, i.e., MNHN-JAC-1894-331 (Entry 84)]

VOUCHER. — Jaw, dried [located, seen].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — Unknown, 1884 (first registration, i.e., inscription) or before.

CAPTURE. — Unknown, but probably France, Europe.

REMARK. — Specimen once registered in the journal of the laboratory of comparative anatomy (JAC) [not seen]; perhaps a relic of another documented but incomplete or unlocated specimen (see also Iglésias & Mollen 2020a: 186 – 'mâchoires (…) souvant sans informations').

REFERENCES. — ?None, here presumed unpublished.

INFO. — Philippe Béarez, Romain Causse, Zouhaira Gabsi, Patrice Pruvost, Guy Duhamel and Samuel P. Iglésias (all MNHN) [lab, ins, pic, com]. Fig. 22D.

Entry 84. [INDIVIDUAL-066] MNHN-JAC-1894-331

VOUCHER. — Head, dried [located, seen].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — Unknown, 1894 (first registration, i.e., inscription) or before.

CAPTURE. — Unknown, but probably France, Europe.

REMARK. — Specimen once registered in the journal of the laboratory of comparative anatomy (JAC) [not seen]; a small round label stuck to the specimen might read ? 'VI 394' (?referring to CAG); another inscription (in red ink) might read ? 'A.10257' (?referring to CAC) [inscriptions faded; see also comments to alternative collection numbers for MNHN-JAC-1884-1066 (Entry 83)]; perhaps a relic of another documented but unlocated specimen.

REFERENCES. — ?None, here presumed unpublished.

INFO. — Philippe Béarez, Romain Causse, Zouhaira Gabsi, Patrice Pruvost, Guy Duhamel and Samuel P. Iglésias (all MNHN) [lab, ins, pic, com]. Fig. 22E.

Entry 85. [INDIVIDUAL-067] MNHN ?unregistered (holotype)

VOUCHER. — Complete specimen, gutted, stuffed and dried [not located, presumed lost (Iglésias & Mollen 2020a)].

INDIVIDUAL DATA. — Female, 227 cm TL (7 pieds) [223 cm TL according to Iglésias & Mollen (2020a, in part, captions for cover illustration and fig. 4, erroneous); 195 cm TL (6 pi.) (preserved) according to Blainville (1825: 67); 130 cm TL (4 pieds) (preserved) according to Broussonet ([1780]; 1784: 673; 1785: 126), presumed erroneous by Iglésias & Mollen (2020a: 184), and copied by others such as Lacepède (1798: 283), Yarrell (1841: 534) and Desvaux (1851: 228)], weight unknown.

DATE. — Between September 8 and October 6, 1680 (caught).

CAPTURE. — Bayonne, Pyrénées-Atlantiques, France, Europe, Bay of Biscay, north-eastern Atlantic Ocean.

REMARK. — Holotype of *Squalus brucus* Bonnaterre, 1788 (for a detailed discussion see Iglésias & Mollen 2020a); relics of this specimen might have been preserved at MNHN but have not been identified as such; extreme individual in terms of date for the north-eastern Atlantic Ocean and all other oceans worldwide (Table 2A).

REFERENCES. — La Hire (1679-1680: 140-143), Du Verney & La Hire (1679-1680), Du Hamel (1682), Broussonet ([1780]; 1784: 672-673; 1785: 125-126), Bonnaterre (1788: 11), Lacepède (1798: 283, ?pl. 3, fig. 2), Blainville ([1809]-1821), ?Cloquet (1822: pl. 28 – specimen similar to Lacepède 1798: pl. 3, fig. 2), Blainville (1825: 67-68), Valencienes [1826-1838], Yarrell (1841: 534), Desvaux (1851: 228), Duméril (1865: 460 – 'sans indication d'origine, et décolorés, l'un, fort ancient, est probablement le type du *Bouclé* de Broussonnet'), Iglésias & Mollen (2020a: 173-193; 2020b: 3, fig.), Le Morlec (2020: 1, fig. unnumbered) and Hilary (2020: 13, fig. unnumbered).

INFO. — Conservators of the Central Library and Samuel P. Iglésias (all MNHN) [?log, ms, pub, com].

Entry 86. [INDIVIDUAL-068] MNHN-IC-0000-0520

VOUCHER. — Material unknown, probably a complete specimen, in alcohol (according to digital database MNHN) [not located, ?lost].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — August 1861 (first registration, deduction from MNHN logbook) or before.

CAPTURE. — Nice, Alpes-Maritimes, France, Europe, Ligurian Sea, Mediterranean Sea.

REMARK. — Specimen from Laurent de Gréaux (dealer); registered as number 520 in MNHN logbook (Anonymous [s.d.]b: 14) [located, seen]; specimen once on public display [museum logbook reads 'Gal.', here presumed 'Galerie'].

REFERENCES. — ?Anonymous (1880d: 233 – 'un autre provenant de Nice') and Maddalena & Zuffa (2003: 170, tab. 1).

INFO. — Romain Causse, Patrice Pruvost, Guy Duhamel and Samuel P. Iglésias (all MNHN) [log, dat, pub, com]. Fig. 23A.

Entry 87. [INDIVIDUAL-069] MNHN-IC-1880-0373

VOUCHER. — Complete specimen, preservation unknown [not located, here presumed lost].

INDIVIDUAL DATA. — Sex, length and weight unknown, but apparently a large specimen (Anonymous 1880d: 233 – 'dont les dimensions sont considérables').

DATE. — May 24, 1880 (first registration) or before.

CAPTURE. — Off Concarneau, Finistère, France, Europe, Bay of Biscay, north-eastern Atlantic Ocean.

REMARK. — Specimen donated by Etienne Guillou; registered as number 373 (1880) in MNHN logbook (Anonymous 1864-1881: 231), referring to 'n° 23 du livre des entrées' [the latter not located].

REFERENCES. — Anonymous (1880d: 233).

INFO. — Romain Causse, Patrice Pruvost, Guy Duhamel and Samuel P. Iglésias (all MNHN) [log, pub, com]. Fig. 24A.



FIG. 23. — *Echinorhinus brucus* (Bonnaterre, 1788) in French (Paris) collections (continuation): **A**, MNHN-IC-0000-0520 (Entry 86); **B**-**E**, MNHN-IC-A9688 (ex 374A) (Entry 92); **E**-**G**, MNHN-IC-A9689 (ex 375) (Entry 94); **H**, MNHN 378 (Entry 80).

Entry 88. [INDIVIDUAL-070] MNHN-IC-1884-0942 (ex 375B)

VOUCHER. — Embryo, in alcohol [located, seen].

INDIVIDUAL DATA. — Male, 23.3 cm TL, weight unknown, evidently from a mature female, 256 cm TL ['1,96 + 0,60 = 2m56' according to museum logbook].

DATE. — November 25, 1884 (first registration) or before.

CAPTURE. — Biarritz, Pyrénées-Atlantiques, France, Europe, Bay of Biscay, north-eastern Atlantic Ocean.

REMARK. — Specimen donated by Jules Moussempès; registered as number 942 (1884) in MNHN logbook (Anonymous 1882-1887: 118-119), referring to 'n° 53 du livre des entrées' [the latter not located]; one of seven embryos that popped out ('Six autres petits ont été expulsés').

References. — None, here presumed unpublished.

Info. — Philippe Béarez, Romain Causse, Zouhaira Gabsi, Patrice Pruvost, Guy Duhamel and Samuel P. Iglésias (all MNHN) [lab, log, dat, pic, com]. Fig. 24B, C.

Entry 89. [INDIVIDUAL-071] MNHN-IC-1965-0089 (AB-0210; ex R.400a Jean Cadenat)

Voucher. — Jaw, dried [located, seen].

Individual data. — Sex, length and weight unknown.

Date. — March 20, 1958 (caught).

Capture. — Kayar, Region of Thiès, Senegal, Africa, eastern Atlantic Ocean.

Remark. — Specimen from Jean Cadenat (IFAN, Gorée); registered as number 89 (1865) in MNHN logbook (Anonymous 1962-1966: 154-155).

References. — None, here presumed unpublished.

Info. — Philippe Béarez, Romain Causse, Zouhaira Gabsi, Patrice Pruvost, Guy Duhamel and Samuel P. Iglésias (all MNHN) [lab, ins, log, dat, pic, com]. Fig. 24D, E.

Entry 90. [INDIVIDUAL-072] MNHN-IC-1965-0090 (AB-0211)

Voucher. — Jaw, dried [not located] and portion of skin, dried [located, seen].

Individual data. — Sex, length and weight unknown.

Date. — December 9, 1961 (caught).

Capture. — Kayar, Region of Thiès, Senegal, Africa, eastern Atlantic Ocean.

Remark. — Specimen from Jean Cadenat (IFAN, Gorée); registered as number 90 (1965) in MNHN logbook (Anonymous 1962-1966: 154-155).

References. — Cadenat & Blache (1981: 25 – '6 ex. pour une seule pirogue, le 9 déc. 1961').

Info. — Philippe Béarez, Romain Causse, Zouhaira Gabsi, Patrice Pruvost, Guy Duhamel and Samuel P. Iglésias (all MNHN) [ins, log, dat, pic, pub, com]. Fig. 24D, F.

Entry 91. [INDIVIDUAL-000] MNHN-IC-1994-0693

Voucher. — Eyes, in alcohol [located, seen].

Individual data. — Sex, length and weight unknown.

Date. — Unknown.

Capture. — Unknown, here presumed France, Europe.

Remark. — Possibly relics of another documented but incomplete or unlocated specimen [here not presumed to represent a separate individual].

References. — ?None, here presumed unpublished.

Info. — Philippe Béarez, Romain Causse, Zouhaira Gabsi, Patrice Pruvost, Guy Duhamel and Samuel P. Iglésias (all MNHN) [lab, dat, pic, com]. Fig. 24G.

Entry 92. [INDIVIDUAL-073] MNHN-IC-A9688 (ex 374A)

Voucher. — Complete specimen, gutted, stuffed and dried [located, seen].

Individual data. — Male, 168.5 cm TL, weight unknown.

Date. — April 1, 1865 (first registration) or before.

Capture. — Nice, Alpes-Maritimes, France, Europe, Ligurian Sea, Mediterranean Sea.

Remark. — Specimen from Gal frères (dealer); registered as number 49 (1865) in MNHN logbook (Anonymous 1864-1881: 11), referring to 'n°10 du livre des entrées' [not located]; later, registered as number A9688 in another MNHN logbook (Anonymous [s.d.]d: 43); old label on specimen explicitly refers to page 459 of Duméril (1865) who, at page 93, mentions a specimen of '1m57' at MNHN.

References. — ?Duméril (1865: 459-460, pl. 12, figs 16-20) [from a specimen of 157 cm TL; see also remark for MNHN-IC-A9689 (INDIVIDUAL-075, Entry 94)] and ?Anonymous (1880d: 233 – 'un autre provenant de Nice').

Info. — Philippe Béarez, Romain Causse, Zouhaira Gabsi, Patrice Pruvost, Guy Duhamel and Samuel P. Iglésias (all MNHN) [lab, log, dat, pic, ?pub, com]. Fig. 23B-E.

Entry 93. [INDIVIDUAL-074] MNHN-IC-A9688 [sic.] (ex 374)

Voucher. — Complete specimen, gutted, stuffed and dried [not located, here presumed lost].

Individual data. — Sex, length and weight unknown.

Date. — 1837 (first registration, i.e., notification in an unpublished manuscript), or before.

Capture. — Cape of Good Hope, South Africa, Africa, south-eastern Atlantic Ocean.

Remark. — Specimen from Jules Verreaux (dealer); one of two 'Verreaux' specimens, the other one in Leiden (see RMNH.PISC.D.2562, INDIVIDUAL-107, Entry 145); original correspondence of this transaction has been preserved at MNHN (Verreaux 1837); specimen first registered as number 374 in 'Catalogue général N°1' (or 'Catalogue méthodique', or 'Catalogue des poissons N°63') (Anonymous [s.d.]b: 43), number 'A.9688' added in later handwriting, but here presumed erroneous because this collection number has always been intended for specimen 374A (not 374); specimen once mounted on the ceiling ('monté plaf.'); extreme individual in terms of date for the south-eastern Atlantic Ocean (Table 2A).

References. — Verreaux (1837: 78, entry 95 – 'Requin Epineux'), Anonymous (1880d: 233) and Iglésias & Mollen (2020a: 186, fig. 10).

Info. — Philippe Béarez, Romain Causse, Zouhaira Gabsi, Patrice Pruvost, Guy Duhamel and Samuel P. Iglésias (all MNHN) [log, ms, pic, pub, com]. Fig. 22A.



Fig. 24. — *Echinorhinus brucus* (Bonnaterre, 1788) in French (Paris) collections (continuation): **A**, MNHN-IC-1880-0373 (Entry 87); **B**, **C**, MNHN-IC-1884-0942 (Entry 88); **D**, **E**, MNHN-IC-1965-0089 (Entry 89); **D**, **F**, MNHN-IC-1965-0090 (Entry 90); **G**, MNHN-IC-1994-0693 (Entry 91); **H**, MNHN-IC-AA-0014 (Entry 95); **I**, MNHN-IC-AA-0015 (Entry 96); **J**, MNHN-IC-AA-0016 (Entry 97); **K**, MNHN-IC-AA-0021 (Entry 98); **L**, MNHN-IC-AA-0042 (Entry 99).

Entry 94. [INDIVIDUAL-075] MNHN-IC-A9689 (ex 375)

VOUCHER. — Complete specimen, gutted, stuffed and dried [located, seen].

INDIVIDUAL DATA. — Male, 149.8 cm TL (preserved) [female according to museum logbook, here presumed erroneous], weight unknown.

DATE. — Unknown, here presumed from the 1860s or before [first registration, by deduction, as for both other specimens from Laurent de Gréaux, see MHNL 42006231 (INDIVIDUAL-055, Entry 68) and MNHN-IC-0000-0520 (INDIVIDUAL-068, Entry 86)].

CAPTURE. — Nice, Alpes-Maritimes, France, Europe, Ligurian Sea, Mediterranean Sea.

REMARK. — Specimen from Laurent de Gréaux (dealer); specimen first registered as number 375 in 'Catalogue général N°1' (or 'Catalogue méthodique', or 'Catalogue des poissons N°63') (Anonymous [s.d.]b: 43), number 'A.9689' added in later handwriting; later MNHN logbook (Anonymous [s.d.]d: 43) reads 'Type A. Duméril' but this 'reference' is not clear [cf. ?André Marie Constant Duméril (the elder) or August Duméril (the younger); ?Duméril (1856: 121, 135)].

REFERENCES. — ?Duméril (1865: 93, 459-460, pl. 12, figs 16-20) [from a specimen of 157 cm TL; see also remark for MNHN-IC-A9688 (INDIVIDUAL-073, Entry 92)], ?Anonymous (1880d: 233 – 'un autre provenant de Nice'), Quéro *et al.* (2014: 2, fig. 1) and Iglésias & Mollen (2020a: 186, fig. 10).

INFO. — Philippe Béarez, Romain Causse, Zouhaira Gabsi, Patrice Pruvost, Guy Duhamel and Samuel P. Iglésias (all MNHN) [lab, ins, log, dat, pic, pub, com]. Figs 22A; 23E-G.

Entry 95. [INDIVIDUAL-000] MNHN-IC-AA-0014

VOUCHER. — Eight dermal denticles, dried [located, seen].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — Unknown.

CAPTURE. — Unknown, here presumed France, Europe.

REMARK. — Possibly relics of another documented but incomplete or unlocated specimen [here not presumed to represent a separate individual].

REFERENCES. — ?None, here presumed unpublished.

INFO. — Philippe Béarez, Romain Causse, Zouhaira Gabsi, Patrice Pruvost, Guy Duhamel and Samuel P. Iglésias (all MNHN) [lab, dat, pic, com]. Fig. 24H.

Entry 96. [INDIVIDUAL-000] MNHN-IC-AA-0015

VOUCHER. — Two portions of skin, dried [located, seen].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — Unknown.

CAPTURE. — Unknown, here presumed France, Europe.

REMARK. — Possibly relics of another documented but incomplete or unlocated specimen [here not presumed to represent a separate individual].

REFERENCES. — ?None, here presumed unpublished.

INFO. — Philippe Béarez, Romain Causse, Zouhaira Gabsi, Patrice Pruvost, Guy Duhamel and Samuel P. Iglésias (all MNHN) [lab, dat, pic, com]. Fig. 24I.

Entry 97. [INDIVIDUAL-000] MNHN-IC-AA-0016

VOUCHER. — Portion of a vertebral column, very small (?from tip of caudal fin), dried [located, seen].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — Unknown.

CAPTURE. — Unknown, here presumed France, Europe.

REMARK. — Possibly a relic of another documented but incomplete or unlocated specimen [here not presumed to represent a separate individual].

REFERENCES. — ?None, here presumed unpublished.

INFO. — Philippe Béarez, Romain Causse, Zouhaira Gabsi, Patrice Pruvost, Guy Duhamel and Samuel P. Iglésias (all MNHN) [lab, dat, pic com]. Fig. 24J.

Entry 98. [INDIVIDUAL-000] MNHN-IC-AA-0021

VOUCHER. — About ten small dermal denticles, dried [located, seen].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — Unknown.

CAPTURE. — Unknown, here presumed France, Europe.

REMARK. — Possibly relics of another documented but incomplete or unlocated specimen [here not presumed to represent a separate individual].

REFERENCES. — ?None, here presumed unpublished.

INFO. — Philippe Béarez, Romain Causse, Zouhaira Gabsi, Patrice Pruvost, Guy Duhamel and Samuel P. Iglésias (all MNHN) [lab, dat, pic, com]. Fig. 24K.

Entry 99. [INDIVIDUAL-000] MNHN-IC-AA-0042

VOUCHER. — Braincase, jaw and hyoid arch, all in anatomical connection, dried [here presumed located, seen].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — Unknown.

CAPTURE. — Unknown, here presumed France, Europe.

REMARK. — The voucher label lacks a collection number and associated data, but is here presumed to represent MNHN-IC-AA-0042 [the latter not located, at least since 2003]; possibly a relic of another documented but unlocated specimen [here not presumed to represent a separate individual; treated equally as all other 'MNHN-IC-AA' collection numbers].

REFERENCES. — ?None, here presumed unpublished.

INFO. — Philippe Béarez, Romain Causse, Zouhaira Gabsi, Patrice Pruvost, Guy Duhamel and Samuel P. Iglésias (all MNHN) [lab, dat, pic, com]. Fig. 24L.



Fig. 25. — *Echinorhinus brucus* (Bonnaterre, 1788) in French (Rillieux-la-Pape and Montpellier) collections (continuation): **A**, UCBL unregistered (Entry 100); **B**, USTL REC 180M (Entry 104).

UCBL – Université Claude Bernard Lyon 1, Musée Testut-Latarjet des Sciences Médicales, Rillieux-la-Pape

Entry 100. [INDIVIDUAL-076] UCBL unregistered

Voucher. — Complete specimen, gutted, stuffed and dried [located, seen].

Individual data. — Sex and length unverified, weight unknown.

Date. — Unknown.

Capture. — Unknown, presumably France, Europe, Mediterranean Sea.

Remark. — Property of the Société nationale de médecine et des sciences médicales de Lyon (ex Société de médecine de Lyon & Société des sciences médicales de Lyon, merged 1923), Musée Testut-Latarjet (UCBL, UL1), translocated from Lyon to Rillieux-la-Pape (2015).

References. — None, here presumed unpublished.

Info. — Jean-Christophe Neidhardt (UCBL) and Cédric Audibert (MHNL) [pic, com]. Fig. 25A.

USTL – Université de Montpellier, UM2-ISEM

Entry 101. [INDIVIDUAL-000] USTL UM REC 2

Voucher. — Single antero-lateral tooth, dried [located, not seen].

Individual data. — Sex, length and weight unknown.

Date. — Unknown, presumably 1960-80s (caught).

Capture. — Eastern Atlantic Ocean.

Remark. — Tooth might originate from a specimen listed in this study.

References. — Cappetta (1987: 52, fig. 50A; 2012: 107, fig. 94A).

Info. — Sylvain Adnet (USTL) [pub, com].

Entry 102. [INDIVIDUAL-000] USTL UM REC 3

Voucher. — Single lateral tooth, dried [located, not seen].

Individual data. — Sex, length and weight unknown.

Date. — Unknown, presumably 1960-80s (caught).

Capture. — Eastern Atlantic Ocean.

Remark. — Tooth might originate from a specimen listed in this study.

References. — Cappetta (1987: 52, fig. 50B; 2012: 107, fig. 94B).

Info. — Sylvain Adnet (USTL) [pub, com].

Entry 103. [INDIVIDUAL-077] USTL UM REC 146

Voucher. — Single tooth, embedded in polyester resin and sectioned [located, not seen]; tooth originates from jaw USTL UM REC 180M (Entry 104).

Individual data. — Male, 180 cm TL, weight unknown.

Date. — 1983 (caught).

Capture. — Kayar, Region of Thiès, Senegal, Africa, Trench of Kayar, eastern Atlantic Ocean; 600 m depth.

Remark. — Specimen collected by Henri Cappetta (USTL); extreme individual in terms of date for the eastern Atlantic Ocean (Table 2B).

References. — Adnet *et al.* (2012: 84, fig. 3B, E-G).

Info. — Sylvain Adnet (USTL) [pub, com].

Entry 104. [INDIVIDUAL-077] USTL UM REC 180M

Voucher. — Jaw, dried [located, seen]; a tooth of this jaw has been removed and sectioned for dental/enamelled research (see USTL UM REC 146, Entry 103).

Individual data, date, capture, remark, references and info. — See USTL UM REC 146 (Entry 103) [+pic]. Fig. 25B.

IE – IRELAND

NMI – National Museum of Ireland (Natural History)

Entry 105. [INDIVIDUAL-078] NMINH 1885.102.1 (ex H.521, NMI 102.1885)

Voucher. — Head, stuffed, dried and mounted [located, seen], and a portion of the tail once secured for the 'Science and Art Museum' (now NMI) [not located, here presumed lost].

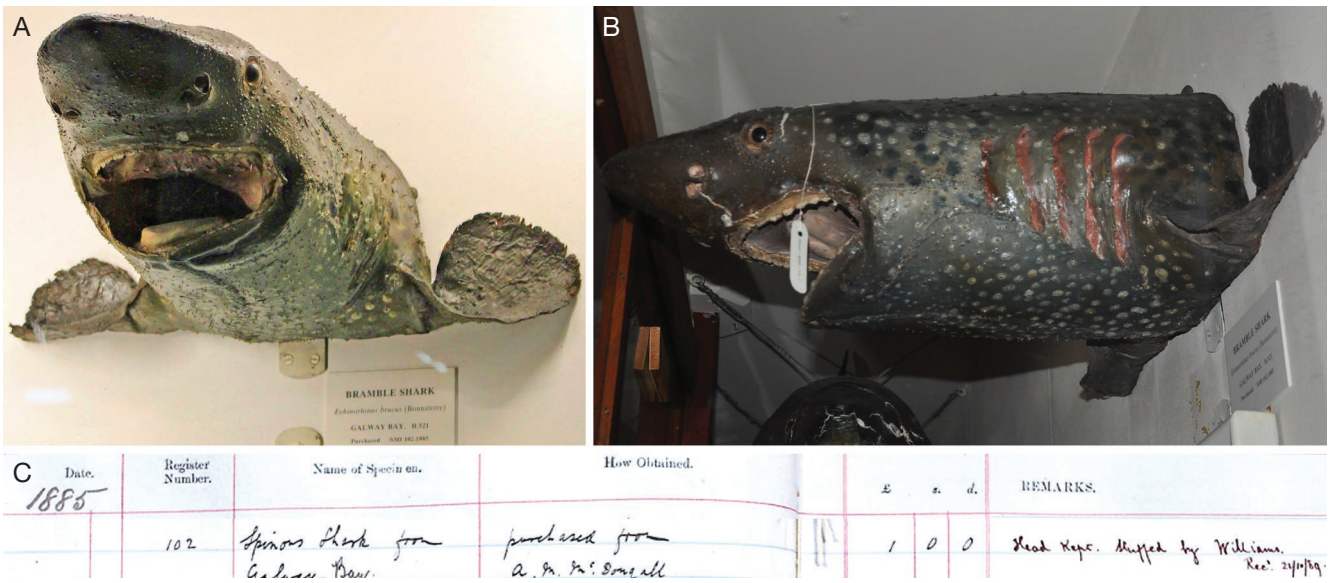


Fig. 26. — *Echinorhinus brucus* (Bonnaterre, 1788) in Irish (Dublin) collections: **A-C**, NMINH 1885.102.1 (Entry 105).

Individual data. — Sex unknown, 290 cm TL (9½ ft), *c.* 152 kg TW (3 cwt).

Date. — June 26, 1885 (caught).

Capture. — Off Hag's Head, western coast of Ireland, Europe, Galway Bay, north-eastern Atlantic Ocean; by handline used for conger eels.

Remark. — One of two specimens caught by Claddagh fishermen in the same event, but the latter escaped; specimen purchased from A. M. Mc Dongall for £ 1.00 (November 1885); extreme individual in terms of size for the north-eastern Atlantic Ocean (Table 2C).

References. — Anonymous (1885a: 6, b: 9, c: 4, d: 2, e: 5, f: 4, g: 2, h: 5, i: 4, j: 3, k: 5, l: 3, m: 5, n: 6, o: 7, p: 3, q: 3), More (1885a: 3, b: 311), Hilgendorf (1886: 434), Scharff (1889: 7), Anonymous (1897: 6), Moffat (1898: 299-300, 331, 336, 569) [footnote 5 on p. 336 should read '1885', not '1882'], Battersby (1898: 187), Anonymous (1904: 617), Went (1959: 75), O'Riordan (1965: 5) and Went & Kennedy (1969: 10; 1976: 10).

Info. — Amy Geraghty and Nigel T. Monaghan (both NMI), Declan T. G. Quigley (SFPA) and Thomas Barreau (MNHN) [lab, pic, pub, com]. Fig. 26A-C.

RCSI – Royal College of Surgeons in Ireland

Entry 106. [INDIVIDUAL-000] RCSI B.b.254 [possibly not *E. brucus*]

Voucher. — Heart, in alcohol [not located, here presumed lost].

Individual data. — Sex, length and weight unknown.

Date. — Unknown, 1834 (first publication) or before.

Capture. — Unknown, presumably Europe, north-eastern Atlantic Ocean.

Remark. — This record is based on Houston (1834) who used the Latin name '*sq(ualus) spinosus*' (syn. *E. brucus*) when referring to a 'Spiny shark', a vernacular name that is used more often for the dogfish *Squalus acanthias* Linnaeus, 1758; the fact that Houston (1834) did not list any *S. acanthias*, casts doubt on the correct identification of this anatomical preparation as a true Spinous or Bramble shark; moreover, a jaw once present in the Buckland Museum (MEFC unregistered, INDIVIDUAL-136, Entry 185) is here presumed to represent the new first Irish record for this species; aside from this, a specimen caught in 1882 has always been presumed to represent the first Irish record for this species (More 1882).

References. — Houston (1834: 76, 174).

Info. — Susan Leyden (RCSI) [pub, com].

Entry 107. [INDIVIDUAL-000] RCSI D.a.120 [possibly not *E. brucus*]

Voucher. — Braincase and/or brain, in alcohol [not located, here presumed lost].

Individual data, date, capture and remark. — See RCSI B.b.254 (Entry 106).

References. — Houston (1834: 107, 182).

Info. — Susan Leyden (RCSI) [pub, com].

Entry 108. [INDIVIDUAL-000] RCSI D.e.954 [possibly not *E. brucus*]

Voucher. — Portion of integuments, in alcohol [not located, here presumed lost].

Individual data, date, capture and remark. — See RCSI B.b.254 (Entry 106).

References. — Houston (1834: 191).

Info. — Susan Leyden (RCSI) [pub, com].



Fig. 27. — *Echinorhinus brucus* (Bonnaterre, 1788) in Italian (Naples) collections: **A**, **B**, (CMSNF) Z518 (Entry 116); **C**, **D**, (CMSNF) Z1122 (Entry 117); **E**, (CMSNF) Z6629 (Entry 118).

Entry 109. [INDIVIDUAL-000] RCSI F.c.517 [possibly not *E. brucus*]

Voucher. — Ovary, in alcohol [not located, here presumed lost].

Individual data, date, capture and remark. — See RCSI B.b.254 (Entry 106).

References. — Houston (1834: 212).

Info. — Susan Leyden (RCSI) [pub, com].

IT – ITALY

CMSNF – Centro Musei delle Scienze Naturali e Fisiche, Università di Napoli Federico II

Entry 110. [INDIVIDUAL-000, ?INDIVIDUAL-083] GAC 2102 (Inv. 2621)

Voucher. — Heart, in alcohol [?not located, ?lost].

Individual data. — Sex, length and weight unknown.

Date. — 1868 (first registration, i.e., 'purchased') or before.

Capture. — Unknown, probably Italy, Europe, ?Tyrrhenian Sea, Mediterranean Sea.

Remark. — Specimen in the collection of Lucarelli; purchased, 15 £; this voucher might perhaps match present collection number Z6629 (Entry 118) at CMSNF (also a heart, now dried though).

References. — Maio *et al.* (2005: 460, tab. 6).

Info. — Nicola Maio (ex CMSNF) [pub, com].

Entry 111. [INDIVIDUAL-079] GAC 2106 (Inv. 5022)

Voucher. — Eyes, in alcohol [lost].

Individual data. — Sex, length and weight unknown.

Date. — 1868 (first registration, i.e., 'purchased') or before.

Capture. — Unknown, probably Italy, Europe, ?Tyrrhenian Sea, Mediterranean Sea.

Remark. — Specimen in the collection of De Sanctis; purchased, 5 £; in view of the unique combination of the collection and the year (i.e., De Sanctis 1868), this voucher is here presumed to represent an individual record for *E. brucus*.

References. — Maio *et al.* (2005: 461, tab. 6).

Info. — Nicola Maio (ex CMSNF) [pub, com].

Entry 112. [INDIVIDUAL-000, ?INDIVIDUAL-080] GAC 2375 (Inv. 5027)

Voucher. — Eyes, in alcohol [lost].

Individual data. — Sex, length and weight unknown.

Date. — 1870 (first registration, i.e., 'purchased') or before.

CAPTURE. — Unknown, probably Italy, Europe, ?Tyrrhenian Sea, Mediterranean Sea.

REMARK. — Specimen in the collection of De Sanctis; purchased, 3 £; observed by Scaricato in 1905; in view of the collection and year (i.e., De Sanctis; 1870), this voucher might represent the same individual as GAC 2423 (a skin) at CMSNF (Entry 114).

REFERENCES. — Maio *et al.* (2005: 461, tab. 6).

INFO. — Nicola Maio (ex CMSNF) [pub, com].

Entry 113. [INDIVIDUAL-000, ?INDIVIDUAL-080] GAC 2422 (Inv. 3466)

VOUCHER. — Branchials, in alcohol [lost].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — 1870 (first registration, i.e., 'purchased') or before.

CAPTURE. — Unknown, probably Italy, Europe, ?Tyrrhenian Sea, Mediterranean Sea.

REMARK. — Specimen in the collection of De Sanctis; purchased, 20 £; in view of the collection and year (i.e., De Sanctis; 1870), this voucher might represent the same individual as GAC 2423 (a skin) at CMSNF (Entry 114).

REFERENCES. — Maio *et al.* (2005: 461, tab. 6).

INFO. — Nicola Maio (ex CMSNF) [pub, com].

Entry 114. [INDIVIDUAL-080] GAC 2423 (Inv. 2147)

VOUCHER. — Skin, preservation unknown [lost].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — 1870 (first registration, i.e., 'purchased') or before.

CAPTURE. — Unknown, probably Italy, Europe, ?Tyrrhenian Sea, Mediterranean Sea.

REMARK. — Specimen in the collection of De Sanctis; purchased, 5 £; in view of the collection and year (i.e., De Sanctis; 1870), this voucher might represent the same individual as GAC 2375, GAC 2422 and Z1122, all at CMSNF (Entries 112, 113 and 117 respectively).

REFERENCES. — Maio *et al.* (2005: 461, tab. 6).

INFO. — Nicola Maio (ex CMSNF) [pub, com].

Entry 115. [INDIVIDUAL-081] GAC unregistered (Inv. 4475)

VOUCHER. — Skin, preservation unknown [lost].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — 1872-1880 (first registration, i.e., 'purchased').

CAPTURE. — Unknown, probably Italy, Europe, ?Tyrrhenian Sea, Mediterranean Sea.

REMARK. — Specimen purchased, 4 £.

REFERENCES. — Maio *et al.* (2005: 461, tab. 6).

INFO. — Nicola Maio (ex CMSNF) [pub, com].

Entry 116. [INDIVIDUAL-082] Z518 (Inv. 488; ex GAC 2738; ex Inv. 2553)

VOUCHER. — Jaw, dried and mounted [located, seen].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — 1871 (first registration, i.e., 'purchased') or before.

CAPTURE. — Unknown, probably Italy, Europe, ?Tyrrhenian Sea, Mediterranean Sea.

REMARK. — Specimen purchased, 5 £.

REFERENCES. — Mancusi *et al.* (2002: 103, tab. 1) and Maio *et al.* (2005: 468).

INFO. — Nicola Maio (ex CMSNF) [lab, pic, pub, com]. Fig. 27A, B.

Entry 117. [INDIVIDUAL-000, ?INDIVIDUAL-080] Z1122 (ex GAC 2374; ex Inv. 3566)

VOUCHER. — Brain, in formaldehyde (5%) [located, seen].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — 1870 (first registration, i.e., 'purchased') or before.

CAPTURE. — Unknown, probably Italy, Europe, ?Tyrrhenian Sea, Mediterranean Sea.

REMARK. — Specimen in the collection of De Sanctis; purchased, 10 £; in view of the collection and year (i.e., De Sanctis; 1870), this voucher might represent the same individual as GAC 2423 at CMSNF (Entry 114); Burckhardt (1907: 107) mentions his first observation of a dissected 'Spinous shark' brain at CMSNF [here presumed to represent Z1122], thanking 'Professor della Valle' [i.e., Antonio Della Valle, CMSNF director 1898-1899; see Maio *et al.* (1995: 211)].

REFERENCES. — Burckhardt (1907: 260), Mancusi *et al.* (2002: 103, tab. 1) and Maio *et al.* (2005: 469).

INFO. — Nicola Maio (ex CMSNF) [lab, pic, pub, com]. Fig. 27C, D.

Entry 118. [INDIVIDUAL-083] Z6629 (old label 195)

VOUCHER. — Heart, dried [located, seen].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — Unknown, but possibly 1868 (first registration, by deduction).

CAPTURE. — Unknown, probably Italy, Europe, ?Tyrrhenian Sea, Mediterranean Sea.

REMARK. — Specimen might perhaps match GAC 2102 (Entry 110) [heart, original in alcohol though], 1868, Lucarelli collection, 15 £.

REFERENCES. — Mancusi *et al.* (2002: 103, tab. 1) and Maio *et al.* (2005: ?460, 469, tab. 6).

INFO. — Nicola Maio (ex CMSNF) [lab, pic, pub, com]. Fig. 27E.



Fig. 28. — *Echinorhinus brucus* (Bonnaterre, 1788) in Italian (Genoa) collections (continuation): **A**, **B**, IZUG unregistered (Entry 119) [i.e., the specimen at the left of the table, hidden in part behind the sailboat model].

IZUG – Istituto di Zoologia, Università degli Studi di Genova

Entry 119. [INDIVIDUAL-084; this number is based on the references (i.e., the Berlin specimen) and is not necessarily linked to the voucher material] IZUG unregistered

Voucher. — Complete specimen, gutted, stuffed, dried and mounted [here presumed located, here presumed seen].

Individual data. — Male, 175 cm TL [158 cm TL (preserved) according to a digital, online version of Maddalena & Zuffa (2003, original print version does not mention a length)].

Date. — 1880 (first publication) or before.

Capture. — Unknown, probably Italy, Europe, Ligurian Sea, Mediterranean Sea.

Remark. — One of two specimens once present at IZUG; one of them was exhibited at the International Fisheries Exhibition in Berlin

(1880); see original photograph by Günther (1880) [i.e., the oldest known photo of a (stuffed) Bramble shark worldwide]; only one of two IZUG specimens has been preserved to date at DISTAV (IZUG) [at DIP.TE.RIS according to a digital, online version of Maddalena & Zuffa (2003, original print version does not mention a department name)]; the preserved voucher [this Entry, INDIVIDUAL-084] is here presumed to represent the 'Berlin' specimen (compare with photo Günther 1880: wooden base, general size and shape, but curves of caudal fin are a little different) [if the preserved voucher does not represent the 'Berlin' specimen, than it does represent the other IZUG specimen (i.e., INDIVIDUAL-085, Entry 120)].

References. — Gasco (1880: 12), Günther (1880: one of the 'Italien' plates), Parona & Cattaneo (1894: 3), Vinciguerra (1923: 270) and Maddalena & Zuffa (2003: 170, tab. 1) [apparently not in Mancusi *et al.* 2002].

Info. — Fulvio Garibaldi (IZUG) [lab, pic, pub, com]. Fig. 28A, B.

Entry 120. [INDIVIDUAL-085] IZUG unregistered

Voucher. — Material and preservation unknown [here presumed not located, here presumed lost].

Individual data. — Sex, length and weight unknown.

Date. — 1923 (first publication), but probably before.

Capture. — Unknown, probably Italy, Europe, Ligurian Sea, Mediterranean Sea.

Remark. — One of two specimens once present at IZUG; see also INDIVIDUAL-084 (Entry 119).

References. — Vinciguerra (1923: 270) and Maddalena & Zuffa (2003: 170, tab. 1) [apparently not in Mancusi *et al.* 2002].

Info. — Fulvio Garibaldi (IZUG) [lab, pic, pub, com].

MRSNT – Museo Regionale di Scienze Naturali di Torino

Entry 121. [INDIVIDUAL-086] MRSNT unregistered

Voucher. — Material and preservation unknown [not located, here presumed lost].

Individual data. — Sex, length and weight unknown.

Date. — 1956 (first publication), but probably before.

Capture. — ?Italy, Europe, Mediterranean Sea.

Remark. — Specimen from 'Mus. Torino' [here presumed MRSNT].

References. — Tortonese (1956: 189).

Info. — None [pub].

MSNG – Museo Civico di Storia Naturale, Genova (G. Doria)

Entry 122. [INDIVIDUAL-087] MSNG 18110

Voucher. — Complete specimen, gutted, stuffed, dried and mounted [located, seen].

Individual data. — Female, 230 cm TL (?preserved) [240 cm TL according to Maddalena & Zuffa 2003], 80 kg (gutted).

Date. — May 22, 1923 (caught).

Capture. — Noli, Italy, Europe, Ligurian Sea, Mediterranean Sea; beach seine (sciabica tirata da terra).

Remark. — Specimen donated by Sebastiano Molinelli; extreme individual in terms of size for the Mediterranean Sea (Table 2C).

References. — Vinciguerra (1923: 270), Tortonese (1956: 189-191, fig. 102), Mancusi *et al.* (2002: 102, tab. 1) [listing two specimens at 'Genova' (here presumed MSNG, see list of authors), here presumed erroneous (evidence of only a single specimen at MSNG was found)], Maddalena & Zuffa (2003: 170, tab. 1), Maddalena & Bänsch (2008: 93, photo).

Info. — Giuliano Doria and Maria Tavano (both MSNG) [log, pic, pub, com]. Fig. 29A, B.

MSNM – Museo Civico di Storia Naturale di Milano

Entry 123. [INDIVIDUAL-088] MSNM 2008

Voucher. — Complete specimen, gutted, stuffed, dried and most likely mounted [lost/destroyed in WWII bombing, 1943].

Individual data. — Female, 296 cm TL, weight unknown.

Date. — 1856 (first registration) or before.

Capture. — Nice, Alpes-Maritimes, France, Europe, Ligurian Sea, Mediterranean Sea.

Remark. — Specimen in the collection of Bellotti (original index card has survived in MSNM Archives); the specimen could not be identified on the postcard 'Sala ittiologia: vetrina dei grandi Squali in mezzo un Pescecane' (MSNM), published by the Laboratorio Fotografico Tecnico Industriale G. Gadola, Milano; possibly an extreme individual in terms of size for the Mediterranean Sea (Table 2C).

References. — Tortonese (1938: 313), Maddalena & Zuffa (2003: 170, tab. 1) and Maddalena & Bänsch (2008: 93).

Info. — Giorgio Bardelli (MSNM) [crd, pub, com]. Fig. 29C.

MSNPV – Museo di Storia Naturale dell'Università di Pavia

Entry 124. [INDIVIDUAL-089] MSNPV CP1833 (ex 644.930, according to MSNPV logbook 1907; ex Pesci 854 according to Maddalena & Zuffa (2003), here presumed erroneous)

Voucher. — Complete specimen, gutted, stuffed, dried and mounted [located, seen].

Individual data. — Male, 149 cm TL (preserved) [258 cm TL according to Maddalena & Zuffa (2003) and Maddalena & Bänsch (2008), here presumed erroneous], weight unknown.

Date. — 1879 (first registration) or before.

Capture. — Nice, Alpes-Maritimes, France, Europe, Ligurian Sea, Mediterranean Sea.

Remark. — Specimen acquired by exchange with the Technical Institute of Pavia, for a monkey skeleton.

References. — Mancusi *et al.* (2002: 102, tab. 1), Maddalena & Zuffa (2003: 170, tab. 1) and Maddalena & Bänsch (2008: 93).



Fig. 29. — *Echinorhinus brucus* (Bonnaterre, 1788) in Italian (Genoa, Milan, Pavia and Pisa) collections (continuation): **A**, **B**, MSNG 18110 (Entry 122); **C**, MSNM 2008 (Entry 123); **D**-**F**, MSNPV CP1833 (Entry 124); **G**, MSNTC Pe 0081 (Entry 125).

INFO. — Stefano Maretti (MSNPV) [lab, log, crd, pic, pub, com]. Fig. 29D-F.

MSNTC – MUSEO DI STORIA NATURALE E DEL TERRITORIO, UNIVERSITÀ DI PISA (CALCI)

Entry 125. [INDIVIDUAL-090] Pe 0081 (ex 1519, according to Borri 1934)

VOUCHER. — Complete specimen, gutted, stuffed, dried and mounted [located, seen].

INDIVIDUAL DATA. — Female, 193 cm TL (preserved), weight unknown.

DATE. — 1934 (first publication) or before; probably caught a few decades earlier.

CAPTURE. — Palermo, Italy, Europe, Tyrrhenian Sea, Mediterranean Sea.

REMARK. — Specimen on public display; extreme individual in terms of date for the Mediterranean Sea (Table 2B).

REFERENCES. — Borri (1934: 100), Mancusi *et al.* (2002: 101, tab. 1), Maddalena & Zuffa (2003: 170, tab. 1) and Carnevale *et al.* (2007: 102).

INFO. — Simone Farina (MSNTC) [pic, pub, com]. Fig. 29G.

MSNVE – MUSEO DI STORIA NATURALE DI VENEZIA (FONTEGO DEI TURCHI)

Entry 126. [INDIVIDUAL-091] MSNVE 11163 (ex 4844; ex IVSLA 998)

VOUCHER. — Eyes, in alcohol [located, seen]; heart and stuffed skin have been preserved as MSNVE 11644 (Entry 127) and MSNVE 21334 (Entry 129) respectively.

INDIVIDUAL DATA. — Male, 162 cm TL [145 cm TL (preserved)], weight unknown.

DATE. — May 5, 1877 (caught).

CAPTURE. — Gulf of Kvarner, Croatia, Europe, Adriatic Sea, Mediterranean Sea.

REMARK. — Specimen collected by Enrico F. Trois at the fish market; specimen on public display (hanging, attached to the ceiling) [March 2021].

REFERENCES. — Trois (1877: 1179-1183; 1880: 55), Brusina (1887: 217), Trois (1900: 156, 227), Ninni (1904: 20; 1912: 232), Roule (1930: 621), Mizzan (1996: 128), Mancusi *et al.* (2002: 106, tab. 1) and Maddalena & Zuffa (2003: 170, tab. 1).

INFO. — Luca Mizzan (MSNVE) [lab, dat, pic, pub, com]. Fig. 30A.

Entry 127. [INDIVIDUAL-091] MSNVE 11644 (ex 3916; ex IVSLA 1470)

VOUCHER. — Heart, in alcohol [located, seen].

INDIVIDUAL DATA, DATE, CAPTURE, REMARK, REFERENCES AND INFO. — Same as MSNVE 11163 (Entry 126) [lab, dat, pic, pub, com]. Fig. 30B.

Entry 128. [INDIVIDUAL-092] MSNVE 21326 (ex 7800; ex 986 Ninni)

VOUCHER. — Complete specimen, gutted, stuffed, dried and mounted [located, seen].

INDIVIDUAL DATA. — Female, 115 cm TL [113 cm TL (preserved); 116 cm TL according to digital database MSNVE], weight unknown.

DATE. — Early February 1904 (caught).

CAPTURE. — Off Chioggia (Venice), Italy, Europe, Adriatic Sea, Mediterranean Sea.

REMARK. — Specimen collected (bought) by Emilio Ninni at the Venice fish market; stuffed specimen restored by R. Miolo (September 2006).

REFERENCES. — Ninni (1904: 20; 1912: 232), ?Roule (1930: 621), Mizzan (1996: 128), Mancusi *et al.* (2002: 106, tab. 1) and Maddalena & Zuffa (2003: 170, tab. 1).

INFO. — Luca Mizzan (MSNVE) [lab, dat, pic, pub, com]. Fig. 30C-E.

Entry 129. [INDIVIDUAL-091] MSNVE 21334 (ex 7781; ex IVSLA 394R)

VOUCHER. — Complete specimen, gutted, stuffed and dried [located, seen].

INDIVIDUAL DATA, DATE, CAPTURE, REMARK, REFERENCES AND INFO. — Same as MSNVE 11163 (Entry 126) [dat, pic, pub, com]. Fig. 30F.

MZGS – MUSEO ZOOLOGICO, TREVISO (G. SCARPA)

Entry 130. [INDIVIDUAL-093] MZGS 19/P

VOUCHER. — Complete specimen, gutted, stuffed, dried and mounted [located, seen].

INDIVIDUAL DATA. — Male, 152 cm TL (preserved), weight unknown.

DATE. — Unknown, 1933 (first registration) or before; not yet present in 1882 museum catalogue [probably caught late 19th to early 20th century].

CAPTURE. — Nice, Alpes-Martimes, France, Europe, Ligurian Sea, Mediterranean Sea [Mediterranean origin not reported by Mancusi *et al.* (2002)].

REMARK. — Specimen not listed in overview of Mediterranean records by Maddalena & Zuffa (2003).

REFERENCES. — Mancusi *et al.* (2002: 105).

INFO. — Giannantonio Zanata Santi (MZGS) [log, pic, pub, com]. Fig. 30G.

MZPA – MUSEO DI ZOOLOGIA, UNIVERSITÀ DI PALERMO (P. DODERLEIN)

Entry 131. [INDIVIDUAL-094; this number is based on the references (i.e., the 1874 specimen) and is not necessarily linked to the voucher material] MZPA P517

VOUCHER. — Complete specimen, gutted, stuffed and dried [here presumed located, not seen].



FIG. 30. — *Echinorhinus brucus* (Bonnaterre, 1788) in Italian (Venice and Treviso) collections (continuation): **A**, MSNVE 11163 (Entry 126); **B**, MSNVE 11164 (Entry 127); **C**-**E**, MSNVE 21326 (Entry 128); **F**, MSNVE 21334 (Entry 129); **G**, MZGS 19/P (Entry 130).



Fig. 31. — *Echinorhinus brucus* (Bonnaterre, 1788) in Mexican (México City) collections: **A**, UNAM CMR-23 (Entry 139); **B**-**D**, UNAM CMR-24 (Entry 140).

Individual data. — Sex unknown, 85 cm TL (?preserved), weight unknown.

Date. — April 1874 (caught).

Capture. — Palermo, Sicily, Italy, Europe, Tyrrhenian Sea, Mediterranean Sea.

Remark. — The '1874' specimen of (at least) three Palermo specimens once preserved at MZPA (see Doderlein 1881) [May 1870; July 1872; April 1874; only one of them has been preserved to date (unspecified)]; this '1874' specimen was once on public display at the International Fisheries Exhibition (Berlin, 1880); according to Bini (1967) this '1874' specimen matches a 85 cm TL specimen preserved at MZPA; subsequently, we here presume this voucher to represent the 85 cm TL specimen mentioned by Doderlein (1878-1879, 1881) [and thus not a smaller preserved length for the (?fresh) 93 cm TL specimen of Doderlein (1878-1879)].

References. — Doderlein (1878-1879: 31 – 'Es. Montati in pelle […] 85'; 1880: 14; 1881: 105 – 'In pelle […] 0,85'), Bini (1967: 107), Sarà & Sarà (1990: 14) and Maddalena & Zuffa (2003: 107, tab. 1).

Info. — Claudio Gargano (University of Palermo) [pub, com].

Entry 132. [INDIVIDUAL-095] MZPA unregistered

Voucher. — Material and preservation unknown, probably (an) anatomical preparation(s), dried and/or in alcohol [not located].

Individual data. — Sex, length and weight unknown, but here presumed to have weighed 28 kg TW.

Date. — May 1870 (caught).

Capture. — Palermo, Sicily, Italy, Europe, Tyrrhenian Sea, Mediterranean Sea.

Remark. — The '1870' specimen of (at least) three Palermo specimens once preserved at MZPA (see Doderlein 1881) [May 1870; July 1872; April 1874; only one of them has been preserved to date (unspecified)]; Doderlein (1869) mentioned for his first time '*Echinorhinus spinosus*' at Palermo [here presumed not collected]; later, Doderlein (1872, 1878-1879) mentions one '*Echinorhinus spinosus*' specimen of 28 kg that he was able to collect since his stay at Sicily (6-7 years) [here presumed to represent the first specimen he collected, i.e., that of May 1870].

References. — Doderlein (1872: 275; 1878-1879: 12, 31 – probably one or more of the anatomical preparations; 1881: 105 – 'Magg. 1870') and Maddalena & Zuffa (2003: 107, tab. 1 – 'May 1870').

Info. — Claudio Gargano (University of Palermo) [pub, com].

Entry 133. [INDIVIDUAL-096] MZPA unregistered

Voucher. — Material and preservation unknown, but probably a complete specimen, gutted, stuffed and dried [here presumed not located].

Individual data. — Sex, length and weight unknown, but here presumed to have measured 93 cm TL.

Date. — July 1872 (caught).

Capture. — Palermo, Sicily, Italy, Europe, Tyrrhenian Sea, Mediterranean Sea.

Remark. — The '1872' specimen of (at least) three Palermo specimens once preserved at MZPA (see Doderlein 1881) [May 1870; July 1872; April 1874; only one of them has been preserved to date (unspecified)]; Doderlein (1878-1879: 31) once mentioned two stuffed specimen ('*c.* 93' and '85' cm TL); remarkably, the specimen of 93 cm TL was no longer listed in Doderlein (1881: 105); the reason is unclear, but it should be noted that one of the two stuffed specimens was exhibited at the International Fisheries Exhibition (Berlin, 1880); so one could suspect that the 93 cm TL specimen was the one sent to Berlin and had not returned; however, based on other data (see MZPA P517, INDIVIDUAL-094, Entry 131), we here presume that it was the 85 cm TL specimen (and not the 93 cm TL) that was exhibited in Berlin.

References. — Doderlein (1878-1879: 31 – '*c.* 93'; 1881: 105 – 'Luglio 1872') and Maddalena & Zuffa (2003: 107, tab. 1 – 'July 1872').

Info. — Claudio Gargano (University of Palermo) [pub, com].



Fig. 32. — *Echinorhinus brucus* (Bonnaterre, 1788) in Dutch (Rotterdam) collections: **A**-**C**, NMR 997900001845 (Entry 142).

MZUF – Museo di Storia Naturale di Firenze (La Specola)

Entry 134. [INDIVIDUAL-097] MZUF 6041

Voucher. — Complete specimen, gutted, stuffed and dried [not seen].

Individual data. — Female, 162 cm TL, weight unknown.

Date. — May 1876 (caught).

Capture. — Livorno, Tuscany, Italy, Europe, Mediterranean Sea.

Remark. — Specimen acquired at the Florence market; a photograph of this specimen was exhibited at the International Fisheries Exhibition in Berlin (1880) [photograph not located].

References. — Giglioli (1880: 113, 116 – entry 534), Vanni (1993: 97), Mancusi *et al.* (2002: 101, tab. 1) and Maddalena & Zuffa (2003: 170, tab. 1).

Info. — Stefano Vanni (MZUF) [pub, com].

Entry 135. [INDIVIDUAL-098] MZUF 6355

Voucher. — Braincase and jaw, preservation unknown (probably dried) [not seen].

Individual data. — Female, length and weight unknown.

Date. — June 26, 1887 (caught).

Capture. — Genoa, Italy, Europe, Mediterranean Sea.

Remark. — Specimen acquired at the Florence market.

References. — Vanni (1993: 97), Mancusi *et al.* (2002: 101, tab. 1) and Maddalena & Zuffa (2003: 170, tab. 1).

Info. — Stefano Vanni (MZUF) [pub, com].

SZN – Stazione Zoologica, Napoli (A. Dohrn)

Entry 136. [INDIVIDUAL-099] SZN ?unregistered

Voucher. — Material and preservation unknown [not located, here presumed lost].

Individual data. — Sex, length and weight unknown.

Date. — 1956 (first publication), but probably before.

Capture. — Unknown, probably Italy, Europe, Mediterranean Sea.

Remark. — None.

References. — Tortonese (1956: 189).

Info. — Andrea Travaglini and Fabio Crocetta (both SZN) [pub, com].

JP – JAPAN

HUMZ – Hokkaido University Museum, Sapporo

Entry 137. [INDIVIDUAL-100] HUMZ 113400

Voucher. — Complete specimen, dissected into small pieces, in alcohol [located, not seen].

Individual data. — Male, 110 cm TL, weight unknown.

DATE. — March 5, 1978 (caught).

CAPTURE. — Namibia, Africa, south-eastern Atlantic Ocean, 20°04'S-12°18'E; 231-235 m depth.

REMARK. — None.

REFERENCES. — Shirai (1992a: 25; 1992b: 7, pl. 3, figs A-C, pl. 29, fig. D, pl. 3, fig. B, pl. 48, fig. C).

INFO. — Toshio Kawai (HUMZ) [pub, com].

MA − MOROCCO

ISCM – INSTITUT SCIENTIFIQUE DE RABAT

Entry 138. [INDIVIDUAL-101] ISCM unregistered

VOUCHER. — Material and preservation unknown [not seen].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — 1955 (first publication) or before.

CAPTURE. — Rabat area, Morocco, Africa, north-eastern Atlantic Ocean.

REMARK. — Specimen bought on the market; originally in the Institut Scientifique Chérifien (ISC) [now ISCM].

REFERENCES. — Dollfus (1955: 87).

INFO. — None [pub].

MX − MEXICO

UNAM – UNIVERSIDAD NACIONAL AUTÓNOMA DE MÉXICO

Entry 139. [INDIVIDUAL-102] UNAM CMR-23

VOUCHER. — Jaw, dried [located, seen].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — Unknown, but before 2005 (the death of Shelton P. Applegate).

CAPTURE. — Quintana Roo, Mexico, North America, Caribbean Sea [locality unknown according to Jesús Alvarado Ortega].

REMARK. — Specimen entered in the collections by Shelton P. Applegate.

REFERENCES. — Del Moral-Flores *et al.* (2015: online appendix).

INFO. — Josep Moreno Bedmar, Jesús Alvarado Ortega and Luis Fernando Del Moral-Flores (all UNAM) [pic, pub, com]. Fig. 31A.

Entry 140. [INDIVIDUAL-103] UNAM CMR-24 (No. Col. 163-2)

VOUCHER. — Jaw, dried [located, seen].

INDIVIDUAL DATA. — Sex, length and weight unknown, but apparently a large specimen.

DATE. — 1975 (caught).

CAPTURE. — The United States, North America, north-western Atlantic Ocean.

REMARK. — Specimen entered in the collection and identified by Shelton P. Appelgate.

REFERENCES. — None, here presumed unpublished.

INFO. — Josep Moreno Bedmar, Jesús Alvarado Ortega and Luis Fernando Del Moral-Flores (all UNAM) [lab, ins, pic, com]. Fig. 31B-D.

NL − THE NETHERLANDS

COLL. D&M – DIRK C. HOVESTADT & LATE MARIA HOVESTADT-EULER (PRIVATE COLLECTION)

Entry 141. [INDIVIDUAL-014] coll. D&M unregistered

VOUCHER. — Tooth, sectioned, dried [located, seen]; tooth originates from ERB* 1286 (ex R.397 Jean Cadenat) [Entry 14].

INDIVIDUAL DATA. — Sex, length and weight unknown [female, 228 cm TL according to Herman & Ladeuze [s.d.] and Herman *et al.* (1989a – in part); female, 240 cm TL according to Herman *et al.* (1989a – in part) and Herman & Van Waes (2014)].

DATE. — 1958 (caught) [1852 according to Herman & Van Waes (2014), presumed erroneous by Mollen (2019), a view followed here].

CAPTURE. — Kayar, Region of Thiès, Senegal, Africa, eastern Atlantic Ocean [Belgium, North Sea according to Herman *et al.* (1989a – in part) and Herman & Van Waes (2014), presumed erroneous by Mollen (2019), a view followed here].

REMARK. — Specimen from Jean Cadenat (IFAN, Gorée); see detailed discussion by Mollen (2019); specimen transferred to Jacques Herman collection in 1983, and later (*c.* 2014), to Elasmobranch Research, Belgium (ERB).

REFERENCES. — Herman & Ladeuze [s.d.], Herman *et al.* (1989a: 102, 106, 135, text-pl. 1, pl. 1; b: 8, fig. 4), Hovestadt & Hovestadt-Euler (1993: pl. 1), Herman *et al.* (2003: 15, text-fig. 49), Herman & Van Waes (2014: 283, pl. 15, figs 1-3) and Mollen (2019: 295-296).

INFO. — Dirk C. Hovestadt, Jacques Herman (IRSNB, retired) and Frederik H. Mollen (ERB) [lab, pic, pub, com].

NMR – NATUURHISTORISCH MUSEUM ROTTERDAM

Entry 142. [INDIVIDUAL-104] NMR 997900001845 (ex ERB 1207)

VOUCHER. — Complete specimen, gutted, stuffed, in alcohol [located, seen], and internal organs and tissue samples, frozen [located, seen, at MNHN, Concarneau]; tissue sample taken by Frederik H. Mollen (ERB 1207), subsample sent to Gavin J. P. Naylor (GN 19546).

INDIVIDUAL DATA. — Female, 101.3 cm TL, 7.0 kg TW.

DATE. — First half of August 2018 (caught).

CAPTURE. — Namibia, Africa, south-eastern Atlantic Ocean, between 20°45.6'S, 12°40.5'E and 21°10.4'S, 12°45.0'E; 329-338 m depth (180-185 fth); bottom trawl; commercial vessel *Milestone* (Freddie Fish Processors); targeting Devil anglerfish *Lophius vomerinus*.

Remark. — Specimen donated by Klaas Post (NHR); extreme individual in terms of date for the south-eastern Atlantic Ocean (Table 2B).

References. — Unpublished.

Info. — Wayne Hart (Freddie Fish Processors), Klaas Post, Bram Langeveld and Sander Schouten (all NHR) [lab, log, dat, pic, com]. Fig. 32.

RMNH – Naturalis Biodiversity Center, Leiden

Entry 143. [INDIVIDUAL-105] RMNH.PISC.84927

Voucher. — Jaw, dried [here presumed located, seen].

Individual data. — Sex, length and weight unknown.

Date. — Unknown, 1853 or before (according to first publication) [possibly caught in the late 1830s].

Capture. — 'Cap', referring to Cape of Good Hope, South Africa, Africa, south-eastern Atlantic Ocean.

Remark. — Specimen from M. von Horstock (van Horstok), 1853; original labels missing [March 2022]; collection number was given by Esther Dondorp (March 1, 2022).

References. — Lidth de Jeude (1898: 42, 47, 50, 54).

Info. — Ronald de Ruiter (ex RMNH), Esther Dondorp and Pepijn Kamminga (both RMNH) [pic, pub, com]. Fig. 33A.

Entry 144. [INDIVIDUAL-106] RMNH.PISC.D.2561

Voucher. — Complete specimen, gutted, stuffed, dried and mounted [located, seen].

Individual data. — Female, 128 cm TL (preserved), weight unknown.

Date. — September 2, 1827 (caught).

Capture. — Genoa, Italy, Europe, Ligurian Sea, Mediterranean Sea.

Remark. — Collected and shipped by François-Joseph Cantraine during his exploration of Italy (see Koninck 1869 for context); packed in a wooden barrel (that included a total of 110 specimens) and loaded on board of *De Vriendschap (van Embden)* (Captain H. J. Spans, Hanoverian); the barrel was shipped together with an inventory or catalogue, that has been preserved in RMNH Archives, together with two original letters mentioning the shipment (all Cantraine 1827); the specimen was listed in the catalogue (entry number 94) under the name '*Sq. spinosus* (Tufo)'; the latter referring to its local, vernacular name; the entry also includes some general info on the species, including a short anecdotal note that its sharp teeth wounded Cantraine's middle finger; extreme individual in terms of date for the Mediterranean Sea and all other oceans worldwide (Table 2A).

References. — Müller & Henle (1839: 97).

Info. — Ronald de Ruiter (ex RMNH), Esther Dondorp, Pepijn Kamminga, Karien Lahaise, Menno Hooft and Martien J. P. van Oijen (all RMNH, the latter retired) [lab, log, ms, pic, pub, com]. Fig. 33B-F.

Entry 145. [INDIVIDUAL-107] RMNH.PISC.D.2562

Voucher. — Complete specimen, gutted, stuffed, dried and mounted [located, seen].

Individual data. — Male, 183 cm TL (preserved), weight unknown.

Date. — Unknown, but here presumed 1838 or before (first registration, by deduction).

Capture. — 'Cap' or 'Kaap' (in Dutch), referring to Cape of Good Hope, South Africa, Africa, south-eastern Atlantic Ocean.

Remark. — Specimen from 'Verreaux', probably referring to Jules Verreaux, brother of Edouard Verreaux (Maison Verreaux, dealers); one of two 'Verreaux' specimens, the other one in Paris (see MNHN-IC-A9688, INDIVIDUAL-074, Entry 93) [not located, presumed lost]; Jules Verreaux helped Andrew Smith to start the South African Museum (SAM), and became curator of the collections in 1829 until he returned to France in 1838 (Summers 1975); note the striking similarities between this voucher and the holotype of *E. obesus* Smith, 1838 (syn. *E. brucus*), also a male, 6 ft 6½ in (*c.* 199 cm TL, in fresh condition), from Cape of Good Hope (depository not mentioned) [not found in any museum worldwide]; early 1837, Andrew Smith withdrew his private collection from SAM, and returned to England and organised the sale of many objects collected during the 1834-1836 expeditions in order to refund the expenses of the Cape of Good Hope Association; several specimens ended up in the NHMUK (London) and MNHN (Paris) but what remained in both museums is not necessarily type material, and are often presumed 'topotypes' (Summers 1975); in view of the fact that the holotype of *E. obesus* is no longer present in South Africa, that a transfer to Europe is most likely and the close relationship between J. Verreaux and A. Smith, this voucher might perhaps represent the holotype of *E. obesus;* extreme individual in terms of date and size for the south-eastern Atlantic Ocean (Table 2A,C).

References. — ?None, here presumed unpublished.

Info. — Ronald de Ruiter (ex RMNH), Esther Dondorp, Pepijn Kamminga and Martien J. P. van Oijen (all RMNH, the latter retired) [lab, log, pic, com]. Fig. 33F-I.

PT – PORTUGAL

AVG – Aquario Vasco da Gama, Lisboa

Entry 146. [INDIVIDUAL-108] PE 112 (N°71 of D. Carlos I)

Voucher. — Complete specimen, gutted, stuffed, dried and mounted [located, seen].

Individual data. — Female, 130 cm TL [128 cm TL according to Gonçalves (1942)], weight unknown.

Date. — June 28, 1897 (caught).

Capture. — Off Setúbal, Portugal, Europe, Funil de Cezimbra (Fosse de Cezimbra), Sesimbra Sea, north-eastern Atlantic Ocean; station 79; 'espinhel 6' (grand palancre 6); more than 713 m depth; research vessel *Amelia*; one of two Bramble sharks caught in the same event.

Remark. — Specimen from the 'Colecção Oceanográfica de D. Carlos I'; three original, historic photos of the stuffed specimen have been preserved in the archives of the Museu de Marhina Archives and in the D. Carlos I Oceanographic Museum Library (AVG); the first photo was taken at the 'Exposição oceanográfica de D. Carlos' ('Congresso da Associação Internacional da Marinha') [Sociedade de Geografia de Lisboa, Lisbon, 1904], the second was taken at the 'Esposizione Internazionale del Sempione' (Milan International Exhibition, 1906), and the third at the 'Liga Naval Portuguesa' (Lisbon, February 2010).



FIG. 33. — *Echinorhinus brucus* (Bonnaterre, 1788) in Dutch (Leiden) collections (continuation): **A**, RMNH.PISC.84927 (Entry 143); **B**-**F**, RMNH.PISC.D.2561 (Entry 144); **F**-**I**, RMNH.PISC.D.2562 (Entry 145).

REFERENCES. — Bragança (1897: no pagination, entry for June 28; 1904: 94-95) and Gonçalves (1942: 11).

INFO. — Paula Leandro and Nuno Galhardo Leitão (both AVG), Isabel Beato (Biblioteca Central de Marinha) and Ana Tavares (Museu de Marinha) [lab, ms, pic, pub, com]. Fig. 34A, B.



FIG. 34. — *Echinorhinus brucus* (Bonnaterre, 1788) in Portuguese (Lisbon and Coimbra) collections: **A**, **B**, AVG PE 112 (Entry 146); **C**, **D**, AVG PE 113 (Entry 147); **E**-**G**, ZOO.0004968 (Entry 149).

Entry 147. [INDIVIDUAL-109] PE 113 (N°276 of D. Carlos I)

Voucher. — Jaw, dried and mounted [located, seen].

Individual data. — Sex, length and weight unknown.

Date. — November 7, 1898 (caught).

Capture. — Portugal, north-eastern Atlantic Ocean; station 121; 'apparelho 8' (petit palancre 8); 366 m depth; research vessel *Amelia*; one of two Bramble sharks caught in the same event.

Remark. — Specimen from the 'Colecção Oceanográfica de D. Carlos I'.

References. — Bragança (1898: no pagination; 1904: 94-95) and Gonçalves (1942: 11).

Info. — Paula Leandro (AVG) [lab, ms, pic, pub, com]. Fig. 34C, D.

MB – Museu Nacional de História Natural, Lisboa

Entry 148. [INDIVIDUAL-110] MB ?unregistered

Voucher. — Complete specimen, probably gutted, stuffed, dried and mounted [lost in museum fire, 1978].

Individual data. — Sex unknown, 175 cm TL, weight unknown.

Date. — 1866 (first publication) or before.

Capture. — Unknown, but here presumed Portugal, Europe, north-eastern Atlantic.

Remark. — None.

References. — Bocage & Capello (1866: 33), Capello (1870: 148) [not an individual record, but the title of this reference links to MB collections and thus the entry suggests the specimen mentioned by Bocage & Capello (1866)], ?Cappello (1880: 50) [same remark as for Capello (1870), but in this reference there is no title link to MB collections] and Nobre (1935: 464).

Info. — Judite Alves (MB) [pub, com].

MZC – Museu Zoológico da Universidade de Coimbra

Entry 149. [INDIVIDUAL-111] ZOO.0004968 (ex ZOO.PIS.POR.0027.01)

Voucher. — Complete specimen, gutted, stuffed, dried and mounted [located, seen].

Individual data. — Male, 143 cm TL, weight unknown.

Date. — April 28, 1889 (caught).

Capture. — Buarcos, Coimbra, Portugal, Europe, north-eastern Atlantic Ocean.

Remark. — Specimen on public display [August 2016]; label on wooden base reads '26a' (in print) ['28' added/?corrected later in pencil]; species respectively listed as '21a' and '28a' according to Vieira (1897, 1898) and Helling (1940, 1943) respectively.

References. — Vieira (1897: 138; 1898: 16), Nobre (1935: 464, 555, ?pl. 64, fig. 901) and Helling (1940: 13; 1943: 104).

Info. — Ana Rufino (MZC) [lab, pic, pub, com]. Fig. 34E-G.

Coll. RM – Rui Marques (private collection)

Entry 150. [INDIVIDUAL-112] coll. RM unregistered

Voucher. — Jaw, dried [not seen].

Individual data. — Sex, length and weight unknown.

Date. — *c.* 1998 (caught) [Rui Marques, pers. comm. June 6, 2007 – 'it's been 8-10 years since'].

Capture. — Algarve, Portugal, Europe, north-eastern Atlantic Ocean.

Remark. — Jaw from a fresh head with no data (the shark was already processed upon arrival); species still being caught (accidentally) in southern Portugal according to Rui Marques (pers. comm. September 2, 2014); extreme individual in terms of date for the north-eastern Atlantic Ocean (Table 2B).

References. — None, here presumed unpublished.

Info. — Rui Marques (Apex Jaws) [com].

SA − SOUTH AFRICA

SAIAB – South African Institute for Aquatic Biodiversity

Entry 151. [INDIVIDUAL-113] SAIAB 6254 (ex ORI 936; ex RUSI-6254)

Voucher. — ?A dissected specimen, in alcohol [not seen], and a portion of skin (in a separate bottle), in alcohol [not seen]; portions of jaw and isolated teeth (SAIAB 99155, Entry 153) [also ORI 936] are here presumed to represent the same individual.

Individual data. — Female, 169 cm TL [170 cm TL according to Compagno (1988)], weight unknown.

Date. — April 30, 1964 (caught).

Capture. — Eastern Cape, South Africa, Africa, south-eastern Atlantic Ocean.

Remark. — Specimen from the Oceanographic Research Institute (ORI).

References. — Bass *et al.* (1976: 51, 103, pl. 11), Pfeil (1983: 135, 138 – tab., 140, 141, figs 62, 63), Bass & Compagno (1986: 63, fig. T), Compagno (1988: fig. 6.15A), Ebert *et al.* (2021: 20) and Ebert (2022: 416, fig. unnumbered – in part, teeth only).

Info. — Nkosinathi Mazungula, Ofer Gon and Roger Bills (all SAIAB) [dat, pub, com].

Entry 152. [INDIVIDUAL-114] SAIAB 99154 (ex ORI 2445; event number 2011/407/2445)

Voucher. — Jaw (disarticulated), in alcohol [located, seen].

Individual data. — Female, 122 cm TL, weight unknown.

Date. — January 1969 (first registration) or before [according to SAIAB digital database].

Capture. — Namibia, Africa, between Walvis Bay and Lüderitz Bay, south-eastern Atlantic Ocean.

REMARK. — Specimen from the Oceanographic Research Institute (ORI).

REFERENCES. — Bass *et al.* (1976: 51-52, 69, 91, tab. 27, fig. 36), Pfeil (1983: 142, fig. 64.1), McEachran & Branstetter (1984: 139; 1989: 139), Bass & Compagno (1986: 63, fig. unnumbered – in part, shark in lateral and ventral views, nostril, not teeth, not dermal denticles) and Ebert (2022: 416, fig. unnumbered – in part, shark in lateral and ventral views, nostril, not teeth); another illustration in McEachran & Fechhelm (1998: 103) seems to be based on both Bigelow & Schroeder (1948: 528, fig. 102A) and Bass *et al.* (1976: 91, fig. 36) [a combination of two illustrations].

INFO. — Nkosinathi Mazungula, Ofer Gon and Roger Bills (all SAIAB) [dat, pic, pub, com]. Fig. 35A.

Entry 153. [INDIVIDUAL-113] SAIAB 99155 (ex ORI 936; event number 2011/407/936)

VOUCHER. — One large and many small portions of jaw, together with several isolated teeth, dried (all stuck on two pieces of black cardboard with transparent tape) [located, seen; here presumed to represent the same individual as SAIAB 6254 (Entry 151)].

INDIVIDUAL DATA, DATE, CAPTURE, REMARK, REFERENCES AND INFO. — See SAIAB 6254 (Entry 151) [+pic]. Fig. 35B, C.

SAM – SOUTH AFRICAN MUSEUM, IZIKO, CAPE TOWN

Entry 154. [INDIVIDUAL-115] SAMC-F003230 (Event number Z03230)

VOUCHER. — Embryo, in alcohol [not seen].

INDIVIDUAL DATA. — Male, 28.5 cm TL, weight unknown; evidently from a mature female.

DATE. — 1922 (first registration, by deduction, according to chronology of event numbers) or before.

CAPTURE. — Unknown, but here presumed South Africa, Africa, south-eastern Atlantic Ocean.

REMARK. — 'Orig. *E. spinosus*' in SAM digital database.

REFERENCES. — Barnard (1925: 46-47 – 'An embryo in the South African Museum').

INFO. — Albé Bosman (ex SAM) [dat, pub, com].

Entry 155. [INDIVIDUAL-116] SAMC-F012757 (Event number Z12757)

VOUCHER. — Material unverified, in alcohol [not seen].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — 1922 (first registration, by deduction, according to chronology of event numbers) or before.

CAPTURE. — Western Cape, South Africa, Africa, Table Bay, south-eastern Atlantic Ocean.

REMARK. — 'Orig. *E. spinosus*' in SAM digital database.

REFERENCES. — Barnard (1925: 47 – 'Locality. […] Table Bay'), but this individual specimen is here presumed unpublished.

INFO. — Albé Bosman (ex SAM) [dat, com].

Entry 156. [INDIVIDUAL-117] SAMC-F013846 (Event number Z13846)

VOUCHER. — 'Skeleton', dried [destroyed, 1924].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — 1922 (first registration, by deduction, according to chronology of event numbers) or before.

CAPTURE. — Western Cape, South Africa, Africa, Table Bay, south-eastern Atlantic Ocean.

REMARK. — Specimen from Daniel [full name unknown]; specimen once on public display (SAM digital database reads 'Destroyed 1924 – Exhibit').

REFERENCES. — Barnard (1925: 47 – 'Locality. […] Table Bay'), but this individual specimen is here presumed unpublished.

INFO. — Albé Bosman (ex SAM) [dat, com].

Entry 157. [INDIVIDUAL-118] SAMC-F016100 (Event number Z16100)

VOUCHER. — 'Skeleton', 'mounted' (according to SAM digital database) [not seen].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — 1922 (first registration, by deduction, according to chronology of event numbers) or before.

CAPTURE. — Western Cape, South Africa, Africa, Saldanha Bay, south-eastern Atlantic Ocean.

REMARK. — Specimen from Cook [first name unknown]; 'Originally *E. spinosus*' in SAM digital database.

REFERENCES. — Barnard (1925: 47 – 'Locality. […] Saldanha Bay'), but this individual specimen is here presumed unpublished.

INFO. — Albé Bosman (ex SAM) [dat, com].

Entry 158. [INDIVIDUAL-119] SAMC-F016345 (Event number Z16345)

VOUCHER. — Complete specimen, gutted, stuffed, dried and ?'mounted' [not seen]; and intestine and portion(s) of the vertebral column, in alcohol [not seen].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — 1922 (first registration, according to SAM digital database).

CAPTURE. — Western Cape, South Africa, Africa, Agulhas Bank, south-eastern Atlantic Ocean; 40 m depth.

REMARK. — None.

REFERENCES. — Barnard (1925: 47 – 'Locality. […] Agulhas Bank'), but this individual specimen is here presumed unpublished.

INFO. — Albé Bosman (ex SAM) [dat, com].

Entry 159. [INDIVIDUAL-120] SAMC-F018076 (Event number Z18076)

VOUCHER. — Jaw, preservation unknown [not seen].

INDIVIDUAL DATA. — Sex, length and weight unknown, probably a female ['F' according to SAM digital database].

DATE. — Unknown, but between 1922 and 1965 (first registration, by deduction, according to chronology of event numbers).

CAPTURE. — Simonstown, Western Cape, South Africa, Africa, south-eastern Atlantic Ocean.

REMARK. — Specimen from Biden [first name unknown].

REFERENCES. — None, here presumed unpublished.

INFO. — Albé Bosman (ex SAM) [dat, com].

Entry 160. [INDIVIDUAL-121] SAMC-F025107 (Event number Z25107)

VOUCHER. — Material unverified, in alcohol [not seen].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — Unknown, but before 1965 (first registration, by deduction, according to chronology of event numbers).

CAPTURE. — Namibia, Africa, north of Walvis Bay, south-eastern Atlantic Ocean.

REMARK. — Specimen from 'Sea Fisheries Research Institute' (South Africa).

REFERENCES. — None, here presumed unpublished.

INFO. — Albé Bosman (ex SAM) [dat, com].

Entry 161. [INDIVIDUAL-122] SAMC-F025140 (Event number Z25140)

VOUCHER. — Material unverified, in alcohol [not seen].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — February 5, 1965 (first registration).

CAPTURE. — West of Rocky Point, Western Cape, South Africa, Africa, south-eastern Atlantic Ocean.

REMARK. — Specimen from Irvin & Johnson Limited.

REFERENCES. — None, here presumed unpublished.

INFO. — Albé Bosman (ex SAM) [dat, com].

Entry 162. [INDIVIDUAL-123] SAMC-F033959 (Event number Z33959)

VOUCHER. — Material unverified, in alcohol [not seen].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — December 20, 1994 (first registration).

CAPTURE. — West of Lüderitz, Namibia, Africa, south-eastern Atlantic Ocean; 380 m depth.

REMARK. — Specimen from B. Rose (Irvin & Johnson Limited).

REFERENCES. — None, here presumed unpublished.

INFO. — Albé Bosman (ex SAM) [dat, com].

Entry 163. [INDIVIDUAL-124] SAMC-F038241 (LJVC-910618)

VOUCHER. — Material unverified, in alcohol [not seen]; SAMC-F038249 and SAMC-F038252 (all LJVC-910618) are here presumed to represent the same individual (see Entries 171 and 174).

INDIVIDUAL DATA. — Female, 250.6 cm TL, weight unknown.

DATE. — June 15, 1991 (first registration).

CAPTURE. — 'Grotto Point' [Grotto Bay], West Coast, South Africa, Africa, south-eastern Atlantic Ocean.

REMARK. — Specimen from M. Boom (collection Leonard J. V. Compagno).

REFERENCES. — None, here presumed unpublished.

INFO. — Albé Bosman (ex SAM) [dat, com].

Entry 164. [INDIVIDUAL-125] SAMC-F038242 (LJVC-891110B)

VOUCHER. — Material unverified, in alcohol [not seen].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — February 12, 1988 (first registration).

CAPTURE. — Namibia, Africa, south-eastern Atlantic Ocean.

REMARK. — Specimen from the collection of Leonard J. V. Compagno.

REFERENCES. — None, here presumed unpublished.

INFO. — Albé Bosman (ex SAM) [dat, com].

Entry 165. [INDIVIDUAL-126] SAMC-F038243 (LJVC-860910; PEM-860701)

VOUCHER. — (?Pectoral) fin skeleton, in alcohol [located, seen]; SAMC-F038256 (also PEM-860701) represents the same individual (see Entry 175).

INDIVIDUAL DATA. — Female, 183.0 cm TL, weight unknown.

DATE. — July 1, 1986 (first registration).

CAPTURE. — East of Bird Island, Eastern Cape, South Africa, Africa, Algoa Bay, south-eastern Atlantic Ocean.

REMARK. — Specimen from Port Elizabeth Museum (PEM); later in the collection of Leonard J. V. Compagno (SAM).

REFERENCES. — None, here presumed unpublished.

INFO. — Albé Bosman (ex SAM) [lab, dat, pic, com]. Fig. 35D.

Entry 166. [INDIVIDUAL-127] SAMC-F038244 (LJVC; NOTO-037)

VOUCHER. — Material unverified, in alcohol [not seen].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — Unknown, *c.* 1985-1994 (first registration, by deduction, according to chronology of collection numbers).

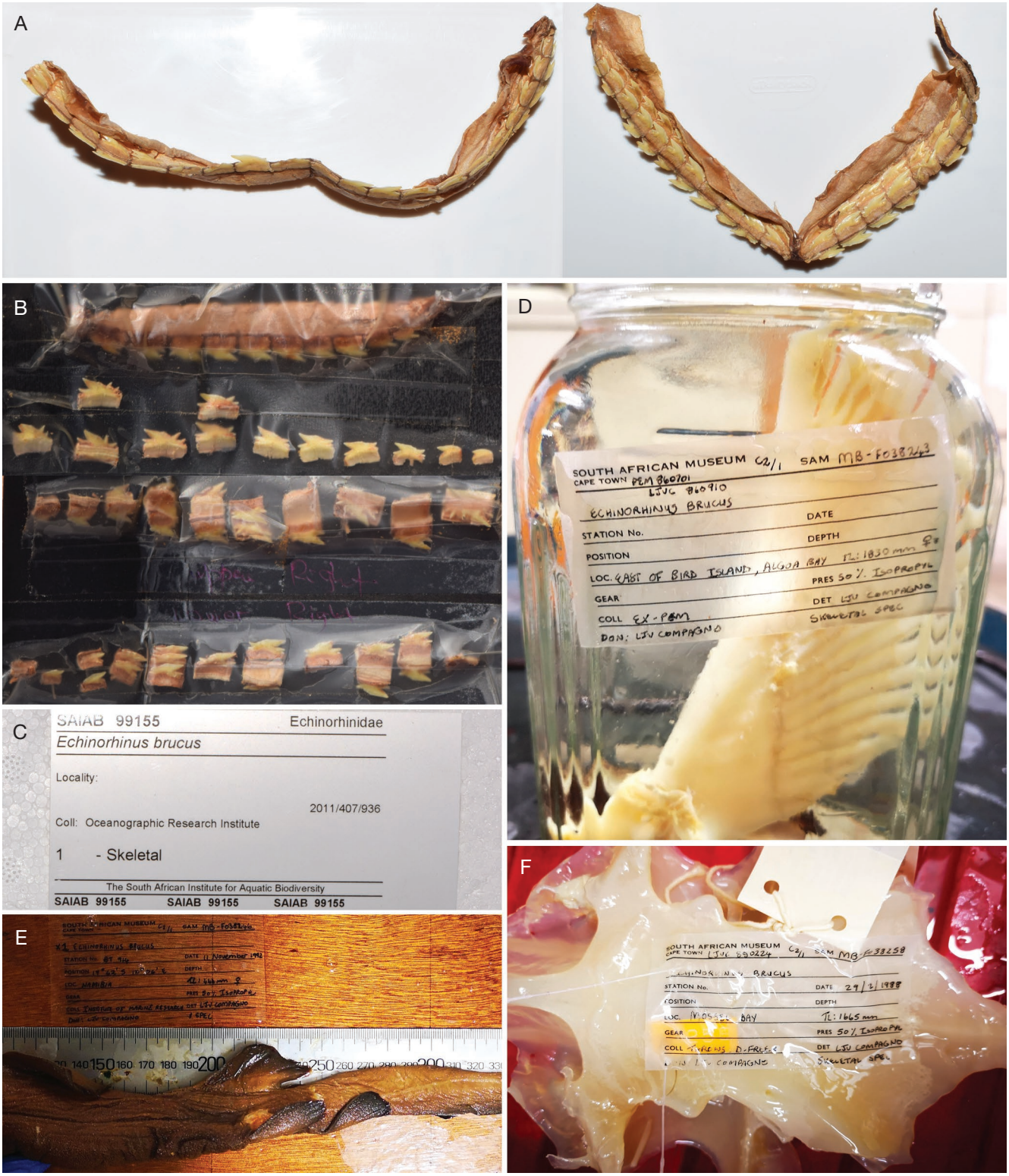


FIG. 35. — *Echinorhinus brucus* (Bonnaterre, 1788) in South African (Grahamstown and Cape Town) collections: **A**, SAIAB 99154 (Entry 152); **B**, **C**, SAIAB 99155 (Entry 153); **D**, SAMC-F038243 (Entry 165); **E**, SAMC-F038246 (Entry 168); **F**, SAMC-F038258 (Entry 176).

CAPTURE. — Unknown, here presumed southern Africa, south-eastern Atlantic Ocean.

REMARK. — Specimen from the collection of Leonard J. V. Compagno.

REFERENCES. — None, here presumed unpublished.

INFO. — Albé Bosman (ex SAM) [dat, com].

Entry 167. [INDIVIDUAL-128] SAMC-F038245 (LJVC-880229)

VOUCHER. — Material unverified, in alcohol [not seen]; at least SAMC-F041442 (also LJVC-880229), but also SAMC-F038258 (LJVC-880224) is here presumed to represent the same individual (see Entries 178 and 176 respectively).

INDIVIDUAL DATA. — Male, 166.5 cm TL, weight unknown.

DATE. — February 29, 1988 (first registration).

CAPTURE. — Western Cape, South Africa, Africa, Mossel Bay, south-eastern Atlantic Ocean.

REMARK. — Specimen from Dave Freer (collection Leonard J. V. Compagno).

REFERENCES. — Compagno *et al.* (1991: 54 – 'specimens have been examined from Mossel Bay'), but this individual specimen is here presumed unpublished.

INFO. — Albé Bosman (ex SAM) [dat, com].

Entry 168. [INDIVIDUAL-129] SAMC-F038246 (LJVC)

VOUCHER. — Embryo, in alcohol [located, seen].

INDIVIDUAL DATA. — Female, 44.4 cm TL, weight unknown, evidently from a mature female.

DATE. — November 11, 1992 (first registration).

CAPTURE. — Namibia, Africa, south-eastern Atlantic Ocean, 19°42'S, 12°26'E; station 'BT 914' [?BT refers to a bottom trawl].

REMARK. — Specimen from the 'Institute of Marine Research' [here presumed IMR, Bergen, Norway; Fridjof Nansen program] (collection Leonard J. V. Compagno); but so far, this specific date and station could not be linked to any IMR cruise (report).

REFERENCES. — None, here presumed unpublished.

INFO. — Albé Bosman (ex SAM) [lab, dat, pic, com]. Fig. 35E.

Entry 169. [INDIVIDUAL-130] SAMC-F038247 (A2944 036; LJVC-851228)

VOUCHER. — Material unverified, in alcohol [not seen]; SAMC-F038251, SAMC-F038267, SAMC-F041469 and SAMC-F041562 [all LJVC-851228] are here presumed to represent the same individual (see Entries 173, 177, 179 and 180 respectively).

INDIVIDUAL DATA. — Female, 249.0 cm TL, weight unknown.

DATE. — December 28, 1985 (first registration).

CAPTURE. — Off Cape Infanta, Western Cape (South Coast), South Africa, Africa, south-eastern Atlantic Ocean; 37 m depth; research vessel *F.R.S. Africana* (south-east cruise 036).

REMARK. — Specimen from the collection of Leonard J. V. Compagno; the only specimen known to have been taken by the *Africana*.

REFERENCES. — Compagno *et al.* (1991: 54).

INFO. — Albé Bosman (ex SAM) [dat, pub, com].

Entry 170. [INDIVIDUAL-131] SAMC-F038248 (LJVC-940629)

VOUCHER. — Material unverified, in alcohol [not seen].

INDIVIDUAL DATA. — Female, 120.0 cm TL, weight unknown.

DATE. — June 29, 1994 (first registration).

CAPTURE. — Unknown, here presumed southern Africa, Africa, south-eastern Atlantic Ocean.

REMARK. — Specimen from the collection of Leonard J. V. Compagno.

REFERENCES. — None, here presumed unpublished.

INFO. — Albé Bosman (ex SAM) [dat, com].

Entry 171. [INDIVIDUAL-124] SAMC-F038249 (LJVC-910618)

VOUCHER. — Material unverified, in alcohol [not seen].

INDIVIDUAL DATA, DATE, CAPTURE, REMARK, REFERENCES AND INFO. — See SAMC-F038241 (Entry 163).

Entry 172. [INDIVIDUAL-132] SAMC-F038250 (LJVC)

VOUCHER. — Material unverified, in alcohol [not seen].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — Unknown, *c.* 1985-1994 (first registration, by deduction, according to chronology of collection numbers).

CAPTURE. — North of Cape Cross, Namibia, Africa, south-eastern Atlantic Ocean.

REMARK. — Specimen from 'Rose' [?same collector as in SAMC-F033959 (see Entry 162)].

REFERENCES. — None, here presumed unpublished.

INFO. — Albé Bosman (ex SAM) [dat, com].

Entry 173. [INDIVIDUAL-130] SAMC-F038251 (LJVC-851228)

VOUCHER. — Material unverified, in alcohol [not seen].

INDIVIDUAL DATA, DATE, CAPTURE, REMARK, REFERENCES AND INFO. — See SAMC-F038247 (Entry 169).

Entry 174. [INDIVIDUAL-124] SAMC-F038252 (LJVC-910618)

VOUCHER. — Material unverified, in alcohol [not seen].

INDIVIDUAL DATA, DATE, CAPTURE, REMARK, REFERENCES AND INFO. — See SAMC-F038241 (Entry 163).

Entry 175. [INDIVIDUAL-126] SAMC-F038256 (LJVC; PEM-860701)

VOUCHER. — Material unverified, in alcohol [not seen].

INDIVIDUAL DATA, DATE, CAPTURE, REMARK, REFERENCES AND INFO. — See SAMC-F038243 (Entry 165) [-lab, -pic].



FIG. 36. — *Echinorhinus brucus* (Bonnaterre, 1788) in United Kingdom (Aberdeen) collections: **A**-**C**, RN/ABDUZ 22716 (Entry 181).

Entry 176. [here presumed INDIVIDUAL-128] SAMC-F038258 (LJVC-880224)

VOUCHER. — Braincase, in alcohol [located, seen].

INDIVIDUAL DATA, DATE, CAPTURE, REMARK, REFERENCES AND INFO. — See SAMC-F038245 (Entry 167) [+lab, +pic]. Fig. 35F.

Entry 177. [INDIVIDUAL-130] SAMC-F038267 (LJVC-851228)

VOUCHER. — Material unverified, in alcohol [not seen].

INDIVIDUAL DATA, DATE, CAPTURE, REMARK, REFERENCES AND INFO. — See SAMC-F038247 (Entry 169).

Entry 178. [INDIVIDUAL-128] SAMC-F041442 (LJVC-880229)

VOUCHER. — Material unverified, in alcohol [not seen].

INDIVIDUAL DATA, DATE, CAPTURE, REMARK, REFERENCES AND INFO. — See SAMC-F038245 (Entry 167).

Entry 179. [INDIVIDUAL-130] SAMC-F041469 (LJVC-851228)

VOUCHER. — Material unverified, in alcohol [not seen].

INDIVIDUAL DATA, DATE, CAPTURE, REMARK, REFERENCES AND INFO. — See SAMC-F038247 (Entry 169).

Entry 180. [INDIVIDUAL-130] SAMC-F041562 (LJVC-851228)

VOUCHER. — Material unverified, in alcohol [not seen].

INDIVIDUAL DATA, DATE, CAPTURE, REMARK, REFERENCES AND INFO. — See SAMC-F038247 (Entry 169).

UK – UNITED KINGDOM

ABDUZ – UNIVERSITY MUSEUMS, UNIVERSITY OF ABERDEEN

Entry 181. [INDIVIDUAL-133] RN/ABDUZ 22716

VOUCHER. — Complete specimen, gutted, stuffed and dried [located, seen].

INDIVIDUAL DATA. — Female, 221 cm TL (7 ft 3 in) [190 cm TL (preserved); nearly 7 ft according to Day (1880-1884); 225 cm TL according to Rappé (1984)], weight unknown.

DATE. — July 1875 (caught).

CAPTURE. — C. 12 mi north of Aberdeen, Aberdeenshire, Scotland, United Kingdom, Europe, off the Ythan river estuary, North Sea.

REMARK. — Specimen sent by Mr. Davidson to the Natural History Museum of Marischal College, Aberdeen [ABDUZ].

REFERENCES. — Trail (1873: 155-156; 1878: 17), Dyce & Sim (1878: 93), Day (1880-1884: 323-325, pl. 162, fig. 2a-b) [not fig. 2; on page 324, '1873' should read '1875'], Anonymous (1885s: 5) [most likely], Howden (1887-1888: 15) [i.e., the 'A.U.' specimen, not the 'S' specimen], Sim (1903: 274) ['1875' should read '1873'] and Rappé (1984: 114).

INFO. — Melia Knecht and Louise Wilkie (both ABDUZ) [lab, pic, pub, com]. Fig. 36A-C.

ASHNHC – Natural History Collections, University of Edinburgh

Entry 182. [INDIVIDUAL-000] XC03-03.01

Voucher. — Small portion of skin, ?dried [located, not seen].

Individual data. — Sex, length and weight unknown.

Date. — Unknown.

Capture. — Unknown, but here presumed United Kingdom, Europe.

Remark. — Specimen possibly present in ASHNHC logbook [not seen].

References. — Unknown, but probably from a published specimen [for the time being, this voucher is not presumed to represent a separate individual].

Info. — Mark Blaxter (ASHNHC) [com].

GMRC – Glasgow Museums Resource Centre

Entry 183. [INDIVIDUAL-134] GMRC 1909.97

Voucher. — Five portions of skin, dried (old stiches present, so here presumed to have belonged to a complete specimen, gutted and stuffed) [located, seen].

Individual data. — Sex unknown, 229 cm TL (7 ft 6 in) [7½ ft according to Anonymous (1909b)], 51 kg TW (112 lbs).

Date. — July 16, 1909 (caught).

Capture. — 15 nmi east of the Isle of May [30 nmi according to Anonymous (1909b)], between Fife and Lothian, Scotland, United Kingdom, Europe, Firth of Forth, North Sea; commercial steam trawler *Bass Rock* (Leith Steam Fishing Company).

Remark. — Specimen offered by David Ross (fishmonger, Edinburgh) to the Glasgow Museum; suspected to be in poor condition in 1979 (to be destroyed), but some portions of the skin were apparently saved (Richard Sutcliffe, pers. comm. October 30, 2014).

References. — Anonymous (?1909a, b: 127) and Clarke (1909: 248).

Info. — Richard Sutcliffe (GMRC) [dat, pic, pub, com]. Fig. 37A.

LIVCM – World Museum, National Museums Liverpool

Entry 184. [INDIVIDUAL-135] – LIVCM unregistered

Voucher. — At least a tissue sample, in spirit [destroyed, 1928].

Individual data. — Sex, length and weight unknown.

Date. — October 19, 1896 (first registration) or before.

Capture. — South-western Ireland, Europe, Bantry Bay, north-eastern Atlantic Ocean.

Remark. — Specimen presented by Messrs. Harley and Miller to the Derby Museum, Liverpool [now World Museum, National Museums Liverpool (LIVCM)]; LIVCM logbook reads 'in flesh minus the viscera', 'a piece of tissue (probably kidney & a small bit of the rectum) from the abdomen: placed in spirit' and 'destroyed as useless' in 1928.

References. — Forbes (1897: 18).

Info. — Tony Parker (LIVCM) [log, pub, com]. Fig. 37B.

MEFC – Museum of Economic Fish Culture (F. Buckland)

Entry 185. [INDIVIDUAL-136] MEFC unregistered

Voucher. — Jaw, preservation unknown (probably dried) [not located, here presumed lost].

Individual data. — Sex, length and weight unknown.

Date. — 1872 (first publication) or before.

Capture. — Ireland, Europe, north-eastern Atlantic Ocean.

Remark. — Specimen from Mr. Thomas; after comparing this jaw with the teeth of a fresh specimen received from Frank Gosden [INDIVIDUAL-137, Entry 186], Buckland (1872a) identified the Irish jaw as a 'Spinous shark' (*E. brucus*), a view followed here [tooth morphology is quite unique (i.e., diagnostic) in *E. brucus*]; the first of only a few Irish records; according to Buckland (1872a), fishermen call it an 'oak kettle' (according to Buckland 1875, however, the 'oak-kettle' is also caught off Iceland; not knowing what species it is, Buckland 1875 considers the Basking shark *Cetorhinus maximus*) [when referring to Iceland, the vernacular name 'oak-kettle' probably referred to the Greenland shark *Somniosus microcephalus* (Bloch & Schneider, 1801)].

References. — Buckland (1872a: 187); not published elsewhere.

Info. — Mel Ruth Oakley (SFM) [pub, com].

Entry 186. [INDIVIDUAL-137] MEFC unregistered

Voucher. — Plaster cast of a complete specimen [not located, here presumed lost]; some anatomical parts of the same individual are presumed to have preserved at RCSL (Entry 217) [not located, presumed lost].

Individual data. — Sex unknown, 160 cm TL (5 ft 3 in) [5 ft according to Buckland (1872a); 7-8 ft according to Kent (1883, 1884), here presumed erroneous, see comment below], 22.7 kg TW (50 lbs) [27 lbs according to Buckland (1872a)].

Date. — March 9, 1872 (caught).

Capture. — Brixham, Devon, United Kingdom, Europe, English Channel.

Remark. — Specimen donated by Frank Gosden (fishmonger at Exeter); the first of two 'Spinous sharks' received by Frank Buckland in 1872 (the other one in May, from Matthias Dunn, INDIVIDUAL-158, Entry 218) [evidence of material from this 2nd specimen in MEFC collections is lacking, so that no Entry is given for this individual in MEFC]; Frank Buckland made a plaster cast of at least one of these two specimens [here presumed to represent Buckland's first 'Spinous shark', from Frank Gosden]; plaster cast once on public display at MEFC; once loaned to the International Inventions Exhibition (May 1885, returned November 1886) and the Piscatorial Exhibition, Royal Aquarium, Westminster (February 1892, returned [no date]); soon after, the Buckland Museum deteriorated and only a few items have survived to date at the Scottish Fisheries Museum (SFM) [this plaster cast not located, here presumed lost].



Fig. 37. — *Echinorhinus brucus* (Bonnaterre, 1788) in United Kingdom (Glasgow, Liverpool, London and Sheffield) collections (continuation): **A**, GMRC 1909.97 (Entry 183); **B**, LIVCM unregistered (Entry 184); **C**-**E**, MEFC unregistered (Entry 186); **F**, MSHF D.4.1.75-2 (Entry 187).

References. — Anonymous (1872a: 2; 1872b: 3), Buckland (1872a: 187, b: 3), Flower (1872: 312) [the material with collection number 439a lacks associated data, but is here presumed to originate from the first of two 'Spinous sharks' received by Frank Buckland (see Entry 217)], Parfitt (1875: 146), Gosden (1876a: 426; 1876b: 3 – 'A magnificent cast […] in the Economic Fish Museum'), Day (1880-1884: 324), ?Kent (1883: 111; 1884: 189 – 'the cast […] between seven and eight feet long […] in the Buckland Museum') [size is here presumed erroneous; if not, this reference should be transferred to the second 'Spinous shark' of Frank Buckland (i.e., INDIVIDUAL-158, Entry 218)], Anonymous (1883-1889: 135-136), Gosden (1898: 400), Anonymous (1890-[1915]: 52) and Gosden (1900: 24).

Info. — Mel Ruth Oakley (SFM), Jennifer Gallichan (NMW), Sarah Sworder (NHMUK), Grant J. K. Jesse (World of Water), Justin Hobson and Hannah Nagle (both Science Museum) [crd, ms, pub, com]. Fig. 37C-E.

MSHF – Museums Sheffield, Natural History Collection

Entry 187. [INDIVIDUAL-138] MSHF D.4.1.75-2

Voucher. — Head and vertebral column ('backbone'), preservation unknown [not located, here presumed lost].

Individual data. — Sex unknown, 224 cm TL (7 ft 4 in), weight unknown.

Date. — November 1874 (caught).

Capture. — Yorkshire, United Kingdom, Europe, Bridlington Bay, North Sea.

Remark. — Specimen presented by Mr. Richard Cammish.

References. — Anonymous (1875a: 7, b: 12).

Info. — Gina Allnatt (MSHF) [log, crd, pub, com]. Fig. 37F.

NHMUK – Natural History Museum, London

Entry 188. [INDIVIDUAL-139] BMNH 1856.12.10.654

Voucher. — Head and portion of skin, dried and mounted (together on a wooden base) [located, seen].

Individual data. — Sex, length and weight unknown, but apparently a large specimen.

Date. — November 1837 (caught).

Capture. — Off Brixham, Devon, England, United Kingdom, Europe, English Channel; trawl net.

Remark. — Specimen left by Rev. Robert Holdswordt, including pen-and-ink sketches of the body, skin and teeth [not located]; specimen purchased at Stevens' sale room, London (Yarrell Colln.); extreme individual in terms of date for the north-eastern Atlantic Ocean (Table 2A).

References. — Anonymous (1837: 6), Yarrell (1841: 533-535), Bellamy (1843: 114), Hamilton (1843: 317; 1854: 317; 1877: 317), Yarrell (1859: 530, 532), Bellamy (1862: 114), Anonymous (1870e: 2), Günther (1870: 429 – 'Jaws of an adult example'), Anonymous (1874: 2), Parfitt (1875: 146), Day (1880-1884: 324; 1881: 338-339), ?Regan (1908: 42 – '*In the British Museum four specimens*') [in fact six have been registered prior to 1908 (1856, 1865, 1868, 1891, 1898, 1900)], Anonymous (1937: 3) and Castro (2011: 46 – 'five captures on the English coast between 1830 and 1838').

Info. — James Maclaine (NHMUK) [lab, log, dat, pic, pub, com]. Fig. 38A-C.

Entry 189. [INDIVIDUAL-140] BMNH 1865.7.10.29

Voucher. — Complete specimen, gutted, stuffed, dried and mounted [located, seen].

Individual data. — Male, 152 cm TL (5 ft) [167 cm TL according to NHMUK digital database (preserved)], weight unknown.

Date. — July 10, 1865 (first registration) or before.

Capture. — Europe, Mediterranean Sea.

Remark. — Specimen purchased from Mr. Wright; collection number '1863.7.10.29' on a wooden base should read '1865.7.10.29'.

References. — Günther (1870: 429) and ?Regan (1908: 42 – 'In the British Museum four specimens') [in fact six have been registered prior to 1908 (1856, 1865, 1868, 1891, 1898, 1900)].

Info. — James Maclaine (NHMUK) [lab, log, dat, pic, pub, com]. Figs 38C; 39A, B.

Entry 190. [INDIVIDUAL-141] BMNH 1868.2.13.2

Voucher. — Complete specimen, gutted, stuffed, dried and mounted [located, seen].

Individual data. — Female, 229 cm TL [7 ft according to Gray (1868); 7½ ft according to Day (1880-1884) and Cunningham (1906); 8 ft according to Günther (1870); 210 cm TL according to NHMUK digital database (preserved)], weight unknown.

Date. — November 7, 1867 (caught).

Capture. — Polperro, Cornwall, England, United Kingdom, Europe, English Channel; line.

Remark. — Specimen purchased from Mr. Laughrin (together with a 6 ft long Sixgill shark *Hexanchus griseus*).

References. — Gray (1868: 76), Günther (1870: 429), Day (1880-1884: 323-325, pl. 162, fig. 2, not fig. 2a-b), Good & Bean (1896: pl. 3, fig. 9), Hearder (1902: 403 – citing Couch) [original account by Couch not found, perhaps a personal comment], Griffini (1903: 111, fig. 60), Cunningham (1906: 305), ?Regan (1908: 42 – 'In the British Museum four specimens') [in fact six have been registered prior to 1908 (1856, 1865, 1868, 1891, 1898, 1900)], Jenkins (1925: pl. 125; 1936, pl. 125) and Matsubara (1936: 126, fig. 91 – image reversed).

Info. — James Maclaine (NHMUK) [lab, log, dat, pic, pub, com]. Figs 38C; 39C.

Entry 191. [INDIVIDUAL-142] BMNH 1891.7.23.1

Voucher. — Complete specimen, gutted, in alcohol [located, seen]; a radiograph of the complete specimen was sent to the Smithsonian Institution (US) and was registered as USNM RAD107112-001 (Entry 232) [located, seen].

Individual data. — Male, 94 cm TL [an embryo according to Springer & Garrick (1964: 81 – 'no evidence of calcification of the centra'), here presumed erroneous], weight unknown.

Date. — July 23, 1891 (first registration).

Capture. — Nice, Alpes-Maritimes, France, Europe, Ligurian Sea, Mediterranean Sea.

Remark. — Specimen purchased from 'Gal Bros.' [brothers] referring to Gal frères (dealer); functional teeth removed (missing) [probably to illustrate Bigelow & Schroeder (1848, fig. 102D, E)].

References. — Günther (1892: 102), ?Regan (1908: 42 – 'In the British Museum four specimens') [in fact six had been registered prior to 1908 (1856, 1865, 1868, 1891, 1898, 1900)], Bigelow & Schroeder (1948: 59, 61, 528, fig. 102A-E – 'eastern Atlantic specimen, about three feet long, in British Museum'; illustration by W. P. C. Tenison) [here presumed to represent BMNH 1891.7.23.1], Bigelow & Schroeder (1953: 56, fig. 23; 1957: 135), Springer & Garrick (1964: 81, 93), Bini (1967: 107) and Schwartz (1993: 161 – citing Springer & Garrick's 'embryo'). Parts of the illustration in Bigelow & Schroeder (1948: fig. 102A-E) have been reproduced or redrawn by many, e.g. Matsubara (1955: pl. 6, fig. 18), Barcellos & Pinedo (1980: 74, fig. 1A), Quéro *et al.* (1982: 1022, fig. 1), Castro (1983: 43, fig. unnumbered), Reif (1985: text-fig. 21C), Lloris (1986: 91, fig. 21A), Sanches (1986: 91, fig. 46 – in part) and Ebert & Stehmann (2013: 54, fig. 52 – in part); another illustration in McEachran & Fechhelm (1998: 103) seems to be based on both Bigelow & Schroeder (1948: 528, fig. 102A) and Bass *et al.* (1976: 91, fig. 36) [a combination of two illustrations].

Info. — James Maclaine (NHMUK) [lab, log, dat, pic, pub, com]. Figs 38C; 39D-F.



FIG. 38. — *Echinorhinus brucus* (Bonnaterre, 1788) in United Kingdom (London) collections (continuation): **A**, **B**, BMNH 1856.12.10.654 (Entry 188); **C**, BMNH register (Entries 188-193); **D**, BMNH 1909.9.3.26 (Entry 194).

Entry 192. [INDIVIDUAL-143] BMNH 1898.12.23.1

VOUCHER. — Complete specimen, gutted, stuffed and dried (in spirit according to NHMUK digital database, but presumed erroneous here) [not located, ?lost].

INDIVIDUAL DATA. — Female, 213 cm TL (7 ft), weight unknown.

DATE. — December 20, 1898 (caught).

CAPTURE. — France, Europe, Bay of Biscay, north-eastern Atlantic Ocean.

REMARK. — Gutted specimen brought to the London fish market; specimen purchased by Charles H. Akroyd (Windham Club) and presented to BMNH (now NHMUK); dispatched to a taxidermist to be stuffed; skinned carcase, without fins and braincase, examined by Ridewood (1899).

REFERENCES. — Lankester (1899: 94, 111), Ridewood (1899: 346-348, fig.) and ?Regan (1908: 42 – 'In the British Museum four specimens') [in fact six have been registered prior to 1908 (1856, 1865, 1868, 1891, 1898, 1900)].

INFO. — James Maclaine (NHMUK) [log, dat, pub, com]. Fig. 38C.

Entry 193. [INDIVIDUAL-144] BMNH 1900.11.6.7

VOUCHER. — Complete specimen, in alcohol [located, seen].

INDIVIDUAL DATA. — Male, 131 cm TL [*c.* 140 cm TL according to James Maclaine, pers. comm. December 2, 2016], weight unknown.

DATE. — November 6, 1900 (first registration) or before.

CAPTURE. — Mossel Bay, South Africa, Africa, south-eastern Atlantic Ocean.

REMARK. — Specimen presented by John D. F. Gilchrist.

REFERENCES. — ?Regan (1908: 42 – 'In the British Museum four specimens') [in fact six have been registered prior to 1908 (1856, 1865, 1868, 1891, 1898, 1900)], Leigh-Sharpe (1926: 307, 313-314, fig. 6), Bini (1967: 107), Kamminga *et al.* (2017: figshare) and Klimpfinger & Kriwet (2020: 747, fig. 4E).

INFO. — James Maclaine (NHMUK) [lab, log, dat, pic, pub, com]. Figs 38C; 39G, H.

Entry 194. [INDIVIDUAL-145] BMNH 1909.9.3.26

VOUCHER. — Ova, probably in alcohol [not located].

INDIVIDUAL DATA. — Female, length and weight unknown, evidently from a mature specimen.

DATE. — September 3, 1909 (first registration) or before.

CAPTURE. — Port Elizabeth, Eastern Cape, South Africa, Africa, south-eastern Atlantic Ocean.

REMARK. — Specimen presented by Frederick William Fitz Simons (PEM).

REFERENCES. — None, here presumed unpublished.

INFO. — James Maclaine (NHMUK) [log, dat, com]. Fig. 38D.

Entry 195. [INDIVIDUAL-146] BMNH 2004.12.5.25 (ZS25)

VOUCHER. — Complete specimen, gutted, stuffed and dried [located, seen].

INDIVIDUAL DATA. — Female, 113.8 cm TL [143 cm TL according to NHMUK digital database], weight unknown.

DATE. — Unknown, registered (?again) in 2004 but apparently old (probably late 19th century).

CAPTURE. — Unknown, but probably Europe.

REMARK. — Original label(s) missing; caudal fin nearly broken off.

REFERENCES. — Deynat (2010: 151, fig. 76B – 'BMNH 2525' should be read 'BMNH ZS25'; 2020: 21, photo – i.e., the same as published in 2010, but now oriented upside down).

INFO. — James Maclaine (NHMUK) [dat, pic, pub, com]. Fig. 39I, J.

Entry 196. [INDIVIDUAL-147] NHMUK unregistered

VOUCHER. — Material and preservation unknown [not located].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — 1902 (caught).

CAPTURE. — Bonne Nuit Bay, Bailiwick of Jersey, British Crown Dependency, Europe, English Channel.

REMARK. — Transferred by Joseph Sinrel to Mr. Hornell; in the 'Natural History Museum at South Kensington' [NHMUK].

REFERENCES. — Sinrel (1909: 57) and Plaster & Chambers (2018: 39).

INFO. — James Maclaine (NHMUK) [pub, com].

Entry 197. [INDIVIDUAL-000] NHMUK unregistered

VOUCHER. — Portions of skin, dried [located, not seen].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — Unknown.

CAPTURE. — Unknown, but probably Europe.

REMARK. — 'Some bits of skin in a cupboard of old display specimens' (James Maclaine, pers. comm. December 20, 2017).

REFERENCES. — Unknown, ?unpublished.

INFO. — James Maclaine (NHMUK) [com].

NHMUK – NATURAL HISTORY MUSEUM, TRING

Entry 198. [INDIVIDUAL-148] NHMUK unregistered

VOUCHER. — Complete specimen, gutted, stuffed and dried [located, seen].

INDIVIDUAL DATA. — Female, 190 cm TL (75 in) (preserved), weight unknown.

DATE. — 1898 (first publication) or before.

CAPTURE. — Unknown, presumably United Kingdom, Europe.



FIG. 39. — *Echinorhinus brucus* (Bonnaterre, 1788) in United Kingdom (London) collections (continuation): **A**, **B**, BMNH 1865.7.10.29 (Entry 189); **C**, BMNH 1868.2.13.2 (Entry 190); **D**-**F**, BMNH 1891.7.23.1 (Entry 191); **G**, **H**, BMNH 1900.11.6.7 (Entry 193); **I**, **J**, BMNH 2004.12.5.25 (Entry 195).

Remark. — Specimen from the Walter Rothschild collection; specimen on public display [December 2017; at least since 1898].

References. — Hartert (1898: 53).

Info. — Paul Kitching, Kelcie Maydom, Pete Key, Kyle Belcher and Claire Walsh (all NHMUK, Tring) and James Maclaine (NHMUK, London) [pic, pub, com]. Fig. 40A.

NMSZ – National Museums Scotland, Edinburgh

Entry 199. [INDIVIDUAL-149] NMS.Z.1868.15

Voucher. — Complete specimen, gutted, stuffed and dried [here presumed not located, see also remark for NMS.Z. unregistered (INDIVIDUAL-150, Entry 200)].

Individual data. — Sex unknown, 137 cm TL (4½ ft), weight unknown.

Date. — January 1868 (caught).

Capture. — Bo'ness, Linlithgowshire, Scotland, United Kingdom, Europe, Firth of Forth, North Sea.

Remark. — Specimen from J. Duns (New College, Edinburgh); re-stuffed by 'Gerrard' (first name unknown) [date unknown]; NMSZ holds a stuffed specimen from J. Duns (New College) [two old labels mentioning 'New College', and 'Duns' as donator, but without other info], suggesting to represent the 'Bo'ness specimen'; however, one other (later) label that is attached to the specimen suggests that it was transferred from Free Church College in July '66 [presumed 1966 by curators; a view followed here], and thus represents another specimen from J. Duns (i.e., the 'Elie specimen'), a view followed here; consequently we here presume the 'Bo'ness specimen' not to be located.

References. — Duns (1871: 333; 1872: 132), Turner (1875: 293), Duns (1877: 146 – 'Two specimens […] from the Firth of Forth, several years intervening between them') [we here refer to the 1st specimen], Day (1880-1884: 324 – 'A stuffed specimen […] in the Edinburgh Museum of Science and Art'), Clarke (1900: 17) and Duns (1932: 146) [same comment as for Duns 1877].

Info. — Zena Timmons and Bill Crighton (both NMSZ) [log, pub, com]. Fig. 40B.

Entry 200. [INDIVIDUAL-150; this number is based on the references (i.e., the 'Elie specimen') and is not necessarily linked to the voucher material] NMS.Z. unregistered (also as NMS.Z.1868.15, but here presumed erroneous or reused) [in fact, this collection number was preoccupied for the 'Bo'ness specimen' (also Firth of Forth) that is presumed lost (see INDIVIDUAL-149, Entry 199)]

Voucher. — Complete specimen, gutted, stuffed and dried (without eyes) [here presumed located, seen].

Individual data. — ?Female [hard to tell from the preserved specimen], 154 cm TL (*c.* 5 ft) [preserved], weight unknown.

Date. — February 1871 (caught).

Capture. — Earlsferry, near Elie, Fife, Scotland, United Kingdom, Europe, Firth of Forth, North Sea.

Remark. — Specimen from J. Duns (New College, Edinburgh) [also Free Church College, Edinburgh]; specimen from Free Church College, July 13, '66 (presumed 1966 by curators, a view followed here) [according to one of the labels attached to the specimen; transaction not registered at NMSZ].

References. — Duns (1871: 333; 1872: 132), Turner (1875: 293 – 'A second specimen […] off Elie'), Duns (1877: 146 – 'Two specimens […] from the Firth of Forth, several years intervening between them') [we here refer to the 2nd specimen], Clarke (1900: 17) and Duns (1932: 146) [same comment as for Duns 1877].

Info. — Zena Timmons and Bill Crighton (both NMSZ) [lab, pic, pub, com]. Fig. 40C-E.

Entry 201. [INDIVIDUAL-151] NMS.Z.1902.128

Voucher. — Complete specimen, gutted, stuffed and dried [located seen].

Individual data. — Female, 229 cm TL (7 ft, 6 in) [7 ft according to Kyle (1903); 7.4 ft or *c.* 225 cm (preserved) according to Z. Timmons (pers. comm. July 7, 2016)], 73.5 kg TW (162 lbs) [245 kg (5 cwt) according to Kyle (1903), here presumed erroneous].

Date. — November 28, 1902 (caught).

Capture. — Bournemouth, Dorset, England, United Kingdom, off the Eddystone, English Channel; beam trawl.

Remark. — Specimen from Messrs. Brown and Wilkes [specimen bought by Mr. Foster according to Hearder (1902)] and sent to London; specimen forwarded by the British Museum Authorities ('they had not room for it there') to the Edinburgh Museum [NMSZ].

References. — Anonymous (1902: 3), Hearder (1902: 403), Kyle (1903: 623), Ogilvie (1903: 939) and Anonymous (1909b: 127).

Info. — Zena Timmons and Bill Crighton (both NMSZ) [log, pic, pub, com]. Fig. 40F, G.

OUMNH – Oxford University Museum of Natural History

Entry 202. [INDIVIDUAL-152] OUMNH.ZC.314b

Voucher. — Portion of the stomach, spleen, pancreas and spiral valve, in alcohol [located seen]; other anatomical preparations of the same individual have been preserved at OUMNH (see OUMNH.ZC.497a, OUMNH.ZC.499a, OUMNH.ZC.499b, OUMNH.ZC.896c, OUMNH.ZC.1099a, OUMNH.ZC.1099b, OUMNH.ZC.1396a, OUMNH.ZC.1396b, Entries 203 to 210 respectively).

Individual data. — Female, 234 cm TL (7 ft 8 in) [7 ft according to Cornish (1875: 4501) and Day (1880-1884: 325); 7½ ft according to Anonymous (1875c: 2)], 113 kg TW (250 lbs).

Date. — February 15, 1875 (caught).

Capture. — Cornwall, England, United Kingdom, Europe, Mount's Bay, English Channel; hook-and-line; one-man boat *Eagle*.

Remark. — Specimen caught by James Roberts; fresh specimen on public display at Penzance for days; specimen arrived at OUMNH on February 20, 1875, still in very good condition and dissected the same day.

References. — Anonymous (1875c: 2), Cornish (1875: 4501), Jackson & Clarke (1875: 75-107, pl. 7), Day (1880-1884: 325)



Fig. 40. — *Echinorhinus brucus* (Bonnaterre, 1788) in United Kingdom (Tring and Edinburgh) collections (continuation): **A**, NHMUK (Tring) unregistered (Entry 198); **B**, NMS.Z.1868.15 (Entry 199); **C**-**E**, NMS.Z. unregistered (Entry 200); **F**, **G**, NMS.Z.1902.128 (Entry 201).

and Cunningham (1906: 305 – 'five taken in Mount's Bay between 1865 and 1881') [in fact six have been reported (1865, 1870, 1875a, 1875b, 1877 and 1881); this specimen is 1875a].

Info. — Mark Carnall and Robert Douglas (both OUMNH) [lab, dat, pic, pub, com]. Fig. 41A.

Entry 203. [INDIVIDUAL-152] OUMNH.ZC.497a

Voucher. — Termination of the intestine and oviducts, in alcohol [located, seen].

Individual data, date, capture, remark, references and info. — See OUMNH.ZC.314b (Entry 202) [+log]. Fig. 41B, L.

Entry 204. [INDIVIDUAL-152] OUMNH.ZC.499a

VOUCHER. — Longitudinal section of the vertebrate column (dorsal region), in alcohol [located, seen].

INDIVIDUAL DATA, DATE, CAPTURE, REMARK, REFERENCES AND INFO. — See OUMNH.ZC.314b (Entry 202) [+log]. Fig. 41C, L.

Entry 205. [INDIVIDUAL-152] OUMNH.ZC.499b

VOUCHER. — Transverse section of the vertebral column, in alcohol [located, seen].

INDIVIDUAL DATA, DATE, CAPTURE, REMARK, REFERENCES AND INFO. — See OUMNH.ZC.314b (Entry 202) [+log]. Fig. 41D, L.

Entry 206. [INDIVIDUAL-152] OUMNH.ZC.896c

VOUCHER. — Brain, in alcohol [located, seen].

INDIVIDUAL DATA, DATE, CAPTURE, REMARK, REFERENCES AND INFO. — See OUMNH.ZC.314b (Entry 202) [+log]. Fig. 41E, L.

Entry 207. [INDIVIDUAL-152] OUMNH.ZC.1099a

VOUCHER. — Left eye, in alcohol [located, seen].

INDIVIDUAL DATA, DATE, CAPTURE, REMARK, REFERENCES AND INFO. — See OUMNH.ZC.314b (Entry 202). Fig. 41F.

Entry 208. [INDIVIDUAL-152] OUMNH.ZC.1099b

VOUCHER. — Right eye, in alcohol [located, seen].

INDIVIDUAL DATA, DATE, CAPTURE, REMARK, REFERENCES AND INFO. — See OUMNH.ZC.314b (Entry 202). Fig. 41G.

Entry 209. [INDIVIDUAL-152] OUMNH.ZC.1396a

VOUCHER. — Portion of the oviduct and ovary, in alcohol [located, seen].

INDIVIDUAL DATA, DATE, CAPTURE, REMARK, REFERENCES AND INFO. — See OUMNH.ZC.314b (Entry 202) [+log]. Fig. 41H, L.

Entry 210. [INDIVIDUAL-152] OUMNH.ZC.1396b

VOUCHER. — Portion of the oviducts, in alcohol [located, seen].

INDIVIDUAL DATA, DATE, CAPTURE, REMARK, REFERENCES AND INFO. — See OUMNH.ZC.314b (Entry 202) [+log]. Fig. 41I, L.

Entry 211. [INDIVIDUAL-000] OUMNH.ZC.4319

VOUCHER. — Portion of a vertebral column, in alcohol [located, seen].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — May 22, 1908 (first 'documented', according to digital database OUMNH) or before.

CAPTURE. — Unknown, but here presumed England, United Kingdom, Europe.

REMARK. — None.

REFERENCES. — None, here presumed unpublished.

INFO. — Mark Carnall and Robert Douglas (both OUMNH) [lab, dat, crd, pic, com]. Fig. 41J.

Entry 212. [INDIVIDUAL-153] OUMNH.ZC.5428

VOUCHER. — Skeletal elements (?splachnocranium, but teeth apparently lacking), in alcohol [located, seen].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — February 5, 1912 (here presumed caught).

CAPTURE. — (?France), Europe, Bay of Biscay, north-eastern Atlantic Ocean.

REMARK. — None.

REFERENCES. — None, here presumed unpublished.

INFO. — Mark Carnall and Robert Douglas (both OUMNH) [lab, dat, pic, com]. Fig. 41K.

Entry 213. [INDIVIDUAL-154] OUMNH.ZC.17347

VOUCHER. — Head, dried [located, seen].

INDIVIDUAL DATA. — Sex, length and weight unknown.

DATE. — Unknown.

CAPTURE. — Unknown, here presumed Europe.

REMARK. — From the 'Hope Collection', referring to Frederick W. Hope [1797-1862] (?but later additions to the collection possible); note that starting from 1849, F.W. Hope also collected lots of fish in Nice (France) and Naples (Italy); for the history of the 'Hope Collection', see e.g. Davies & Hull (1976) and Smith (1986).

REFERENCES. — None, here presumed unpublished.

INFO. — Mark Carnall and Robert Douglas (both OUMNH) [lab, dat, crd, pic, com]. Fig. 41M.

Entry 214. [INDIVIDUAL-155; this number is based on the references and is not necessarily linked to the voucher material] OUMNH.ZC.17618

VOUCHER. — Complete specimen, gutted, stuffed and dried [here presumed located, seen].

INDIVIDUAL DATA. — Male, 155 cm TL (5 ft 1 in), 133.5 cm TL (preserved), weight unknown.

DATE. — May 5, 1875 (caught).

CAPTURE. — Cornwall, England, United Kingdom, Europe, Mount's Bay, English Channel; hook-and-line.

REMARK. — Except for a collection number, the material lacks associated data; however, we here presume that it matches a male specimen once dissected by Jackson & Clarke (1875) at OUMNH; i.e., a specimen from James Roberts, who caught another female specimen earlier that year on his boat *Eagle* (see OUMNH.ZC.314b, INDIVIDUAL-152, Entry 202).

REFERENCES. — Cornish (1875: 4501), Jackson & Clarke (1875: 75-107) and Day (1880-1884: 325), Day (1881: 339) and Cunningham (1906: 305 – 'five taken in Mount's Bay between 1865 and 1881') [in fact six have been reported (1865, 1870, 1875a, 1875b, 1877 and 1881); this specimen is 1875b].

INFO. — Mark Carnall and Robert Douglas (both OUMNH) [lab, ins, dat, crd, pic, com]. Fig. 41N, O.



FIG. 41. — *Echinorhinus brucus* (Bonnaterre, 1788) in United Kingdom (Oxford) collections (continuation): **A**, OUMNH.ZC.314b (Entry 202); **B**, OUMNH.ZC.497a (Entry 203); **C**, OUMNH.ZC.499a (Entry 204); **D**, OUMNH.ZC.499b (Entry 205); **E**, OUMNH.ZC.896c (Entry 206); **F**, OUMNH.ZC.1099a (Entry 207); **G**, OUMNH.ZC.1099b (Entry 208); **H**, OUMNH.ZC.1396a (Entry 209); **I**, OUMNH.ZC.1396b (Entry 210); **J**, OUMNH.ZC.4319 (Entry 211), **K**, OUMNH.ZC.5428 (Entry 212); **L**, OUMNH registers; **M**, OUMNH.ZC.17347 (Entry 213); **N**, **O**, OUMNH.ZC.17618 (Entry 214).

PEMM – Porth Enys Museum, Mousehole (Baily's Museum)

Entry 215. [INDIVIDUAL-156] PEMM unregistered

Voucher. — ?Complete specimen, gutted, stuffed and dried [not located, here presumed lost].

Individual data. — Sex, length and weight unknown, though a 'large specimen'.

Date. — 1898 (first publication) or before.

Capture. — Cornwall, England, United Kingdom, Europe, Mount's Bay, English Channel.

Remark. — Specimen was once on public display at PEMM; PEMM collections transferred in 1903 to a new Mansfield Museum (Nottinghamshire) [not located]; for the history of the Porth Enys Museum and the Mansfield Museum, see e.g. Ruhrmund & Turk (2008); a few photos of the collections, in both Museums, have been preserved, but this specific specimen could not be located on these photos either.

References. — Anonymous (1898a: 1; 1898b: 1; 1898c: 1).

Info. — Jodie Henshaw (Mansfield Museum) and Lisa di Tommaso (Morrab Library, Penzance) [pub, com].

PZNAS – Penzance Natural History Society's Museum

Entry 216. [INDIVIDUAL-157; this number is based on the references and is not necessarily linked to the Gibson photo] PZNAS unregistered

Voucher. — Complete specimen, gutted, stuffed and dried [not located, here presumed lost].

Individual data. — Male, 188 cm TL (6 ft 2 in), weight unknown.

Date. — December 15, 1865 (caught).

Capture. — About a mile offshore at the back of Mousehole Island, Cornwall, England, United Kingdom, Europe, Mount's Bay, English Channel; 18-22 m depth (10-12 fth); caught when fishing for conger.

Remark. — In September 1870, a second specimen was 'obtained for' PZNAS (see Anonymous 1870a: 4; 1870b: 2; 1870c: 3; 1870d: 3); however, it is unclear if this 2nd specimen ever made it to PZNAS collections; Penlee House Gallery & Museum hold an original photo of a specimen on display at PZNAS (photo taken by Gibson of Scilly & Sons *c.* 1900; Fig. 41A) [here presumed to represent the specimen caught in 1865, not 1870].

References. — Cornish (1866a: 102-105; 1866b: 113), Anonymous (1866a: 4; 1866b: 2; 1866c: 6; 1870b: 2; 1870c: 3; 1870d: 3), Day (1880-1884: 324) and Richards (1939: 3).

Info. — Katie Herbert (Penlee House Gallery & Museum) [pic, pub, com]. Fig. 42A.

RCSL – Royal College of Surgeons of England (Hunterian)

Entry 217. [here presumed INDIVIDUAL-137] RCSL 439A

Voucher. — Jaw, teeth, fins and a portion of skin, dried [not located, here presumed lost]; a plaster cast of the same individual is presumed to have preserved at MEFC (Entry 186) [not located, presumed lost].

Individual data, date, capture, remark, references and info. — See MEFC unregistered (Entry 186).

Entry 218. [INDIVIDUAL-158] RCSL 649A

Voucher. — Intestinal canal, preservation unknown (probably in alcohol) [not located, here presumed lost]; other anatomical preparations of this specimen had been preserved at RCSL (see RCSL 911F, RCSL 1311Ba and RCSL E.234, Entries 219-221).

Individual data. — Female, 227 cm TL (7 ft 6 in), weight unknown.

Date. — May 4, 1872 (caught).

Capture. — Mevagissey, Cornwall, United Kingdom, Europe, English Channel; hook and line.

Remark. — Specimen purchased by Matthias Dunn and forwarded by rail to Francis [Frank] Buckland; the second of two Bramble sharks received by Frank Buckland in 1872 (the other in March, from Frank Gosden, see INDIVIDUAL-137, Entry 186).

References. — Anonymous (1872c: 3; 1873: 178), Flower (1873: 310-312), Turner (1875: 299), Stewart (1902: 73-74; 1906: 439-442), Keith (1906: 57-74), Stewart (1907: 153) and Keith (1909: 359-363) [some of the anatomical preparations lack associated data, but are here presumed to originate from the same individual, i.e., the second of two Bramble sharks received by Frank Buckland in 1872].

Info. — Sarah Pearson and Geraldine O'Driscoll (both RCSL) [pub, com].

Entry 219. [INDIVIDUAL-158] RCSL 911F

Voucher. — Heart, preservation unknown (probably in alcohol) [not located, here presumed lost].

Individual data, date, capture, remark, references and info. — See RCSL 649A (Entry 218).

Entry 220. [INDIVIDUAL-158] RCSL 1311Ba (equals D.70, D.70a)

Voucher. — Brain, in alcohol [located, seen].

Individual data, date, capture, remark, references and info. — See RCSL 649A (Entry 218) [+pic]. Fig. 42B.

Entry 221. [INDIVIDUAL-158] RCSL E.234 [FIX-037]

Voucher. — Braincase (in part) and integument, in alcohol [not located, here presumed lost].

Individual data, date, capture, remark, references and info. — See RCSL 649A (Entry 218).

UMZC – University Museum of Zoology, Cambridge

Entry 222. [INDIVIDUAL-159] UMZC CH50.1/1

Voucher. — Four to five portions of skin, dried (one rectangular portion sticks to a piece of cardboard) [located, seen].

Individual data. — Female, 198 cm TL (6 ft 6 in) [6 ft according to Allen (1896) and Anonymous (1896: 4], weight unknown.



FIG. 42. — *Echinorhinus brucus* (Bonnaterre, 1788) in United Kingdom (Penzance, London and Cambridge) collections (continuation): **A**, PZNAS unregistered (Entry 216); **B**, RCSL 1311Ba (Entry 220); **C**-**F**, UMZC CH50.1/1 (Entry 222).

Date. — May 13, 1896 (caught) [May 14 according to Hearder (1896a, 1896b) and Anonymous (1896)].

Capture. — Plymouth, Devon, United Kingdom, Europe, 40 nmi south of the Mewstone, north-eastern Atlantic Ocean; 82 m depth (about 45 fth); longline targeting conger; vessel *Florinda* (Capt. Dollington).

Remark. — Specimen offered at two pounds to UMZC; fresh shark shipped from Plymouth to Cambridge by passenger train (May 14, 1896, 'last night').

References. — Allen (1896), Stead (1896a; 1896b: 264-265), Hearder (1896a: 69; 1896b: 1), Anonymous (1896: 4), Kyle (1903: 623 – 'a further sample captured in 1895' ['1895' should be read '1896'] and Aflalo & Marston (1904: 102).

Info. — Mathew [Matt] Lowe (UMZC) [lab, ins, ms, pic, pub, com]. Fig. 42C-F.

US − UNITED STATES OF AMERICA

FLMNH – Florida Museum of Natural History, University of Florida

Entry 223. [INDIVIDUAL-160] UF103000 (also as UFFC 103000; field number GHB89-50)

Voucher. — Complete specimen, gutted, in alcohol (formalin fixed), and 22 embryos, in alcohol (in two jars, one jar for each oviduct) [located, seen]; nidamental glands removed by Matthew Larsen (Coastal Carolina University, June 19-22, 2017); tissue sample at Gavin J. P. Naylor (GN 1983).

Individual data. — Female, length and weight unknown (evidently a mature specimen), and one male embryo, 30 cm TL, weight unknown (data for other embryos unknown).

Date. — July 1989 (first registration).

Capture. — Off Louisiana, the United States, North America, Gulf of Mexico, north-western Atlantic Ocean; 183 m depth (100 fms) [according to FLMNH digital database].

Remark. — Adult specimen stored in a tank (not well sealed in the past), all specimens of tank in advanced state of decay and destruction planned for entire content of tank [July 2021]; all embryos in good condition.

References. — Castro (2011: 45), Naylor *et al.* (2012a: 42, fig. 2.7 – 'GN1983'; 2012b: 66, 213, fig. 48 – 'GN1983'), Henderson *et al.* (2016: 429, fig. 6 – 'GN1983'), Silva *et al.* (2015: 875) and Vaz (2015: 274, 341).

Info. — Robert H. Robins (FLMNH) and Matthew Larsen (CCU) [dat, pic, pub, com]. Fig. 43A, B.

Entry 224. [INDIVIDUAL-161] UF103001 (field number GHB89-51)

Voucher. — Complete specimen, gutted, in alcohol [located, seen]; nidamental glands removed by Matthew Larsen (Coastal Carolina University, June 19-22, 2017).

Individual data. — Sex and length unverified, weight unknown [said to be an adult specimen].

Date. — July 1989 (first registration).

Capture. — Off Louisiana, the United States, North America, Gulf of Mexico, north-western Atlantic Ocean; 183 m depth (100 fms) [according to FLMNH digital database].

Remark. — Specimen stored in a tank (not well sealed in the past), all specimens of tank in advanced state of decay and destruction planned for entire content of tank [July 2021].

References. — Castro (2011: 45).

Info. — Robert H. Robins (FLMNH) and Matthew Larsen (CCU) [dat, pic, pub, com]. Fig. 43B.

MCZ – Museum of Comparative Zoology, Harvard University

Entry 225. [INDIVIDUAL-162] MCZ 39633

Voucher. — Complete specimen, in alcohol [located, not seen], and two portions of skin, dried [located, not seen].

Individual data. — Male, 165.0 cm TL [140 cm TL according to Dolce & Wilga (2013 – supplemental material)], weight unknown.

Date. — November 1955 (caught) [according to MCZ logbook].

Capture. — Mauritania, Africa, eastern Atlantic Ocean; trawler *Alfama*.

Remark. — Specimen from A. M. Ramalho; extreme individual in terms of date and size for the eastern Atlantic Ocean (Table 2A-C).

References. — Bigelow & Schroeder (1957: 6, 108-109, fig. 14, 135) and Dolce & Wilga (2013: 103, appendix 1; supplemental material: 6).

Info. — Andrew (Andy) Williston (MCZ) and Cheryl A. Wilga (UAA) [log, pub, com]. Fig. 43C.

NCSM – North Carolina Museum of Natural Sciences

Entry 226. [INDIVIDUAL-163] NCSM 44134 (ex UNC-IMS 17387)

Voucher. — Complete specimen, cut into several pieces (head, caudal fin, other fins and organs), in alcohol [located, seen]; and several portions of the vertebral column, dried [located, seen].

Individual data. — Female, 280.8 cm TL, 200.3 kg TW.

Date. — March 15, 1992 (caught).

Capture. — Off Dare County, 69.2 km east-northeast of Cape Hatteras ['*ca.* 58.5 air miles SE center Manteo' according to NCSM label], North Carolina, the United States, North America, north-western Atlantic Ocean; 111 m depth; commercial longline.

Remark. — Original label mentions 'Tom Jones' as collector ['Ted James' according to Schwartz (1993), here presumed erroneous]; specimen from the University of North Carolina – Institute of Marine Sciences (UNC-IMS) [transferred 1996]; extreme individual in terms of size for the north-western Atlantic Ocean (Table 2C).

References. — Schwartz (1993: 158-162) and Castro (2011: 44).

Info. — Gabriela M. Hogue (NCSM) [lab, dat, pic, pub, com]. Fig. 43D-H.



Fig. 43. — *Echinorhinus brucus* (Bonnaterre, 1788) in United States (Gainesville, Cambridge, Raleigh, New Port Richey and Washington D.C.) collections: **A**, **B**, UF103000 (Entry 223); **B**, UF 103001 (Entry 224); **C**, MCZ 39633 (Entry 225); **D**-**H**, NCSM 44134 (Entry 226); **I**, coll. PMH223-9 (Entry 228); **J**, coll. PMH223-10 (Entry 229); **K**, USNM RAD107112-001 (Entry 232).

NOAA – National Oceanic and Atmospheric Administration

Entry 227. [INDIVIDUAL-164] 'NOAA 1986' (Collection of José Castro, unregistered)

Voucher. — Portion of skin, dried [not seen].

Individual data. — Female, length and weight unknown, though a 'large' specimen.

Date. — 1986 (caught).

Capture. — Tobago, Republic of Trinidad and Tobago, South America, western Atlantic Ocean.

Remark. — Specimen caught at a fishing tournament; tail of the specimen was brought to José I. Castro (NOAA).

References. — Castro (2011: 44).

Info. — José I. Castro (NOAA) [pub, com].

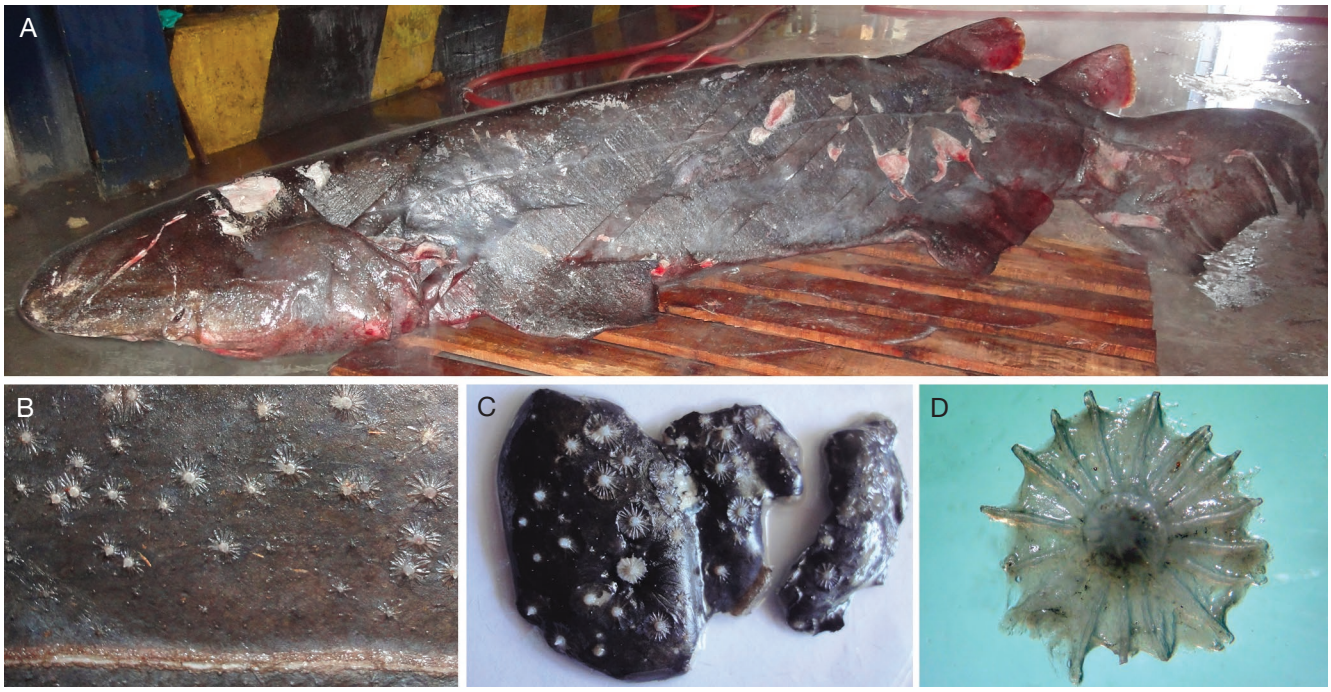


Fig. 44. — *Echinorhinus brucus* (Bonnaterre, 1788) in Venezuelan (Cumaná) collections: **A**-**D**, TNEC-MT (Entry 233).

Coll. PMH – Patrick Mark Harris (private collection)

Entry 228. [INDIVIDUAL-165] coll. PMH223-9

Voucher. — Jaw, dried [located, seen].

Individual data. — Female, 247 cm TL, 77 kg TW [data could not be verified].

Date. — November 2, 1997 (caught).

Capture. — north-west of Swakopmund, Namibia, Africa, south-eastern Atlantic Ocean; 250-265 m depth; commercial prawn trawler.

Remark. — Specimen acquired by exchange with the 'Ministry of Fisheries'.

References. — None, here presumed unpublished.

Info. — Patrick Mark Harris (PMH) [lab, pic, com]. Fig. 43I.

Entry 229. [INDIVIDUAL-166] coll. PMH223-10

Voucher. — Jaw, dried [located, seen].

Individual data. — Male, 253 cm TL, 84 kg TW [data could not be verified].

Date. — March 12, 1996 (caught).

Capture. — north-west of Swakopmund, Namibia, Africa, south-eastern Atlantic Ocean; *c.* 200 m depth; commercial prawn trawler.

Remark. — Specimen acquired by exchange with the 'Ministry of Fisheries'; extreme individual in terms of size for the south-eastern Atlantic Ocean (Table 2C).

References. — None, here presumed unpublished.

Info. — Patrick Mark Harris (PMH) [lab, pic, com]. Fig. 43J.

TU – Tulane University Museum of Natural History

Entry 230. [INDIVIDUAL-167] TU 172379

Voucher. — Material and preservation unverified [not seen]; tissue sample at Gavin J. P. Naylor (GN 1067).

Individual data. — Female, 261.4 cm TL, 81.36 kg TW.

Date. — December 31, 1994 (caught).

Capture. — 27 km south of Grand Isle [45 nmi according to FishNet2 digital database], Jefferson, Louisiana, the United States, North America, edge of Mississippi Canyon, Gulf of Mexico, north-western Atlantic Ocean; *c.* 200 m depth [110 fth according to FishNet2 digital database]; vessel *M/V Self Reliant*.

Remark. — Specimen collected by James E. Flanner (captain); possibly an extreme individual in terms of date for the north-western Atlantic Ocean (Table 2B).

References. — Castro (2011: 44-45, fig. 6) and Naylor *et al.* (2012b: 66, 213, fig. 48).

Info. — Jose I. Castro (NOAA) [pub, com].

USNM – National Museum of Natural History (Smithsonian)

Entry 231. [INDIVIDUAL-168] USNM 225111 [USNM 202581 according to Musick & McEachran (1969)]

Voucher. — Material unverified, in alcohol [located, not seen].

Individual data. — Female, 216 cm TL (85 in) [7½ ft long according to Anonymous (1968a)], 78.2 kg TW (173 lb) [250 lb according to Anonymous (1968a)].

Date. — January 20, 1968 (caught).

Capture. — 75 nmi east-northeast of Cape Henry, Virginia, North Carolina, the United States, North America, north-western Atlantic Ocean, 37°38'N, 74°15'W [off Cape Hatteras, North Carolina according to Castro (2011), here presumed erroneous]; station 68-T016; 186.5 m depth (102 fth); 10.6°C; research vessel *Sea Breeze* (Capt. W. E. Mansfield) [chartered by VIMS].

Remark. — Specimen collected by John A. Musick and John D. McEachran (both VIMS); specimen donated by VIMS; extreme individual in terms of date for the north-western Atlantic Ocean (Table 2A).

References. — Anonymous (1968a: 9; 1968b: 6), Musick & McEachran (1969: 205-206), Castro (1983: 43), Stewart (2001: 71), Kiraly *et al.* (2003: 3), Castro (2011: 44) and Kent (2018: 58).

Info. — John [Jack] A. Musick (VIMS), Lynne R. Parenti and Diane E. Pitassy (both USNM) [dat, pub, com].

Entry 232. [INDIVIDUAL-142] USNM RAD107112-001

Voucher. — Radiograph of a complete specimen (not a biological sample) [located, seen]; the radiograph was received/taken from specimen BMNH 1891.7.23.1 (NHMUK, London).

Individual data, date, capture, remark and references. — See BMNH 1891.7.23.1 (Entry 191).

Info. — Lynne R. Parenti, Diane E. Pitassy and Lisa Palmer (all USNM) [lab, dat, pic, pub, com]. Fig. 43K.

VE – VENEZUELA

Ec-501UDO – Laboratorio de Ecología de Peces Marinos, Departamento de Biología, Universidad de Oriente, Cumaná

Entry 233. [INDIVIDUAL-169] TNEC-MT

Voucher. — Portion of the skin, dermal denticles and tissue samples, in alcohol [lost/destroyed after a violent raid ruining the University campus, 2020].

Individual data. — Female, 252 cm TL, 76 kg TW.

Date. — July 2012 (caught).

Capture. — Between the islands Margarita and La Tortuga, Venezuela, South America, southern Caribbean Sea, south-western Atlantic Ocean; *c.* 200 m depth (using a submarine platform); rod and reel (recreational); vessel *Fidanzata*.

Remark. — Specimen caught by Luis Alcalá and Vincente Reboll; molecular analysis suggests that the specimen differs from other *E. brucus* specimens from the Atlantic Ocean; extreme individual in terms of date for the north-western Atlantic Ocean (Table 2B).

References. — Fariña *et al.* (2014: 1-4, figs 1-3), Fariña *et al.* (2015: 531-536, figs 1-2, 4) and Ehemann *et al.* (2019: 9, 13, tab. 3).

Info. — Ángel Rafael Fariña Pestano (Ec-501UDO) [pic, pub, com]. Fig. 44.

ADDENDUM

CFA – Fundación de Historia Natural Félix de Azara Colección, Universidad Maimónides, Buenos Aires

Entry 234. [INDIVIDUAL-025] CFA–IC–9219 (ex MOFURG 79-020)

Voucher. — Tooth set, dried (stuck on a piece of black cardboard, tens of teeth detached) [located, seen] and dermal denticles, dried [located, seen].

Individual data. — Female, 207.6 cm TL, weight unknown.

Date. — August 16, 1978 (caught).

Capture. — Near Rio Grande, South Region of Brazil, South America, south-western Atlantic Ocean; 35m depth; bottom trawl; commercial vessel *Abel I*.

Remark. — Specimen donated by Hugo Castello; coordinates given by Barcellos & Pinedo (1980) in abstract (i.e., 33°10'S, 53°40'W) differ from those given in the introduction (i.e., 35°10'S, 53°40'W); data on old label of dermal denticles (female, 2m, August 1978) is congruent with MOFURG 79-020 (INDIVIDUAL-025, Entry 34); old label of tooth set (female, 3m, August 1978) mixes data of MOFURG 79-020 (2m, August 1978) [Entry 34] and MOFURG 79-021 (3m, October 1978) [Entry 35], but maximum tooth count (i.e., 11 or 12 files in the upper right) favours attribution to MOFURG 79-020 as is for the dermal denticles.

References. — Barcellos & Pinedo (1980: 71-72, 74, fig. 1B, C) and Bogan & Agnolín (2022: 3, fig. 2A-I).

Info. — Sergio Bogan (CFA) [lab, pic, pub, com]. Fig. 5A-C.

Appendix 3. — List of museum collections that yielded negative (zero) results for *Echinorhinus brucus* (Bonnaterre, 1788) material originating from the Atlantic Ocean and Mediterranean Sea.

1. AU – Australian National Fish Collection (ANFC, CSIRO). Info: Alastair Graham.
2. BE – Aquarium-Muséum de l'Université de Liège (MZULG). Info: Marie Bournonville.
3. BG – National Museum of Natural History, Sofia (NMNHS). Info: Tisho Stefanov.
4. CH – Muséum d'Histoire naturelle de Neuchâtel (MHNN). Info: Thierry Malvesy.
5. CH – Natur-Museum Luzern. Info: René Heim.
6. CH – Naturhistorisches Museum der Burgergemeinde Bern (NMBE). Info: Lukas Rüber.
7. CH – Zoological Museum, University of Zurich (ZMZ). Info: Barbara Oberholzer.
8. DE – Institut für Anatomie und Zellbiologie Heidelberg. Info: Sara Doll.
9. DE – Senckenberg Forschungsinstitut, Ichthyologie, Frankfurt am Main (MTD F). Info: Susanne Dorow.
10. GR – Natural History Museum of Crete (NHMC). Info: Petros Lymberakis.
11. HR – Institute of Oceanography and Fisheries (IOR). Info: Jakov Dulčić.
12. HR – Natural History Museum Rijeka (PMR). Info: Marcelo Kovacic.
13. HR – National Museum Zadar (Natural History). Info: Snježana Vujčić-Karlo.
14. LB – Natural History Museum, American University of Beirut. Info: Michel Bariche.
15. NO – Natural History Museum, University of Oslo (NHMO). Info: Ann-Helen Rønning.
16. NO – Tromsø University Museum (TMU). Info: Robert Bergersen.
17. NO – Vitenskapsmuseet, Trondheim (VM). Info: Torkild Bakken.
18. NO – University Museum of Bergen (Natural History) (ZMUB). Info: Ingvar Byrkjedal.
19. MC – Musée Océanographique de Monaco (MOM). Info: Michèle Bruni.
20. PL – Museum of Natural History, University of Wroclaw (MPUW). Info: Jan Kotusz.
21. RO – Grigore Antipa National Museum of Natural History, Bucharest (MGAB). Info: Alexandru Iftime.
22. RU – Zoological Institute, Russian Academy of Sciences, St. Petersburg (ZIN). Info: Mikhail Nazarkin.
23. SA – KwaZulu-Natal Sharks Board, Durban (KZNSB). Info: Sabine Wintner.
24. SE – Göteborg Natural History Museum (GNM). Info – Kennet Lundin.
25. SE – Swedish Museum of Natural History (NRM). Info – Sven Kullander.
26. UK – Booth Museum of Natural History (BMB). Info – Lee Ismail.
27. UK – Cliffe Castle Museum, Keighley (Bradford Museums & Galleries). Info: Gerard McGowan.
28. UK – Clifton Park Museum, Rotherham. Info: Karl Noble.
29. UK – Dorman Museum, Middlesbrough. Info: Zoe Wilson.
30. UK – Dorset County Museum, Dorchester. Info: Geoff Turnock.
31. UK – Edinburgh Theological Seminary (ex Free Church College, ex New College). Info: Donald MacLeod.
32. UK – Grant Museum of Zoology and Comparative Anatomy. Info: Mark Carnall.
33. UK – Great North Museum Hancock (incl. Newcastle & Sunderland Museums). Info: Dan Gordon.
34. UK – Hereford Museums, Herefordshire. Info: Ben Moule.
35. UK – Hull and East Riding Museum. Info: Paula Gentil.
36. UK – Hull Maritime Museum. Info: Jocelyn Anderson-Wood.
37. UK – Inverness Museum & Art Gallery. Info: Kari Moodie.
38. UK – Museum of Gloucester (Natural History). Info: Sarah Orton.
39. UK – National Maritime Museum Cornwall. Info: Sarah Riddle.
40. UK – National Museum Wales (Natural Sciences) (NMWZ). Info: Jennifer Gallichan.
41. UK – Norfolk Museums (Natural History). Info: David Waterhouse.
42. UK – Nottingham Natural History Museum. Info: Sheila Wright.
43. UK – Plymouth City Museum & Art Gallery. Info: Jan Freedman.
44. UK – Marine Biological Association, Plymouth (MBA). Info: Angela Ward.
45. UK – Plymouth Marine Laboratory (PML). Info: Jon White.
46. UK – The Hunterian (Zoology), University of Glasgow (GLAHM). Info: Maggie Reilly.
47. UK – Torquay Museum. Info: Barry Chandler.
48. UK – Victoria and Albert Museum (ex-South Kensington Museum) (V&A). Info: Marion Crick.