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AN ANNOTATED BIBLIOGRAPHY OF THE POISONOUS AND VENOMOUS FISHES OF AUSTRALIA

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FOREWORD.

In 1943 the Council for Scientific and Industrial Research, in Melbourne, published its Bulletin No. 159, "Poisonous and Harmful Fishes." This Bulletin was originally intended for use by His Majesty's Forces in World War II. In the foreword to that publication it was stated that a more detailed report and a bibliography on the same subject had been assembled for separate publication. No further edition of the Bulletin has been issued, but separate articles on poisonous fishes have appeared. In view of the increased interest in the subject by scientific organizations in the United States, Japan and the Pacific Islands, it was deemed advisable to publish the present bibliography.

The literature of medical ichthyology is extensive and widely scattered throughout scientific journals in a variety of languages. Since a review of the world literature on toxic fishes is not feasible at this time, the present work has been limited chiefly to those publications concerned with the poisonous and venomous fishes of Australia. The term fishes is used in the zoological sense and does not include such invertebrates as jellyfish, shellfish, etc. It will be noted that a number of articles have been listed under the section entitled "General". The works listed in this section are concerned with the more general aspects of the problem of toxic fishes and would be pertinent to a discussion of any area. Papers containing articles on both poisonous and venomous fishes have also been listed in the general section. The remainder of the references have been segregated into the two categories "Poisonous Fishes" and "Venomous Fishes." The term poisonous fishes refers to those whose flesh when ingested by human beings produces toxic symptoms. In contrast, venomous fishes produce their injurious effects by injecting their venom by means of stings or spines. In the latter case the injury is associated with mechanical trauma.

In some instances, e.g., tetraodon poisoning, stingrays, catfishes, etc., it was felt advisable to include certain additional basic papers which were considered to have a bearing on the subject under consideration even though they were not concerned directly with Australian species. It is the hope of the authors that this contribution will stimulate others to conduct research in this greatly neglected field.

GENERAL PAPERS.

Anonymous.

Vernacular names and brief popular descriptions are given for some of the more poisonous and venomous fishes. Precautionary measures are suggested relative to ingesting and handling tropical fishes.

Blanchard, R.

Poisonous, venomous, and electric fishes are briefly discussed. Scientific names are given for a number of species which have been reported dangerous to man.
Bou勒enger, G. A.


References are made to poisonous, venomous, and electric fishes. Bou勒enger disagrees with some authors on the poison-organ of Noturus, but considers Trachinus species to be venomous. Puffers (five genera named) and Monacanthus species may be poisonous.

CILento, R. W.


A general discussion of toxic fishes with quotations from recent authorities concerning various species. Synanceja horrida, Notothenia robusta, Dasyatidae spp., and Noturus spp. are named as venomous. Tetraodon spp. and Paralichthys venenatus are named as poisonous.

Cleveland, J. B.


A collection of cases involving poisonous and venomous fishes as well as other sea and land animals. Effects of a bite or sting from several species of venomous fishes are included, but only poisonous fishes named are Tetraodon and Boleophthalmus spp.


Specific cases are given of injury from stingrays, stone-fish, and the spike of the bugler fish. One case concerns a poisonous fish and its effect on the person who ate it.


Recent cases are listed of attacks by sharks and stingrays, bites from a kingfish and a green cat, and poisoning after eating Callionymus calanopus and Paralichthys venenatus. Symptoms and treatment are mentioned briefly under the last-named fish.

Coly, M. J.


Poisonous and venomous fishes are discussed briefly under these divisions. Puffers, porcupine fish, barracuda, herrings, and gars have been named as poisonous. Venomous fishes include Muraena, sting rays, scorpionfishes, and eels. Some invertebrates (jellyfish, mussels, and echinoderms) are also mentioned.

Coutiére, H.


Poisonous and venomous fishes are listed without comment if they had been previously incriminated. Effects of the poison or venom are discussed in a scientific manner, and cases are cited. It includes some experimental data on fish poisons. One of the more valuable early works.

Dean, B.


A comprehensive collection of references to poisonous and venomous fishes appears in the index volume (Vol. 3) on pages 572-374.

Faust, E. S.


A scientific presentation of experiments and data on poisonous and venomous fishes. Various types of intoxications are discussed.


This article is essentially the same as the above.

Gudger, E. W.


A review of data on venomous and poisonous fishes. Siluridae, Scorpaenidae, weavers and stingrays are listed as having venomous stings, but the toxicity of Muraena bites is questioned. Eel and fish blood is mentioned as a poison. Fishes which are named as poisonous to eat are Sphyraena barracuda, S. pica, Tetraodon unicinctus, and Clupea volekii. The clinical characteristics of Ciguatera are described and the Japanese studies of Tetrodonotoxin are summarized. An important basic work.
POISONOUS AND VENOMOUS FISHES—WHITLEY AND HALSTEAD.

GÜNTHER, A. C.

Poisonous fishes (Clupea, Tetraodon, Sphyrana, Balistes, Ostracion, Caranx, Thamus, etc.) are said to become toxic through their diet. Venomous fishes mentioned are the stingrays, Scorpiaena, Trachinus, Synanceia, Thalassophryne, and perhaps some Silurids. Brief anatomical descriptions are given of the venom organs of some species.

HALSTEAD, B. W.

A general review of fish poisoning and its relationship to the armed forces. The clinical characteristics of the disease and theories as to the cause of fish poisoning are reviewed.


A general review of the problem of fish poisoning. The article is primarily concerned with definitions of terminology.

JORDAN, D. S.

Fish poisoning is considered as a defensive measure for the fish. Ciguatera is attributed to an alkaloid. Some poisonous fishes are named.

KOBERG, R.

A report on poisonous and venomous fishes; scientific names, types of poisoning, and causes of poisoning. General information from a wide variety of sources is included.

LEA, A. M.
1903.—The poisonous and stinging animals of Tasmania. Folding sheet, reprinted from the Tasmanian Mail (November): unpagd, 10 figs.

Illustrates Toadfish and Soldier Fish [Pentaroge]. Case of poisoning through eating Whiting (Sillago).

MAASS, T. A.

A systematic tabulation of poisonous and venomous fishes and their poisons.

MACHT, D. L., and E. C. SPENCER.

The pharmacological effects of fish muscle extracts are reported. Preliminary experiments on plants and mice indicated that the following fish had toxic flesh: Ameiurus catus, Anguilla clariaque, Pomorana salmoides, Diadromus hybrida, Pleurodes maculatus, Mustelinus conia, Dasyatis say, and Opisurus tao. Experimental techniques for use in testing fish extracts are given.

MOSOQ, A.

A scientific account of a wide variety of experiments to determine the properties of eel and moray blood. The serum is found to be toxic when injected. An important basic work.

NORMAN, J. B.

A general summary of basic information on poisonous and venomous fishes.

PAWLOWSKY, E. N.
1927.—Gifttiere und ihre Giftigkeit. Gustav Fischer, Jena: 245-247 (figs. 114, 115), 406-418 (figs. 166-170), and 478-481.

An excellent general work on poisonous animals, containing comprehensive sections on poisonous and venomous fishes. It is particularly good on the anatomy of the venom organs of fishes. Excellent bibliography.
RECORDS OF THE AUSTRALIAN MUSEUM.

PELLERIN, J.
A comprehensive systematic review of poisonous fishes. Only brief mention is made of venomous fishes. Numerous case histories are included and treatment is discussed.

PHISALISIN, M.
The most comprehensive work in existence on the general subject of poisonous and venomous animals. It contains a great deal of experimental data and an excellent bibliography.

A scientific account of the properties of fish venen. Treatment for fish stings is described.

PHEY, J. C.
A general report on toxic fishes as they relate to naval personnel. It lists about two dozen important species.

SAVTSCHENKO, P.
One of the most complete of the early works on poisonous and venomous fishes. It contains a general discussion of the problem, descriptions and figures of about 45 species. An important work.

SCOTT, H. H.
Some of the better-known species of poisonous and venomous fishes are discussed. Figures are supplied to assist the general reader in identifying dangerous fishes.

STRONG, R. P.
Several poisonous and venomous fishes are named with general comments on their effects. Those considered poisonous are Tetrodon, Diodon, and M eletta species, and barracuda. Venomous fishes listed are Tratlon, Trygon, Trachinus, and Scorpaena.

TENISON-WOODS, J. E.
1882.—Fish and fisheries of New South Wales. Thomas Richards, Sydney: 30-91.
This chapter on marine food fishes contains many scattered references to poisonous and venomous fishes. It is written primarily from the standpoint of the angler.

TYRING, O.
Cases of fish poisoning are cited from many parts of the world, naming the fish involved where possible. Venomous fishes are only casually mentioned. The paper is too general to be of great value.

WHEATLEY, G. P.
Brief reference is made to the occasional toxicity of Paradiicichthys venenatus, and to the work of Duhig and Jones on the venomous properties of Australian stonefish (Synanceja spp.).

The book deals with sharks, rays, and fish-like animals. Venomous properties of Trygon, Scorpaena, and Trachinus are mentioned. Reference is made to the purgative and toxic effects of shark flesh.

Popular descriptions are given of all common poisonous or venomous fishes of Australia or the south-western Pacific. A practical guide to protect those who have not studied toxic Australian fishes.
POISONOUS AND VENOMOUS FISHES—WHITLEY AND HALSTEAD.

POISONOUS FISHES.

ANDERSON, W.

One of the first published accounts of fish poisoning in the South Seas. It gives a clinical résumé of an outbreak involving several persons poisoned from eating *Spermacoelus popus*, and it states that Captain Cook was poisoned from eating a *Tetraodon*.

ANONYMOUS.
1821.—*Sydney Gazette* (April 21): 2, 3.

Coroner's inquest on man poisoned by toadfish at Parramatta.

1831.—*The Colonial Times*, Hobart (March 29, April 5).

Coroner's inquest on three victims of toadfish poisoning.

1839.—Barraeotua of the West Indies. *Nautical Magazine*, 8: 256.

Silver test not infallible.


The author warns against eating *Tetraodon hamiltoni* and summarizes several cases of poisoning from eating it and other *Tetraodon* species.

1874.—*Poisonous fish*. *Sydney Morning Herald* (July 7): 5.

Lady had convulsions from eating fish—blackfish, garfish and trout—from Sydney, at Wagga, 2/7/74. Recovered.

1899.—*The “Palu” or “oil-fish” of Funafuti*. *Nature*, 60 (1561): 536.

A brief note giving a popular description of the oilfish and identifying it as *Ruvettus pretiosus*, which is well-known for its purgative properties.


A guide for servicemen.

1950.—*Daily Telegraph* (newspaper), Sydney (December 9-12).

Toadfish poisoning.

1951.—*Sydney Morning Herald* (March 6).

Woman dies, family ill, after eating toad fish.

1951.—*Sun* (newspaper), Sydney (March 7): 14.

Same as 1950, 1951 cases.

Autenrieth, H. F.

Fishes which had been reported as poisonous are enumerated with comment. Much of the book is devoted to a semi-popular account of fish poisons. A useful work.

Backhouse, J.

Toadfish poisoning, Hobart, 1831.

Bennett, G.

A figure and description of *Tetraodon hamiltoni* are given with a warning against eating it. Several cases are cited of poisoning from eating *Tetraodon*.

Brenchley, J. L.

Random notes are included on poisonous fishes at the various South Sea Islands. The work is of minor importance.

Burrows, W.

The author states that reef fishes become poisonous for 10 to 14 days after the swarming of the palolo worm.
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CICERO, R. W.
Chapter 16 was slightly revised and published as “Some poisonous plants, sea and land animals of Australia and New Guinea (notes for medical nursing and ambulance staffs).” Brisbane, 1944: 23-25. Notes treatment of wounds from venomous fishes and for toadfish and chinaman fish poisoning.

COOK, J.
1777.—A voyage towards the South Pole and around the world, ed. 3, London, 2: 112-113.
This is one of the first published experiences concerning poisonous fish. Captain Cook described the predominant symptoms and treatment of his illness after eating a fish “something like a sunfish” [now known as a puffer, *Pleuronectes occelatus*].

CROWCHER, W. E. L. H.
Toadfish poisoning in Tasmania.

DALYMPLE, A.
1775.—An historical collection of the several voyages and discoveries in the South Pacific Ocean. J. Nourse, London: 1, 140-141.
Early English translation of Quirós's account of men having been poisoned by pargos in 1606.

DEMPSTER, G. O. L.
The author takes issue with the theory that fishes become toxic because of the dumping of war materials, stating that he saw entire villages in the South Pacific sick with fish poisoning during the 1930's. He believes fish become poisonous as a result of eating a poisonous marine growth.

DEWBERY, E. B.
Brief mention of symptoms of fish poisoning and signs of decomposition in fish.

DUMERIL, A.
This article in English translation appeared as follows:

A study of poisonous fishes, not venomous ones. It names, as poisonous fishes, the following genera: *Melesta*, *Tetraodon*, *Diodon*, *Balistes*, *Caranx*, *Scarus*, *Thynnus*, *Engraulis*, and others. Some case histories are outlined, and typical symptoms are described in detail, with treatment. Causes for toxicity of fish are discussed briefly.

DUNCAN, C.
Clinical history and post-mortem are described in a fatal case of poisoning from *Spheroidees occelatus*. Some general discussion on fish poisoning is included.

EYERMANN, B. W., and T. H. SHAW.
Cooking of toadfish, *Spheroidees occelatus*, so that it is not poisonous; (not explained).

FLECKER, H.
No reliable evidence that this fish, also known as Chinaman Fish, is poisonous.

FORSTER, J. H.
A new species of *Tetradon* (later named *sceleratus*) affected as a powerful poison the three men who ate it. He also mentions a poisonous *Sperus* from Malakand and describes symptoms of both forms of poisoning in men and animals.

1844.—Descriptiones Animalium (ed. Lichtenstein), Berlin: 254 and 282.
Poisoning by *Tetradon sceleratus*. 
GILL, W. W.
Fish poisonous in certain parts of Cook Islands, not in others; poison ascribed to their eating a Nereid worm.

GILMAN, R. L.
A report of ten cases occurring on Culebra Island.

Grimble, [Sir] A.
Poisonous Fishes, Gilbert Islands.

Halstead, B. W.
A general account of the problem of fish poisoning. Clinical characteristics and causes of fish poisoning are discussed.
Poisoning from eating Endemilus at Johnston Island and Katsuwonus in the Philippines.

Halstead, B. W., and N. C. Bunker.
1953.—The effect of the commercial canning process upon puffer poison. Calif. Fish and Game, 39 (2): 219-228, 4 figs., 1 tab.
A review of chemical studies of the poison. Results of experiments in canning puffers are tabulated, showing that the process affects some species by reducing toxicity. Other species may become completely non-toxic, and in some the poison does not appear to be affected by canning. Clinical characteristics of poisoning are mentioned.
Collection of material; toxicity tests; public health significance.

Halstead, B. W., and W. M. Lively.
A discussion on the military importance of poisonous fishes. Includes a classification of fish poisoning into four types: puffer poisoning, Gymnothorax poisoning, ciguatera, and scombroid poisoning. Case reports for ciguatera are detailed.

Halstead, B. W., and R. J. Ralls.
Experiments indicate that toxins from four poisonous species (Fugu, Gymnothorax, Latifrons, and Ceronius) are small water-soluble molecules.

Harry, R. R.
Poisonous fishes (pp. 71, 137, 167 and 177); venomous fishes (pp. 151, 156 and 177).

Hashimoto, Y.
Results of experiments on the toxicity of Sphoeroides vermicularis radiata indicate that the ovary and liver are the most poisonous organs, although individual specimens vary greatly in toxicity.

Hashimoto, Y., and M. Migita.
A technical report on experiments with fugu toxin, including details of methods used to extract the poison and a comparison of the dose-effect curve of fugu with shell-fish toxin.
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HERRE, A. W.


Taxonomic review of Philippine species likely to be poisonous to eat.

HILL, E. S.

1871.—Sydney Mail (March 4, 1871): 22; (June 3): 426.
Two boys poisoned by toadfishes at Coogee, New South Wales.

Poisonous fishes, toad fishes, porcupine fishes.

HIROA, Te Rangi.

Quotes 1856 MS. of Laval on poisonous fishes.

HIYAMA, Y.

Toxicity of many different species is discussed; local names, morphology and distribution of the fishes are included. A large part of the work consists of tables which illustrate the degree of toxicity of various fishes. Experiments on the toxic substances, especially in puffer, are described. Also mentioned are typical symptoms of poisoning, popular theories of the cause of toxicity, and variations in toxicity. A valuable work.

HORA, S. L.

Method of rendering flesh of fish poisonous to enemies in ca. 300 B.C. Parallel modern cases.

INGLETON, G. C.

1952.—True patriots all, Angus & Robertson, Sydney: 88 and 265, 1 fig.
Cases of toadfish poisoning.

ISHIHARA, F.

An excellent and thorough study of the physiological effects of fugutoxin. The reactions of various organ systems and various animals to the toxin are recorded.

An excellent scientific report on the chemical and pharmacological properties of puffer toxin.

JONES, H. W.

1940.—Index-catalogue of the library of the Surgeon-General’s office, United States Army. (4) 5: 1006-1012.
Many references to fish poisoning.

JORDAN, D. S.

A report of ten types of fish which may cause poisoning. It lists twelve types which are always edible.

KAOEPFER, E.

Toadfish poisoning.

KERQUELEN, Y. J. de.

Poisonous toadfish of Western Australia.

KIMURA, S.

A fairly complete scientific report of the action of tetrodotoxin in animals. Physiological effects in various experiments were observed and recorded.

Fish poisoning on Cook's Expedition.


A review of literature on tetrodon poisoning with a clinical history of three cases in Hawaii. Experiments conducted by the author yielded a white crystal which poisoned laboratory animals. The theory that the poison may come from unusual dietary habits was propounded, since cases of poisoning are rare in Hawaii.


This report is concerned with two outbreaks of fish poisoning which occurred in Honolulu following the eating of fishes which had been imported from Midway and Christmas Islands. It also contains a number of case histories and a brief review of the problem of fish poisoning.


A report on a series of experiments which showed histamine to be the cause of poisoning from eating tuna. Possible causes for production of histamine are discussed.

1924.—A synopsis of the vertebrate animals of Tasmania. Oldham, Beddome & Meredith, Hobart: 94.

Toadfish poisoning.


"Salmon," Arripis georgianus, poisoning.


Brief reference is made to three persons being fatally poisoned as a result of eating puffer.


Toadfish poisoning [evidently referring to Mrs. Bell's death in Tasmania in 1831].


Aboriginal at Rottnest I. poisoned by eating blow-fish in 1840.


Describes poisonous qualities to fish having been left in moonlight. Case of poisoning through eating barracouta [evidently "milky" fish whose condition was due to protozoan parasites—G.P.W.].


Poisoning by Red Bass (Lutjanus coaetos); chinaman fish and trigger fishes dangerous to eat.
Ommaney, H. M.
Death from eating a fish (Tetraodon).

Paradice, W. E. J.
Includes notes on various fishes poisonous to eat, or with venomous spines.

Pattison, G. J.
The author presents cases of eating toadfish flesh without ill effects. He has eaten it himself and has fed it to cats and to a dog.

Medical treatment is described for five children who were poisoned by eating sardines.

Poe, F.
An annotated list of seventy species of fishes suspected of being poisonous in the Caribbean area. Causes of poisoning, symptoms, precautions and curative measures. [Copy in G.P.W. library.]

Ross, S. G.
This account involves 95 cases of fish poisoning which occurred at Fanning Island during 1945 to 1947. Author summarizes the clinical characteristics of the outbreak and discusses theories as to the cause of fish poisoning.

Scott, J.
1832.—The poisonous or toad fish of Van Diemen's Land. *The Hobart Town Almanack for the year 1832:* 89-90, 1 pl.
Historic account of poisoning of a family in Tasmania [(by Sphaeroides glaber).]

Somerville, J. D.
The poisoning of Captain Cook is quoted from G. A. Wood’s *The Discovery of Australia.*

Sparrman, A.
Symptoms of redfish and *Tetraodon* poisoning.

Spofforth, J. L.
A brief medical report of symptoms and post-mortem findings in a fatal case of poisoning by a Tetraodon.

Stephenson, J.
An account of symptomatology and other data on poisoning by *Megalops throna* (Clupea), *Sphyraena barracuda,* Tetraodon occidentalis, and *T. esculentus.*

Stevens, H. N.

Suehiro, Y.
This includes a review of Japanese work on puffer poison, a list of poisonous fishes, and physiological and chemical studies of the poison. An important work.
Experiments with pufferfish poison (Sphaeroides aholpense) on various animals are tabulated. Some information is included on methods and interpretation of results. A valuable work.
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Takahara, Y. 1910. Über das Tetrodongift. Biochem. Zeitschr., 30: 255-275. One of the more important original chemical studies on puffer poison. It includes also some data on physiological effects of the poison.


Yano, I. 1937. The pharmacological study of tetrodotoxin. (Text in Japanese.) Fukuoka Med. Coll. Jour., 30 (9): 1669-1704. Details are given of experiments with tetrodotoxin on laboratory animals. The author describes the effect of varying doses on vascular and nervous systems. Tetrodotoxin does not produce immunity.


RECORDS OF THE AUSTRALIAN MUSEUM.

VENOMOUS FISHES.

AFLALO, F. G.

Fortescue, etc. Brief note.

BANFIELD, E. J.

Popular account of Stonefish.

BAYLEY, H. H.

Typical symptoms of scorpion fish wounds are recorded with medical treatment. An incomplete taxonomic description is given for the two species Scorpaena plumieri (Bloch) and S. grandicornis (Cuv. and Val.).

BOTTARD, A.

A valuable historical review on venomous fishes. The author discusses various types of stinging and biting fishes, describes venom organs, and suggests treatment for wounds from fish. An important work.

BURGESS, J.

Clinical characteristics are given for three cases of stingray wounds.

BYRNE, K.
1924.—Injuries and diseases in Australia attributable to animals, Med. Jour. Australia, 2: 539.

Synanceja horrida is described as a venomous fish; other animals are mentioned.

CALDWELL, N.

Stings from stingrays.

CASTELLANI, A., and A. J. CHALMERS.

Lists the venomous fishes by zoological classification. Examples of each type are given, e.g., Muraena, Synanceja, Thalassophryne, Trachinus, and the stingray, with some concise general information.

CLELAND, J. B.

Injuries from Stingrays and Bullrout; references to toadfish poisoning.


Shark-bites, numb-fish, catfish, fortescue, stingrays, Kuhlotoxus, black trevalli, toadfish.


Two cases of injury are described: one from eating mussels and one from being stung by a catfish. Treatment of the catfish sting is reported.

COOK, H.

An interesting popular account on the Australian venomous stonefish, scorpionfish and stingrays.

DANE, P. G.

This note describes treatment given for a stingray injury.
Duhig, J. V.

1929.—The nature of the venom of Synanceja horrida (the stonefish). *Zschr. Immu­n­forsch.*, 62 (3-4): 185-189, 2 figs.

An account of the experiments used to determine the nature of Synanceja horrida venom.

Duhig, J. V., and G. Jones.


An important report on the anatomy of the venom organ of Synanceja horrida. Clinical notes on a case of wounding by stonefish are supplied by M. J. Gallagher.


A report on the haemotoxic properties of stonefish venom. Quantitative experiments were made with the venom on guinea-pig, sheep and human red blood cells. The venom is said to have physiological properties similar to cobra venom and curare.

Evans, H. M.


A report on the histology of the sting and venom gland of the stingray, *Trygon*. It presents evidence that the secretion is actually a venom. A very important paper on the subject.


A discussion on the histology of the spine of *Acanthias vulgaris*, with mention of a person who was wounded by a dogfish spine.


A general summary of information about *Trygon*, *Trachinus*, and *Scorpaena*, from Aristotle to modern times. It gives briefly the anatomical location of the venom glands in the spines of *Scorpaena*, *Synanceia*, and *Thalassophryne*. Several experiments were performed to show the effects of this venom on fish and laboratory animals. Treatment for wounds is discussed.


A valuable histological study of the venom organs of some venomous fishes (*Trygon pastinaca*, *Acanthias vulgaris*, *Cestracion philippi* and *Chimaera monstrosa*). Experiments with *Trachinus draco* venom are described.


Additional histological experiments confirm the presence of a venom gland in a stingray (*Trygon*).


This book discusses weevers (*Trachurus*), other stingfish, stingrays, scorpionfish, *Muraena*, other eels, surgeonfish, triggerfish, catfish, electric fish, jellyfish, and others. Scientific names are given wherever possible, and histological descriptions of the venom organs appear often. The book is written in a popular style but contains a great deal of valuable information.


Listed as venomous sharks are the spiny dogfish, the Port Jackson shark and the chimaeras. They are said to have venom glands connected with their spines. The article is of minor importance.


Clinical notes on cases of stingray wound in the Bay of Bengal are given. Effects of stingings from the stingray and from jellyfish are compared.

Proes, H. P.


A brief report on experimental work showing that the venom of *Thalassophryne* acts as a neurotoxin.

Gill, W. W.


Crab, nereid, fish and cone-shell, Hervey Islands.


Especially pp. 22-24, stingrays, and 24-25 stonefish.

An excellent historical résumé of the venomous properties of stingings of stingrays. An important historical work.

1947.—Is the stingray’s sting poisonous to vertebrates other than men and fishes? Amer. Naturalist, 81: 297-307, 4 figs.

This paper is essentially a review of the work of J. Vellard (1931) which showed that vertebrates other than man are affected by the venom of stingrays.

HALSTEAD, B. W., and N. C. BUNKER.


A detailed report on the gross and microscopic anatomy of Hydrologus colliei.


A general résumé of the anatomy of stingrays as it relates to their stinging ability. Clinical characteristics and treatment of stingray attacks are discussed.

HALSTEAD, B. W., L. S. KUNINOGU and H. B. HERARD.


An exhaustive study on catfish stings and the anatomy of the venom organs of catfishes.

HALSTEAD, B. W., and F. R. MODGIN.


A study of the gross and microscopic anatomy of the venom organ of Holorhinus californicus.

HARMON, R. W., and C. B. POLLARD.


A chronological bibliography covering the years 1875 to 1946. References to venomous fishes are scattered throughout. A valuable work.

HEWITT, G. H.


Treatment with novocain.

HOLLOWAY, J. E., N. C. BUNKER and B. W. HALSTEAD.

1953.—The venom of Urobatis halluci (Cooper), the round stingray. Calif. Fish and Game, 39 (1): 77-82, 1 fig., 2 tabs.

The venom of the round stingray is found to be concentrated in the epithelium lining the ventrolateral-glandular grooves of the sting. Experiments indicating this are described and results tabulated.

JORG, M. E.


KESTEVIC, L.


A report on the clinical characteristics of a wound from Notesthes robusta, the bullrout. The author concludes that the sting is undoubtedly venomous.

LABILLARDIERE, J. J.


Seaman pricked by Scorpioenus digitata in New Caledonia.

LOGGINS, J. B.


A clinical report of the internal and external injuries to a girl whose heart was pierced by a stingray’s sting.
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McCulloch, A. B.
1925.—Stone fishes and the art of camouflage. *Australian Mus. Mag.*, 2: 159-162, 3 figs. Popular article

Mylea, G. G.
The author advocates novocaine and adrenaline for the sting of scorpions and venomous fishes.

Ocampo, R. R., B. W. Halstead and F. R. Modigli.
A detailed histological study of the caudal appendage and venom apparatus of the stingray *Aetobatus narinari*. Recommendations are made regarding the terminology concerned with the anatomy of stingray venom organs.

Ogilby, J. D.
1903.—Edible fishes and crustaceans of New South Wales. Govt. Printer, Sydney: 68.

Paradice, W. E. J.

Parlowsky, E. N.
A histological study of the epidermis and skin glands in venomous fish. Species of the following genera were studied: *Trachinus*, *Scorpaena*, *Batrachus*, *Doras*, *Triglumus*, and *Leptodactylus*.

This article appeared in German as follows:

A detailed discussion of the histology of the venom organs of *Apistus*, *Paracentropogon*, *Pterois*, *Siganus*, and *Plotosus*.

Phirak, M.
A report on the toxicity of the venom of *Trachinus draco*, *Scorpaena porcus*, *Triglumus fistulosus*, the bite of *Muraena helena*, and the serum of *C. helena*. Venom apparatus of each is anatomically described and experimental data are included.
RALPH, C. C.

REED, H. D.
1907.—The poison glands of *Noturus* and *Schilbeodes*. *Amer. Naturalist*, 41: 553-566, 5 figs.
A detailed histological study on the venom apparatus of *Noturus* and *Schilbeodes*. An important anatomical work.

A report on the dermal glands of catfishes with reference to their venom organs. An important paper.

RONKA, E. K., and W. F. ROE.
1945.—Cardiac wound caused by the spine of the stingray (suborder Masticura). *Mil. Surg.,* 97: 135-137.
A clinical report on a victim who received a cardiac puncture from a stingray.

RUSSELL, F. E.

Many "attacks" in California and other countries, including Australia. Effects of venom.

SAGCHI, M.
Excellent descriptions of the venom organs of *Scorpena*.

SAVILLE-KENT, W.
Brief reference is made to the venomous properties of the stonefish.

SCHNEE, S.
A report on the treatment for a wound from *Pterois*, with comments on the appearance of the fish. The paper is of minor importance.

SMITH, J. L. B.
Personal experience of a wound from *Synanceja verrucosa* is related. An excellent case report.

TASCHENBERG, E. O.
1909.—Die giftigen Tiere. Stuttgart: 174-194 (figs. 34-41), 253-267 (figs. 60-62), and 293-297.
A fairly complete record is made of poisonous and venomous fishes, with comments on the habitat, appearance and toxic effects of many.

VELLARD, J.
Experiments are described to show the physiological reactions of various animals to the venom of *Taeniura demersii* and *T. mulleri*. An important paper.

WALLACE, L. B.
Histological study of *Batrachus* glands as described, showed three sets of glands near the pectoral fin. The nature of the secretion was not determined.

WHITLEY, G. P.
A taxonomic description of *Synanceja trachynis* with a reference to the venom organ.

Popular account.
ADDENDA

As this Bibliography was in the course of publication the following papers were received in Sydney: the first two dealing with poisonous fishes, and the third with venomous fishes.

CLARK, E., and H. A. F. GOHAR.


Poisonous properties of blowfishes and method of preparing them for food. Regional variation in poison of *Lagocephalus sceleratus* with fatal cases of poisoning at Gieims, Red Sea.

HALSTEAD, B. W., and N. C. BUNKER.


Extracts of various parts of 96 fishes, representing 60 species, tested on white mice. About 75 per cent. were found to be toxic; 64 per cent. of those tested had toxic musculature and about 98 per cent. of the poisonous fishes had toxic viscera.

RUSSELL, F. E., and A. VAN HARERFELD.


Observations on vasodilatation and vasoconstriction. The venom has a direct effect on the heart.