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**THE POISONOUS FISHES  
OF  
THE CROATIAN ADRIATIC**

**DRAGA, 1994.**

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## **THE POISONOUS FISHES OF THE ADRIATIC SEA**

The poisonous fish of the Adriatic Sea can be divided into three groups:

### **1. Fish that contain venomous spines in the pines on the tail or on the operculum.**

The poison can be very strong and can seriously endanger the victim. The sting is dangerous even in the dead fish. Trachinidae are considered aggressive so they can attack divers that approach them.

### **2. Fish that carry poisonous bite.**

In this group we include only murray eels. It has not been proved that they carry any poisonous glands in the mouth.

### **3. Fish having poisonous flesh or liver.**

The poisonous flesh or some other part of the fish body that is in use for nourishment (usually the liver) can be dangerous. The ingestion of some species of the Scombridae family can cause poisonings during the hot season.

## **FIRST AID**

Stab wounds should be washed with cold sea or fresh water. It is recommendable to perform a cross incision on the wound and suck the poison out. In the case of wounding by certain species that carry thermolabile poison (Trygonidae) it is recommendable to put the wounded part of the body into hot water. In the case of ingestion of poisonous fish flesh the poisoned should be brought to a hospital as soon as possible.

## **TREATMENT (only for physicians)**

### **The poisoning by the flesh of the fish**

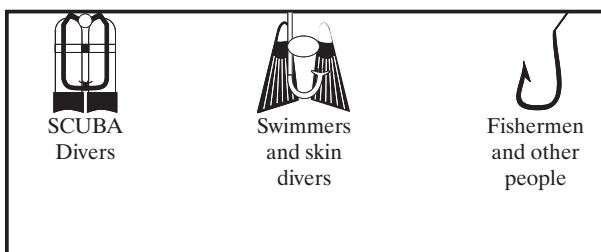
The stomach should be lavaged at once. The rest of the therapy is non-specific and symptomatic.

### **Venomous stings or bites**

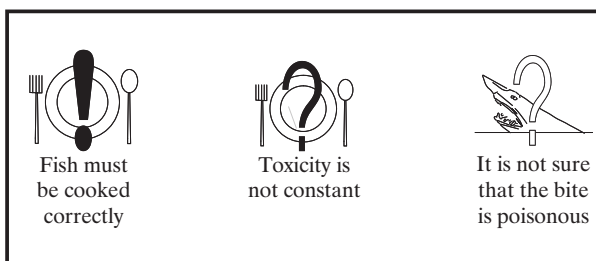
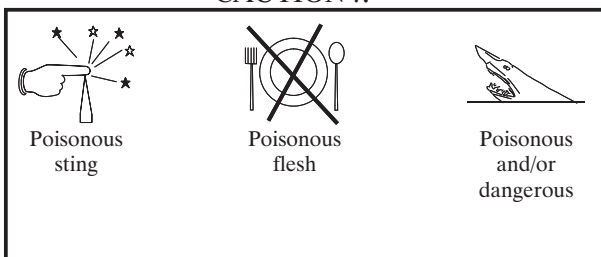
The first aim of the therapy is to reduce the pains. The appropriate serum (if it is available) should be administered. The lacerations caused by stabs of the Trygonidae and of the Myliobatidae require surgical treatment. Extremely intensive pains are experienced after the sting of the Trachinidae, so that occasionally even morphine does not reduce them.

## SYMBOLS IN THE BOOK

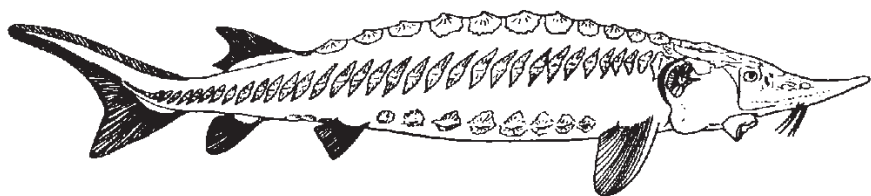
### DANGEROUS FOR ...



### CAUTION !!



# **POISONOUS FISHES**



1.50 m

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## **Accipenser sturio**

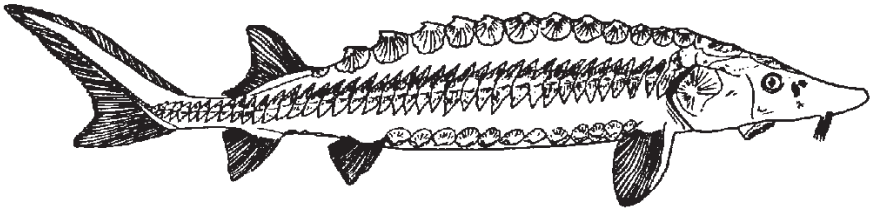
**LINNAEUS, 1758.**

*Sturgeon fish*

toxic flesh

The poisoning by the flesh or by the fish-roe is rare in the Adriatic Sea.





1.00 m

---

## **Accipenser naccarii**

**BONAPARTE, 1836.**

*Adriatic Sturgeon*

toxic flesh

The poisoning by the flesh or by the fish-roe is rare in the Adriatic Sea.

This species is endemic in the Adriatic Sea.







1.00 m

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## **Anguilla anguilla**

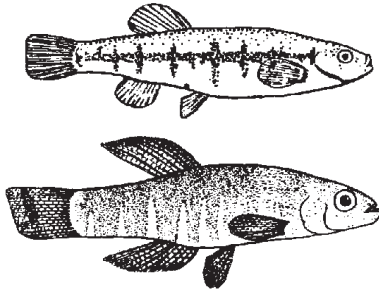
**LINNAEUS, 1758.**

*Europaean Eel*

**toxic blood**

A poisonous substance belonging to the group of ichthyochemotoxins has been found in the blood of the anguilla. The symptoms of poisoning are nausea, vomitus, hyper salivation, urticaria and general weakness. The severe cases can include respiratory disorders, paralyses and death. Therefore it is important to avoid the consumption of raw slices of this fish.





9 cm

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## **Aphanius fasciatus**

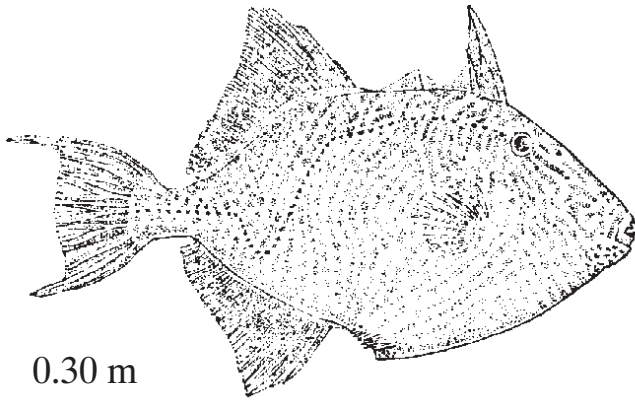
**NARDO, 1827.**

*Salk-Work Fish*

toxic flesh

Data about the poisonousness of this species are insufficient. This small fish does not have any economical importance.





0.30 m

## **Balistes carolinensis**

**GMELIN, 1789.**

*Gray Triggerfish*

toxic flesh

This species does not have any larger importance in the epidemiology of the fish poisoning. It is not commonly in use for alimentary purposes.





0.80 m

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## **Belone belone**

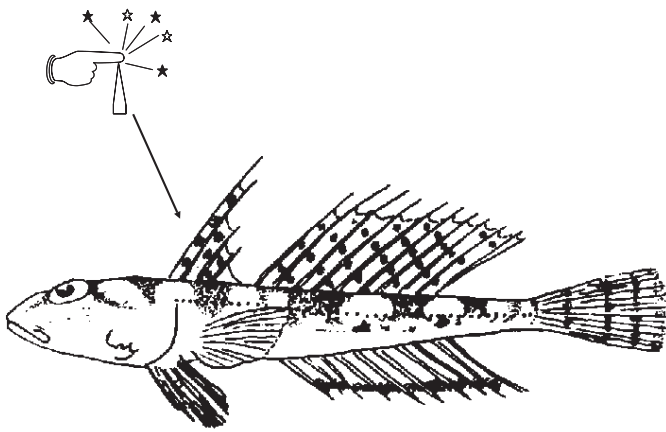
**LINNAEUS, 1758.**

*Garfish, Flat Needlefish*

toxic flesh

There is evidence on poisoning with the flesh of the *B. belone*. According to the symptoms, the poison influences the gastrointestinal and the nervous system. The intoxication is similar to the scombroticism.





0.12 m

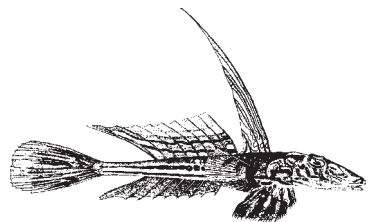
## Callyonimmus fasciatus

VALENCIENNES, 1837.

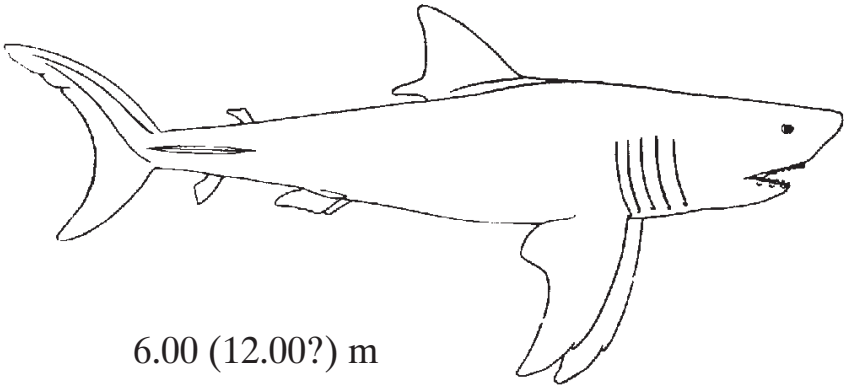
*Saddled Dragonet*

venomous sting

In this genus of fish, a strong spine is located on the operculum. Most of the species inhabit the sea depths. The gill spine of the *Callyonimus lyra* species, which inhabits the Mediterranean Sea is considered poisonous. There is evidence on very serious poisonings, thus the wounds have to be treated carefully. Although cases of poisoning by Adriatic species are unknown, some caution by handling these fishes is definitely recommended.



*Callyonimus lyra* Linnaeus, 1758.



6.00 (12.00?) m

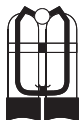
# Carcharodon carcharias

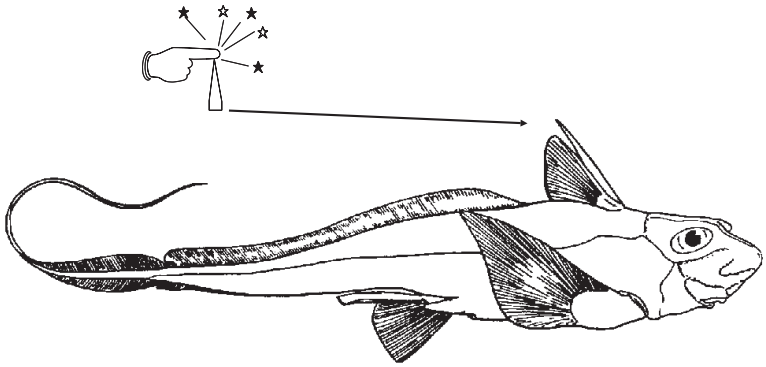
(LINNAEUS, 1758.)

*Great White Shark, Man Eater*

toxic flesh

The poisoning occurs after the ingestion of the liver, rarely of the flesh of this shark species. Gastrointestinal disorders, headaches, and tingling about the mouth can be observed no more than thirty minutes after the ingestion. This is followed by general weakness, muscular spasms, a feeble and accelerated pulse, and breathing disorders. The severe cases present paralysis, coma and death. Yet, in most of the cases the complete recovery lasts 5 to 20 days.





1.00 m

## Chimaera monstrosa

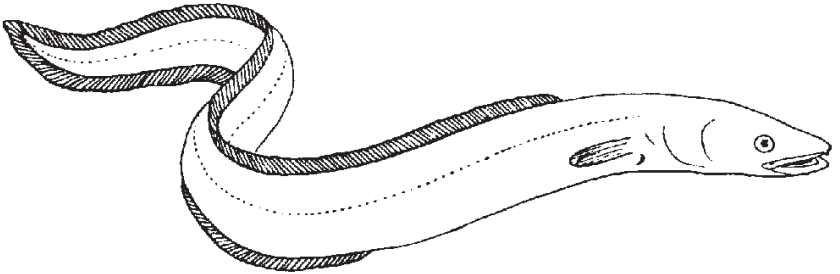
LINNAEUS, 1758.

*European Ratfish, Rabbitfish*

venomous sting

The sting of the spine in the first dorsal spine is poisonous. The venomous organ consists of one single spine by the front edge of the first dorsal fin. The spine has a caudal groove. The shallow sulcus contains the poisonous gland. After the sting, breathing disorders, hyper salivation and cyanosis may occur. The symptoms are usually mild. The complete recovery takes some 6 to 48 hours. Experiments made on animals (mice, cats, apes) have shown that the poison can cause death. The wounds are very painful. The wounding occurs occasionally since these fishes are not aggressive. The chimaera is a benthic fish, and does not carry lateral line.





2.30 m

## **Conger conger**

(LINNAEUS, 1758.)

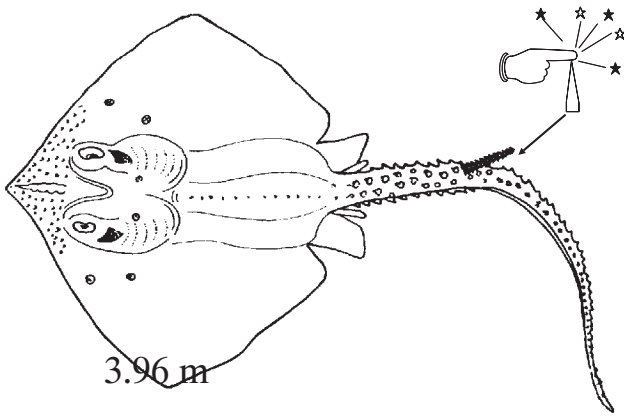
*Conger Eel*

toxic blood

The blood of the conger contains an ichthyochemotoxin similar to the one in the eel's blood. The poison is subject to high temperature, thus it decomposes during the preparation of the flesh for alimentary purposes (cooking and grilling).







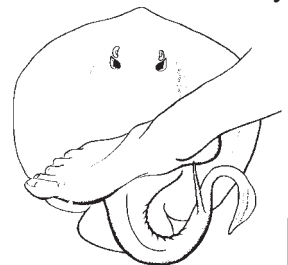
# Dasyatis centroura

(MITCHIN, 1815.)

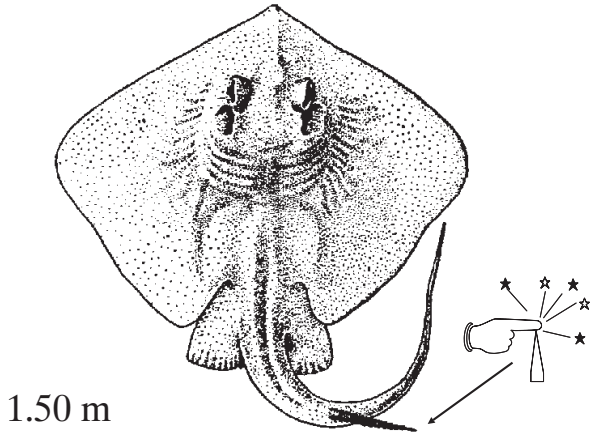
*Rough-tailed Stingray*

venomous sting

The tail is short and thick. The spine is well-developed, indented and situated away from the body of the fish, so it can be swung. It has an integumental sheath. The poisonous glands are situated in the sulcus of the spine. The wounds provoked by the spine are mainly lacerations or stabs. The main symptom is pain. Blood pressure decrease, vomiting, diarrhea, sweating, tachycardia and paralysis of skeletal muscles can occasionally occur. This is the largest Trygon in the Adriatic Sea.



How stingray wounds are most frequently



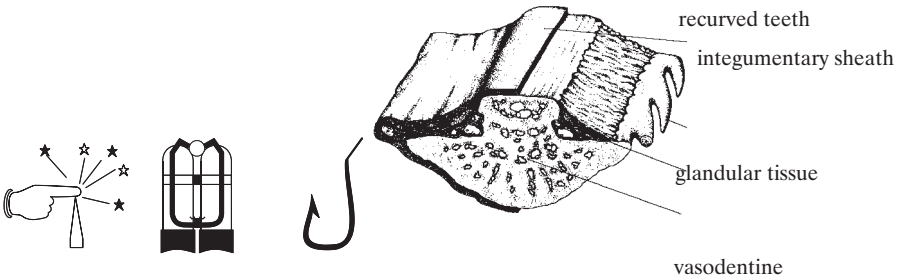
# *Dasyatis pastinaca*

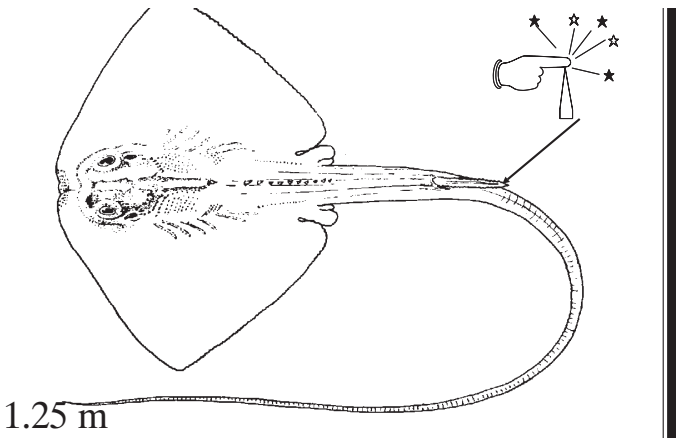
(LINNAEUS, 1758.)

*Sting ray*

**venomous sting**

The tail is of medium length. The spine is well-developed, indented and situated away from the body of the fish, so it can be swung. It has an integumental vagina. The poisonous glands are situated in the sulcus of the spine. The wounds provoked by the spine are mainly lacerations or stabs. The main symptom is pain. Blood pressure decrease, vomiting, diarrhea, sweating, tachycardia and paralysis of skeletal musculature can occasionally occur.





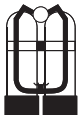
## **Dasyatis violacea**

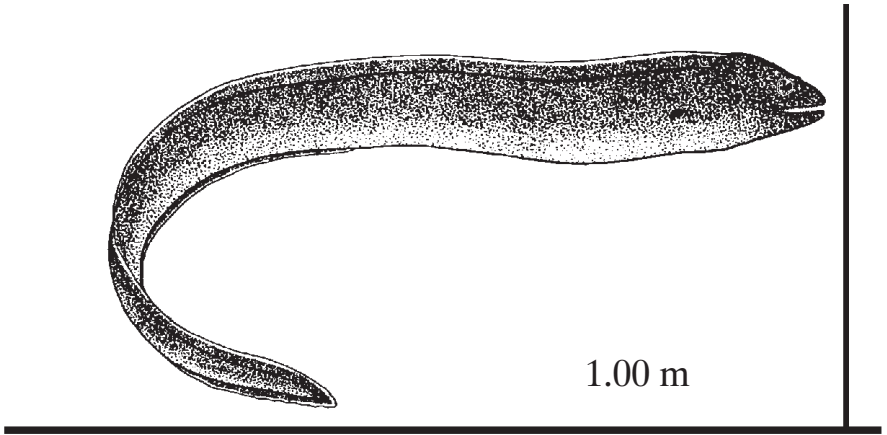
(BONAPARTE, 1832.)

*Blue Stingray, Pelagic Stingray*

**venomous sting**

The tail is very long. The spine is well- developed, indented and located away from the body of the fish, so it can be swung. It has an integumental sheath and the poisonous glands are situated in the sulcus of the spine. The wounds provoked by the spine are mainly lacerations or stabs. The main symptom is pain. Blood pressure decrease, vomiting, diarrhea, sweating, tachycardia and paralysis of skeletal muscles can occasionally occur.





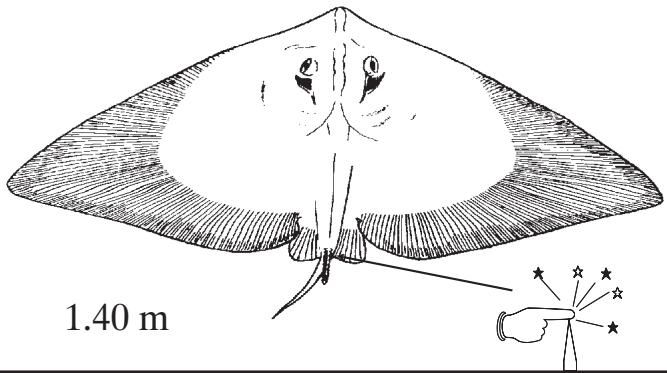
## **Gymnothorax unicolor** (DELANCHE, 1809)

*Brown Moray*

toxic bite

There is no special evidence about the poisonousness of the bite or of the blood. However we can assume that the effects of poisoning are similar to those caused by *Muraena helena*. Many species of the *Muraena* genus, living outside the Adriatic have been described as poisonous (poisonous bite and raw blood).





# Gymnura altavela

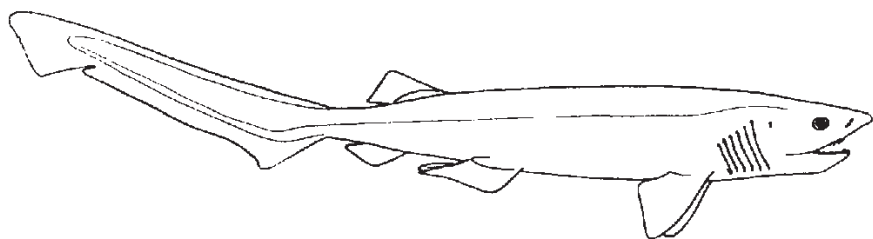
(LINNAEUS, 1758.)

*Spiny Butterfly ray*

**venomous sting**

The spine is located at the basis of the tail, which is short. The spine is also short, indented and situated in an integumental sheath. The poisonous glandular tissue is situated in the longitudinal sulcus of the spine. The tail is short, and it can not grip the prey. The allocation of the spine next to the body makes its swinging impossible.





3.75 m

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## **Hexanchus griseus**

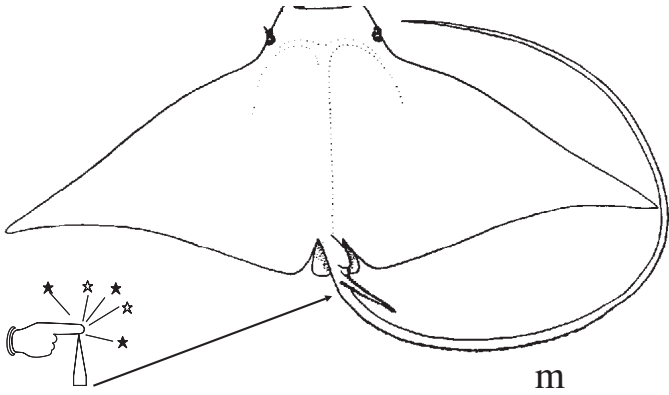
**(BONNATERRE, 1788.)**

*Bluntnose, Six-gilled Shark*

**toxic flesh and liver**

The alimentary consumption of the liver, rarely of the flesh of this shark, can bring to poisoning. The liver is very poisonous. The symptoms occur thirty minutes after the meal. The symptoms are: intestinal disorders, headaches, paresthesiae around the mouth. The later symptoms can be muscular weakness, spasms and respiratory disorders. The pulse is weak and accelerated. Sight disorders may occur. If ataxiae, severe respiratory disorders and coma occur, the life of the poisoned is in severe danger. Usually the complete recovery lasts 5 to 20 days.





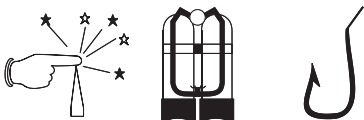
# Mobula mobular

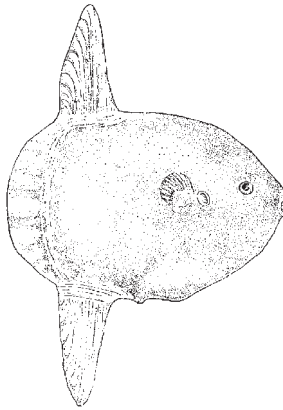
(BONNATERRE, 1788.)

*Horned Ray, Ox Ray*

venomous sting

The tail contains a spine .Along either side of the spine are a series of sharp recurved teeth It is situated by the origin of the tail. This species presents a spine of small dimensions. The poisonous glands are situated at the basis of the spine and in the longitudinal groove. The tail is long and resembles a whip. The Cephaloptera uses its tail to catch its prey.





2.00 m

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## **Mola mola**

(LINNAEUS, 1758.)

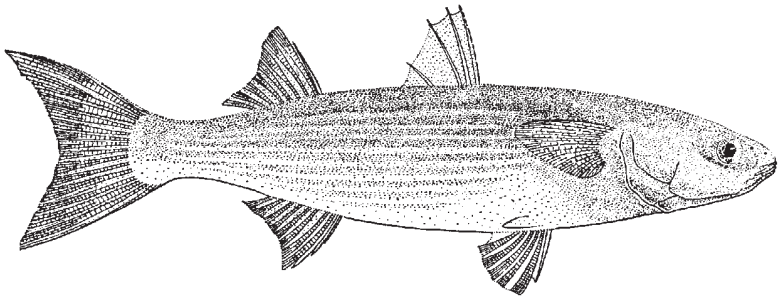
*Sunfish, Moonfish*

toxic flesh

This species does not have any larger importance in the epidemiology of the fish poisoning. It is not commonly in use for alimentary purposes. The tetrodotoxin in some non-Adriatic species of the Tetraodontidae is the strongest fish venom known up to date.







0.75 m

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## **Mugil cephalus** (LINNAEUS, 1758.)

*Gray Mullet*

toxic flesh

The poisoning with the flesh brings usually to hallucinations without any gastroenterological difficulties or signs of the nervous system. 10 up to 90 minutes after the meal consumption, the poisoned feels the weakness. Muscular incoordination, ataxiae, hallucinations and depression occur. The severe cases are marked by paresthesia about the mouth, muscular paralysis and dispnea. If the poisoned gets asleep, nightmares can occur. Usually the complete recovery lasts 2 to 24 hours, so the intervention is rarely necessary.





1.00 m

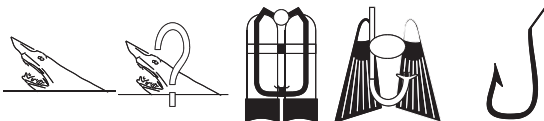
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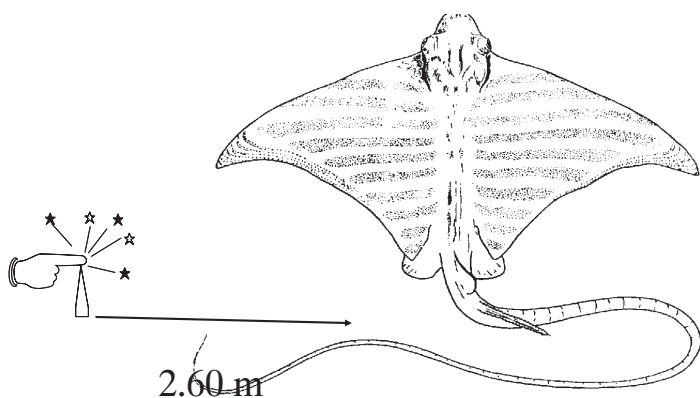
## **Muraena helena** (LINNAEUS, 1758.)

*Moray Eel*

toxic lood

Contains ichthychemitoxins in the blood just as the *Anguilla* or the *Conger*. The isolated toxin provokes death in the *Eriphia spinifrons* crab in approximately thirty seconds. People poisoned by raw blood ingestion present nausea, vomitus, hyper salivation and general weakness. Severe cases include paresthesia about the mouth, respiratory disorders, paralysis and death. The bite of the murray eel is very painful and the wounds heal slowly. The *Muraena* is an aggressive fish and bites if caught by an angle or by a harpoon. It is considered by some experts to be the most aggressive Adriatic fish.





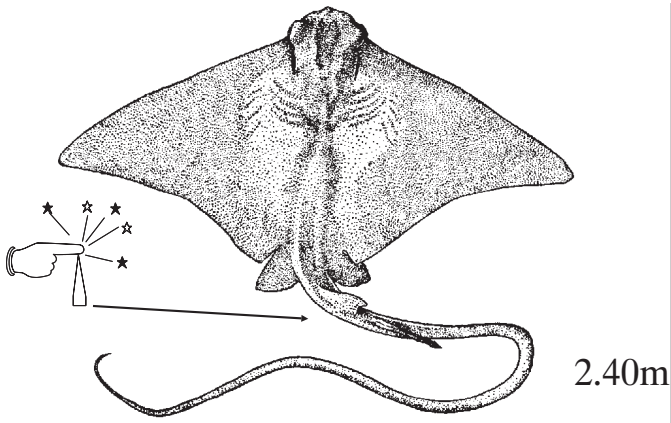
## **Pteromylaeus bovinus** (GEOFFROY SAINT-MILAIRE 1817.)

*Bull Ray, Duckbill*

**venomous sting**

The spine, located at the basis of the tail is well-developed. The spine is markedly indented, so the wounds can be very grave. The poisonous organ consists of glandular tissue at the basis of the spine and in the longitudinal sulcus. The basal position makes distinkted swinging of the spine impossible.





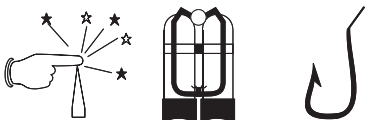
# Myliobatis aquila

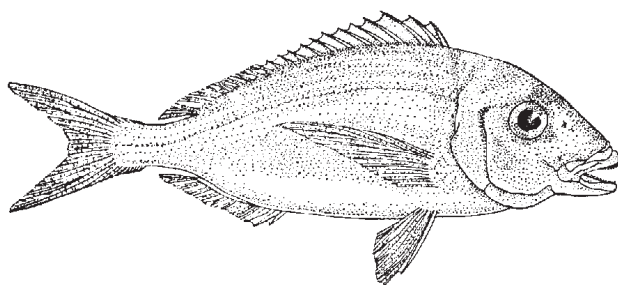
(LINNAEUS, 1758.)

*Eagle Ray*

venomous sting

The tail is very long and ends like a long whip. The spine is large and well-developed. It is situated at the basis of the tail. It is situated in an integumental sheath. Occasionally have been found exemplars with two or more than two spines by the tail. Once ripen out, the spine grows again. The spine is made out of a hard material similar to the bone (vasodentin). Along the spine there is a longitudinal groove (the ventrolateral glandular sulcus). The poisonous glandular tissue is situated in the sulcus. The poison is produced in the sheath of the spine and in the integument of the tail near the basis of the spine.





0.60 m

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## **Pagellus erythrinus**

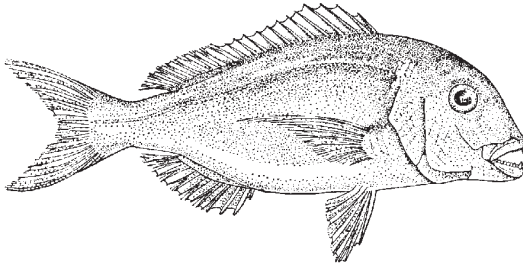
(LINNAEUS, 1758.)

*Sea bream, Porgie*

toxic flesh

Ciguatera poisoning is typical for tropical and subtropical areas. The Adriatic sea is on the northboundary of this area. The poisoning has been described in more than 300 species of fish. This particular species inhabits the area from Scandinavia, the British Islands and the Black Sea in the North, until the Azure and Canary islands in the South. There is no evidence of this form of poisoning in the Adriatic Sea. Porgies are the only Adriatic species mentioned. The same species of fish can be poisonous or harmless, so the ciguatera is a serious problem in the tropics. It is believed that the production of toxin in the body is linked with its nourishment. Occasionally do occur massive poisonings with species that have been harmless since.





0.75 m

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## **Pagrus pagrus** (LINNAEUS, 1758.)

*Common sea bream, Porgie*

toxic flesh

Cases of ciguatera poisoning with this species have been described in the Mediterranean Sea and in the eastern Atlantic. The poisoning is very grave, with multiple symptoms of the respiratory, the nervous and the gastrointestinal system. The poisoned can go through unbearable pains. The mortality is up to 10%. The survived go through a long period of recovery which can last for months or even years. There is no evidence of this form of poisoning in the Adriatic Sea.





1.00 m

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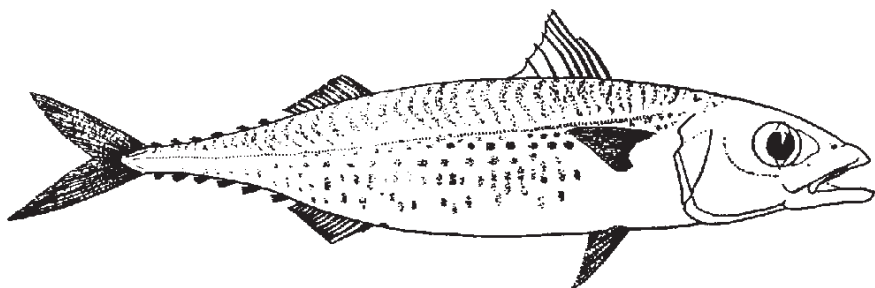
## **Petromyzon marinus** (LINNAEUS, 1758.)

*Sea Lamprey*

toxic blood

The venom is found in the serum. It is thermolabile and inactivates after cooking.





0.45 m

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## **Scomber japonicus**

**HOUTUYN, 1782.**

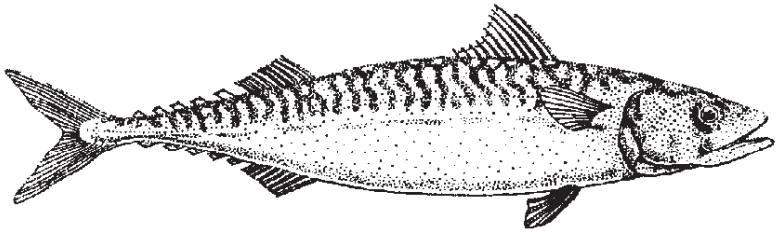
*Spanish Mackerel*

**toxic flesh**

This species is potentially poisonous, just like any other Scombridae. All the remarks that apply for the tuna-fish or the mackerel, are valid for this species as well. The danger of poisoning is greater in South areas. The fish should not be kept in hot places or exposed to the sun, because the histidin, through bacterial decomposition, changes into saurin, a substance similar to histamin which causes the poisoning. The symptoms are equal to the poisoning with the tuna-fish. The poisoned heal quickly. Severe cases, with the lethal conclusion are very rare. See also - Tuna-fish.







0.45 m

## **Scomber scomber**

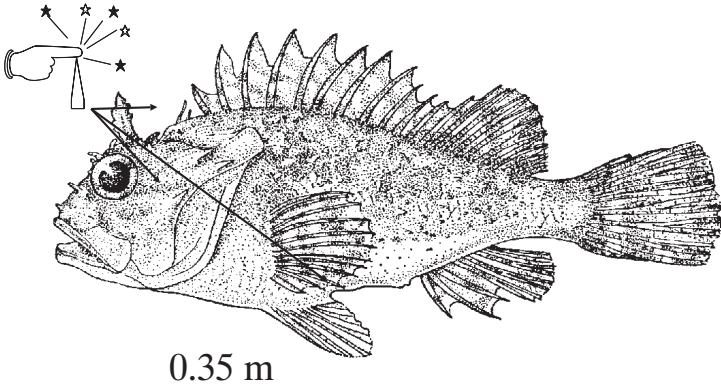
**LINNAEUS, 1758.**

*Atlantic Mackerel*

**toxic flesh**

The mackerel is generally more appreciated for alimentary purposes than the similar *Scomber colias*. The poisoning occurs after the intake of flesh that has started to deteriorate. On higher temperatures, through bacterial decomposition, the histidin changes into saurin, which is similar to histamin and therefore poisonous. The poisoning resembles a very expressed allergic reaction. The symptomatology and the course of the illness are similar to the poisoning caused by any other species from the family Scombridae. The poisoning generally ends with the complete recovery. See also the tuna- fish and the *Scomber colias*.





## Scorpaena porcus

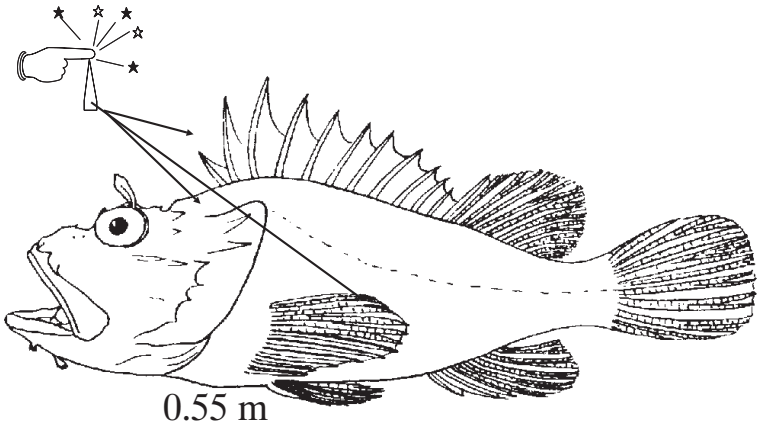
LINNAEUS, 1758.

*Black Scorpionfish, Sea Pig*

venomous sting

This Scorpionfish carries venomous spines of medium length and strength in the first dorsal and in the anal and pectoral fins. Short and strong, but not poisonous spines are found on the operculum. The glandular groove is situated in the distal two thirds of the spine. It contains glandular tissue, but only in the distal half. The skin that forms the sheath of the spine is thick. The sting is painful. The pain is intensive, sharp and pulsating. It stretches radially from the wound. The pain lasts for a few hours. Though there is little evidence, severe cases with the lethal outcome have been seldomly described.





## Scorpaena scrofa

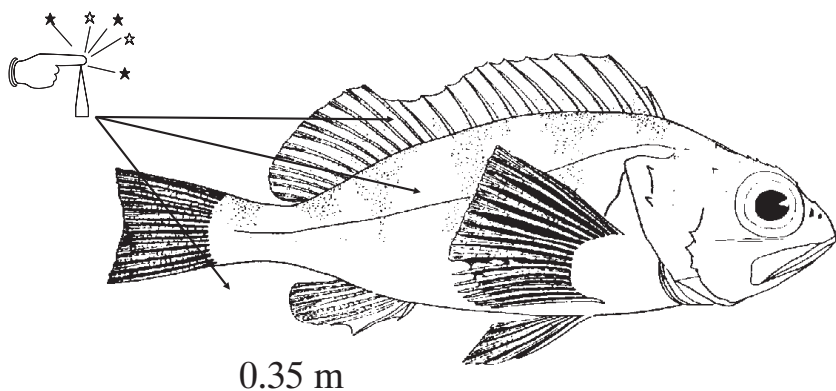
LINNAEUS, 1758.

*Red Scorpionfish*

venomous sting

The poisonous apparatus consists of spines in the dorsal and anal fins, The spines are situated in an integumental sheath, while the longitudinal groove contains glandular tissue. The symptoms appear immediately after the stab. The pain is strong, pulsating and spreads to the vicinity of the wound. The area around the wound becomes ischaemic and cyanotic. The pain lasts for a few hours. If the wound does not infect, there is no complications. Sometimes it is recommendable to make a cross section of the wound and suck the content out through a thin and elastic membrane (medical glove or condom).





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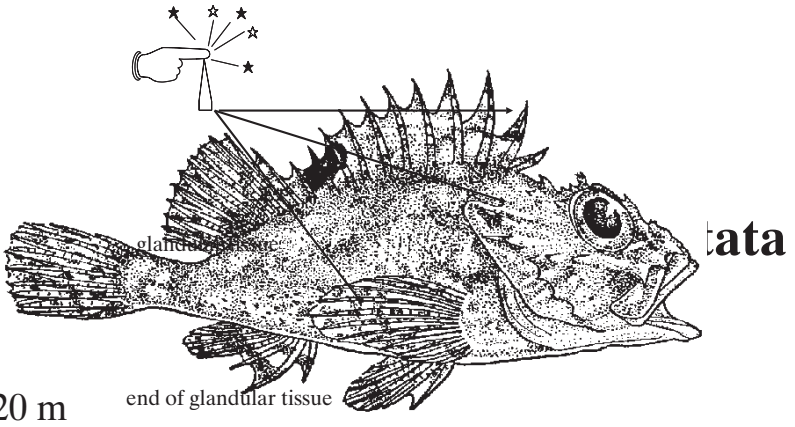
## **Heliocolenus dactylopterus dactylopterus** (Delaroche, 1809.)

*Blue-throat*

venomous sting

All of the characteristics are equal to those of the *S. scrofa*.  
See also the *S. Scrofa* and *S. porcus*.

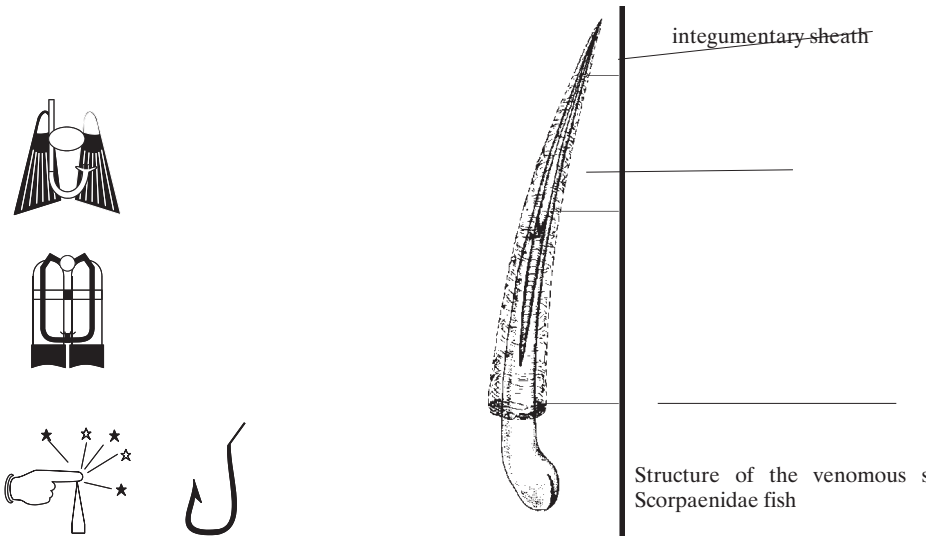


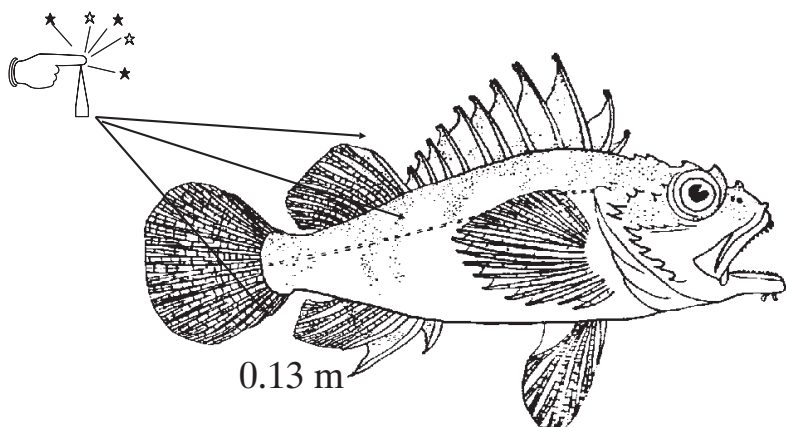


*Small red Scorpionfish*

venomous sting

The venomous organs and the symptoms of poisoning are equal to those of the *S. porcus*. See also *S. Scrofa* and *S. Porcus*.





## Scorpaena maderensis

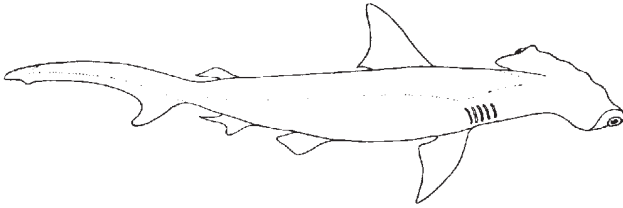
VALENCIENNES, 1833.

*Madeira rockfish*

venomous sting

The venomous organs and the symptoms of poisoning are equal to those of the *S. Porcus*. See also *S. Scrofa* and *S. Porcus*.





4.00 m

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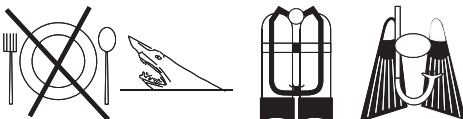
## **Sphyrna zygaena**

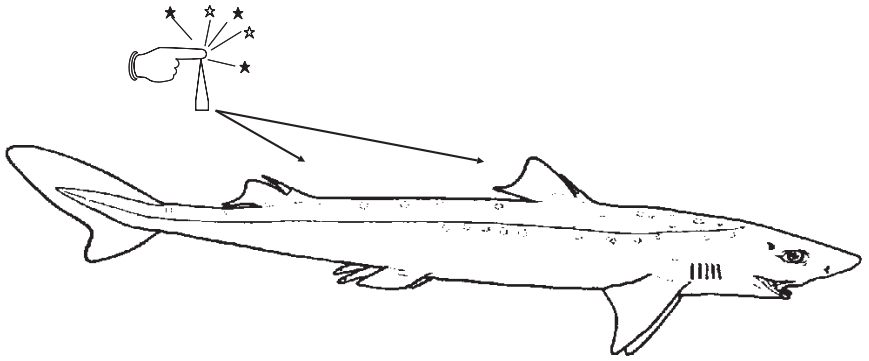
(LINNAEUS, 1758.)

*Hammerhead Shark*

**toxic flesh and liver**

The poisoning occurs after the intake of the liver, more seldomly of the flesh of this fish species. 30 minutes after the meal, digestive problems, headaches and paresthesiae about the mouth occur. General weakness, muscular spasms and breathing disorders occur later on. The pulse is usually accelerated and feeble. Sight disorders may occur. If ataxiae and severe respiratory disorders appear, the disease may bring to coma and death. Luckily, most of the poisoned heal completely in 5 to 20 days.





1.20 m

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## **Squalus acanthias**

**LINNAEUS, 1758.**

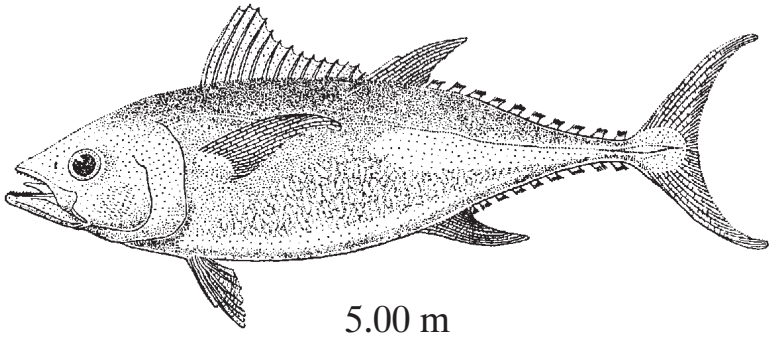
*Spiny Dogfish*

**venomous sting**

The poisonous glands are situated in the shallow groove on the posterior side of the spines within the dorsal fin. When the spine sticks into the tissue, the poisonous glands get damaged and the poison infiltrates the wound. A very strong pain appears instantaneously and it can last for hours. The pain is followed by blushing, sometimes by swelling. The hypersensitivity round the wound lasts for a few days. In a small number of cases, the stab brought to death.







5.00 m

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## **Thunnus thynnus**

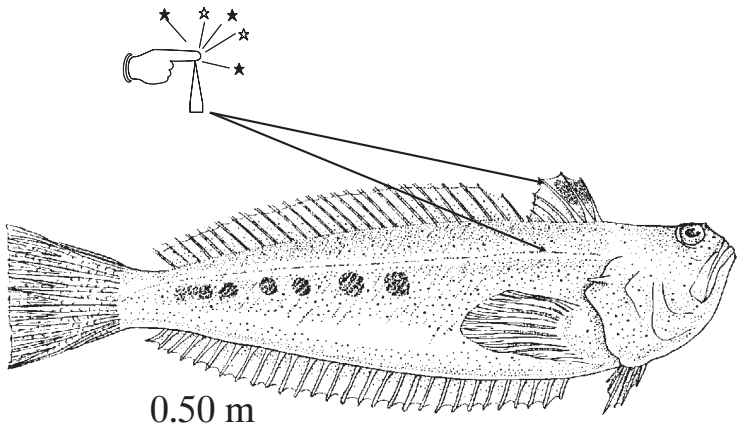
(LINNAEUS, 1758.)

*Atlantic bluefin Tuna*

toxic flesh

The poisoning is more common in warm areas. The flesh contains histidin. Through bacterial decomposition the histidin turns into saurin, a substance similar to histamin. The poisoning resembles the allergic reaction. If the flesh stays for a few hours out of refrigerator, or if it is exposed to the sun, it becomes poisonous. The poisonous flesh has a peppery taste. The symptoms show up just a few minutes after the meal: a strong headache, vertigo, the pulsation of the neck vessels, palpitation, chewing difficulties, nausea, vomiting, diarrhea and abdominal pain. Massive rednesses appear on the skin. A prominent itching is felt. Shock may occur, and there is even evidence of death cases. The symptoms last 8 to 12 hours, followed by a rapid recovery.





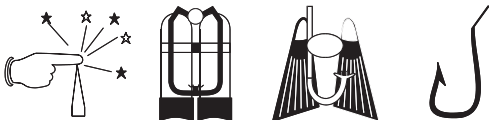
## Trachinus araneus

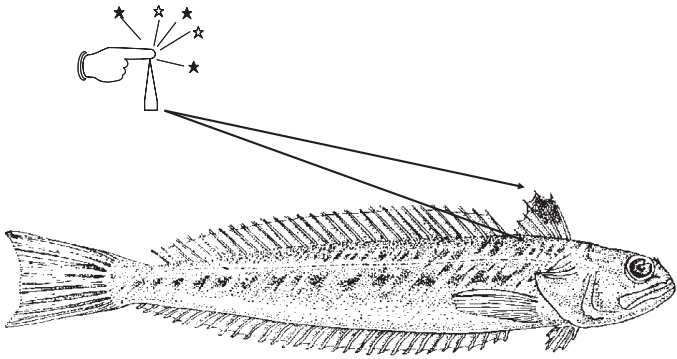
CUVIER, 1829.

*Spotted Weever*

venomous sting

The poisonous apparatus consists of spines in the first dorsal fin, and of the short, strong spines on the operculum. The spines are situated in a thin integumental sheath, the pointed tops sticking out. The spine has a longitudinal groove which contains spongy glandular tissue near the top. Similarly to the poison of the snakes, the poison of the *Trachinus* acts neurotoxically and chemotoxically. See also *T. Vipera*.





0.37 m

## Trachinus draco

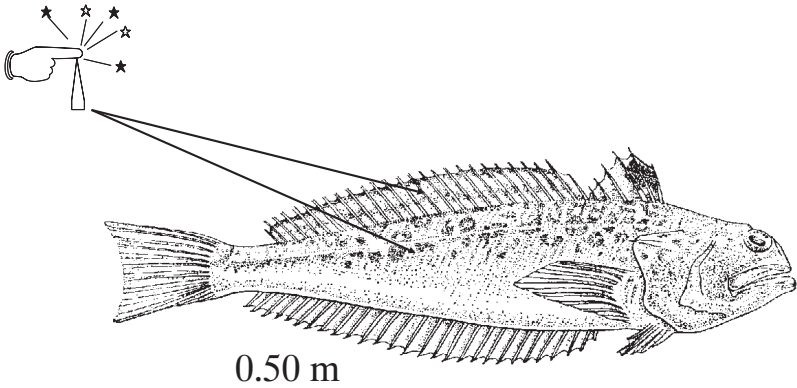
LINNAEUS, 1758.

*Great Weever*

venomous sting

The poisonous apparatus consists of spines in the first dorsal fin, and of the short, strong spines on the operculum. The spines are situated in a thin integumental sheath, the pointed tops sticking out. The spine has a longitudinal groove which contains spongy glandular tissue near the top. Similarly to the poison of the snakes, the poison of the *Trachinus* acts neurotoxically and chemotoxically. See also *T. Vipera*.





# Trachinus radiatus

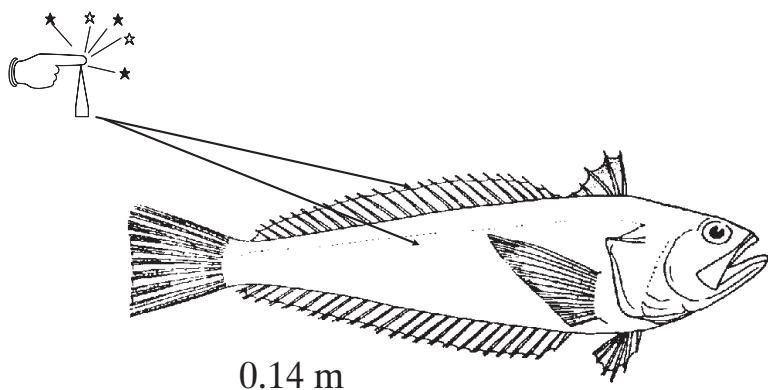
CUVIER, 1829.

*Starry Weever*

venomous sting

The poisonous apparatus consists of spines in the first dorsal fin, and of the short, strong spines on the operculum. The spines are situated in a thin integumental sheath, the pointed tops sticking out. The spine has a longitudinal groove which contains spongy glandular tissue near the top. Similarly to the poison of the snakes, the poison of the Trachinus acts neurotoxically and chemotoxically. See also T. Vipera.





## Trachinus vipera

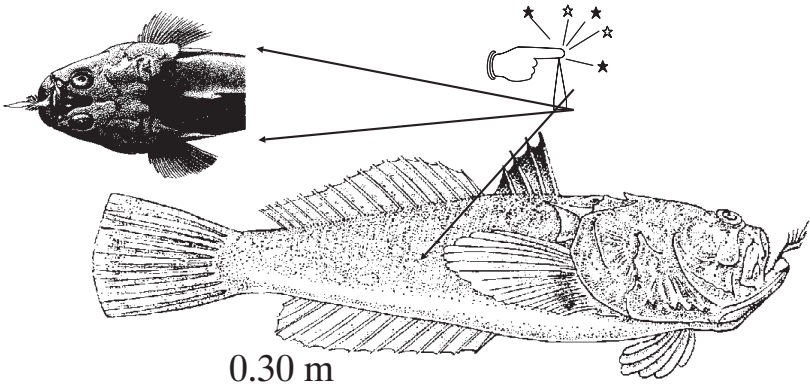
CUVIER, 1829.

*Lesser Weever*

venomous sting

The sting is very painful, similar to burning and spreading all over the limb. The pain becomes stronger and reaches the peak in 30 minutes. The poisoned can lose consciousness. The pain decreases and ends in 2 to 24 hours. The skin around the wound becomes pale in the beginning and red and swollen later on. The swelling can be remarkable and last for ten days. The other symptoms are headache, fever, chills, delirium, nausea, vomiting, dizziness, sweating, cyanosis, joint aches, loss of speech, bradycardia, palpitations, mental depression, convulsions and breathing disorders. The lethal outcome is possible. The gangrene as a complication appears occasionally. The recovery period varies from a few days to a few months.





## Uranoscopus scaber

LINNAEUS, 1758.

*Star Gazer*

venomous sting

The poisonous spines are located laterally on both side just above the bases of the pectoral fins. The poisonous tissue is attached to the spines. The spine is said to have a double groove through which the venom flows. Evidence on the symptomatology is insufficient. Wounds may be fatal.



# The Valid Latin Names for the Fish and their Synonyms

The latin terms for the fish in this publication are boldly printed. These are the names valid in the current systematics of the fish. The terms used by dr. T. Šoljan in his book "Pisces Mari Adriatici" are reproduced here, together with valid terminology. This will enable those who posses this book to identify the fish species. Some of the species do not have any synonym, so they do not carry any part printed in normal typeface. They are signed by an asterisk (\*).

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