

1984

Orange roughy

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UNIVERSITY OF MINNESOTA
TWIN CITIES

Department of Ecology and Behavioral Biology
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318 Church Street S.E.
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February 6, 1984

Dear Cal,

The day after I wrote you there was an article in the food section of the paper indicating that the Australian "ruff" was probably not the orange roughy of recent fame. I hope to have a book on marine fishes of New Zealand waters before too long and no doubt there will be more about the illustrious fish.

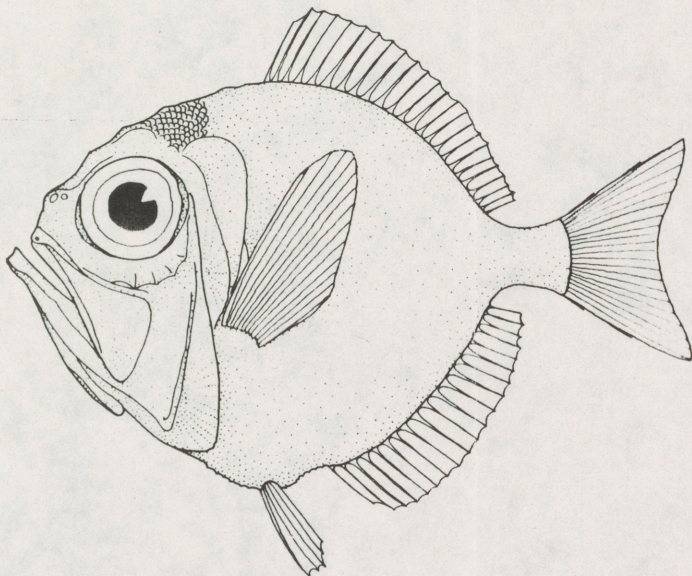
In answer to your question about Hoplostethus atlanticus, it is a member of the family Trachichthyidae in the order Beryciformes, suborder Berycoidei. The common name for the family is "slimeheads" which may account for the new name. There are five genera and 14 species in the family. All members are marine and found in the Atlantic, Indian and Pacific Oceans. No pictures that I can locate. The genus Hoplostethus is equivalent to the genus Leiogaster in some classifications.

Once I get the New Zealand book if there is material on the orange roughy I'll duplicate it and send it on to you.

Cordially,

P.S. The o.r. sounds similar to the story about ocean perch.

I did get copies of your lab. manual from the publisher. Thanks again.

DISCFISHES: Diretmidae**DISCFISH** *Diretmus argenteus*

size 30-40cm; D 26; A 22; P 6; LL 70

The discfish is a widely distributed species reaching a maximum length of about 40cm. When adult it has a flattened almost disc-shaped body with a sharp scute-covered edge on the belly. A large upturned mouth and huge eye dominate one half of the disc and a small forked tail projects from the other. This strange fish has small spiny scales but no lateral line and is a uniform silvery colour. It is a rare but widespread species being occasionally found in depths from 200 to 1000m in most oceans.

ROUGHYS: Trachichthyidae**COMMON ROUGHY** (Sandpaper fish) *Paratrachichthys trailli*

Pl. 11, p. 128

size 10-25cm; D V 13; A III 10; P I 6; LL 118

The common roughy is a deep-bodied, laterally compressed fish that averages 10 to 20cm in length, and attains a maximum of 25 to 30cm. Like all the other species in this family it has a large head that bears a conspicuous pattern of bony ridges and spines. A large eye is positioned well forward on the snout of this fish, above the almost vertical mouth. This species of roughy has small rough scales and because of this

feature it is sometimes known as the sandpaper fish. Along the belly there is a row of enlarged scales forming a serrated ridge between the pelvic and anal fins. An unusual feature of this species is the position of the anus; between the pelvic fins, instead of in the more normal position immediately in front of the anal fin. The common roughy is attractively coloured, having a crimson-brown body colour, tinged with silver on the sides, and with red-pink fins. In shallow water roughys spend the daylight hours sheltering in caves or large crevices, emerging at night to feed on the larger planktonic animals such as crustaceans and worms. In the deeper parts of their range, from 50 to 100m down to 500m, these fishes are found in the open during the day, but it is not known whether they feed at this time as well or only at night like the shallow water individuals. Common roughys are found throughout New Zealand, although they are rarely seen north of Cook Strait. The same species is also found in southern Australia.

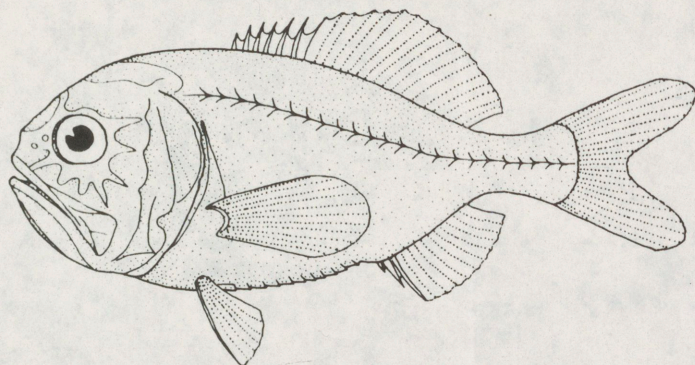
SLENDER ROUGHY *Optivus elongatus* (*Hoplostethus elongatus*) Pl. 12, p. 129
size: 8-10cm; D IV 10; A III 9; P I 6; LL 67

The slender roughy is a small fish, averaging only 8 to 10cm in length, and is more elongate than the other members of this family. Fin shape and arrangement is similar to the other roughys, with a deeply forked tail and a high dorsal. When seen alive slender roughys have a pink-brown body colour with a distinctive whitish stripe along the dorsal surface. The fins are whitish, tinged with pink, and there is a thin red stripe along each lobe of the tail fin. However, in a fresh dead specimen of this species the colour pattern is reversed: the white dorsal stripe becomes a deep red-brown and the rest of the body a pale silvery brown. This fish lives in depths from a metre or so down to about 100m, spending the day hanging beneath rocky overhangs or in caves and crevices, moving little unless disturbed. They are commonly seen by divers from North Cape to East Cape in these habitats, often sharing their hiding places with schools of big-eyes (*Pempheris adspersa*). At night they venture out into open water where they use their large mouths to gulp down planktonic animals, easily detected even in dim moonlight or starlight by the forward positioned eyes. When seen at night slender roughys are a pale pink-brown in colour with faint rainbow tinges on the fins and body. This species is also found off the east coast of Australia.

ORANGE ROUGHY *Hoplostethus atlanticus* (Illustrated overleaf)

size 25-40cm; D VI 17; A III 11; P I 6; LL 31 other scales small and irregular

The orange roughy is a large deepwater species with a deep, laterally compressed body. It has more dorsal and anal soft fin rays than other roughys, and has small irregularly shaped and arranged scales. The scales of the lateral line and the serrated scales along the belly ridge are considerably larger than the other body scales. The typical roughy head is even more massive and bony than in the previous two species. This fish takes its name from the bright orange colour of the body and fins, although there are distinct silver tinges on the flanks. Orange roughys are found in most temperate seas, including the North Atlantic, and waters off South Africa, southern Australia, and New Zealand. It appears to be irregularly distributed around New Zealand in water from 100 to 500m deep, and is particularly common in some areas on the Chatham Rise. Young specimens have not been trawled here but it may be that they frequent rocky ground and hence are not taken in trawls with the adults.



ORANGE ROUGHY

SILVER ROUGHY *Hoplostethus mediterraneus*
size 10-20cm; D VI 13; A III 9; P I 6; LL 29

Pl. 11, p. 128

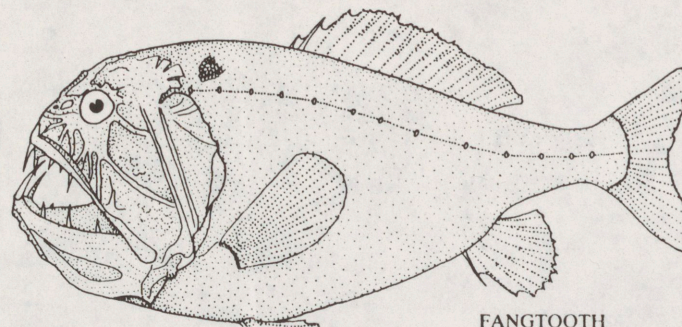
The silver roughy is a moderate sized deep water species similar in shape to the orange roughy but averaging only 10 to 20cm in length. Occasional specimens up to 30cm in length have been reported. On the head are a series of conspicuous, delicate ridges and spines, with the intervening hollows covered by a thin membrane. Large easily dislodged scales cover the body, but those on the mid-line of the belly and along the lateral line are larger and more firmly attached. This species is silver in colour with a rosy-pink tinge on the back and black-edged pink fins. Silver roughys have large gill rakers, a feature they share with other roughys, that are designed to prevent the planktonic animals that make up their normal diet from escaping through the gill openings. They are widely distributed in temperate seas including the area around New Zealand and have been brought up in trawls in water between 100 and 500m deep.

FANGTOOTH: Anoplogasteridae

FANGTOOTH *Anoplogaster cornuta*

size 10-15cm; D II 17; A I 8; P I 4; small scales

The fangtooth is a small deep-bodied fish found in very deep water. It has a huge upturned mouth with a pair of long sharp canine teeth in the front of each jaw, and a bony head bearing conspicuous ridges and spines that are reminiscent of the roughys. On the dark brown-black body the scales are small, rough and irregular. This species lives in 500 to over 5000m of water throughout the temperate and tropical regions of all three major oceans, and has recently been recorded from deep water off northern New Zealand.



FANGTOOTH

ALFONSINOS: Berycidae

GOLDEN SNAPPER *Centroberyx affinis* (*Trachichthodes affinis*) Pl. 11, p. 128
(Nannygai, red snapper, koarea)

size 30-40cm; D VII 12; A III 13; P I 7; LL 44

In spite of its name the golden snapper is not related to the true snapper and is in fact more similar to the roughys. They average 30 to 40cm in length but specimens up to almost 60cm in length and weighing about 5kg have been caught. Spines and bony ridges cover the head, and this, along with the large eyes and upturned mouth give this species a close resemblance to the roughy. Golden snapper scales feel rough to the touch and have coarse spines on their hind margin. The colour of this fish is a beautiful glowing golden orange on the head and body and fins, with darker red-orange longitudinal bands along each row of scales. Golden snapper usually swim in large schools that in water less than 50m deep are confined to large caves and archways during the daylight hours. Around the offshore islands of eastern Northland and the Bay of Plenty divers often see these fishes drifting slowly in the dim light of their daytime shelter sites. In deeper water, from 50m down to their normal depth limit of about 400m, these fishes do not seek shelter during the day but rather swim slowly to and fro above rock outcrops. At night golden snapper disperse into open water where they feed on large planktonic animals, gulping them down one at a time with their large fine-toothed jaws. Apart from being common off the north-east coast of the North Island this species is occasionally found around the other parts of New Zealand, and is very common around southern and eastern Australia. Schools of golden snapper often move out over open sand flats in deeper water and are then regularly caught in bottom trawls and sold as red fish. They take a line easily and make excellent eating but must be handled with great care as the fin and head spines are extremely sharp and can cause painful wounds.

(ORANGE) ROUGHY

now added
after brought to state

Hoplostethus atlanticus

Superfamily Calarioidea

New Zealand
marine

100 fathoms
appears along shore
to spawn



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January 25, 1984

Dear Cal,

The book arrived in great shape and I intend to order several copies for the Ichthyology course. I appreciate the copy.

When I talked with you the other day I gave a bit of misinformation about the ruff or roughy. It is a member of the family Arripidae - Australian Salmon family. It is marine and native to the South Pacific, specifically southern Australia and New Zealand. I have enclosed a few pages from an Australian book that describes in a general way the two species in the family (one genus Arripis, with two species). They are members of the order Perciformes, unfortunately all I could find was a color photograph of the Arripis trutta which did not duplicate very well. It is characterized by three anal spines; gill membranes free from the isthmus; anal fin much shorter than the soft dorsal; it has a body shape not too different from the walleye or sauger but with anterior and posterior dorsal fins joined. I have a book on New Zealand marine fishes on order and I suspect it will have a line drawing or photograph I can duplicate. If so I'll send a copy for your associates.

Thanks again for the copy of your book on the drum.

Cordially,

A handwritten signature in cursive script, appearing to read 'Jim'.

FISH AND FISHERIES OF AUSTRALIA

BY

T. C. ROUGHLEY

WITH 59 COLOUR PLATES
29 PLATES IN BLACK AND WHITE
AND 11 TEXT FIGURES



ANGUS AND ROBERTSON

AUSTRALIAN SALMON

(Family Arripididae)

(Plate 26)

THERE should be no delay in pointing out that the Australian salmon, also known as salmon trout (*Arripis trutta*) is not a true salmon and is not even remotely related to the salmon of the northern hemisphere. It belongs to the family Arripididae, which is included in the great group of perches and contains only two species, the Australian salmon and the ruff (*Arripis georgianus*).

How this fish received its name is not known, but it has come down from the early days of Australian colonization, and no doubt the fish was confused with the true salmons because of a superficial resemblance to them and because of its outstanding fighting qualities when hooked.

The Australian salmon is one of the most abundant fish round the southern half of the Australian coast. Although it has been recorded from the waters of southern Queensland, only a few stragglers are met with there; nor is it common on the north coast of New South Wales, but from Port Jackson southwards it becomes more and more prevalent till on the far south coast it is very abundant. Great numbers occur in Bass Strait, round the Tasmanian coast, in Victoria, South Australia and Western Australia. As on the east coast, the salmon decreases in numbers in a northerly direction on the west coast, and, although it is found as far north as Geraldton the fish seen there are more or less strays from the parent stocks.

The salmon occurs also at Lord Howe and Norfolk islands, and it is an abundant fish in New Zealand where it is known under the Maori name of kahawai.¹

In New South Wales the average size of the salmon captured is 4 or 5 pounds with a limit of about 10 pounds, but on the Western Australian coast the fish grow faster and to a much greater size; the average run is from 8 to 12 pounds, and fish from 16 to 20 pounds are not uncommon. The South Australian salmon also grow to a larger size than those found in New South Wales, the average weight of fish found in many shoals varying from 7 to 9½ pounds.

Although the actual breeding grounds of the Australian salmon have not been determined it is known that the fish spawns at sea and that the eggs are pelagic. The principal nursery for the young fish found in eastern Australian waters appears to be the Bass Strait area, for those in the young stages, up to two years old, are found in greatest abundance along the north coast of Tasmania, in the vicinity of the islands in Bass Strait, and along the southern seaboard of Victoria, where the young fish are frequently known as "salmon trout" on account of the spots that are present on the back and sides.

¹ Pronounced "carwy".

Similar fish are occasionally seen on the south coast of New South Wales but they are by no means so common in this area.

Spawning occurs from January to March in eastern waters and somewhat later in Western Australia, where it probably reaches its peak in April and May.

The fish spend the first two years of their lives in the estuaries before they make to sea; when two years old they measure 8 to 10 inches in length, and it is usually not till they are three or four years old that they are captured commercially. The salmon that comprise the bulk of the New South Wales fishery are from five to nine years old. A fish 2 feet long and 6 pounds in weight is about nine years old. Growth is, however, much more rapid in Western Australia.

The shoals of salmon travel usually close to the coast and are rarely seen beyond the 15-fathom line. They are most abundant in the waters of southern New South Wales from the middle of April till the end of October, in Victoria from November to April, and on the south coast of Western Australia from May to November. On the south-west coast of Western Australia as far north as Busselton the fish are most prevalent in late summer and early autumn.

Salmon tagged at Gippsland Lakes Entrance late in April were subsequently recovered from the waters adjacent to Eden on the far south coast of New South Wales, thus indicating that the fish move north into New South Wales waters during the winter months.

It has long been known that the salmon occurs on the southern Australian coast in great abundance, and many large shoals were seen by S. Fowler during the course of his aerial observations carried out from 1936 to 1948. Much evidence has accumulated to indicate that if salmon are netted in an estuary for a season or two they will avoid that estuary in the future.

The salmon consumes a wide variety of foods, including small crustacea such as krill (*Nyctiphanes australis*), sea worms, pelagic shellfish, small squid and cuttlefish, and many species of small fish such as pilchards.

The salmon is a fish of poor edible quality; the texture of the flesh is rather coarse; its appearance is dark, and it lacks the delicate flavour of many other fish common on the Australian market. In New South Wales it ranks low in popular esteem and, except during the second world war when the absence from the market of trawled fish caused an acute shortage, it is rarely eaten in the fresh state. In Victoria, however, there has long been an active demand for it.

The edible quality of the salmon obtained at Lord Howe Island is far superior to that of the fish found on the Australian coast; the flesh is of fine texture and excellent flavour.

Only in Victoria and South Australia are any quantities of salmon marketed in the fresh state. In all the southern States there are canneries which depend very largely on salmon for their basic supplies.

Both the flavour and the texture of the salmon improve when it is canned, and, although the product has not the high quality of northern hemisphere salmon, it serves a useful purpose when cooked in various ways and when made into rissoles, and there is a wide and constant demand for it throughout Australia.

Most salmon are captured in Australia on ocean beaches where large seine nets are used to encircle and land them. Large quantities are taken on the beaches adjacent to Gippsland Lakes in Victoria. The nets used there are provided with a detachable bunt or bag and when the net is run round the fish from a beach they are concentrated into this bag beyond the surf; it is then detached and towed into the lake where the fish are transferred to a pen through which the water is free to circulate, and from this the fish are netted according to market requirements. The fish will remain in good condition in the pen for about two months, and it has been found that after several weeks there they become more tender.

The salmon is one of the finest small-game fish in Australian waters; it takes a bait or lure readily and when hooked it fights tenaciously; it moves with great speed and frequently makes spectacular leaps from the water in its frantic efforts to throw the hook.

When trolling for salmon either No. 9 cord lines or nylon with an equivalent breaking strain are mostly used. Feather or metal lures and spinners are taken freely, and the hooks used vary from 3/0 to 5/0. If fishing from a beach a line with a breaking strain of from 12 to 15 pounds provides the best sport, and the hook may be baited with such fish as yellowtail, tailor, bonito, or mullet, although prawns and beach worms are sometimes taken freely. A running sinker is usually most effective.

RUFF (Rough, roughy, tommy rough, sea herring—*A. georgianus*)

Although the ruff occurs in all southern States, it is rarely seen in New South Wales waters and is most abundant in South Australia and Western Australia, where it is a fish of considerable importance in the markets, and potentially of much greater importance.

The ruff is closely related to the Australian salmon, but, unlike that fish, it is held in high esteem for its excellent edible qualities, its flesh being tender and tasty. It never grows to any size, rarely attaining a length beyond 16 inches. In addition to being a good table fish it provides excellent sport for anglers.

In South Australia the ruff is present in large quantities throughout the year, but the greatest supplies are marketed during the winter months when the fish concentrate closer to the coast.

In Western Australia this fish is frequently called the "sea herring" (a most inappropriate name). In that State it is found in vast shoals in early winter when the fish are schooling for spawning purposes, mainly on the south and south-west coasts from Esperance Bay to Fremantle, and although small quantities have been canned it is probably more important as a fresh fish than as a canned product. It is caught by net fishermen with seine nets principally on the ocean beaches, but large quantities occur offshore and it may be found practicable to capture them in such situations in purse seine, lampara, or ring nets, and, if so, a great increase in supplies can be expected.