

HAWAIIAN 'AKULE' NIGHT FISHING GEAR

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The South Pacific Commission has received a number of requests for information on small-scale fishing methods which have been developed in particular countries throughout the Pacific and which might have application elsewhere in the region. To this end, we are publishing below the first in a series of articles on such techniques. This article is based on a pamphlet, now out of print, produced for an SPC fishing techniques course held in Palau in 1968.

Introduction

The fish known in Hawaii as 'akule', *Selar crumenophthalmus*, (Figure 1) occurs in hundreds of islands across the Pacific where it is known by a number of local names. Quite frequently, the fish is known by a different name at each stage of its growth. The mature fish is known by the following names in some of the Pacific islands:

Cook Islands	: Ature, Aturepai
Niue	: Atule
Tahiti	: Ature, Aramea, Orare
Tonga	: Otule
Samoa	: Otule
Solomon Islands	: Buma

The common English name is 'big-eyed scad'.

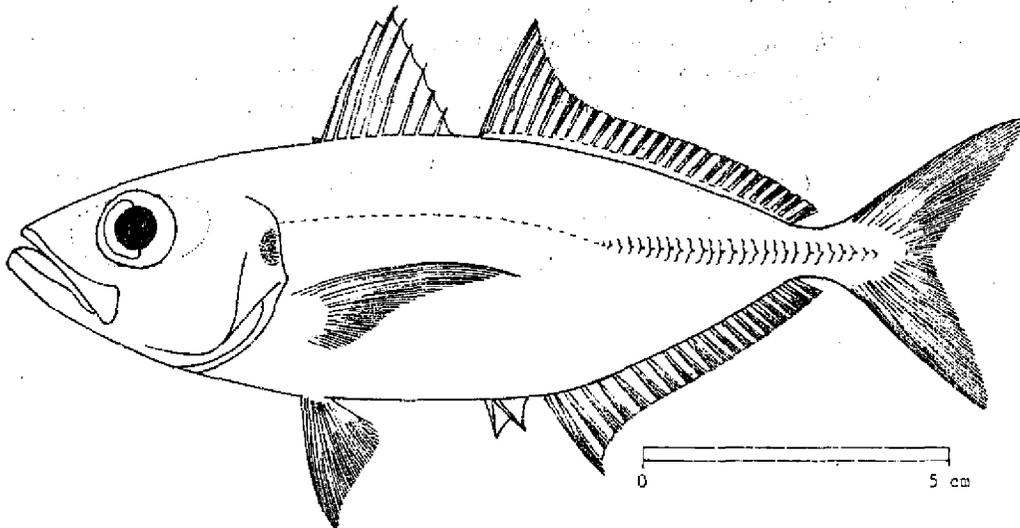


Figure 1: 'Akule' (*Selar crumenophthalmus*)

Illustration from *Species identification sheets for fishery purposes: eastern Indian Ocean fishing area 57 and western central Pacific fishing area 71*, vol. 1, Rome: FAO, 1974.

The Hawaiians have developed a commercial fishery for akule caught using lights and artificial lures as described in this paper. Similar gear and methods can also be used to catch opelu or mackerel scad (*Decapterus* spp.).

Akule occur in big schools in the shallow water of bays, harbours and reef entrances in most Pacific islands. Under these conditions they are traditionally caught with surround nets,

or scare lines. When the fish move out of the shallow water inshore, these traditional methods are of no use. The method described here is designed to catch the larger fish offshore in relatively deep water beyond the reef.

The fish are most easily caught when they spawn. This occurs in the southern hemisphere during the summer months of November and December. In the northern hemisphere, June and July are the times when greatest catches can be expected.

Within these months the best fishing nights are close to the new moon when the longest periods of darkness occur. As the moon sets later, the period of time in which it is opportune to fish decreases. Close to full moon, this method is of little use.

A very light, offshore breeze is best for this type of fishing. Under such conditions it is possible to anchor with the boat held off the reef by the wind, with little danger of being set into the breakers. On nights when the wind is strong onshore and the sea is rough, fishing becomes difficult and sometimes dangerous.

Light source

All the Hawaiian fishermen use electric light. In larger vessels where a d.c. generator can be run continuously, electric light offers few problems. In a small boat or canoe a heavy-duty storage battery is the most convenient power pack. A 12-volt 25-watt electric light bulb will give a steady light all night if supplied from a fully charged, heavy-duty battery. This light bulb can be easily shaded by mounting it inside a plastic or aluminium bucket which is, in turn, held in place by a bracket made from standard 3/4" (2 cm) pipe fittings.

The light shade is illustrated in Figure 2. When mounting this shade it is important to make sure that the shade does not dip below the surface in rough water. If, in turn, it does reflect just sufficient light to enable the fishermen to see to untangle their lines, it is a great advantage. A light which is bright inboard makes handling gear easy, but is a danger when one needs to watch for navigational hazards incidental to this fishing. As every fisherman knows, it is generally better, when working at night, to get one's eyes accustomed to the darkness rather than use bright illumination to work with and suffer partial blindness in areas outside the field of light.

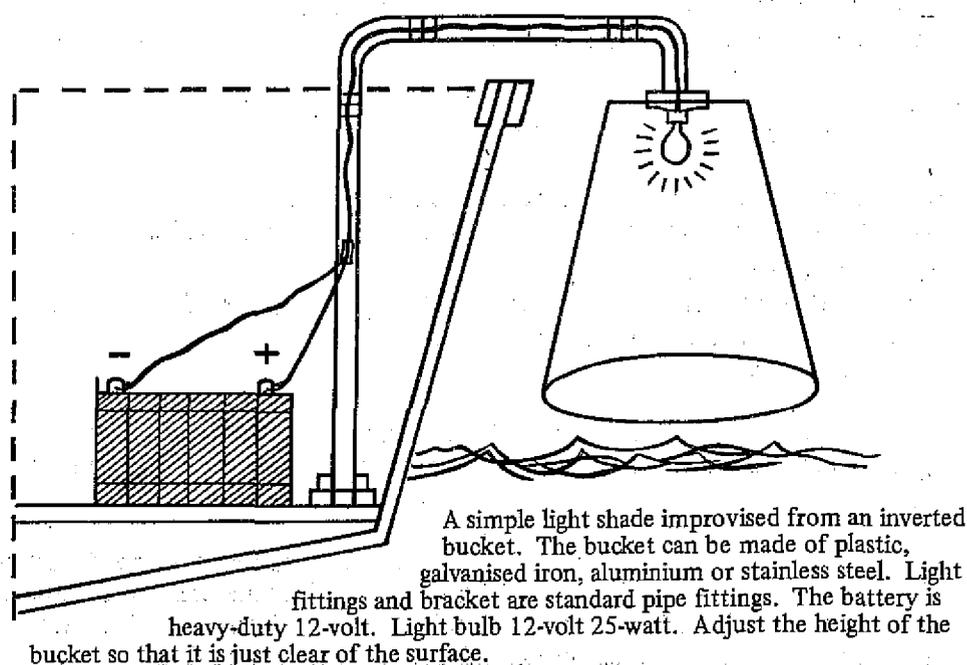


Figure 2: The light shade

A long canoe is a convenient type of vessel for this type of fishing. If the light is mounted in the centre of the canoe, it is possible for two men to fish, one from each end of the canoe, so that the lines do not tangle. When a small boat is used, it is problematical as to just how far two lines should be separated so that cross-overs and tangles do not occur. A 20 ft (approximately 6 m) boat with a light mounted in the centre provides a convenient platform for two fishermen to work, although smaller boats can be used if some care is taken.

All Pacific fishermen who are familiar with catching flying fish at night have noticed that large fish often circle round a bright light but seldom swim close to it. It is only when one can concentrate the light into a small cone close under the boat that akule fishing becomes possible. Once a shaded light is used so that the pool of light is only about 2 metres (6 ft) in diameter, all the marine life concentrates into and around this small circle. This makes fishing much easier.

Given a good fishing night, when the moon sets soon after sunset and with a light, offshore breeze and the sea calm without a strong current, fishing can start as soon as twilight fades. When the light is first switched on, very little is likely to happen for the first hour. Then gradually a few very small planktonic animals will appear. Once these zooplankton have collected in the circle of light, it is not long before larger fish move in and begin feeding. Within the next few hours more plankton will collect and a wide variety of small fish will be actively feeding. It will be noticed that the small fish stay within the circle of bright light while the larger fish stay further away. Even larger fish stay outside this circle of half light and often dart in to snatch a smaller fish. The akule are, in turn, attracted and begin feeding on the fast-moving plankton.

The fishing gear

It is common in Hawaii to use a line of five to six hooks, as illustrated in Figure 3A. However, any number of hooks can be used, depending on the preference of the individual fishermen.

The line is made up as follows:

- line for mainline: about 16 kilos (35 lbs) test, either three strands of monofilament loosely braided together or some suitable braided multifilament;
- line for snoods: monofilament of 4.5 to 9 kilos (10 to 20 lbs) test. The snoods are attached to the centreline by loop knots and should be 38 cm (15 ") to 51 cm (20") long and spaced sufficiently to prevent their tangling.
(Note: for the centreline and snoods, white nylon is satisfactory for akule but black is essential for opelu.);
- a small swivel (attached where the mainline joins the centreline);
- a terminal lead of about .06 kg (2 oz).

Most fishermen will prefer to make up their own lures.

Akule lures (Figure 3B) can be made out of a variety of materials. These include:

- white nylon knitting wool,
- white feathers (traditionally those from the breast of a tropic bird),
- bristles from the tail of a white dog or pig,
- fibreglass floss.

The best hooks for the purpose are Mustad Limerick ringed, tinned, extra strong quality 8235 H. Size 6 is an average size; larger sizes can be used to advantage when large akule are biting.

The lures are made up simply by passing the wool or similar material through the eye of the hook, binding the wool to the shank of the hook with a few turns of cotton (often red cotton is preferred) and teasing the wool to make a lure as illustrated. It is advisable to make a number of lures, as many are lost in use and also they lose their efficiency after repeated use.

Lures for opelu must be made with *black* wool or feathers and with slightly smaller hooks. (Akule will also take black lures at times.)

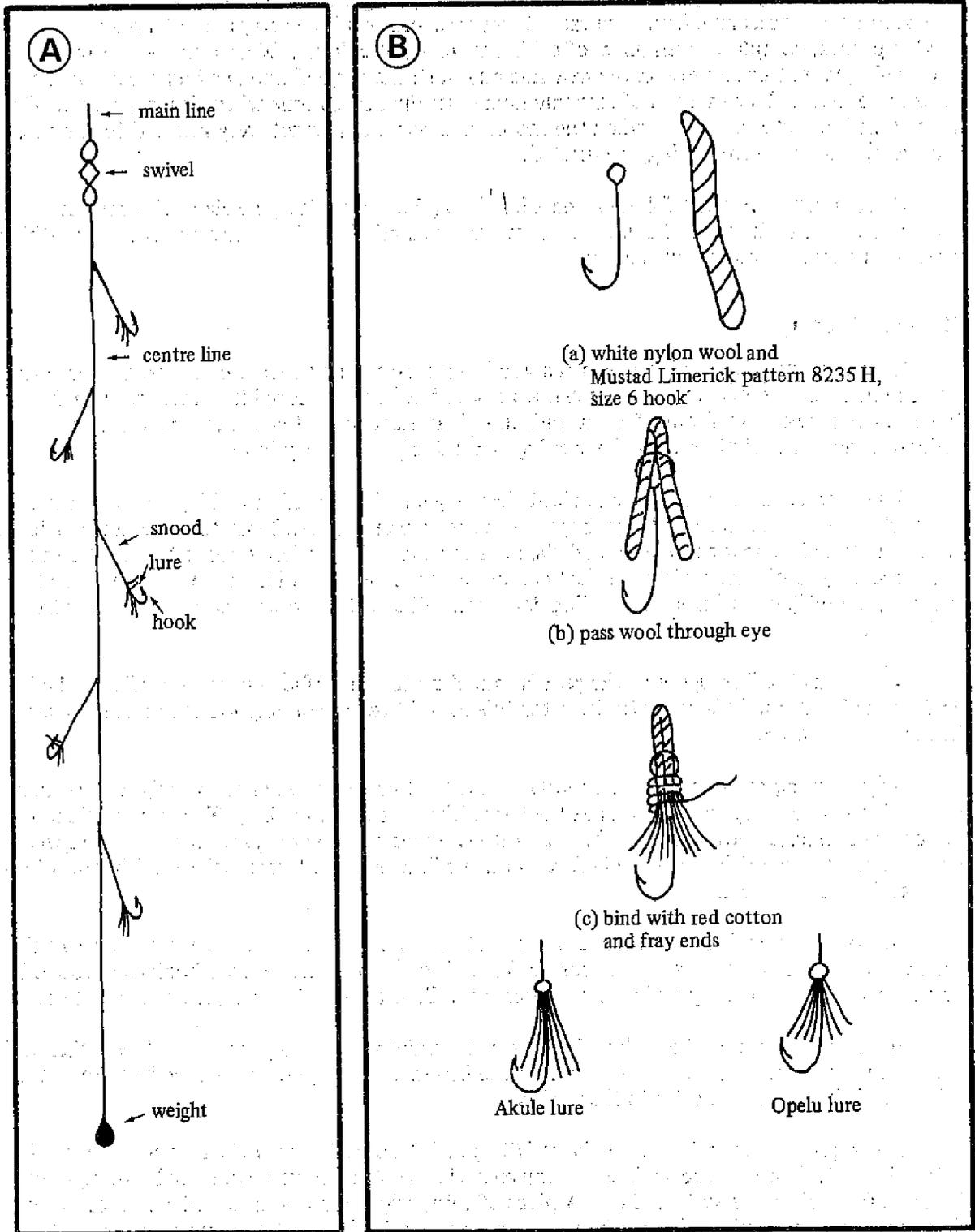


Figure 3: A: Layout of terminal rig. B: Method of making lures using wool.

When working at night in semi-darkness, it is easy to get line and snoods tangled. This can become a serious problem. The easiest way to avoid this is to carry about half-a-dozen made up lines, complete with lures of different sizes and colours. When a snarl-up occurs, it is then a simple matter to use a whole new line and push the tangled line in a box for attention later in daylight. This method of carrying numerous lines saves time when fish are biting. Time is the limiting factor on nights when the moon rises very early or sets very late and the hours of darkness, and therefore fishing, are limited.

It is a great help when fishing to rig a bamboo pole round the gunwale of the boat over which lines will be hauled. Bamboo stands up to repeated chafe from lines better than anything else. It is easy to replace and is cheap.

Method of fishing

Let us assume that we have chosen a good night with a light breeze offshore, the sea calm and the night of the new moon. The canoe or boat has been anchored in a likely place offshore beyond the breakers in about 15 to 20 fathoms. The electric light is turned on soon after twilight fades. The first hour of the evening is not likely to be very busy.

After about an hour it will be noticed that very small zooplankton will gather under the light. Soon we notice a few silvery shapes deep down where it is difficult to recognise individual fish. The time has now come to uncoil the lines for about five fathoms above the small swivel. It is necessary to choose a place on the boat so that the line is handled in the zone between the bright circle of light and the surrounding darkness. The best place will soon be found by trial and error.

As soon as the line tightens, the gear is hauled up to the surface until the small swivel clicks against the bamboo. It is easier to listen for this sound than to actually look for this small swivel in the semi-darkness.

When hauling the line, it is all important that the line be retrieved at a *steady, continuous speed*. This is not easy to do at first as the hands change over in hauling. The line should not be retrieved in jerks, but in a smooth, steady flow. It may take some practice to get the speed of retrieving to the critical rhythm before the fish will bite. Once this is achieved, fish attack these lures and are easily hooked.

The akule have a hard mouth and it takes a few seconds to unhook each fish. During this time other fish will often take the lower hooks. It is easy to get these small hooks embedded in one's fingers when working under these conditions. Practice is, of course, the only solution.

As the night goes on, the fish will increase in numbers and on a good night they gather under the light in hundreds. It will be noticed that the largest fish are generally on the bottom of the school and the smaller fish rise to the surface.

The larger fish generally weigh about 1/2 kg (1 lb), sometimes a little heavier. The smaller fish swim actively about the surface and can sometimes be caught more quickly by using a thin bamboo fish pole and a suitable lure. A piece of thin, bright akule skin cut with a razor blade from the bright side of the fresh fish makes a very attractive lure at times, but on other nights a variety of different lures will be found more effective. The larger fish seldom break surface and the fishermen will have to decide whether a lot of small fish is more valuable than a smaller number of large fish.

Bait and lures don't mix

Akule have been caught traditionally by using a variety of different baits. In every island group, successful fishermen can be found who will make good catches at night using ground fish as chum. Then by baiting their hooks with small pieces of cut bait, and under good conditions, some successful catches can be made.

Where fishermen are using this time-honoured method of fishing, it is most unlikely that anyone will be entirely successful by using the method described above.

It is difficult to decide why the two methods of fishing will not work side by side. It is probable that when fish are feeding hungrily on zooplankton, they are feeding visually. Their reactions are then quite different from the reactions of the same fish, which, while feeding on ground chum, are possibly feeding by sensing or smelling the ground bait in the water. Under such conditions they are not feeding visually and they fail to be attracted by the zooplankton until the bait and chum are removed.

The night can be going well for the fishermen using lures, with fish feeding in a frenzy, only to end suddenly when someone liberates some finely ground fish in the area. When this happens, it is necessary to up-anchor and move off to another area, thus wasting an hour or more before a new sequence of fishing can begin.

On good nights when conditions are favourable, fish will continue to bite well until nearly sunrise.

Moonlight nights are seldom successful, although catches can sometimes be made by lowering the gear down into much deeper water. Akule swim down to at least 70 fathoms, at times perhaps even deeper. But it is slow fishing when every fish has to be hauled all this distance and most fishermen will prefer to change over to other methods of fishing during the bright nights of the moon.