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Polychaetes of commercial interest from the Mediterranean East Coast of Algeria

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Abstract

Three species of polychaetous annelids are commercially collected, as baits, from natural populations along the coast of Algeria. They are collected by semi-professional bait harvesters supplying a variety of local outlets and are used as bait by local fishermen. Bait harvesters commonly use bleaching liquid (10% in sea water) or a KMnO₄ (0.5 to 1% in sea water) solution to force *Perinereis cultrifera* (Nereididae) individuals out of their algal mat. *Hediste diversicolor* (Nereididae) and *Scolecopsis squamata* (Spionidae) are dug from intertidal mudflats and sandy beaches. Commercial prices and ways of utilization are given for each species. The necessity for the legislative establishment of a regulatory management plan for worm angling is demonstrated.

Keywords: Annelids; Polychaetes; Commercial bait species; Recreational fishing.

Found in abundance in all marine ecosystems, worms are a source of food for a great diversity of animals, vertebrates and invertebrates, some of which are either fished or reared (SCAPS, 2003a). Marine worms of commercial interest belong to the phylum Annelida and the class Polychaeta. They are used as bait in recreational fishing and as a food source in aquaculture.

During preliminary investigations on the Mediterranean East Coast of Algeria (Fig. 1) we observed that polychaetous annelids are collected by bait harvesters and used as

bait by local fishermen. The main goal of this study was to describe the way polychaetes are exploited on the Mediterranean East Coast of Algeria including identification of the different species collected by bait harvesters, methods of collection, commercial value and utilization of each species.

In order to identify polychaete species of commercial value and the methods used for their collection, we interviewed bait harvesters and accompanied them in the field in the vicinity of the town of Annaba, located close to the Tunisian boarder (30 km) on the Algerian

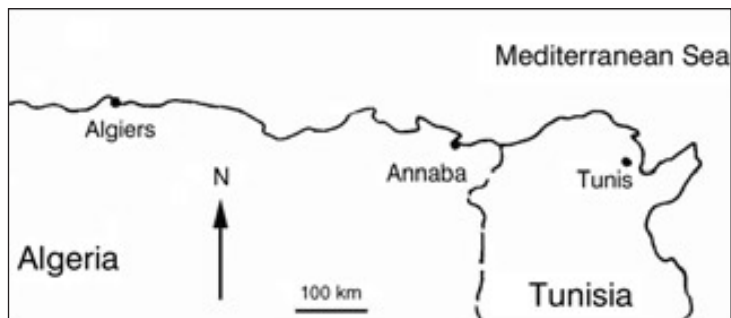


Fig. 1: Map of North Africa showing the location of Annaba on the Mediterranean East coast of Algeria near the Tunisian border.

Mediterranean coast. We also held discussions with baitworm dealers and local fishermen.

The maximum tidal range in this region is 0.9 m. Air temperature in the daytime changed from 14° C in December to 42° C in August and from 6° C in January to 28° C in August when measured at night. Sea-water temperature during the low tide period fluctuated from 11° C in January to 25° C July to September.

Three species of polychaetes are commercially collected from natural populations (Fig. 2). In the region of Annaba, *Perinereis cultrifera* (Grube, 1840) (Nereididae) is known commercially as ‘the worm with antennae and legs’ or ‘the green worm’ (Fig. 2A). *P. cultrifera* can reach 9 cm in length but is collected from about 6-7 cm. Worms are found within Rhodophyceae, in algal-covered hard bottoms (metamorphic rocks: gneiss and quartzite). The individuals occur low in the intertidal and extend down into the sublittoral.

Hediste diversicolor (O.F. Müller, 1778) (Nereididae) is locally called ‘mudworm’ (Fig. 2B). It is found near the mouth of estuaries. *H. diversicolor* can reach 8 cm in length but it is collected from about 3 cm. Baitworm diggers also collect *Scolecopsis squamata* (O.F. Müller, 1778) (Spionidae) which is locally called ‘sandworm’ (Fig. 2).

Bait harvesters commonly use bleaching

liquid (10% in sea-water) or a KMnO₄ solution (0.5 to 1% in sea-water) to force individuals of *P. cultrifera* out of their algal mat inducing a dramatic destruction of the algae and of the environment. The recovery of the algal cover starts about one month after the harvesting of worms. Baitworm harvesters may collect green worms for 6 to 8 hours a day.

The other two species, *H. diversicolor* and *S. squamata*, are burrowers; they live in the sediment in the top 10-20 cm. Using a shovel or more generally by hand, a bait digger turns over the mud or sand and removes the worms from the exposed sediment. The mudworms (*H. diversicolor*) are present in high densities, so their collection in great numbers is very easy and the time spent on collecting individuals is short (1 or 2 hours a day). On the contrary, a sandworm (*S. squamata*) digger may dig for 4 to 5 hours per day, but 3 hours is more the norm. Harvesters spend more time on the locating of sites with high worm densities than on the collection of worms. Sites are abandoned as soon as the density of worms decreases.

Sandworms and mudworms are collected in much greater quantities than green worms since their collection is much easier. Generally worms are collected at the end of the afternoon to be sold next morning, but sometimes they are sold within a maximum of the

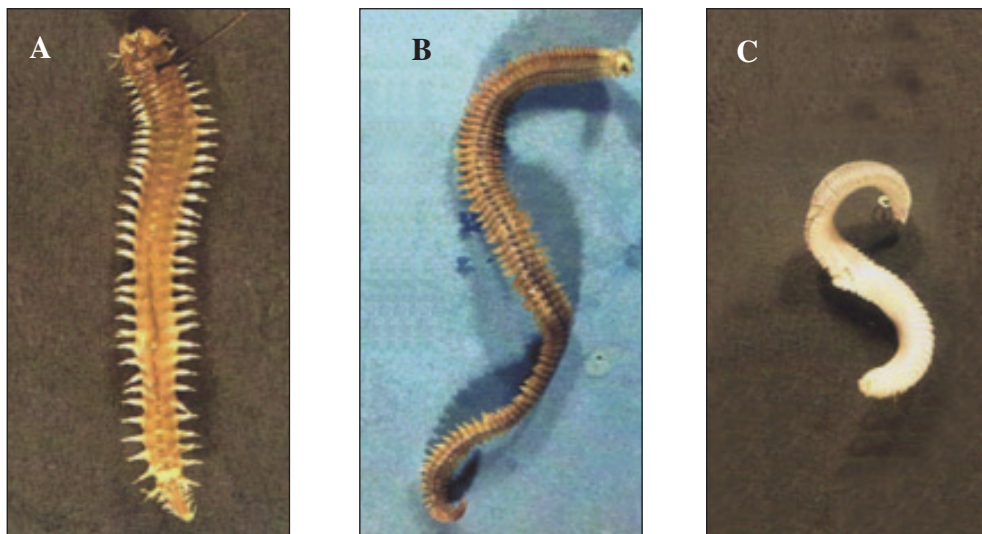


Fig. 2: The three different species of polychaetes harvested for commercial purposes on the East coast of Algeria. A. *Perinereis cultrifera* (Nereididae); B. *Hediste diversicolor* (Nereididae); C. *Scolelepis squamata* (Spionidae).

following three days. Worms are brought to the dealers, who pack sandworms and mudworms in sand or mud, in buckets. Green worms are packed in seaweed collected intertidally and placed in shallow, newspaper-lined cardboard cartons with lids. Worms are stored at ambient temperature, sheltered from the sun. Occasionally, green worms are stored in the fridge for three to five days. Dealers sell their worms in the market. The cost in 2007 fluctuated from about US \$ 0.5 in winter (the bad season for angling) to US \$ 1 in mid-summer (the best season for angling, corresponding to the maximal demand of worms), for a box of 100-150 worms (50 to 100 g); so there is an effective extra income for local people if they engage in worm collecting.

In winter the collection of the green worm is more difficult due to bad weather conditions and, therefore, the market is dominated by the other two species. Generally, the same price is asked for the three species but the green worm is the more valuable species and it is the species more used by local fish-

ermen because its iridescent colour makes it more attractive as bait. Sometimes, in mid summer, when the demand for bait is high, the commercial price of the green worm is higher than that of the other two species.

Buyers use worms for recreational fishing for red mullet (*Mullus surmuletus*), grey mullet (*Chelon labrosus*) (sandworm and mudworm), common sole (*Solea solea*), bass (*Dicentrarchus labrax*) (green worm) and various Sparidae (*Sparus aurata*, *Lithognathus mormyrus*, *Pagellus erythrinus*) (sandworm, mudworm and green worm). Catches are limited to fish weighing no more than 3-4 kg.

Polychaetes are gaining in importance commercially because they are used as bait for sport and professional fishing and as a food source in aquaculture (GAMBI *et al.*, 1994, OLIVE, 1994, SCAPS, 2003a and b). OLIVE (1994) reviewed the patterns of exploitation of polychaetes as sea angling bait. Moreover, GAMBI *et al.*, (1994) drew up a list of bait species harvested in Italy and the world. *P. cultrifera* and *H. diversicolor* are known to be

used as bait for sea angling in Italy (ANSALONI *et al.*, 1986) and in France (BELLAN, 1964). Our results indicate the utilisation for the first time of a spionid polychaete (*Scolelepis squamata*) as bait for sea angling.

ROUABAH & SCAPS (2003) studied the life cycle and population dynamics of *P. cultrifera* in the same area as that used by bait harvesters. They showed that *P. cultrifera* has a 3-year life span and reproduces exclusively by epitoky. The reproductive season is short, and spawning occurs in late April/early May when the sea-water surface temperature starts rising. The maximal demand for worms for angling is mid-summer. In this period worms have stopped reproducing so the threat to the species is less important than if the best season for angling was just before or during the reproductive period. No data concerning the life cycle and population dynamics are available for the other two species harvested in the region of Annaba.

GAMBI *et al.*, (1994) reviewed the effects of worm exploitation on the population, the associated communities and the environment. This review pointed out different results and patterns, and suggested the need for systematic studies to evaluate the environmental impact of long term exploitation of worm populations. The chemicals used in Algeria to force the worms out of their burrows cause a dramatic destruction of the algal cover. GAMBI *et al.*, (1994) also indicated the use of chemical (CuSO₄ solution) to force the worms out of their burrows on the coasts of Sicily, Italy. In Algeria worms are collected without legislation to regulate periods of collecting, or the individuals which can be removed, and with no regard to their life history and the potential destructive effects of collecting. In these conditions, dramatic destruction of the habitat is to be anticipated. Bait harvesters spend a longer time on locating the sites with high worm densi-

ties than on collecting worms, and sites are abandoned as soon as the density of worms decreases. In consequence, further biological and ecological studies are necessary to assess the ecological impact of worm harvesting and to achieve maximum return with minimum impact on their populations and habitat.

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