

**NEW ARCHAEOZOOLOGICAL EVIDENCE FOR THE CONSUMPTION
OF LOCALLY-PRODUCED FISH SAUCE IN THE NORTHERN PROVINCES
OF THE ROMAN EMPIRE**

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ABSTRACT: Fish sauce was an important trade product in antiquity and widely used for culinary and medicinal purposes. In this paper, new archaeozoological finds are described from a 3rd century AD context of a Roman site in Belgium. This material comprises fish bones, mainly of small clupeids, interpreted as the remains of a fish sauce made along the northern Atlantic coast. The finds are discussed within the general archaeological and historical context of production and commerce of fish sauces in antiquity, from both Mediterranean and Atlantic origin. The importance of local production and trade of fish sauce in the northern provinces of the Roman Empire during the 3rd century AD is illustrated.

KEYWORDS: FISH SAUCE, ALLEC, CLUPEIDAE, ROMAN

RESUMEN: Las salsas de pescado fueron un importante bien de intercambio en la antigüedad, tanto con fines culinarios como medicinales. El trabajo presenta nuevos hallazgos arqueozoológicos de un contexto romano del tercer siglo D.C. procedente de Bélgica. Este material se compone de restos de peces, principalmente pequeños clupeidos, que interpretamos como vestigios de una salsa de pescado confeccionada en algún lugar de la costa atlántica nororiental. Los hallazgos son valorados dentro de un contexto arqueo-histórico de producción y comercio de salsas de pescado, tanto atlánticas como mediterráneas, durante la Edad Antigua. En concreto, se ilustra la importancia de las producciones locales y del comercio en las provincias norteñas del Imperio Romano durante el mencionado siglo.

PALABRAS CLAVE: SALSAS DE PESCADO, ALLEC, CLUPEIDAE, ROMANO

INTRODUCTION

Fish remains from Roman inland sites in northwestern Europe indicate that there existed a heavy reliance on local freshwater fishes (Van Neer & Ervynck, 1993, 1994). Although certain marine products, such as oysters, were occasionally imported, sea fish did not seem to be traded inland. In Luxemburg, a 1st century BC context (final La Tène or Early Roman) of the oppidum of Titelberg yielded a vertebra of albacore (*Thunnus alalunga*) corresponding to a fish that must have been imported in dried or salted form (Desse-Berset, 1993a). As far as we know, this is the only early find of imported marine fish from the northwestern part of the continent that has been mentioned in the literature; the exact origin of the fish cannot be determined because the species occurs in both the Atlantic and the Mediterranean. We report here the discovery of an assemblage of marine fish from a 3rd century AD context, derived from the site of Braives in Belgium (Figure 1). The circumstances leading to this find will be mentioned briefly, followed by a description of the fish remains. The finds will then be compared with other archaeozoological material from the literature and categorized in a wider perspective, using archaeological and historical data.

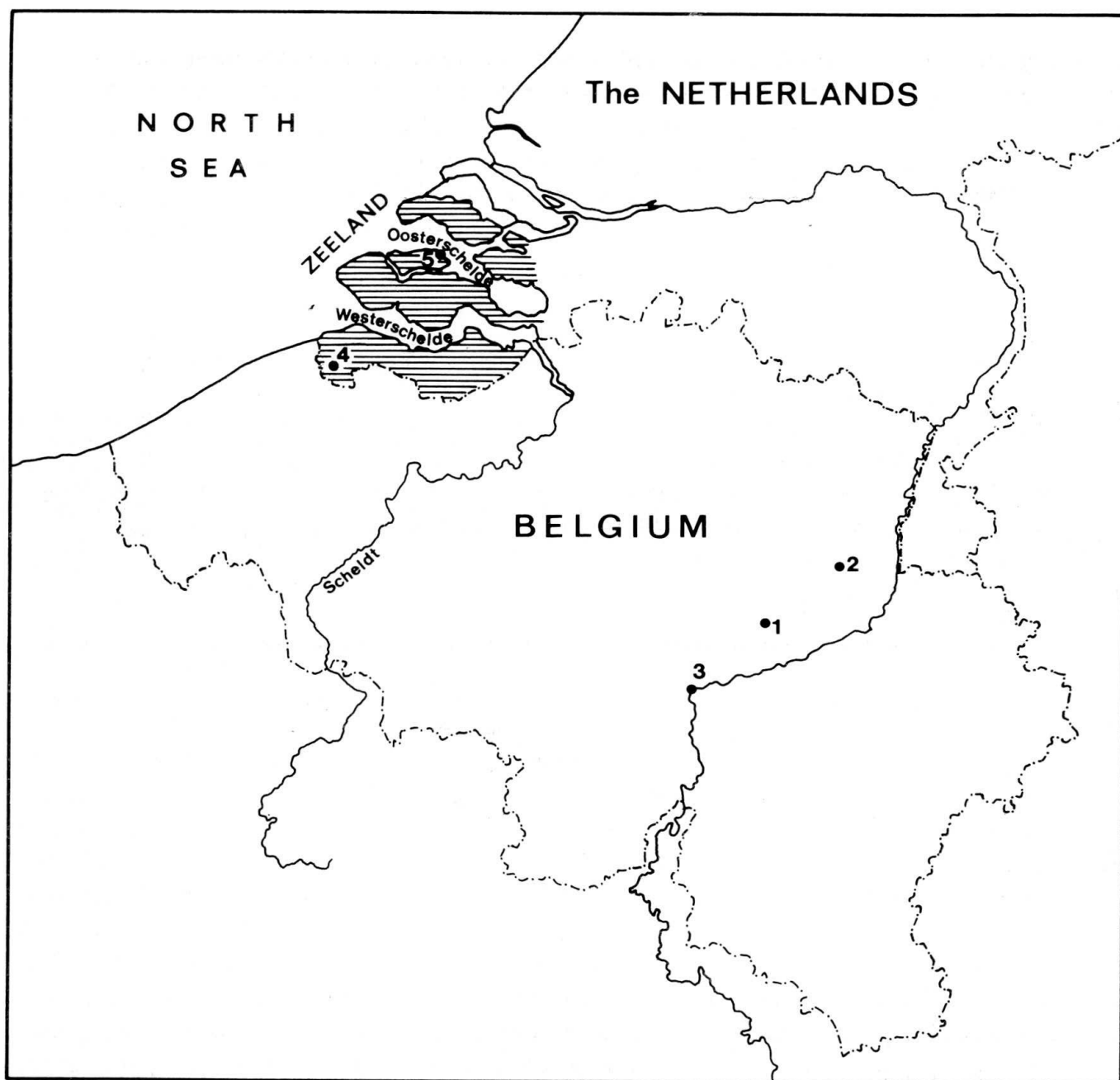


FIGURE 1. Present-day map of Belgium and the Netherlands with indication of late Roman sites mentioned in the text. 1, Braives; 2, Tongeren; 3, Namur; 4, Aardenburg; 5, Colijnsplaat.

MATERIAL

Excavations of a late Roman *vicus* at Braives (Brulet, 1981, 1983, 1985, 1990, in press) yielded numerous faunal remains which were initially only hand-collected (Cordy, 1981; Cordy & Stassart, 1983; Cordy & Rapaille, 1985; Trabert, 1990; Yernaux *et al.*, in press). In 1990 a well was emptied and samples from its filling were taken for sieving. The finds mainly constitute complete carcasses of domestic animals and some butchery and kitchen refuse. The basal layer of the filling, deposited during the period the well was in use, has been dated to the 3rd century AD on the basis of

the pottery remains. This layer contained well-preserved microfaunal remains. Small mammals and insects were abundant and allowed a reconstruction of the ancient environment (Lentacker *et al.*, in press). Moreover, this basal layer yielded minute remains of fish which are described below. This material was retrieved from the residue of a sample of approximately 20 litres, sieved through a 0.5 mm mesh. The residue in the sieve was extremely rich in botanical remains hence the process of the retrieval of the bone fragments was usually protracted. The fish fauna identified from this sample is indicated in Table 1.

sprat (<i>Clupea sprattus</i>)	2
Clupeidae indet.	56
smelt (<i>Osmerus eperlanus</i>)	1
whiting (<i>Merlangius merlangus</i>)	3
three-spined stickleback (<i>Gasterosteus aculeatus</i>)	1
sandeel (<i>Ammodytes</i> cf. <i>tobianus</i>)	1
unidentified species	19
unidentifiable	6

TABLE 1. List of species identified from the 3rd century AD filling of the well at Braives. Figures indicate numbers of identified specimens.

The majority of the fish remains are derived from clupeids and belonged to individuals of maximum size 4-5 cm standard length (SL). Only two bones of this family could be identified at species level because of the small size of the specimens and their fragmentary nature. A ceratohyal and a dentary belong to sprat whereas the remaining material (22 precaudals, 22 caudals, 1 caudal or precaudal vertebra, 4 dentaries, 1 quadrate, 1 operculum, 1 cleithrum, and 4 fragments of frontal) are classified as from 'clupeids'. The smelt is represented only by a complete cleithrum of an individual measuring about 5 cm SL. Three caudal vertebrae indicate the presence of whiting; similarly these are from small individuals not much larger than 5 cm SL. The three-spined stickleback is represented by a basiptyrgium of an individual measuring 3-4 cm SL. An operculum of a sandeel was compared to the three species living in the North Sea today and most closely matches that of *Ammodytes tobianus* (Brinkhuizen, pers. comm.). The body size of this specimen is estimated at about 10 cm SL. Besides the aforementioned remains there are 19 vertebrae, apparently belonging to a single species, which could not be identified despite their characteristic shape (Figure 2). The chorda is extremely well developed in these young specimens and, consequently, the vertebral centra consist almost exclusively of their walls. These walls are almost featureless externally and the centra appear as small barrels. Apophyses and the neural and haemal arches are tiny. The unknown species present in the remains is not represented in our reference collection which comprises about 125 species. A further extension of the comparative collections with economically less-favoured species or with juvenile specimens of commercial fish will be necessary in order to identify this species. Attempts to obtain an identification of this material by showing the vertebrae or pictures of them to colleagues familiar with both Mediterranean and Atlantic fauna were unsuccessful.

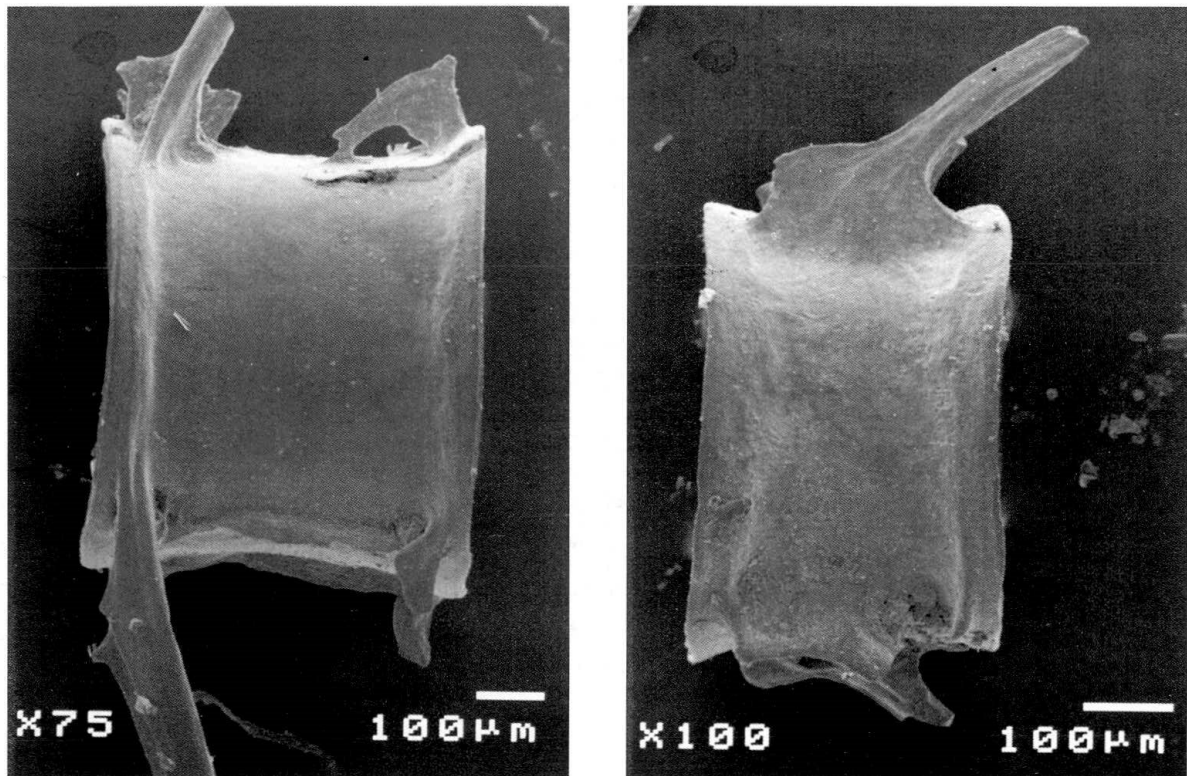


FIGURE 2. Lateral view of caudal vertebrae of the unidentified species at Braives.

DISCUSSION

1. Origin and nature of the finds

The ichthyofauna from the 3rd century AD deposit at Braives forms a typical assemblage of north-eastern Atlantic, inshore living species. Sprat and three-spined stickleback occur in both the Atlantic and the Mediterranean. The smelt is wholly absent from the Mediterranean Sea and the sandeel has, for that area, only been reported from the Balearic Islands. The presence of whiting is doubtful in the western Mediterranean Sea but the species occurs in the Aegean and Adriatic Seas (Whitehead *et al.*, 1984-1986). Sprats are gregarious marine fish which live inshore. In spring, juveniles of sprat and herring form mixed schools occurring near the coast (Poll, 1947). The smelt is a gregarious coastal species which can attain lengths of about 30 cm. Spawning takes place in March (Nijssen & de Groot, 1987). Juvenile whiting are extremely abundant during spring; at this time they are captured in large numbers in the nets of shrimp-fishers (Poll, 1947). The three-spined stickleback occurs in both freshwater and marine environments. We presume that the stickleback found in the remains at Braives had been captured in the sea because all the other fish present are marine. Sticklebacks, when living in the sea, are found near the shore and are often captured during shrimp fishing (Poll, 1947). The sandeel occurs inshore on sandy bottoms and it burrows into the substrate. It is clear from the foregoing discussion that the fish from Braives must have been captured inshore, using small-meshed fishing gear, during spring or early summer.

The marine fish from Braives are all very small and are predominantly clupeids. Such fish spoil very quickly and, therefore, it is very unlikely that they were transported to Braives in a fresh state. The small size of the fish indicates that we are probably dealing with the remains of a fish sauce. During Roman times, fish sauce made from species with a high fat content (such as clupeids) was highly appreciated (Curtis, 1991). The following discussion considers the finds from Braives within the general context of production and commerce of fish sauces in antiquity.

2. Mediterranean fish sauce

Fish sauces were originally a typically Mediterranean product used for culinary and medicinal purposes. The Greeks were manufacturing fish sauces by the time of the 5th century BC, or possibly even earlier. Research in Spain seems to indicate a Phoenico-Punic origin for the salting factories in the Western Mediterranean (Edmondson, 1987; Curtis, 1991: 46). In any case, the word *garum* is derived from the Greek word *garon*, which designated a fish (thus far unidentified) that was mainly used by the Greeks for the manufacture of fish sauce (Cuvier & Valenciennes, 1832). Fish sauces became even more popular in the Roman world and were produced on a large scale. Archaeological remains of large production centres for salted fish have been found in Spain, Portugal and northern Africa. These structures usually consist of a series of salting vats made of stone and covered on the inside with a layer of fine mortar. The vats were roofed, thereby preventing any alteration of the salt content of the liquid by excessive evaporation or rain but still allowing the air to circulate freely over the contents (Ponsich & Tarradell, 1965; Immerzeel, 1990). Large fish were beheaded and eviscerated and then salted in these vats to produce the so-called *salsamenta*. The heads, entrails, blood and gills of these fish were used for the production of fish sauce. Complete, small fish were used as well as the aforementioned butchery waste from large fish. Several layers of fish were alternated with layers of salt in the preparatory phase of sauce production. The aforementioned salting vats and smaller containers made of pottery could be used for this preparation. The mixture was left in the sun for up to several months and had to be stirred twice or three times a day from the seventh day onwards (Curtis, 1991). The final product is obtained through a process of autolysis, mediated by the enzymes in the digestive tracts of the fish (Martínez Maganto, 1992). The process can be accelerated by heating but then less end-product is obtained. Several types of fish sauce are distinguished in the literature (*garum*, *allec*, *muria*, and *liquamen*), although definitions may vary from one author to another. Spices, olive oil, wine, etc., could be added to the basic products and numerous additional names were applied, accordingly, to the different fish sauces (Grimal & Monod, 1952; Corcoran, 1963; Curtis, 1991; Martínez Maganto, 1992).

Fish sauce of Mediterranean origin was transported over large distances in the Roman Empire. It even reached northern Gaul, where the stationed soldiers initially received prescribed amounts of fish sauce, olive oil, and wine (Martin-Kilcher, 1990). This is evident from various sources of information, not least the numerous finds of amphorae in excavated military camps along the *limes* (Curtis, 1983). Moreover, the wealthy, local inhabitants of the region adopted the culinary habits of the Romans and this resulted in an increased demand for fish sauce. The transport and trade of this product can be studied by examination of the containers (dolias and amphorae) and the bones of the fish from which the sauce was made. When bones are found we are probably dealing with *allec* since this is the product obtained after the liquid part (*garum*) has been decanted. Bone remains of Mediterranean fish, found inside excavated amphorae, have been described from sites in Spain (von

den Driesch, 1980; Morales & Roselló, 1989), Greece (Williams, 1978), Italy (Curtis, 1991), Sicily (Wheeler & Locker, 1985), and Austria (Lepiksaar, 1986). Additional bone finds, possibly originating from Mediterranean fish but not sampled from amphorae, have been found at York in a Roman well at the site of The Bedern (Kenward *et al.*, 1986) and at the 'General Accident' site (O'Connor, 1988). A large number of species have been identified from these archaeozoological assemblages but sardines (*Sardina pilchardus*), anchovies (*Engraulis encrasicolus*), and sometimes mackerels (*Scomber scomber* and *Scomber japonicus*) and sparids predominate numerically. All these assemblages have been interpreted as the remains of fish sauce; however, there has been one reported case of *salsamenta*, made of *Scomber japonicus*, found in amphorae from a 1st century AD shipwreck off the coast of southern Corsica (Desse-Berset, 1993b). The remains of these almost complete mackerels were found in a type of amphora (Dressel VII) which is commonly considered as a container for *garum*. This example shows the importance of an interdisciplinary approach when studying ancient trade in fishing products. Thus far no bones have been found in Belgium that would indicate importation of Mediterranean fish sauce. However, fragments of amphorae that are believed to have contained fish sauce occur at various sites, including the Roman town of Tongeren and at Braives and they indicate importation from southern Spain and the region of Lyon. The material from Tongeren is dated to the 1st and 2nd centuries AD (Vanderhoeven, pers.comm.). The amphorae discovered thus far at Braives, dating to the 1st century AD and the beginning of the 2nd century AD, show that about three-quarters came from the Iberian peninsula and the remaining quarter came from the region of Lyon (Vilvorder, pers. comm.). The fish sauce from the Mediterranean region may have been transported along the Rhone and the Rhine and, possibly, also over sea.

3. Fish sauce from the northern Atlantic

From the 2nd century AD onwards the commerce of Mediterranean fish sauce was competed by local production along the Atlantic coast of Gaul (Martin-Kilcher, 1990). The number of amphorae of Mediterranean origin decreased in northern Gaul during the 2nd and 3rd centuries AD. It is probably significant that the activities of Spanish salting factories seem to have declined or even completely stopped from the 3rd century AD onwards (Curtis, 1984). Gallic fish sauce amphorae also gradually disappear but it is unlikely that this sauce was no longer consumed in northern Gaul. It is believed that salted products were also transported in wooden containers which makes it difficult to trace back this commerce archaeologically. It is not clear whether the locally-made fish sauce completely replaced the Mediterranean one in northern Gaul. The high quality Mediterranean product was, possibly, still imported in small quantities for the social elite, whereas other people relied on the north-western fish sauce. Archaeological evidence has been found in Brittany (Armorica) for installations related to fish sauce production (Sanquer & Galliou, 1972; Immerzeel, 1990; Martin-Kilcher, 1990). Heating was necessary because of the lower temperatures at these latitudes. Ovens have been discovered in Zeeland (The Netherlands) that are believed to have been used during the production process (Immerzeel, 1990). A dolium that, according to its inscriptions, contained 300 litres of *allec* has been discovered at Aardenburg (Figure 1). This find has been interpreted as an indication for local production since dolia of this size are considered too heavy for long-distance trade (Bogaers, 1971).

Fish bones illustrating this locally-made sauce have, thus far, only been reported twice in the literature. The Peninsular House site in London yielded a joist and plank floor, dated to the mid 3rd

century AD, which was overlain by a layer of silt containing small fish bones and sherds of a re-used southern Spanish amphora (Bateman & Locker, 1982). The majority of the fish bones (229) were from young herring and sprat no larger than 8 cm total length. A few remains of small individuals of bass (*Dicentrarchus labrax*), flounder (*Platichthys flesus*), and greater sandeel (*Hyperoplus lanceolatus*) have also been found. Similar deposits with thousands of small herring and sprat bones have been discovered at the 'General Accident' site at York (Jones, 1988). A few bones of whiting were also identified. Accurate dating of the material was impossible but a late Roman or early post-Roman date is probable.

The late Roman remains of fish sauce from Braives are comparable to the two previous assemblages with regard to the predominance of clupeids. Another feature common to these assemblages are the small numbers of young specimens of other species (sandeel and whiting). The sites at York and London were considered to be production centres for fish sauce, whereas Braives should be interpreted as a place where the product was consumed. Nevertheless, it is difficult to establish from where the fish sauce found at Braives was imported. The available fish species do not indicate a more detailed origin than 'the coastal area of the north-eastern Atlantic'. Thus far, no salting factories have been discovered along the Belgian coast; however, this does not necessarily exclude the likelihood of fish sauce production in that region because there is ample evidence for salterns (Thoen, 1987). Furthermore, the *vicus* of Braives was situated on the Boulogne-Bavay-Cologne road, hence importation of sauce from along the Channel coast or even from Brittany is also plausible. Similarly, importation of fish sauce from Britain cannot be completely ruled out. Salt was occasionally transported by ship from Britain to the Rhine area (van den Broeke, 1986). It is possible that other goods, such as fish sauce, were imported at the same time. Certain archaeological finds and historical data indicate that in late Roman times there was an intense commerce between Britain and regions as distant as the upper Rhine, eastern and northern France (Martin-Kilcher, 1990). Fish sauce was also an important part of this trade network, as indicated by votive altars discovered during dredging at the Colijnsplaat (Figure 1) in the bed of the eastern estuary of the River Scheldt (Oosterschelde). These votive altars were dedicated by merchants to the goddess Nehalennia, in order to ask for a safe journey during seafaring (Bogaers, 1971). A majority of the merchants cited on the altars were involved in the commerce of salt (*negotiator salarii*) and three were specifically merchants in fish sauce (*negotiatores allecari*). These altars prove the importance of trade in salted fish products between Britain and Gaul; however, they do not give details on the location of the centres of production and consumption.

CONCLUDING REMARKS

The isolated finds of small marine fish at the late Roman site of Braives can be reliably attributed to an imported fish sauce, produced somewhere along the north-eastern Atlantic coast. This is the first time that fish bones have unequivocally attested the consumption, in continental Europe, of locally produced fish sauce. Production may have taken place in Gaul but importation from Britain cannot be completely discounted. Recognising such fish sauces on the basis of bones, using the criteria of species composition, skeletal distribution, and size of the fish, is relatively easy at inland sites which are a large distance of the sea. Conversely, it would be more difficult to distinguish such an assemblage at a coastal site, especially if no circumstantial evidence was available. A similar

problem of interpretation was encountered during the analysis of freshwater fish from inland Roman sites. Numerous bones of mainly very small freshwater fish were obtained from two, well-sampled, late Roman sites in the town of Tongeren (Belgium); these bones can only be anthropic, judging from their context (Vanderhoeven *et al.*, in press). A late 2nd - early 3rd century context from Place Marché aux Légumes at Namur also yielded large numbers of small freshwater fish, mainly cyprinids (Van Neer & Lentacker, 1994). These freshwater fish, with the exception of the eel and the rare salmonids, do not have the high fat content which is said to be required for the production of good fish sauce. Consequently, in previous papers we hesitated attributing these remains to the production of *garum* and, instead, believed them to be leftovers of fish soup or small fried fish. Nevertheless, preparation of fish sauce from small freshwater fish has been described sporadically in the literature (Jardin, 1961, and references therein). Further research and suitable find contexts will be necessary to further elucidate this problem.

ACKNOWLEDGEMENTS

This text presents research results of the Belgian programme on Interuniversity Poles of Attraction initiated by the Belgian State, Prime Minister's Office, Science Policy Programming. We also thank Dick Brinkhuizen (Groningen) for help during the identification of some difficult specimens and Anton Eryvynck (IAP, Zellik) for critically reading the manuscript. Ian Harrison (American Museum of Natural History, New York) kindly agreed to correct the English spelling. Fabienne Vilvorder (Louvain-la-Neuve) and Alain Vanderhoeven (IAP) gave us dates of the amphorae found at Braives and Tongeren respectively.

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