

First record of *Alkmaria romijni* Horst, 1919 (Polychaeta: Ampharetidae) from the Mediterranean coast (Smir Lagoon, Morocco)

Première signalisation d'*Alkmaria romijni* Horst, 1919 (Polychaeta :
Ampharetidae) en Méditerranée (lagune de Smir, Maroc)

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Résumé

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Maroc)]. *Mar. Life*, 16 (1-2) : 15-19.

La collecte du polychète *Alkmaria romijni* Horst, 1919 dans la lagune de Smir sur les côtes nord-ouest du Maroc représente la première signalisation de l'espèce en Méditerranée. L'espèce a été trouvée dans différents types de sédiments et de substrats : vases fines, vases sableuses, sables fins envasés et tapis d'algues, et de phanérogames. Cette nouvelle signalisation dans cette lagune élargit la répartition géographique de l'espèce aussi bien au Maroc qu'en Méditerranée. Elle contribue à approfondir les connaissances sur la biogéographie de cette espèce rare, trouvée jusqu'à maintenant seulement sur les côtes atlantiques localisées entre la mer Baltique au nord et le Maroc au sud. Quelques données sur la distribution et l'autoécologie de l'espèce sont discutées.

MOTS CLÉS :

Alkmaria romijni, polychètes, répartition géographique, Méditerranée.

Abstract

Abdellatif C., A. Bayed – First record of *Alkmaria romijni* Horst, 1919 (Polychaeta: Ampharetidae) from the Mediterranean coast (Smir Lagoon, Morocco). *Mar. Life*, 16 (1-2) : 15-19.

The collection of the polychaete *Alkmaria romijni* Horst, 1919 in the Mediterranean coastal Lagoon of Smir in the Northwest of Morocco represents the first record of this species for the Mediterranean Sea. The species was found in different habitats: mud, sandy mud, fine sand sediments and algal and seagrass meadows. This new record from this lagoon extends the known geographical distribution range of the species both in Morocco and in the Mediterranean. It contributes to knowledge of the biogeography of this rare species found, to date, only on Atlantic coasts between the Baltic Sea in the North and Morocco in the South. Some data on the distribution and auto-ecology of the species are provided.

KEY-WORDS:

Alkmaria romijni, polychaetes, geographical distribution, Mediterranean Sea.

The tentacled lagoon worm *Alkmaria romijni* Horst, 1919 is a Polychaeta species that currently belongs to the family Ampharetidae Malmgren, 1867, subfamily Ampharetinae Chamberlin, 1919 (Day, 1964; Hartmann-Schröder, 1971; Holthe, 1986) (for a photo of the species, see the website http://www.frammandearter.se/0/2english/pdf/Alkmaria_rominji.pdf). It was previously classified in the group of the Ampharetidae *incertae sedis* between Ampharetidae and Terebellidae (Fauvel, 1927). It was first described and named by Horst (1919) from three specimens collected in the Alkmardeer Sea (Netherlands). This description was brief and resulted in several systematic confusions (Amoureux, Elkaïm, 1972; Junoy, 1987). The first report of the species from Morocco was came from three Atlantic estuaries (Amoureux, Elkaïm, 1972). These authors provided a fairly complete diagnosis with some ecological and reproduction data and analysed the previous synonymies with other species such as *Microsammytha ryckiana* Augener, 1928 (Day, 1964; Hartmann-Schröder, 1971). Subsequently, Cazaux (1982) studied its larval development in the Arcachon lagoon (France). Later, the species was again described from the Spanish Atlantic estuaries and more data on its morphology and ecology were provided (Junoy, 1987).

In Smir lagoon, samples of the species were collected during a survey on macrobenthic fauna, carried out between May 1999 and November 2000 using 12 stations with different habitat types (Chaouti, Bayed, 2005). Samples were taken by a corer to a depth of 30 cm and they were sieved immediately through a 1 mm mesh size sieve.

The coastal lagoon of Smir (35°43' N and 5°20' W) is located on the Mediterranean northwest coast of Morocco 25 km from the southern shore of the Strait of Gibraltar. It has an area of about 3 km² and its maximum depth is almost 1.5 m. The bottom is dominated by muddy substrate and few sandy zones extend as intertidal sandbanks in the vicinity of the lagoon entrance. The substrate is extensively covered by algae (*Enteromorpha linza*, *Gracillaria verrucosa*, *Ulva lactuca*, *Ulva rigida*...) and seagrass (*Zostera noltii* and *Ruppia cirrhosa*) meadows. The lagoon is linked to the sea by a narrow inlet and regularly undergoes the tidal range with a mean amplitude of 1 m. Salinity ranges between 16 and 40 PSU and water temperature varies from 12°C (Winter) to 32°C (Summer).

The collected specimens of *A. romijni* had a length varying from 2 to 6 mm (see the following websites for further information: <http://www.marlin.ac.uk/species/Alkmariaromijni.htm> and <http://www.marbef.org/data/aphia.php?p=taxdetails&id=129769#>). The species is a



Figure 1

Geographical distribution of *Alkmaria romijni*.
White circles (○) indicate sites where the species was found.

Distribution géographique d'Alkmaria romijni.

Les cercles blancs (○) indiquent les sites où l'espèce a été trouvée.

tube builder and occurs in small thick tube of mucus covered by particles and various remnants and dug into the sediment. These tubes extend above the sediment surface, where the worm feeds on settling organic matter using its tentacles. Most of the characters commonly used for identification of the species such as prostomium (with two black eyes, three pairs of gills, two parallel hulls and eight fine tentacles), thoracic region with 16 segments (presence of thoracic setigers and uncini, thirteen thoracic uncinigers, three pairs of branchiae at least and cylindrical dorsal ramus, first several neuropodia without acicular setae, all neurosetae uncini) and abdominal region (13-19 of abdominal chaeta-bearing segments, absence of anal cirri) were observed using the detailed description given by Fauvel (1927); Amoureux, Elkaïm (1972); Junoy (1987) and Hartmann-Schröder (1996).

This boreo-lusitanian species (Junoy, 1987) was known in the Baltic Sea (Holthe, 1986), throughout the British islands (Gilliland, Sanderson, 2000), in the North Sea (Horst, 1919; Fauvel, 1927), in French Atlantic waters, the Marennes-Oléron Bay (Montaudouin, Sauriau, 2000) and the Arcachon basin (Cazaux, 1982), on the North western Iberian coasts (Junoy, 1987; Junoy, Viéitez, 1990; 1992; Castellanos *et al.*, 2003) and in intertidal areas of southern and western coastal ecosystems of Portugal: the Tagus estuary (Rodrigues *et al.*, 2006) and the Óbidos Lagoon (Carvalho *et al.*, 2005) respectively (**Figure 1**).

Table I

Habitat preferences and some ecological characteristics of *Alkmaria romijni*.
 Habitats et caractéristiques écologiques d'*Alkmaria romijni*.

Site	Ecosystem type	Habitat	Organic matter (%)	Salinity (PSU)	Temperature (°C)	Associated polychaetes	References
Bou Regreg (Morocco)	Estuary	Fine sand, Coarse sand	Not recorded	1.5 – 34.9	29 – 30 at surface 26 – 27 at 5 cm depth	<i>Nephtys hombergii</i> <i>Glycera convoluta</i> <i>Hediste diversicolor</i> <i>Streblospio shrubsolii</i> <i>Mercierella enigmatica</i> <i>Scolecopsis squamata</i>	Amoureux , Elkaim (1972)
Bou Regreg (Morocco)	Estuary	Intertidal area Sandy mud, silty mud, fine muddy sand Md: <63 µm Silty particles: 02 – 87.4 %	2.1 – 11.4	17.3 – 36.8	16.7 – 17.9	<i>Nephtys hombergii</i> <i>Diopatra neopolitana</i> <i>Hediste diversicolor</i> <i>Streblospio dekhuyzeni</i> <i>Capitella capitata</i>	Cherkaoui et al. (2003)
		Subtidal area Sandy mud, Heterogeneous sandy, Md: 110 – 180 µm Silty particles: 3.0 – 63.1%	2.2 – 11.2	21.2 – 37.3	17.3 – 18.3		
Merja Zerga (Morocco)	Lagoon	Sand Muddy sand Sandy mud	6 – 12.7	5 – 31	10.5 – 30.8 at surface 9.4 – 23.6 at 5 cm depth	<i>Hediste diversicolor</i> <i>Heteromastus filiformis</i> <i>Scoloplos armiger</i> <i>Nephtys hombergii</i> <i>Glycera tridactyla</i> <i>Nephtys cirrosa</i> <i>Capitella capitata</i>	Bazairi et al. (2003)
Smir (Morocco)	Lagoon	Fine silty, sandy mud, fine sand Md: <63 – 236 µm Silty particles: 18.8 – 84.3% <i>Zostera noltii</i> and <i>Enteromorpha linza</i> beds	3.3 – 14.8	23.7 – 38.3	17.2 – 30.8	<i>Hediste diversicolor</i> <i>Streblospio shrubsolii</i>	Chaouti, Bayed (2005)
Tagus (Portugal)	Estuary	Intertidal area Sand 74.6% Fines content 25%	2.4	Not recorded	Not recorded	<i>Streblospio shrubsolii</i>	Rodrigues et al. (2006)
Óbidos (Portugal)	Lagoon	Intertidal area Sand: 9 – 94% Fines content: 4 – 81%	0.72 – 6.14	Not recorded	Not recorded	<i>Heteromastus filiformis</i>	Carvalho et al. (2005)
Iberian coasts (Spain)	Estuary	Mud, fine mud Md: 57 – 206 µm Trask index: 1.16 – 1.27	0.7 – 5	24 – 33	7.4 – 19	<i>Pygospio elegans</i> <i>Streblospio benedicti</i> <i>Capitella capitata</i> <i>Heteromastus filiformis</i>	Junoy (1987)
Ria de Foz (Spain)	Estuary	Muddy silt clay >5%	Moderate to high	≥ 31.5	Not recorded	<i>Pygospio elegans</i> <i>Streblospio benedicti</i> <i>Capitella capitata</i> <i>Heteromastus filiformis</i>	Junoy, Viéitez (1990)
Arcachon bay (France)	Lagoon	Mud	Moderate	5 – 35	Not recorded	<i>Pygospio elegans</i> <i>Capitella capitata</i>	Cazaux (1982)
British coastal waters (27 sites)	Estuary and Lagoon	Silty mud, clay , sand Mud, sand flat, mud-fine mud, mud with gravel, gravel with muddy sand, muddy sand, slate gravel on sand with mud	Not recorded	5 – 48	Not recorded	<i>Pygospio elegans</i> <i>Hediste diversicolor</i>	Gilliland, Sanderson (2000)
North of Europe	Coastal ecosystem	Not available	Not available	0.9 – 5 <5 1.8 – 20/30 3.6 – 5.6	Not available	Not available	Amoureux, Elkaim (1972)

Furthermore, *A. romijni* was recorded from Morocco in the Atlantic Estuaries of Sebou, Oum R'bia (Amoureux, Elkaïm, 1972), Bou Regreg (Amoureux, Elkaïm, 1972; Cherkaoui *et al.*, 2003) and from the Atlantic Lagoon of Merja Zerga close to the Gibraltar Strait (Bazaïri *et al.*, 2003) (**Figure 1**).

In Smir Lagoon, *A. romijni* primarily occurred in intertidal areas (**Table I**) where pH varied from 8.1 to 8.8, sediment organic matter content from 3.3% to 14.8%, silty particle rate from 19% to 85% with rather low hydrodynamics. The species was recorded from a wide range of sediment categories from silty mud to sand, but its preferred sediment was thought to be sandy mud with the organic matter content not exceeding 14%. The species abundances ranged from 1 to 464 ind./m recorded on unvegetated sediments and from 1 to 219 individuals on algae and seagrass habitats.

Considering all of the samples collected during this study, it was clear that this species preferentially lives in the intertidal areas without high hydrodynamics (strong tidal currents and high sediment mobility) covered - or not - by vegetation and with a wide range of salinity, temperature, silt and sand content and organic matter (**Table I**). According to Giangrande *et al.* (2000), the species is devoid of the teeth suited for herbivory, but has 8 retractile buccal (mouth) tentacles able to stretch ahead to collect the food particles. The species is considered as surface deposit-feeder and detritivore depending on its occurrence at shallowest depth or on vegetal surface respectively.

A. romijni is a familiar species in Poecilohaline ecosystems (wide range of salinity) and is considered as a typical lagoon species (Barnes, 1994), as a brackish water species (Amoureux, Elkaïm, 1972) and as mesopolyhaline lagoonal mud species (Cazaux, 1982). It is clearly tolerant of a wide range of salinity, possibly from less than 5 to 48 PSU (Gilliland, Sanderson, 2000), but certainly within the range 5-35 PSU because more recordings, including those with greatest abundance, have been found within the latter.

The importance of the discovery of *A. romijni* in the Mediterranean resides in the fact that the species was known previously only on Atlantic coasts. The present record from the Smir Lagoon significantly extends the distributional range of the species both along the Moroccan coasts and in the Mediterranean.

Bibliography

- Amoureux L., B. Elkaïm**, 1972 - *Alkmaria romijni* Horst, 1919, un Ampharetidae (Annelida, Polychaeta) nouveau pour les côtes marocaines. *Bull. Soc. Sci. nat. phys. Maroc*, **25** : 73-83.
- Barnes R.S.K.**, 1994 - A critical appraisal of the application of Guélorget and Perthuisot's concepts of the paralic ecosystem and confinement to macrotidal Europe. *Estuar. Coast. Shelf Sci.*, **38** : 41-48.
- Bazaïri H., A. Bayed, M. Glémarec, C. Hily**, 2003 - Spatial organisation of macrozoobenthic communities in response to environmental factors in a coastal lagoon of the NW African coast (Merja Zerga, Morocco). *Oceanologica Acta*, **26** : 457-471.
- Carvalho S., A. Moura, M.B. Gaspar, P. Pereira, L.C. da Fonseca, M. Falcão, T. Drago, F. Leitão, J. Regala**, 2005 - Spatial and inter-annual variability of the macrobenthic communities within a coastal lagoon (Óbidos lagoon) and its relationship with environmental parameters. *Acta Oecol.*, **27** : 143-159.
- Castellanos C., S. Hernández-Vega, J. Junoy**, 2003 - Cambios bentónicos en la ría de Foz (Lugo) (noroeste de España) tras la construcción de un espigón. *Boln Inst. esp. Oceanogr.*, **19** (1-4): 205-217.
- Cazaux C.**, 1982 - Développement larvaire de l'Ampharetidae lagunaire *Alkmaria romijni* Horst, 1919. *Cah. Biol. mar.*, **23** (2) : 143-157.
- Chaouti A., A. Bayed**, 2005 - Diversité taxonomique et structure de la macrofaune benthique des substrats meubles de la lagune méditerranéenne de Smir (Maroc). In: *Ecosystèmes côtiers sensibles de la Méditerranée : cas du littoral de Smir*, A. Bayed, F. Scapini (eds). *Travaux de l'Institut Scientifique*, Rabat, série générale, 4, pp : 31-40.
- Cherkaoui E., A. Bayed, C. Hily**, 2003 - Organisation spatiale des peuplements subtidiaux d'un estuaire de la côte atlantique marocaine : l'estuaire de Bou Regreg. *Cah. Biol. mar.*, **44** : 339-352.
- Day J.H.**, 1964 - A review of the family of Ampharetidae (Polychaeta). *Ann. S. Afr. Mus.*, **48** (4) : 97-120.
- Fauvel P.**, 1927 - *Faune de France, Polychètes sédentaires* (16). Office Central de faunistique, 494 pp.

Giangrande A., M. Licciano, P. Pagliara, 2000 - The diversity of diets in Syllidae (Annelida: Polychaeta). *Cah. Biol. mar.*, **41** (1) : 55-65.

Gilliland P.M., W.G. Sanderson, 2000 - Re-evaluation of marine benthic species of nature conservation importance: a new perspective on certain 'lagoonal specialist' with particular emphasis on *Alkmaria romijni* Horst (Polychaeta: Ampharetidae). *Aquat. Conserv. Mar. Freshwat. Ecosyst.*, **10** : 1-12.

Hartmann-Schröder G., 1971 - *Annelida, Borstenwürmer Polychaeta*. Die Tierwelt Deutschlands und der angrenzenden Meeresteile, **58**, 594 pp.

Hartmann-Schröder G., 1996 - *Annelida, Borstenwürmer Polychaeta*. Die Tierwelt Deutschlands und der angrenzenden Meeresteile, **58**, Neuarbeitete Auflage, Gustav Fischer Verlag, Jena, 648 pp.

Holthe T., 1986 - *Polychaete - Terebellomorpha, Marine Invertebrates of Scandinavia*. N° 7, Norwegian University Press, Oslo, 191 pp.

Horst R., 1919 - Twee sedentarie Polychaeten uit het brakke water van Netherland. *Zoologische Meded., Leiden*, **5** : 110-111.

Junoy J., 1987 - Primera cita de *Alkmaria romijni* Horst, 1919 (Polychaeta, Ampharetidae) en las costas ibéricas. *Misc. Zool.*, **11** : 87-91.

Junoy J., J.M. Viéitez, 1990 - Macrozoobenthic community structure in the Ría de Foz, an intertidal estuary (Galicia, Northwest Spain). *Mar. Biol.*, **107** : 329-339.

Junoy J., J.M. Viéitez, 1992 - Macrofaunal abundance analyses in the Ría de Foz (Lugo, Northwest Spain). *Cah. Biol. mar.*, **33** (3) : 331-345.

Montaudouin X., P.G. Sauriau, 2000 - Contribution to a synopsis of marine species richness in the Pertuis Charentais Sea with new insights in soft-bottom macrofauna of the Marennes-Oléron Bay. *Cah. Biol. mar.*, **41** (2) : 181-222.

Rodrigues A.M., S. Meireles, T. Pereira, A. Gama, V. Quintino, 2006 - Spatial patterns of benthic macroinvertebrates in intertidal areas of a Southern European estuary: the Tagus, Portugal. *Hydrobiologia*, **555** : 99-113.