Short Note

Galemys, 31: 83-88, 2019
ISSN 1137-8700
e-ISSN 2254-8408
DOI: 10.7325/Galemys.2019.N3

First record of Clymene dolphin (*Stenella clymene* Gray, 1846) in European waters

Primera cita de delfín de Clímene (*Stenella clymene* Gray, 1846) en aguas europeas

José Antonio Pis-Millán[1]*, Eufrasia Roselló[2], Arturo Morales-Muñiz[2] & Carlos Nores[3]

1. Dirección General de Pesca Marítima, Consejería de Desarrollo Rural y Recursos Naturales, Gobierno del Principado de Asturias, Escuela de Formación Profesional Náutico-Pesquera, 2ª planta, Avenida Príncipe de Asturias s/n, 33212 Gijón, Spain. joseantonio.pismillan@asturias.org
2. Laboratorio de Arqueozoología, Universidad Autónoma de Madrid, 28049 Madrid, Spain. eufrasia.rosello@uam.es, arturo.morales@uam.es
3. INDUROT, Universidad de Oviedo, Campus de Mieres, Edificio de Investigación, 7ª planta, 33600 Mieres, Spain. cnores@uniovi.es

* Corresponding author: joseantonio.pismillan@asturias.org

On May 17th, 2016 the carcasses of two stranded dolphins in a good condition were found on the beach of Rodiles near the town of Villaviciosa (Asturias, Spain: 43º 32' N; 5º 22' W). The animals did not exhibit any injuries or marks of having been entangled in fishing tackle, nor signs associated with a violent death, as is so often in other cases of cetaceans stranded in the Cantabrian seashore. It should be remarked that one month before the beaching (i.e. April 17th, 2016), around 8 pm and a few meters away from the beach-line, a pod of no less than three dolphins (some reporters believe up to eight animals) was filmed that were spinning and synchronically jumping out of the water. This behaviour was considered unusual for the species of dolphins known to inhabit these waters but matches the repertoire of spinner dolphins, including Clymene dolphin (Perrin *et al*. 1981).

On the day they were found, both specimens were collected by personnel of the *Dirección General de Pesca Marítima* and the *Guardería de Medio Natural* of the *Consejería de Desarrollo Rural y Recursos Naturales* from the *Principado de Asturias* and frozen at the *Centro de Experimentación Pesquera*. A preliminary inspection based on external features identified them as *Stenella clymene* Gray, 1846.

Diagnostic features

The two specimens were females, one adult [Total length (TL): 178 cm] and one juvenile (TL: 122 cm). Both animals had three coloured bands, an uppermost band of dark grey with its maximum breadth below the pectoral fin; a middle band of light grey, and a lower white/whitish band extending to the anal opening and reaching to the caudal fin as a fine line (Fig. 1). On the anterior half of the uppermost band of the adult, two paler, parallel lines were seen on the melon that reached to the margin of the spiracle. The posterior half of this upper band featured several diffuse, parallel lines directed upwards and backwards, that converged on the upper border, creating a chevron-like pattern.

A grey band connected the eye to the pectoral fin above which it expanded. The eyes were rimmed by a dark grey band with a very narrow line emerging from the anterior margin that reached over the commissure of the mouth and onto the melon. On the upper side of the beak, over light grey background, a whitish band was present on each side and above it, dark zigzagging lines (i.e. "moustaches") appeared (Fig. 2). The lips and tip of the beak were dark grey. The length of the beak in the adult female was 11 cm and the number of upper and lower teeth ranged from 35 (right side) to 36 (left side). Except for the lower number of emerged teeth, all features correspond with those provided by Perrin *et al*. (1981) for the species.

With slight differences, the young individual was similar to the adult. The whitish zones were darker into more grey tones and the transition zones among bands more diffuse. The intermediate whitish band on the caudal half of the flank was wider and connected to the whitish belly. The back

behind the dorsal fin lacked the chevron-like lines of the adult whereas the dorsal fin was more uniformly coloured, missing traces of lines. The mandibular toothrow featured two more teeth than the number recorded on the adult.

Two apparently contradictory features complicate the evaluation of the physical condition. On the one hand, the weights of both animals (58.0 and 22.5 kg) exceeded the mean values estimated for those same lengths in the length-weight curve provided by Jefferson *et al.* (1995) for the Gulf of Mexico (i.e. 53.4 and 19.0 kg). Such parameter contrasts with the vertebrae of the two caudal peduncles and some ribs of the adult being insinuated through the skin, normally taken as a sign of malnutrition. The most plausible way to reconcile such contradictory

Figure 1. Carcasses of two female Clymene dolphins stranded in beach of Rodiles in may 17, 2016: **a)** adult, **b)** young.

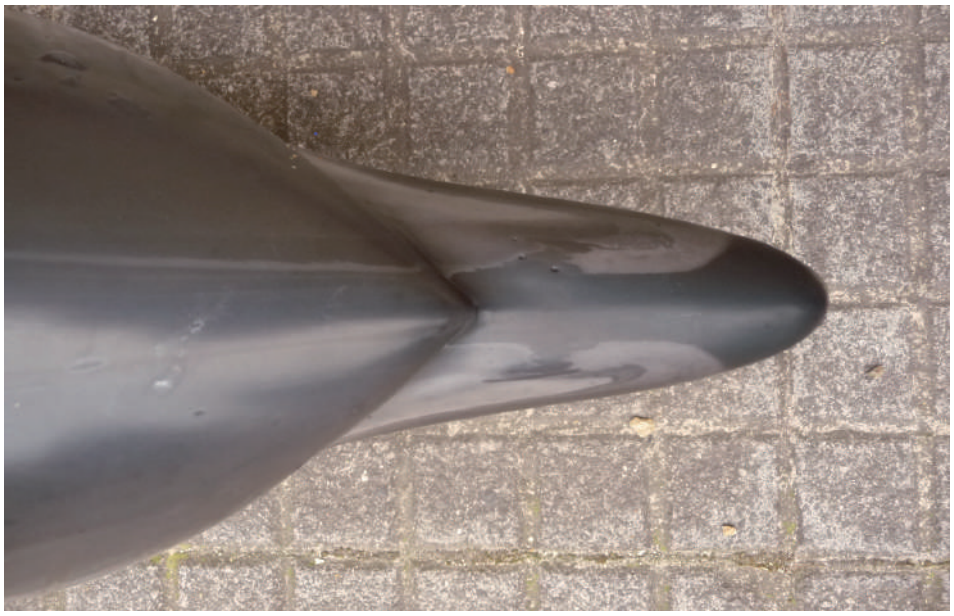

Figure 2. Design of "moustache" on the dorsal surface of the beak of the adult female.

observations may have to do with the condition of the subcutaneous fat. Indeed, soon after death, fat liquefies and in doing so, the stiffness of the tissue fades away. As a result, the skin collapses over the underlying bones, a process being more evident in areas where either the bone lies closer to the surface, the fatty pad is less developed or both conditions concur, as would be the case of the aforementioned bones. This process would be far more evident in stranded corpses, where gravitation exerts its full force on the body, than in submerged carcasses.

The absence of external decomposition signs on these carcasses, including their immaculate skins, allow one to postulate that the animals had been dead for less than five days, probably only one, when found, yet that concedes ample time for fat to start liquefying (Peltier *et al*. 2012). This lack of external decomposition also suggests that both dolphins were very close to the shore when they died, or else that both stranded alive just few hours before. No internal injuries nor abnormal parasitosis signs were recorded during necropsy although abundant foam spilled out of the spiracle when they were found.

The two skeletons were prepared and are housed at the *Centro de Experimentación Pesquera*, in the *Dirección General de Pesca Marítima,* of the *Consejería de Desarrollo Rural y Recursos Naturales* from the *Principado de Asturias* of reference CEP 2016-05-17-001 and CEP 2016-05-17-002.

Stomach contents

No remains undergoing digestion appeared in the stomachs of the dolphins, reinforcing the idea of a poor physical condition. The stomach of the adult featured the upper beak of a decapodiform cephalopod with an upper rostral length (URL) of 4.7 mm, along with ten otoliths. Except for one fractured specimen that could not be identified to species level, all otoliths represent hake (*Merluccius merluccius* L., 1758). Due to intensive surface erosion, one otolith could not be measured, but the sagittal lengths of the remaining eight revealed two slightly different size groups (values represent underestimations due to slight surface erosion):

Five specimens with sagittal lengths ranging between 6.32-6.75 mm represent hakes with standard lengths (SL) around 10 cm (TL: ca. 13 cm).

Three specimens, of which two had sagittal lengths between 4.6-4.77 mm represent 8 cm SL hakes (TL: ca. 10 cm), the third one being non-measurable due to the broken tip of the Sagitta.

Given that Iberian hakes do not attain 20 cm TL until their second year, these specimens represent fishes 6-8 months old (i.e. born at the end of 2015).

Distribution range

Despite its etymology (Greek for "fame"), *S. clymene* is a not well known species and has never before been reported in European waters. An exclusively Atlantic taxon, the species behaves as a warm water denizen on the eastern half of that ocean. In American waters, it features a wider distribution along with a higher number of records, with 61 reported strandings ranging between 39º N and 30º S. In the eastern Atlantic, the eight reported strandings range from 19º N (Fertl *et al*. 2003) to 6º S (Weir 2006). One would expect a bias against records from the African side of the Atlantic because of difficulties for accessing those shores during these past decades due to ongoing conflicts in the region. Our record expands the latitudinal range of *S. clymene* to 43º N (i.e. by more than 24º). It seems remarkable that in the intermediate zones of this latitudinal range, where there is intensive whale watching activity, such as in the Canary Islands and the Strait of Gibraltar, this species has been never reported. This is all the more remarkable given the efficient stranding networks set along the Atlantic facade of the Iberian Peninsula.

A similar case was reported three decades ago for a pod of tropical pilot whales (*Globicephala macrorhynchus,* Gray 1846). From September 12th, 1984 to February 6th, 1985, seven individuals stranded along a 130 km stretch of the Cantabrian seashore (García-Castrillo 1986, Nores & Pérez 1988). Remarkable in the case of these dolphins is that the stranding did not take place in the autumn, when warm-water cetaceans such as *Kogia* sp. and *Globicephala macrorhynchus*, are more often reported in Asturias. Indeed, 27 out of the 29 strandings of *Kogia breviceps* recorded in Galicia and Asturias took place between September and January with a modal peak in November (9 strandings) (Santos *et al*. 2006 and pers. obs.), a similar phenology recorded for the French coast of the Gulf of Biscay (Van Canneyt & Dorémus 2003).

If such were the case, the date and circumstances of this first European record are crucial. Very often, first records of cetaceans with tropical or subtropical distributions in the Gulf of Biscay are interpreted

as exceptional events involving vagrant individuals that later data reveal as pioneering events instead (Duguy 1968, Nores & Pérez 1988, González *et al*. 2000, Sabatier *et al*. 2014). In this way, it has been estimated that between 2-3% of the putative sightings of the common pilot whale *Globicephala melas* (Traill, 1809) may, in fact, correspond to its tropical vicariant form, *G. macrorhynchus* (Van Canneyt *et al*. 2012).

It is for such reason that the large leap northwards this *Stenella clymene* record represents cannot be fully grasped right now. Only future, and well contextualized records, would allow us to decide whether the species reached Europe as yet another side effect of climate change, or merely represents an erratic episode associated with vagrant individuals, chance events or processes one can only speculate about at this point.

Habitat

Very little is known about the feeding ecology of the Clymene dolphin, as few stomachs have been examined. It apparently feeds mostly on mesopelagic fishes and squids (Jefferson 2018). The presence of hake otoliths of age class 0+ in the stomach of the adult female reveal that this dolphin fed in areas of the continental shelf relatively close to the shore. Indeed, hake was probably caught closer to the shore than to the *shelf break*. In the Gulf of Biscay hake juveniles are most often found over muddy bottoms at depths ranging between 70-200 m, reaching maximum densities around 100 m, moving into coastal waters as size increases (Álvarez *et al*. 2001, Kacher & Amara 2005). Habitat preferences of young hake, together with a location of the 100 m isobath at an average of ca. 10 km from the Cantabrian shore (a mere 5 km off Rodiles), suggest that the reported dolphins must have spent days, or perhaps weeks, very near the shore prior to their stranding. Keeping in mind that this record may constitute an exceptional event, it is even possible that the "spinning" dolphins (i.e. dolphins exhibiting a behaviour never recorded on the local Asturian dolphins yet coincident with that of *S. clymene*) sighted in Rodiles during the previous month of the stranding episode (April) were members of the same pod.

The biogeographical and ecological features reported here do not coincide with those recorded on open waters, but only with those carried out in deep water (i.e. 250 to 5,000 m) (Perrin *et al*. 1981, Davis *et al*. 2002) or when feeding (Fertl *et al*. 1997). Fertl *et al*. (2003) considered these features atypical in a sighting of an 18 Clymene dolphins pod reported over a continental shelf 44 m deep (Mullin *et al*. 1994) although Jefferson (2018) considers that they are occasionally observed in inshore water provided deep water lies close to the coast, as is the case around some Caribbean islands. Such peculiarities have been also recorded in the eastern Atlantic (Weir *et al*. 2014). Their occurrence in deep water may link to the offshore location of prey given that cetacean distributions are best explained in terms of prey availability (Davis *et al*. 1998). In our case, it would be the narrowness of the continental shelf off the North Iberian Peninsula (35-55 km in the case of Asturias) what explains why deep waters –along with the aforementioned behavioural traits– are documented so close to the coast.

Acknowledgements

Fran Saborido-Rey, researcher at the Department of Ecology and Marine Resources of the Institute of Marine Research (IIM) from Vigo, is acknowledged by his comments on the habitat of juvenile hakes. Thanks also to Begoña Santos, from that same institution, who tried to identify the beak of the squid, to Marina Sequeira from the *Instituto da Conservação da Natureza e das Florestas* of Portugal for providing complementary information and Juan Antonio Raga from the University of Valencia and an anonymous referee for their suggestions. The retrieval of these specimens was possible thanks to the contribution of the *Guardería de Medio Natural* from the *Consejería de Desarrollo Rural y Recursos Naturales* of the *Principado de Asturias*.

References

Álvarez P., Motos L., Uriarte A. & Egaña J. 2001. Spatial and temporal distribution of European hake, *Merluccius merluccius* L., eggs and larvae in relation to hydrographical conditions in the Bay of Biscay. *Fisheries Research,* 50: 11-128. DOI: 10.1016/S0165-7836(00)00245-9

Davis R.W., Fargion G.S., May N., Leming T.D. Baumgranter M. Evans W.E., Hassen I.J. & Mullin K. 1998. Physical habitat of cetaceans along the continental slope in the North-Central and Western Gulf of Mexico. *Marine Mammal Science,* 14: 490-507. DOI: 10.1111/j.1748-7692.1998.tb00738.x

Davis R.W., Ortega-Ortiz J.G., Ribic C.A., Evans W.E., Biggs D.C., Resseler P.H., Cady R.B. *et al.* 2002. Cetacean habitat in the northern oceanic Gulf of Mexico. *Deep-Sea Research* I, 49: 121-142.

Duguy R. 1968. Note sur *Globicephala macrorhyncha* Gray, 1846; un cétacé nouveau pour les côtes de France. *Mammalia,* 32: 113-117. DOI: 10.1515/mamm.1968.32.1.113

Fertl D., Jefferson T.A., Moreno I.B., Zebrini A.N., & Mullin K.D. 2003. Distribution of the Clymene dolphin *Stenella clymene*. *Mammal Review,* 33: 253-271. DOI: 10.1046/j.1365-2907.2003.00033.x

Fertl D., Schiro A.J. & Peake D. 1997. Coordinate feeding by Clymene dolphin (*Stenella clymene*) in the Gulf of Mexico. *Aquatic Mammals,* 23: 111-112.

García-Castrillo G. 1983-1986. Contribución al conocimiento de los mamíferos marinos de las costas de Cantabria. I. Cetáceos. *Anuario del Instituto de Estudios Marítimos Juan de la Cosa,* 5: 207-236.

González A.F., López A. & Valeiras X. 2000. First recorded mass stranding of short-finned pilot whales (*Globicephala macrorhynchus* Gray, 1846) in the northeastern Atlantic. *Marine Mammal Science,* 16: 640-646. DOI: 10.1111/j.1748-7692.2000.tb00958.x

Jefferson T., Odell D.K. & Pruner K.T. 1995. Notes on the biology of the Clymene dolphin (*Stenella clymene*) in the Northern Gulf of Mexico. *Marine Mammal Science,* 11: 564-573. DOI: 10.1111/j.1748-7692.1995.tb00679.x

Jefferson T.A. 2018. Clymene dolphin: *Stenella clymene*. Pp. 1897-200. In: B. Würsing, J. G. M. Thewissen & K. M. Kovacs (eds). *Encyclopedia of Marine Mammals, Third Edition*. Academic Press/ Elsevier Inc, San Diego.

Kacher M. & Amara R. 2005. Distribution and growth of 0-group European hake in the Bay of Biscay and Celtic Sea: a spatial and inter-annual analyses. *Fisheries Research,* 71: 373-378. DOI: 10.1016/j.fishres.2004.08.034

Mullin K.D., Higgins L.V., Jefferson T.A. & Hansen L.J. 1994. Sightings of the Clymene dolphin (*Stenella clymene*) in the Gulf of Mexico. *Marine Mammal Science,* 10: 464-470. DOI: 10.1111/j.1748-7692.1994.tb00502.x

Nores C. & Pérez M.C. 1988. Overlapping range between *Globicephala macrorhynchus* and *Globicephala melaena* in northern Atlantic. *Mammalia,* 52: 51-55.

Peltier H., Dabin W., Daniel P., Van Canneyt O., Dorémus G., Houn M. & Ridoux V. 2012. The significance of stranding data as indicators of cetacean populations at sea: Modelling the drift of cetacean carcasses. *Ecological Indicators,* 18: 278-290. DOI: 10.1016/j.ecolind.2011.11.014

Perrin W.F., Mitchell E.D., Mead J.G., Caldwell D.K. & Van Bree P.J.H. 1981. *Stenella clymene*, a rediscovered tropical dolphin of the Atlantic. *Journal of Mammalogy,* 62: 583-598. DOI: 10.2307/1380405

Sabatier E., Pante E., Dussud C., Van Canneyt O., Simon-Bouhet B. & Viricel A. 2014. Genetic monitoring of pilot whales, *Globicephala* spp. (Cetacea: Delphinidae), stranded on French coasts. *Mammalia,* 79: 111-114. DOI: 10.1515/mammalia-2013-0155.

Santos M.B., Pierce G.J., López A., Reid R.J., Ridoux V. & Mente E. 2006. Pygmy sperm whales *Kogia breviceps* in the Northeast Atlantic: New information on stomach contents and strandings. *Marine Mammal Science* 22(3): 600-616. DOI: 10.1111/j.1748-7692.2006.00038.x

Van Canneyt O. & Dorémus G. 2003. *Les échouages de mammifères marins sur le litoral français en 2002*. Centre de Recherche sur les Mammifères Marins / Ministère de l'Ecologie et du Développement durable, La Rochelle, 41 pp.

Van Canneyt O., Dabin W., Demaret F., Dorémus G., Dussud C. & Gonzalez, L. 2012. *Les échouages de mammifères marins sur le littoral français en 2011*. Rapport UMS–CRMM pour le Ministère de l'Ecologie, du Développement Durable et de l'Energie, Direction de l'eau et de la biodiversité, Programme Observatoire du Patrimoine Naturel, 52 pp.

Weir C.R. 2006. First confirmed records of Clymene dolphin, *Stenella clymene* (Gray, 1850), from Angola and Congo, South-East Atlantic Ocean. *African Zoology,* 41: 297-300. DOI: 10.1080/15627020.2006.11407366.

Weir C.R, Coles P., Ferguson A., May D., Baines, M., Figueirdo, I. Reichelt, M. *et al.* 2014. Clymene dolphins (*Stenella clymene*) in the eastern tropical Atlantic: distribution, group size, and pigmentation pattern. *Journal of Mammalogy,* 95: 1289-298. DOI: 10.1644/14-mamm-a-115

Submitted: 30 November 2018
Accepted: 5 February 2019

Associate editor was: L. Javier Palomo

Complementary materials
External morphometry of the two specimens of *Stenella clymene*. (in cm)

Measurements (cm)			Adult female	Juvenile female
Total length			178	122
Length from tip of upper jaw to center of eye			30	22.5
Length from tip of upper jaw to apex of melon			11	7
Length from tip of upper jaw to angle of gape			25.5	18
Length from center of eye to angle of gape			5	4
Length from center of eye to center of blowhole			6.5	14
Length from tip of upper jaw to center of blowhole			30.5	22
Length from tip of upper jaw to anterior insertion of flipper			41	30
Length from tip of upper jaw to tip of dorsal fin			103	70
Length from tip of upper jaw to midpoint of umbilicus			85	61
Length from tip of upper jaw to midpoint of genital slit			124	85
Length from tip of upper jaw to center of anus			129	90
Projection of lower jaw beyond upper			0.4	0.6
Length of eye			2.3	2
Length of mammary slits		Right	2.5	0.6
		Left	2.2	0.7
Length of genital and anal slits		Genital	7	6.5
		Anus	1	0.8
Blowhole		Width	2.5	2
		Length	1	1
Anterior length of flipper (anterior insertion to tip)			31	23
Posterior length of flipper (axilla to tip)			22	16
Maximum width of flipper			8.5	6
Height of dorsal fin			17	12.5
Length of dorsal fin base			28	19
Width of flukes (tip to tip)			44.5	33
Distance from nearest point on anterior border of flukes to median notch			12.5	9
Length of median notch (between flukes)			2.5	1.5
Number of visible teeth	Upper jaws	Right	35	36
		Left	36	36
	Lower jaws	Right	35	37
		Left	36	38
Thickness of blubber at the height of the anterior insertion of the dorsal fin		Dorsal	1.4	1
		Flank	0.8	0.9
		Belly	0.9	1