CORA Cork Open Research Archive
Cartlann Taighde Oscailte Chorcaí

Title	First recorded occurrence of Cheirocratus robustus Sars, 1894 in the British Isles
Authors	Myers, Alan A.;McGrath, David;Musk, Will
Publication date	2017-01-13
Original Citation	Myers, A. A., McGrath, D. and Musk, W. (2017) 'First recorded occurrence of Cheirocratus robustus Sars, 1894 in the British Isles', Marine Biodiversity Records, 10(1), pp. 3. doi:10.1186/s41200-017-0106-1
Type of publication	Article (peer-reviewed)
Link to publisher's version	10.1186/s41200-017-0106-1
Rights	© The Author(s). 2017 Open Access This article is distributed under the terms of the Creative Commons Attribution 4.0 International License (http://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made. The Creative Commons Public Domain Dedication waiver (http://creativecommons.org/publicdomain/zero/1.0/) applies to the data made available in this article, unless otherwise stated. - https://creativecommons.org/licenses/by/4.0/
Download date	2026-10-16 22:09:34
Item downloaded from	https://hdl.handle.net/10468/3535

UCC
University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

Myers et al. Marine Biodiversity Records (2017) 10:3
DOI 10.1186/s41200-017-0106-1

Marine Biodiversity Records

RESEARCH Open Access

First recorded occurrence of *Cheirocratus robustus* Sars, 1894 in the British Isles

Alan A. Myers[1*], David McGrath[2] and Will Musk[3]

Abstract

Background: Collections of the amphipod genus *Cheirocratus* from the North Sea and Ireland proved to include *C. robustus* Sars a species previously known only from Norway and Sweden.

Results: Material of *C.robustus* is described and figured from the Humber and Ireland together with the closely related species *C. sundevalli* (Rathke). A key to males of the *Cheirocratus* species of the North East Atlantic and Mediterranean is provided.

Conclusions: *C. robustus* is shown to be widespread in the eastern North Atlantic where it was previously overlooked.

Keywords: Amphipoda, *Cheirocratus robustus*, British Isles, New record

Background

Collections of *Cheirocratus* from the Humber region of the North Sea and from several localities on the West Coast of Ireland, proved to include specimens of *C. robustus* Sars, a species previously recorded only from Norway and Sweden and probably overlooked elsewhere.

Methods

Specimens were preserved in 70% ethanol. Dissection was made under a Wild stereomicroscope and body parts were mounted on microscope slides in glycerine for drawing with a drawing tube on a Nikon compound microscope. In the diagnoses, character states that distinguish *C. robustus* from *C. sundevallii* are listed in bold.

Material is deposited in the National Museum of Ireland, Natural History. (NMINH) and Goteborgs Naturhistorika Museum (GNM) Sweden.

Results

Systematics

Order Amphipoda Latreille, (Latreille 1816)
Suborder Senticaudata Lowry & Myers, (Lowry & Myers 2013)
Infraorder Hadziida S. Karaman, (Karaman 1932)
Superfamily Calliopioidea Sars, (Sars 1893)
Family Cheirocratidae d´Udekem d'Acoz, (D'Udekem d'Acoz 2010)
Cheirocratus robustus Sars.
(Figs. 1, 2 and 3)
Cheirocratus robustus Sars, (Sars 1894): 526, pl. 185, fig. 2.—Oldevig, (Oldevig 1932): 186, pl.2, fig. 2.

Material examined

Three males, six females (NMINH 2016.16.1), RSMP H 0205 Baseline (53.431843°N, 0.38073°E), Humber region of North Sea, 10 m depth, gravel, 23.09.2014, IECS (collected by MESL) one male, one female (NMINH 2016.16.2) RSMP H 0293 Baseline (53.414395°N, 0.52727°E), Humber region of North Sea, 12 m depth, gravel, 23.09.2014, IECS (collected by MESL); one female (NMINH 2016.16.3), RSMP H 0211 Baseline (53.437086°N, 0.398443°E), Humber region of North Sea, 11 m depth, gravel, 23.09.2014, IECS (collected by MESL); one male (NMINH 2016.16.4), Marine Harvest salmon farm, Inishdoonver, Clew Bay, Co Galway, Ireland, 21.5 m depth, current 17 cm/.sec, 50 m from edge of salmon cage, 07.08.2013; one male (NMINH 2016.16.5), JN1067, Rutland Island, 01.09.2010, RUG38; three males, eight females, two immature (NMINH 2016.16.6), JN1006, Kilkieran, 14.10.2010, KKG 17; two males, three females (NMINH 2016.16.7), JN1066, Valentia 16.9.2010, VAG 14; three males, (NMINH 2016.16.8) Hum Agg, 2014, sample

* Correspondence: bavayia@gmail.com
[1]School of Biological, Earth and Environmental Sciences, University College Cork, Cork Enterprise Centre, Distillery Fields, North Mall, Cork, Ireland
Full list of author information is available at the end of the article

BioMed Central

© The Author(s). 2017 **Open Access** This article is distributed under the terms of the Creative Commons Attribution 4.0 International License (http://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made. The Creative Commons Public Domain Dedication waiver (http://creativecommons.org/publicdomain/zero/1.0/) applies to the data made available in this article, unless otherwise stated.

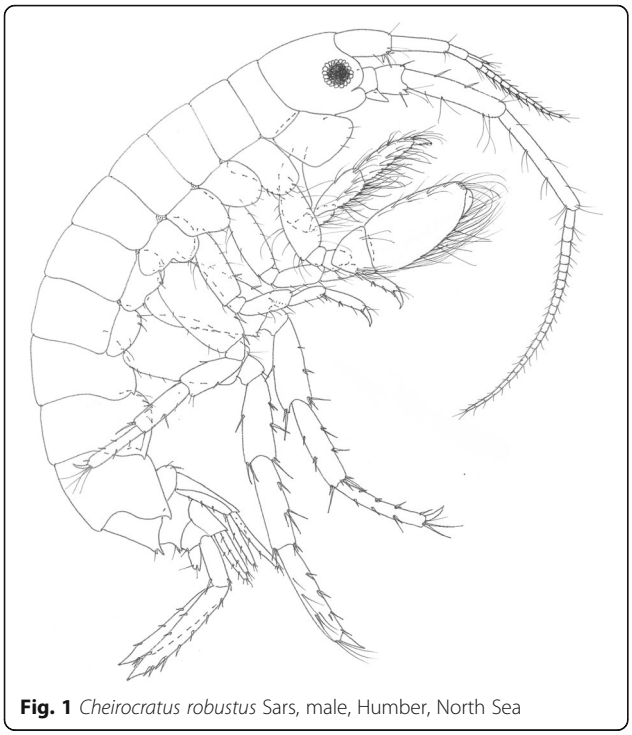

Fig. 1 *Cheirocratus robustus* Sars, male, Humber, North Sea

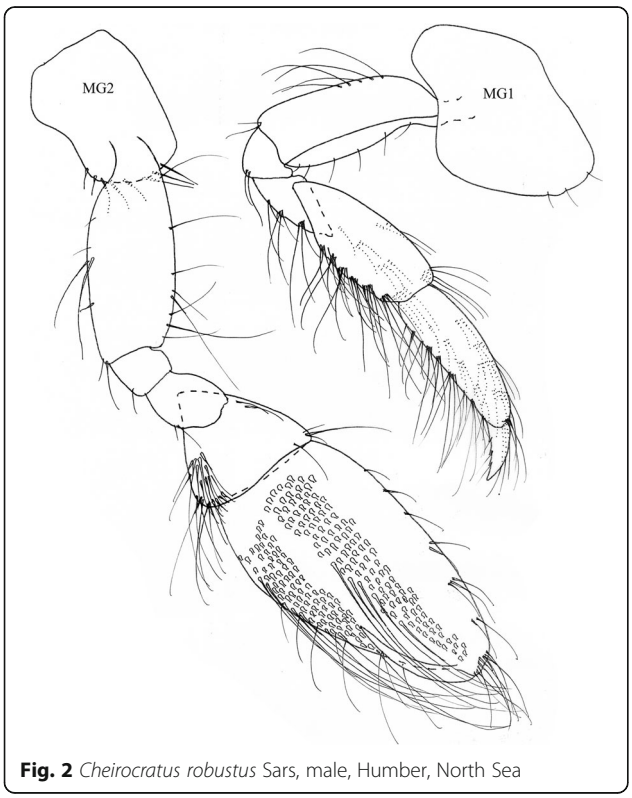

Fig. 2 *Cheirocratus robustus* Sars, male, Humber, North Sea

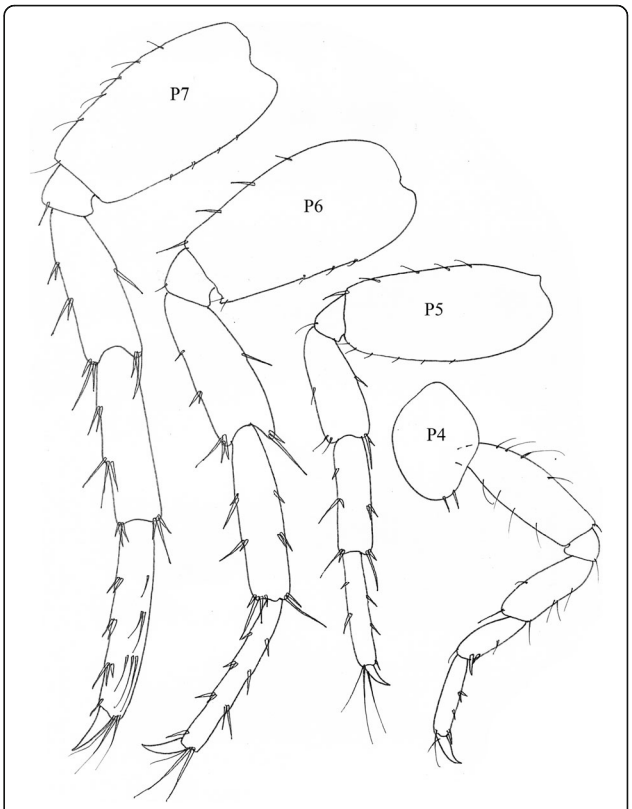

Fig. 3 *Cheirocratus robustus* Sars, male, Humber, North Sea

523; 11 males, seven females, (GNM 9907), Gullmarfjord, Gullmar strömmar, Sweden, 58°15′10″N 11°30′00″E, 15 m, stone, gravel and sand, living and dead algae, 31.07.1921, Hugo Oldevig; two males, three females, (GNM 9908) Gullmarfjord, Gullmar strömmar, Sweden, 58°15′10″N 11°30′00″E, 6–10 m, dead algae, gravel. 31.07.1921, Hugo Oldevig.

Diagnosis

Head with cheek notch; antenna 2 much longer than antenna 1; male gnathopod 2 much larger than gnathopod 1; **male gnathopod 1 robust**, basis subovoid, **without anterodistal spine, carpus and propodus subequal in length, dactylus stout; male gnathopod 2 propodus inner face heavily clothed in long setae, inner face without medial ridge, spine or robust setae, but with small bifid protrubence distally**; pereopods 5–7 robust, pleon segment 1 with three strong dorsal spines; uropod 3 biramous, rami long, subequal in length, distally acute.

Discussion

This is the first record of *C. robustus* Sars from the British Isles. It was previously known only from Norway, Sars, (Sars 1894) (59°91′23″N, 10°74′92″E to 63°43′05″N, 10°39′51″E) and Sweden (see material examined). It can be distinguished in general from its close congener *C. sundevallii* by its much more

robust appendages. The male gnathopod 1 lacks an anterodistal spine on the basis, has the carpus and propodus subequal in length, and has a stout dactylus (*C. sundevallii* male gnathopod 1 has anterodistal spine, carpus much longer than propodus and a slender dactylus). In *C. robustus*, the gnathopod 2 has dense setae over much of the inner face of the propodus that lacks ridges, spine or robust setae medially on the inner face. It does have a small protrubence on the distal end of the inner face but this cannot be viewed without removal of some of the dense setation (*C. sundevallii* has dense setae restricted to the outer margin of the inner face of the propodus and has a ridge on the inner face bearing medially a spine and two robust setae and distally a blunt irregular spine bearing a robust seta). The absence of *C. robustus* from the diagnostic key to Irish and British marine Amphipoda in Lincoln (Lincoln 1979) and the superficial similarity of *C. robustus* to C. *sundevallii* probably explains why *C. robustus* was overlooked in the past and confused with *C. sundevalili.* All previous records of *C. sundevallii* in British and Irish waters must be regarded with caution.

Cheirocratus sundevallii (Rathke)

(Fig. 4)

Gammarus sundevallii Rathke, (Rathke 1843): 65.

Cheirocratus sundevallii: Stebbing, (Stebbing 1888): 204.– Stebbing, (Stebbing 1906): 418.– Chevreux & Fage, (Chevreux & Fage 1925): 223.– Lincoln, (Lincoln 1979): 308, fig. 144.– Karaman, (Karaman 1982): 267, fig. 182.

Cheirocratus sundewallii: Sars, (Sars 1894): 524, pl. 184, 185.

Liljeborgia shetlandica Bate & Westwood, (Bate & Westwood 1863): 206.

Protomedeia whitei Bate, (Bate 1862): 169.

Material examined

Three males, five females (NMINH 2016.16.9), JN1066, Valentia, 16.9.2010, VAG 13; one male (NMINH 2016.16.10), JN1066, Valentia, 16.9.2010, VAG 16; two males, one female (NMINH 2016.16.11), JN1066, Valentia,16.9.2010, VAG 14; one male, one female (NMINH 2016.16.12), Carnsore point, C72 52.267 N 6.213 W in 29 m, 1977, Gravel, D. McGrath.

Diagnosis

Head with cheek notch; antenna 2 much longer than antenna 1; male gnathopod 2 much larger than gnathopod 1; **male gnathopod 1 very slender**, basis subovoid, **with strong anterodistal spine, carpus much longer than propodus, dactylus slender; male gnathopod 2 basis with small anterodistal spine, propodus heavily clothed in long setae on the posterior margin of the**

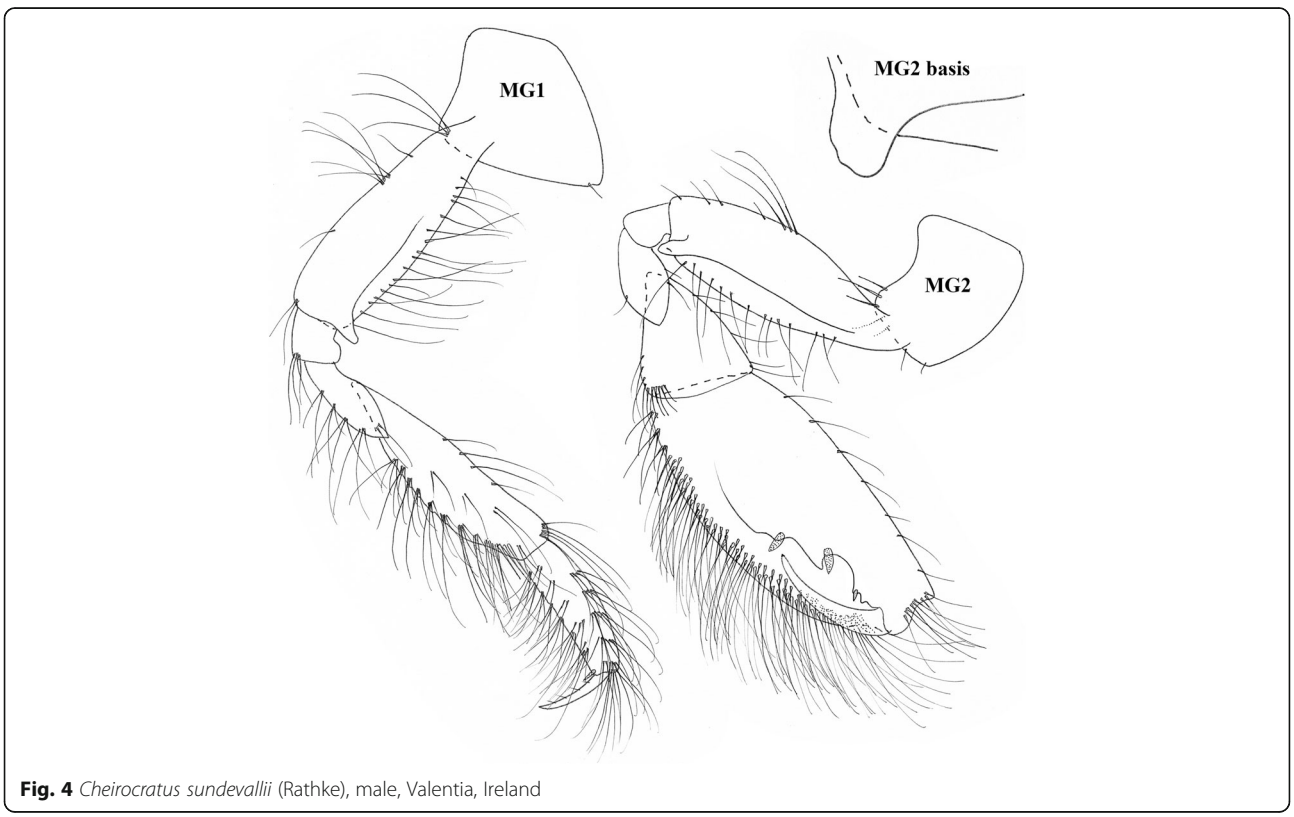

Fig. 4 *Cheirocratus sundevallii* (Rathke), male, Valentia, Ireland

inner face, lacking long setae on the centre of the inner face, but with scalloped ridge bearing a spine and two (Lincoln (1979) figures three) robust setae medially and a small, blunt, irregular spine distally that bears a robust seta; pereopods 5–7 relatively feeble, pleon segment 1 with three strong dorsal spines; uropod 3 biramous, rami long, subequal in length, distally acute.

Discussion

C. sundevalli is widespread in the North East Atlantic and Mediterranean. For differences between *C. sundevalli* and *C. robustus,* see the remarks for that species.

Key to the male *Cheirocratus* of the N.E. Atlantic and Mediterranean

1. Urosome segment 1 with median dorsal spine.....*C. monodontus*
   Urosome segment 1 with three dorsal spines…….....2
2. Gnathopod 2 propodus palm with multiple spines…….....*C. assimilis*
   Gnathopod 2 propodus palm without spines.....3
3. Gnathopod 2 propodous broadest proximally, dactylus not folding across face of propodus……*C. intermedius*
   Gnathopod 2 propodous sub-ovoid, dactylus folding across face of propodus …….....4
4. Gnathopod 1 basis without anterodistal spine, propodus equal to carpus; gnathopod 2 basis without anterodistal spine, propodus inner face clothed in dense and very long setae and lacking medial spine or robust setae……*C. robustus*
   Gnathopod 1 basis with anterodistal spine, propodus half the length of carpus; gnathopod 2 basis with anterodistal spine, propodus with dense very long setae on posterior margin of inner face only and with a medial ridge bearing a spine and 2–3 robust setae…….....*C. sundevallii*

Conclusions

Cheirocratus robustus Sars previously known only from Norway and Sweden is now shown to be widespread in the British Isles, occurring in the North Sea and along the west coast of Ireland.

Abbreviations

G1–2: Gnathopod 1–2; M: Male; P3–7: Pereopods 3–7

Acknowledgements

The authors would like to thank Mark Russell from British Marine Aggregate Producers Association (BMAPA), Tarmac Marine Ltd and Hanson Aggregates Marine Ltd for permission to use their PSA and survey data, Keith Cooper from the Centre for Environment, Fisheries and Aquaculture Science (Cefas), for providing PSA and survey data, and Marine Ecological Surveys Limited (MESL) for collecting the North Sea specimens. We wish to thank Dr Kennet Lundin for the loan of *C. robustus* from the Goteborg Naturhistorika Museum and for locality data and Dr. Eddie McCormack of Aquafact International Services Ltd. for making available Irish *C. robustus* material.

Funding

No funding was available.

Availability of data and materials

Material is stored in the National Museum of Ireland Natural History, Dublin and Goteborgs Naturhistorika Museum (GNM) Sweden.

Authors' contributions

Taxonomic expertise, descriptions and illustrations of taxa AM, Taxonomic expertise DMcG, collection and ecological input WM. All authors read and approved the final manuscript.

Competing interests

The authors declare that they have no competing interests.

Consent for publication

Consent to publication has been granted by the British Marine Aggregate Producers Association, Tarmac Marine Ltd and Hanson Aggregates Marine Ltd.

Ethics approval and consent to participate

There are no ethical considerations.

Author details

[1]School of Biological, Earth and Environmental Sciences, University College Cork, Cork Enterprise Centre, Distillery Fields, North Mall, Cork, Ireland. [2]Department of Natural Sciences, Galway and Mayo Institute of Technology, Dublin Road, Galway, Ireland. [3]Institute of Estuarine & Coastal Studies (IECS), University of Hull, Cottingham Road, Hull HU6 7RX, UK.

Received: 1 November 2016 Accepted: 4 January 2017
Published online: 13 January 2017

References

Bate CS. Catalogue of the Specimens of Amphipodous Crustacea in the Collection of the British Museum. London: Trustees, British Museum; 1862. p. 1–399.

Bate CS, Westwood JO. A History of the British Sessile-eyed Crustacea. London: John van Voorst; 1863. p. 1–507.

Chevreux E, Fage L. Amphipodes. Faune de France. 1925;9:1–488.

D'Udekem d'Acoz C. Contribution to the knowledge of European Liljeborgiidae (Crustacea, Amphipoda), with considerations on the family and its affinities. Bull Inst Roy Sci Nat Belg. 2010;80:127–259.

Karaman S. Beitrage zur Kenntnis der Süsswasser-Amphipoden. Prirod Razp. 1932;2:179–232.

Karaman GS. Family Gammaridae. In: Ruffo S, editor. The Amphipoda of the Mediterranean, Part III, vol. 13. Monaco: Mém Inst Océanogr; 1982. p. 245–364.

Latreille PA. Amphipoda. In: Nouveau Dictionaire d'histoire naturelle, appliquée aux Arts, à l'Agriculture à l'Économie rurale et domestique à la Médecine etc. Par une societé de Naturalistes et d'Agriculteurs. 2nd edition, volume 1. Paris: Deterville; 1816. p. 467–9.

Lincoln RJ. British Marine Amphipoda: Gammaridea. London, British Museum (Natural History). 1979. p. 1–658.

Lowry JK, Myers AA. A Phylogeny and Classification of the Senticaudata subord. nov. (Crustacea: Amphipoda). Zootaxa. 2013;3610(1):1–80.

Oldevig H. Sveriges Amphipoder. Got Kungl Vetenskaps Vitterh-Samhalles Handl. 1932;ser. B,3(4):1–282.

Rathke H. Beitrage zur Fauna Norwegens. Verh Kaiser Leop-Carol Akad Natur, Breslau. 1843;20(1):1–264,264b,264c.

Sars GO. An account of the Crustacea of Norway, with short descriptions and figures of all the species. Part 16 Paramphithoidae, Epimeridae (part); Part 17 Epimeridae (concluded), Syrrhoidae (part); Part 18 Syrrhoidae (concluded), Pardaliscidae (part); Part 19 Pardaliscidae (concluded), Eusiridae; Part 20 Calliopiidae (part); Part 21 Calliopiidae (concluded), Atylidae. Christiania and Copenhagen (Cammermeyers).1893;p.341–472, pls.121–168.

Sars GO. An account of the Crustacea of Norway, with short descriptions and figures of all the species. Part 22 Gammaridae (part); Part 23 Gammaridae (continued); Part 24 Gammaridae (concluded), Photiidae (part); Part 25/26 Photiidae (concluded), Podoceridae (part); Part 27/28 Podoceridae (concluded), Corophiidae, Cheluridae; Part 29/30 Dulichiidae, Caprellidae, Cyamidae. Christiania and Copenhagen (Cammermeyers). 1894;p. 473–671. pis169~240.

Stebbing TRR. Report on the Amphipoda collected by H.M.S. Challenger during the years 1873–1876. Rep Sci Res H.M.S. Challenger 1873–76. Zoology. 1888; 29:1–1737. pls 1–210.

Stebbing TRR. Amphipoda. I. Gammaridea. Das Tierreich. 1906;2:1–806.