Tanaidacea (Crustacea: Peracarida) of the northeast Atlantic: *Chauliopleona* Dojiri and Sieg, 1997 and *Saurotipleona* n. gen. from the ‘Atlantic Margin’

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Two akanthophoreid taxa, *Chauliopleona* and the new genus *Saurotipleona*, are modest contributors to tanaidacean diversity in the benthos of seas from Iceland to the British Isles along the ‘Atlantic Margin’. Three of H.J. Hansen’s ‘Ingolf’ species, originally within the genus *Leptognathia*, are rediagnosed, i.e. *Chauliopleona amdrupii*, *C. armata* and *C. hastata*. One new species, *C. bamberi*, from British waters is described and a new genus and species, *Saurotipleona julii*, is described from bathyal depths in the Irminger and Iceland basins. The latter is similar to *Chauliopleona* in having a sternal spur on pleonite-5 but this is of a slightly different form and is ventrally directed; it also has two superodistal spines on the propodus of pereopod-5, a distinctly plesiomorphic character in the family. A distribution map and key to the identification of these species are given.

http://zoobank.org/urn:lsid:zoobank.org:pub:E7EF8C72-D1C6-438E-B9C2-A5CE637FB75A

**Keywords:** AFEN; Akanthophoreidae; BIOFAR; BIOICE; new species

**Introduction**

In a previous paper on the peracarid crustacean group Tanaidacea Dana from the ‘Atlantic Margin’ (Bird 2014), two akanthophoreid-like taxa, *Leptognathioides* Bird and Holdich, 1984 and *Portaratrum* Guerrero-Kommritz, 2003 were studied, but the taxonomy of two genera genuinely belonging to the Akanthophoreidae Sieg, 1986 are examined here. The first, *Chauliopleona* Dojiri and Sieg, 1997, was originally known from the Ingolf Expedition (Hansen 1913) as *Leptognathia* ‘group a, subdivision γ’ that included *Leptognathia armata* Hansen, 1913, *L. hastata* Hansen, 1913 and *L. Amdrupii* Hansen, 1913, all easily recognized by the recurved sternal spur on pleonite-5. However, a single pleonal spur is no longer diagnostic after the publication of *Portaratrum* and a new genus described in this paper.

These *Chauliopleona* species are widely distributed but never abundant tanaidaceans in the soft sediments of the northeast Atlantic at bathyal and abyssal depths, including the Norwegian Sea and the ‘cold-water’ province north of Iceland. The type species, *C. dentata* Dojiri and Sieg, 1997, was incompletely described because the authors did not give details of mouthparts (apart from the mandibles) and pereopods 2–6. I feel justified in offering new figures of Hansen’s species as those given by...
Guerrero-Kommritz (2005) in a previous study of this genus were insufficiently clear or precise for identification purposes and phylogenetic analyses. This research is one product of the surveys BIOICE (Benthic Invertebrates of Icelandic waters) and BIOFAR (Marine Benthic Fauna of the Faroe Islands), and under, or associated with, the umbrella organisation AFEN (Atlantic Frontier Environment Network); the last includes a survey in 2000 carried out by the United Kingdom’s Department of Trade & Industry (DTI) and the SEA4 study (Bett and DTI 2003). These are placed in context with previous studies such as those carried out in the 1970s and 1980s by Centre océanologique de Bretagne (COB), Institute of Oceanographic Sciences (IOS), Scottish Marine Biological Association (SMBA) and Woods Hole Oceanographic Institution (Chain-106 cruise).

Materials and methods
I identified Chauliopleona specimens from unsorted tanaidacean samples loaned by the National Museums of Scotland (NMS; for AFEN-related samples), Kaldbak Marine Biological Laboratory (KMBL; for BIOFAR samples) and the Icelandic Institute of Natural History (IINH; for BIOICE samples). The background to these surveys, details of environmental data and sampling gear were summarised in Bird (2010) while other station data have been given in Bird (2004a, 2004b, 2014). Excluding the stations covered in those papers, details of the samples from which these genera were extracted are shown in Table 1. Additional material of Chauliopleona from the North Sea was kindly provided by Dr. Roger Bamber of ARTOO Marine Biology Consultants, Southampton, UK.

Type material of the Hansen-described species was examined by me during a visit in 1987 to the Zoologisk Museum, Copenhagen, for comparison with specimens then being recorded in related studies of northeast Atlantic tanaidaceans (Holdich and Bird 1989). Type material of the new species has been deposited in the IINH and NMS. Terminology and abbreviations follow Bird and Bamber (2013) including those for setation, with some overlap in the use of ‘spine’ or ‘seta’. Pleon is used exclusive of the pleotelson. The cheliped carpal shield aspect ratio was determined by its length and depth (Figure 1A). Distribution maps were produced using PANMAP, available from www.pangaea.de/software/PanMap. Bathymetry is shown by isobaths at 200 m, 500 m and 1000–4500 m at 500 m intervals.

Systematics

Order TANAIDACEA Dana, 1849
Suborder TANAIDOMORPHA Sieg, 1980
Superfamily PARATANAOIDEA Lang, 1949
Family AKANTHOPHOREIDAE Sieg, 1986

Remarks
Although the continuous discovery of tanaidacean species worldwide during the last 30 years (Błażewicz-Paszkowycz, Bamber, Anderson 2012) showed that the ‘Akanthophoreus’ habitus was a particular bauplan consistent with a family-level
Table 1. List of samples in which *Chauliopleona* and *Saurotipleona* species were recorded (excluding stations reported in Bird 2004a, 2004b, 2010, 2014).

| Survey  | Sample   | Gear | Date       | Locality                | Depth [m] | Latitude [°N] | Longitude [°W] | Mean B. Temp °C | Temp. °C | Sediment       | Taxon |
|---------|----------|------|------------|-------------------------|-----------|---------------|----------------|-----------------|----------|----------------|-------|
| AFEN 1996 | 53715#1  | Mega | 25 July 1996 | Faroe-Shetland Channel | 1095      | 61.08         | 3.27           | Fine sand        | 4        |                 |       |
| AFEN 1996 | 53716#1  | Mega | 25 July 1996 | Faroe-Shetland Channel | 1100      | 61.06         | 3.33           | Very fine sand   | 4        |                 |       |
| AFEN 1996 | 53815#4/5 | DG   | 25 July 1996 | West Shetland Shelf    | 180       | 61.43         | 0.82           | Medium sand      | 3        |                 |       |
| AFEN 1996 | 53816#4  | DG   | 25 July 1996 | West Shetland Slope    | 235       | 61.49         | 1.12           | Fine sand        | 3        |                 |       |
| AFEN 1996 | 53832#1  | Mega | 5 August 1996 | Faroe-Shetland Channel | 1388      | 61.46         | 2.60           | Very fine sand   | 4        |                 |       |
| AFEN 1996 | 53835#1  | Mega | 5 August 1996 | Faroe-Shetland Channel | 1517      | 61.63         | 2.87           | Medium sand      | 4        |                 |       |
| AFEN 1996 | 53885#2  | DG   | 5 August 1996 | West Shetland Shelf    | 120       | 60.63         | 2.55           |                 | 3        | Medium sand     |       |
| AFEN 1996 | 53919#2/3 | DG   | 5 August 1996 | West Shetland Shelf    | 168       | 61.28         | 1.11           | Medium sand      | 3        |                 |       |
| AFEN 1998 | 54516#1/2 | M10  | 25 May 1998  | Faroe-Shetland Channel | 1601      | 61.90         | 2.31           | Sandy mud        | 4        |                 |       |
| AFEN 1998 | 54523#1/2 | M10  | 25 May 1998  | Faroe-Shetland Channel | 1363      | 61.86         | 1.70           | Muddy sand       | 4        |                 |       |
| AFEN 1998 | 54524#2  | M10  | 25 May 1998  | Faroe-Shetland Channel | 1393      | 61.77         | 1.81           | Muddy sand       | 4        |                 |       |

(Continued)
Table 1. (Continued).

| Survey    | Sample  | Gear | Date         | Locality              | Depth [m] | Latitude [°N] | Longitude [°W] | Mean B. Temp °C | Temp. °C | Sediment                          | Taxon |
|-----------|---------|------|--------------|------------------------|-----------|---------------|----------------|----------------|----------|-----------------------------------|-------|
| AFEN 1998 | 54525#1/2 | M10  | 25 May 1998  | Faroe-Shetland Channel | 1386      | 61.70         | 1.90           |                 |          | Sandy mud                        | 4     |
| AFEN 1998 | 54526#1/3 | M10  | 25 May 1998  | Faroe-Shetland Channel | 1529      | 61.85         | 2.05           |                 |          | Sandy mud                        | 4     |
| AFEN 1998 | 54612#2  | M6   | 5 June 1998  | Hebrides Slope         | 398       | 58.76         | 7.84           |                 |          | Slightly gravelly sand           | 3     |
| AFEN 1998 | 54615#1  | 5     | 6 June 1998  | Hebrides Slope         | 991       | 58.84         | 7.99           |                 |          | Gravelly sand                     | 5     |
| AFEN 1998 | 54621#79 | DG   | 5 June 1998  | Hebrides Slope         | 301       | 59.08         | 7.35           |                 |          | Gravelly sand                     | 3     |
| BIOICE    | 2027     | RP   | 23 July 1991 | Iceland Plateau        | 1646      | 67.12         | 13.21          | 0              | −0.8     | Mud (black)                       | 4     |
| BIOICE    | 2102     | Sn   | 6 July 1992  | Denmark Strait         | 1146      | 68.00         | 19.44          | 0              | −0.6     | Silt                              | 4     |
| BIOICE    | 2257     | RP   | 5 September 1992 | Irminger Basin  | 1209      | 63.24         | 26.49          | 3              | 4.1      | Clay, shell-sand                  | 1     |
| BIOICE    | 2647     | Sn   | 13 July 1994 | Iceland Plateau        | 1300      | 68.08         | 15.32          | 0              | −0.7     | Silt                              | 4     |
| BIOICE    | 2648     | RP   | 14 July 1994 | Iceland Plateau        | 1306      | 68.08         | 15.31          | 0              | −0.7     | Silt                              | 4     |
| BIOICE    | 2773     | RP   | 3 August 1995| Iceland Plateau        | 1629      | 69.25         | 14.28          | 0              | −0.9     | Gravelly sandy silt               | 4     |
| BIOICE    | 2776     | DS   | 3 August 1995| Iceland Plateau        | 1555      | 68.61         | 14.67          | 0              |          | Gravelly sandy silt               | 4     |
| BIOICE    | 2810     | Sn   | 23 August 1995| Iceland Basin [Slope] | 1695      | 62.66         | 19.75          | 4              | 3.3      | Silt                              | 2     |
| BIOICE    | 2863     | RP   | 30 August 1995| Iceland Basin         | 2400      | 61.17         | 18.04          | 4              | 2.1      | Sand, shell debris             | 2     |
| BIOICE    | 3071     | RP   | 12 July 1997 | Iceland Basin         | 2068      | 62.18         | 15.19          | 4              | 3.2      |                                | 2     |

(Continued)
| BJOICE 3219 | RP | 11 July 2001 | Norwegian Basin | 1639 | 67.15 | 8.28 | 1 | −0.8 | 4 |
| BJOICE 3222 | RP | 11 July 2001 | Jan Mayen Ridge | 1529 | 67.54 | 8.06 | 1 | −0.8 | 4 |
| BJOICE 3225 | RP | 12 July 2001 | Norwegian Basin | 1994 | 68.35 | 8.15 | 0 | −0.9 | 4 |
| DTI 2000 55278#1 MC | 4 August 2000 | Faroe-Shetland Channel | 1277 | 61.56 | 2.08 | 4 |
| DTI 2000 55296#1 MC | 8 August 2000 | Faroe-Shetland Channel | 1265 | 61.57 | 1.01 | 4 |
| DTI 2000 55316#1-3 MC | 12 August 2000 | Faroe-Shetland Channel | 1530 | 61.70 | 3.07 | 4 |
| DTI 2000 55317#1,2 MC | 13 August 2000 | Faroe-Shetland Channel | 1652 | 61.91 | 2.81 | 4 |
| DTI 2000 55445#1,2 MC | 1 September 2000 | Faroe-Shetland Channel | 1058 | 61.19 | 2.78 | 4 |
| DTI 2000 55447#10 MC | 2 September 2000 | Faroe-Shetland Channel | 1656 | 61.92 | 2.80 | 4 |
| DTI 2000 55447#13 MC | 2 September 2000 | Faroe-Shetland Channel | 1656 | 61.92 | 2.80 | 4 |
| INCAL CP01 CP | 16 July 1976 | North Rockall Trough | 2040 | 57.93 | 10.92 | 2 |
| SEA4 57018#2 DG | 1 July 2002 | West Shetland Shelf | 198 | 61.58 | 0.08°E | 193 μm [mean grain size] | 3 |
| SEA4 57020#1 DG | 1 July 2002 | North Shetland Shelf | 193 | 61.57 | 0.53 | 3 |
| SEA4 57023#1 DG | 1 July 2002 | West Shetland Slope | 243 | 61.87 | 0.03°E | 169 μm | 3 |
| SEA4 57030#1 BC | 1 July 2002 | Faroe-Shetland Channel | 1588 | 62.73 | 1.12 | 4 |
| SEA4 57031#1,2 BC | 1 July 2002 | Faroe-Shetland Channel | 1593 | 62.76 | 1.07 | 4 |
| SEA4 57032#1 BC | 1 July 2002 | Faroe-Shetland Channel | 1598 | 62.85 | 1.00 | 4 |
| SEA4 57036#1 BC | 1 July 2002 | Norwegian Basin | 2064 | 63.44 | 0.42 | 4 |

(Continued)
| Survey | Sample | Gear | Date       | Locality               | Depth [m] | Latitude [°N] | Longitude [°W] | Mean B. Temp °C | Temp. °C | Sediment       | Taxon |
|--------|--------|------|------------|------------------------|-----------|---------------|----------------|----------------|---------|----------------|-------|
| SEA4   | 57068#1| BC   | 1 July 2002| Faroe-Shetland Channel | 1741      | 62.75         | 1.87           | 4              |         |                |       |
| SEA4   | 57075#1| SBC  | 1 July 2002| North Shetland Slope   | 400       | 61.97         | 0.23           |                | 255 μm  |                | 4     |
| SEA4   | 57082#1| DG   | 1 July 2002| West Shetland Slope    | 200       | 61.61         | 0.15           |                | 226 μm  |                | 3     |
| SEA4   | 57100#2| DG   | 1 July 2002| North Shetland Shelf   | 158       | 61.24         | 0.06           |                | 110 μm  |                | 3     |
| SMBA   | ES218  | ES   | 3 August 1982| North Rockall Trough | 2175      | 57.37         | 10.40          | 2              |         |                |       |
| SMBA   | SBC166 | SBC  | 12 August 1979| North Rockall Trough | 2274      | 57.12         | 10.33          | 2              |         |                |       |
| SMBA   | SBC216 | SBC  | 3 August 1982| North Rockall Trough   | 2200      | 57.32         | 10.38          | 2              |         |                |       |

Note: Taxon key: 1, *Chauliopleona amdrupii*; 2, *C. armata*; 3, *C. bamberi*; 4, *C. hastata*; 5, *Saurotipleona julii*. Gear key: AT, Agassiz Trawl; BC, box-corer; DG, Day grab; DS, detritus sledge; ES and RP, epibenthic sled; Sn, Sneli sledge (= detritus sledge); Mega, MC, M, multi-corer; SBC, spade-box corer. Decimal latitude and longitude values are rounded to two decimal points, latter °W unless stated otherwise, ‘Temp.’ to one.
Figure 1. *Chauliopleona*. Sketch drawings: (A) measurement of cheliped carpal shield aspect ratio l/b; *C. armata*, non-ovigerous female, co-type, Ingolf Stn 22; (B) habitus; (C) pleonite-5 spur; (D) cheliped, distal; (E) cheliped, fixed finger; (F) pereopod-1, distal; (G) uropod. *C. hastata*, non-ovigerous female co-type, Ingolf Stn 125: (H) habitus; (J) pleonite-5 spur, pleotelson, and uropod; (K) cheliped, distal; (L) pereopod-1, distal; *C. hastata* one of two co-types, Ingolf Stn 102: (M) pleonite-5 spur. Not to scale.
status, Sieg’s subfamily Akanthophoreinae was elevated to the Akanthophoreidae only recently (Błażewicz-Paszkowycz and Bamber 2011). A phylogenetic analysis confirming the monophyly of most of the previously assigned genera and new family members has been carried out recently (Larsen and Araújo-Silva 2014).

Within a fairly conservative overall morphology, specialised characters such as high pleonal spurs, lateral pleotelson spurs, crenation or nodules on various regions of the cheliped, extension of a cheliped carpal shield, slender uropods with one or two-segmented exopods, and grooved and serrate dactylus of pereopods 4–6 are part of the morphological expression within this taxon.

The following two genera are typical akanthophoreids, from their overall habitus to the narrow mandibular molars that carry a palmate array of distal spines. The latter character is quite different from that expressed in akanthophoreid-like taxa such as Portaratrum and Leptognathioides where the molar is broader and has a coronal spine array (Bird 2014).

**Chauliopleona** Dojiri and Sieg, 1997

*Leptognathia*: Hansen 1913: 79, in part, for *Leptognathia* ‘group a, subdivision γ’

**Chauliopleona** Dojiri and Sieg, 1997: 231 (diagnosis); Guerrero-Kommritz 2005: 1179–1180 (diagnosis and remarks); Larsen 2005: 251–252 (diagnosis and remarks); Larsen and Shimomura 2007: 32–33 (remarks and description of *C. hansknechtii*); Bird 2007: 141–143 (remarks and records of Japan Trench species); Larsen and Shimomura 2009: 50–58 (remarks and description of *C. sinusa*); Błażewicz-Paszkowycz, Bamber, Jóźwiak 2012: 19–21 (redescription of *C. hansknechtii*); Larsen and Araújo-Silva 2014: 245–255 (diagnosis and description of *C. ciimari* and *C. andeepei*); else, see Anderson 2013 or Sieg 1983

**Diagnosis** (developed from Dojiri and Sieg 1997, Larsen and Shimomura 2009). Akanthophoreid with cephalothorax with parallel or sub-parallel lateral margins. Pleonites 1–4 sternites with or without low medial process, pleonite-5 sternite with acute recurved spur. Pleotelson lateral margins smooth. Mandible molar acuminate-palmate. Maxilliped bases with or without long seta. Cheliped carpus inferior shield very slight to strongly developed; fixed finger without proximal dentition, with two inferior bayonet spines; dactylus with crenate or smooth superior margin. Pereopods 1–3 basis not broader than that of pereopods 4–6, superior margin with large plumose sensory seta (PSS); pereopod-1 carpus with two bayonet spines, pereopods 2–3 with three. Pereopods 4–6 carpus with three bayonet spines and superodistal rod-like seta; pereopods 4–5 propodus with one superodistal spine, pereopod-6 with three (sometimes slender). Uropod peduncle simple [without spur]; exopod two-segmented, shorter than segment-1 of endopod.

**Preparatory male.** Pleon slightly larger than in female. Antennule five-articled, broader than female. Mouthparts similar. Pleopods slightly larger and/or with more setae than female. Swimming male: unknown or not proven.

**Type species**

*Chauliopleona dentata* Dojiri and Sieg, 1997.
**Composition**

*Chauliopleona amdrupii* (Hansen 1913); *C. amftae* Guerrero-Kommritz, 2005; *C. andeepi* Larsen and Araújo-Silva, 2014; *C. armata* (Hansen 1913); *C. bamberi* n. sp.; *C. ciimari* Larsen and Araújo-Silva, 2014; *C. dentata*; *C. faini* Larsen, 2005; *C. hansknechti* Larsen and Shimomura, 2007; *C. hastata* (Hansen 1913); *C. nickeli* Guerrero-Kommritz, 2005; *C. paradoxa* Guerrero-Kommritz, 2005; *C. sinusa* Larsen and Shimomura, 2009.

**Remarks**

*Chauliopleona* is an *Akanthophoreus* or *Parakanthophoreus*-like genus with pleonite-5 supporting an acute, recurved, sternal spur. Diagnoses of this akanthophoreid genus have been given previously several times (see above). Twelve species have been described to date (Anderson 2013; Larsen and Araújo-Silva 2014) but it has been a problematic genus, mainly because it has been difficult to find diagnostic and phylogenetically valid characters that separate it from *Akanthophoreus*, *Parakanthophoreus* and *Paraleptognathia*, other than the pleonal spur. There has also been speculation that the pleonal spur might only be a sex-related character (Bamber, Larsen pers. comm.). Surprisingly, this was the only character in the original generic diagnosis (Dojiri and Sieg 1997, p. 231). Its status in mancae remains unresolved as none of these were identified as *Chauliopleona* in the present study; it is quite possible that the spur is absent in this developmental stage and they would be indistinguishable from mancae of *Akanthophoreus* or *Parakanthophoreus*.

*Chauliopleona amdrupii* (Hansen 1913)
(Figures 2–4, 18)

*Leptognathia Amdrupii* Hansen, 1913: 81–82, pl. VIII figs. 2a–c

*Leptognathia amdrupi*: Nierstrasz 1913: 30; Stephensen 1932: 347; Stephensen 1937: 23; Stephensen 1943: 36, 63; Just 1970: 24; else, see Sieg 1983

*Chauliopleona amdrupii*: Guerrero-Kommritz 2005: 1184–1187, figs 3–4; else, see Anderson 2013

**Diagnosis**

Cephalothorax 1.4 times longer than broad (ltb). Pereonites 1–6 all shorter than broad, with parallel lateral margins. Pleon shorter than cephalothorax, without posteriodorsal protuberances; pleonites 1–4 sternite with low recurved subrectangular process. Antennule article-1 (1.25 times) longer than rest of antennule. Maxilliped bases with short distal seta. Cheliped merus without inferior protuberance; carpus relatively slender, twice as long as broad, inferior shield shallow (aspect ratio \(\approx 0.2\)), subtriangular, distal margin not angular; fixed finger with four teeth; dactylus superior margin smooth. Pereopods 1–3 basis with marginal setules; carpus and propodus inferior spinules fine to moderate; pereopods 2–3 carpus with distomedial seta. Pereopods 4–6 ischium with two short setae. Uropod exopod just over half the length of endopod segment-1; endopod slender, > three times longer than peduncle.
Figure 2. Chaudiopleona amdrupii. Non-ovigerous female, BIOICE Stn 3282: (A) habitus; (B) pleonal sternites, lateral; (C) antennule; (D) antenna; (E) pleopod endopod (setae very finely plumose, omitted for clarity; and following); (F) pleopod exopod; (G) uropod. Scale bar: 1 mm for A; 0.5 mm for B; 0.25 mm for C–G.
Figure 3. Chauliopleona amdrupii. Non-ovigerous female, BIOICE Stn 3282: (A) labrum; (B–C) left mandible and molar; (D) right mandible; (E) maxillule; (F) maxilla; (G) maxilliped (one palp omitted); (H) cheliped. Scale bars: (i) 0.25 mm for A–G; (ii) 0.25 mm for H.
Figure 4. *Chauliopleona amdrupii*. Non-ovigerous female, BIOICE Stn 3282: (A–F) pereopods 1–6 respectively. Scale bar 0.25 mm.
Material examined
One non-ov.♀, BIOICE Stn 2257; one non-ov.♀, BIOICE Stn 2697; one non-ov.♀, BIOICE Stn 2701; two non-ov.♀♀, BIOICE Stn 2849; five non-ov.♀♀, three prep.♂♂, BIOICE Stn 2853; eight non-ov.♀♀, three prep.♂♂, BIOICE Stn 3280; four non-ov.♀♀ (one dissected on microslide), BIOICE Stn 3282; three non-ov.♀♀, BIOICE Stn 3518; one non-ov.♀, BIOICE Stn 3528; two non-ov.♀♀ BIOICE Stn 3531; three non-ov.♀♀, one prep.♂, BIOICE Stn 3532.

Size
Non-ovigerous female. Body length 2.44–3.64 mm, cf. 2.7 mm, Hansen (1913), and 3.2 mm, Guerrero-Kommritz (2005). Preparatory male: body length 2.96–3.16 mm.

Distribution records from the AFEN, BIOICE and BIOFAR area
Eleven records from the BIOICE survey: three from the Irminger Basin 1042–1209 m, eight from the Iceland Basin, 988–1840 m. All have positive bottom temperatures of 2.4–4.2°C, with various sediment types including ‘clay’, ‘silty sand’, and ‘shell-sand’.

Distribution elsewhere
Originally described from Forsblad Fjord, East Greenland, 73–165 m (Hansen 1913); other records are from Jörgen Brönlund Fjord, East Greenland, 160–180 m (Just 1970), and the Greenland Sea, 188–191 m (Guerrero-Kommritz 2005).

Remarks
This species of Chauliopleona is characterised by a relatively slender cheliped carpus that has a low-aspect ratio (shallow) sub-rectangular shield (Figure 3H) and a slightly recurved sternal process on pleonites 1–4 (Figure 2C). The basal setae of the maxilliped (Figure 3G) are also relatively short compared to those in C. armata and C. hastata. There is some discrepancy between the present specimens and the specimen illustrated by Guerrero-Kommritz (2005) in the size of the inferior propodal spinules on pereopods 1–3: his material, one specimen from the Greenland Sea, has robust spinules (also on the carpus), whereas the current material has both weak and moderate setules (Figure 4A–C). This better corresponds to Hansen’s description of ‘second pair of legs [pereopod-1] without spinules on the posterior margin of sixth joint [propodus]’ (Hansen 1913, p. 81). The presence of a distomedial seta on the carpus of pereopods 2–3 is another possible distinguishing character from C. armata and C. hastata.

This species is partly sympatric with C. armata and C. hastata in the Irminger Basin and its depth and geographic distributions indicate polar emergence.

Chauliopleona armata (Hansen 1913)
(Figures 1B–G, 5–7, 18)

Leptognathia armata Hansen, 1913: 80–81, pl. VIII figs. 1a–f
Figure 5. Chauliopleona armata. Non-ovigerous female, BIOICE Stn 2856: (A) habitus; (B) pleonal sternites, lateral; (C) antennule; (D) antenna; (E) uropod. Scale bars: (i) 1 mm for A; (ii) 0.5 mm for B; (iii) 0.25 mm for C–E.
Figure 6. *Chauliopleona armata*. Non-ovigerous female, BIOICE Stn 2856: (A) labrum; (B) left mandible molar; (C) right mandible; (D) maxillule endite; (E) maxilliped (palps omitted); (F) maxilliped palp article-2; (G) epignath; (H) cheliped; (J) cheliped propodus mesial comb and dactylus. Scale bars: (i) 0.25 mm for A–G; (ii) 0.25 mm for H–J.
Figure 7. Chauliopleona armata. Non-ovigerous female, BIOICE Stn 2856: (A–F) pereopods 1–6 respectively; (G) pleopod (setae very finely plumose, omitted for clarity). Scale bar 0.25 mm.
Leptognathia armata: Nierstrasz 1913: 30; Stephensen 1932: 347; Stephensen 1943: 36, 63; Holdich and Bird 1985: 443 table 1; else, see Sieg 1983
Chauliopleona armata: Guerrero-Kommritz 2005: 1188–1191, figs. 5–6; else, see Anderson 2013

Diagnosis
Cephalothorax 1.3–1.6 times ltb. Pereonites all shorter than broad; with parallel lateral margins. Pleon shorter than cephalothorax, without posterior dorsal protuberance; pleonites 1–4 sternite with subtriangular sternal process. Antennule article-1 (1.2 times) longer than rest of antennule. Maxilliped basis with long seta. Cheliped merus without inferior protuberance; carpus fairly stout, 1.6 times ltb, inferior shield shallow (aspect ratio ≈ 0.3), rounded, distal margin not angular; fixed finger with four teeth; dactylus superior margin smooth. Pereopods 1–3 basis margins smooth; propodus inferior spines numerous, moderate or robust. Pereopods 2–3 carpus without distomedial seta.1 Pereopods 4–6 ischium with two short setae. Uropod exopod about half as long as endopod segment-1; endopod > three times longer than peduncle.

Material examined
BIOICE stns. One non-ov. ♀, 2810; 21 non-ov. ♂ ♀ (one dissected on microslide), 18 prep. ♂ ♀, 2856; one non-ov. ♀, one prep. ♂, 2859; six non-ov. ♀ ♀, one ov. ♀, two prep. ♂ ♀, 2860; one non-ov. ♀, one prep. ♂, 2863; one prep. ♂, 3067; one prep. ♂, 3071; one non-ov. ♀, 3504; one non-ov. ♀, 3515.

AFEN Stn. One individual, 54591#1; one non-ov. ♀, 54600#2.

Co-type. Non-ov. ♀, Ingolf Stn 22.

Other material. SMBA stns: one individual (ind.), ES105; four ind., ES218; two ind., SBC61; two ind., one ind., SBC68; SBC166; one ind., SBC216. INCAL stns: one ind., CP01; two ind., CP02; one ind., DS01.

Size
Non-ovigerous female. Body length 2.28–3.64 mm, cf. 3.6 mm as measured by Hansen (1913) or 3.8 mm by Guerrero-Kommritz (2005). Ovigerous female: body length 2.96 mm.

Preparatory male. Body length 2.72–3.44 mm, cf. 3.3 mm Hansen (1913).

Distribution records from the AFEN, BIOICE and BIOFAR area
Eleven from AFEN: two from North Feni Ridge, 1600–2000 m, eight from the northern Rockall Trough, 1859–1871 m, and one from the Hebrides Slope, 1800 m. Ten records from BIOICE: all from the Iceland Basin, 1333–2400 m; with positive bottom temperatures 2.1–3.99°C and a variety of sediment types including ‘silty sand’, ‘shell debris’, ‘silt’ and ‘muddy gravel’.
Distribution elsewhere

The type locality is the Davis Strait, 2702 m, and southwest of Cape Farewell, 3474 m (Hansen 1913). I have 51 records from the northeast Atlantic, extending from the Iceland Basin (deeper and further south than the BIOICE area) to the southern Bay of Biscay, including the South Feni Ridge, Rockall Trough, Porcupine Seabight, Celtic and Armorican Slopes, and Biscay Abyssal Plain, 1180–4823 m (SMBA, IOS, COB, Chain-106). Some of these were reported by Holdich and Bird (1985). These data are available from the author on request.

Remarks

A significant problem in assessing any new records of *C. armata* is that the original type material consists of only two specimens (Figure 1B–G) and this shows some differences from the specimens illustrated here that have a slightly shorter cephalothorax and somewhat weaker propodal spinules on pereopods 1–3 (Figure 7A–C).

If these new records are genuine, *Chauliopleona armata* appears to be a eurybathic species, inhabiting both bathyal (200–2000 m) and abyssal zones (2000–6000 m). However, it is almost certain that the records of *C. armata* outside of the Atlantic Margin study area (see above) refer to more than one species, and the material needs re-examination.

*Chauliopleona bamberi* n. sp.
(Figures 8–10, 19)

*Chauliopleona* sp.AM#1: Bird 2001 (unpubl.), not *Chauliopleona* sp.AM#1 sensu Bird 2014

Diagnosis

Cephalothorax elongate, 1.6 times ltb. Pereonites all shorter than broad; with parallel lateral margins. Pleon shorter than cephalothorax, without posteriodorsal protuberances; pleonites 1–4 with recurved sternal process. Antennule article-1 as long as rest of antennule. Antenna article-4 without suture. Maxilliped basis with long seta. Cheliped merus without inferior protuberance; carpus fairly slender, 1.8 times ltb, inferior shield shallow (aspect ratio \(\approx 0.2\)), rounded, distal margin not angular; fixed finger with four teeth; dactylus superior margin crenate or nodulose. Pereopods 1–3 propodus slender, about six times ltb; carpus and propodus inferior spinules sparse and weak, or absent. Pereopods 2–3 carpus without distomedial seta. Pereopods 4–6 ischium with one long seta (of two). Uropod exopod half as long as endopod segment-1; endopod about three times length of peduncle.

Material examined

Holotype. Non-ov.♀, AFEN Stn 53919#2/3, West Shetland Shelf, 168 m, NMS. Z.2014.165.

Allotype. Prep.♂, AFEN Stn 53815, NMS.Z.2014.166.
Figure 8. *Chauliopleona bambergi* n. sp. Non-ovigerous female, holotype, AFEN Stn 53919#2/3. (A) habitus; (B) pleon and pleotelson, lateral; (C) pleonite-5 sternal spur. Ovigerous female paratype, AFEN Stn 53815: (D) antennule; (E) antenna; (F) uropod. Preparatory male, allotype, AFEN Stn 53815: (G) cephalothorax–pereonite-1; (H) antennule. Scale bars: (i) 1 mm for A, G; (ii) 0.5 mm for B–C, 0.25 mm for D–F, H.
Figure 9. Chauliopleona bambergi n. sp. Ovigerous female, paratype, AFEN Stn 53815: (A) labrum; (B–C) left and right mandibles, respectively; (D) labium; (E) maxillule; (F) maxillule endite spines; (G) maxilla; (H) maxilliped (one palp omitted); (J) maxilliped endite; (K) epignath; (L) cheliped; (M) cheliped propodus mesial comb and dactylus. Scale bars: (i) 0.25 mm for A–K; (ii) 0.25 mm for L–M.
Figure 10. *Chauliopleona bamberi* n. sp. Ovigerous female, paratype, AFEN Stn 53815: (A–C) pereopods 1–3, respectively; (D) pereopod-4 ischium; (E) pereopod-4, basis omitted; (F) pereopod-5; (G–H) pereopod-6 basis and propodus-claw, respectively; (J) pleopod endopod (setae very finely plumose, omitted for clarity; and following); (K) pleopod basal article and exopod. Scale bar: 0.25 mm.
Paratypes. AFEN Stns: two non-ov. ♀♀, one ov. ♀, one prep. ♂, Stn 53815#4/5, NMS.Z.2014.167.1; one non-ov. ♀, 53816#4, NMS.Z.2014.167.2; one non-ov. ♀, 53885#2, NMS.Z.2014.167.3; one non-ov. ♀, 54612#2, NMS.Z.2014.167.4; one non-ov. ♀, one prep. ♂, 54615#1, NMS.Z.2014.167.5; one non-ov. ♀, 54621#7/9, NMS.Z.2014.167.6; one non-ov. ♀, one prep. ♂, 57018#2, NMS.Z.2014.168.1; one non-ov. ♀, 57020#1, NMS.Z.2003.114.0032; one prep. ♂, 57023#1, NMS.Z.2003.114.042; one ov. ♀, 57082#1, NMS.Z.2014.168.2; one non-ov. ♀, 57100#2, NMS.Z.2014.168.3.

Other material. North Sea: eight non-ov. ♀♀, one ov. ♀, eight prep. ♂♂, one swimming ♂ (?)..

Description
Female: habitus (Figure 8A) slender, 7.4 times ltb; non-ovigerous body length 1.8–3.0 mm (n = 19); ovigerous body length 2.5–2.6 mm (n = 3).

Cephalothorax longer than pereonites 1–2 combined, 1.6 times ltb. Pereon with pereonites with scarcely concave lateral margins or parallel-sided, all shorter than broad, pereonites 1 and 6 shortest, subequal, pereonites 2–3 longest. Pleon (Figure 8B–C) as long as pereonites 5–6 combined, epimera with seta, sternites 1–4 with recurved process, sternite-5 with recurved spur reaching uropod attachments. Pleotelson about as long as pleonites 4–5 combined, setation typical.

Antennule (Figure 8D) about 0.6 times length of cephalothorax; article-1 as long as distal articles combined, three times ltb; article-2 twice as long as broad, with lateral seta longer than article; article-3 half as long as article-2, with two setae; article-4 slender, just longer than article-2, with six setae and aesthetasc; without caplike terminal segment; other setation as figured. Antenna (Figure 8E) about 0.75 times length of antennule; article-2 with superior and lateral setae; article-3 half as long as article-2; article-4 about seven times ltb, with pseudo-suture; article-5 about as third as long as article-4; article-6 small, as long as broad; other setation as figured.

Labrum (Figure 9A) typical, hood-shaped, distally setulate. Mandibles (Figure 9B–C) typical, molar process of both acuminate, with rosette of terminal spines; incisors weakly tricuspid, left mandible with acuminate lacinia mobilis. Labium (Figure 9D) typical, outer lobes reduced, naked; inner lobes distally setulate. Maxillule (Figure 9E–F) typical, endite with nine spines four of which are pectinate. Maxilla (Figure 9G) simple, as long as maxilliped bases. Maxilliped (Figure 9H–J) basis with long distal seta; endite with medial cusp, lateral seta, and medial coupling hook; palp article-1 as long as article-2, naked; article-2 with lateral seta reaching beyond article-3; article-3 with four unequal mesial setae; article-4 shorter and narrower than article-3 with superodistal seta and five terminal; setae. Epignath (Figure 9K) simple, elongate.

Cheliped (Figure 9L–M) basis with posterior lobe about as long as anterior mass; carpus 1.8 times ltb, carpal shield shallow, aspect ratio 0.22; chela longer but as wide as carpus, fixed finger incisive margin with four teeth; dactylus superior margin nodulose.

Pereopod-1 (Figure 10A) typical; merus and carpus with few, or no, setules; propodus slender, six times ltb, 1.7 times longer than carpus, setules sparse; dactylus and unguis together 0.75 times length of propodus. Pereopod-2 (Figure 10B) typical;
carpus without distomedial seta; propodus slender as in pereopod-1. Pereopod-3 (Figure 10C) similar to pereopod-2.

Pereopod-4 (Figure 10D–E) typical; basis with one inferior PSS (not figured); ischium with two unequal setae; merus and carpus with sparse setules; dactylus and unguis together just longer than propodus. Pereopod-5 (Figure 10F) similar to pereopod-4, basis three times ltb, with two inferior PSS. Pereopod-6 (Figure 10G–H) similar to pereopod-5 but basis with one inferior PSS; propodus with three slender superodistal spines; dactylus and unguis as long as propodus.

Pleopod (Figure 10J–K) relatively small; endopod slightly narrower and shorter than exopod, with superodistal seta and distal fringe of seven setae (all finely plumose); exopod with proximal seta separated from distal fringe of 10 finely plumose setae.

Uropod (Figure 8F) peduncle over twice as long as broad; endopod slender, segment-1 1.6 times longer than peduncle, as long as segment-2; exopod slender, just shorter than peduncle, segment-1 just shorter than segment-2.

**Preparatory male.** Habitus (Figure 8G) similar to female but showing typical dimorphic characters; body length 1.8–2.5 mm (n = 13). Antennule (Figure 8H) article-1 2.4 times ltb.

**Etymology**
For my much esteemed colleague Dr. Roger Bamber, for his tireless work and contributions on Tanaidacea (and much else besides).

**Type locality**
West Shetland Shelf, ≈ 61.50°N, 1.00°W, ≈ 200 m.

**Distribution records from the AFEN, BIOICE and BIOFAR area**
Eleven records from the AFEN surveys: nine from the North and West Shetland Shelf and Slope, 120–243 m, and two from the Hebrides Slope, 301–398 m, in sandy substrata.

**Distribution elsewhere**
North Sea (via Roger Bamber); no site data available.

**Remarks**
Until the publication of *Chauliopleona bamberi* n. sp., three species of this genus had originally been recorded with a nodulose or crenate superior margin of the cheliped dactylus: *C. dentata*, *C. paradoxa* and *C. sinus*, but with the discovery of the female of *C. hansknechti*, Błażewicz-Paszkowycz, Bamber, Jóźwiak (2012) showed that this also has a finely crenulate cheliped dactylus. *Chauliopleona bamberi* is therefore the most similar of the four known northeast Atlantic *Chauliopleona* to the type species in possessing this character. This is also shared by several species in *Akanthophoreus* and
Parakanthophoreus. The relatively long cephalothorax and slender, almost smooth, propodus of pereopods 1–3 appear to be other useful or diagnostic characters.

The records from west of the Shetland Isles at shelf and shelf-break depths, 120–243 m, mean at least that it is another (somewhat unexpected) addition to the shallow-water fauna (< 200 m) from the British Isles, following the discovery of Zeuxo holdichi Bamber, 1990 in the Scilly Isles (Bamber 2011). Twenty-seven species were reported by Holdich and Jones (1983) with additions made by Jones and Holdich (1983) and Holdich and Bird (1986), bringing the published total now to 32. It is probable that this species is the source of some records of ‘Leptognathia gracilis’ or ‘Akanthophoreus’ in British waters if the pleonal spur was not observed. In the outer shelf and shelf-break area from where C. bamperi has been found, the tanaidacean fauna is sparse (Bird 2001) and same-sample records include Akanthophoreus gracilis sensu lato, Araphura brevimanus (Lilljeborg, 1864), Akanthophoreus longiremis (Lilljeborg, 1864) and Tanaopsis graciloides (Lilljeborg, 1864), in descending order of abundance (all lower than that of C. bamperi). The first and last of these taxa have a crenulate cheliped dactylus.

Chauliopleona hastata (Hansen, 1913)
(Figures 1H–M, 11–13, 17A, 18)

Leptognathia hastata Hansen, 1913: 79–80, pl. VII figs. 7a–g
Leptognathia hastata: Nierstrasz 1913: 30; Stephensen 1932: 348; else, see Sieg 1983
Chauliopleona hastata: Guerrero-Kommritz 2005: 1191–1195, figs. 7–8; else, see Anderson 2013

Diagnosis
Cephalothorax 1.2 times ltb. Pereonites all shorter than broad; with parallel or weakly convex lateral margins. Pleon shorter than cephalothorax, pleonites 1–4 sternite without prominent sternal process. Antennule article-1 as long as rest of antennule. Maxilliped basis with long seta. Cheliped merus without inferior protuberance; carpus stout, 1.6 times ltb, inferior shield deep (aspect ratio ≈ 0.36–0.4), rounded, distal margin not angular; fixed finger with four teeth; dactylus superior margin smooth. Pereopods 1–3 basis margins smooth; carpus and propodus inferior spines weak. Pereopod-1 dactylus and unguis short, about 2/3 length of propodus. Pereopods 2–3 carpus without distomedial seta. Pereopods 4–6 ischium with two short setae. Uropod endopod < three times length of peduncle; exopod half as long as endopod segment-1.

Material examined
AFEN stns. One non-ov.♀, 53715#1; one ?prep.♂, 53716#1; one ?prep.♂, 53828#1; one non-ov.♀, two non-ov.♀♀, 53832#1; one non-ov.♀, 53835#1; one ?prep.♂, 53839#1; two non-ov.♀♀, 54516; one non-ov.♀, 54523#1/2; one non-ov.♀, 54524#2; one non-ov.♀, 54525#1/2; one prep.♂, 54526#3; one non-ov.♀/early prep.♂, 55278#1; one non-ov.♀, 55282#1; one non-ov.♀, 55283#1; one prep.♂, 55283#2; one non-ov.♀, 55284#1; one non-ov.♀, 55296#1; one non-ov.♀,
Figure 11. *Chauliopleona hastata*. Non-ovigerous female, BIOICE Stn 2027: (A) habitus; (B) pleonal sternites, lateral; (C) pleonite-5 spur variant; (D) antennule; (E) antenna; (F) uropod. Preparatory male, BIOICE Stn 2027: (G) habitus; (H) antennule. Scale bars: (i) 1 mm for A, G; (ii) 0.5 mm for B–C, 0.25 mm for D–F, H.
Figure 12. Chauliopleona hastata. Non-ovigerous female, BIOICE Stn 2027: (A) labrum; (B–C) left and right mandibles, respectively; (D) maxillule; (E) maxilla; (F) maxilliped (one palp omitted); (G) maxilliped palp article-2 mesial setation; (H) epignath; (J) cheliped; (K) cheliped propodus mesial comb. Scale bars: (i) 0.25 mm for A–H; (ii) 0.25 mm for J–K.
Figure 13. *Chauliopleona hastata*. Non-ovigerous female, BIOICE Stn 2027: (A–F) pereopods 1–6, respectively; (G) pleopod (setae very finely plumose, omitted for clarity). Scale bar 0.25 mm.
55300♀; one non-ov.♀, 55300♀; one ind., 55304♀; one non-ov.♀, 55308♀; one non-ov.♀, 55316♀♂; one ov.♀, three post-ov.♀♀, 55317♀♂; one non-ov.♀, 55398♀♂; one non-ov.♀, 55445♀♂; one non-ov.♀, one post-ov.♀, one prep.♂, 55447♀♂; two non-ov.♀♀, 55447♀♂; one non-ov.♀, 57030♀; one non-ov.♀, 57031♀♂; one non-ov.♀, 57068♀♂; one non-ov.♀, 57075♀♂.

**BIOFAR stn.** Two early prep.♂♂, 9009.

**BIOICE stns.** One ov.♀, 2102; eight non-ov.♀♀ (one dissected on microslide), two prep.♂♂, 2027; one non-ov.♀, 2647; three non-ov.♀♀, 2648; one non-ov.♀, 2773; two non-ov.♀♀, 2776; one prep.♂, 3143; one prep.♂, 3187; three non-ov.♀♀, 3219; one non-ov.♀, 3222; one non-ov.♀, 3225.

**Co-types.** Two non-ov.♀♀, Ingolf Stn 102; one non-ov.♂ Stn 125.

**Size**

*Non-ovigerous female.* Body length 1.79–3.85 mm, cf. 2.5–2.8 mm Hansen (1913).

*Ovigerous/post ovigerous female:* body length 2.55–3.27 mm. Preparatory male: body length 2.20–3.15 mm.

**Distribution records from the AFEN, BIOICE and BIOFAR area**

33 records from AFEN surveys: 31 from the Faroe-Shetland Channel, 1026–1741 m, one from the Norwegian Basin 2064 m, one from the West Shetland Slope, 400 m. One record from BIOFAR: Norwegian Basin, 1261 m. Eleven records from BIOICE: two from Denmark Strait, 1012–1146 m, one from the Irminger Basin, 1326 m, five from the Iceland Plateau, 1300–1646 m, one from the Jan Mayen Ridge, 1529 m, and two from the Norwegian Basin, 1639–1994 m; almost all bottom temperatures are negative, ranging from −0.9°C to −0.6°C, but with the exception of Irminger Basin Stn 3187, 3.99°C. A variety of sediments types are recorded including ‘very fine sand’, ‘sandy mud’, ‘silt’ and ‘gravelly sandy silt’.

Also in the area: Ingolf Stn 102, 1412 m, and Stn 125, 1372 m (Hansen 1913); overall depth range 400–1994 m.

**Distribution elsewhere**

Fifteen records from the deep Norwegian Basin (NORBI survey, Bird unpub.) 2470–3709 m.

**Remarks**

This species is recognised by its stout cheliped carpus (1.6 times ltb, Figure 12J) with its deep and rounded inferior shield, while its pereopods 1–3 (Figure 13A–C) are more robust compared to those of *C. amdrupii* and *C. armata*. The pleonal sternites are also lower than in *C. armata* and *C. amdrupii*. The cheliped shown by Guerrero-Kommritz (2005, fig. 7b, f) based on non-type material from the Greenland Sea at
188–191 m is far more massive and angular than those illustrated here from the co-
type and new topotypical material, and is more similar to that of the new genus
described below. Similarly, his drawing of the pereopod-5 (Guerrero-Kommritz 2005,
fig. 8l) suggests that it may not be C. hastata. Another Atlantic species, C. amftae
from the abyssal Angola Basin, also has a robust cheliped but this taxon differs from
C. hastata at least by having a proportionately longer cephalothorax (> pereonites
1–2), a small protuberance/apophysis on the cheliped merus and fewer pleopodal
setae.

Chauliopleona hastata is a cold-water species with an overall recorded depth range
of 400–3709 m, i.e. it is primarily characteristic of the Arctic area of the Norwegian
Sea, but there is a single, possibly spurious, record from the West Shetland Slope at
400 m (SEA-4 Stn 57075#1). The record of a preparatory male from the Irminger
Basin (BIOICE Stn 3187) also looks anomalous but the specimen appears to have
characters consistent with C. hastata, such as its robust cheliped (Figure 17A).

Saurotipleona n. gen.

Akanthophoreus: Holdich and Bird 1989: in part; Bird 2001: in part, see below

Diagnosis
Akanthophoreid with pereonites 2–5 as long as broad or slightly longer, lateral
margins parallel or slightly produced at pereopod insertion. Pleonite-5 sternite with
non-recurved acuminate spur. Pleotelson without lateral spurs. Maxilla setulate.
Maxilliped bases with long seta. Cheliped carpus shield large, rounded; fixed finger
incisive margin without proximal denticulation; dactylus superior margin smooth.
Pereopods 2–3 carpus with three bayonet spines and medial seta. Pereopods 1–3 basis
superior margin with PSS; propodus (and some carpus) inferior spinules robust.
Pereopod-5 propodus with two superodistal spines. Uropod peduncle simple; exopod
two-segmented; endopod slender, about three times length of peduncle.

Preparatory male similar to female but pleon slightly larger; antennule five-
articled, stouter than in female.

Swimming male not known.

Etymology
From the Greek saurotos, ‘spiked’, and suffix pleona; a similar name to
Chauliopleona; gender female.

Type species
Saurotipleona julii sp. nov.; see below. Monotypic.

Remarks
Two superodistal spines (rather than one) on the propodus of pereopod-5 are plesio-
morphic relative to most paratananaoids other than leptocheliids, teleotanaids,
pseudozeuxids, heterotanoidids and a few others, such as *Tangalooma* Bamber, 2008. The presence of this character in an akanthophoreid genus is surprising, although it was apparently observed, but for pereopod-4 and without comment, by Guerrero-Kommritz (2005) for *C. hastata*. The validity of this is discussed below.

**Saurotipleona julii** n. sp.
(Figures 14–16, 17C–E, 19)

*Akanthophoreus* sp.1: Holdich and Bird 1989
*Akanthophoreus* sp.AM#1: Bird 2001
*Chauliopleona* sp.AM#1: Bird 2014: 28, fig. 11b

**Material examined**

*Holotype.* Non-ovigerous ♀, BIOICE Stn 3504, Iceland Basin, 62.02°N, 19.49°W, 1734 m, IINH 29997.

*Allotype.* Preparatory ♂, BIOICE Stn 3522, IINH 29996.

*Paratypes.* AFEN Stn: non-ov. (possibly post-ov.) ♀, 54599#1, NMS.Z.2014.169.

*BIOICE Stns.* One non-ov. ♀, 2257, IINH 29995; one non-ov. ♀, 2337, IINH 29994; one non-ov. ♂, 2410, IINH 29993; one non-ov. ♀, 3181, IINH 29992; one non-ov. ♂, one post-ov. ♀?, 3504, IINH 29991; two non-ov. ♀♀, 3522, IINH 29990.

**Description**

Non-ovigerous female: habitus (Figure 14A) slender, eight times ltb; body length 2.84–4.16 mm. Cephalothorax 1.5 times ltb, about as long as pereonites 1–2 (excluding pereonal gap). Pereon 64% of body length, pereonites parallel-sided or with slight lateral process at pereopod attachment; pereonites 1 and 6 shortest, subequal, shorter than broad, pereonites 2–3 longest. Pleon (Figure 14B) 13% body length, as long as pereonite-6 and half of pereonite-5 combined; epimera with simple setae; sternites 1–4 with low rounded process; pleonite-5 sternal spur acuminate, slightly hamate in some specimens (Figure 14C). Pleotelson as long as two preceding pleonites, smooth, with two simple setae and two PSS on posterior margin.

Antennule (Figure 14D) 0.7 times length of cephalothorax, article-1 about half total length, 2.6 times ltb; article-2 1.6 times ltb, about as long as articles 3–4 combined; setation as figured; article-3 with fine distal setules; article-4 with four or five terminal setae and aesthetasc. Antenna (Figure 14E) about 0.8 times antennule length; article-2 with inferior and superior setae, superior margin with small setules; article-4 with fusion line. Labrum (Figure 15A) typical. Mandibles (Figure 15B–C) typical, left and right incisors tricuspid, lacinia of left mandible relatively narrow; molaris acuminate-palmar with six–eight terminal spines. Labium (Figure 15D) typical, inner lobes distally setulate; outer lobes much reduced with distal setules. Maxillule (Figure 15E) endite with combs; terminal array of nine spines (one thinner than rest, four pectinate) and several long setules. Maxilla (Figure 15F) just shorter
Figure 14. *Saurotipleona julii* n. gen. n. sp. Non-ovigerous female, holotype, BIOICE Stn 3504: (A) habitus; (B) pleonal sternites, lateral. Non-ovigerous female, paratype, BIOICE Stn 3522: (C) pleonite-5 sternal spur; (D) antennule; (E) antenna; (F) uropod. Preparatory male, allotype, BIOICE Stn 3522: (G) habitus; (H) pleonite-5 sternal spur; (J) antennule. Scale bars: (i) 1 mm for A, G; (ii) 0.5 mm for B–C, H; (iii) 0.25 mm for D–F, J.
Figure 15. *Saurotipleona julii* n. gen. n. sp. Non-ovigerous female paratype, BIOICE Stn 3522: (A) labrum; (B–C) left and right mandibles, respectively; (D) labium; (E) maxillule; (F) maxilla; (G) maxilliped (one palp omitted); (H) cheliped; (J) cheliped carpus inferior setae; (K) cheliped propodus mesial comb and dactylus. Scale bars: (i) 0.25 mm for A–G; (ii) 0.25 mm for H–J.
Figure 16. *Saurotipleona julii* n. gen. n. sp. Non-ovigerous female paratype, BIOICE Stn 3522: (A–F) pereopods 1–6, respectively; (G) pleopod (setae very finely plumose, omitted for clarity). Scale bar 0.25 mm.
than maxilliped bases, distally setulate. Maxilliped (Figure 15G) bases together cardioid, about twice as long as broad, each with one long distal seta; endites with proximal coupling hook, two distal setae, setulate distolateral margins and medial lobe; palp article-1 just shorter than article-2, naked; article-2 with lateral seta and three mesial setae; article-3 about as long as article-2, with four unequal mesial setae; article-4 smaller and thinner than article-3, with superodistal seta and five terminal setae. Epignath not observed.

Cheliped (Figure 15H–J) basis with posterior lobe of similar size to anterior mass; carpus fairly slender, 1.8 times ltb (excluding shield), superior margin with setules and two setae, with large, rounded shield (aspect ratio 0.5 on holotype), inferior setae attached medial to this; chela longer than basis and as wide (excluding shield); propodus with two inferior setae attached along ridge or groove, medial comb of about eight spines, and a distolateral seta near the dactylus attachment; fixed finger incisive margin with proximal spine (of group of three) thickest, with

Figure 17. Sketch drawings of Chauliopleona and Saurotipleona. (A) C. hastata?, BIOICE Stn 3187; (B) C. armata sensu lato, Thalassa-73 Stn Z.426; (C–E) S. julii, INCAL ØS.04, cheliped, pleon and pleonite-5 spur, respectively. Not to scale.
low distal teeth; dactylus with smooth superior margin and small proximomedial seta.

Pereopod-1 (Figure 16A) coxa with seta; basis as wide as those of pereopods 4–6, as long as ischium, merus and carpus combined, with superior PSS; ischium with small seta; merus twice as long as broad, with distomesial seta and inferodistal (lateral) spine as long as carpus; carpus twice as long as broad, with superior and inferior distal bayonet spines and inferior margin with weak to moderate spinules; propodus four times ltb, with inferodistal spine, superodistal seta and palmate array of spinules, inferior margin with weak to robust spinules; dactylus and unguis subequal, former with accessory seta, together two thirds as long as propodus. Pereopod-2 (Figure 16B) similar to pereopod-1 but carpus and propodus slightly shorter, carpus with additional inferodistal spine and mesial seta; (PSS on basis probably detached on drawn specimen). Pereopod-3 (Figure 16C) similar to pereopod-2.

Pereopod-4 (Figure 16D) basis longer than in pereopods 1–3, with inferior PSS; ischium with two setae; merus about twice as long as broad, with two inferodistal spines; carpus longer than merus, 2.5 times ltb, with weak inferior spinules; propodus narrower than carpus but as long, with weak inferior spinules; dactylus twice as long as unguis, with double row of inferior spinules, together longer than propodus. Pereopod-5 (Figure 16E) similar to pereopod-4 but basis with two inferior PSS and propodus with two superodistal spines; dactylus and unguis about as long as propodus. Pereopod-6 (Figure 16F) similar to pereopod-4 but propodus with three superodistal spines.

Pleopod (Figure 16G) endopod slightly smaller than exopod, with superodistal seta and distal fringe of seven setae (all finely plumose); exopod with proximal seta on partly demarcated segment, with distal fringe of 13 plumose setae.

Uropod (Figure 14F) as long as pleotelson and pleonites 4–5 combined; peduncle twice as long as wide, simple; exopod half as long as segment-1 of endopod, segment-1 just longer than segment-2; setation typical, as figured; endopod slender, segment-1 just over half total length, five times ltb, with two distal PSS and seta; segment-2 almost seven times ltb, setation as figured.

Post-ovigerous female. Similar to non-ovigerous female but pereon dorso-ventrally compressed, oostegites lost; body length 2.24 mm.

Preparatory male. Habitus (Figure 14G) slender, eight times ltb, body length 2.86 mm. Pleon about 15% of body length; pleonite-5 sternal process (Figure 14H) similar to female. Antennule (Figure 14J) article-1 shorter than rest of articles, 2.2 times ltb; article-4 shorter than broad.

Etymology
For my wonderful son, Julius.

Type locality
Bathyal Iceland Basin, 62.00°N, 19.50°W, ≈ 1000 m.
Distribution records from the AFEN, BIOICE and BIOFAR surveys

Two records from AFEN surveys: one from the Hebrides Slope, 991 m, and one from the northern Rockall Trough, 1886 m. Six records from BIOICE: one from the Irminger Basin, 1209 m, and five from the Iceland Basin, 940–1074 m; temperature range 2.34–4.1°C, with a variety of sediment types including ‘fine sand’, ‘medium sand’ and ‘gravelly sand’.

Distribution elsewhere

There are 21 records from various surveys ranging from the Rockall Trough to the abyssal South Bay of Biscay, 1400–4829 m (see under C. armata).

Remarks

As defined for the genus, this species is distinguished by a long, ventrally directed, pleonal spur and two superodistal spines on pereopod-5. The latter character shown for C. hastata by Guerrero-Kommritz (2005, fig. 8l); is possibly an error as pereopod-6 (Guerrero-Kommritz 2005, fig. 8m) is shown with only one superodistal spine, when typically for akanthophoreids there are three.

Most records of Saurotipleona julii n. sp. are from south of the main study area, at abyssal depths but with an overall depth range of 991–4829 m. An example is INCAL (Intercalibration) Stn 2.4, sample ØS.04, from the Biscay Abyssal Plain (46.05°N, 10.18°W, 4786 m); sketches of the individual presumed to be S. julii are shown in Figure 17C–E. This distribution pattern suggests a eurybathic tolerance but with some degree of polar emergence.

Key to the species of northeast Atlantic Chauliopleona and Saurotipleona

1. Pleonite-5 spur directed ventrally; pereopod-5 propodus with two superodistal spines .......................................................... Saurotipleona julii
   – Pleonite-5 spur recurved; pereopod-5 propodus with one superodistal spine .... Chauliopleona, ................................................................. 2

2. Cheliped dactylus superior margin crenate; pereopods 1–3 propodus slender (six times ltb) and scarcely spinulate ............................................ C. bambergi
   – Cheliped dactylus not crenate; pereopods 1–3 propodus not slender (< six times ltb) and densely spinulate .................................................. 3

3. Cheliped carpus stout, with deep shield ........................................ C. hastata
   – Cheliped carpus not stout, with shallow or moderate shield ..................... 4

4. Cheliped carpus shield shallow, subrectangular; pleonal sternites 1–4 with slightly recurved process .................................................. C. amdrupii
   – Cheliped carpus shield moderate, rounded; pleonal sternites 1–4 with non-recurved process .................................................. C. armata
Discussion

*Chauliopleona* is widely distributed in the world's oceans and may be present in intermediate areas from which no records have yet been obtained (Larsen and Shimomura 2009). In the more local context of this study, no *Chauliopleona* species were recorded by Brandt (1993) or Błażewicz-Paszkowycz and Bamber (2011) from the Kolbeinsey Ridge or the Norwegian Margin, respectively, although the first is within the ‘Atlantic Margin’ region; the second is northeast of the Shetlands sector of this area. Another modern published account, Błażewicz-Paszkowycz and Sekulska-Nalewajko (2004), did not record any *Chauliopleona* species from Kongsfjorden on

Figure 18. Distribution of *Chauliopleona* species in the Atlantic Margin area. Filled triangles *C. amdrupii*, filled squares *C. armata*, and filled circles *C. hastata*; crosses indicate Ingolf records of *C. hastata*. 
the northwest coast of Spitsbergen, although some of the samples were from a depth comparable to those in the Greenland Sea from where the genus had been obtained (Guerrero-Kommritz 2005).

Those results could be rationalised as, although there are about 96 records of these two genera within the context of the present study, they represent only 6.6% of the 1445 samples studied (Bird 2014). Similarly, the actual sampled abundance values are usually small: single specimen (singleton) counts for individual species are most frequent (63, or 66%), 2–5 individuals less frequent (28, 29%), and 6–10 individuals scarce (4, 4%). Only one sample, BIOICE Stn 2856, in the Iceland Basin at 2079 m, yielded a higher count, with 38 specimens of *C. armata*.

Figure 19. Distribution of *Chauliopleona bamberi* and *Saurotipleona julii* in the Atlantic Margin area. Filled squares indicate *C. bamberi*, and filled circles *S. julii*. 
Because the focus of this study is one area of the northeast Atlantic, it leaves unresolved the status of many published and unpublished records of *Chauliopleona* from elsewhere in the Rockall-Biscay area and further afield, many of which rest under the name *Leptognathia armata* (e.g. Holdich and Bird 1985). One undescribed species from the Celtic Slope at 860 m (THALASSA-73 Stn Z.426) exhibits a truly extreme and bizarre character in its cheliped propodus morphology, with five inferior spines (Figure 17B).

It is also evident that some deep-sea and shallow cold-water environments support more than one species of *Chauliopleona*, making identification more difficult. While sympatry occurs with *C. amdrupii*, *C. armata* and *S. julii*, the other two species, *C. hastata* and *C. bamberi*, appear to be more specialised in their distribution, the former primarily from cold bathyal–abyssal Norwegian Sea water, and the latter from sandy sediments in the North Sea and outer shelf and upper slope northwest of the British Isles.

**Addendum**

Two errors appear in the ‘Material examined’ section for *Portaratrum holdichi* Bird, 2014 (p. 18): BIOICE Stn 3624 should read 3264, and BIOICE Stn 2836 should be 2856. These do not affect the maps or other distributional data.

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**Geolocation information**

Study Area (box): 69.2568°N, 30.1150°W to 56.2170°N, 0.8331°E.

**Note**

1. This observation is provisional.

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