

*The British Species of the Copepod Genus Nitocra,\**  
Boeck. By ROBERT GURNEY, M.A.

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THE species of the genus *Nitocra*, hitherto recorded as British, are—*N. hibernica* (Brady), *N. palustris* (Brady), *N. palustris*, var. *elongata*, Scott, *N. simplex*, Schmeil\*, *N. oligochaeta*, Giesb., and *N. (Ameira) amphibia*, Brady. Of these *N. hibernica* is a purely fresh-water species, quite distinct from the rest, and *N. simplex* is also undoubtedly a distinct species; but, concerning the remaining species, there is some confusion as regards their validity and relationship to one another. Prof. Sars, in his 'Crustacea of Norway,' has treated *N. palustris*, *N. oligochaeta*, and *Ameira amphibia* as synonyms of *N. typica*, Boeck, while he regards *N. palustris*, var. *elongata*, Scott, as identical with *N. spinipes*, Boeck. With regard to *N. oligochaeta* and *A. amphibia*, he is unquestionably right, but some uncertainty remains about *N. palustris* (Brady). Having recently met with the species attributed by Prof. Sars to *N. spinipes*, Boeck, I was led to re-examine specimens which I had previously referred to *N. palustris*, and found that, in all cases, these specimens were properly to be referred to *N. spinipes*. This species is

\* Ann. & Mag. Nat. Hist. (9) v. p. 356 (1920).

identical in all respects with Brady's *N. palustris*, with the exception that Brady describes the fifth foot of the male of that species as "obsolete, being reduced to a minute setiferous lobe," so that it was evident, either that *N. palustris* is synonymous with *N. spinipes*, and not with *N. typica*, as Prof. Sars states, or that it is a species distinct from both.

Through the kindness of Dr. Calman, I have been allowed to examine all the specimens of the genus in the Norman Collection in the British Museum. This collection contains specimens (named as *N. palustris*) from seven localities, and in all cases the females were found to be indistinguishable from *N. spinipes*. In four cases only were males present, but these males also agree exactly with those of *N. spinipes*, so that all the specimens in the Norman Collection may be regarded as belonging to that species. Prof. Meek has been good enough to send me a slide containing specimens collected by Prof. Brady at Oulton Broad, Suffolk, and named by him *Canthocamptus palustris*, and, as this is one of the original localities given by him, the specimens may be regarded as co-types. Unfortunately no males were found upon the slide, but the females agree in all respects with *N. spinipes*. The Norman Collection includes examples from Seaton Carew, Durham, which were probably named by Dr. Brady, and among these were one or two males having the fifth foot as in *N. spinipes*, so that there can be no doubt that *N. palustris* (Brady) is not a distinct species, but is synonymous with *N. spinipes*, Boeck, as described by Prof. Sars. Van Douwe\* figures the fifth foot of *N. palustris* as a broad plate with four setæ, but, as he does not appear to have met with the male himself† probably his figure is taken from Dr. Brady's, which, in my opinion, represents the basal part only, the distal joint having been overlooked.

The following synonymy and short description will suffice to discriminate the British species of *Nitocra* :—

#### 1. *Nitocra hibernica* (Brady).

*Canthocamptus hibernicus*, Brady, Mon. British Copepoda, xi. 1880, p. 52.

*Nitocra hibernica*, Schmeil, Deutsch. Freil. Cop. 1893, p. 78.

Abdominal segments with rings of spines complete dorsally. Dorsal surface marked with very fine cilia. Furcal rami longer than wide.

\* 'Deutschlands Susswasserfauna,' Heft xi. 1909, p. 57.

† Zool. Anz. xxix. 1905, p. 519.



First legs : first joint of endopodite as long as the whole exopodite, the last two joints very small.

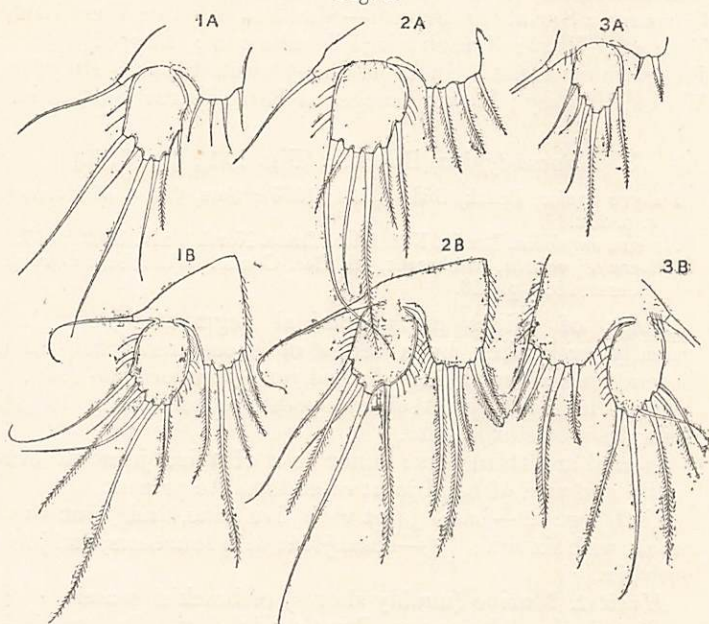
Second and third legs : no inner seta on third joint of exopodite, no seta on basal joint of endopodite.

Fifth legs of female : basal joint with two setae and three modified spines ; second joint narrow, with six setae.

*Habitat.* Fresh water.

*Distribution.* Germany, France, South Russia. In England only in South and East, and in Ireland. Common in Norfolk Broads.

Fig. 1.



Fifth legs of male (A) and female (B) of *N. typica* (1), *N. spinipes* (2), and *N. simplex* (3).

## 2. *Nitocra spinipes*, Boeck. (Fig. 1, 2 ; fig. 2, B.)

*Nitocra spinipes*, Boeck, Forh. i. vid. Selsk. Christ. 1865, p. 274 ; Sars, Crustacea of Norway, v. 1911, p. 213.

*Canthocamptus palustris*, Brady, Monog. 1880, p. 53.

*Canthocamptus palustris*, Van Douwe, Zool. Anz. xxix. 1905, p. 519.

*Canthocamptus palustris*, var. *elongata*, T. & A. Scott, Ann. & Mag. Nat. Hist. (6) xiv. 1895, p. 459.

Rings of spines on abdominal segments not complete

dorsally. In the male there is a transverse row of spines at the base of the operculum. Furcal rami broader than long.

First leg: endopodite slightly longer than exopodite, its first joint exceeding the first two joints of the exopodite.

Second and third legs: inner seta of third joint of exopodite present.

Fifth leg of female: basal joint with five setæ. Second joint oval, with five setæ. In the male the basal joint has three or four setæ, and the second joint has six setæ and is broader than in the female.

*Habitat.* Brackish water.

*Distribution.* Norway; Novaya Zemlya; Baltic coast of Germany; Syria. In Britain—Shetland islands; West Loch Tarbert; Unst; Langbank; Dumbarton; Bay of Nigg; Hengistbury Head. In Norfolk—Oulton Broad; Breydon Water; Horsey; Lower reaches of River Bure; Salthouse.

### 3. *Nitocra typica*, Boeck. (Fig. 1, 1; fig. 2, A.)

*Nitocra typica*, Boeck, *ibid.* p. 274 (1865); Sars, *Crust. of Norway*, v. p. 212.

*Ameira amphibia*, Brady, *Nat. Hist. Trans. Northd.* xiv. 1902, p. 57.

*Nitocra oligochaeta*, Giesbrecht, 4th Ber. *Comm. Wiss. Unt. deutsch. Meeres*, 1882, p. 116.

Rings of spines on abdominal segments incomplete dorsally or broken by a series of exceedingly fine cilia. Lateral spines very long. Furcal rami broader than long.

First leg: first joint of endopodite considerably longer than the whole exopodite.

Second and third legs: inner seta of third joint of exopodite and seta of basal joint of endopodite present.

Fifth leg: ♀—basal joint with five setæ, 2nd joint oval, broad, with six setæ. ♂—basal joint with four setæ, 2nd joint with six.

*Habitat.* Marine (muddy shores) or brackish water.

*Distribution.* Norwegian Coast; Kiel Bay. In Britain—Salcombe; Southport; Scilly Islands; Newcastle, Co. Down; Salthouse (Norfolk).

### 4. *Nitocra simplex*, Schmeil. (Fig. 1, 3; fig. 2, C.)

*Nitocra simplex*, Schmeil, *Zeits. Naturw.* lxvii. 1894, p. 347.

*Nitocra mülleri*, Van Douwe, *Zool. Anz.* xxviii. 1905, p. 434.

Rings of spines on abdominal segments incomplete dorsally.

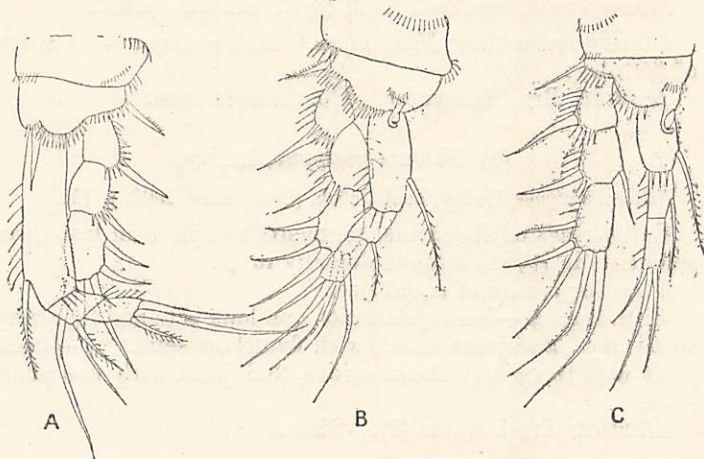
First leg: endopodite and exopodite of about the same length.



Second and third legs: inner seta of third joint of exopodite present. No seta on basal joint of endopodite.

Fifth leg of female: basal joint with five setæ, second joint with six setæ, rather narrower than in *N. spinipes*.

Fig. 2.



A. *N. typica*. First leg of female.  
B. *N. spinipes*. First leg of male.  
C. *N. simplex*. First leg of male.

First antenna of male: penultimate joint with a row of knobs.

*Habitat*. Slightly brackish water.

*Distribution*. Germany (Baltic Coast). Norfolk—Hickling Broad and a ditch at Cley-by-Sea.

The genus includes also the following species:—

(1) *Nitocra pusilla*, Sars.

*Nitocra pusilla*, Sars, Crust. of Norway, v. p. 396.

Differs from all other species in absence of spines from the operculum and last segment of the abdomen. In this and other respects it approaches the genus *Ameira*.

*Habitat*. Marine. Norwegian Coast.

(2) *Nitocra wolterecki*, Brehm.

*Nitocra wolterecki*, Brehm, Zool. Anz. xxxiv. 1909, p. 421.

First leg: rami of equal length.

Fifth leg of female : basal joint with five setæ, 2nd joint narrow, with five setæ.

*Habitat.* Brackish water. Phlegræan Plain, Italy.

(3) *Nitocra fragilis*, Sars.

*Nitocra fragilis*, Sars, Zool. Jahrb. (Syst.) xxi. 1905, p. 386.

Closely resembling *N. spinipes*. Differs from it in shape of fifth leg.

*Habitat.* Brackish water. Chatham Islands.

(4) *Nitocra platypus*, Daday.

*Nitocra platypus*, Daday, Zool. Jahrb. (Syst.) xxiv. 1906, p. 192.

Spine-rings of abdominal segments complete in last three segments in ♂, incomplete dorsally in ♀.

First leg : rami of equal size.

Fifth leg : ♀ —basal joint with one long seta and four very small ones, 2nd joint small, with five short setæ. ♂ —basal joint with three very short spines, 2nd joint with five short setæ.

*Habitat.* Fresh water (?). Siam.

The following species which have been ascribed to the genus *Nitocra* should, in my opinion, be referred to other genera :—

(1) *Nitocra paradoxa*, Daday.

*Nitocra paradoxa*, Daday, Zool. Jahrb. (Syst.) xix. 1904, p. 492 (Turkestan).

The possession of two egg-sacs, the structure of the mandible-palp, and the absence of denticles on the operculum, together with the arrangement of the setæ of the swimming-legs bring this species within the definition of the genus *Schizopera*, Sars, eight species of which have been described by Prof. Sars from Lake Tanganyika, while he notes the occurrence of species also in the Chatham Islands, Caspian Sea, and in Birket-el-Kurun, Egypt.

(2) *Nitocra phlegræa*, Brehm.

*Nitocra phlegræa*, Brehm, Zool. Anz. xxxiv. 1909, p. 422 (Italy).

Brehm's description is somewhat incomplete, but the extreme elongation of the endopodite of the first leg and the form of the sensory spine at the base of this leg in the ♂ agree more with the genus *Ameira* than with *Nitocra*.

(3) *Nitocra brevisetosa*, Daday.

*Nitocra brevisetosa*, Daday, Termes. Fuz. xxxiv. 1901, p. 37 (New Guinea).

The two-jointed endopodite of the fourth leg and the structure of the antenna and fifth feet exclude this species from the genus *Nitocra*. It should be included in the genus *Canthocamptus*.

(4) *Nitocra gracilimana*, Giesbrecht.

*Nitocra gracilimana*, Giesbrecht, Res. Voyage du Belgica, 1902.

The smooth anal operculum, slenderness of first leg, form of the sensory spine of the male first leg, and the structure of the fifth feet indicate the genus *Ameira*.

*Key for Discrimination of the European Species of Nitocra.*

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|---|-------------------------------|
| 1. First leg: first joint of endopodite as long as, or longer than, exopodite . . . . . | 2.                            |
| This joint shorter than the exopodite . . . . .   | 4.                            |
| 2. Anal operculum smooth . . . . .  | <i>N. pusilla</i> , Sars.     |
| Anal operculum with spines . . . . .  | 3.                            |
| 3. Furcal rami longer than wide . . . . .   | <i>N. hibernica</i> (Brady).  |
| Furcal rami wider than long . . . . .   | <i>N. typica</i> , Boeck.     |
| 4. Distal joint of fifth leg of female with six setæ . . . . .                          | <i>N. simplex</i> , Schmeil.  |
| This joint with five setæ . . . . .   | 5.                            |
| 5. Furcal rami as wide as long. Distal joint of fifth foot of female narrow . . . . .   | <i>N. wolterecki</i> , Brehm. |
| Furcal rami wider than long. Distal joint of fifth leg of female broad . . . . .        | <i>N. spinipes</i> , Boeck.   |